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# KOGANEI

## ACCESSORIES GENERAL CATALOG

### AIR TREATMENT, AUXILIARY, VACUUM, AND FLUORORESIN PRODUCTS

MULTI SERIES

## MULTI SERIES CONTENTS

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**Caution**

Before use, be sure to read the "Safety Precautions" on p. 49.

# Modular Types Achieve Maximally Rationalized Air Preparation Systems.

The Koganei Multi Series offers a wide variety of series configurations and variations, supplying optimized air for all kinds of air actuation and air controls. Moreover, the modular type enables the user to assemble individual devices into a single compact assembly for easy maintenance after mounting.

## F.R.L. Combinations 59



| Model       | Port size |     |     |     | Rc |
|-------------|-----------|-----|-----|-----|----|
|             | 1/8       | 1/4 | 3/8 | 1/2 |    |
| <b>C150</b> | 01        | 02  |     |     |    |
| <b>C200</b> |           | 02  |     |     |    |
| <b>C300</b> |           | 02  | 03  |     |    |
| <b>C400</b> |           | 02  | 03  |     |    |
| <b>C600</b> |           | 02  | 03  | 04  |    |

## Filter Regulators 63

Standard, low pressure, built-in check mechanism types



| Model        |              |                          | Port size |     |     |     | Rc |
|--------------|--------------|--------------------------|-----------|-----|-----|-----|----|
| Standard     | Low pressure | Built-in check mechanism | 1/8       | 1/4 | 3/8 | 1/2 |    |
| <b>FR150</b> | <b>FR151</b> | <b>FR152</b>             | 01        | 02  |     |     |    |
| <b>FR300</b> | <b>FR301</b> | <b>FR302</b>             |           | 02  | 03  |     |    |
| <b>FR600</b> | <b>FR601</b> | <b>FR602</b>             |           | 02  | 03  | 04  |    |

## Air Filters 67



| Model       | Port size |     |     |     | Rc |
|-------------|-----------|-----|-----|-----|----|
|             | 1/8       | 1/4 | 3/8 | 1/2 |    |
| <b>F150</b> | 01        | 02  |     |     |    |
| <b>F300</b> |           | 02  | 03  |     |    |
| <b>F600</b> |           | 02  | 03  | 04  |    |

## Mist Filters 69



| Model        | Port size |     |     | Rc |
|--------------|-----------|-----|-----|----|
|              | 1/4       | 3/8 | 1/2 |    |
| <b>MF300</b> | 02        | 03  |     |    |
| <b>MF400</b> | 02        | 03  | 04  |    |
| <b>MF600</b> | 02        | 03  | 04  |    |

## Micro Mist Filters 71



| Model         | Port size |     |     | Rc |
|---------------|-----------|-----|-----|----|
|               | 1/4       | 3/8 | 1/2 |    |
| <b>MMF150</b> | 02        | 03  |     |    |
| <b>MMF300</b> | 02        | 03  | 04  |    |
| <b>MMF400</b> | 02        | 03  | 04  |    |

## Auto Drains 73



| Model        | Body size      |
|--------------|----------------|
| <b>AD300</b> | For 300 series |
| <b>AD600</b> | For 600 series |

## Regulators 74

Standard, low pressure, built-in check mechanism types



| Model       |              |                          | Port size |     |     |     | Rc |
|-------------|--------------|--------------------------|-----------|-----|-----|-----|----|
| Standard    | Low pressure | Built-in check mechanism | 1/8       | 1/4 | 3/8 | 1/2 |    |
| <b>R150</b> | <b>R151</b>  | <b>R152</b>              | 01        | 02  |     |     |    |
| <b>R300</b> | <b>R301</b>  | <b>R302</b>              |           | 02  | 03  |     |    |
| <b>R600</b> | <b>R601</b>  | <b>R602</b>              |           | 02  | 03  | 04  |    |

## Precision Regulator 77



| Model        | Port size | Rc |
|--------------|-----------|----|
| <b>PR200</b> | 1/4       | 02 |

### High-relief Regulators 79



|                | Model         | Port size |     |     |     | Rc |
|----------------|---------------|-----------|-----|-----|-----|----|
|                |               | 1/8       | 1/4 | 3/8 | 1/2 |    |
| Internal pilot | <b>HR200</b>  | 01        | 02  |     |     |    |
|                | <b>HR600</b>  |           |     | 03  | 04  |    |
| External pilot | <b>HRA200</b> | 01        | 02  |     |     |    |
|                | <b>HRA600</b> |           |     | 03  | 04  |    |

### Manifold Regulators 83

Standard, low pressure types



| Model        |              | Port size |     | Rc |
|--------------|--------------|-----------|-----|----|
| Standard     | Low pressure | 1/4       | 3/8 |    |
| <b>MR302</b> | <b>MR303</b> | 02        | 03  |    |

### Lubricators 86

Standard, micro lubricator



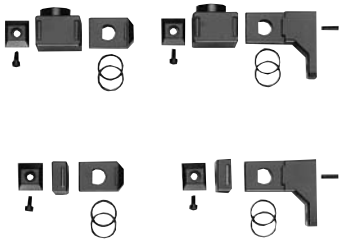
|             | Model       |                  | Port size |     |     |     | Rc |
|-------------|-------------|------------------|-----------|-----|-----|-----|----|
|             | Standard    | Micro lubricator | 1/8       | 1/4 | 3/8 | 1/2 |    |
| <b>L150</b> | —           |                  | 01        | 02  |     |     |    |
| <b>L300</b> | <b>L301</b> |                  | 02        | 03  |     |     |    |
| <b>L600</b> | <b>L601</b> |                  | 02        | 03  | 04  |     |    |

### Residual Pressure Exhaust Valves 89



| Model       | Port size |     |     |     | Rc |
|-------------|-----------|-----|-----|-----|----|
|             | 1/8       | 1/4 | 3/8 | 1/2 |    |
| <b>300V</b> | 01        | 02  | 03  |     |    |
| <b>600V</b> |           |     |     | 04  |    |

### Modules and Adapters 91



### Brackets 95



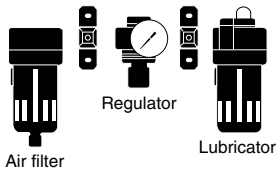
# Components Maximize the Benefits of the Modular Type.

A wide selection of accessories for system upgrades of components and their functions allows for extensive adaptability of the modular type.

## Modular System Upgrades

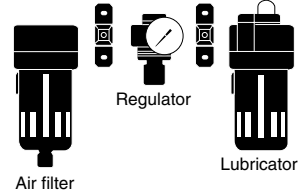
Use of modules and S adapters allows configuration of systems optimized for all kinds of applications and air consumption.

### F.R.L. Combinations

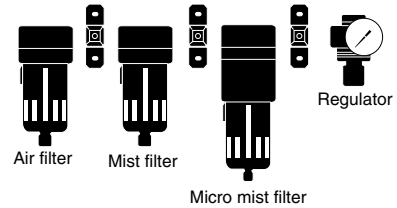


### F.R.L. Combinations

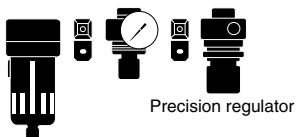
(Large capacity air filters and lubricators for easy maintenance)



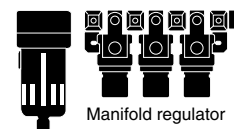
### F, MF, MMF, and R for Clean Air Applications



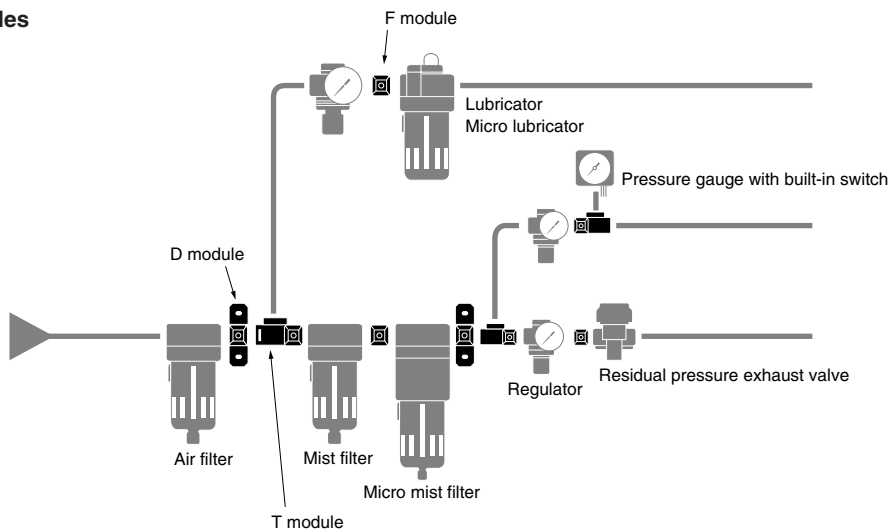
### Precision Pressure Control



### Individual Pressure Control



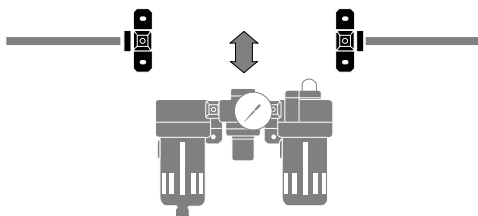
## Modules



## S adapters

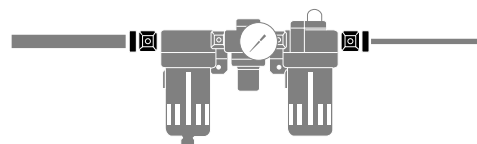
### Quick attaching and removal

Allows installation or removal of equipment while leaving the piping intact.



### Connect different size piping

Allows changes in the IN and OUT piping sizes.



### List of Equipment Combinations

| Body size  |                         | 150 series   |      |      |      |       | 300 series  |      |       |        |      |                         |                         | 600 series  |      |       |      |       |       |        |        |      |      |      |       |
|------------|-------------------------|--|------|------|------|-------|---|------|-------|--------|------|-------------------------|-------------------------|---|------|-------|------|-------|-------|--------|--------|------|------|------|-------|
| Model      |                         | FR150  | F150 | R150 | L150 | HR200 | FR300   | F300 | MF300 | MMF150 | R300 | PR200 <sup>Note 2</sup> | MR300 <sup>Note 1</sup> | L300  | 300V | FR600 | F600 | MF400 | MF600 | MMF300 | MMF400 | R600 | L600 | 600V | HR600 |
| 150 series | FR150                   | <b>8-15F</b><br><b>8-15D</b><br><b>8-15T</b> □<br><b>8-15DT</b> □<br><b>8-15S</b> □<br><b>8-15DS</b> □ |      |      |      |       | <b>8-20D</b> (D module for bracket-combined use)  |      |       |        |      |                         |                         |   |      |       |      |       |       |        |        |      |      |      |       |
|            | F150                    |  |      |      |      |       |   |      |       |        |      |                         |                         |   |      |       |      |       |       |        |        |      |      |      |       |
|            | R150                    |  |      |      |      |       |   |      |       |        |      |                         |                         |   |      |       |      |       |       |        |        |      |      |      |       |
|            | L150                    |  |      |      |      |       |   |      |       |        |      |                         |                         |   |      |       |      |       |       |        |        |      |      |      |       |
|            | HR200                   |  |      |      |      |       |   |      |       |        |      |                         |                         |   |      |       |      |       |       |        |        |      |      |      |       |
|            |                         |  |      |      |      |       |   |      |       |        |      |                         |                         |   |      |       |      |       |       |        |        |      |      |      |       |
| 300 series | FR300                   | <b>8-20D</b><br>(D module for bracket-combined use)  |      |      |      |       | <b>8-30F</b> (F module)<br><b>8-30D</b> (D module for bracket-combined use)<br><b>8-30T</b> □ (T module)<br><b>8-30DT</b> □ (T module for bracket-combined use)<br><b>8-30S</b> □ (S adapter)<br><b>8-30DS</b> □ (S adapter for bracket-combined use) |      |       |        |      |                         |                         | <b>8-40D</b> (D module for bracket-combined use)  |      |       |      |       |       |        |        |      |      |      |       |
|            | F300                    |  |      |      |      |       |   |      |       |        |      |                         |                         |   |      |       |      |       |       |        |        |      |      |      |       |
|            | MF300                   |  |      |      |      |       |   |      |       |        |      |                         |                         |   |      |       |      |       |       |        |        |      |      |      |       |
|            | MMF150                  |  |      |      |      |       |   |      |       |        |      |                         |                         |   |      |       |      |       |       |        |        |      |      |      |       |
|            | R300                    |  |      |      |      |       |   |      |       |        |      |                         |                         |   |      |       |      |       |       |        |        |      |      |      |       |
|            | PR200 <sup>Note 2</sup> |  |      |      |      |       |   |      |       |        |      |                         |                         |   |      |       |      |       |       |        |        |      |      |      |       |
|            | MR300 <sup>Note 1</sup> |  |      |      |      |       |   |      |       |        |      |                         |                         |   |      |       |      |       |       |        |        |      |      |      |       |
|            | L300                    |  |      |      |      |       |   |      |       |        |      |                         |                         |   |      |       |      |       |       |        |        |      |      |      |       |
|            | 300V                    |  |      |      |      |       |   |      |       |        |      |                         |                         |   |      |       |      |       |       |        |        |      |      |      |       |
|            |                         |  |      |      |      |       |   |      |       |        |      |                         |                         |   |      |       |      |       |       |        |        |      |      |      |       |
| 600 series | FR600                   |  |      |      |      |       | <b>8-40D</b> (D module for bracket-combined use)  |      |       |        |      |                         |                         | <b>8-60F</b> (F module)<br><b>8-60D</b> (D module for bracket-combined use)<br><b>8-60T</b> □ (T module)<br><b>8-60DT</b> □ (T module for bracket-combined use)<br><b>8-60S</b> □ (S adapter)<br><b>8-60DS</b> □ (S adapter for bracket-combined use) |      |       |      |       |       |        |        |      |      |      |       |
|            | F600                    |  |      |      |      |       |   |      |       |        |      |                         |                         |   |      |       |      |       |       |        |        |      |      |      |       |
|            | MF400                   |  |      |      |      |       |   |      |       |        |      |                         |                         |   |      |       |      |       |       |        |        |      |      |      |       |
|            | MF600                   |  |      |      |      |       |   |      |       |        |      |                         |                         |   |      |       |      |       |       |        |        |      |      |      |       |
|            | MMF300                  |  |      |      |      |       |   |      |       |        |      |                         |                         |   |      |       |      |       |       |        |        |      |      |      |       |
|            | MMF400                  |  |      |      |      |       |   |      |       |        |      |                         |                         |   |      |       |      |       |       |        |        |      |      |      |       |
|            | R600                    |  |      |      |      |       |   |      |       |        |      |                         |                         |   |      |       |      |       |       |        |        |      |      |      |       |
|            | L600                    |  |      |      |      |       |   |      |       |        |      |                         |                         |   |      |       |      |       |       |        |        |      |      |      |       |
|            | 600V                    |  |      |      |      |       |   |      |       |        |      |                         |                         |   |      |       |      |       |       |        |        |      |      |      |       |
|            | HR600                   |  |      |      |      |       |   |      |       |        |      |                         |                         |   |      |       |      |       |       |        |        |      |      |      |       |

- Modules combining same-size equipment.
- Modules combining equipment of different sizes.
- Cannot be combined.



Notes: 1. Piping direction for the manifold regulator **MR300** differs from other equipment types. See p.83 for details.  
 2. The precision regulator **PR200** cannot be combined with the **600** series.

### List of Module Adapter Types

For 150, 300, and 600 series

| Module and adapter<br>Body size | F module                          |                                   | D module                          |  | T module                          |  | S adapter                         |                                   |                                   |
|---------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|--|-----------------------------------|--|-----------------------------------|-----------------------------------|-----------------------------------|
|                                 | F<br>(For modules only)           | D<br>(For brackets only)          | T<br>(Branch piping)              | DT<br>(Brackets for combined use with branch piping) | S<br>(Port connection)            | DS<br>(Brackets for combined use with port connection) |                                   |                                   |                                   |
| 15<br>(For 150 series)          | Multi series<br>↔<br>Multi series | Multi series<br>↔<br>Multi series | Multi series<br>↔<br>Multi series | Multi series<br>↔<br>Multi series                    | Multi series<br>↔<br>Multi series | Multi series<br>↔<br>Multi series                      | Multi series<br>↔<br>Multi series | Multi series<br>↔<br>Multi series | Multi series<br>↔<br>Multi series |
| 30<br>(For 300 series)          | 8-15F                             | 8-15D                             | 8-15T □                           | 8-15DT □   | 8-15S □                           | 8-15DS □   |                                   |                                   |                                   |
| 60<br>(For 600 series)          | 8-30F                             | 8-30D                             | 8-30T □                           | 8-30DT □   | 8-30S □                           | 8-30DS □   |                                   |                                   |                                   |
|                                 | 8-60F                             | 8-60D                             | 8-60T □                           | 8-60DT □   | 8-60S □                           | 8-60DS □   |                                   |                                   |                                   |

### For connections between different sizes

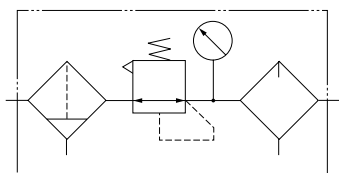
| Module<br>Body size                       | D module<br>(Brackets for combined use)   |
|---|---|
| 20<br>(For connecting 150 and 300 series) | 300 Series ↔  ↔ 150 Series<br><b>8-20D</b> |
| 40<br>(For connecting 300 and 600 series) | 600 Series ↔  ↔ 300 Series<br><b>8-40D</b> |

# F.R.L. COMBINATIONS

## C150, C200, C300, C400, C600

- An easy-mounting and easy-maintenance modular type.
- Many combinations of body sizes and port sizes.
- Full range of accessories and options with priority on performance.

### Symbol

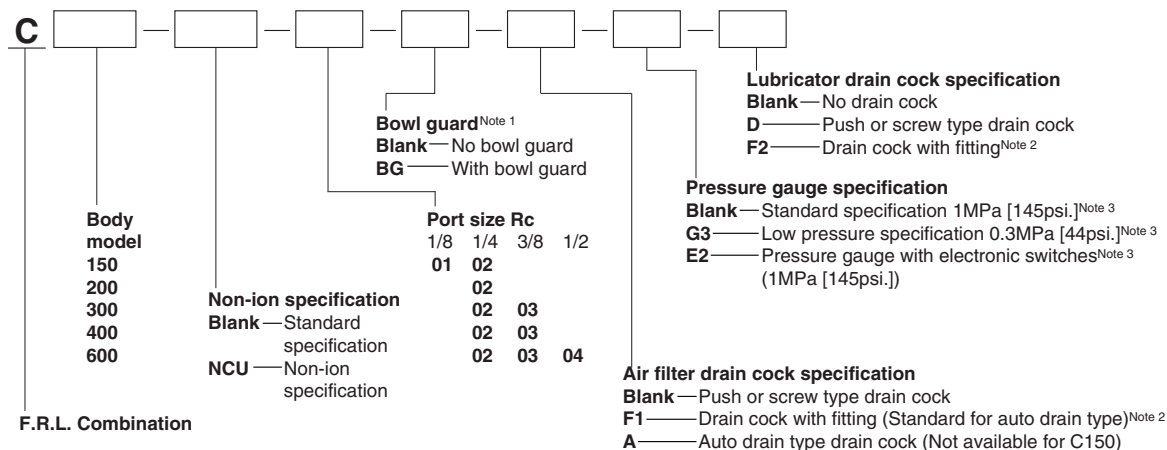


### Specifications

| Item   | Model                                     | C150  | C200                                     | C300             | C400                                     | C600                 |
|--|---|---|--|------------------|--|----------------------|
| Media  |   | Air   |  |                  |  |                      |
| Port size  | Rc  | 1/8, 1/4  | 1/4                                      | 1/4, 3/8         | 1/4, 3/8                                 | 1/4, 3/8, 1/2        |
| Filtration rating                                  | $\mu\text{m}$                             | 5   |  |                  |  |                      |
| Pressure setting range                             | MPa [psi.]                                | 0.05~0.83 [7~120]   |  |                  |  |                      |
| Maximum operating pressure                         | MPa [psi.]                                | 0.93 [135]  |  |                  |  |                      |
| Proof pressure                                     | MPa [psi.]                                | 1.47 [213]  |  |                  |  |                      |
| Operating temperature range (atmosphere and media) | $^{\circ}\text{C}$ [ $^{\circ}\text{F}$ ] | 5~60 [41~140]   |  |                  |  |                      |
| Air filter drain capacity                          | cc [in <sup>3</sup> ]                     | 15 [0.92]   | 55 [3.36]                                |                  | 90 [5.49]                                |                      |
| Oil capacity for lubricator                        | cc [in <sup>3</sup> ]                     | 25 [1.53]   | 85 [5.19]                                |                  | 160 [9.76]                               |                      |
| Recommended lubrication                            |   | Turbine oil Class 1 [ISO VG32] or equivalents.            |  |                  |  |                      |
| Mass (with pressure gauge)                         | kg [lb]                                   | Standard  | 1.16 [2.56]                              | 1.20 [2.65]      | 1.43 [3.15]                              | 1.51 [3.33]          |
|  |   | Auto drain type   | 1.19 [2.62]                              | 1.23 [2.71]      | 1.46 [3.22]                              | 1.54 [3.40]          |
| Materials  | Body                                      | Aluminum die-casting                                      | Aluminum die-casting<br>Zinc die-casting | Zinc die-casting | Aluminum die-casting<br>Zinc die-casting | Aluminum die-casting |
|  | Bowl                                      | Polycarbonate   |  |                  |  |                      |
| Models of components                               | Air filter                                | F150  | F300                                     | F300             | F600                                     | F600                 |
|  | Regulator                                 | R150  | R150                                     | R300             | R300                                     | R600                 |
|  | Lubricator                                | L150  | L300                                     | L300             | L600                                     | L600                 |
| Standard attachments                               | Bracket                                   | D module  |  |                  |  |                      |
|  | Air filter                                | Push type drain cock                                      | Screw type drain cock, bowl guard        |                  |  |                      |
|  | Regulator                                 | Pressure gauge G1-40 ( $\phi$ 40 $\times$ 1MPa [145psi.]) |  |                  |  |                      |
|  | Lubricator                                | —   | Bowl guard                               |                  |  |                      |

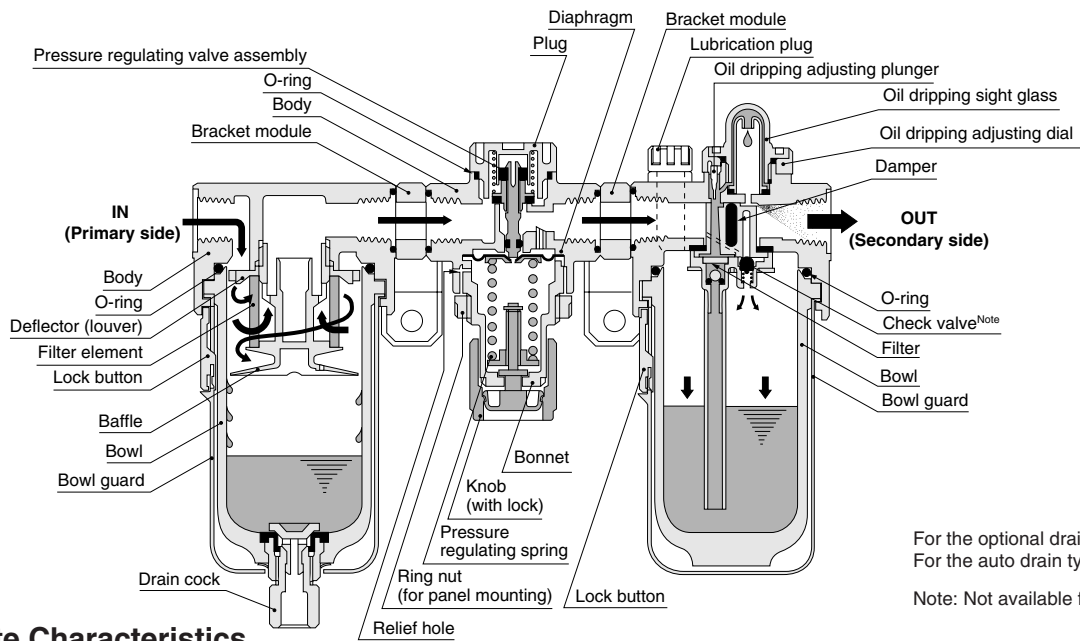
Note: Figure in parentheses ( ) shows mass with bowl guard.

### Order Codes



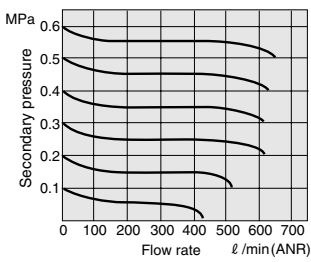
- Notes: 1. For C150 only. Standard for all models other than C150.  
2. Available only for C150 with -BG (bowl guard).  
3. For the specifications and dimensions for the pressure gauge, and pressure gauge with electronic switches, see p.172 and 177~181.

# Inner Construction

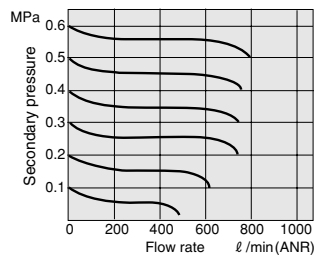


## Flow Rate Characteristics

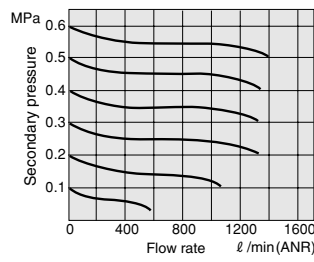
**C150**



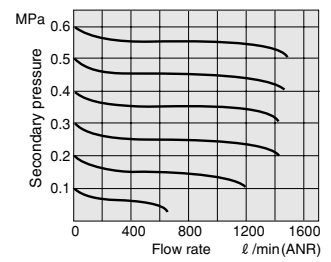
**C200**



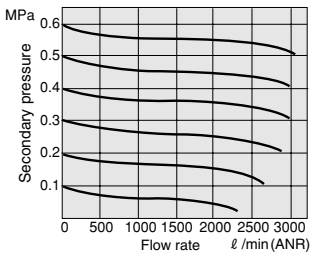
**C300**



**C400**



**C600**

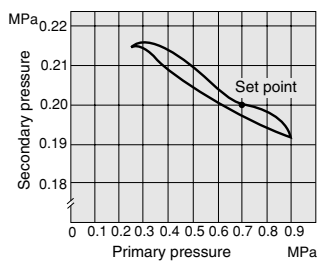


Remark: Graphs show flow rate characteristics when the primary pressure is fixed at 0.7MPa [102psi].

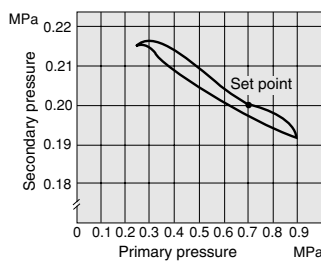
1MPa=145psi. 1 ℓ/min=0.0353ft<sup>3</sup>/min.

## Pressure Characteristics

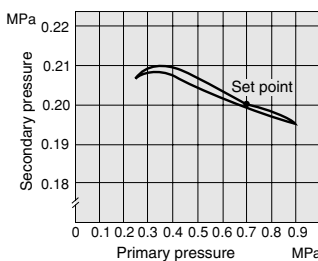
**C150**



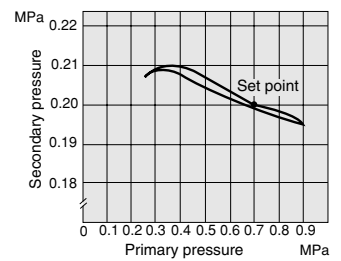
**C200**



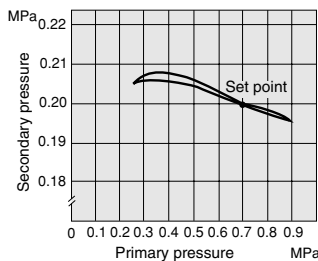
**C300**



**C400**



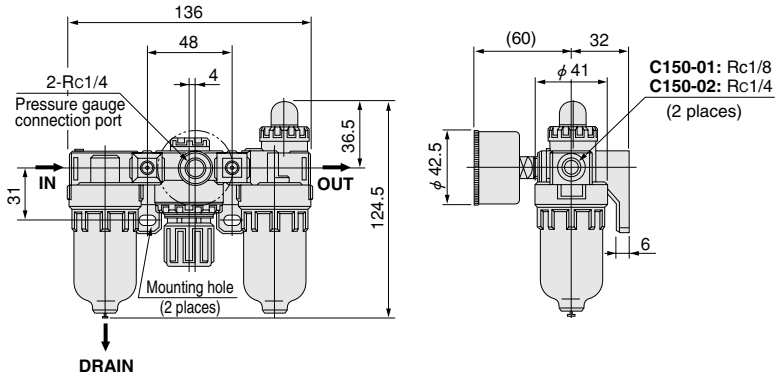
**C600**



1MPa=145psi. 1 ℓ/min=0.0353ft<sup>3</sup>/min.

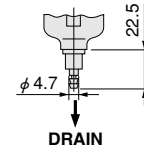
# Dimensions of F.R.L. Combinations (mm)

## C150

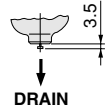


### Drain cock option

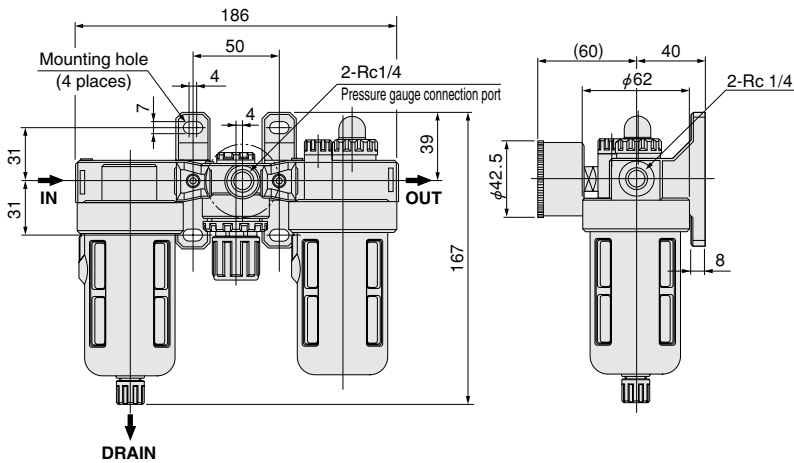
- Push type with fitting  
(Air filter: -BG-F1)  
(Lubricator: -BG-F2)



- Push type  
(Air filter: Standard)  
(Lubricator: -D)

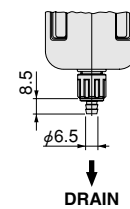


## C200

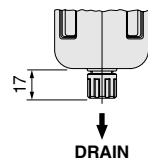


### Drain cock option

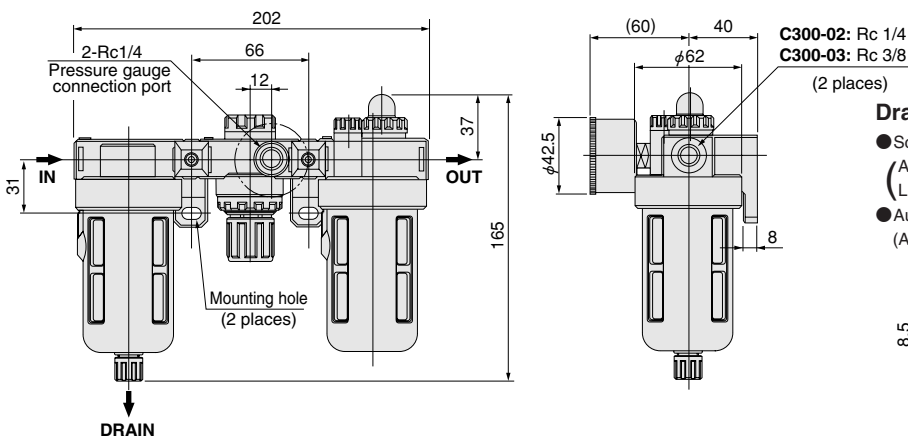
- Screw type with fitting  
(Air filter: -F1)  
(Lubricator: -F2)
- Auto drain type  
(Air filter: -A)



- Screw type  
(Air filter: Standard)  
(Lubricator: -D)

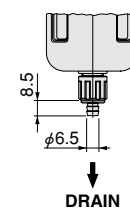


## C300

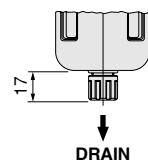


### Drain cock option

- Screw type with fitting  
(Air filter: -F1)  
(Lubricator: -F2)
- Auto drain type  
(Air filter: -A)

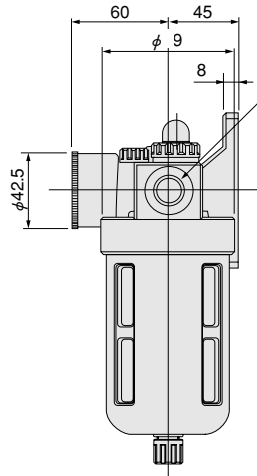
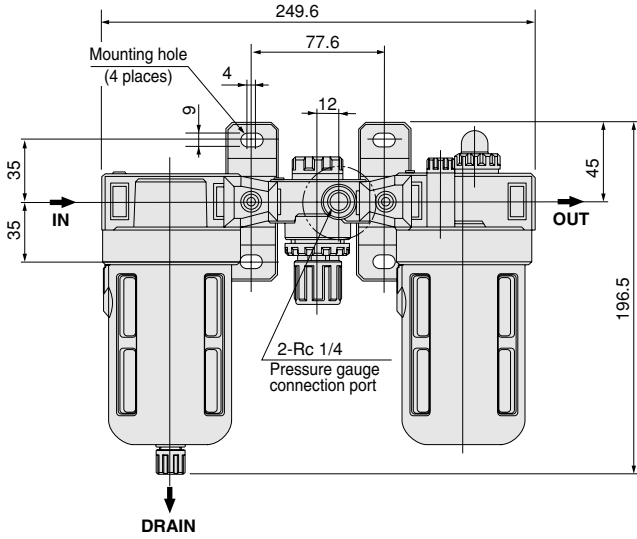


- Screw type  
(Air filter: Standard)  
(Lubricator: -D)





### C400



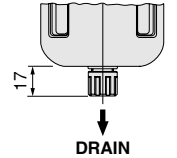
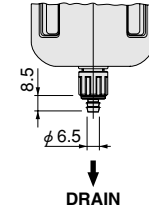
C400-02: Rc1/4  
C400-03: Rc3/8  
(2 places)

#### Drain cock option

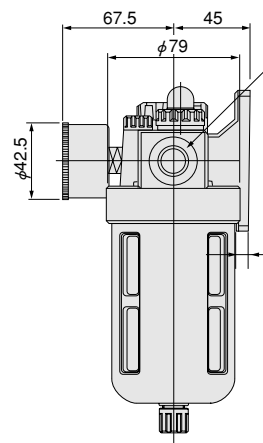
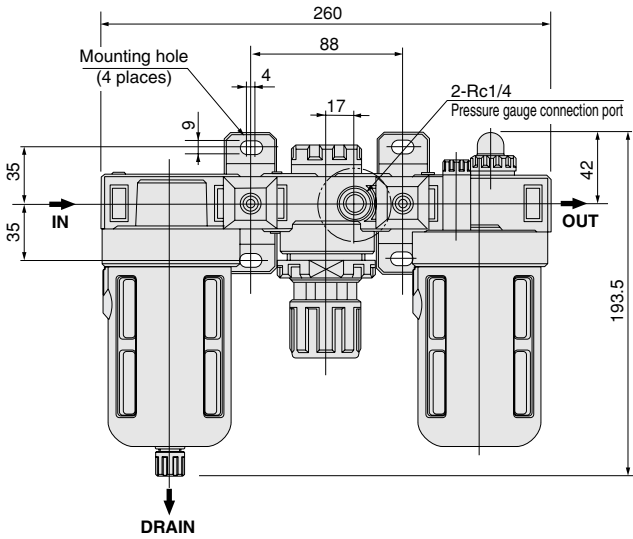
● Screw type with fitting  
(Air filter: -F1)  
(Lubricator: -F2)

● Auto drain type  
(Air filter: -A)

● Screw type  
(Air filter: Standard)  
(Lubricator: -D)



### C600



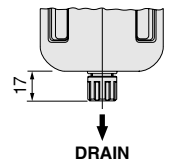
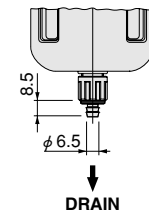
C600-02: Rc 1/4  
C600-03: Rc 3/8  
C600-04: Rc 1/2  
(2 places)

#### Drain cock option

● Screw type with fitting  
(Air filter: -F1)  
(Lubricator: -F2)

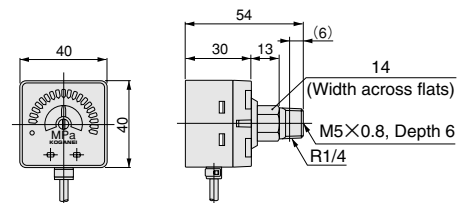
● Auto drain type  
(Air filter: -A)

● Screw type  
(Air filter: Standard)  
(Lubricator: -D)



#### Option

● Pressure gauge with electronic switches: -E2



# FILTER REGULATORS

## FR150, FR300, FR600

- A 5 $\mu$ m air filter and a small regulator are combined into a compact body.
- Pressure gauge with preset marker is standard equipment.
- Model for low pressure and model with built-in check mechanism also incorporated into the series.
- Drain cock with fitting, and auto drain type drain cock, are optional.

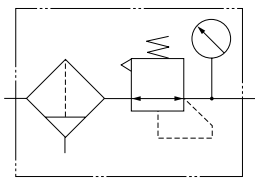


### Specifications

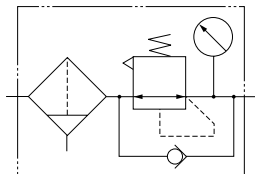
| Item   | Model                                       | FR150  | FR300                                      | FR600                |
|--|---|--|--|----------------------|
|  | Standard type                               |  |  |                      |
|  | Low pressure type                           | <b>FR151</b>   | <b>FR301</b>                               | <b>FR601</b>         |
|  | Built-in check mechanism type               | <b>FR152</b>   | <b>FR302</b>                               | <b>FR602</b>         |
| Media  |   | Air  |  |                      |
| Port size  | Rc  | 1/8, 1/4   | 1/4, 3/8                                   | 1/4, 3/8, 1/2        |
| Filtration rating                                  | $\mu$ m                                     | 5  |  |                      |
| Pressure setting range                             | Standard and built-in check mechanism types | 0.05~0.83 [7~120]  |  |                      |
|  | Low pressure type                           | 0.05~0.25 [7~36]   |  |                      |
| Maximum operating pressure                         | MPa [psi.]                                  | 0.93 [135]   |  |                      |
| Proof pressure                                     | MPa [psi.]                                  | 1.47 [213]   |  |                      |
| Operating temperature range (atmosphere and media) | $^{\circ}$ C [ $^{\circ}$ F]                | 5~60 [41~140]  |  |                      |
| Drain capacity                                     | cc [in <sup>3</sup> ]                       | 15 [0.92]  | 55 [3.36]                                  | 90 [5.49]            |
| Mass (with pressure gauge)                         | Standard                                    | 0.28 [0.62]<br>(0.29 [0.64]) <sup>Note</sup>               | 0.46 [1.01]                                | 0.60 [1.32]          |
|  | Auto drain type                             | —  | 0.49 [1.08]                                | 0.64 [1.41]          |
| Materials  | Body  | Aluminum die-casting                                       | Zinc die-casting                           | Aluminum die-casting |
|  | Bowl  | Polycarbonate  |  |                      |
| Standard attachments                               | Standard and built-in check mechanism types | Bracket, push type drain cock                              | Bracket, screw type drain cock, bowl guard |                      |
|  | Low pressure type                           | Bracket, push type drain cock                              | Bracket, screw type drain cock, bowl guard |                      |
|  |   | Pressure gauge G1-40 ( $\phi$ 40 $\times$ 1MPa [145psi.])  |  |                      |
|  |   | Pressure gauge G3-40 ( $\phi$ 40 $\times$ 0.3MPa [44psi.]) |  |                      |

Note: Figure in parentheses ( ) shows mass with bowl guard.

### Symbols

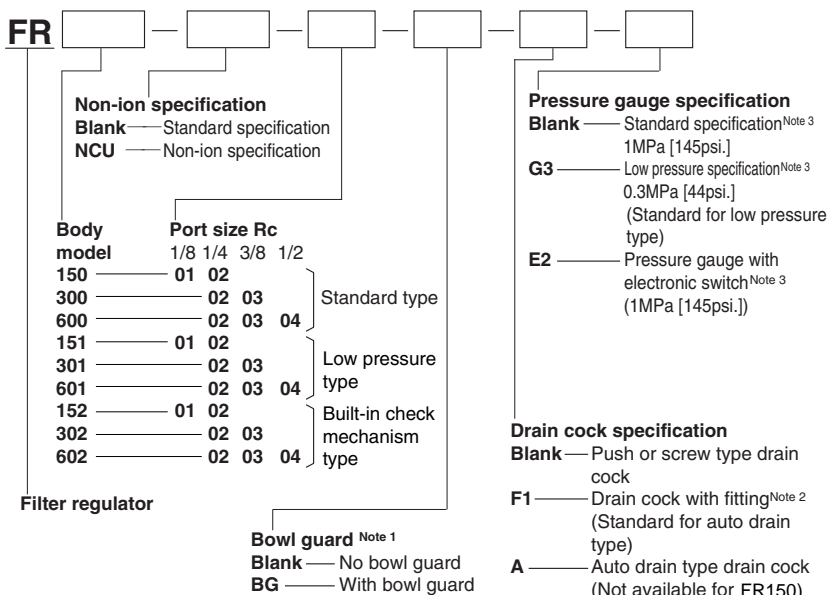


- Standard type
- Low pressure type



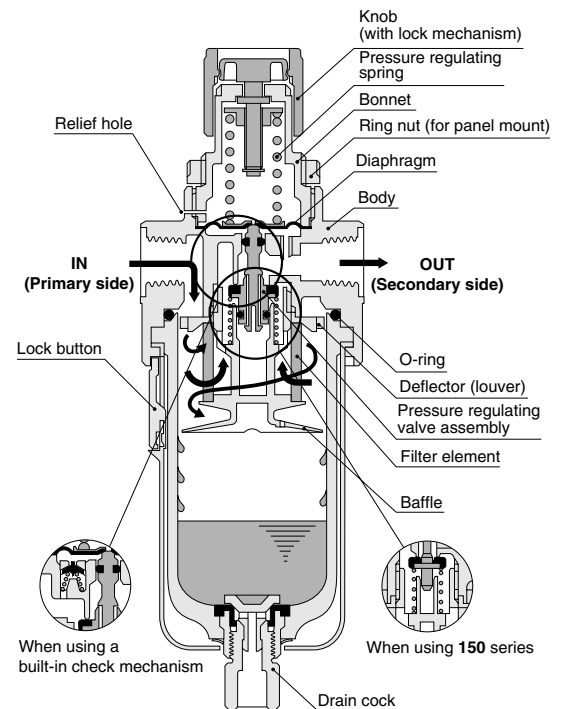
- Built-in check mechanism type

### Order Codes



Notes: 1. For **FR150** only. Standard for all models other than **FR150**.  
 2. Available only for **FR150** with **-BG** (bowl guard).  
 3. For the specifications and dimensions for the pressure gauge, and pressure gauge with electronic switches, see p.172 and 177~181.

### Inner Construction

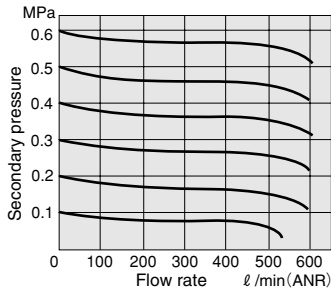


Remarks: For the optional drain cock, see p.98.  
 For the auto drain type, see p.73.  
 For the check mechanism function, see p.74.

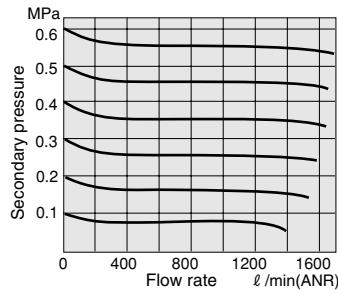
## Flow Rate Characteristics

### Standard and built-in check mechanism types

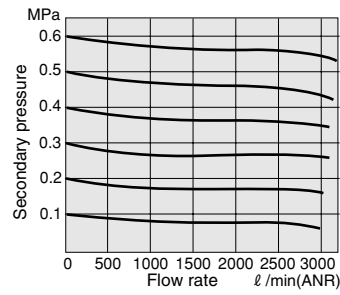
**FR150, FR152**



**FR300, FR302**

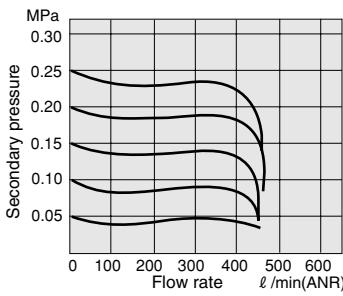


**FR600, FR602**

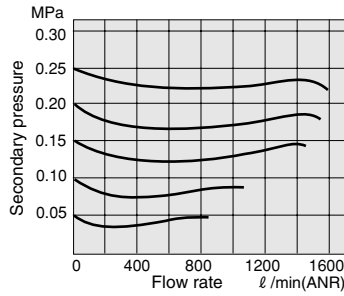


### Low pressure type

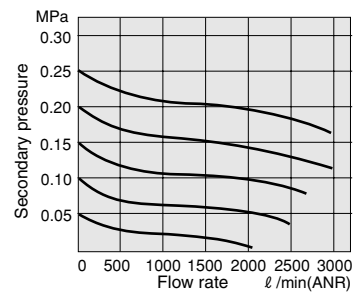
**FR151**



**FR301**



**FR601**



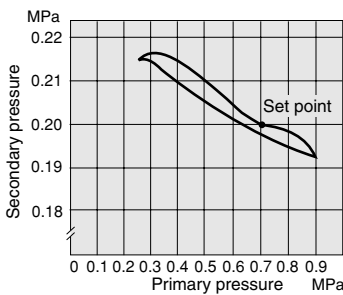
Remark: Graphs show flow rate characteristics when the primary pressure is fixed at 0.7MPa [102psi].

1MPa = 145psi. 1 l/min = 0.0353ft<sup>3</sup>/min.

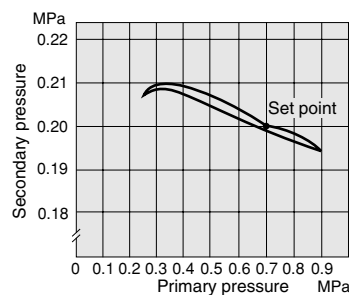
## Pressure Characteristics

### Standard and built-in check mechanism types

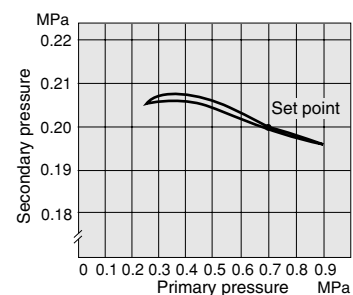
**FR150, FR152**



**FR300, FR302**

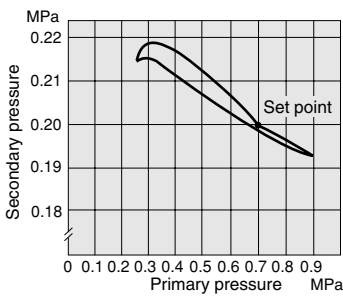


**FR600, FR602**

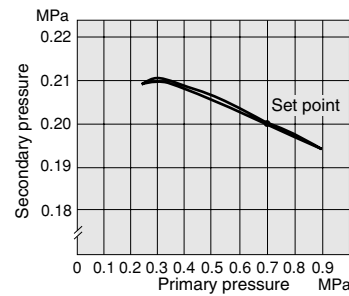


### Low pressure type

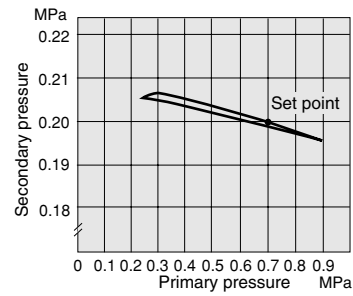
**FR151**



**FR301**



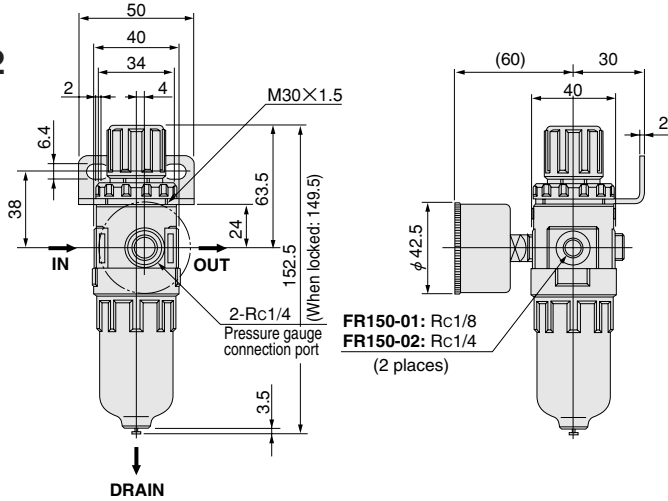
**FR601**



1MPa = 145psi.

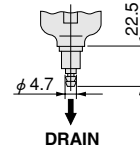
# Dimensions of Filter Regulators (mm)

FR150  
FR151  
FR152

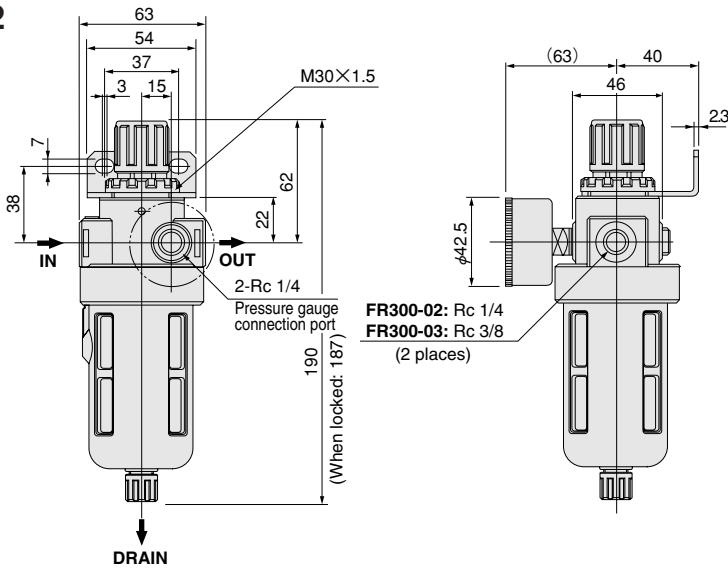


### Drain cock option

● Push type with fitting: -BG-F1



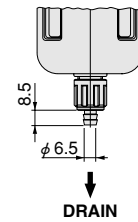
FR300  
FR301  
FR302



### Drain cock option

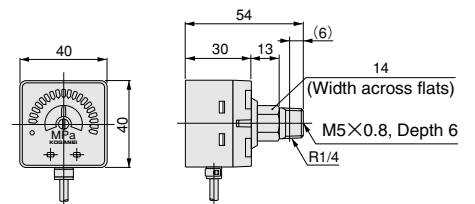
● Screw type with fitting: -F1

● Auto drain type: -A

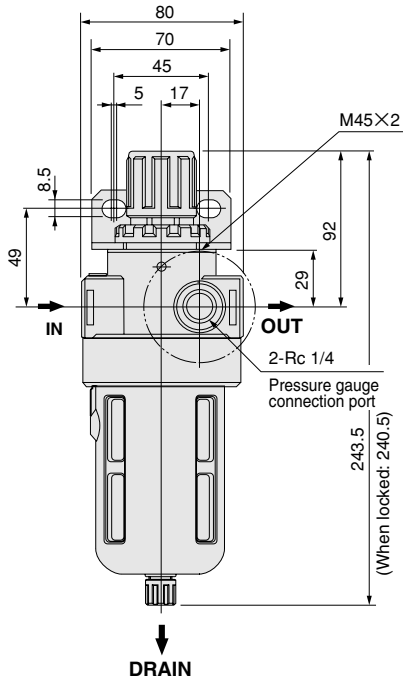


### Options

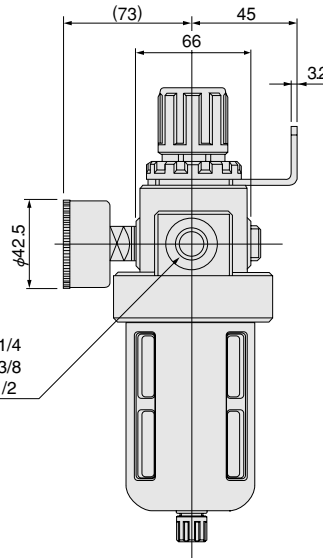
● Pressure gauge with electronic switches: -E2



FR600  
FR601  
FR602

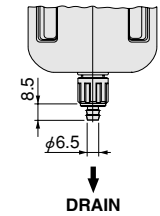


FR600-02: Rc 1/4  
FR600-03: Rc 3/8  
FR600-04: Rc 1/2  
(2 places)



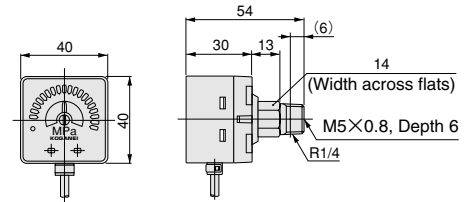
**Drain cock option**

- Screw type with fitting: -F1
- Auto drain type: -A



**Options**

- Pressure gauge with electronic switches: -E2



# AIR FILTERS

## F150, F300, F600

- A 5 $\mu$ m element minimizes pressure loss.
- Easy to attach and remove click-on bowl.
- Drain cock with fitting, and auto drain type drain cock, are optional.

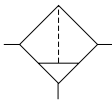


### Specifications

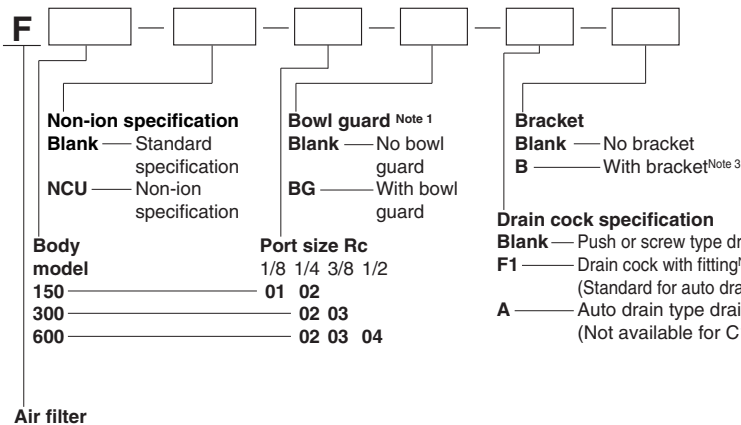
| Item   | Model                        | F150   | F300                              | F600                 |
|--|------------------------------|--|-----------------------------------|----------------------|
| Media  |                              | Air  |                                   |                      |
| Port size  | Rc                           | 1/8, 1/4                                     | 1/4, 3/8                          | 1/4, 3/8, 1/2        |
| Filtration rating                                  | $\mu$ m                      | 5  |                                   |                      |
| Maximum operating pressure                         | MPa [psi.]                   | 0.93 [135]                                   |                                   |                      |
| Proof pressure                                     | MPa [psi.]                   | 1.47 [213]                                   |                                   |                      |
| Operating temperature range (atmosphere and media) | $^{\circ}$ C [ $^{\circ}$ F] | 5~60 [41~140]                                |                                   |                      |
| Drain capacity                                     | cc [in <sup>3</sup> ]        | 15 [0.92]                                    | 55 [3.36]                         | 90 [5.49]            |
| Mass   | kg [lb]                      | 0.14 [0.31]<br>(0.15 [0.33]) <sup>Note</sup> | 0.33 [0.73]                       | 0.38 [0.84]          |
|  |                              | —  | 0.36 [0.79]                       | 0.41 [0.90]          |
| Materials  | Body                         | Aluminum die-casting                         | Zinc die-casting                  | Aluminum die-casting |
|  | Bowl                         | Polycarbonate                                |                                   |                      |
| Standard attachments                               |                              | Push type drain cock                         | Screw type drain cock, bowl guard |                      |

Note: Figure in parentheses ( ) shows mass with bowl guard.

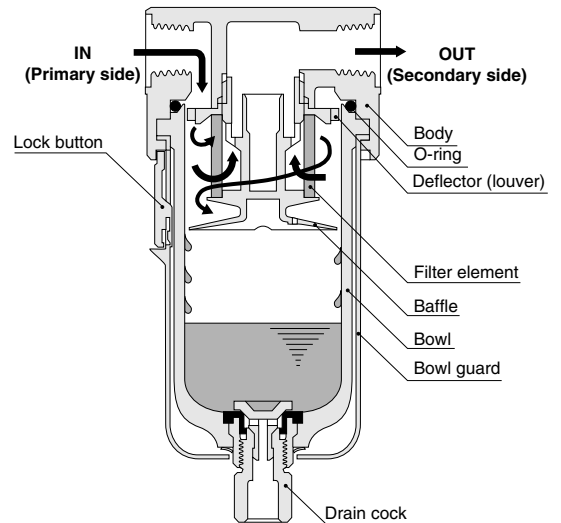
### Symbol



### Order Codes



### Inner Construction

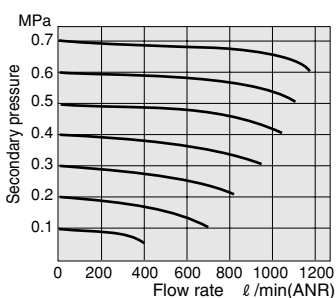


Notes: 1. For **FR150** only. Standard for all models other than **FR150**.  
 2. Available only for **FR150** with **-BG** (bowl guard).  
 3. For the bracket order codes and dimensions, see p.95~96.

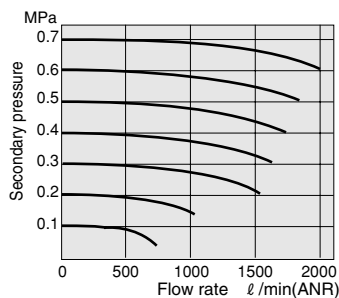
For the optional drain cock, see p.98.  
 For the auto drain type, see p.73.

### Flow Rate Characteristics

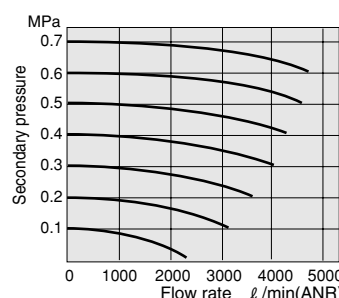
#### F150



#### F300

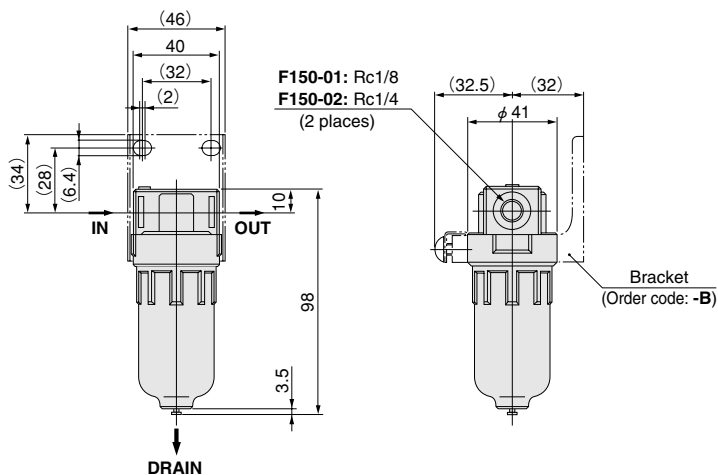


#### F600



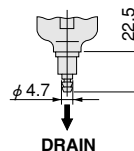
1MPa = 145psi.  
 1 l/min = 0.0353ft<sup>3</sup>/min.

F150

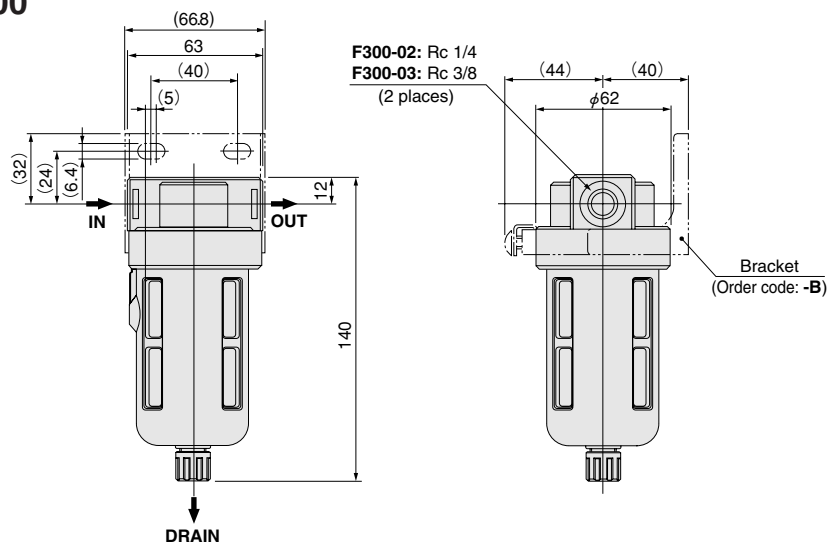


Drain cock option

- Push type with fitting: -BG-F1

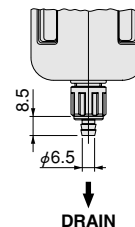


F300

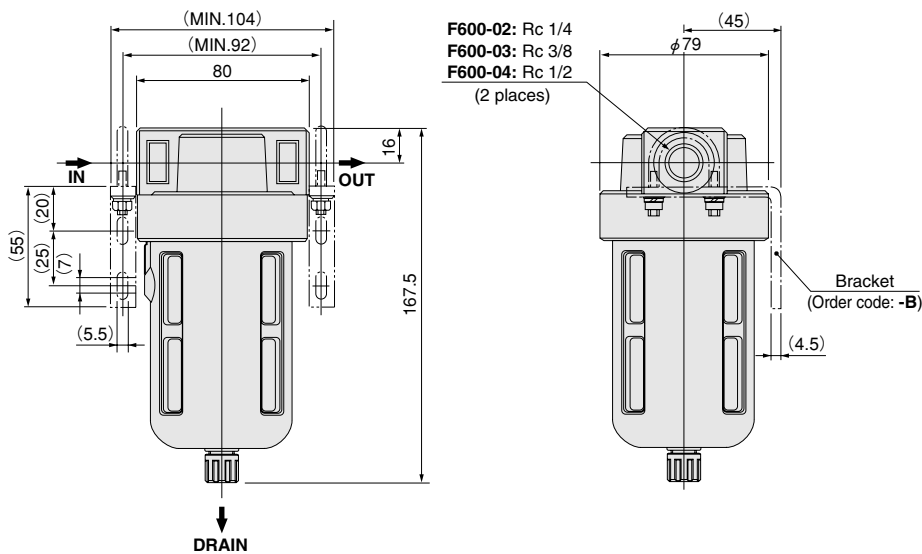


Drain cock option

- Screw type with fitting: -F1
- Auto drain type: -A

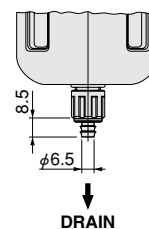


F600



Drain cock option

- Screw type with fitting: -F1
- Auto drain type: -A



# MIST FILTERS

## MF300, MF400, MF600



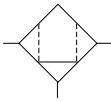
- A 0.3 $\mu$ m element eliminates particles and oil.
- Easy to attach and remove click-on bowl.
- Cartridge type element simplifies maintenance.
- Drain cock with fitting, and auto drain type drain cock, are optional.

### Specifications

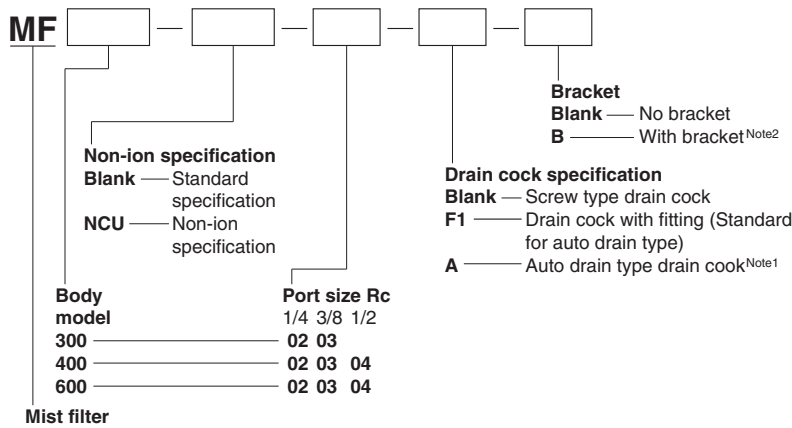
| Item   | Model                                    | MF300                             | MF400 <sup>Note 1</sup> | MF600         |             |
|--|--|-----------------------------------|-------------------------|---------------|-------------|
| Media  |  | Air                               |                         |               |             |
| Port size  | Rc                                       | 1/4, 3/8                          | 1/4, 3/8, 1/2           | 1/4, 3/8, 1/2 |             |
| Filtering particle diameter                        | $\mu$ m                                  | 0.3                               |                         |               |             |
| Filtering efficiency                               | %  | 99.9                              |                         |               |             |
| Volume of processed air <sup>Note 2</sup>          | $\ell$ /min [ft <sup>3</sup> /min] (ANR) | 300 [10.6]                        | 750 [26.5]              | 1500 [53.0]   |             |
| Maximum operating pressure                         | MPa [psi.]                               | 0.93 [135]                        |                         |               |             |
| Proof pressure                                     | MPa [psi.]                               | 1.47 [213]                        |                         |               |             |
| Operating temperature range (atmosphere and media) | $^{\circ}$ C [ $^{\circ}$ F]             | 5~60 [41~140]                     |                         |               |             |
| Drain capacity                                     | cc [in <sup>3</sup> ]                    | 35 [2.14]                         | 65 [3.97]               | 90 [5.49]     |             |
| Mass   | kg [lb]                                  | Standard                          | 0.41 [0.90]             | 0.45 [0.99]   | 0.78 [1.72] |
|  |  | Auto drain type                   | 0.51 [1.12]             | 0.79 [1.74]   | 0.81 [1.79] |
| Materials  | Body                                     | Zinc die-casting                  | Aluminum die-casting    |               |             |
|  | Bowl                                     | Polycarbonate                     |                         |               |             |
|  | Element type                             | E-30M                             | E-40M                   | E-60M         |             |
| Standard attachments                               |  | Screw type drain cock, bowl guard |                         |               |             |

Notes: 1. The MF400 body size is the same as the 600 series.  
2. Values are for air pressure of 0.7MPa [102psi].

### Symbol

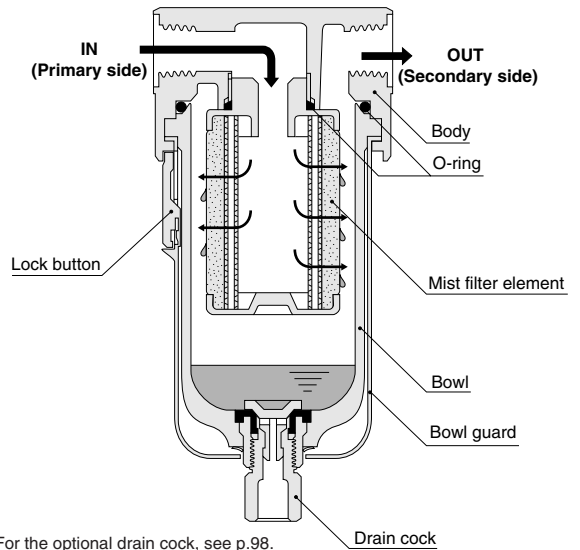


### Order Codes



Notes: 1. The auto drain type drain cock for the MF300 and MF400 is a manufacturer option.  
2. For the bracket order codes and dimensions, see p.95~96.

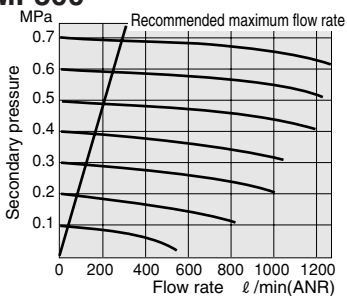
### Inner Construction



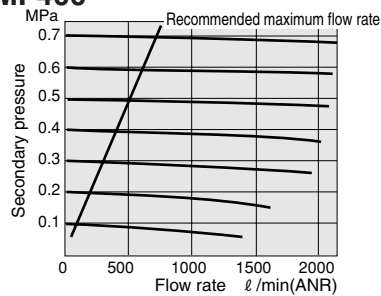
For the optional drain cock, see p.98.  
For the auto drain type, see p.73.

### Flow Rate Characteristics

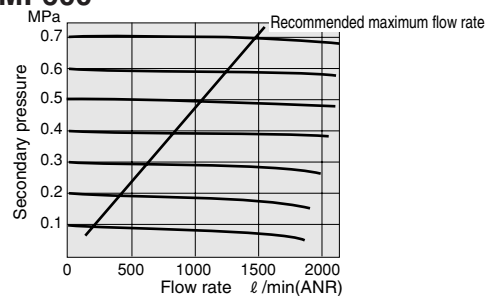
#### MF300



#### MF400



#### MF600



1MPa = 145psi.  
1  $\ell$ /min = 0.0353ft<sup>3</sup>/min.



# Dimensions of Mist Filters (mm)

## MF300

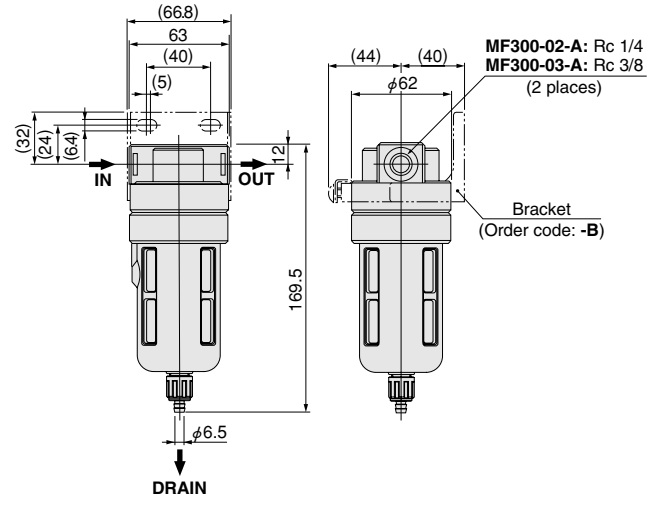
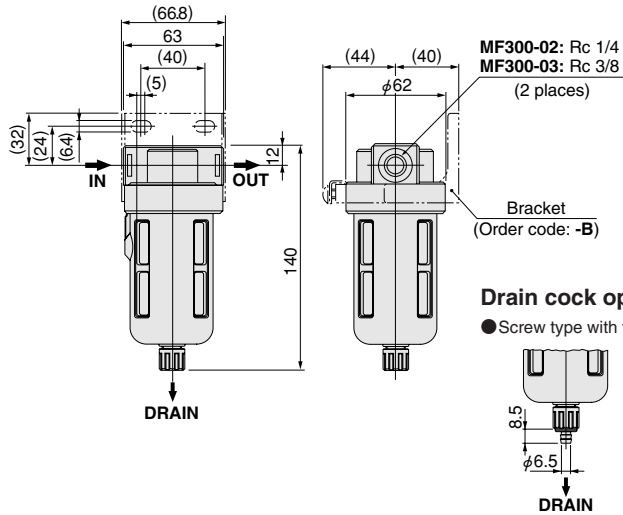


MF300

## MF300-A



MF300-A



## MF400

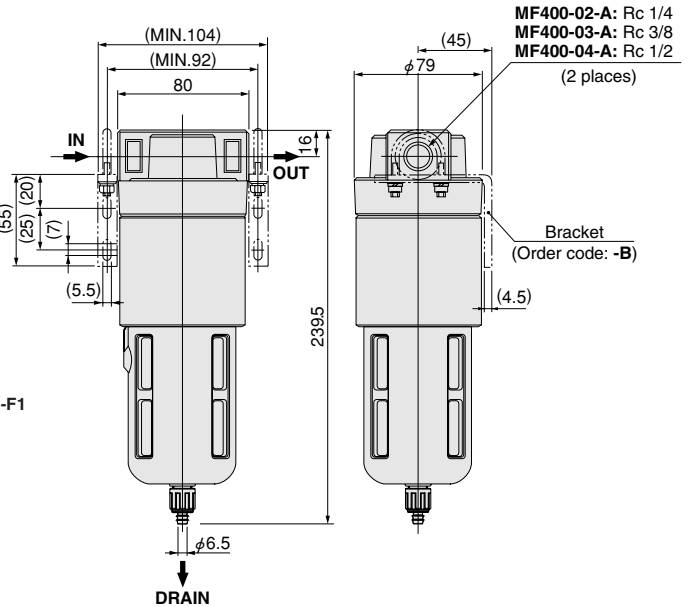
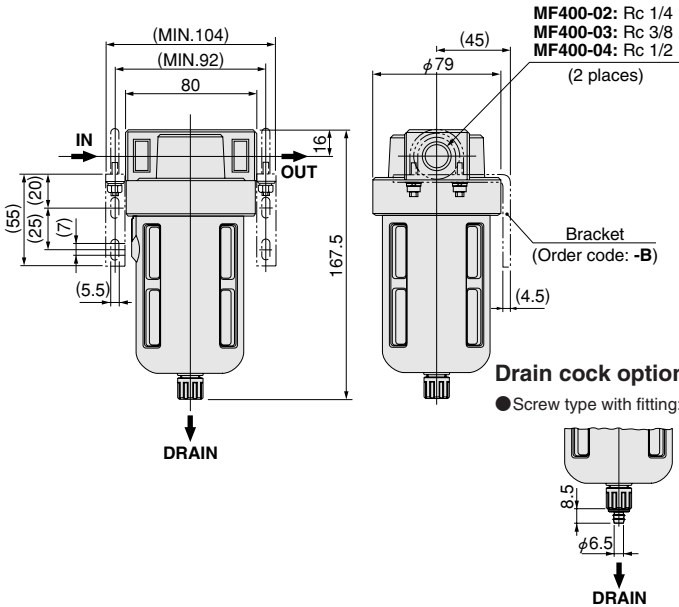


MF400

## MF400-A



MF400-A



## MF600

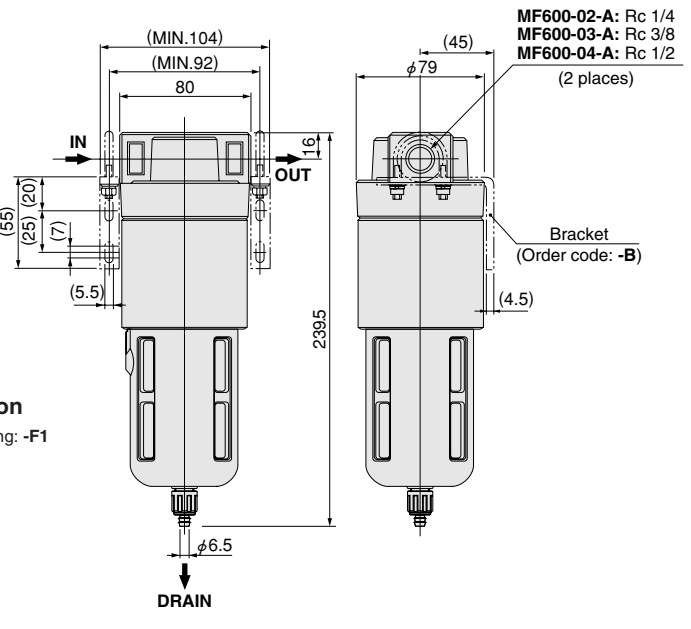
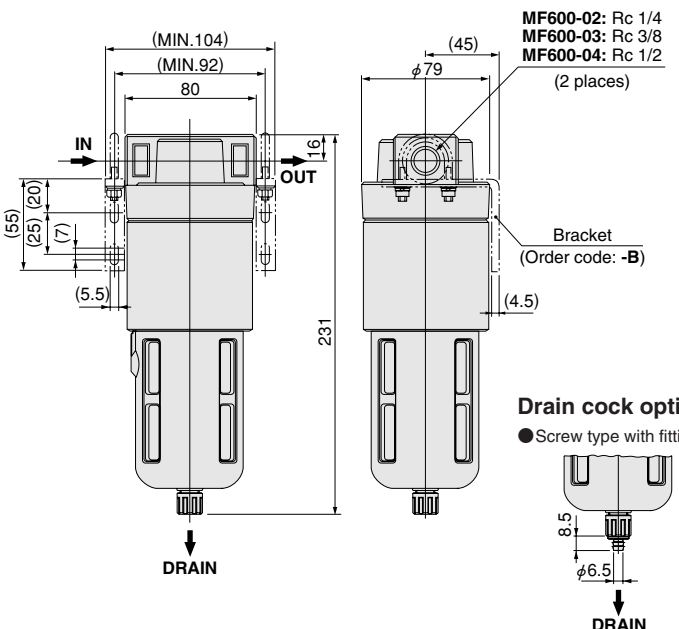


MF600

## MF600-A



MF600



# MICRO MIST FILTERS

## MMF150, MMF300, MMF400

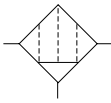


- A 0.01 $\mu\text{m}$  element eliminates fine particles and oil, protecting the equipment against breakdowns.
- Easy to attach and remove click-on bowl.
- Cartridge type element simplifies maintenance.
- Drain cock with fitting, and auto drain type drain cock, are optional.

### Specifications

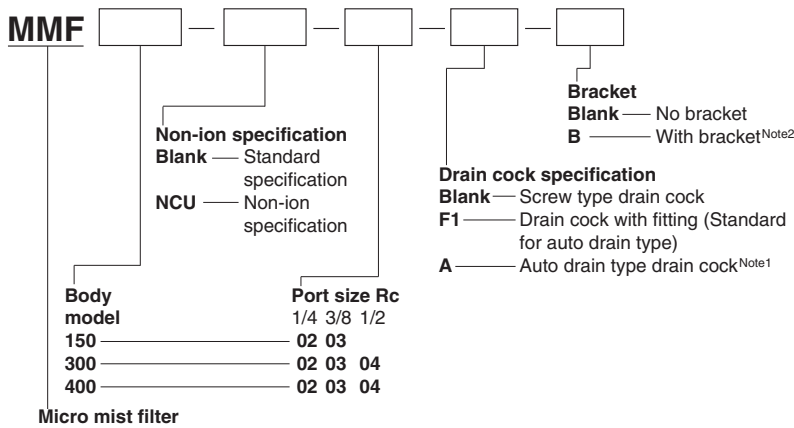
| Item   | Model  | MMF150 <sup>Note 1</sup>          | MMF300 <sup>Note 1</sup> | MMF400 <sup>Note 1</sup> |             |
|--|--|-----------------------------------|--------------------------|--------------------------|-------------|
| Media  |  | Air                               |                          |                          |             |
| Port size  | Rc   | 1/4, 3/8                          | 1/4, 3/8, 1/2            | 1/4, 3/8, 1/2            |             |
| Filtering particle diameter                        | $\mu\text{m}$  | 0.01                              |                          |                          |             |
| Filtering efficiency                               | %  | 99.9999                           |                          |                          |             |
| Volume of processed air <sup>Note 2</sup>          | $\ell/\text{min}$ [ $\text{ft}^3/\text{min}$ ] (ANR) | 150 [5.3]                         | 300 [10.6]               | 750 [26.5]               |             |
| Maximum operating pressure                         | MPa [psi.]   | 0.93 [135]                        |                          |                          |             |
| Proof pressure                                     | MPa [psi.]   | 1.47 [213]                        |                          |                          |             |
| Operating temperature range (atmosphere and media) | $^{\circ}\text{C}$ [ $^{\circ}\text{F}$ ]            | 5~60 [41~140]                     |                          |                          |             |
| Drain capacity                                     | cc [ $\text{in}^3$ ]                                 | 35 [2.14]                         | 65 [3.97]                | 90 [5.49]                |             |
| Mass   | kg [lb]  |                                   |                          |                          |             |
|  |  | Standard                          | 0.41 [0.90]              | 0.45 [0.99]              | 0.78 [1.72] |
|  |  | Auto drain type                   | 0.51 [1.12]              | 0.79 [1.74]              | 0.81 [1.79] |
| Materials  | Body   | Zinc die-casting                  | Aluminum die-casting     |                          |             |
|  | Bowl   | Polycarbonate                     |                          |                          |             |
|  | Element type   | E-15MM                            | E-30MM                   | E-40MM                   |             |
| Standard attachments                               |  | Screw type drain cock, bowl guard |                          |                          |             |

### Symbol



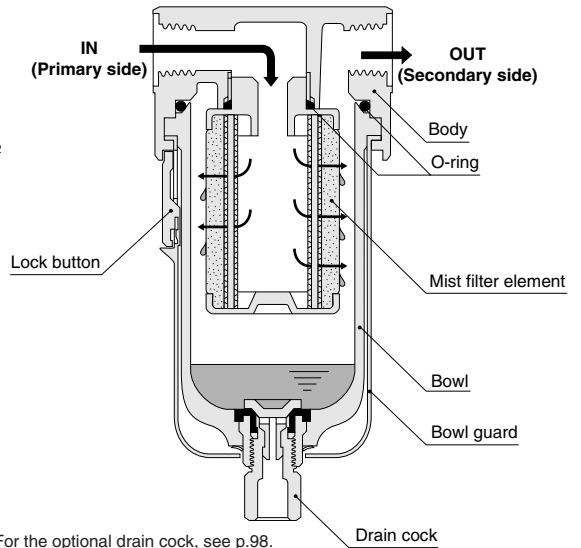
Notes: 1. The body size of the MMF150 is the same as the body size of the 300 series, while the body sizes of the MMF300 and the MMF400 are the same as the 600 series.  
2. Values are for air pressure of 0.7MPa [102psi.].

### Order Codes



Notes: 1. The auto drain type drain cock for the MF150 and MMF300 is a manufacturer option.  
2. For the bracket order codes and dimensions, see p.95~96.

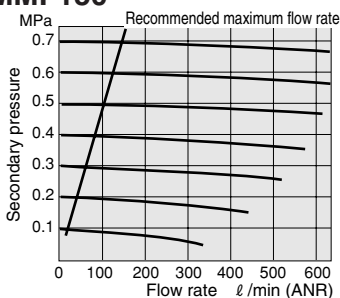
### Inner Construction



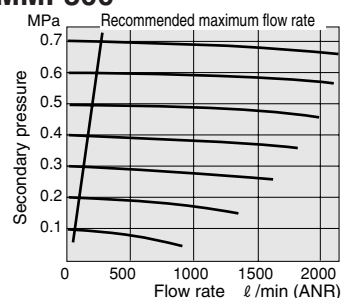
For the optional drain cock, see p.98.  
For the auto drain type, see p.73.

### Flow Rate Characteristics

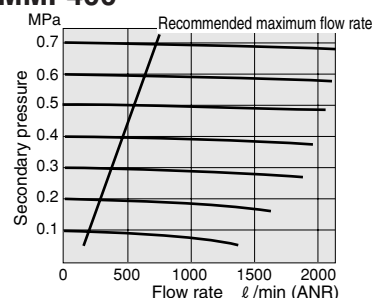
#### MMF150



#### MMF300



#### MMF400



1MPa = 145psi.  
1  $\ell/\text{min}$  = 0.0353ft<sup>3</sup>/min.

**MMF150**

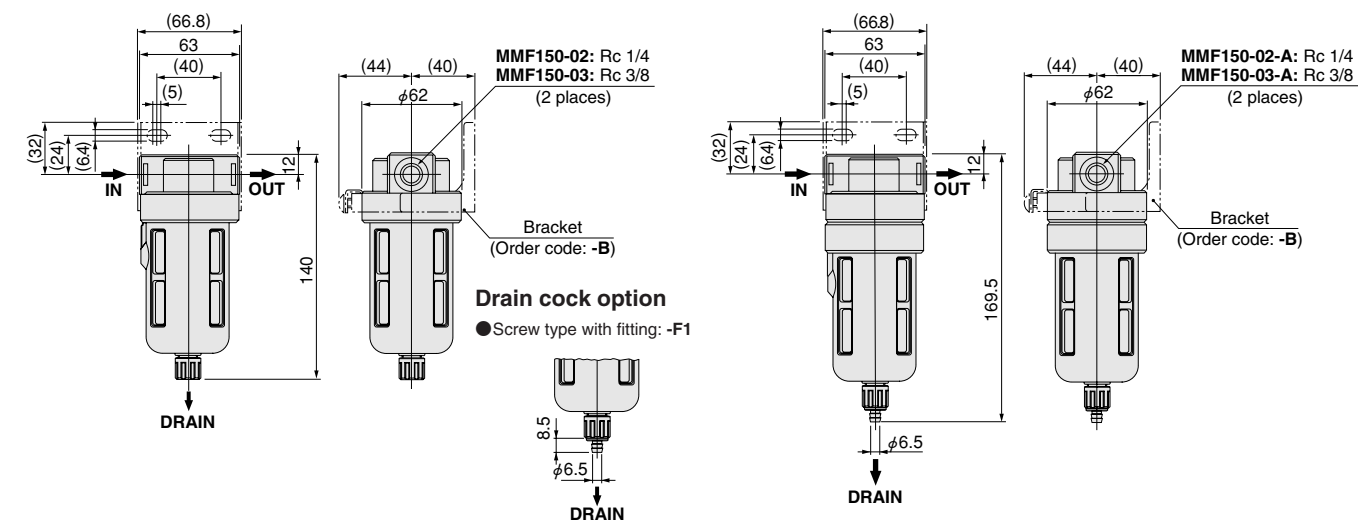


MF300

**MMF150-A**



MF300-A



**MMF300**

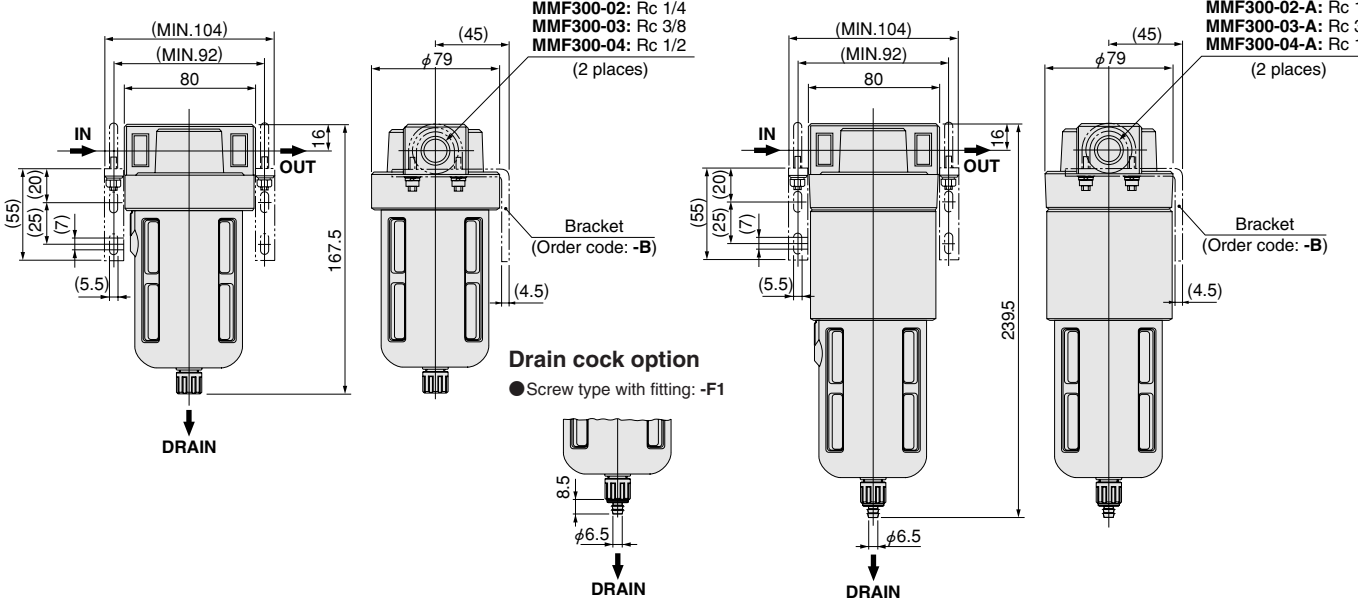


MF400

**MMF300-A**



MF400-A



**MMF400**

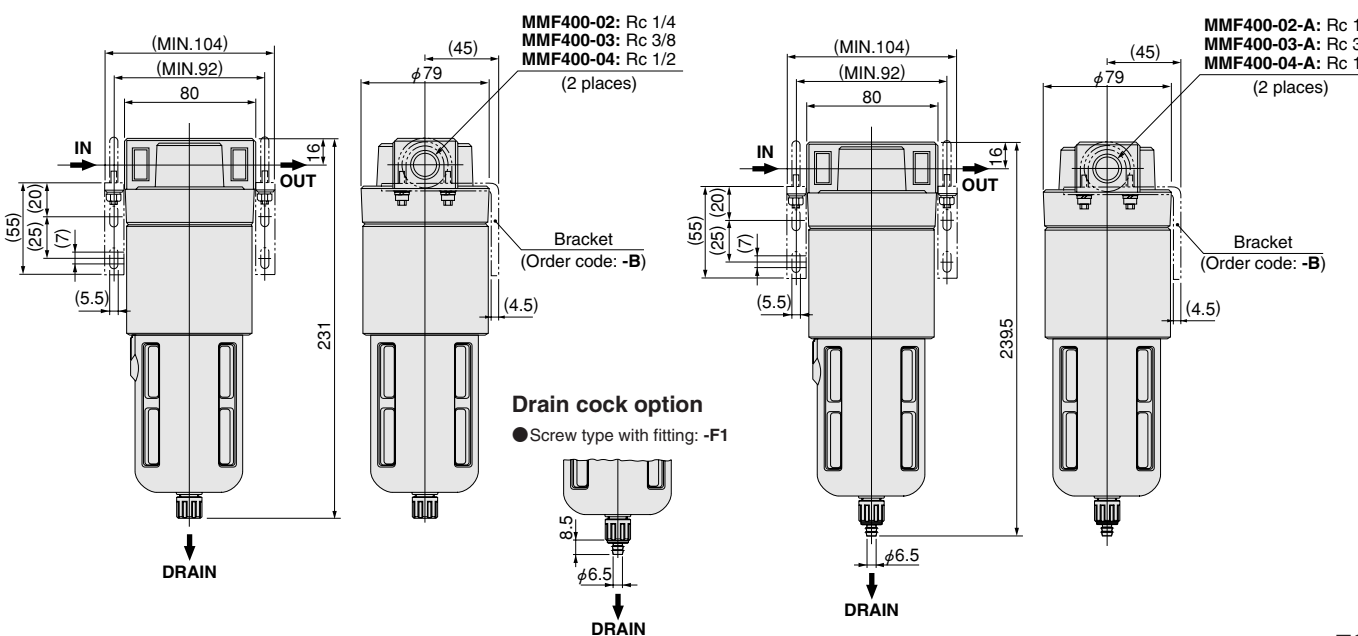


MF600

**MMF400-A**



MF600



# AUTO DRAINS

## AD300, AD600

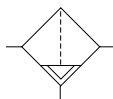


- Automatically drains any liquid collected inside the bowl.
- Automatically drains any liquid when pressure is lost inside the bowl.
- The drain cock is equipped with a fitting to prevent dirtying of surrounding equipment.
- Collected liquid can also be discharged manually.

### Specifications

| Device type         | Auto drain type | Remark       |
|---------------------|-----------------|--------------|
| F.R.L. Combinations | C150            | —            |
|                     | C200            | <b>AD300</b> |
|                     | C300            |              |
|                     | C400            | <b>AD600</b> |
|                     | C600            |              |
| Filter regulators   | FR150           | —            |
|                     | FR300           | <b>AD300</b> |
|                     | FR600           | <b>AD600</b> |
| Air filters         | F150            | —            |
|                     | F300            | <b>AD300</b> |
|                     | F600            | <b>AD600</b> |
| Mist filters        | MF300           | <b>AD300</b> |
|                     | MF400           | <b>AD600</b> |
|                     | MF600           |              |
| Micro mist filters  | MMF150          | <b>AD300</b> |
|                     | MMF300          | <b>AD600</b> |
|                     | MMF400          |              |
| Drain filters       | DF300           | <b>AD300</b> |
|                     | DF600           | <b>AD600</b> |
|                     | DF900           |              |

### Symbol



### Order Codes

AD



Body size

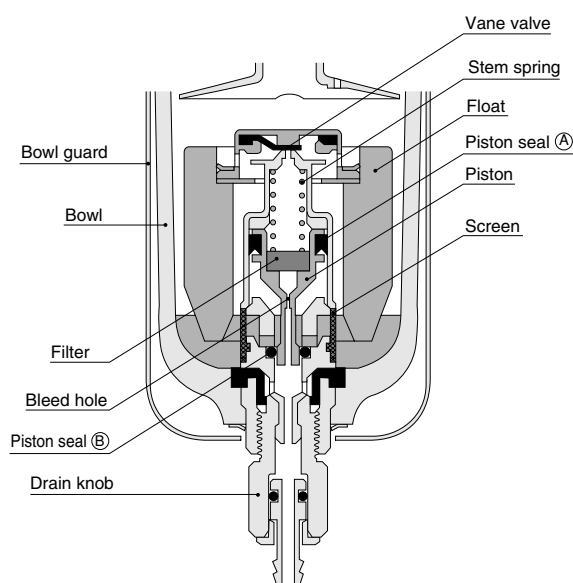
300 — For 300 series

600 — For 600 series

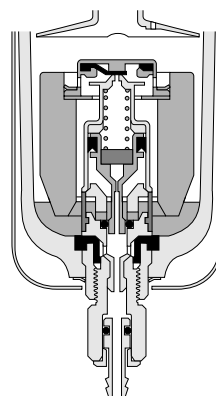
Auto drain type drain cock assembly  
(with bowl and bowl guard)

Note: Models without auto drain have different body shapes. For this reason, they cannot be converted to auto drain type even if the bowl assembly is replaced.

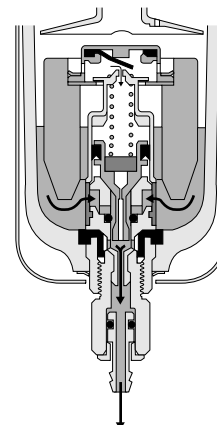
### Inner Construction



#### Condition of collected liquid



#### Condition of draining liquid



#### Operation principles

When liquid collects inside the bowl, the float rises and opens up the vane valve. Air brought to the top of the piston forces the piston downward, opening up the bottom of the piston and expelling liquid that has passed through the screen. As the liquid is drained out, the float falls, closing the vane valve. Air at the top of the piston is released through a bleed hole, and air pushes up on the piston from the bottom, returning the unit to the normal state.

If pressure inside the bowl is lost, the stem spring pushes down on the piston to drain out all of the liquid. After the liquid has been drained out, the air inside the bowl is also released.

Remark: Air is released from the drain port until the supply pressure rises to 0.15MPa [22psi.]. In this situation, even rotating the drain knob will not prevent the air from bleeding out.

# REGULATORS

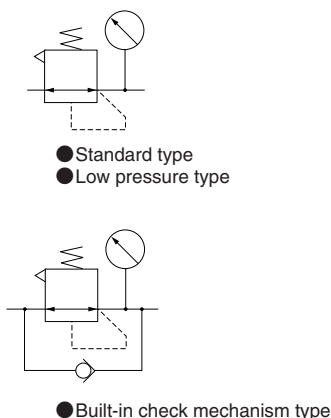
## R150, R300, R600

- Compact size achieves stable pressure regulation and large flow rate.
- Push lock type regulator knob for light, smooth pressure regulation.
- Pressure gauge with preset marker is standard equipment.
- Model for low pressure and model with built-in check mechanism also incorporated into the series.



MULTI SERIES

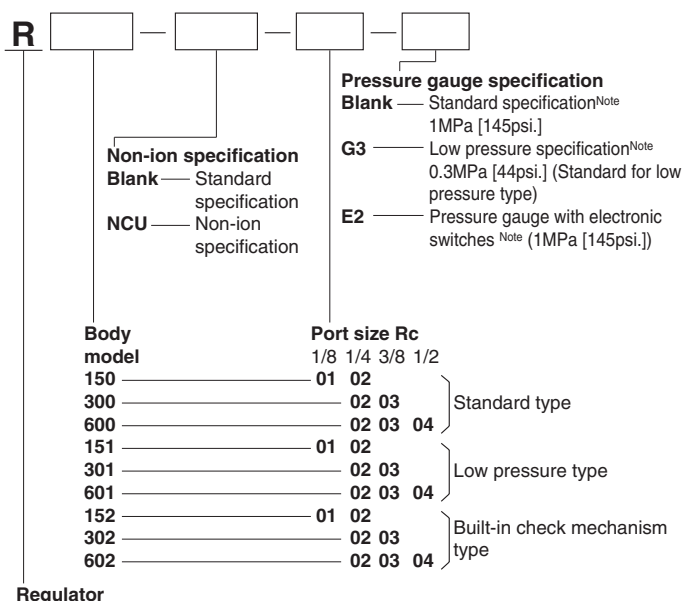
### Symbols



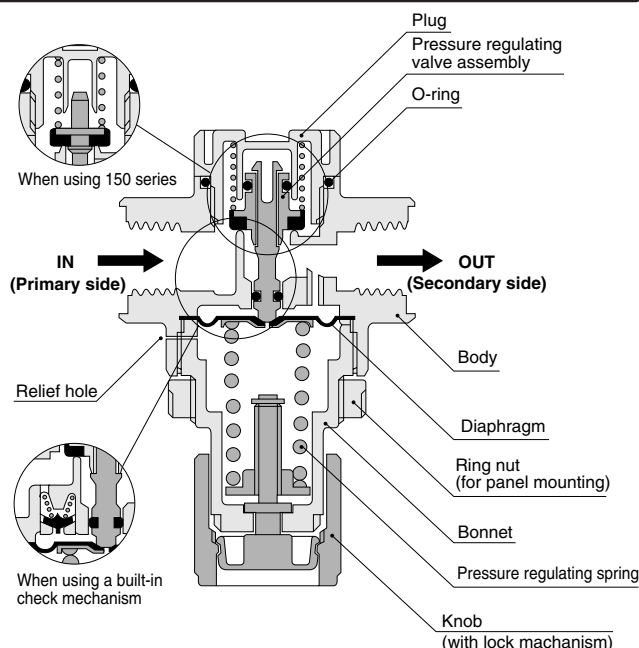
### Specifications

| Model  | Standard type                 | R150  | R300             | R600                 |
|--|-------------------------------|---|------------------|----------------------|
|  | Low pressure type             | R151  | R301             | R601                 |
| Item   | Built-in check mechanism type | R152  | R302             | R602                 |
| Media  |                               | Air   |                  |                      |
| Port size  |                               | Rc  | 1/8, 1/4         | 1/4, 3/8, 1/2        |
| Pressure setting range                             |                               | Standard and built-in check mechanism types             |                  |                      |
| MPa [psi.]   |                               | 0.05~0.83 [7~120]                                       |                  |                      |
| Maximum operating pressure                         |                               | MPa [psi.]  |                  |                      |
| MPa [psi.]   |                               | 0.93 [135]  |                  |                      |
| Proof pressure                                     |                               | MPa [psi.]  |                  |                      |
| MPa [psi.]   |                               | 1.47 [213]  |                  |                      |
| Operating temperature range (atmosphere and media) |                               | °C [°F]   |                  |                      |
| °C [°F]  |                               | 5~60 [41~140]   |                  |                      |
| Lubrication  |                               | Not required  |                  |                      |
| Mass (with pressure gauge)                         |                               | kg [lb.]  | 0.20 [0.44]      | 0.23 [0.51]          |
| Materials  |                               | Aluminum die-casting                                    | Zinc die-casting | Aluminum die-casting |
| Standard attachments                               |                               | Standard and built-in check mechanism types             |                  |                      |
| Bracket and pressure gauge                         |                               | G1-40 (φ 40×1MPa [145psi.])                             |                  |                      |
| Low pressure type                                  |                               | Bracket and pressure gauge G3-40 (φ 40×0.3MPa [44psi.]) |                  |                      |

### Order Codes



### Inner Construction



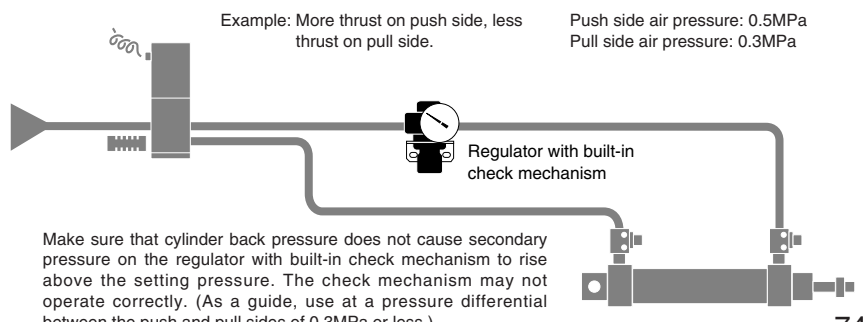
Note: For the specifications and dimensions for the pressure gauge, and pressure gauge with electronic switches, see p.172 and 177~181.

### System Upgrade Using a Regulator with Built-in Check Mechanism

The regulator with built-in check mechanism is equipped with a built-in check valve that opens up when the primary pressure falls off, causing the pressure balance to collapse and simultaneously opening up the main valve to relieve the secondary pressure to the primary side.

#### Changing push side and pull side thrust

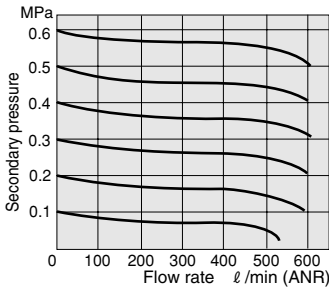
The thrust on an air cylinder's push side and pull side can be changed easily. Cylinders can be operated at low pressure on the side where thrust is not required, allowing reduction of air consumption.



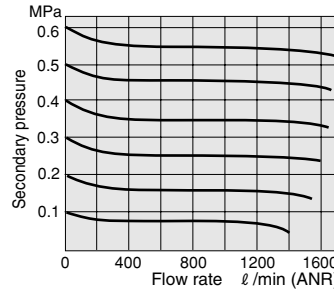
# Flow Rate Characteristics

## Standard and built-in check mechanism types

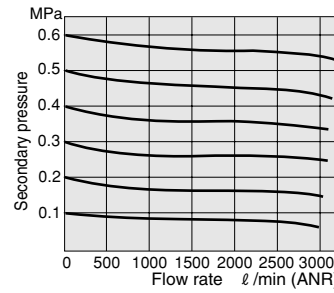
**R150, R152**



**R300, R302**

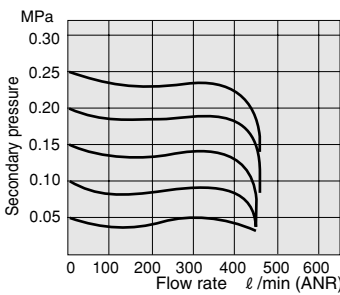


**R600, R602**

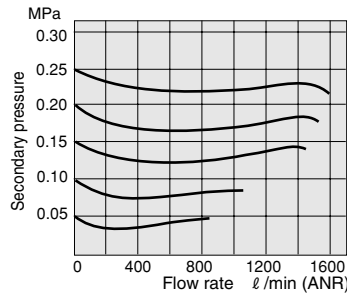


## Low pressure type

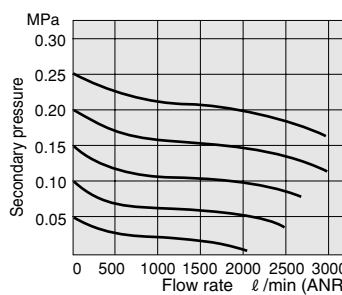
**R151**



**R301**



**R601**



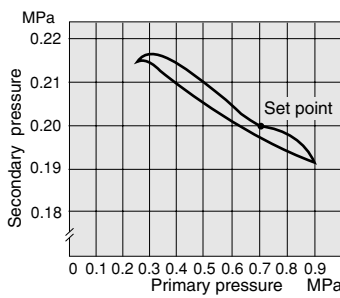
Remark: Graphs show flow rate characteristics when the primary pressure is fixed at 0.7MPa [102psi.].

1MPa = 145psi. 1 l/min = 0.0353ft<sup>3</sup>/min.

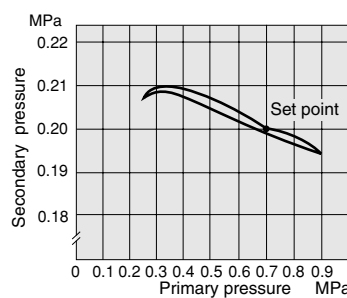
# Pressure Characteristics

## Standard and built-in check mechanism types

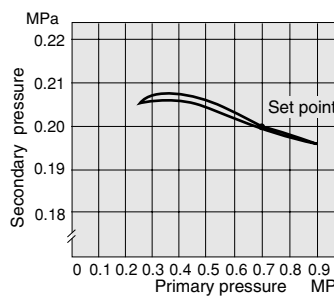
**R150, R152**



**R300, R302**

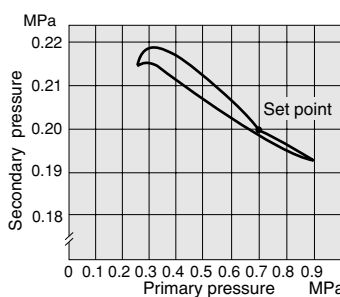


**R600, R602**

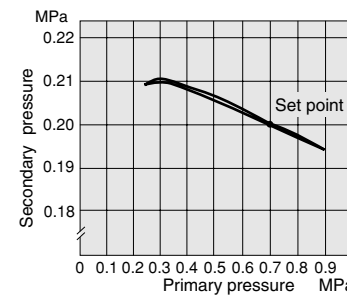


## Low pressure type

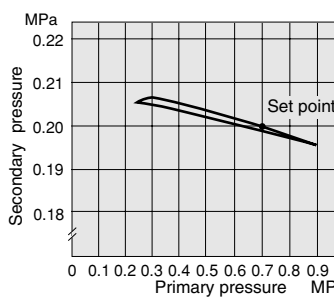
**R151**



**R301**



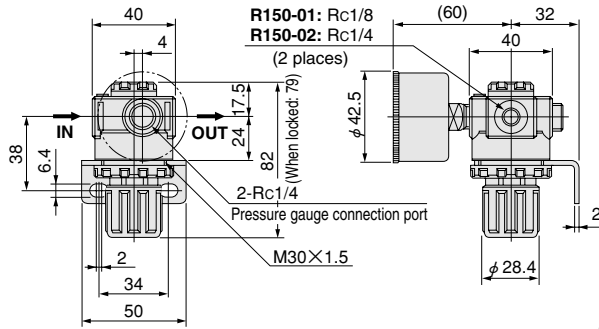
**R601**



1MPa = 145psi. 1 l/min = 0.0353ft<sup>3</sup>/min.

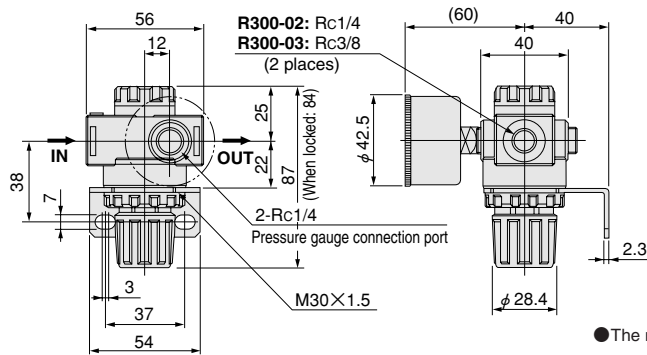
# Dimensions of Regulators (mm)

R150  
R151  
R152



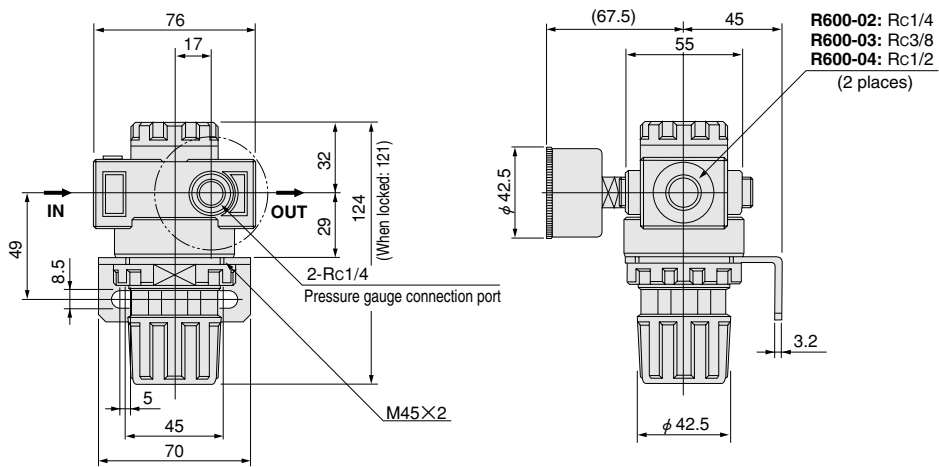
●The mounting hole for mounting the regulator on a panel, etc. is  $\phi$  30.5.

R300  
R301  
R302



●The mounting hole for mounting the regulator on a panel, etc. is  $\phi$  30.5.

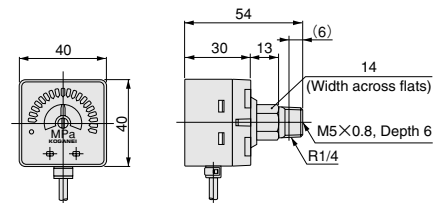
R600  
R601  
R602



●The mounting hole for mounting the regulator on a panel, etc. is  $\phi$  45.

## Options

●Pressure gauge with electronic switches: -E2





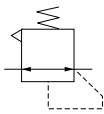
# PRECISION REGULATOR

## PR200

- Single diaphragm type achieves high-precision pressure regulation in a compact size.
- Push lock type regulator knob for light, smooth pressure regulation.



### Symbol



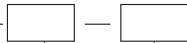
### Specifications

| Item   | Model                                | PR200                |
|--|--------------------------------------|----------------------|
| Media  |                                      | Air                  |
| Port size  | Rc                                   | 1/4                  |
| Sensitivity  | MPa [psi.]                           | 0.001 [0.15]         |
| Pressure setting range                             | MPa [psi.]                           | 0.005~0.25 [0.7~36]  |
| Maximum operating pressure                         | MPa [psi.]                           | 0.73 [106]           |
| Proof pressure                                     | MPa [psi.]                           | 1.03 [149]           |
| Operating temperature range (atmosphere and media) | °C [°F]                              | 5~60 [41~140]        |
| Air consumption <sup>Note</sup>                    | ℓ / min [ft <sup>3</sup> /min] (ANR) | 5 [0.18]             |
| Lubrication  |                                      | Not required         |
| Mass   | kg [lb.]                             | 0.29 [0.64]          |
| Materials  |                                      | Aluminum die-casting |

Note: Values are at secondary air pressure 0.25MPa [36psi.].

### Order Codes

#### PR200



**Bracket**  
**Blank** — No bracket  
**B** — With bracket

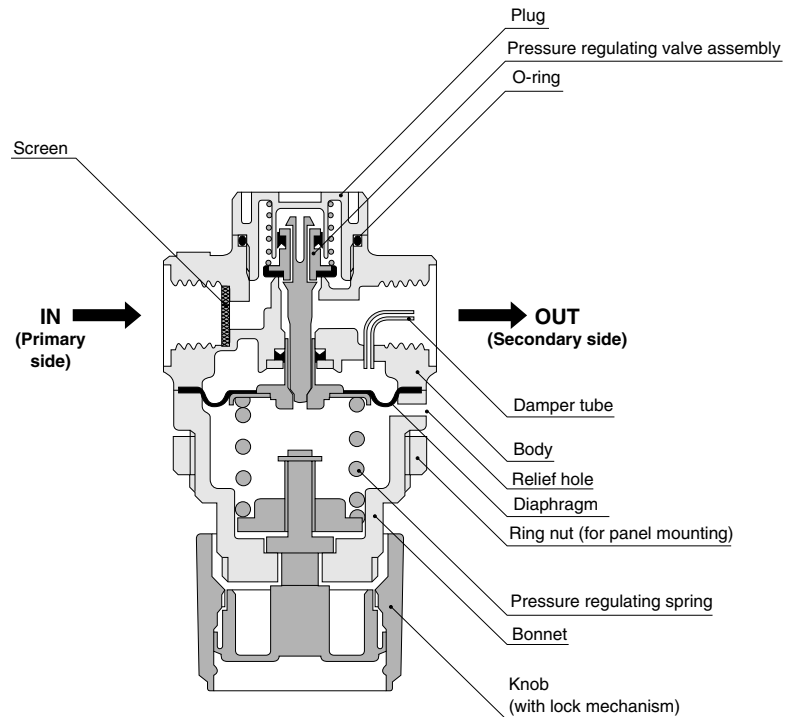
#### Pressure gauge specification

**Blank** — No pressure gauge  
**G3P** — With small precision pressure gauge (0.3MPa [44psi.])<sup>Note 1</sup>  
**G3PS** — With small precision pressure gauge (with throttle valve) (0.3MPa [44psi.])  
**G3** — With pressure gauge<sup>Note 2</sup> (0.3MPa [44psi.])  
**E2** — With pressure gauge with electronic switches<sup>Note 3</sup> (1MPa [145psi.])  
**E21** — With pressure gauge with electronic switches<sup>Note 3</sup> (100kPa [14.5psi.])

Precision regulator

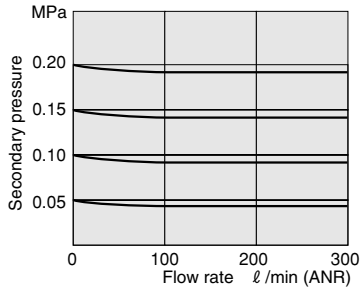
- Notes: 1. For details about the **G3P** small precision pressure gauge, see p.174.  
 2. For details about the **G3** pressure gauge, see p.172.  
 3. For specifications and dimensions of the pressure gauge with electronic switches, see p.177~181.

### Inner Construction





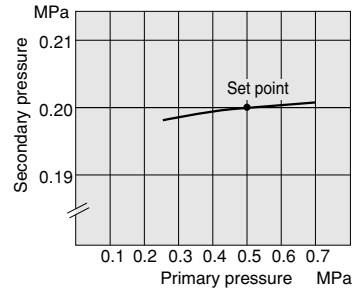
## Flow Rate Characteristics



Remark: Graph shows flow rate characteristics when the primary pressure is fixed at 0.7MPa [102psi.].

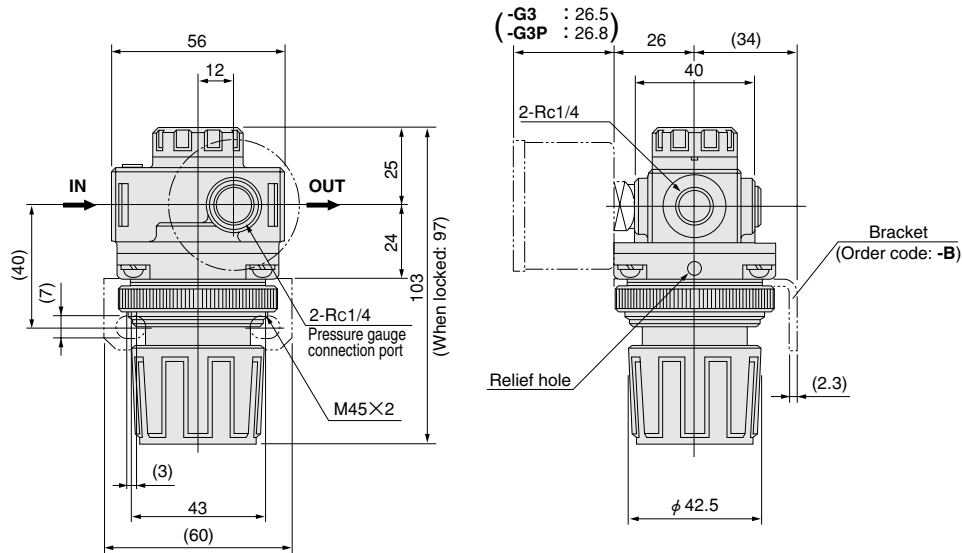
1MPa = 145psi. 1 l/min = 0.0353ft<sup>3</sup>/min.

## Pressure Characteristics



## Dimensions of Precision Regulator (mm)

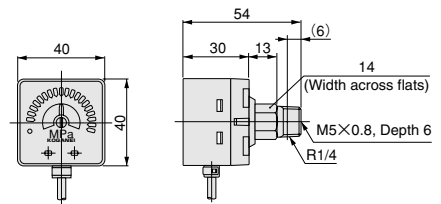
### PR200



Note: The mounting hole for attaching the regulator on a panel, etc. is  $\phi 46$ .  
A panel thickness of 1.5~6mm is required for mounting. Use the ring nuts provided to mount.

### Options

- Pressure gauge with electronic switches: -E2, -E21



# HIGH-RELIEF REGULATORS

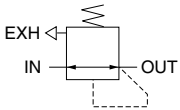
## Internal Pilot Type and External Pilot Type



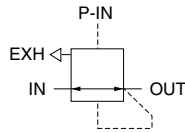
- Uses the air pilot type (diaphragm indirect operation type).
- Quick response even when secondary pressure fluctuations are large.
- Stable pressure regulation and large exhaust flow rate in a compact body.
- Can form modules with all Multi Series components.

### Symbols

#### Internal pilot



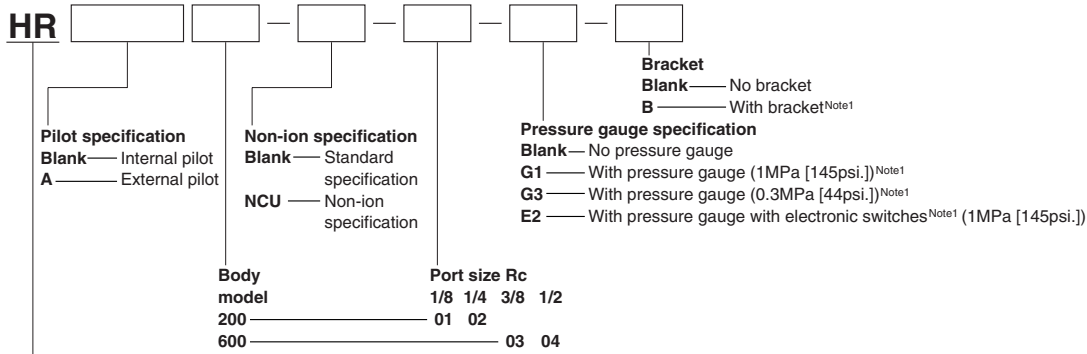
#### External pilot



### Specifications

| Item   | Model                               | HR200                | HR600       | HRA200      | HRA600      |
|--|-------------------------------------|----------------------|-------------|-------------|-------------|
| Media  |                                     | Air                  |             |             |             |
| Port size  | Rc                                  | 1/8, 1/4             | 3/8, 1/2    | 1/8, 1/4    | 3/8, 1/2    |
| Pressure setting range                             | MPa [psi.]                          | 0.05~0.7 [7~102]     |             |             |             |
| Relief starting pressure                           | MPa [psi.]                          | Max. 0.02 [3]        |             |             |             |
| Maximum operating pressure                         | MPa [psi.]                          | 0.9 [131]            |             |             |             |
| Proof pressure                                     | MPa [psi.]                          | 1.5 [218]            |             |             |             |
| Operating temperature range (atmosphere and media) | °C [°F]                             | 5~60 [41~140]        |             |             |             |
| Air consumption                                    | ℓ/min [ft <sup>3</sup> /min.] (ANR) | Max. 5 [0.18]        |             |             |             |
| Mass   | kg [lb]                             | 0.19 [0.42]          | 0.42 [0.93] | 0.15 [0.33] | 0.38 [0.84] |
|  | Pressure gauge                      |                      |             |             |             |
| Materials  |                                     | Aluminum die-casting |             |             |             |

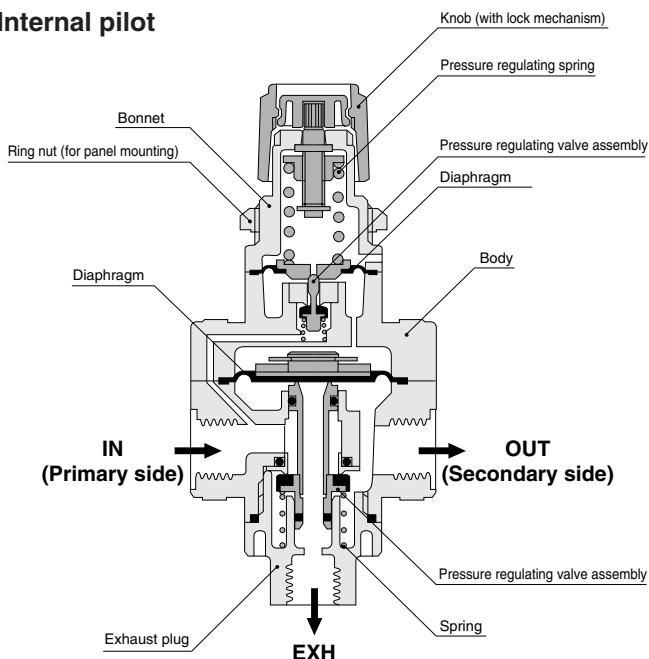
### Order Codes



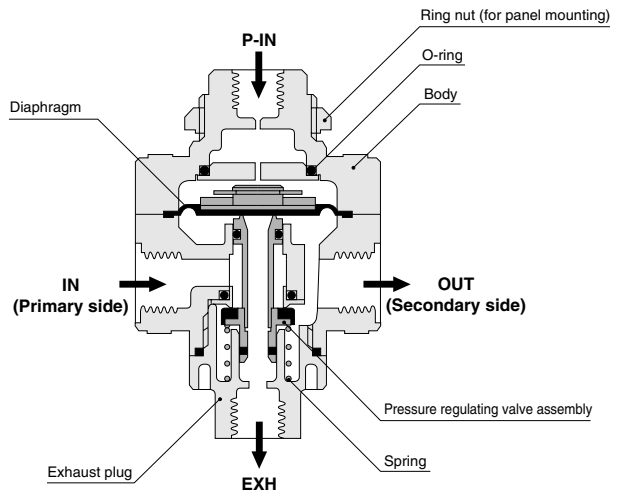
Notes: 1. For the specifications and dimensions for the pressure gauge, and pressure gauge with electronic switches, see p.172 and 177~181.  
2. For the bracket order codes and dimensions, see p.95~96.

### Inner Construction

#### Internal pilot

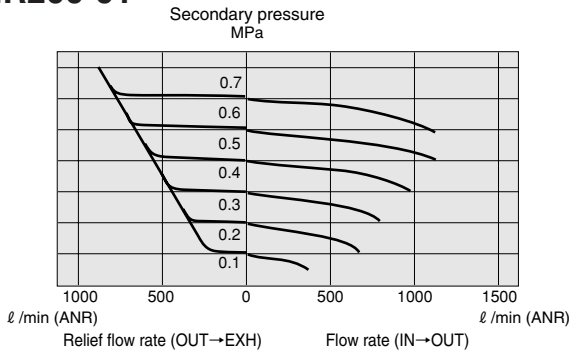


#### External pilot

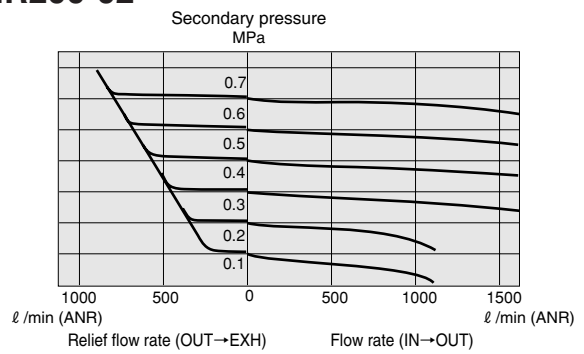


Internal pilot

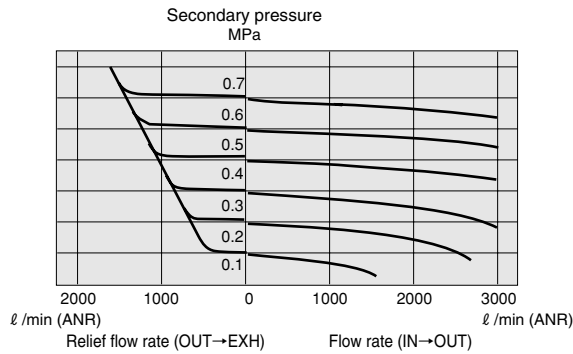
HR200-01



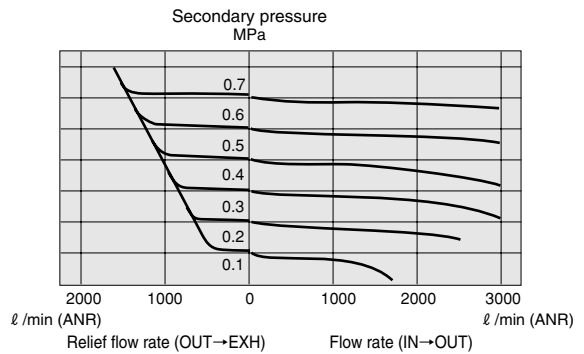
HR200-02



HR600-03

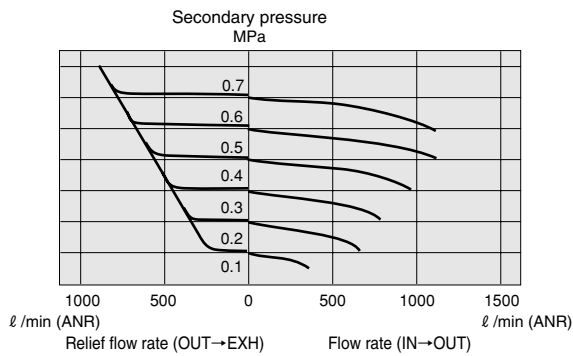


HR600-04

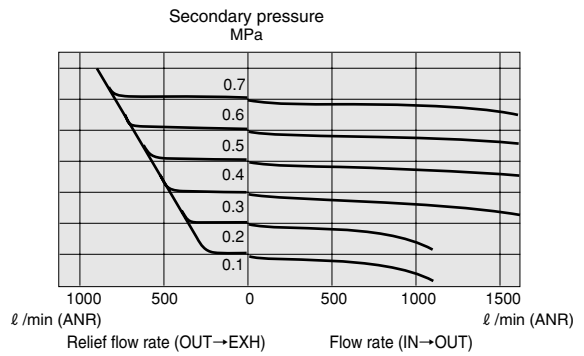


External pilot

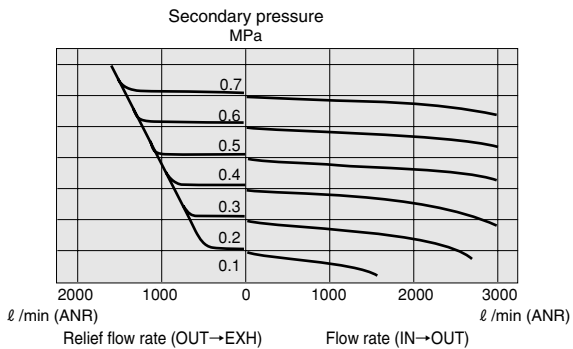
HRA200-01



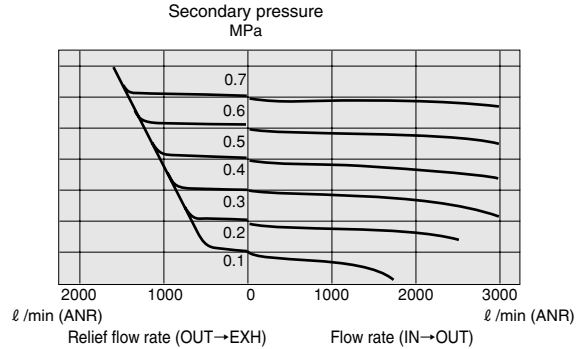
HRA200-02



HRA600-03



HRA600-04



Remarks: 1. Graphs show flow rate characteristics when the primary pressure is fixed at 0.7MPa [102psi].

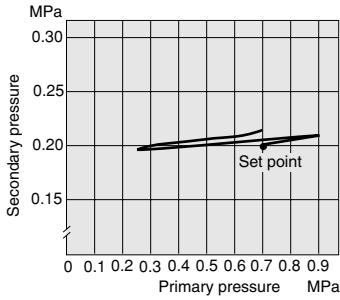
2. The right side of each graph shows the air flow rate from primary side to secondary side, while the left side shows the relief (exhaust) flow rate from the secondary side to EXH.

1MPa = 145psi. 1 l/min = 0.0353ft<sup>3</sup>/min.

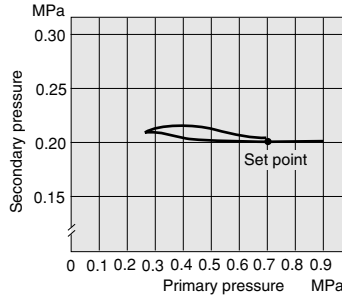
# Pressure Characteristics

## Internal pilot

### HR200

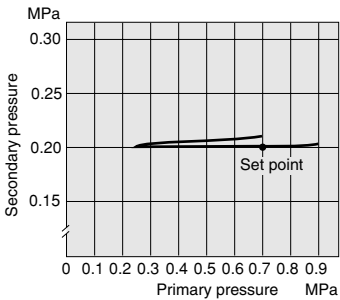


### HR600

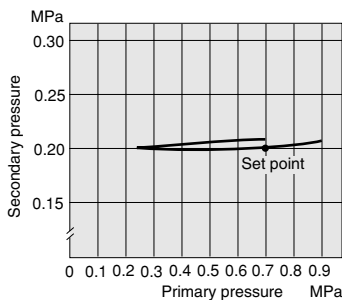


## External pilot

### HRA200



### HRA600



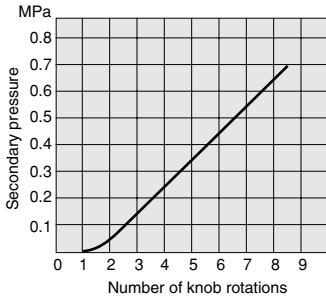
Remark: While the pressure characteristics shown are for a single unit, they may also be affected by the pilot regulator characteristics.

## Pressure Setting Characteristics

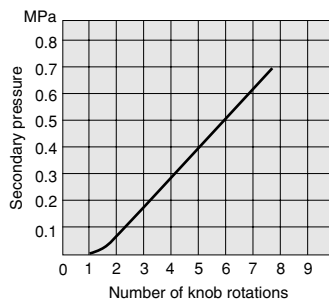
1MPa = 145psi.

## Internal pilot

### HR200



### HR600

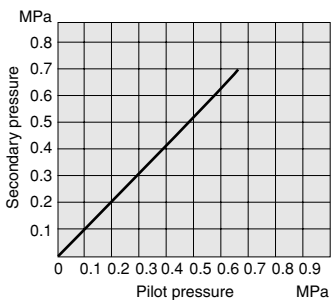


Remarks: 1. Graphs show flow rate characteristics when the primary pressure is fixed at 0.9MPa [131psi].  
2. The number of knob rotations is zero when the knob is rotated counterclockwise all the way.

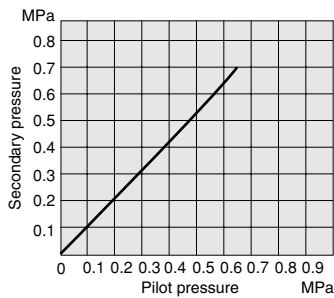
1MPa = 145psi.

## External pilot

### HRA200



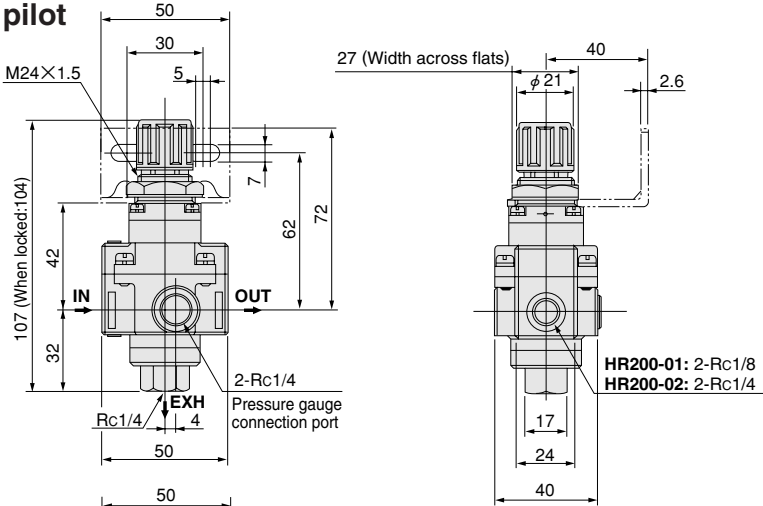
### HRA600



# Dimensions of High-relief Regulators (mm)

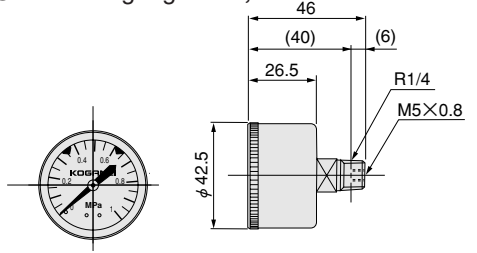
## Internal pilot

### HR200

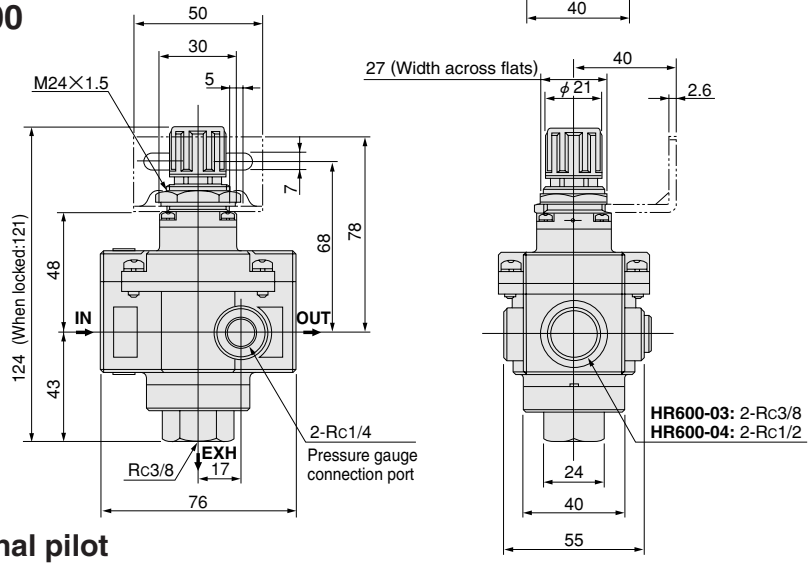


### Options

- Pressure gauge: -G1, -G3

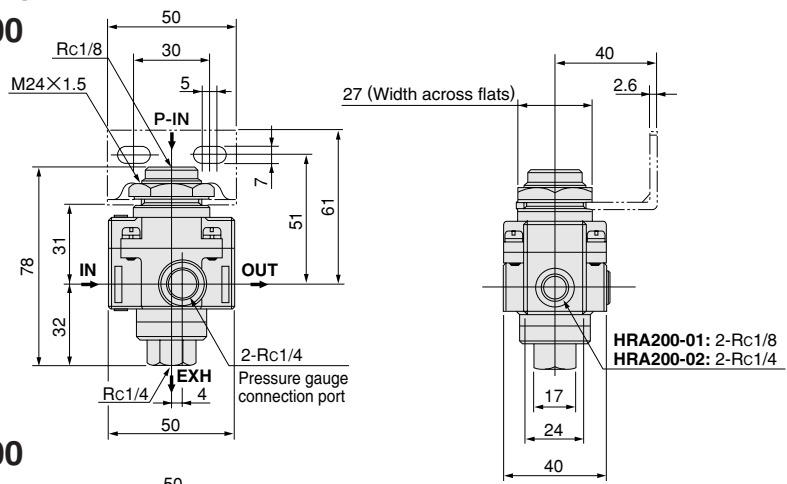


### HR600



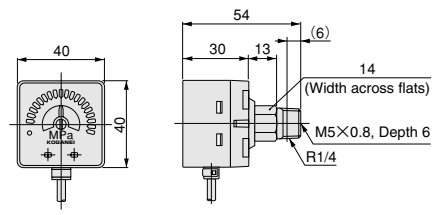
## External pilot

### HRA200

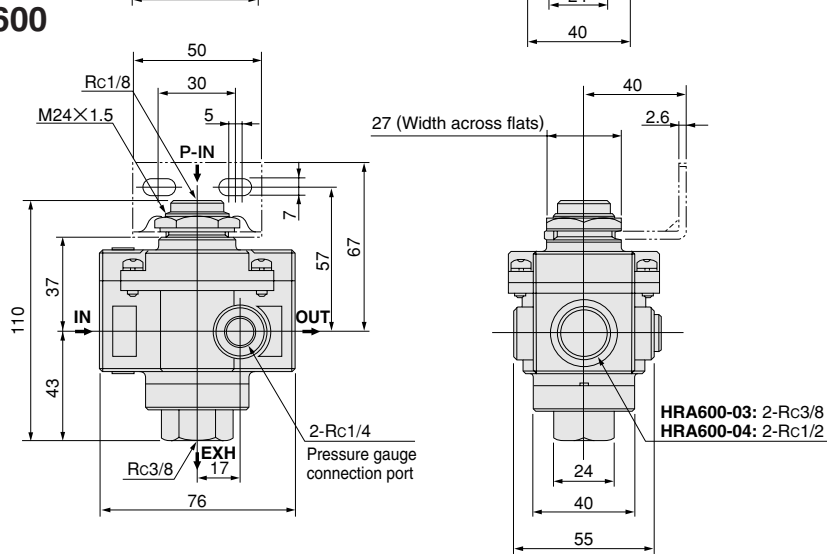


### Options

- Pressure gauges with electronic switches: -E2



### HRA600



Remark: The mounting hole for attaching the high-relief regulator on a panel, etc. is  $\phi 24.5$ .

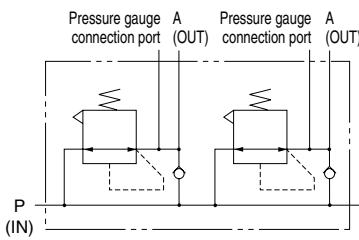
# MANIFOLD REGULATORS

R300M  A



- Regulation of supply pressure can be checked at a single location for all lines.
- Stable pressure regulation and large exhaust flow rate in a compact body.
- Push lock type regulator knob for light, smooth pressure regulation.

## Symbol



## Specifications

| Item   | Model      | MR302                | MR303 (low pressure) |
|--|------------|----------------------|----------------------|
| Media  |            | Air                  |                      |
| Port size  | Rc         | 1/4, 3/8             |                      |
| Pressure setting range                             | MPa [psi.] | 0.05~0.83 [7~120]    | 0.05~0.25 [7~36]     |
| Maximum operating pressure                         | MPa [psi.] | 0.93 [135]           |                      |
| Proof pressure                                     | MPa [psi.] | 1.47 [213]           |                      |
| Operating temperature range (atmosphere and media) | °C [°F]    | 5~60 [41~140]        |                      |
| Lubrication  |            | Not required         |                      |
| Materials  |            | Aluminum die-casting |                      |
| Check mechanism                                    |            | As standard          |                      |

## Order Codes

**R300M**  **A**

**IN port specification, bracket**  
T — With T module  
DT — With T module bracket-combined use  
S — S adapter  
DS — With S adapter bracket-combined use

**Number of units**  
1 — One unit  
2 — Two units  
⋮  
10 — Ten units

**IN port**  
Port size  
2 — Rc 1/4  
3 — Rc 3/8

**Non-ion specification**  
Blank — Standard specification  
NCU — Non-ion specification

**OUT port**  
Port size  
02 — Rc 1/4  
03 — Rc 3/8

**Pressure gauge specifications**  
Blank — No pressure gauge  
GA20 — ϕ 20 A type (bottom piping) 1MPa [145psi.] specification<sup>Note2</sup>  
GD20 — ϕ 20 D type (back side piping) 1MPa [145psi.] specification<sup>Note2</sup>

**Order codes for regulators only**<sup>Note1</sup>

**Pressure gauge specification**  
Blank — No pressure gauge  
GA20 — ϕ 20 A type (bottom piping) 1MPa [145psi.] specification<sup>Note2</sup>  
GD20 — ϕ 20 D type (back side piping) 1MPa [145psi.] specification<sup>Note2</sup>

**Non-ion specification**  
Blank — Standard specification  
NCU — Non-ion specification

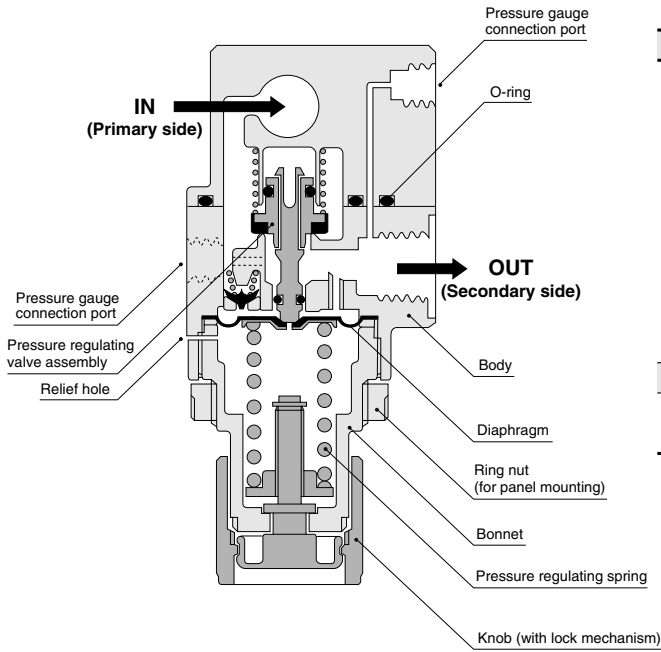
**Mounted regulator model**  
MR302 — Built-in check mechanism  
MR303 — Built-in check mechanism for low pressure

**Station**  
stn.1 — First station  
stn.2 — Second station  
⋮  
stn.10 — 10th station  
Regulator mounting location from the left, with the OUT port faces forward.

**Regulator model**  
MR302 — Built-in check mechanism  
MR303 — Built-in check mechanism for low pressure

Notes: 1. Cannot be used as a single unit.  
The bracket modules are required for additional units, order separately.  
2. For the pressure gauge specifications, order codes, and dimensions, see p.171.

## Inner Construction

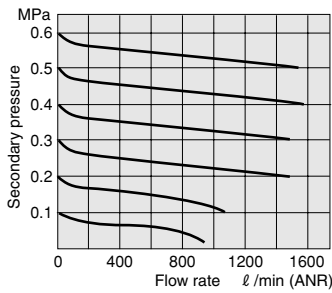


## Mass

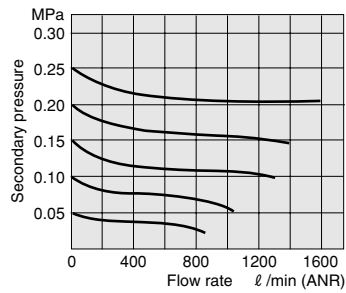
|                           |       | kg [lb]       |             |             |             |
|---------------------------|-------|---------------|-------------|-------------|-------------|
| Item                      | Model | R300M□AT      | R300M□ADT   | R300M□AS    | R300M□ADS   |
| Number of manifold units  | 1     | 0.58 [1.28]   | 0.74 [1.63] | 0.36 [0.79] | 0.52 [1.15] |
|                           | 2     | 0.84 [1.85]   | 1.00 [2.21] | 0.61 [1.35] | 0.77 [1.70] |
|                           | 3     | 1.10 [2.43]   | 1.26 [2.78] | 0.87 [1.92] | 1.03 [2.27] |
|                           | 4     | 1.34 [2.95]   | 1.52 [3.35] | 1.13 [2.49] | 1.29 [2.84] |
|                           | 5     | 1.62 [3.57]   | 1.78 [3.92] | 1.39 [3.06] | 1.55 [3.42] |
|                           | 6     | 1.87 [4.12]   | 2.11 [4.65] | 1.65 [3.64] | 1.89 [4.17] |
|                           | 7     | 2.13 [4.70]   | 2.46 [5.42] | 1.91 [4.21] | 2.23 [4.92] |
|                           | 8     | 2.39 [5.27]   | 2.71 [5.98] | 2.17 [4.78] | 2.49 [5.49] |
|                           | 9     | 2.65 [5.84]   | 2.97 [6.55] | 2.43 [5.36] | 2.75 [6.06] |
|                           | 10    | 2.91 [6.42]   | 3.23 [7.12] | 2.69 [5.93] | 3.01 [6.64] |
| MR30□ (single unit)       |       | 0.20 [0.44]   |             |             |             |
| Pressure gauge (Optional) | -GA20 | 0.007 [0.015] |             |             |             |
|                           | -GD20 | 0.007 [0.015] |             |             |             |

## Flow Rate Characteristics

### MR302



### MR303

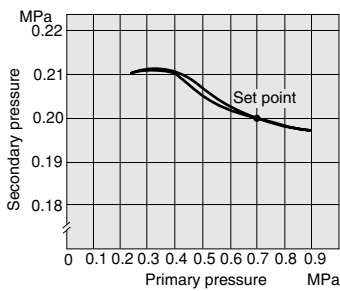


Remark: Graphs show flow rate characteristics when the primary pressure is fixed at 0.7MPa [102psi].

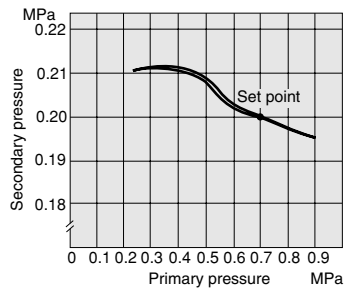
1MPa = 145psi. 1ℓ/min = 0.0353ft<sup>3</sup>/min.

## Pressure Characteristics

### MR302



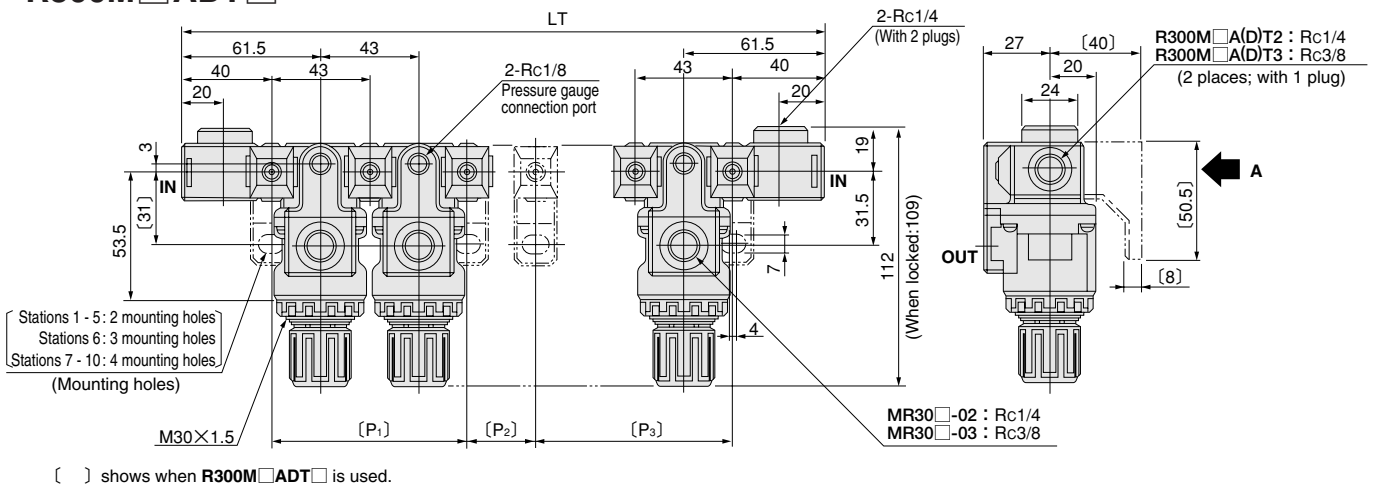
### MR303



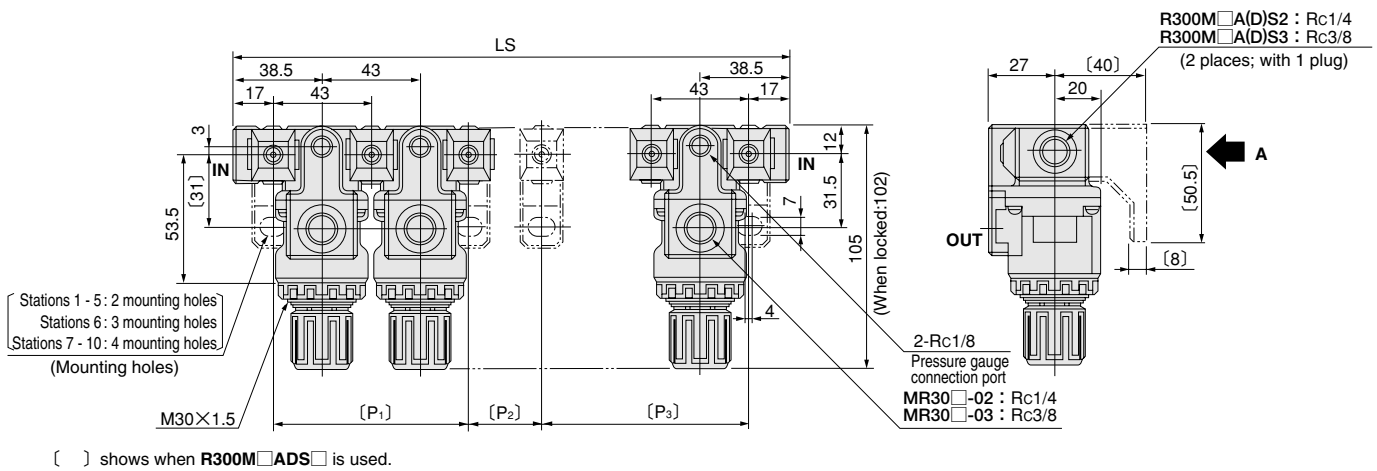
1MPa = 145psi.

# Dimensions of Manifold Regulators (mm)

R300M□AT□  
R300M□ADT□

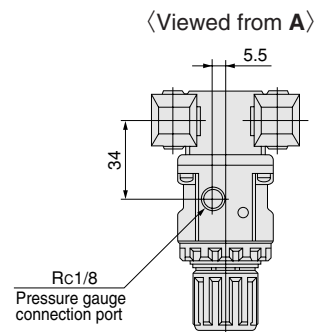


R300M□AS□  
R300M□ADS□



## Unit dimensions

| No. of units | Code | LT  | LS  | P <sub>1</sub> | P <sub>2</sub> | P <sub>3</sub> |
|--------------|------|-----|-----|----------------|----------------|----------------|
| 1            | 123  | 123 | 77  | —              | —              | —              |
| 2            | 166  | 166 | 120 | —              | —              | —              |
| 3            | 209  | 209 | 163 | —              | —              | —              |
| 4            | 252  | 252 | 206 | —              | —              | —              |
| 5            | 295  | 295 | 249 | —              | —              | —              |
| 6            | 338  | 292 | 292 | 129            | —              | 129            |
| 7            | 381  | 335 | 335 | 86             | 129            | 86             |
| 8            | 424  | 378 | 378 | 86             | 172            | 86             |
| 9            | 467  | 421 | 421 | 129            | 129            | 129            |
| 10           | 510  | 464 | 464 | 129            | 172            | 129            |





# LUBRICATORS

## L150, L300, L600

- Constant lubrication even with varied flow rates or pressure.
- Scaled dial ensures easy droplet regulation.
- Easy to attach and remove click-on bowl.
- Micro lubricator also included in model series. Assures steady lubrication even in long piping.
- Drain cock, and drain cock with fitting, are optional.

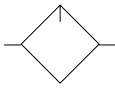


### Specifications

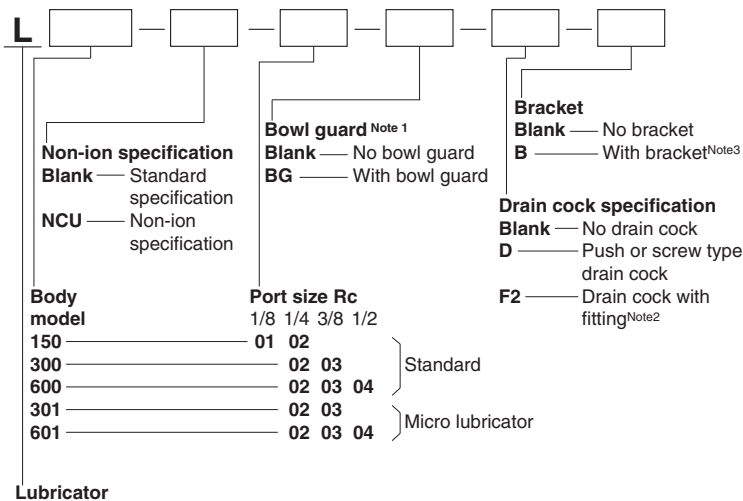
| Item   | Model                  | Standard                                     | L150   | L300             | L600                 |
|--|------------------------|--|--|------------------|----------------------|
|  | Micro lubricator       |  | —  | L301             | L601                 |
| Media  |                        | Air  |  |                  |                      |
| Port size  | Rc                     |  | 1/8, 1/4                                     | 1/4, 3/8         | 1/4, 3/8, 1/2        |
| Maximum operating pressure                                 | MPa [psi.]             | 0.93 [135]                                   |  |                  |                      |
| Proof pressure   | MPa [psi.]             | 1.47 [213]                                   |  |                  |                      |
| Operating temperature range (atmosphere and media) °C [°F] |                        | 5~60 [41~140]                                |  |                  |                      |
| Oil capacity   | cc [in. <sup>3</sup> ] |  | 25 [1.5]                                     | 85 [5.2]         | 160 [9.8]            |
| Recommended lubrication                                    |                        | Turbine oil Class 1 [ISO VG32] or equivalent |  |                  |                      |
| Mass   | kg [lb.]               |  | 0.17 [0.37]<br>(0.18 [0.40]) <sup>Note</sup> | 0.36 [0.79]      | 0.42 [0.93]          |
| Materials  | Body                   |  | Aluminum die-casting                         | Zinc die-casting | Aluminum die-casting |
|  | Bowl                   |  | Polycarbonate                                |                  |                      |
| Standard attachments                                       |                        |  | —  | Bowl guard       |                      |

Note: Figure in parentheses ( ) shows mass with bowl guard.

### Symbol

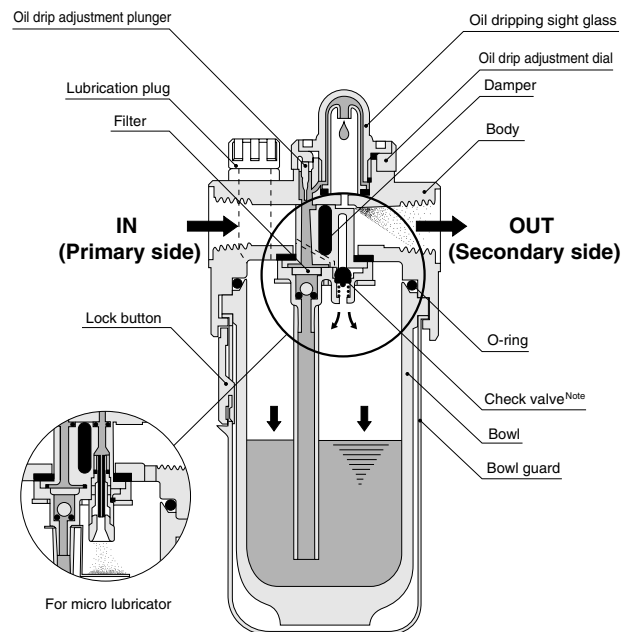


### Order Codes



Notes: 1. For L150 only. Standard specification for all models other than L150.  
2. Available for L150 as "With bowl guard: -BG" only.  
3. For the bracket order codes and dimensions, see p.95~96.

### Inner Construction

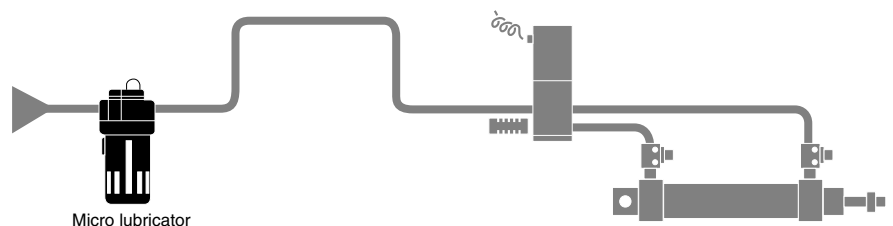


### Micro Lubricator for System Upgrade

Note: Not available for L150.

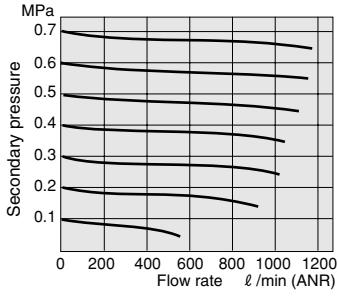
The micro lubricator uses a pipe and nozzle to generate an oil mist inside the bowl, and supplies only the most finely microscopic mist to the OUT side.

The micro mist rides easily on the air flow, to ensure faster, more assured lubrication supply. This method is effective even when the piping distance to the actuator is unusually far or is subject to complex twists and turns, or when the actuator is mounted in a high position.

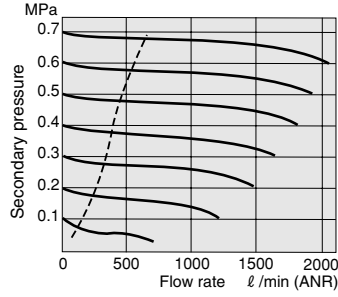


# Flow Rate Characteristics

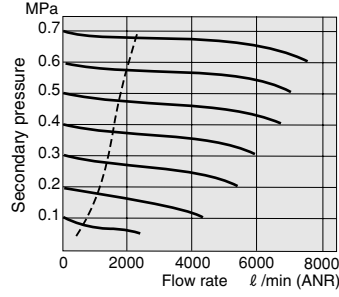
## L150



## L300



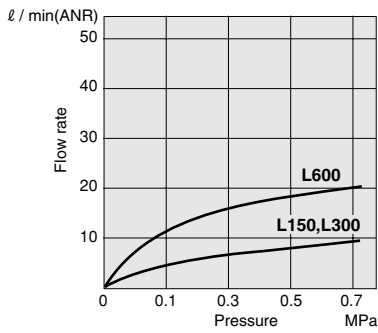
## L600



1MPa = 145psi.  
1 l/min = 0.0353ft.<sup>3</sup>/min.

Note: The dotted line shows the smallest flow rate of micro lubricator allowed. A micro mist cannot be formed below this flow rate. Always select a product with a flow rate that exceeds this dotted line.

## Minimum Flow Rate for Dripping Oil

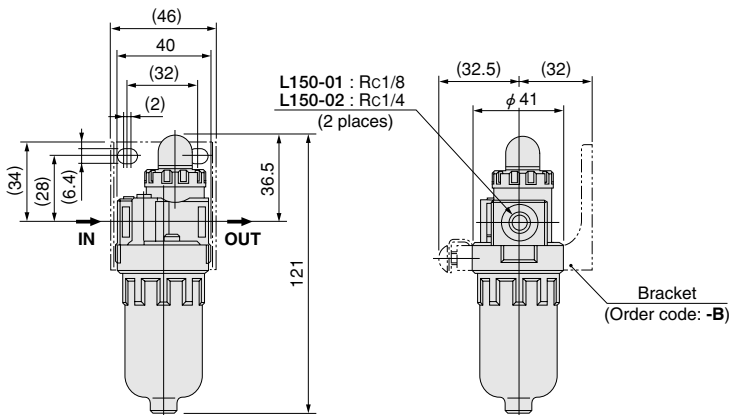


1MPa = 145psi. 1 l/min = 0.0353ft.<sup>3</sup>/min.

## Dimensions of Lubricators (mm)

### L150

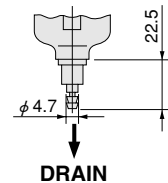
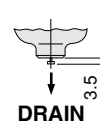
CAD L150



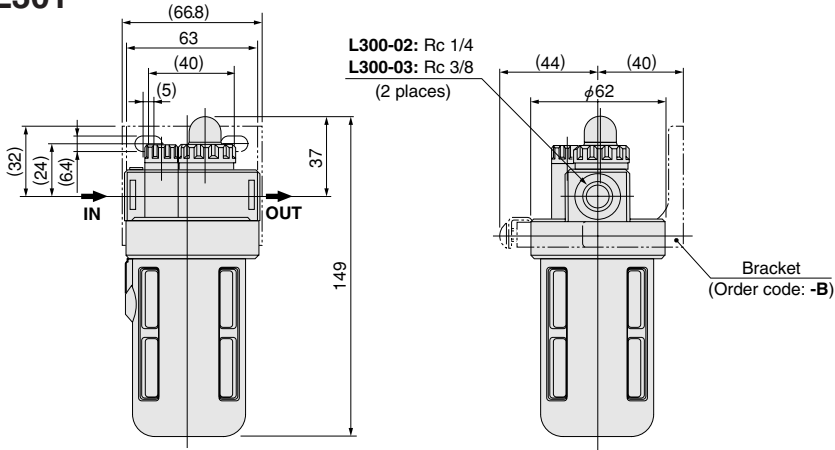
### Optional drain cocks

● Push type :-D

● Push type with fitting :-BG-F2

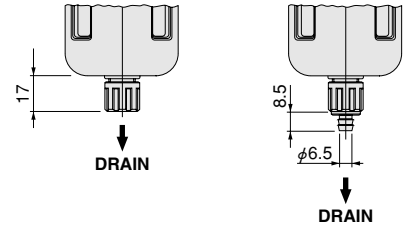


**L300  
L301**

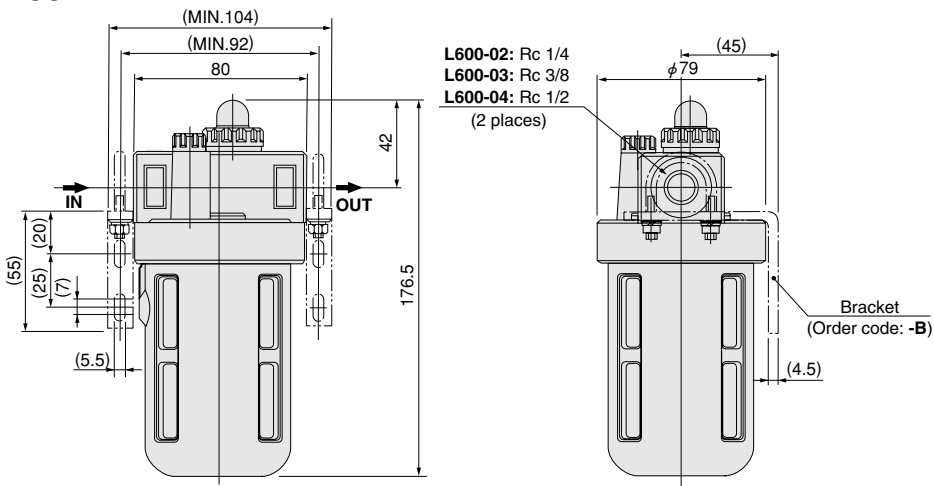


**Optional drain cocks**

- Screw type: -D
- Screw type with fitting: -F2

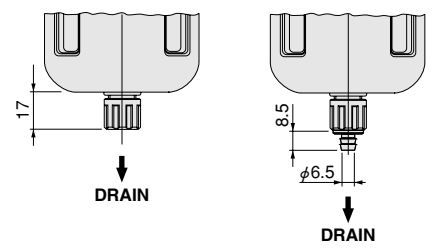


**L600  
L601**



**Optional drain cocks**

- Screw type: -D
- Screw type with fitting: -F2



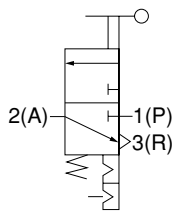
# RESIDUAL PRESSURE EXHAUST VALVES

300V, 600V



- Absence of a neutral position ensures safe and sure switching between air supply and exhaust.
- The exhaust port employs an orifice for restraining sudden exhaust.

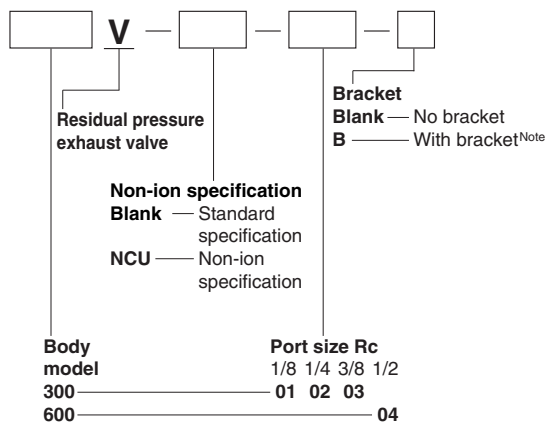
## Symbol



## Specifications

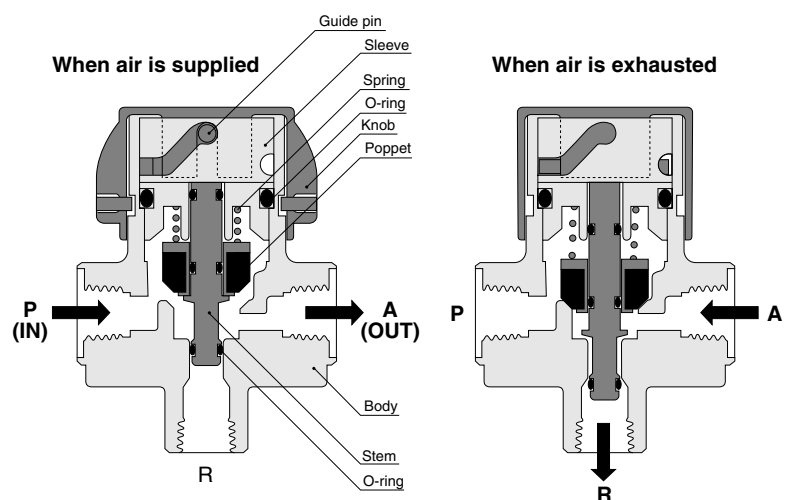
| Item   | Model | 300V-01              | 300V-02     | 300V-03     | 600V-04     |
|--|-------|----------------------|-------------|-------------|-------------|
| Media  |       | Air                  |             |             |             |
| Operation type   |       | Manual knob type     |             |             |             |
| Number of positions, number of ports                       |       | 2 positions, 3 ports |             |             |             |
| Effective area<br>mm <sup>2</sup> [Cv]                     | P, A  | 15 [0.83]            | 27 [1.50]   | 40 [2.22]   | 55 [3.06]   |
|  | R     | 10 [0.56]            |             |             |             |
| Port size Rc   | P, A  | 1/8                  | 1/4         | 3/8         | 1/2         |
|  | R     | 1/4                  |             |             |             |
| Operating pressure range MPa [psi.]                        |       | 0~0.9 [0~131]        |             |             |             |
| Proof pressure MPa [psi.]                                  |       | 1.32 [191]           |             |             |             |
| Operating temperature range (atmosphere and media) °C [°F] |       | 5~60 [41~140]        |             |             |             |
| Mounting direction   |       | Any                  |             |             |             |
| Lubrication  |       | Not required         |             |             |             |
| Mass kg [lb.]  |       | 0.22 [0.49]          | 0.21 [0.46] | 0.20 [0.44] | 0.25 [0.55] |
| Materials  | Body  | Aluminum die-casting |             |             |             |
|  | Knob  | Plastic              |             |             |             |
| Knob operation force N-cm [in-lbf]                         |       | 69 [6.1]             |             |             |             |
| Knob operation angle                                       |       | 90°                  |             |             |             |

## Order Codes



Note: For the bracket order codes and dimensions, see p.95~96.

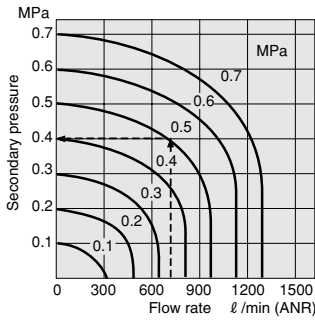
## Inner Construction



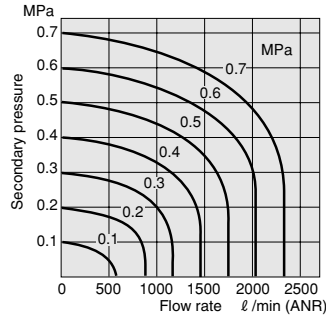
# Flow Rate Characteristics

## Supply air flow rate

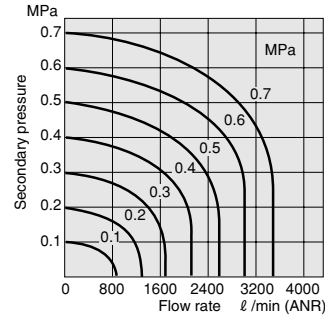
300V-01



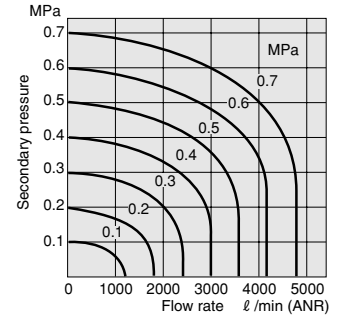
300V-02



300V-03



600V-04



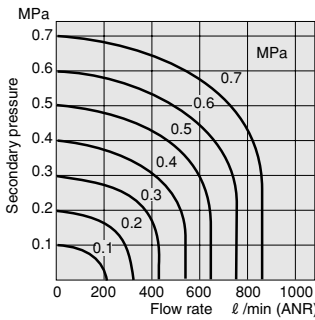
1MPa = 145psi. 1 l/min = 0.0353ft<sup>3</sup>/min.

### How to read the graph

When supply pressure is 0.5MPa [73psi.] and flow rate is 720 l/min [25.4ft<sup>3</sup>/min.] (ANR), the valve delivery pressure becomes 0.4MPa [58psi.].

## Exhaust flow rate

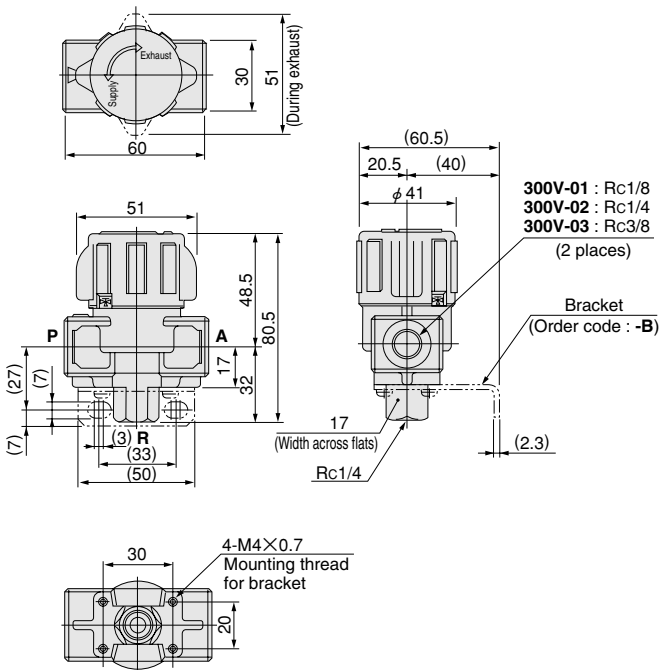
300V-□, 600V-04



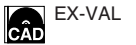
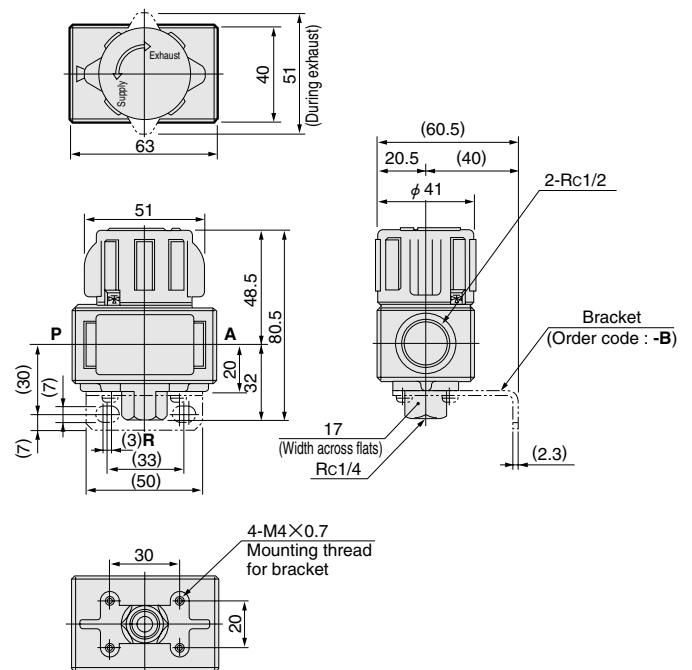
1MPa = 145psi. 1 l/min = 0.0353ft<sup>3</sup>/min.

## Dimensions of Residual Pressure Exhaust Valves (mm)

300V



600V



# MODULES AND ADAPTERS



- F module is a connector facilitating combinations of Multi Series equipment of the same body size.
- D module offers a mounting bracket function.
- T module provides branch piping at desired locations.
- S adapter allows easy installation and removal of equipment without disturbing the piping.
- Standard can be used as NCU specification.

## Model List

### For 150, 300 and 600 series

| Module, adapter<br>Body size  | F module<br>(For modules only)                | D module<br>(Brackets for combined use)       | T module<br>(Branch piping)                      |   | S adapter<br>(Port connection)                   |   |
|-------------------------------|---|---|--|---|--|---|
|                               | <b>F</b><br>Multi Series<br>↔<br>Multi Series | <b>D</b><br>Multi Series<br>↔<br>Multi Series | <b>T</b><br>Connection port<br>↔<br>Multi Series | <b>DT</b><br>Connection port<br>↔<br>Multi Series | <b>S</b><br>Connection port<br>↔<br>Multi Series | <b>DS</b><br>Connection port<br>↔<br>Multi Series |
| <b>15</b><br>(For 150 series) | <b>8-15F</b>                                  | <b>8-15D</b>                                  | <b>8-15T</b>                                     | <b>8-15DT</b>                                     | <b>8-15S</b>                                     | <b>8-15DS</b>                                     |
| <b>30</b><br>(For 300 series) | <b>8-30F</b>                                  | <b>8-30D</b>                                  | <b>8-30T</b>                                     | <b>8-30DT</b>                                     | <b>8-30S</b>                                     | <b>8-30DS</b>                                     |
| <b>60</b><br>(For 600 series) | <b>8-60F</b>                                  | <b>8-60D</b>                                  | <b>8-60T</b>                                     | <b>8-60DT</b>                                     | <b>8-60S</b>                                     | <b>8-60DS</b>                                     |

### For connections between different sizes

| Module<br>Body size                              | D module<br>(Brackets for combined use)        |
|--|--|
| <b>20</b><br>(For connecting 150 and 300 series) | For 300 series ↔ <b>8-20D</b> ↔ For 150 series |
| <b>40</b><br>(For connecting 300 and 600 series) | For 600 series ↔ <b>8-40D</b> ↔ For 300 series |

Remark: Material is zinc die-casting.

## Order Codes



### Module and adapter

- F — F module
- D — D module for bracket-combined use
- T — T module
- DT — T module for bracket-combined use
- S — S adapter
- DS — S adapter for bracket-combined use

### Body size

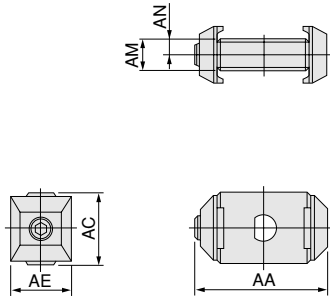
- 15 — For 150 series, HR200 and HRA200
- 20 — For connecting 150 and 300 series<sup>Note 1</sup>
- 30 — For 300 series
- 40 — For connecting 300 and 600 series<sup>Note 1</sup>
- 60 — For 600 series, HR600 and HRA600

| Port size <sup>Note 2</sup> | Rc  |     |     |     | Applicable body size |
|-----------------------------|-----|-----|-----|-----|----------------------|
|                             | 1/8 | 1/4 | 3/8 | 1/2 |                      |
| 1                           | 2   |     |     |     | 150                  |
| 2                           | 3   |     |     |     | 300                  |
| 2 <sup>Note 3</sup>         | 3   | 4   |     |     | 600                  |

- Notes: 1. Used only with D module.  
2. Not available in F module or D module.  
3. Used only with S adapter and DS adapter.

For details about equipment combinations, see p.58.

## Dimensions of F Modules (mm)

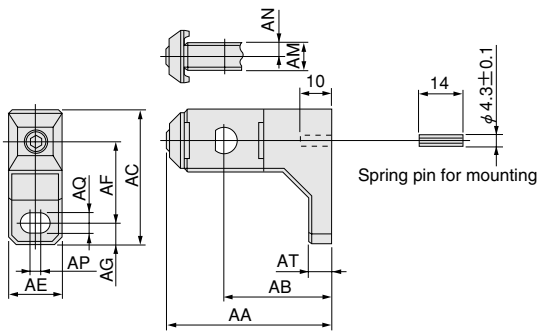


| Type Code | AA   | AC | AE   | AM | AN | Mass g |
|-----------|------|----|------|----|----|--------|
| 8-15F     | 36   | 20 | 17.4 | 8  | 4  | 38     |
| 8-30F     | 42   | 24 | 19.4 | 10 | 5  | 63     |
| 8-60F     | 56.5 | 30 | 31   | 12 | 6  | 150    |

Note: When assembling with other equipment, add the AM dimensions to the total.

## Dimensions of D Modules (mm)

8-15D  
8-30D

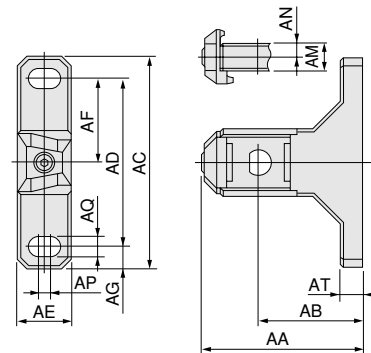


| Model Code | AA   | AB | AC   | AE   | AF | AG | AM | AN | AP |
|------------|------|----|------|------|----|----|----|----|----|
| 8-15D      | 50.5 | 32 | 49   | 17.4 | 31 | 8  | 8  | 4  | 4  |
| 8-30D      | 61.5 | 40 | 50.5 | 19.4 | 31 | 8  | 10 | 5  | 4  |

| Model Code | AQ | AT | Mass g |
|------------|----|----|--------|
| 8-15D      | 7  | 6  | 84     |
| 8-30D      | 7  | 8  | 137    |

Note: When assembling with other equipment, add the AM dimensions to the total.

8-20D  
8-40D

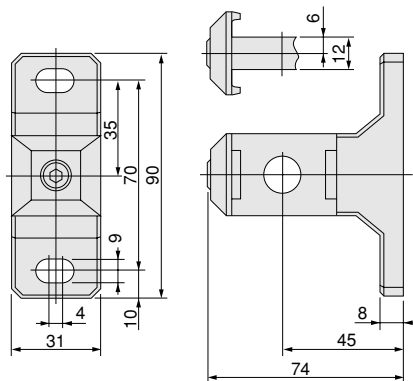


| Model Code | AA   | AB | AC | AD | AE   | AF | AG | AM   | AN | AP |
|------------|------|----|----|----|------|----|----|------|----|----|
| 8-20D      | 61.5 | 40 | 78 | 62 | 19.4 | 31 | 8  | 10   | 5  | 4  |
| 8-40D      | 74   | 45 | 90 | 70 | 31   | 35 | 10 | 16.8 | 6  | 4  |

| Model Code | AQ | AT | Mass g |
|------------|----|----|--------|
| 8-20D      | 7  | 8  | 141    |
| 8-40D      | 9  | 8  | 300    |

Note: When assembling with other equipment, add the AM dimensions to the total.

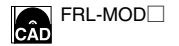
8-60D



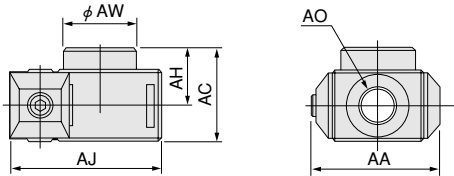
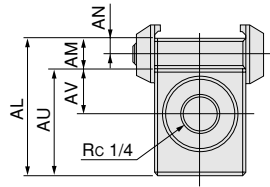
Mass: 260 g

Note: When assembling with other equipment, add 12mm to the total.

# Dimensions of T Modules (mm)



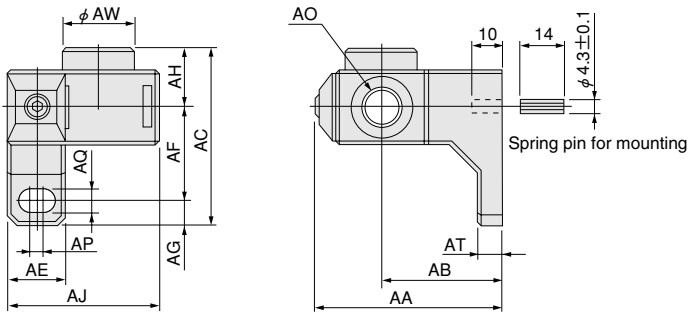
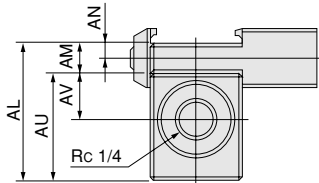
- 8-15T
- 8-30T
- 8-60T



| Model Code | AA   | AC | AH | AJ   | AL | AM | AN | AO    | AU | AV | AW | Mass g |
|------------|------|----|----|------|----|----|----|-------|----|----|----|--------|
| 8-15T1     | 36   | 27 | 17 | 43.5 | 39 | 8  | 4  | Rc1/8 | 31 | 13 | 20 | 116    |
| 8-15T2     | 36   | 27 | 17 | 43.5 | 39 | 8  | 4  | Rc1/4 | 31 | 13 | 20 | 110    |
| 8-30T2     | 42   | 31 | 19 | 49.5 | 45 | 10 | 5  | Rc1/4 | 35 | 15 | 24 | 196    |
| 8-30T3     | 42   | 31 | 19 | 49.5 | 45 | 10 | 5  | Rc3/8 | 35 | 15 | 24 | 181    |
| 8-60T3     | 56.5 | 40 | 24 | 66.5 | 57 | 12 | 6  | Rc3/8 | 45 | 19 | 32 | 271    |
| 8-60T4     | 56.5 | 40 | 24 | 66.5 | 57 | 12 | 6  | Rc1/2 | 45 | 19 | 32 | 264    |

Note: When assembling with other equipment, add the AL dimensions to the total.

- 8-15DT
- 8-30DT



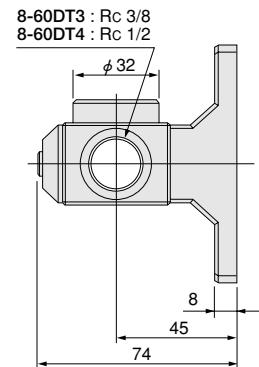
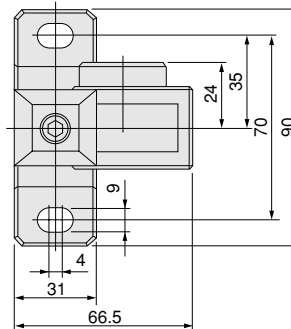
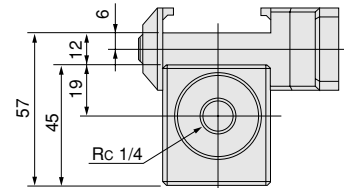
| Model Code | AA   | AB | AC | AE   | AF | AG | AH | AJ | AL |
|------------|------|----|----|------|----|----|----|----|----|
| 8-15DT1    | 50.5 | 32 | 56 | 17.4 | 31 | 8  | 17 | 44 | 39 |
| 8-15DT2    | 50.5 | 32 | 56 | 17.4 | 31 | 8  | 17 | 44 | 39 |
| 8-30DT2    | 61.5 | 40 | 58 | 19.4 | 31 | 8  | 19 | 50 | 45 |
| 8-30DT3    | 61.5 | 40 | 58 | 19.4 | 31 | 8  | 19 | 50 | 45 |

| Model Code | AM | AN | AO    | AP | AQ | AT | AU | AV | AW |
|------------|----|----|-------|----|----|----|----|----|----|
| 8-15DT1    | 8  | 4  | Rc1/8 | 4  | 7  | 6  | 31 | 13 | 20 |
| 8-15DT2    | 8  | 4  | Rc1/4 | 4  | 7  | 6  | 31 | 13 | 20 |
| 8-30DT2    | 10 | 5  | Rc1/4 | 4  | 7  | 8  | 35 | 15 | 24 |
| 8-30DT3    | 10 | 5  | Rc3/8 | 4  | 7  | 8  | 35 | 15 | 24 |

| Model Code | Mass g |
|------------|--------|
| 8-15DT1    | 161    |
| 8-15DT2    | 155    |
| 8-30DT2    | 273    |
| 8-30DT3    | 257    |

Note: When assembling with other equipment, add the AL dimensions to the total.

- 8-60DT

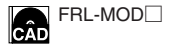


Mass  
 8-60DT3: 385g  
 8-60DT4: 375g

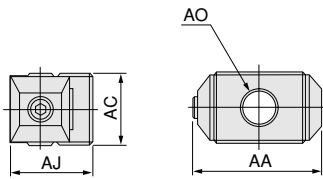
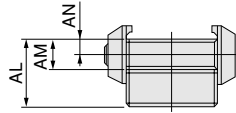
Note: When assembling with other equipment, add 57mm to the total.



### Dimensions of S Adapters (mm)



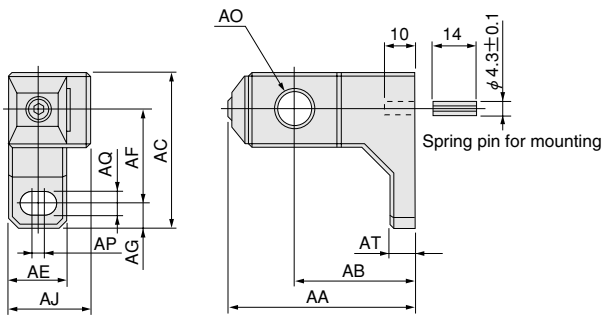
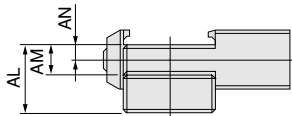
- 8-15S
- 8-30S
- 8-60S



| Model  | Code | AA   | AC | AJ   | AL | AM | AN | AO    | Mass g |
|--------|------|------|----|------|----|----|----|-------|--------|
| 8-15S1 |      | 36   | 20 | 24.5 | 20 | 8  | 4  | Rc1/8 | 51     |
| 8-15S2 |      | 36   | 20 | 24.5 | 20 | 8  | 4  | Rc1/4 | 49     |
| 8-30S2 |      | 42   | 24 | 26.5 | 22 | 10 | 5  | Rc1/4 | 81     |
| 8-30S3 |      | 42   | 24 | 26.5 | 22 | 10 | 5  | Rc3/8 | 78     |
| 8-60S2 |      | 56.5 | 32 | 37.5 | 28 | 12 | 6  | Rc1/4 | 190    |
| 8-60S3 |      | 56.5 | 32 | 37.5 | 28 | 12 | 6  | Rc3/8 | 187    |
| 8-60S4 |      | 56.5 | 32 | 37.5 | 28 | 12 | 6  | Rc1/2 | 183    |

Note: When assembling with other equipment, add the AL dimensions to the total.

- 8-15DS
- 8-30DS

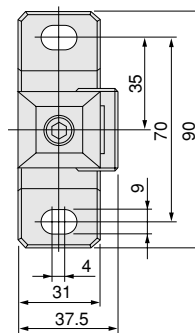
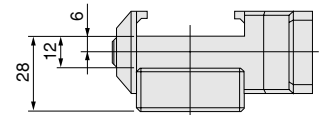


| Model   | Code | AA   | AB | AC | AE | AF | AG | AJ | AL | AM | AN | AO    | AP | AQ | AT |
|---------|------|------|----|----|----|----|----|----|----|----|----|-------|----|----|----|
| 8-15DS1 |      | 50.5 | 32 | 49 | 18 | 31 | 8  | 25 | 20 | 8  | 4  | Rc1/8 | 4  | 7  | 6  |
| 8-15DS2 |      | 50.5 | 32 | 49 | 18 | 31 | 8  | 25 | 20 | 8  | 4  | Rc1/4 | 4  | 7  | 6  |
| 8-30DS2 |      | 61.5 | 40 | 51 | 20 | 31 | 8  | 27 | 22 | 10 | 5  | Rc1/4 | 4  | 7  | 8  |
| 8-30DS3 |      | 61.5 | 40 | 51 | 20 | 31 | 8  | 27 | 22 | 10 | 5  | Rc3/8 | 4  | 7  | 8  |

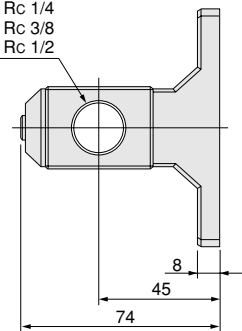
| Model   | Code | Mass g |
|---------|------|--------|
| 8-15DS1 |      | 96     |
| 8-15DS2 |      | 94     |
| 8-30DS2 |      | 155    |
| 8-30DS3 |      | 150    |

Note: When assembling with other equipment, add the AL dimensions to the total.

- 8-60DS



8-60DS2 : Rc 1/4  
8-60DS3 : Rc 3/8  
8-60DS4 : Rc 1/2



Mass  
8-60DS2: 302g  
8-60DS3: 299g  
8-60DS4: 295g

Note: When assembling with other equipment, add 28mm to the total.

# BRACKETS



## Bracket Models and Applicable Components

| Components type                  |        | Bracket model                              | Remark  |
|----------------------------------|--------|--|---|
| F.R.L. combinations              | C150   | <b>8-15D</b>                               | D module for bracket-combined use, standard equipment |
|                                  | C200   | <b>8-20D</b>                               |   |
|                                  | C300   | <b>8-30D</b>                               |   |
|                                  | C400   | <b>8-40D</b>                               |   |
|                                  | C600   | <b>8-60D</b>                               |   |
| Filter regulators                | FR150  | <b>8-15 (8-15A)</b>                        | Standard equipment                                    |
|                                  | FR300  | <b>8-30 (8-30A, 8-60B)<sup>Note2</sup></b> |   |
|                                  | FR600  | <b>8-65 (8-60B)<sup>Note2</sup></b>        |   |
| Air filters                      | F150   | <b>8-15A</b>                               | Body supporting type, optional                        |
|                                  | F300   | <b>8-30A (8-60B)<sup>Note2</sup></b>       | Piping supporting type, optional                      |
|                                  | F600   | <b>8-60B</b>                               | Piping supporting type, optional                      |
| Mist filters                     | MF300  | <b>8-30A (8-60B)<sup>Note2</sup></b>       | Body supporting type, optional                        |
|                                  | MF400  | <b>8-60B<sup>Note2</sup></b>               | Piping supporting type, optional                      |
|                                  | MF600  |  |   |
| Micro mist filters               | MMF150 | <b>8-30A (8-60B)<sup>Note2</sup></b>       | Body supporting type, optional                        |
|                                  | MMF300 | <b>8-60B<sup>Note2</sup></b>               | Piping supporting type, optional                      |
|                                  | MMF400 |  |   |
| Regulators                       | R150   | <b>8-15</b>                                | Standard equipment                                    |
|                                  | R300   | <b>8-30 (8-60B)<sup>Note2</sup></b>        |   |
|                                  | R600   | <b>8-65 (8-60B)<sup>Note2</sup></b>        |   |
| Precision regulator              | PR200  | <b>8-21Z</b>                               | Body supporting type, optional                        |
| High-relief regulators           | HR200  | <b>8-22Z</b>                               | Body supporting type, optional                        |
|                                  | HR600  |  |   |
|                                  | HRA200 |  |   |
|                                  | HRA600 |  |   |
| Manifold regulators              | MR300  | <b>8-30D</b>                               | D module for bracket-combined use, optional           |
| Lubricators                      | L150   | <b>8-15A</b>                               | Body supporting type, optional                        |
|                                  | L300   | <b>8-30A (8-60B)<sup>Note2</sup></b>       | Piping supporting type, optional                      |
|                                  | L600   | <b>8-60B<sup>Note2</sup></b>               |   |
| Residual pressure exhaust valves | 300V   | <b>8-31C</b>                               | Body supporting type, optional                        |
|                                  | 600V   |  |   |

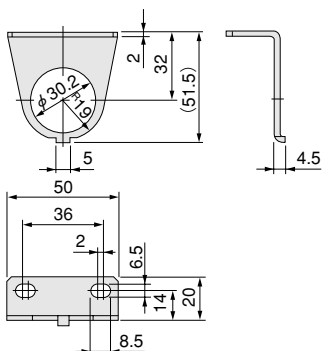
Notes: 1. Models in parentheses ( ) are non-standard, but are acceptable for use.  
 2. Pipe supporting type brackets (8-60B) are sold in a set of two brackets.

# Dimensions of Brackets (mm)



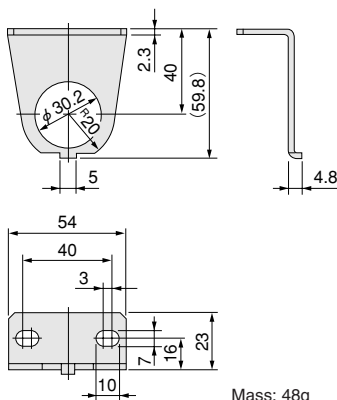
## For Filter Regulator and Regulator

### 8-15



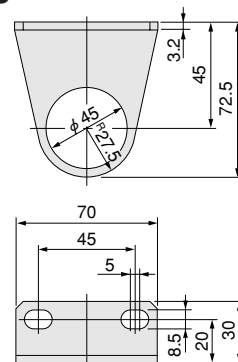
Mass: 31g

### 8-30



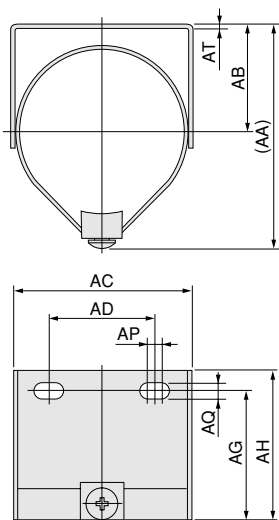
Mass: 48g

### 8-65

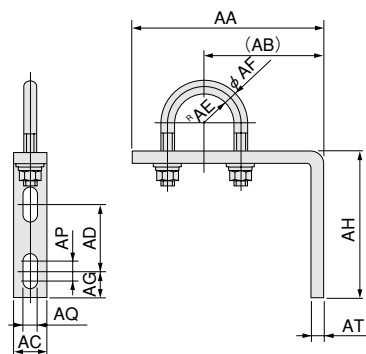


Mass: 69g

## For Air Filter, Mist Filter, Micro Mist Filter, and Lubricator



Mass  
8-15A: 60g  
8-30A: 80g



Mass: 107g

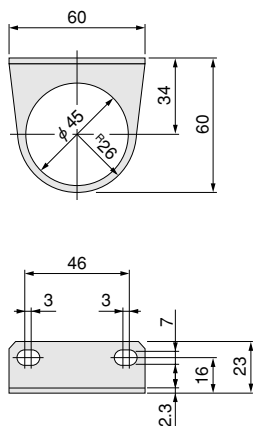
| Model | Code | AA | AB | AC   | AD | AG | AH | AP | AQ  | AT  |
|-------|------|----|----|------|----|----|----|----|-----|-----|
| 8-15A |      | 64 | 32 | 46   | 32 | 50 | 56 | 2  | 6.4 | 1.2 |
| 8-30A |      | 84 | 40 | 66.8 | 40 | 48 | 56 | 5  | 6.4 | 1.2 |

| Model | Code | AA | AB | AC | AD | AE | AF | AG | AH | AP | AQ  | AT  |
|-------|------|----|----|----|----|----|----|----|----|----|-----|-----|
| 8-60B |      | 72 | 45 | 12 | 25 | 11 | 5  | 10 | 55 | 7  | 5.5 | 4.5 |

Note: Pipe supporting type brackets (8-60B) are sold in a set of two brackets.

## For Precision Regulator

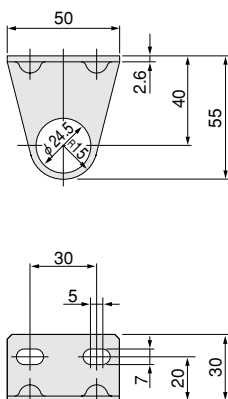
### 8-21Z



Mass: 42g

## For High-relief Regulator

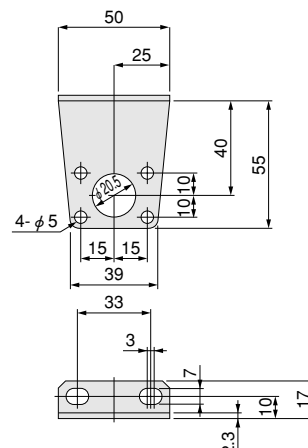
### 8-22Z



Mass: 52g

## For Residual Pressure Exhaust Valve

### 8-31C

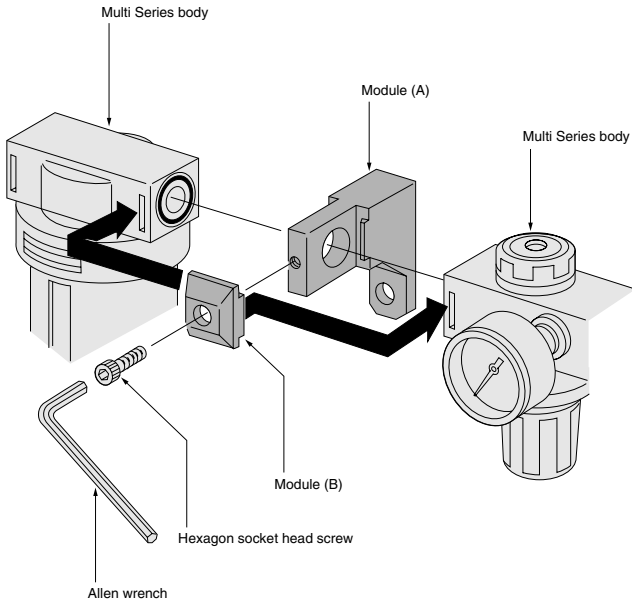


Mass: 50g



## Module

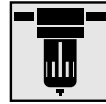
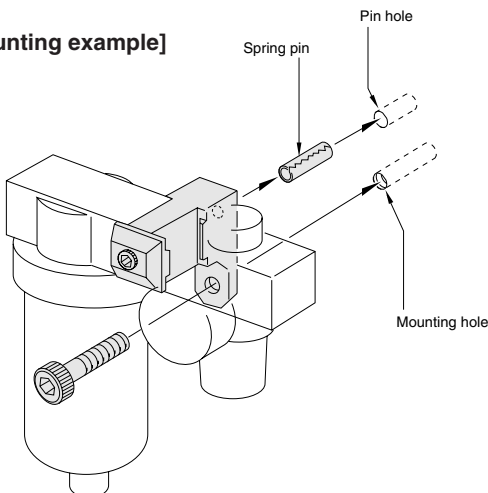
### Installation



1. On all Multi Series equipment, the side displaying an arrow ► mark on the top of the body indicates the IN port (primary side).
2. Align convex section of modules (A) and (B) in the grooves of the Multi Series body, and use a hexagon socket head screw to tighten and secure them in place.

- Cautions:**
1. For the module types applicable to each Multi Series type, see p.91.
  2. The Multi Series modules should not be allowed to sag when mounted. As there is a possibility that they will sag under the weight of connections of steel piping or other heavy piping, always connect module brackets to both ends of the modules before mounting.
  3. There is only one mounting hole when mounting a module using one of either 8-15D or 8-30D onto a mechanical device, causing an unstable installation. Use the spring pin supplied to prevent the unit from rotating. The pin hole here is  $\phi 4.6$  with a depth of 6.
  4. Assemble the T module so that the piping port faces upward.

### [Mounting example]



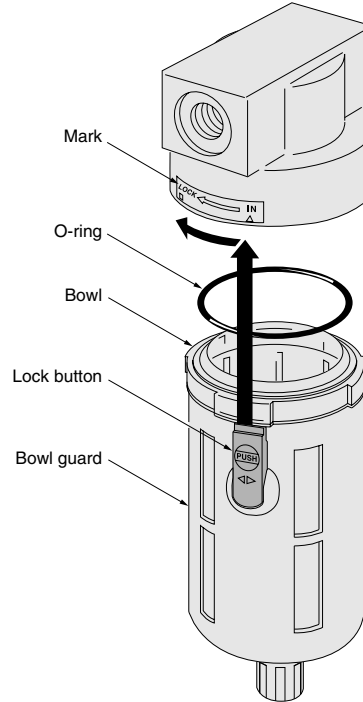
## Filter Regulator, Filter, and Lubricator

### Mounting and piping

Mount in a vertical position, with the piping connections on the top and the drain port on the bottom.

### Bowl

Because the bowl is made of polycarbonate, avoid subjecting it to excessive force or shocks. Also, do not use it in atmospheres subject to organic solvents, etc.



### ● Removing the bowl

While pushing down on the red lock button, rotate the bowl and bowl guard to the right (the direction opposite to the arrow mark) until it is aligned to the IN mark, then remove the bowl and bowl guard from the body.

### ● Mounting the bowl

1. Align the bowl and bowl guard to the convex section along their rims, and set the bowl into the bowl guard.
2. Align the lock button to the IN mark, and insert into the body. While pressing the bowl against the body, rotate it to the left (the direction shown by the arrow mark) until it reaches the LOCK position, and secure in place.

- Cautions:**
1. Always shut off the media before removing or mounting the bowl.
  2. Set the O-ring onto the body, and then mount the bowl and bowl guard.
  3. The bowl for the 150 series is a screw-in type. For removal or mounting, manually rotate the bowl or bowl guard.
  4. Use a neutral detergent to clean the bowl.

### Filter

1. Drain the collected liquid from the air filter on a periodic basis.
2. To clean the air filter element, remove the element and blow it off with compressed air, etc.

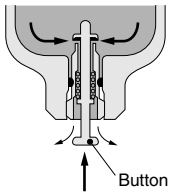
**Drain cock**

● **Push type**

**150 series**

(Air filter Standard  
Lubricator Order code: **-D**)

Pressing the button opens the drain port, and the collected liquid is expelled.

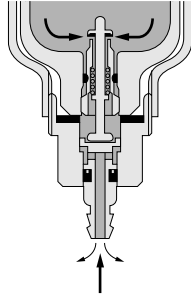


● **Push type with fitting**

**150 series**

(Air filter Order code: **-BG-F1**  
Lubricator Order code: **-BG-F2**)

Pushing the fitting upward opens the drain port, and the collected liquid is expelled.

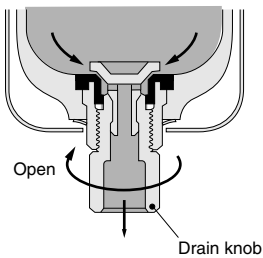


● **Screw type**

**300-600 series**

(Air filter Standard  
Lubricator Order code: **-D**)

Rotating the drain knob to the left opens the drain port, and the collected liquid is expelled.

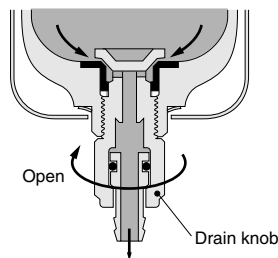


● **Screw type with fitting**

**300-600 series**

(Air filter Order code: **-F1**  
Lubricator Order code: **-F2**)

Rotating the drain knob to the left opens the drain port, and the collected liquid is expelled.



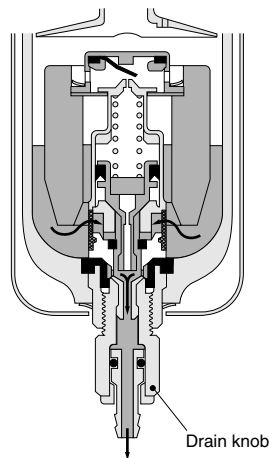
**Caution:** The drain knob should be operated using the fingertips.

● **Auto drain type**

**300-600 series**

(Air filter Order code: **-A**)

When a certain volume of collected liquid has accumulated, or when the pressure inside the bowl has fallen to less than 0.02MPa [3psi.], the collected liquid is automatically expelled. The collected liquid may also be expelled manually by turning the drain knob to the left.



**Cautions:** 1. In the auto drain, air is exhausted from the drain port until the supply pressure reaches 0.15MPa [22psi.]. This is normal, and even rotating the drain knob in this situation will not prevent the air from bleeding out.

(If the time required for the supply pressure to rise to 0.15MPa [22psi.] seems too long, consult us.)

2. The drain knob should be operated using the fingertips.
3. If attaching a tube to the fitting, use a nylon tube with inner diameter of 6mm. Do not let the tube bend in the area near the fitting connection.
4. The fitting can be rotated freely in any direction. As a result, the tube does not need to be removed even when manually draining the collected liquid.

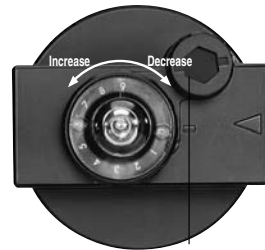
**Lubrication**

1. Use Turbine Oil Class 1 (ISO VG32) or an equivalent for lubrication. Avoid using spindle oil or machine oil.
2. For lubrication, use an Allen wrench to remove the plug from the lubrication port, and supply oil until the bowl is 80% filled.

**Caution:** Even though lubrication can be carried while supplying compressed air for the L300 and L600, lubrication cannot be carried while supplying compressed air for the L150.

**Oil drip-rate adjustment**

Rotating the lubricator dial to the left increases the oil drip-rate. Use the adjustment marks on the body and the numbers on the dial to adjust the oil drip-rate.



- Cautions:** 1. While the dial can be rotated continuously to the right, the rate of change for the oil dripping volume does not correspond to the numbers on the dial.
2. The numbers on the dial represent rough oil drip-rate, not the number of droplets.

# Handling Instructions and Precautions



## Filter Regulator, Regulator, Precision Regulator, Manifold Regulator, and High-relief Regulator

### Mounting and piping

#### ● General overview for regulators

In regulator configurations (with the exception of types with built-in check mechanism), the OUT port (secondary) pressure may not be exhausted to the IN port (primary) side even when the IN port pressure is 0MPa. To ensure that exhaust is performed, either use a type with built-in check mechanism, or install a check valve alongside. If a regulator with built-in check mechanism installed after the solenoid valve for cylinder pressure adjustment performed, make sure that cylinder back pressure does not cause secondary pressure on the regulator with built-in check mechanism to rise above the set pressure. The check mechanism may not operate correctly. (As a guide, use at a pressure differential between the push and pull sides of 0.3MPa or less.)

Also, because regulator (with the exception of the High-relief Regulator) relief ports are smaller than the diameter of the piping port, they may not be able to respond to sudden increases in pressure on the OUT port (secondary) side. For situations where pressures can rise sharply due to a force being applied to the cylinder externally, either use a High-relief Regulator or set the relief valve to OUT.

#### ● Precision Regulator

1. If mounting the Precision Regulator as a single unit, use a bracket (optional). A ring nut for panel mounting can also be used.
2. When piping to the Precision Regulator, position the piping so that the air supply side connects to the IN port and the actuator side connects to the OUT port. To prevent the fitting on the OUT port side from interfering with the damper tube, use piping with inner diameter at least 3mm [0.12in.] or more.



- Cautions:**
1. The regulator cannot be used with the IN port and the OUT port in the opposite positions.
  2. When mounting a fitting on the OUT port, be careful to avoid damaging the damper tube. In addition, avoid using a plug or a fitting with too small inner diameter in the OUT port. Bending the damper tube or blocking the hole could damage the precision regulator function, preventing accurate regulating pressure.
  3. Avoid a mounting position that blocks the relief hole. Blocking the relief hole could prevent regulating pressure.

#### ● Manifold Regulator

1. Use sufficiently large IN port piping, and supply via the IN ports at both manifold ends as much as possible. Moreover, when using five or more units on a manifold, mount a T module somewhere in the middle of the units, and supply via the IN ports in at least three different locations.
2. To stabilize secondary pressure, ensure a sufficiently large pressure differential (0.3MPa [44psi.] MIN.) between the IN port pressure and OUT port pressure.

#### ● High-relief Regulator

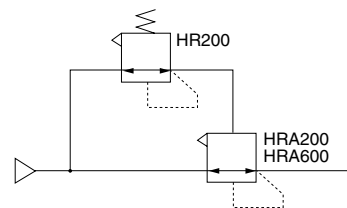
1. The High-relief Regulator's IN port (primary side) is on the top surface of the body, where the arrow ► mark is located.
2. The High-relief Regulator can be mounted as a module with any equipment in the air preparation Multi Series. Module formation and equipment compatibility for HR200 and HRA200 is the same as the 150 series, and for HR600 and HRA600, the same as the 600 series.
3. For single unit mounting, use brackets (order code :-B). A ring nut for panel mounting can also be used.
4. When mounting a pressure gauge, never grab the pressure gauge body for tightening. Always use a wrench on the square section around the connection port to tighten.
5. When mounting a muffler or exhaust filter on the EXH port, use the following table to select the type.

| Model           | Recommended muffler, exhaust filter |
|-----------------|-------------------------------------|
| HR200<br>HRA200 | KM-22, KM-23<br>EF300, EF600, EF800 |
| HR600<br>HRA600 | KM-31<br>EF300, EF600, EF800        |

For details, see p.549 and 552.

6. While any mounting direction is acceptable, mounting with the EXH port pointing straight up could result in noisy operation. In this case, change the pressure setting, increase the exhaust volume, or perform some other preventive measures.
7. If using a mounting ring to mount the regulator, use a mounting torque of 980.7N·cm [86.7in·lbf] or less.

- Cautions:**
1. Avoid operating methods that involve setting a valve on the primary side of the High-relief Regulator and repeatedly switching the primary pressure.
  2. If mounting a muffler, etc., on the EXH port, use a tightening torque for HR200 and HRA200 of 294.2N·cm [26.0in·lbf] or less, and for HR600 and HRA600, 490.3N·cm [43.4in·lbf] or less. When mounting, always use a wrench on the hexagonal section of the exhaust plug. Avoid using steel piping to connect the EXH port.
  3. In the external pilot type, exhausting primary pressure while supplying pilot air could cause damage to the diaphragm. For this reason, exhaust the primary side of the regulator that controls pilot pressure, and the primary side of the external pilot type at the same time.



4. To avoid interfering with the piping volume, select a regulator with a large relief flow rate for the pilot regulator to be used for the external pilot type. In addition, do not allow the pilot air piping length to exceed the values shown in the table below.

| O.D × I. D.mm [in.] | Piping length m [ft.] |
|---------------------|-----------------------|
| 4×2 [0.157×0.079]   | 2 [6.6]               |
| 6×4 [0.236×0.157]   | 20 [65.6]             |
| 8×6 [0.315×0.236]   | 50 [164]              |

### Pressure regulation

**Caution:** Perform the setting while checking the primary pressure and secondary pressure gauge displays. Rotating the knob too far could cause damage to the internal parts. Be particularly careful not to rotate it too far during depressurization, since time is required for relief.

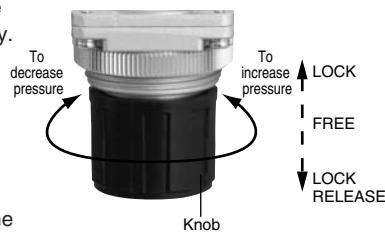
#### ● Filter Regulator, Regulator, Manifold Regulator

Perform pressure regulation by pulling out the knob firmly. Rotating it to the right (clockwise direction) increases the pressure, and rotating to the left (counterclockwise direction) reduces the pressure. After regulating pressure, push the knob back into the body and lock it in place.

- Cautions:**
1. Do not attempt to rotate the knob while in the locked position.
  2. In the FR150 and R150 series, vibration noise can occur when the pressure differential between the primary pressure and setting pressure is large (0.7MPa [102psi.] or more). In this situation, reduce the pressure differential (0.5MPa [73psi.] or less).

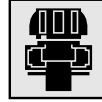
#### ● Precision Regulator, High-relief Regulator

Perform regulating pressure by pulling out the knob firmly. Rotating it to the right (clockwise direction) increases the pressure, and rotating to the left (counterclockwise direction) reduces the pressure. After regulating pressure, push the knob back into the body and lock it in place.



**Remark:** When regulating pressure, connect a pressure gauge of a class JIS 1.5 or equivalent to the Precision Regulator's pressure gauge connection port (Rc1/4).

- Cautions:**
1. To maintain accurate pressure adjustment conditions while locked, the Precision Regulator knob includes a free (neutral) state between the lock state and pressure adjustment state. To switch between the regulating pressure and lock states, pull the knob firmly out or push it in until a clicking sound shows that it has firmly arrived in the lock state or pressure adjustment state.
  2. The Precision Regulator is a bleed type, which means that a slight amount of air constantly bleeds out of the bleed hole while the secondary side is undergoing pressure adjustment. This is a normal situation.
  3. The internal pilot type uses a metal contact seal on the pilot regulator portion that causes it to bleed a slight amount of air. This is a normal situation.



### Residual Pressure Exhaust Valve

#### Mounting and piping

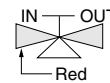
1. When mounting the Residual Pressure Exhaust Valve as a single unit, use either a mounting thread on the R port side or a bracket (optional). If using steel piping, the piping itself can serve as a support.
2. Connect the piping for the Residual Pressure Exhaust Valve so that the P port is on the primary (media) side and the A port is on the mechanical device side. If using as a 2-port valve, use a Rc1/4 plug to block the R port.

- Cautions:**
1. The unit cannot be used with the P port and A port in reversed positions.
  2. If using in locations subject to dripping water, dripping oil, etc., or to large amounts of dust, use something to cover and protect the unit.

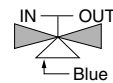
#### Switching valves

To switch between air supply or exhaust, rotate the knob by 90 degrees. Rotation to the left (counterclockwise direction) switches to the air supply state, while rotating to the right (clockwise direction) switches to the exhaust state. As there is no neutral position (where the P port air would return back to A or R), slowly rotating the knob can slowly increase the supply or exhaust volume. To determine the current valve state, check a display window on the side of the knob.

#### Air supply



#### Exhaust



**Caution:** After switching the knob firmly by 90 degrees, always check that it is locked in place.



### General precautions

1. Always thoroughly blow off (use compressed air) the tubing before piping. Entering chips, sealing tape, rust, etc., generated during piping work could result in air leaks or other defective operation.
2. Use clean air for the media. Install an air filter (with filtration of a minimum 5 $\mu$ m). For the use of any other media, consult us.
3. The product cannot be used when the media or the ambient atmosphere contains any of the substances listed below. Organic solvents, phosphoric acid ester type hydraulic oil, sulphur dioxide, chlorine gas, acids, or alkali.
4. If using in locations subject to dripping water, dripping oil, etc., or to large amounts of dust, use something to cover and protect the unit.

