



# Operation Manual

PRODUCT NAME

*Activated Carbon Filter*

MODEL / Series / Product Number

**AMK50-(F,N)06 ~ (F,N)10(B)(-R,Z)-D**  
**AMK60-(F,N)10(B)(-R,Z)-D**

**SMC Corporation**

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# Activated Carbon Filter Safety Instructions

These safety instructions are intended to prevent hazardous situations and/or equipment damage. These instructions indicate the level of potential hazard with the labels of "Caution," "Warning" or "Danger." They are all important notes for safety and must be followed in addition to International Standards (ISO/IEC)\*1), and other safety regulations.

\*1) ISO 4414: Pneumatic fluid power -- General rules relating to systems.

ISO 4413: Hydraulic fluid power -- General rules relating to systems.

IEC 60204-1: Safety of machinery -- Electrical equipment of machines .(Part 1: General requirements)

ISO 10218: Manipulating industrial robots -Safety.

etc.



## Caution

**Caution** indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.



## Warning

**Warning** indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.



## Danger

**Danger** indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.

## Warning

### **1. The compatibility of the product is the responsibility of the person who designs the equipment or decides its specifications.**

Since the product specified here is used under various operating conditions, its compatibility with specific equipment must be decided by the person who designs the equipment or decides its specifications based on necessary analysis and test results.

The expected performance and safety assurance of the equipment will be the responsibility of the person who has determined its compatibility with the product.

This person should also continuously review all specifications of the product referring to its latest catalog information, with a view to giving due consideration to any possibility of equipment failure when configuring the equipment.

### **2. Only personnel with appropriate training should operate machinery and equipment.**

The product specified here may become unsafe if handled incorrectly.

The assembly, operation and maintenance of machines or equipment including our products must be performed by an operator who is appropriately trained and experienced.

### **3. Do not service or attempt to remove product and machinery/equipment until safety is confirmed.**

1. The inspection and maintenance of machinery/equipment should only be performed after measures to prevent falling or runaway of the driven objects have been confirmed.

2. When the product is to be removed, confirm that the safety measures as mentioned above are implemented and the power from any appropriate source is cut, and read and understand the specific product precautions of all relevant products carefully.

3. Before machinery/equipment is restarted, take measures to prevent unexpected operation and malfunction.

### **4. Contact SMC beforehand and take special consideration of safety measures if the product is to be used in any of the following conditions.**

1. Conditions and environments outside of the given specifications, or use outdoors or in a place exposed to direct sunlight.

2. Installation on equipment in conjunction with atomic energy, railways, air navigation, space, shipping, vehicles, military, medical treatment, combustion and recreation, or equipment in contact with food and beverages, emergency stop circuits, clutch and brake circuits in press applications, safety equipment or other applications unsuitable for the standard specifications described in the product catalog.

3. An application which could have negative effects on people, property, or animals requiring special safety analysis.

4. Use in an interlock circuit, which requires the provision of double interlock for possible failure by using a mechanical protective function, and periodical checks to confirm proper operation.



# Activated Carbon Filter Safety Instructions

## Caution

### **The product is provided for use in manufacturing industries.**

The product herein described is basically provided for peaceful use in manufacturing industries.

If considering using the product in other industries, consult SMC beforehand and exchange specifications or a contract if necessary.

If anything is unclear, contact your nearest sales branch.

## **Limited warranty and Disclaimer/Compliance Requirements**

The product used is subject to the following "Limited warranty and Disclaimer" and "Compliance Requirements".

Read and accept them before using the product.

### **Limited warranty and Disclaimer**

1. The warranty period of the product is 1 year in service or 1.5 years after the product is delivered, whichever is first.\*2)

Also, the product may have specified durability, running distance or replacement parts. Please consult your nearest sales branch.

2. For any failure or damage reported within the warranty period which is clearly our responsibility, a replacement product or necessary parts will be provided.

This limited warranty applies only to our product independently, and not to any other damage incurred due to the failure of the product.

3. Prior to using SMC products, please read and understand the warranty terms and disclaimers noted in the specified catalog for the particular products.

\*2) Vacuum pads are excluded from this 1 year warranty.

A vacuum pad is a consumable part, so it is warranted for a year after it is delivered.

Also, even within the warranty period, the wear of a product due to the use of the vacuum pad or failure due to the deterioration of rubber material are not covered by the limited warranty.

### **Compliance Requirements**

1. The use of SMC products with production equipment for the manufacture of weapons of mass destruction(WMD) or any other weapon is strictly prohibited.

2. The exports of SMC products or technology from one country to another are governed by the relevant security laws and regulation of the countries involved in the transaction. Prior to the shipment of a SMC product to another country, assure that all local rules governing that export are known and followed.

## Caution

### **SMC products are not intended for use as instruments for legal metrology.**

Measurement instruments that SMC manufactures or sells have not been qualified by type approval tests relevant to the metrology (measurement) laws of each country.

Therefore, SMC products cannot be used for business or certification ordained by the metrology (measurement) laws of each country.

## Precautions for Design

### Warning

- 1) Carefully consider the application, required specifications, and operating conditions (pressure, flow rate, temperature, environment and power supply) in accordance with the latest catalog (SMC website), making sure not to exceed the specification range.
- 2) Consult SMC if no leakage is allowed due to the environment, or if the operating fluid is not air.
- 3) This product cannot be used in the following environments.
  - Atmosphere containing corrosive gas, organic solvent, or chemical agent solution is, or a location where any of these substances is attached.
  - Atmosphere containing with sea water or water or containing steam, or a location where any of these substances is attached.
  - Locations subject to direct sunlight (Block direct sunlight to the product to prevent deterioration due to ultraviolet rays or temperature rise).
  - Where the product is exposed to heat sources or in areas that the product is exposed to radiant heat.
  - Where impact or vibration is present.
  - In a location with high humidity and a large quantity of dust.
  - Outdoor.
  - Mounting on vehicle or vessel (The product may be damaged due to excessive vibration).
- 4) For air blow applications, prevent airborne particles from the operating environment entering into the compressed air stream, or foreign matter may adhere to the workpiece during the air blow.
- 5) If the air equipment is mounted on the outlet of the product, particles will be generated from the equipment and required cleanliness may not be obtained. Instead, install the air equipment at the inlet.

### Caution

- 1) Applications in which the difference between the inlet and outlet pressure exceeds 0.1MPa must be avoided. Or the element is broken.
- 2) The activated carbon filter (AMK series) adsorbs oil vapor contained in the compressed air and removes the odors derived from it, but does not remove all odors.

## Selection

### Warning

- 1) Grease is used on the internal seal. If this is not acceptable, please consult SMC.
- 2) Select the model so that the maximum discharge value (instantaneous) of the flow rate will not exceed the rated air capacity. If the flowrate exceeds the maximum air flow capacity, the activated carbon will not be able to adsorb properly, it may cause deterioration in the performance.

### Caution

- 1) Do not use the product with low air pressure (e.g. for blower). This product is dedicated for compressed air whose minimum operating pressure is specified depending on the equipment. If the product is operated at a pressure lower than the minimum operating pressure, it may cause deterioration in the performance or malfunction.

## Installation

### Warning

- 1) Do not drop or apply impact during transportation or installation. It will cause damage to the product and result in operation failure.
- 2) Do not install in areas of high humidity or high temperature. Operation outside of the product specification range may cause damage to the product or operation failure, or shorten the product life.
- 3) Connect the product ensuring the direction of arrow or "1"(IN) and "2"(OUT) ports for air direction or an arrow. Incorrect connections may cause malfunction.
- 4) Install with adequate space for maintenance beneath the product. Refer to [11. Dimensions] (page 16) for necessary space.

## Piping

### Warning

- 1) Before piping, perform flushing or cleaning of the piping, etc. to remove any cutting chips, cutting oil, solid foreign matter, etc. from the piping. Contamination of piping may cause damage or malfunction.
- 2) When screwing together pipes and fittings, etc., be certain that chips from the pipe threads and sealant do not get inside the pipe. When a sealant tape is used, leave 1.5 to 2 thread ridges exposed at the end of the threads.
- 3) Connect piping/fittings using the recommended torque while holding the female thread side tightly. Insufficient tightening torque can cause loose piping or sealing failure. Excess tightening torque may cause damage to threads. If the female side is not held while tightening, excessive force will be applied to the bracket directly, causing breakage.

Recommended tightening torque (Unit: N m)

Thread size	3/4	1
Torque	28 to 30	36 to 38

- 4) Before screwing-in an SMC fitting or S coupler, please refer to "Tightening the threaded portion of the connection thread" section of the Fitting & Tubing Precautions.
- 5) Do not apply torsion or bending moment other than the weight of the product itself. External piping needs to be supported separately as it may cause damage. Non-flexible piping like steel tube is susceptible to excessive moment load or vibration. Insert flexible tubes to prevent this.

## Air Source

### Warning

- 1) Use clean air. Do not use compressed air containing chemicals, organic solvent, synthetic oil or corrosive gas as it may be cause of breakage of components or operation failure.
- 2) Air containing too much moisture may deteriorate the performance. Install the refrigerated air dryer or aftercooler before the activated carbon filter.
- 3) Make sure that the supply pressure is not below the minimum operating pressure. If it is used at the minimum operating pressure or less, pressure resistance increases, leading to the decrease of operation life or operation failure.

### Caution

- 1) On the inlet side of the activated carbon filter, install a micro mist separator (AMD series) as a pre-filter to eliminate oil droplets and oil aerosol.

## Maintenance

### Warning

- 1) Release the pressure in the product to the atmosphere when replacing parts or removing piping.
- 2) Maintenance and checks should be done by following the procedure in the operation manual. Incorrect handling of the product may cause breakage or operation failure of the equipment or device.
- 3) Do not touch the product when operating at high temperature (40 to 60°C). The operators may get burnt. Be sure to confirm that the temperature of the container or operating part is reduced to 40 °C or less to prevent burns.
- 4) Periodically check the bowl internal surface for dirt. If any dirt is observed, clean the bowl interior with neutral detergent for household used to remove the foreign matters and oil content. Accumulation of foreign matters and scale causes the performance to drop.
- 5) Replace the element before 1 year or 2000 operating hours passed from start of use as it may deteriorate the performance.  
The replacement period of the element varies depending on the operating conditions. Even before the aforementioned replacement period is reached, replace the element if oil smell comes out from the outlet side.

### Caution

- 1) Check the element periodically and replace it with a new one if necessary. If it is found that outlet pressure drops or the flow is restricted, check the condition of the element.

## 2. Application

This product aims at eliminating oil vapor in the air line.

## 3. Standard specifications

Model No.	AMK50	AMK60
Port size	3/4, 1	1
Fluid	Air	
Ambient and o fluid temperature	-5 to 60 °C (No freezing)	
Proof pressure	1.5MPa	
Max. operating pressure	1.0MPa	
Min. operating pressure	0.05MPa	
Outlet side oil concentration <sup>Note1)</sup>	Max. 0.003mg/m <sup>3</sup> (≐0.0025ppm)	
Max. air flow capacity <sup>Note2)</sup>	2200L/min(ANR)	3700L/min(ANR)
Compressed air purity class <sup>Note3)</sup>	ISO8573-1:2010 [1:4:1]	
Bowl material	Stainless steel	
Weight	1.25kg	1.50kg

Note 1) Conditions in accordance with below and in addition to the conditions above.

- AMD is mounted on the inlet.
- Flow capacity, inlet pressure, and the amount of oil concentration at the filter inlet are stable.
- New element.

Note 2) Inlet pressure: 0.7 MPa. Flow at 20°C, atmospheric pressure, and 65% of relative humidity.

The compressed air quality class on the inlet side is [1:4:2].

Note 3) Based on ISO8573-1:2010 Compressed air - Part1: Contaminants and purity classes.

## 4. How to Order

AMK **50** -  **06** **B** -  - D

1
2
3
4
5

				Symbol	Description	<b>1</b>	
						Body size	
						50	60
<b>2</b>	Thread type			Nil	Rc	●	●
				N	NPT	●	●
				F	G	●	●
<b>3</b>	Port size			06	3/4	●	—
				10	1	●	●
<b>4</b>	Options	a	Mounting	Nil	Without mounting option	●	●
				B	With bracket	●	●
<b>5</b>	Semi-standard	b	Flow direction	Nil	Flow direction: Left to right	●	●
				R	Flow direction: Right to left	●	●
		c	Pressure unit Temperature unit	Nil	Pressure unit: MPa                      Temp. unit: °C	●	●
				Z	Pressure unit: psi                      Temp. unit: °F	○ <sup>Note2)</sup>	○ <sup>Note2)</sup>

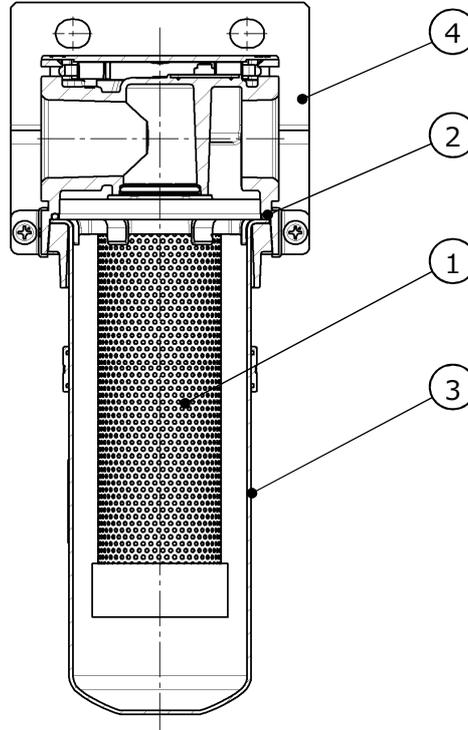
Note1) **4**Option and **5**Semi-standard: Select one each for **a** to **c**.

Note2) ○: For NPT thread type only.

## 5. Construction / Options / Replacement parts

### Construction / Options / Replacement parts

AMK50 / AMK60



### Replacement parts

No.	Parts description	Part No.	
		AMK50	AMK60
①	Element	AMK54P-060AS	AMK64P-060AS
②	Bowl seal	AM54P-160S	
③	Bowl assembly	AMK54P-120AS	AMK64P-120AS

Note1) The numbers in the table and construction are consistent with the number in [9. How to Replace the Components] (P13 and 14) and [10. Disassembly Drawing](P15).

### Options

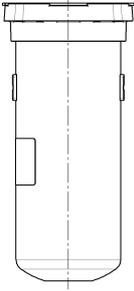
No.	Parts description	Part No.	
		AMK50	AMK60
④	Bracket assembly <sup>Note2)</sup>	AF54P-070AS	

Note1) Refer to the [7. Assembly of Optional parts](P12) for mounting the bracket assembly.

Note2) Assembly of the mounting bracket (2 types) and set screw (2 pcs.).

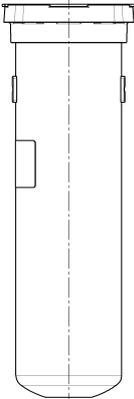
## 6. Bowl assembly specifications

### 6-1. Bowl assembly for AMK50

Option symbol	—	
Semi-standard symbol	—	
Appearance and Part No.	<b>Semi-standard: "-" (Standard)</b>	
	Port thread type	③Part No.
	Rc	AMK54P-120AS
	G	
	NPT	
		

Note1) Part No.③ includes Bowl seal ②. Refer to [10. Disassembly Drawing ](P15).

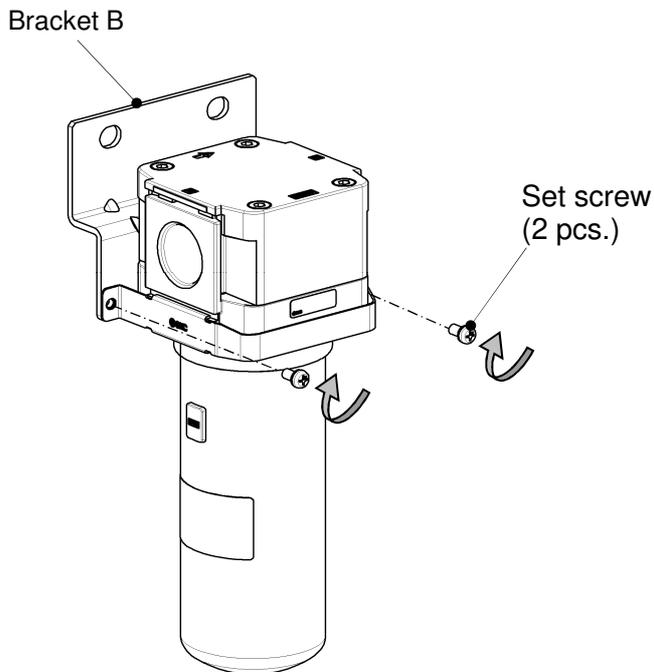
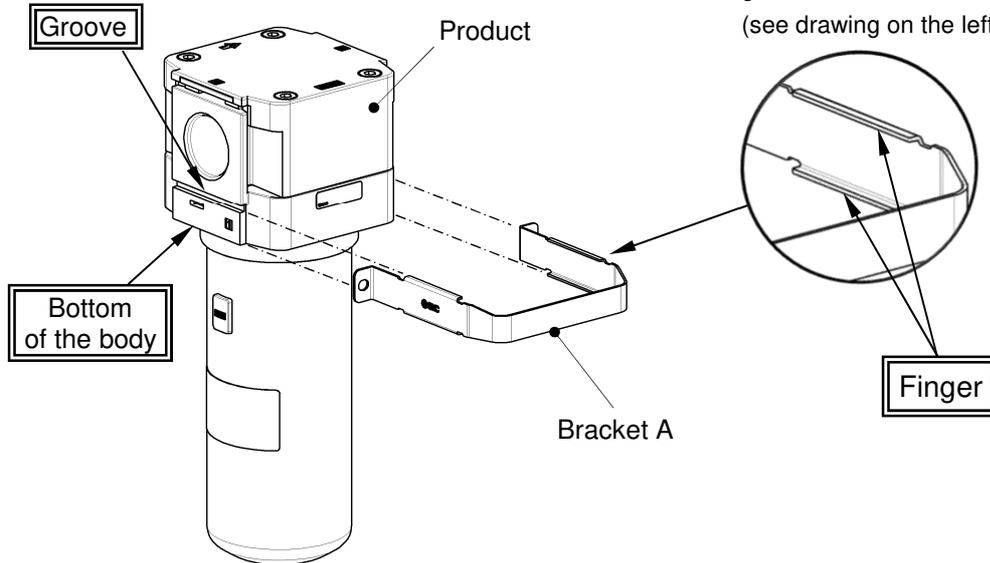
### 6-2. Bowl assembly for AMK60

Option symbol	—	
Semi-standard symbol	—	
Appearance and Part No.	<b>Semi-standard: "-" (Standard)</b>	
	Port thread type	③Part No.
	Rc	AMK64P-120AS
	G	
	NPT	
		

Note1) Part No.③ includes Bowl seal ②. Refer to [10. Disassembly Drawing](P15).

## 7. Assembly of Optional parts

### Bracket



Model No.	Tools	Tightening torque
AMK50	Phillips screwdriver(+)	1.5±0.2 N m
AMK60		

## 8. Troubleshooting

Refer to [9. How to Replace the Components](P13 and 14) and [10. Disassembly Drawing](P15).

Problem		Possible causes	Countermeasure	Page for reference
Category	Failure			
Flow rate	As pressure drop is large, fluid does not flow.	1. The filter installed upstream is clogged.	Replace the element of the filter on the inlet side.	-
Performance	Oil is smelled from the outlet side.	1. The activated carbon in the element cannot normally absorb oil.	Replace the element.	P13 to 14
	Oil aerosol flows from the outlet side.	1. From the filter installed on the inlet side, oil aerosol comes out.	Replace the element of the filter on the inlet side and the element of the activated carbon filter.	P13 to 14
		2. The level of fluid accumulated in the drain on the inlet side filter has reached the bottom of the element surface or higher.	Discharge the drain accumulated in the container and wipe off the oil content in the pipes. Then, replace the element of the activated carbon filter.	P13 to 14
	Particles flow from the outlet side.	1. From the filter installed on the inlet side, particles come out.	Replace the element of the filter on the inlet side and the element of the activated carbon filter.	P13 to 14
2. The influence of the chemicals, organic solvent, ozone and others have deteriorated the activated carbon filter causing particles to flow from the outlet side.		Supply clean air.	-	
Air leakage	Air leaks between the body and bowl.	1. Breakage of the bowl seal.	Replace the bowl seal. Apply grease to the bowl seal before assembling it. <sup>Note1)</sup>	P13
		2. Bowl is damaged.	Replace the bowl assembly.	P13

Note1) Fluorine grease is recommended when applying additional grease.

## 9. How to Replace the Components

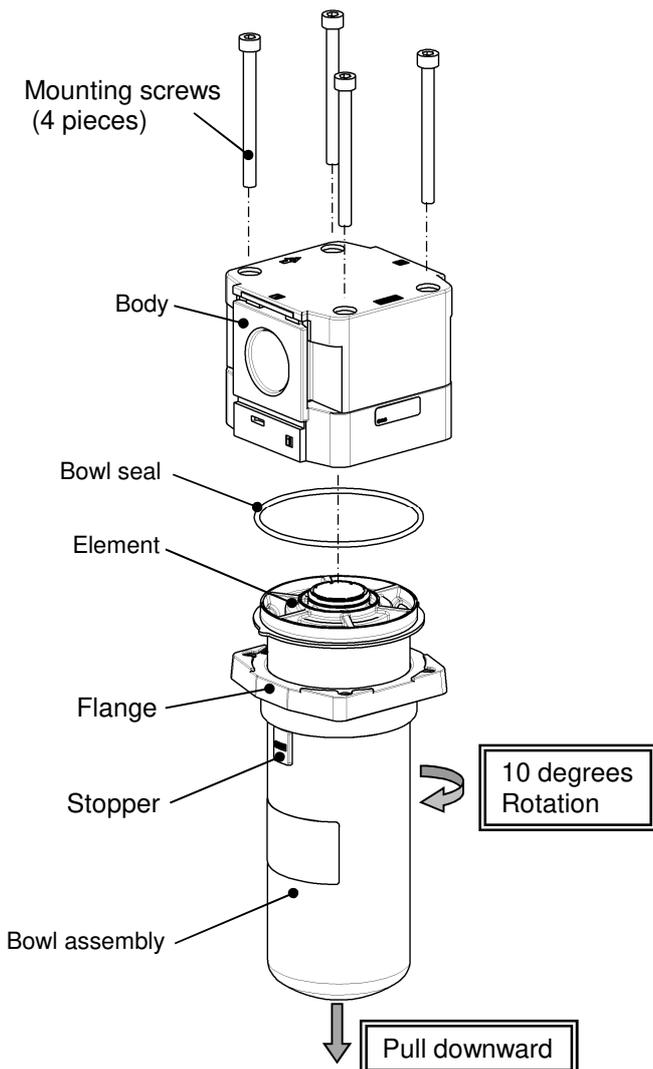
### Warning

Before replacement, make sure that no pressure remains in the equipment.

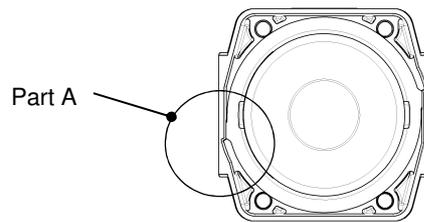
After replacement, confirm that the product satisfies specific functions and no external leakage occurs before operating it.

### 9-1. Bowl assembly Replacement

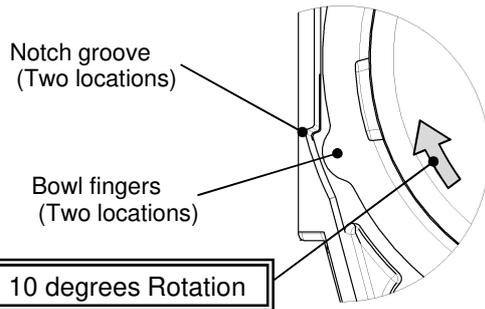
Model No.	Work classification	Work step	Tools	Criteria	
AMK50 AMK60	Disassembly	1) Remove the bowl assembly from the product. Remove four mounting screws while supporting the flange by hand, and lower the flange up to the stopper.	AMK50/AMK60 Hexagon wrench key (Nominal size: 5)	—	
		2) Rotate bowl assembly by around 10° in the arrow direction, then remove the bowl assembly from the body.	—	—	
		3) Remove the bowl seal and element.	—	—	
	Assembly	4) Install the element and bowl seal in the bowl assembly.	—	—	
		5) Insert the fingers (two locations) of the bowl into the notches (two locations) of the body by aligning them with each other, and turn the bowl assembly by around 10° in the arrow direction. Engage both fingers (two locations) of the bowl with the body.	—	—	
		6) Install the flange to the body, temporarily tighten four mounting screws, and then tighten them diagonally and evenly to secure the flange.	AMK50/AMK60 Hexagon wrench key (Nominal size: 5)	Tightening torque: <table border="1"> <tr> <td>AMK50</td> <td rowspan="2">3.5±0.3N m</td> </tr> <tr> <td>AMK60</td> </tr> </table>	AMK50
AMK50	3.5±0.3N m				
AMK60					



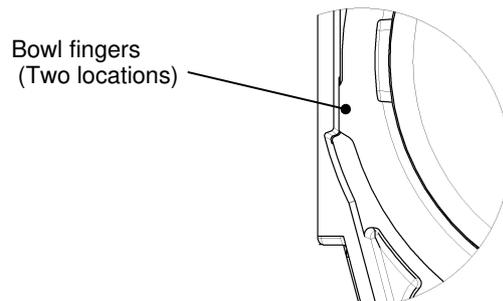
#### Assembly 5. Engagement condition of finger part of bowl



Align the notch groove with the finger of the bowl (Part A).

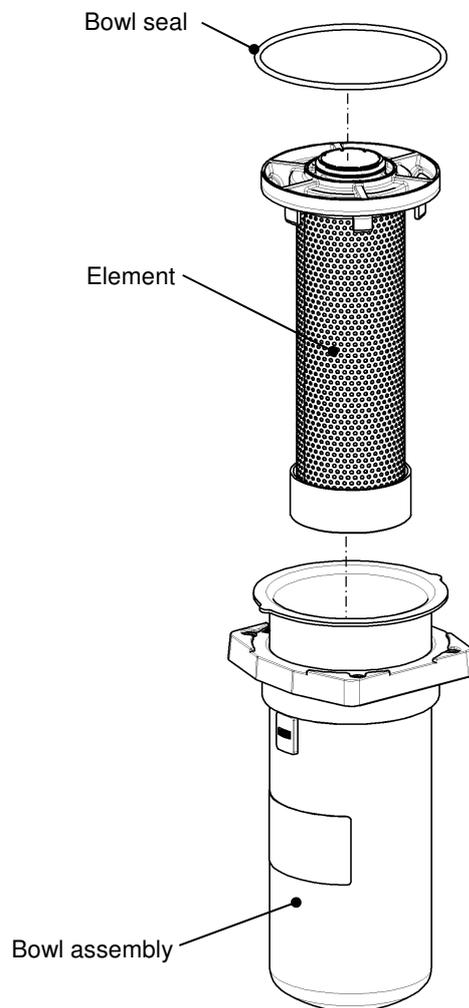


Engage the fingers of the bowl with the body (Part A).



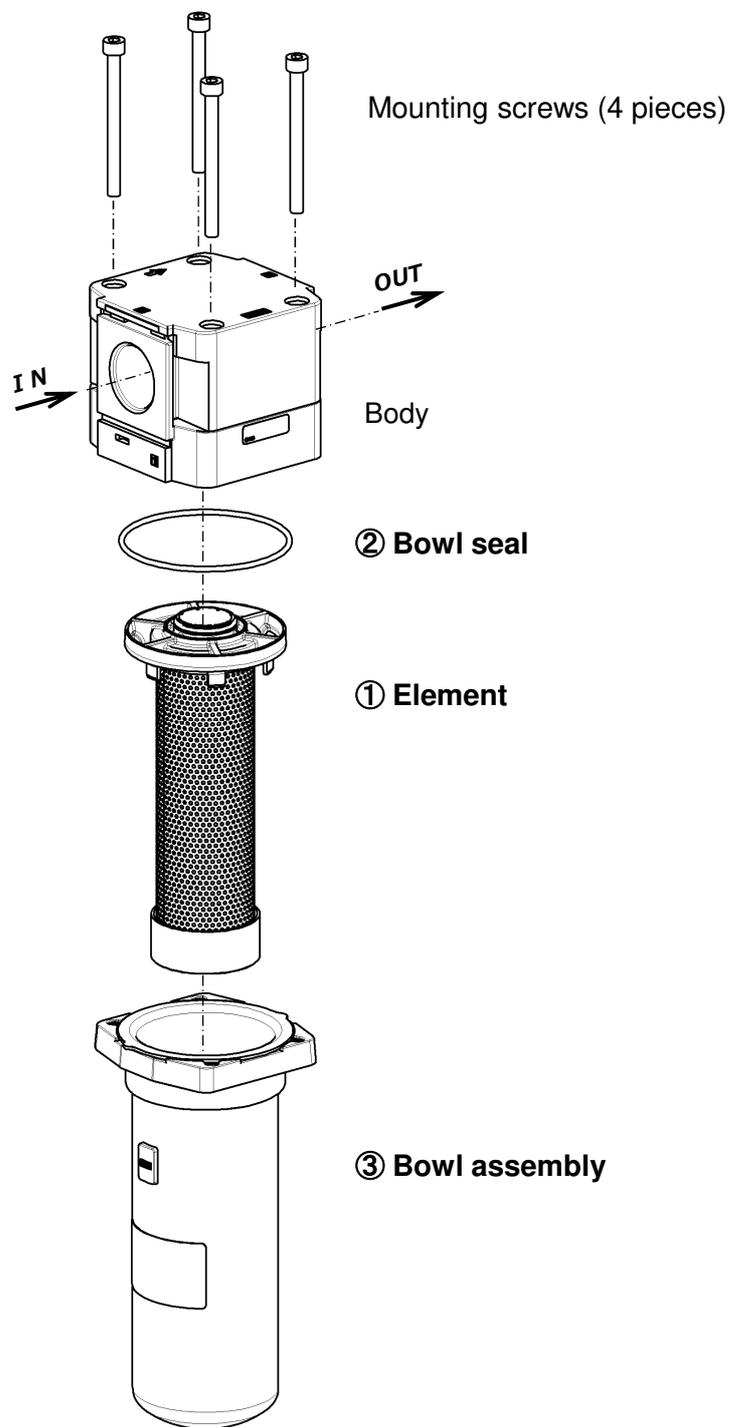
## 9-2. Element Replacement

Model No.	Work classification	Work step	Tools	Criteria
AMK50 AMK60	Disassembly	1) Remove the bowl assembly by referring to the section [9-1. Bowl assembly Replacement] (P13).	—	—
	Assembly	2) Install the replacing element and bowl seal in the bowl assembly. Mount the bowl assembly by referring to the section [9-1. Bowl assembly Replacement] (P13).	—	—

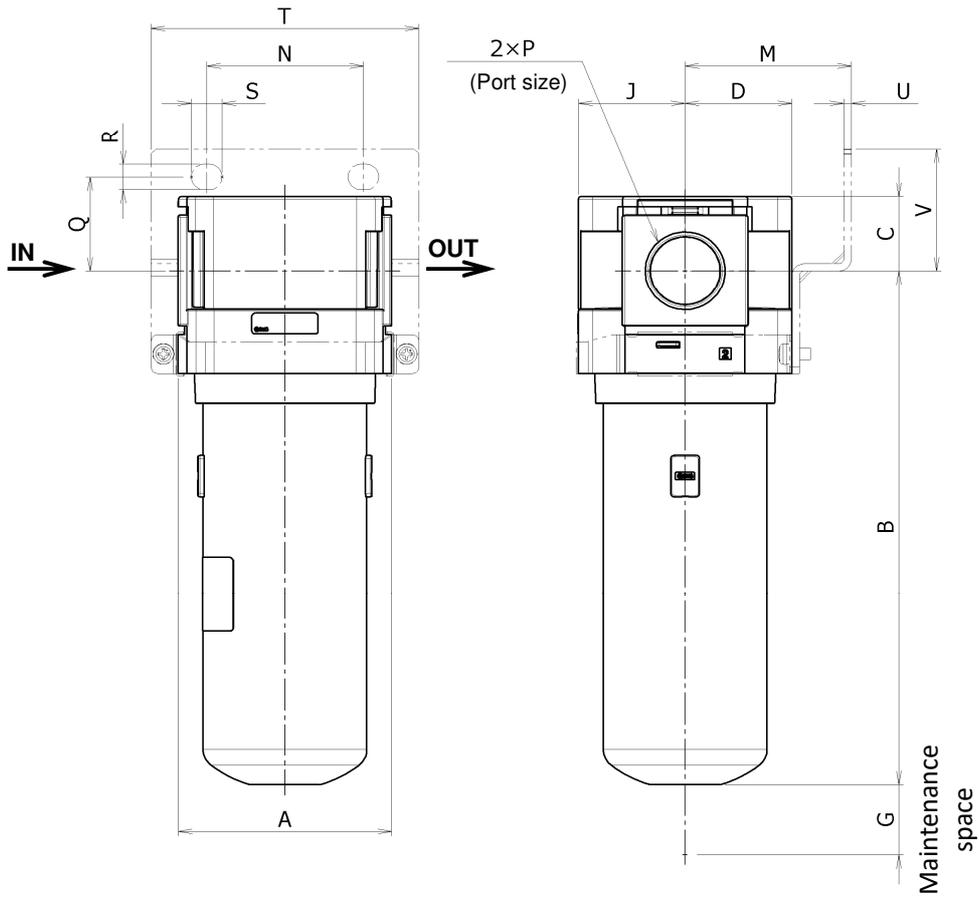


## 10. Disassembly Drawing

AMK50 / AMK60



# 11. Dimensions



Model No.	Standard specifications							Option specifications							
								Bracket mount							
	P	A	B	C	D	G	J	M	N	Q	R	S	T	U	V
AMK50	3/4.1	90	222	32	45	30	45	70	66	40.5	11	13	113	3.2	52.5
AMK60	1	90	299.1	32	45	30	45	70	66	40.5	11	13	113	3.2	52.5

Revision history
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