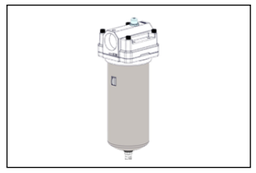
ORIGINAL INSTRUCTIONS

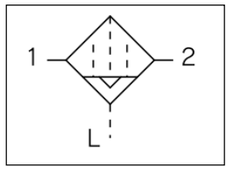
Refer to Declaration of Conformity for relevant Directives

# Instruction Manual

## *Mist Separator*

## *AM80D/90D*






The intended use of this product is to filter the air in the main line.

## 1 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 10218-1: Manipulating industrial robots -Safety.etc.

This manual contains essential information for the protection of users and others from possible injury and/or equipment damage.

- Read this manual before using the product, to ensure correct handling, and read the manuals of related apparatus before use.
- Keep this manual in a safe place for future reference.
- To ensure safety of personnel and equipment the safety instructions in this manual must be observed, along with other relevant safety practices.

| | |
|---|---|
| ⚠ **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**

- **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 catalogue information, with a view to giving due consideration to any possibility of equipment failure when configuring the equipment.
- **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.

## 1 Safety Instructions - continued

- **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.
- **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, combustions 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 specification described in the product catalogue.
  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.
- **Always ensure compliance with relevant safety laws and standards.**
  All electrical work must be carried out in a safe manner by a qualified person in compliance with applicable national regulations.

**⚠ 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.

## 2 Specifications

Refer to the operation manual for additional information on this product.

| Model | | AM80D | AM90D |
|---|---|---|---|
| Port size | | 1 1/2 | 1 1/2, 2 |
| Weight | | 4.7kg | 5.0kg |
| Scope | Fluid | Compressed air | |
| | Inlet air pressure range | 0.1 to 1.0MPa (1.6MPa) Note1) | |
| | Operating fluid temperature | -5 to 60°C (No freezing) | |
| | Ambient temperature | -5 to 60°C (No freezing) | |
| | Proof pressure | 1.5MPa (2.4MPa) Note 1) | |
| Rated conditions | Air flow capacity $m^3$/min(ANR) Note 2) | 11.0 | 14.5 |
| | Flow capacity of the compressor intake condition $m^3$/min Note 3) | 11.5 | 15.1 |
| | Inlet air pressure | 0.7MPa | |
| | Filtration Note 4) | 0.1μm (Filtration efficiency: 99%) | |
| | Oil mist density at outlet Note5) | Max 1mg/m3 (ANR)(≒0.8ppm) | |

Note 1) When selecting Option H or Option J
Note 2) Air flow capacity with 20 °C, atmospheric pressure and relative humidity of 65 %.
Note 3) Air flow capacity with 32 °C, and when calculated to atmospheric pressure.
Note 4) Filtration efficiency for conditions below in addition to the rated conditions above [Test condition ISO8573-4: 2010 compliant].
* Flow capacity, inlet pressure and the amount of solid bodies at the filter inlet are stable.
* New element

## 2 Specifications - continued

Note 5) Water droplet elimination ratio for conditions below in addition to the rated conditions above.
* Oil mist density at outlet for conditions below in addition to the rated conditions above [Compliant to test condition ISO8573-9:2010 and test method ISO12500-4:2009] (Water droplet indicates condensed moisture. Water vapour which is not condensed is not included)
* Inlet air temperature = 25 °C
* Flow capacity, inlet pressure and the water droplet concentration at the filter inlet are stable.
* New element

## 3 Installation

### 3.1 Installation

**⚠ Warning**

Do not install the product unless the safety instructions have been read and understood.

**Confirm the specifications.**
This product is designed for use in compressed air systems only.
Do not operate at conditions outside of the specification, as this could cause damage, malfunction or performance reduction. SMC does not guarantee against any damage if the product is used outside of the specification range.

**Air source**
- Applicable fluid is compressed air.

Do not use this product with a fluid other than compressed air (e.g. oxygen, hydrogen, inflammable gas, mixed gas, etc.).
- **Do not use compressed air which includes chemicals, organic solvents, or corrosive gases, etc**. It may lead to damage or malfunction.
- **Do not use for caisson shield, breathing, medical purposes, air blow to any medicines and foods that enter the human body.**

Air preparation equipment including this product is for exclusive use for industrial compressed air. Do not use for any other purposes.

**Model selection**
- Carefully consider the application, required specifications, and operating conditions (pressure, flow rate, temperature, environment and power supply) in accordance with the latest catalogue (SMC website), making sure not to exceed the specification range.
- Although it depends on the types or specifications of the compressor, compressed air generally contains particle contaminants. Please select the system construction in reference to the model selection of air preparation equipment in accordance with the user required cleanliness of the compressed air or applications.

Contaminants contained in the compressed air:
- Moisture (water droplet, water vapour)
- Dust and chemicals which are sucked from the ambient air
- Deteriorated oils coming out of the compressor
- Solid foreign matter or oils including rust in the piping

**Select the model so that the maximum value (instantaneous) of the flow rate will not exceed the rated air capacity.**
When compressed air is used for air blow, calculate the maximum amount of the consumed air before selecting the size. If compressed air exceeding the rated air flow capacity is applied, the outlet compressed air cleanliness might be reduced or oil mist on the outlet side may leak out, which may damage the element.

**Do not use the product with low air pressure (e.g. for blower).**
If it is used at the minimum operating pressure or less, pressure resistance or increase in pressure resistance due to clogging may reduce the performance or cause operation failure.

**Do not put a heavy object on the product, or step on it.**
It may cause damage and dropping of the product, and injury or an accident.

**Installation location**
- **Install the product in a location where pulsation is unlikely to occur.**

When the difference between the inlet and outlet sides exceeds 0.1MPa, element may be subject to damage.
- **Install so that reverse pressure and back flow will not be generated.**

If this happens, the element may be subject to damage.

## 3 Installation - continued

- **When installing, allow sufficient space for maintenance.**
- **The piping of this product should be horizontal (drain exhaust should vertically face downwards)**

If it is mounted inclined, laterally or upward/downward, the separated drainage will spill into the outlet. It may cause the operation failure of the auto drain.
- **Pay attention to the dust generated from the air equipment which is mounted on the outlet.**

If the air equipment is mounted on the outlet of the filter, dust will be generated from the equipment and cleanliness of the compressed air might be reduced. Consider the mounting position of the air equipment in accordance with the required cleanliness of the compressed air.
- **Filter is a heavy object, please transfer or install it making sure that it will not be dropped or dented.**

### 3.2 Environment

**⚠ Warning**

- Do not use in an environment where corrosive gases, chemicals, salt water or steam are present.
- Do not use in an explosive atmosphere.
- Do not expose to direct sunlight. Use a suitable protective cover.
- Do not install in a location subject to vibration or impact. Check the product specifications.
- Do not mount in a location exposed to radiant heat.
- Do not install in a location subject to sea water, high humidity and a large quantity of dust.
- Do not install outdoors
- Do not install on vehicles or vessels (the product might be damaged due to vibration)

### 3.3 Piping

**⚠ Caution**

- Before piping make sure to clean up chips, cutting oil, dust etc.
- When installing piping or fittings, ensure sealant material does not enter inside the port. When using seal tape, leave 1 thread exposed on the end of the pipe/fitting.
- Tighten fittings to the specified tightening torque.

Insufficient tightening torque can cause loose piping or sealing failure.
Excessive tightening torque can cause thread damage.
If the female side is not held while tightening, excessive force will be applied to the bracket directly, causing breakage.
Recommended tightening torque (N·m)

| Thread | Tightening Torque |
|---|---|
| Rc 1 ½ 2 | 48 to 50 |

- Avoid excessive torsional moment or bending moment other than those caused by the equipment's own weight as this can cause damage. External piping needs to be supported separately.
- Piping materials without flexibility such as steel tube piping are prone to be effected by excess moment load and vibration from the piping side. Use flexible tubing in between to avoid such an effect.
- **Reverse connection is not available. IN and OUT should be connected correctly.**
  The compressed air inlet is indicated with a flow direction symbol on the top of the product.
- **Drain piping of the auto drain should be performed with an appropriate tube diameter and length.**
  Tube I.D. φ6.5 (φ1/4 inch) or more, length within 5m (200 inch)
- **Rising of the auto drain piping should be avoided.**
  It may cause the operation failure of the auto drain

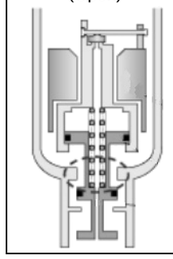
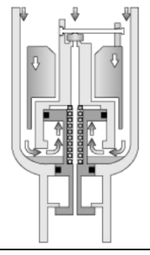
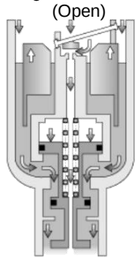
### 3.4 Lubrication

**⚠ Caution**

- SMC products have been lubricated for life at manufacture, and do not require lubrication in service.
- If a lubricant is used in the system, use turbine oil Class 1 (no additive), ISO VG32. Once lubricant is used in the system, lubrication must be continued because the original lubricant applied during manufacturing will be washed away.

## 4 Settings

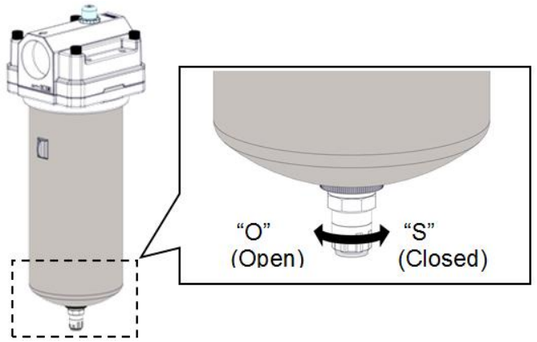
**Auto drain**

| Not pressurized (After releasing residual pressure) | Pressurized (Pressure in the product: 0.1MPa or more) | |
|---|---|---|
| | Before drainage is accumulated | When drainage is accumulated |
| Drainage is released (Open) | Drainage is not released (Closed) | Drainage is released (Open) |
|  |  |  |

**Manual release**

The drain cock is usually tightened to the "S" side, but when it is rotated to the "O" side, drainage can be released manually.

If the drainage is released while residual pressure is present in the filter, drainage blows out from the drain port abruptly.




## 5 How to Order

AM☐D-☐☐-☐-☐

Accessory Note1)

| Symbol | Details |
|---|---|
| Nil | N/A |
| B | Bracket Note2) |

Size

| Symbol |
|---|
| 80 |
| 90 |

Piping port size

| Symbol | Port size |
|---|---|
| 14 | 1 1/2 |
| 20 | 2 |

Thread type

| Symbol | Type |
|---|---|
| Nil | Rc |
| F | G |
| N | NPT |

Drain release specification Note3)

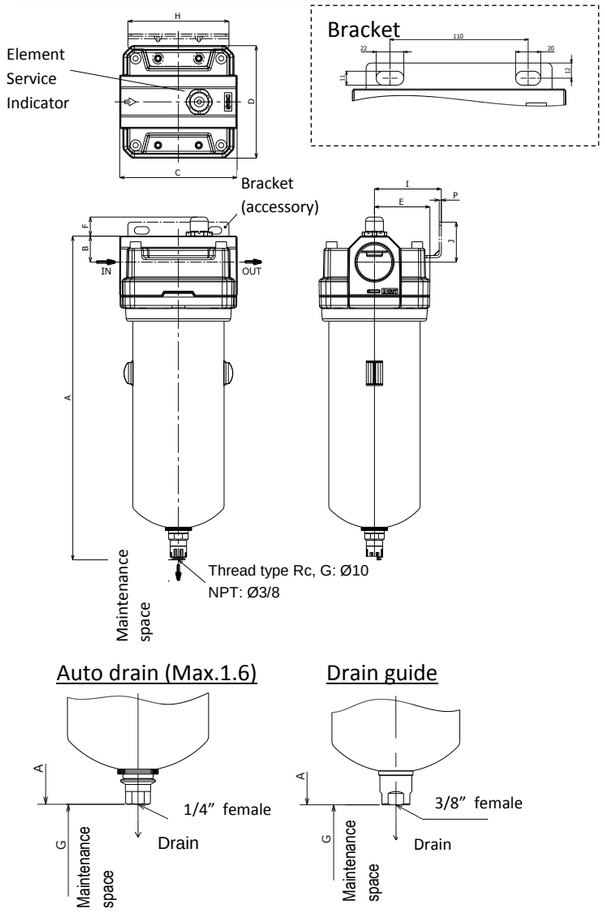
| Symbol | Details | Auto drain |
|---|---|---|
| Nil | Auto drain (MAX1.0MPa) | Yes |
| H | Auto drain (MAX1.6MPa) | |
| J | Drain guide (MAX1.6MPa) | N/A |

Note 1) Even when the accessories are selected, they are not listed on the product label.

Note 2) Bracket is included but not assembled. Mounting is to be performed by the user.

Note 3) Option H and option J cannot be selected simultaneously.

## 6 Outline Dimensions (mm)




| Model | | AM80D | AM90D |
|---|---|---|---|
| Port size | | 1 1/2 | 1 1/2 , 2 |
| Auto drain (Max 1.0MPa) | A | 404 | 470 |
| Auto drain (Max 1.6MPa) | | 392 | 458 |
| Drain guide | | 394.5 | 460.5 |
| B | | 38 | 38 |
| C | | 170 | 170 |
| D | | 160 | 160 |
| E | | 80 | 80 |
| F | | 23 | 23 |
| G | | 40 | 40 |

| Model | AM80D | AM90D |
|---|---|---|
| H | 148 | 148 |
| I | 93.5 | 93.5 |
| J | 58.5 | 58.5 |
| K | 110 | 110 |
| L | 22 | 22 |
| M | 11 | 11 |
| N | 20 | 20 |
| O | 12 | 12 |
| P | 3.2 | 3.2 |

## 7 Maintenance

### 7.1 General Maintenance

**Caution**

- Not following proper maintenance procedures could cause the product to malfunction and lead to equipment damage.
- If handled improperly, compressed air can be dangerous. Maintenance of pneumatic systems should be performed only by qualified personnel.
- Before performing maintenance, turn off the power supply and be sure to cut off the supply pressure. Confirm that the air is released to atmosphere.
- After installation and maintenance, apply operating pressure and power to the equipment and perform appropriate functional and leakage tests to make sure the equipment is installed correctly.
- If any electrical connections are disturbed during maintenance, ensure they are reconnected correctly and safety checks are carried out as required to ensure continued compliance with applicable national regulations.
- Do not make any modification to the product.

## 7 Maintenance - continued

- Do not disassemble the product, unless required by installation or maintenance instructions.
- **Removal of equipment, and supply/exhaust of compressed air**

When equipment is to be removed, first confirm that measures are in place to prevent losing control of the equipment or workpieces from falling, etc. Then, shut off the supply air and exhaust the compressed air in the system.

When machinery is restarted, turn off the power supply, stop the air supply and exhaust all compressed air from the system

- **Element replacement with a new one when the replacement timing has come**

If an element is used even after exceeding the replacement timing, the outlet compressed air cleanliness might be reduced or oil mist may leak out, which may damage the element.

- **Element replacement timing**

Element should be replaced when the red piston of the service indicator is visible or 2 years after starting operation, whichever comes first.

- **Element service indicator**

Perform periodical check to find cracks, flaws or other deterioration. If any are seen, replace with new parts and review the operating condition. Otherwise, a malfunction may occur. Please consult SMC if the review of the operating conditions is not possible.

- **Be sure to exhaust the drainage that has accumulated in the filter**

Operation with condensate caught in the equipment or the piping may lead to operation failure of the equipment, splashing from the outlet, and unexpected accidents.

- **Clean the bowl regularly**

Clean inside of the bowl with tepid water in which detergent is dissolved (25 $^{O}$C or less), and eliminate foreign matter and oil. If foreign matter or drain scale is accumulated, it could cause operation failure of the auto drain, so please clean it regularly. If necessary, remove the auto drain from the bowl before cleaning. Please refer to Auto drain replacement on page 14 of operation manual for removal of the auto drain.

**Service parts**

| Description | Part No. |
|---|---|
| Element | AM-EL80D |
| | AM-EL90D |

## 8 Limitations of Use

### 8.1 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. 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 catalogue for the particular products.

- **Compliance Requirements**

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

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

**If an error is generated, turn off the power supply and stop the compressed air supply.**

If smoke, abnormal smells or noises are generated, there is a possibility of fire. In that case, stop supplying the compressed air and reduce the pressure in the equipment to zero.

**When maintenance of the auto drain is performed, or filter element is replaced, be sure to reduce the compressed air to zero. Do not touch the high temperature section.**

Using this product at a high temperature (40 to 60$^{o}$C) may cause burns. Be sure to confirm that the temperature of the container or operating part is reduced to 40 degrees or less to prevent burns.

## 0 Limitations of Use - continued

**About oil-free products**

The AM series includes parts (such as resin parts, rubber parts, and elements) that do not allow degreasing wash. Therefore, oil free products with all parts degreasing washed are not available.

**Degreasing wash**

Certain parts such as the body and housing can be degreasing washed. Contact SMC after confirming the specifications (available as Option or Made to Order)

**Change of oil**

On the AFF series, no oil such as grease is applied to parts exposed to compressed air. However, for certain specifications, there are some parts to which oil is applied. It is possible to change the type of applied oil (as Option or Made to Order).

**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.

## 9 Contacts

| | |
|---|---|
| **AUSTRIA** | SMC Pneumatik GmbH,Girakstrasse 8, AT-2100 Korneuburg, Austria |
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| **CROATIA** | SMC IndustrijskaAutomatikad.o.o. ZagrebačkaAvenija 104,10 000 Zagreb |
| **CZECH REP.** | SMC Industrial Automation CZ s.r.o. Hudcova 78a, CZ-61200 Brno, Czech Republic |
| **DENMARK** | SMC Pneumatik A/S,Egeskovvej 1, DK-8700 Horsens, Denmark |
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| **PORTUGAL** | SMC España S.A. Zuazobidea 14, 01015 Vitoria, Spain |
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Specifications are subject to change without prior notice from the manufacturer.

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