

# Air Filter

# AF10 to 60

## How to Order

**AF 30 - F 03 BD - 2R**

**Body size**  
10 20 30 40 50 60

**Thread type**

|           |                    |
|-----------|--------------------|
| Nil       | Metric thread (M5) |
| N Note 1) | Rc                 |
| F Note 2) | NPT                |
|           | G                  |

**Port size**

| Symbol | Port size | Body size |    |    |    |    |    |
|--------|-----------|-----------|----|----|----|----|----|
|        |           | 10        | 20 | 30 | 40 | 50 | 60 |
| M5     | M5        | ●         | —  | —  | —  | —  | —  |
| 01     | 1/8       | —         | ●  | —  | —  | —  | —  |
| 02     | 1/4       | —         | ●  | ●  | ●  | —  | —  |
| 03     | 3/8       | —         | —  | ●  | ●  | —  | —  |
| 04     | 1/2       | —         | —  | —  | ●  | —  | —  |
| 06     | 3/4       | —         | —  | —  | ●  | ●  | —  |
| 10     | 1         | —         | —  | —  | —  | ●  | ●  |

### Accessories

| Symbol    | Description                          | Applicable model |
|-----------|--------------------------------------|------------------|
| Nil       | —                                    | —                |
| B Note 3) | With bracket                         | AF20 to 60       |
| C         | Float type Note 4) auto drain (N.C.) | AF10 to 60       |
| D         | Float type Note 4) auto drain (N.O.) | AF30 to 60       |

### Optional specifications

| Symbol    | Description   | Applicable model |
|-----------|---|------------------|
| 2         | Metal bowl  | AF10 to 60       |
| 6         | Nylon bowl  | AF10 to 60       |
| 8         | Metal bowl with level gauge                                       | AF30 to 60       |
| C         | With bowl guard   | AF20             |
| J Note 5) | Drain guide 1/4   | AF30 to 60       |
| R         | Flow direction: Right to left                                     | AF10 to 60       |
| W         | Drain cock with barb fitting: ø6 x ø4 nylon tubing                | AF30 to 60       |
| Z Note 6) | Name plate and caution plate for bowl in imperial units (PSI, "F) | AF10 to 60       |

Note 1) Drain guide is NPT1/4 (applicable to AF30 to 60), and the exhaust port for auto drain comes with ø3/8" One-touch fitting (applicable to AF30 to 60).

Note 2) Drain guide is G1/4 (applicable to AF30 to 60).

Note 3) Bracket is not assembled and is supplied loose at the time of shipment.

Note 4) Applicable tube O.D for auto drain connection should be ø3/8" in case NPT thread port is chosen.

\* When more than one specification is required, indicate in ascending alphanumeric order.

Note 5) Without a valve function.

Note 6) This product is for overseas use only according to the new Measurement Law. (The SI unit type is provided for use in Japan.)

⊙: Combination available    ⊖: Combination not available

### Accessory/Optional specification combinations

| Accessory/Optional specifications                                 | Combination  | Symbol | Accessory |   |   | Optional specification |   |   |   |   |   |   | Applicable filter |      |      |            |   |   |
|---|--|--------|-----------|---|---|------------------------|---|---|---|---|---|---|-------------------|------|------|------------|---|---|
|   |  |        | B         | C | D | 2                      | 6 | 8 | C | J | R | W | Z                 | AF10 | AF20 | AF30 to 60 |   |   |
| Accessories   | With bracket                                       | B      | ⊖         | ⊙ | ⊖ | ⊙                      | ⊙ | ⊙ | ⊙ | ⊙ | ⊙ | ⊙ | ⊙                 | ⊙    | ⊙    | ⊙          | ⊙ |   |
|   | Float type auto drain (N.C.)                       | C      | ⊙         | ⊖ | ⊖ | ⊙                      | ⊙ | ⊙ | ⊙ | ⊙ | ⊙ | ⊙ | ⊙                 | ⊙    | ⊙    | ⊙          | ⊙ |   |
|   | Float type auto drain (N.O.)                       | D      | ⊙         | ⊖ | ⊖ | ⊙                      | ⊙ | ⊙ | ⊙ | ⊙ | ⊙ | ⊙ | ⊙                 | ⊙    | ⊙    | ⊙          | ⊙ |   |
| Optional specifications   | Metal bowl   | -2     | ⊙         | ⊙ | ⊙ | ⊙                      | ⊙ | ⊙ | ⊙ | ⊙ | ⊙ | ⊙ | ⊙                 | ⊙    | ⊙    | ⊙          | ⊙ |   |
|   | Nylon bowl   | -6     | ⊙         | ⊙ | ⊙ | ⊙                      | ⊙ | ⊙ | ⊙ | ⊙ | ⊙ | ⊙ | ⊙                 | ⊙    | ⊙    | ⊙          | ⊙ |   |
|   | Metal bowl with level gauge                        | -8     | ⊙         | ⊙ | ⊙ | ⊙                      | ⊙ | ⊙ | ⊙ | ⊙ | ⊙ | ⊙ | ⊙                 | ⊙    | ⊙    | ⊙          | ⊙ |   |
|   | With bowl guard                                    | -C     | ⊙         | ⊙ | ⊙ | ⊙                      | ⊙ | ⊙ | ⊙ | ⊙ | ⊙ | ⊙ | ⊙                 | ⊙    | ⊙    | ⊙          | ⊙ |   |
|   | Drain guide 1/4                                    | -J     | ⊙         | ⊙ | ⊙ | ⊙                      | ⊙ | ⊙ | ⊙ | ⊙ | ⊙ | ⊙ | ⊙                 | ⊙    | ⊙    | ⊙          | ⊙ |   |
|   | Flow direction: Right to left                      | -R     | ⊙         | ⊙ | ⊙ | ⊙                      | ⊙ | ⊙ | ⊙ | ⊙ | ⊙ | ⊙ | ⊙                 | ⊙    | ⊙    | ⊙          | ⊙ | ⊙ |
|   | Drain cock with barb fitting: ø6 x ø4 nylon tubing | -W     | ⊙         | ⊙ | ⊙ | ⊙                      | ⊙ | ⊙ | ⊙ | ⊙ | ⊙ | ⊙ | ⊙                 | ⊙    | ⊙    | ⊙          | ⊙ | ⊙ |
| Name plate and caution plate for bowl in imperial units (PSI, "F) | -Z   | △      | △         | △ | △ | △                      | △ | △ | △ | △ | △ | △ | △                 | △    | △    | △          | △ |   |

### Standard specifications

| Model                             | AF10                          | AF20     | AF30     | AF40          | AF40-06 | AF50   | AF60 |
|-----------------------------------|-------------------------------|----------|----------|---------------|---------|--------|------|
| Port sizes                        | M5 x 0.8                      | 1/8, 1/4 | 1/4, 3/8 | 1/4, 3/8, 1/2 | 3/4     | 3/4, 1 | 1    |
| Fluid                             | Air                           |          |          |               |         |        |      |
| Proof pressure                    | 1.5MPa                        |          |          |               |         |        |      |
| Maximum operating pressure        | 1.0MPa                        |          |          |               |         |        |      |
| Ambient and fluid temperature     | -5 to 60°C (with no freezing) |          |          |               |         |        |      |
| Nominal filtration rating         | 5µm                           |          |          |               |         |        |      |
| Bowl material                     | Polycarbonate                 |          |          |               |         |        |      |
| Bowl guard                        | —                             | Option   | Standard |               |         |        |      |
| Drain capacity (cm <sup>3</sup> ) | 2.5                           | 8        | 25       | 45            | 45      | 45     | 45   |
| Weight (kg)                       | 0.06                          | 0.18     | 0.22     | 0.45          | 0.49    | 0.99   | 1.05 |

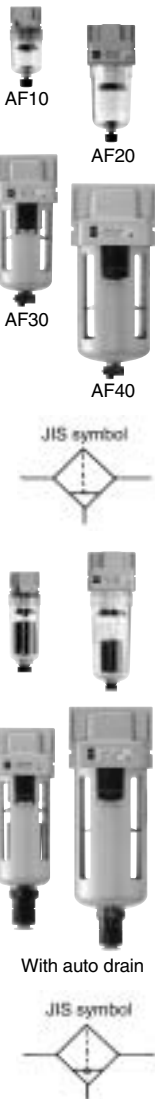
### Accessory part no.

| Accessory                     | Applicable model |             |                    |                    |                    |                    |                    |  |
|-------------------------------|------------------|-------------|--------------------|--------------------|--------------------|--------------------|--------------------|--|
|                               | AF10             | AF20        | AF30               | AF40               | AF40-06            | AF50               | AF60               |  |
| Bracket assembly Note 1)      | —                | AF20P-050AS | AF30P-050AS        | AF40P-050AS        | AF40P-070AS        | AF50P-050AS        | AF60P-050AS        |  |
| Float type auto drain Note 2) | N.O.             | —           | AD38 AD38N Note 3) | AD48 AD48N Note 3) | AD48 AD48N Note 3) | AD48 AD48N Note 3) | AD48 AD48N Note 3) |  |
|                               | N.C.             | AD17        | AD27               | AD37 AD37N Note 3) | AD47 AD47N Note 3) | AD47 AD47N Note 3) | AD47 AD47N Note 3) |  |

Note 1) Assembly includes a bracket and 2 mounting screws.

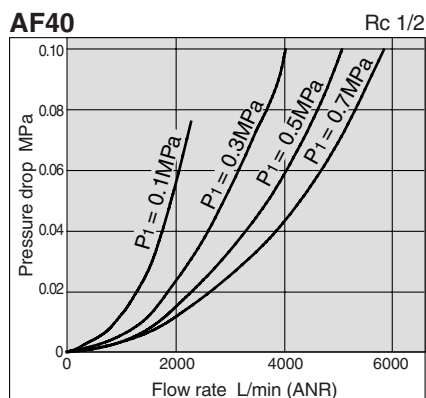
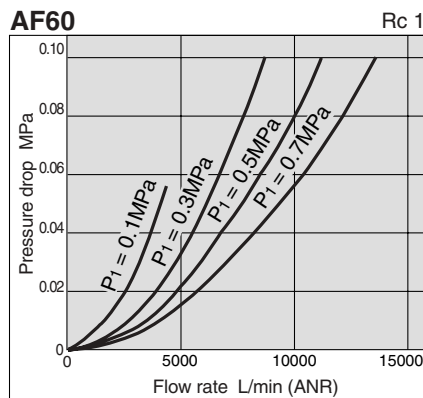
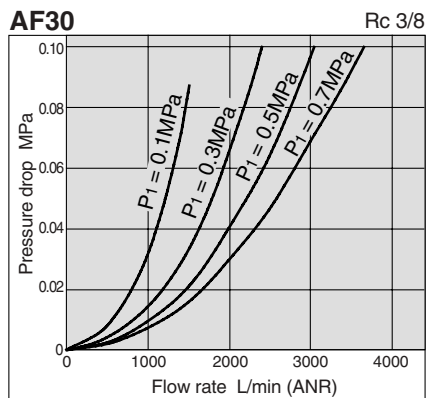
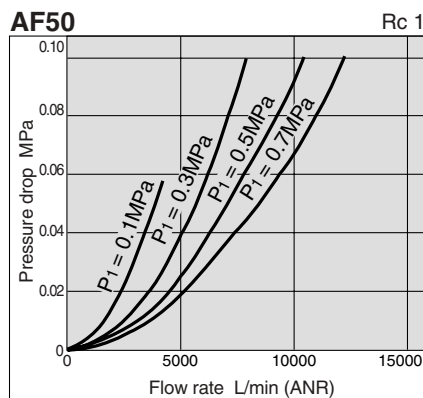
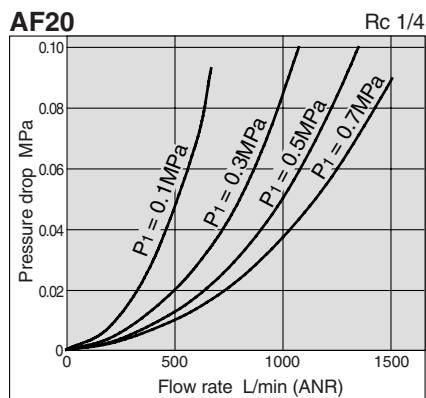
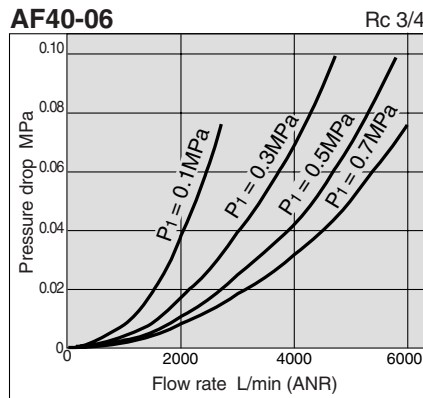
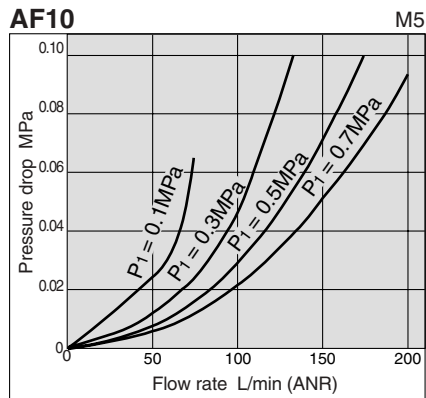
Note 2) Minimum operating pressure: N.O. type-0.1MPa; N.C. type-0.1MPa (AD17/27) and 0.15MPa (AD37/47).

Note 3) When "N" is specified in the end of part number of auto drain, applicable tube O.D should be ø3/8".



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## Flow Characteristics (Representative values)



## ⚠ Specific Product Precautions

- Be sure to read before handling.
- Refer to pages 75 through 78 for safety instructions and F.R.L. unit precautions.

## Maintenance

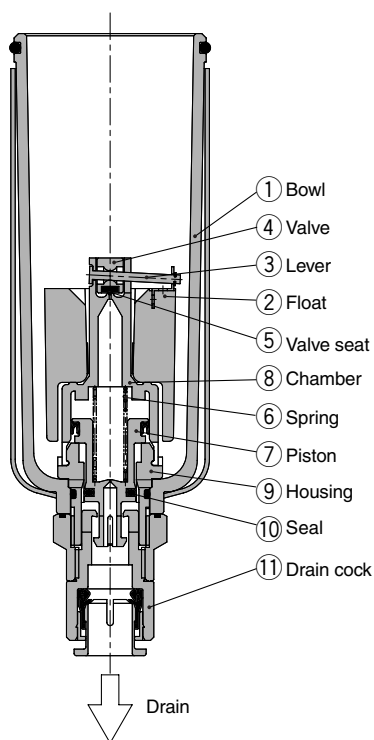
### ⚠ Warning

1. Replace the element every 2 years or when the pressure drop becomes 0.1MPa, whichever comes first, to prevent damage to the element.

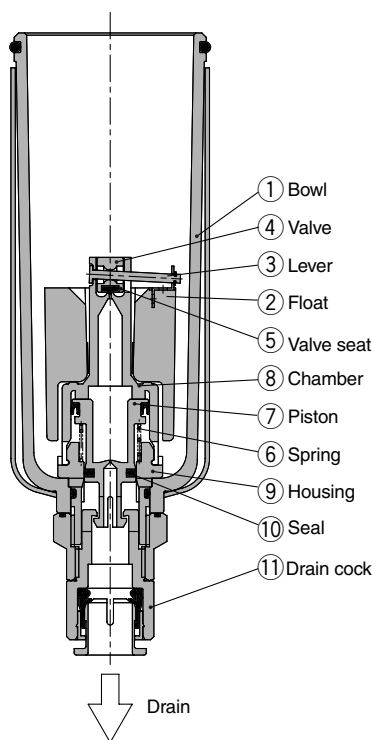
# AF10 to 60

## Operation Principle: Float Type Auto Drain

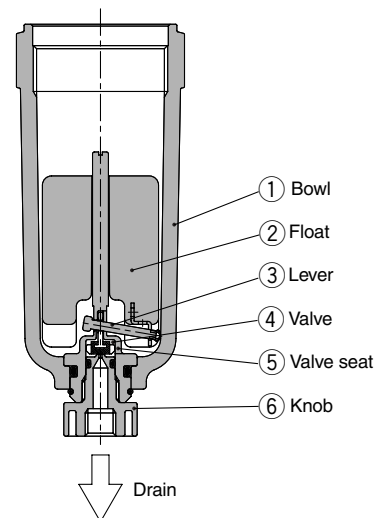
N.O. type: AD38, 48



N.C. type: AD37, 47



Compact auto drain  
N.C. type: AD17, 27



- **When the pressure inside the bowl is released:**

When pressure is released from the bowl ①, piston ⑦ is lowered by spring ⑥.

The sealing action of seal ⑩ is interrupted, and the outside air flows inside the bowl ①, through housing hole ⑨ and drain cock ⑪.

Therefore, if there is an accumulation of condensate in the bowl ①, it will drain out through the drain cock.

- **When pressure is applied inside the bowl:**

When the pressure exceeds 0.1MPa, the force of piston ⑦ surpasses the force of spring ⑥, and the piston goes up.

This pushes seal ⑩ up so that it creates a seal and the inside of the bowl ①, is shut off from the outside air.

If there is no accumulation of condensate in the bowl ①, at this time float ② will be pulled down by its own weight, causing valve ④, which is connected to lever ③, to seal valve seat ⑤.

- **When there is an accumulation of condensate in the bowl:**

Float ② rises due to its own buoyancy and pushes open the seal created by the valve seat, ⑤.

This allows the pressure inside the bowl ①, to enter the chamber ⑧. The result is that the combined pressure inside chamber ⑧ and the force of the spring ⑥, lower the piston ⑦.

This causes the sealing action of seal ⑩ to be interrupted, and the accumulated condensate in the bowl ①, drains out through the drain cock ⑪.

Turning drain cock ⑪ manually counterclockwise lowers piston ⑦, which pushes open the seal created by seal ⑩, thus allowing the condensate to drain out.

- **When the pressure inside the bowl is released:**

Even when pressure inside the bowl ①, is released, spring ⑥ keeps piston ⑦ in its upward position.

This keeps the seal created by the seal ⑩, in place, thus shutting the outside air from inside the bowl ①.

Therefore, even if there should be some condensate accumulation inside the bowl ①, it will not drain out.

- **When pressure is applied inside the bowl:**

Even when pressure is applied inside the bowl ①, the combined force of spring ⑥ and the pressure inside the bowl ①, keeps piston ⑦ in its upward position.

This maintains the seal created by the seal ⑩, in place, thus shutting the outside air from inside the bowl ①.

If there is no accumulation of condensate in the bowl ①, at this time float ② will be pulled down by its own weight, causing valve ④, which is connected to lever ③, to seal valve seat ⑤.

- **When there is an accumulation of condensate in the bowl:**

Float ② rises due to its own buoyancy and pushes open the seal created by the valve seat ⑤. Pressure passes from the bowl to chamber ⑧.

The result is that the pressure inside chamber ⑧ surpasses the force of the spring ⑥, and pushes piston ⑦ downwards.

This causes the sealing action of seal ⑩ to be interrupted and the accumulated condensate in the bowl ①, drains out through the drain cock ⑪.

Turning drain cock ⑪ manually counterclockwise lowers piston ⑦, which pushes open the seal created by seal ⑩, thus allowing the condensate to drain out.

- **When the pressure inside the bowl is released:**

Even when pressure inside the bowl ①, is released, the weight of the float ② causes valve ④, which is connected to lever ③, to seal valve seat ⑤. As a result, the inside of the bowl ①, is shut off from the outside air.

Therefore, even if there is an accumulation of condensate in the bowl ①, it will not drain out.

- **When pressure is applied inside the bowl:**

Even when pressure is applied inside the bowl ①, the weight of the float ②, and the differential pressure that is applied to valve ④ cause valve ④ to seal valve seat ⑤, and the outside air is shut off from the inside of the bowl ①.

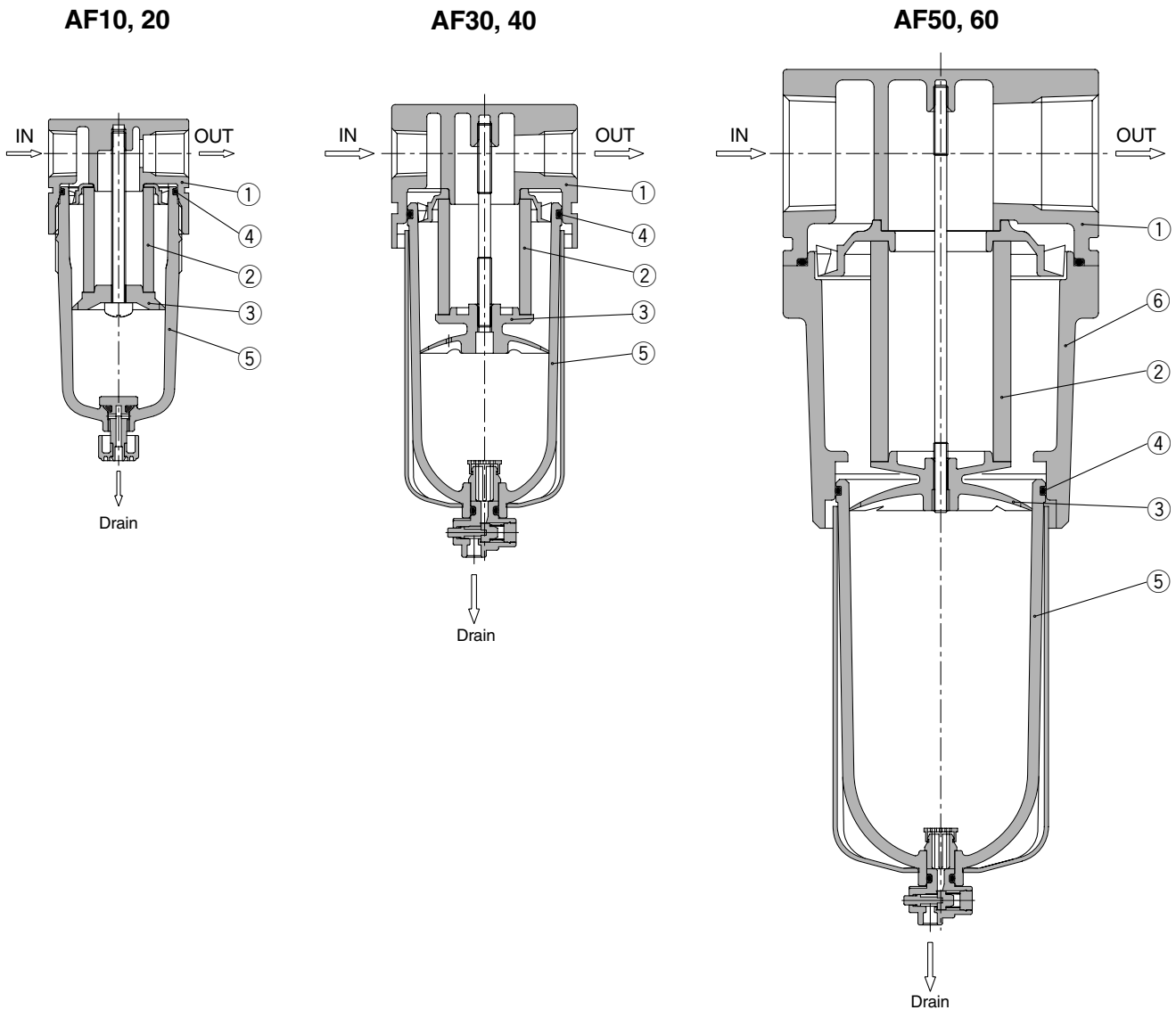
- **When the drain is accumulated in the bowl:**

Float ② rises due to its own buoyancy and the seal at valve seat ⑤ is interrupted.

The condensate inside the bowl ① drains out through the knob, ⑥.

Turning knob ⑥ manually counterclockwise lowers it and causes the sealing action of valve seat ⑤ to be interrupted, thus allowing the condensate to drain out.

## Construction



### Parts list

| No. | Description | Material      |                   |                   | Color           |
|-----|-------------|---------------|-------------------|-------------------|-----------------|
|     |             | AF10, 20      | AF30, 40, 40-06   | AF50, 60          |                 |
| 1   | Body        | Zinc die-cast | Aluminum die-cast |                   | Platinum silver |
| 6   | Housing     | —             |                   | Aluminum die-cast | Platinum silver |

### Air filter replacement parts

| No. | Description                      | Material         | Part no.                      |            |                         |                         |                         |                         |                         |
|-----|----------------------------------|------------------|-------------------------------|------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|
|     |                                  |                  | AF10                          | AF20       | AF30                    | AF40                    | AF40-06                 | AF50                    | AF60                    |
| 2   | Filter element                   | Non-woven fabric | AF10P-060S                    | AF20P-060S | AF30P-060S              | AF40P-060S              | AF40P-060S              | AF50P-060S              | AF60P-060S              |
| 3   | Baffle                           | PBT              | AF10P-040S <sup>Note 1)</sup> | AF20P-040S | AF30P-040S              | AF40P-040S              | AF40P-040S              | AF50P-040S              | AF60P-040S              |
| 4   | Bowl O-ring                      | NBR              | C1SFP-260S                    | C2SFP-260S | C3SFP-260S              | C4SFP-260S              | C4SFP-260S              | C4SFP-260S              | C4SFP-260S              |
| 5   | Bowl assembly <sup>Note 2)</sup> | PC               | C1SF                          | C2SF       | C3SF <sup>Note 3)</sup> | C4SF <sup>Note 3)</sup> | C4SF <sup>Note 3)</sup> | C4SF <sup>Note 3)</sup> | C4SF <sup>Note 3)</sup> |

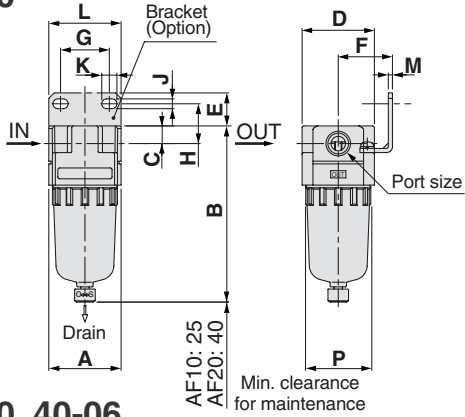


Note 1) The material of the baffle for AF10 (AF10P-040S) only is POM.  
 Note 2) Contact SMC regarding the bowl assembly supply for PSI and "F" unit specifications.  
 Note 3) Bowl assembly for AF30 to 60 models comes with a bowl guard (steel band material).

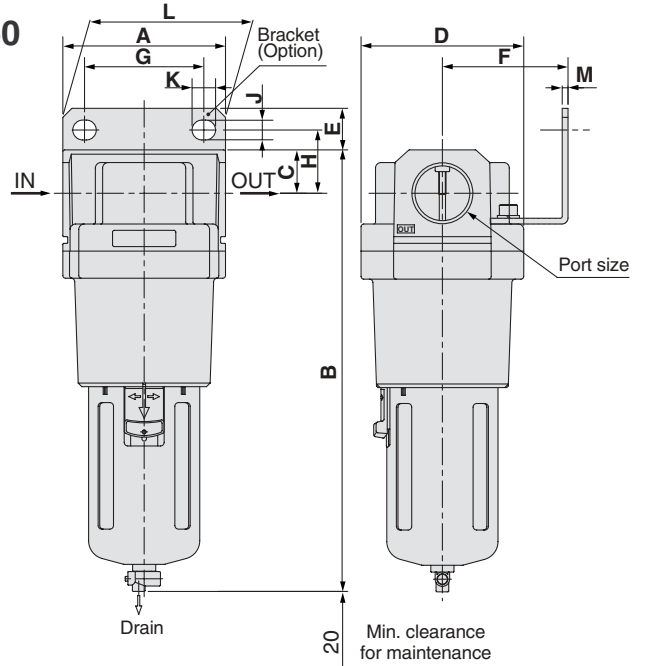
# AF10 to 60

## Dimensions

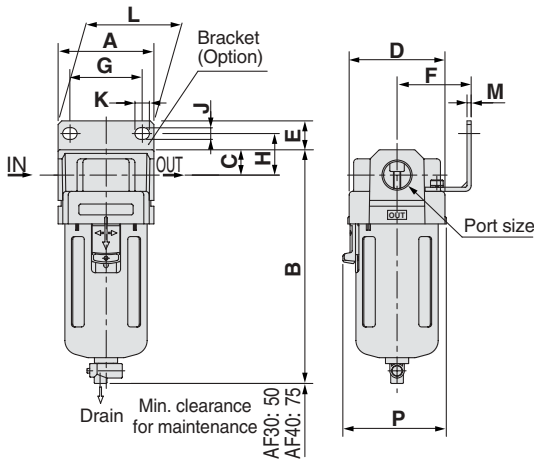
### AF10, 20



### AF50, 60



### AF30, 40, 40-06



| Applicable model        | AF10, AF20             |            | AF30, AF40, AF40-06, AF50, AF60                        |            |                             |                                  |  |
|-------------------------|------------------------|------------|--|------------|-----------------------------|----------------------------------|--|
| Optional specifications | With auto drain (N.C.) | Metal bowl | With auto drain (N.O./N.C.)                            | Metal bowl | Metal bowl with level gauge | With drain guide                 | Drain cock with barb fitting                 |
|                         |                        |            | <br>N.O.: Black<br>N.C.: Gray<br>ø10 One-touch fitting |            |                             | <br>1/4<br>Width across flats 17 | <br>Barb fitting<br>Applicable tubing: T0604 |

| Model   | Port size     | Standard specification |    |    |    |     | Accessory specification |    |     |     |   |   |   |   |   |   |                 |
|---------|---------------|------------------------|----|----|----|-----|-------------------------|----|-----|-----|---|---|---|---|---|---|-----------------|
|         |               | A                      | B  | C  | D  | P   | Bracket mounting size   |    |     |     |   |   |   |   |   |   | With auto drain |
|         |               | E                      | F  | G  | H  | J   | K                       | L  | M   | B   |   |   |   |   |   |   |                 |
| AF10    | M5 x 0.8      | —                      | —  | —  | —  | —   | —                       | —  | —   | —   | — | — | — | — | — | — | 85              |
| AF20    | 1/8, 1/4      | 18                     | 30 | 27 | 22 | 5.4 | 8.4                     | 40 | 2.3 | 115 |   |   |   |   |   |   |                 |
| AF30    | 1/4, 3/8      | 16                     | 41 | 40 | 23 | 6.5 | 8                       | 53 | 2.3 | 170 |   |   |   |   |   |   |                 |
| AF40    | 1/4, 3/8, 1/2 | 17                     | 50 | 54 | 26 | 8.5 | 10.5                    | 70 | 2.3 | 204 |   |   |   |   |   |   |                 |
| AF40-06 | 3/4           | 14                     | 50 | 54 | 25 | 8.5 | 10.5                    | 70 | 2.3 | 208 |   |   |   |   |   |   |                 |
| AF50    | 3/4, 1        | 23                     | 70 | 66 | 35 | 11  | 13                      | 90 | 3.2 | 284 |   |   |   |   |   |   |                 |
| AF60    | 1             | 23                     | 70 | 66 | 35 | 11  | 13                      | 90 | 3.2 | 297 |   |   |   |   |   |   |                 |

| Model   | Optional specification |                   |            |                             |
|---------|------------------------|-------------------|------------|-----------------------------|
|         | With drain guide       | With barb fitting | Metal bowl | Metal bowl with level gauge |
|         | B                      | B                 | B          | B                           |
| AF10    | —                      | —                 | 66         | —                           |
| AF20    | —                      | —                 | 97         | —                           |
| AF30    | 136                    | 137               | 142        | 162                         |
| AF40    | 172                    | 173               | 178        | 198                         |
| AF40-06 | 176                    | 177               | 182        | 202                         |
| AF50    | 252                    | 253               | 258        | 278                         |
| AF60    | 265                    | 266               | 271        | 291                         |

# Air Filter AF20 to 60 Made to Order Specifications

Contact SMC for detailed dimensions, specifications, and lead times.



## ① Special Temperature Environment

Special materials are used in the manufacturing of seals and resin parts to allow them to withstand various temperature conditions in cold or tropical (hot) climates.

### Specifications

| Part no.                   | -X430                         | -X440            |
|----------------------------|-------------------------------|------------------|
| <b>Environment</b>         | Low temperature               | High temperature |
| <b>Ambient temperature</b> | -30 to 60°C                   | -5 to 80°C       |
| <b>Fluid temperature</b>   | -5 to 60°C (with no freezing) |                  |
| <b>Material</b>            | <b>Rubber parts</b>           | Special NBR      |
|                            | <b>Main parts</b>             | FPM              |
|                            | Metal (Aluminum die-cast)     |                  |

### Applicable models

| Model             | AF30       | AF40              | AF40-06 | AF50     | AF60 |
|-------------------|------------|-------------------|---------|----------|------|
| <b>Port sizes</b> | 1/4<br>3/8 | 1/4<br>3/8<br>1/2 | 3/4     | 3/4<br>1 | 1    |

### How to Order

**AF 30 F 03 B 2 R X430**

Air filter | Body size (30, 40, 50, 60) | Thread type (Nil, Rc, NPT, G) | Optional specifications (J, R, Z) | Bowl (2) | Option (B)

**For high/low temperature**  
X430 Low temperature  
X440 High temperature

**Optional specifications**

| Symbol   | Description   | Applicable model |
|----------|---|------------------|
| J Note 5 | Drain guide 1/4   | AF30 to 60       |
| R        | Flow direction: Right to left                                     | AF30 to 60       |
| Z Note 6 | Name plate and caution plate for bowl in imperial units (PSI, °F) | AF30 to 60       |

\* When more than one specification is required, indicate in ascending alphanumeric order.

Note 5) Without a valve function.  
Note 6) For thread type NPT. This product is for overseas use only according to the new Measurement Law. (The SI unit type is provided for use in Japan.)

**Bowl**

| Symbol   | Description | Applicable model |
|----------|-------------|------------------|
| 2 Note 4 | Metal bowl  | AF30 to 60       |

Note 4) Only Metal Bowl available.

**Option**

| Symbol   | Description  | Applicable model |
|----------|--------------|------------------|
| Nil      | —            | —                |
| B Note 3 | With bracket | AF30 to 60       |

Note 3) Bracket is not assembled and is supplied loose at the time of shipment.

**Port size**

| Symbol | Port size | Body size |    |    |    |
|--------|-----------|-----------|----|----|----|
|        |           | 30        | 40 | 50 | 60 |
| 02     | 1/4       | ●         | ●  | —  | —  |
| 03     | 3/8       | ●         | ●  | —  | —  |
| 04     | 1/2       | ●         | ●  | —  | —  |
| 06     | 3/4       | —         | ●  | ●  | —  |
| 10     | 1         | —         | —  | ●  | ●  |

Note 1) Drain guide is NPT 1/4 (applicable to AC30 to 60)  
Note 2) Drain guide is G1/4 (applicable to AF30 to 60).

## ② High Pressure

Strong materials are used in the manufacturing of air filters intended for high pressure operation.

### Specifications

| Part no.                             | -X425                         |
|--------------------------------------|-------------------------------|
| <b>Proof pressure</b>                | 3.0MPa                        |
| <b>Maximum operating pressure</b>    | 2.0MPa                        |
| <b>Ambient and fluid temperature</b> | -5 to 60°C (with no freezing) |

### Applicable models

| Model             | AF20       | AF30       | AF40              | AF40-06 | AF50     | AF60 |
|-------------------|------------|------------|-------------------|---------|----------|------|
| <b>Port sizes</b> | 1/8<br>1/4 | 1/4<br>3/8 | 1/4<br>3/8<br>1/2 | 3/4     | 3/4<br>1 | 1    |

### How to Order

**AF 30 F 03 B 2 R X425**

Air filter | Body size (20, 30, 40, 50, 60) | Thread type (Nil, Rc, NPT, G) | Optional specifications (J, R, Z) | Bowl (2) | Option (B)

**For high pressure**

**Optional specifications**

| Symbol   | Description   | Applicable model |
|----------|---|------------------|
| J Note 5 | Drain guide 1/4   | AF30 to 60       |
| R        | Flow direction: Right to left                                     | AF20 to 60       |
| Z Note 6 | Name plate and caution plate for bowl in imperial units (PSI, °F) | AF20 to 60       |

\* When more than one specification is required, indicate in ascending alphanumeric order.

Note 5) Without a valve function.  
Note 6) For thread type NPT. This product is for overseas use only according to the new Measurement Law. (The SI unit type is provided for use in Japan.)

**Bowl**

| Symbol   | Description                 | Applicable model |
|----------|-----------------------------|------------------|
| 2 Note 4 | Metal bowl                  | AF20 to 60       |
| 8 Note 3 | Metal bowl with level gauge | AF30 to 60       |

Note 4) Only metal bowl or metal bowl with level gauge available.

**Option**

| Symbol   | Description  | Applicable model |
|----------|--------------|------------------|
| Nil      | —            | —                |
| B Note 3 | With bracket | AF20 to 60       |

Note 3) Bracket is not assembled and is supplied loose at the time of shipment.

**Port size**

| Symbol | Port size | Body size |    |    |    |    |
|--------|-----------|-----------|----|----|----|----|
|        |           | 20        | 30 | 40 | 50 | 60 |
| 01     | 1/8       | ●         | —  | —  | —  | —  |
| 02     | 1/4       | ●         | ●  | —  | —  | —  |
| 03     | 3/8       | —         | ●  | ●  | —  | —  |
| 04     | 1/2       | —         | —  | ●  | —  | —  |
| 06     | 3/4       | —         | —  | ●  | ●  | —  |
| 10     | 1         | —         | —  | —  | ●  | ●  |

Note 1) Drain guide is NPT 1/4 (applicable to AF30 to 60)  
Note 2) Drain guide is G1/4 (applicable to AF30 to 60).

Note) Contact SMC regarding the detailed dimensions and optional availability.