Compressed Air Preparation Filter

New

Stainless Steel Type

CE UKCA RoHS

* Depends on the size and max. operating pressure

Improved environmental resistance with the stainless steel exterior

Main Line Filter *AFF□DS Series* — 1 µm — Water droplet removal

Mist Separator *AM□DS Series* — 0.1 µm — Oil mist separation and removal

Micro Mist Separator *AMD□DS Series* — 0.01 µm — Oil mist separation and removal

Flow capacity

14.5 *1 m³/min (ANR)

*1 For **AFF90DS/AM90DS/AMD90DS**

Pressure drop

5 kPa or less

AFF□DS/AM□DS/AMD□DS Series

SMC

CAT.ES30-27A

Variations

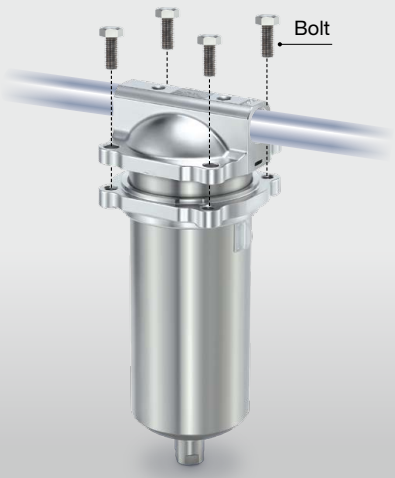
Series	Size	Port size (1 / 1 1/2 / 2)	Flow capacity [m³/min (ANR)]
AFF□DS Series Main Line Filter Large dust particle filtration, Water droplet separation Water droplet removal ratio: 99% Nominal filtration rating: 1 µm [Filtration efficiency: 99%]	70	1	7.0
	80	1 1/2	11.0
	90	2	14.5
AM□DS Series Mist Separator Dust filtration, Oil mist separation Nominal filtration rating: 0.1 µm [Filtration efficiency: 99%] Oil mist concentration on the outlet side: Max. 1.0 mg/m³ (ANR) [≈ 0.8 ppm]	70	1	7.0
	80	1 1/2	11.0
	90	2	14.5
AMD□DS Series Micro Mist Separator Dust filtration, Oil mist separation Nominal filtration rating: 0.01 µm [Filtration efficiency: 99.9%] Oil mist concentration on the outlet side: Max. 0.1 mg/m³ (ANR) [≈ 0.08 ppm]	70	1	7.0
	80	1 1/2	11.0
	90	2	14.5

Easier replacement of the element

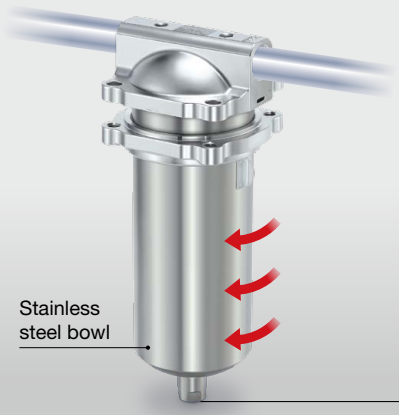
The stopper function prevents the bowl from falling.

The bowl will not fall even if the bolts are loosened. It is not necessary to hold the bowl when removing the bolts. Safe and secure mounting and removing of the bowl with both hands is possible.
The lightweight stainless bowl with reduced thickness allows for easier element replacement.

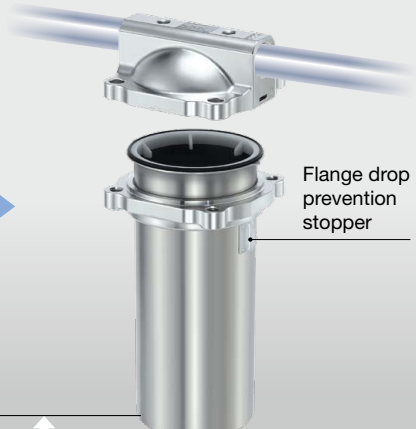
1 Loosen the 4 securing bolts.



2 Rotate the bowl to release the stopper. Pull it down to remove the bowl.

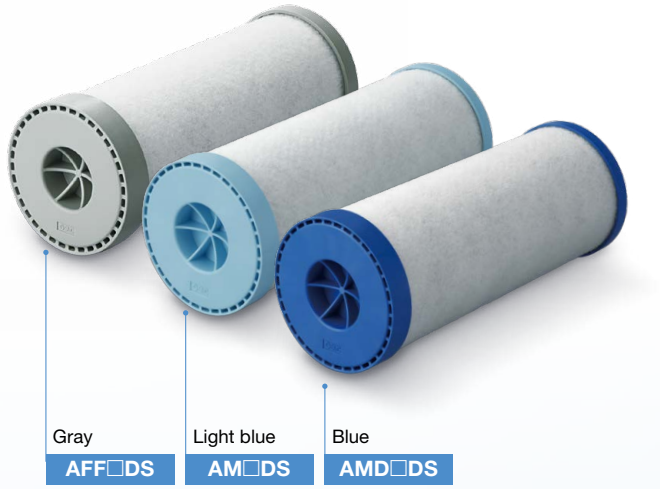


3 At least 40 mm of maintenance space is necessary for removing the bowl.



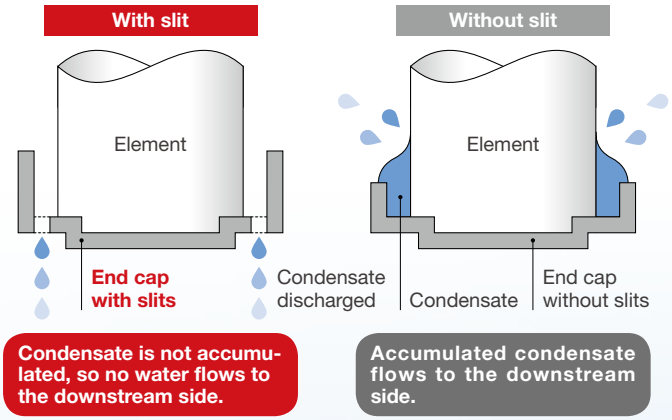
Can be identified by color

The type of element can be identified by the color of the end cap.



An end cap with slits is used for the element.

This eliminates the accumulation of condensate. Even high-velocity fluid is not spattered. The result is a compact bowl design.

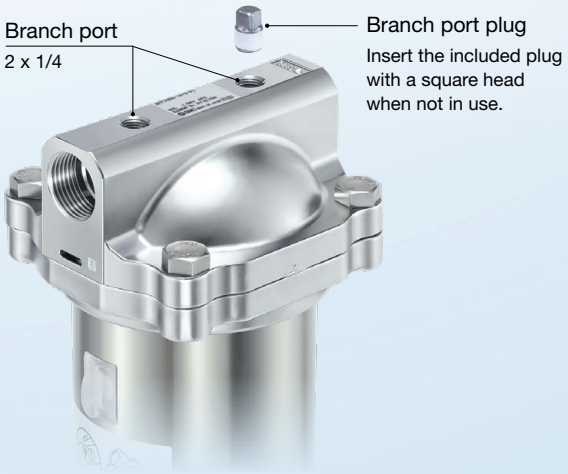


Condensate is not accumulated, so no water flows to the downstream side.

Accumulated condensate flows to the downstream side.

Branch port

Mounting a sensor, etc., allows for element differential pressure management.



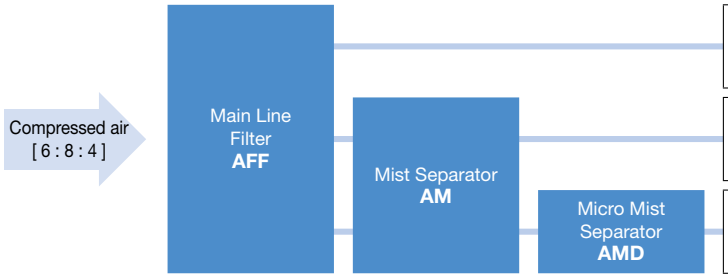
Related Product

Pressure Sensor PSE560 Series

- Piping port/Parts in contact with fluid: Stainless steel 316L
- IP65

Compliant with ISO 8573 Compressed Air Purity Class

Systems which are in compliance with the degree of purity required for compressed air (For details ➡ p. 9)



Purity class as a system		
Particles	Liquid water	Oil
4	7	4
2	7	3
1	7	2

The class indicates the compressed air purity according to ISO 8573-1:2010 (JIS B 8392-1:2012) and indicates the maximum purity class which can be obtained using that system. Note, however, that this value will differ according to the inlet air conditions.

Compressed Air Preparation Filter
Stainless Steel Type
AFF□DS/AM□DS/AMD□DS Series

∗ Refer to the CE/UKCA-compliance list below.

RoHS

How to Order

AFF 70 D S – □ 10 – J – P1

Filter type

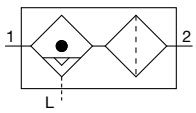
Symbol	Description	Specifications
AFF	Main line filter	Nominal filtration rating: 1 μm Water droplet removal ratio: 99% or more
AM	Mist separator	Nominal filtration rating: 0.1 μm Oil mist density at outlet: 1.0 mg/m³
AMD	Micro mist separator	Nominal filtration rating: 0.01 μm Oil mist density at outlet: 0.1 mg/m³

Body size

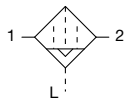
Symbol	Flow capacity
70	7 m³/min (ANR)
80	11 m³/min (ANR)
90	14.5 m³/min (ANR)

Symbol

Main line filter



Mist separator
Micro mist separator



Stainless steel type

Thread type

Symbol	Type
Nil	Rc
F	G
N	NPT

Port size

Symbol	Port size	Applicable body size		
		70	**80**	**90**
10	1	●	–	–
14	1 1/2	–	●	–
20	2	–	–	●

Drain exhaust

Symbol	Description
J∗1	Drain guide
V∗2, ∗3	Drain cock (Ball valve + Nipple)

∗1 Without a valve function
∗2 The drain cock comes together with the product, but it does not come assembled.
∗3 It cannot be used in combination with "J."

Accessory∗4, ∗5

Symbol	Description
P1	With branch port plug

∗4 The branch port plug is a plug with a square head.
∗5 2 plugs are included and shipped with the product, but they do not come assembled.

CE/UKCA-compliant

Model	Max. operating pressure	
	1.0 MPa	1.6 MPa
AFF/AM/AMD70DS	–	–
AFF/AM/AMD80DS	–	●
AFF/AM/AMD90DS	●	●

Replacement Parts

Description		End cap color	Order no.		
			70	**80**	**90**
Element	**For AFF**	Gray	AFF-EL70DS	AFF-EL80DS	AFF-EL90DS
	For AM	Light blue	AM-EL70DS	AM-EL80DS	AM-EL90DS
	For AMD	Blue	AMD-EL70DS	AMD-EL80DS	AMD-EL90DS

∗ Contact SMC if degreasing treatment is required.

SMC

Main Line Filter AFF Series

Standard Specifications

Model			AFF70DS	AFF80DS	AFF90DS
Port size			1	1 1/2	2
Fluid			Air		
Ambient and fluid temperatures		°C	–5 to 60 (No freezing)		
Proof pressure		MPa	1.5 (2.4∗1)		
Max. operating pressure		MPa	1.0 (1.6∗1)		
Min. operating pressure		MPa	0.1		
Nominal filtration rating∗2		μm	1.0 (Filtration efficiency: 99%)		
Water droplet removal ratio∗3		%	99		
Max. flow capacity∗4		m^3/min (ANR)	7.0	11.0	14.5
Compressed air purity class∗5			ISO 8573-1:2010 [4 : 7 : 4]∗6		
Weight [kg]			4.6	7.3	8.2
Material	**Body**∗7		Stainless steel		
	Bowl∗7				

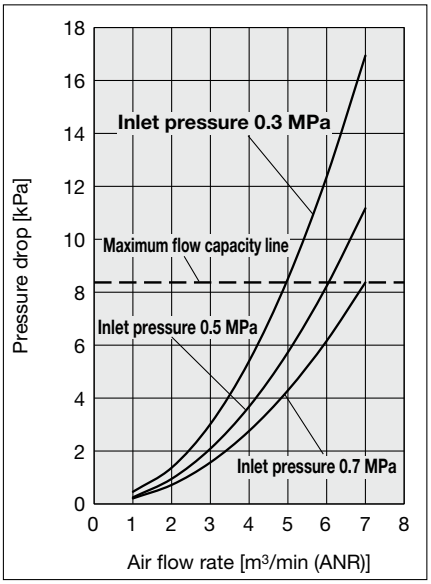
When the max. flow capacity is converted into the compressor discharge air volume

Model		AFF70DS	AFF80DS	AFF90DS
Max. flow capacity∗8	m^3/min	7.3	11.5	15.1

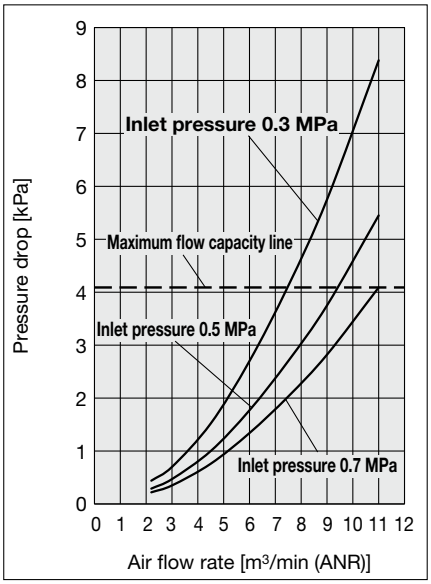
∗1 When selecting option J.
∗2 Filtration efficiency under the conditions below [Test condition ISO 8573-4:2001, Test method ISO 12500-3:2009 compliant]
∗∗ At 0.7 MPa inlet pressure and max. flow capacity
∗∗ When the air flow capacity, inlet pressure, and the amount of solid or liquid particles on the filter inlet side are stable.
∗∗ When a new element is used
∗3 Water droplet removal rate under the conditions below [Test method ISO 12500-4:2009 compliant]
∗∗ At 0.7 MPa inlet pressure and max. flow capacity
∗∗ Water droplet on the filter inlet side = 33 g/m^3
(Water droplet indicates condensed moisture. Water vapor which is not condensed is not included.)
∗∗ When the air flow capacity, inlet pressure, and the amount of water droplets on the filter inlet side are stable.
∗∗ When a new element is used
∗4 Flow at 20°C, atmospheric pressure, and 65% of the relative humidity
∗5 The compressed air purity class is indicated based on ISO 8573-1:2010 Compressed air – Part 1: Contaminants and purity classes.
∗6 The compressed air quality class on the inlet side is [6 : 8 : 4].
∗7 Due to the production process, the product may have scratches, rubbing, stains, or discoloration that do not affect its function or performance.
∗8 The compressor discharge air volume is the flow rate converted into atmospheric pressure (compressor intake condition) at 32°C.

Flow Rate Characteristics

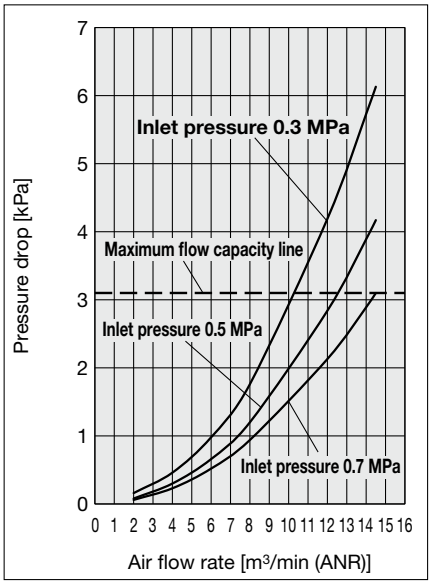
AFF70DS



AFF80DS



AFF90DS



Mist Separator AM Series

Standard Specifications

Model			AM70DS	AM80DS	AM90DS
Port size			1	1 1/2	2
Fluid			Air		
Ambient and fluid temperatures		°C	–5 to 60 (No freezing)		
Proof pressure		MPa	1.5 (2.4∗1)		
Max. operating pressure		MPa	1.0 (1.6∗1)		
Min. operating pressure		MPa	0.1		
Nominal filtration rating∗2		μm	0.1 (Filtration efficiency: 99%)		
Oil mist concentration on the outlet side∗3		mg/m³ (ANR)	1 (≈ 0.8 ppm) or less		
Max. flow capacity∗4		m³/min (ANR)	7.0	11.0	14.5
Compressed air purity class∗5			ISO 8573-1:2010 [2 : 7 : 3]∗6		
Weight [kg]			4.6	7.3	8.2
Material	Body∗7		Stainless steel		
	Bowl∗7				

When the max. flow capacity is converted into the compressor discharge air volume

Model		AM70DS	AM80DS	AM90DS
Max. flow capacity∗8	m³/min	7.3	11.5	15.1

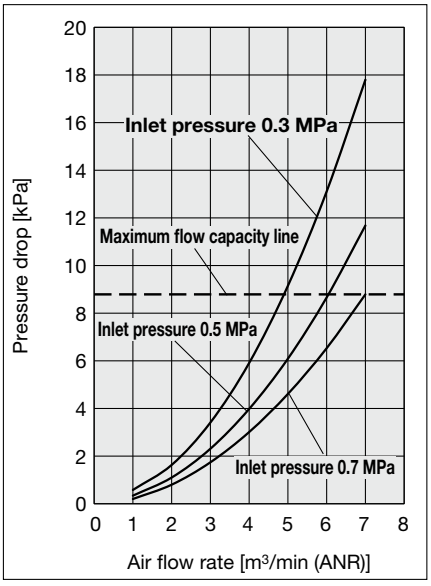
∗1 When selecting option J.
∗2 Filtration efficiency under the conditions below [Test condition ISO 8573-4:2001, Test method ISO 12500-3:2009 compliant]
- ∗∗ At 0.7 MPa inlet pressure and max. flow capacity
- ∗∗ When the air flow capacity, inlet pressure, and the amount of solid or liquid particles on the filter inlet side are stable.
- ∗∗ When a new element is used

∗3 Oil mist concentration on the outlet side under the conditions below [Test condition ISO 8573-2:2007, Test method ISO 12500-1: 2007 compliant]
- ∗∗ At 0.7 MPa inlet pressure and max. flow capacity
- ∗∗ Oil mist concentration on the filter inlet side = 10 mg/m³
- ∗∗ When the air flow capacity, inlet pressure, and the amount of water droplets on the filter inlet side are stable.
- ∗∗ When a new element is used

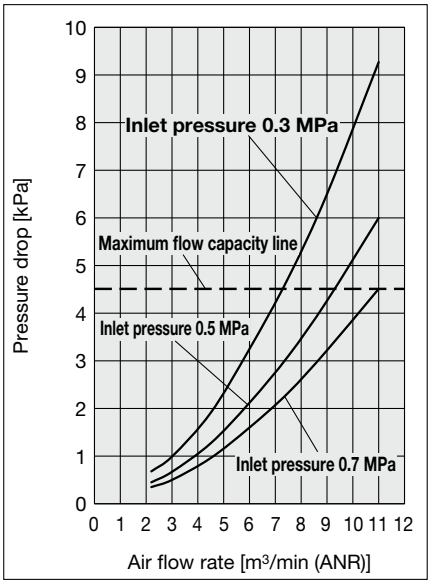
∗4 Flow at 20°C, atmospheric pressure, and 65% of the relative humidity
∗5 The compressed air purity class is indicated based on ISO 8573-1:2010 Compressed air – Part 1: Contaminants and purity classes.
∗6 The compressed air quality class on the inlet side is [4 : 7 : 4].
∗7 Due to the production process, the product may have scratches, rubbing, stains, or discoloration that do not affect its function or performance.
∗8 The compressor discharge air volume is the flow rate converted into atmospheric pressure (compressor intake condition) at 32°C.

Flow Rate Characteristics

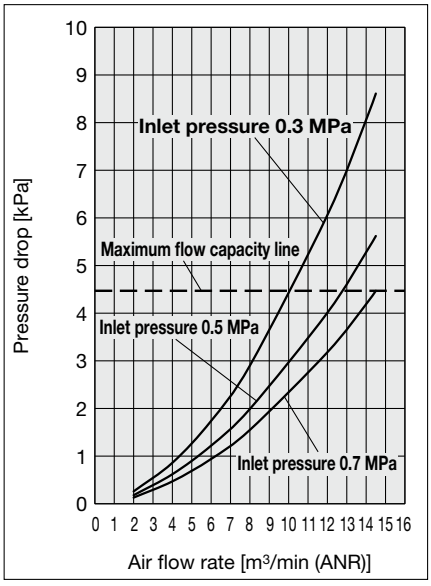
AM70DS



AM80DS



AM90DS



Micro Mist Separator AMD Series

Standard Specifications

Model			AMD70DS	AMD80DS	AMD90DS
Port size			1	1 1/2	2
Fluid			Air		
Ambient and fluid temperatures		°C	–5 to 60 (No freezing)		
Proof pressure		MPa	1.5 (2.4*1)		
Max. operating pressure		MPa	1.0 (1.6*1)		
Min. operating pressure		MPa	0.1		
Nominal filtration rating*2		μm	0.01 (Filtration efficiency: 99%)		
Oil mist concentration on the outlet side*3		mg/m³ (ANR)	0.1 (≈ 0.08 ppm) or less*4		
Max. flow capacity*5		m³/min (ANR)	7.0	11.0	14.5
Compressed air purity class*6			ISO 8573-1:2010 [1 : 7 : 2]*7		
Weight [kg]			4.6	7.3	8.2
Material	**Body***8		Stainless steel		
	Bowl*8				

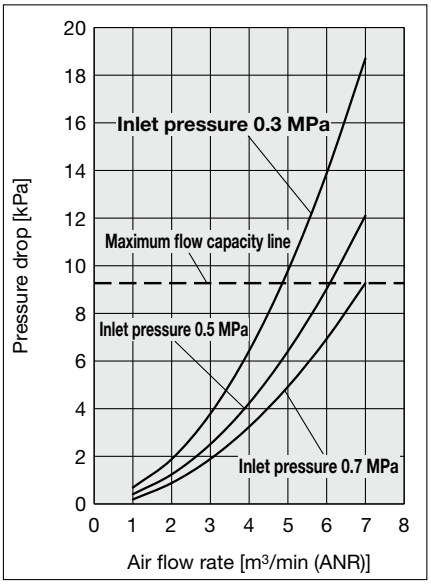
When the max. flow capacity is converted into the compressor discharge air volume

Model		AMD70DS	AMD80DS	AMD90DS
Max. flow capacity*9	m³/min	7.3	11.5	15.1

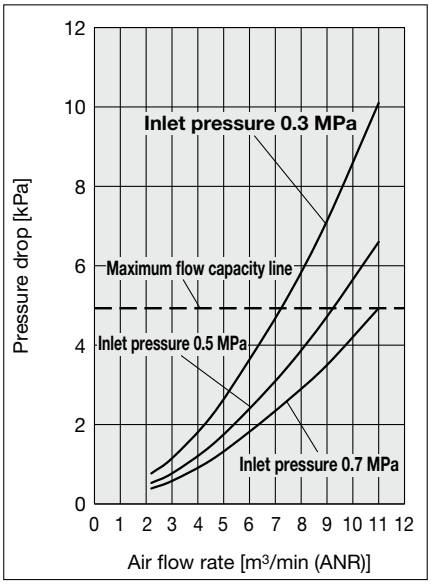
*1 When selecting option J.
*2 Filtration efficiency under the conditions below [Test condition ISO 8573-4:2001, Test method ISO 12500-3:2009 compliant]
** At 0.7 MPa inlet pressure and max. flow capacity
** When the air flow capacity, inlet pressure, and the amount of solid or liquid particles on the filter inlet side are stable.
** When a new element is used
*3 Oil mist concentration on the outlet side under the conditions below [Test condition ISO 8573-2:2007, Test method ISO 12500-1: 2007 compliant]
** At 0.7 MPa inlet pressure and max. flow capacity
** Oil mist concentration on the filter inlet side = 10 mg/m³
** When the air flow capacity, inlet pressure, and the amount of water droplets on the filter inlet side are stable.
** When a new element is used
*4 0.01 mg/m³ (≈ 0.008 ppm) or less in the initial state
*5 Flow at 20°C, atmospheric pressure, and 65% of the relative humidity
*6 The compressed air purity class is indicated based on ISO 8573-1:2010 Compressed air – Part 1: Contaminants and purity classes.
*7 The compressed air quality class on the inlet side is [2 : 7 : 3].
*8 Due to the production process, the product may have scratches, rubbing, stains, or discoloration that do not affect its function or performance.
*9 The compressor discharge air volume is the flow rate converted into atmospheric pressure (compressor intake condition) at 32°C.

Flow Rate Characteristics

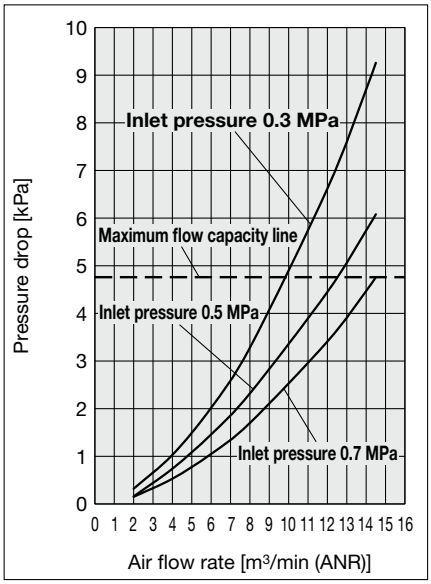
AMD70DS



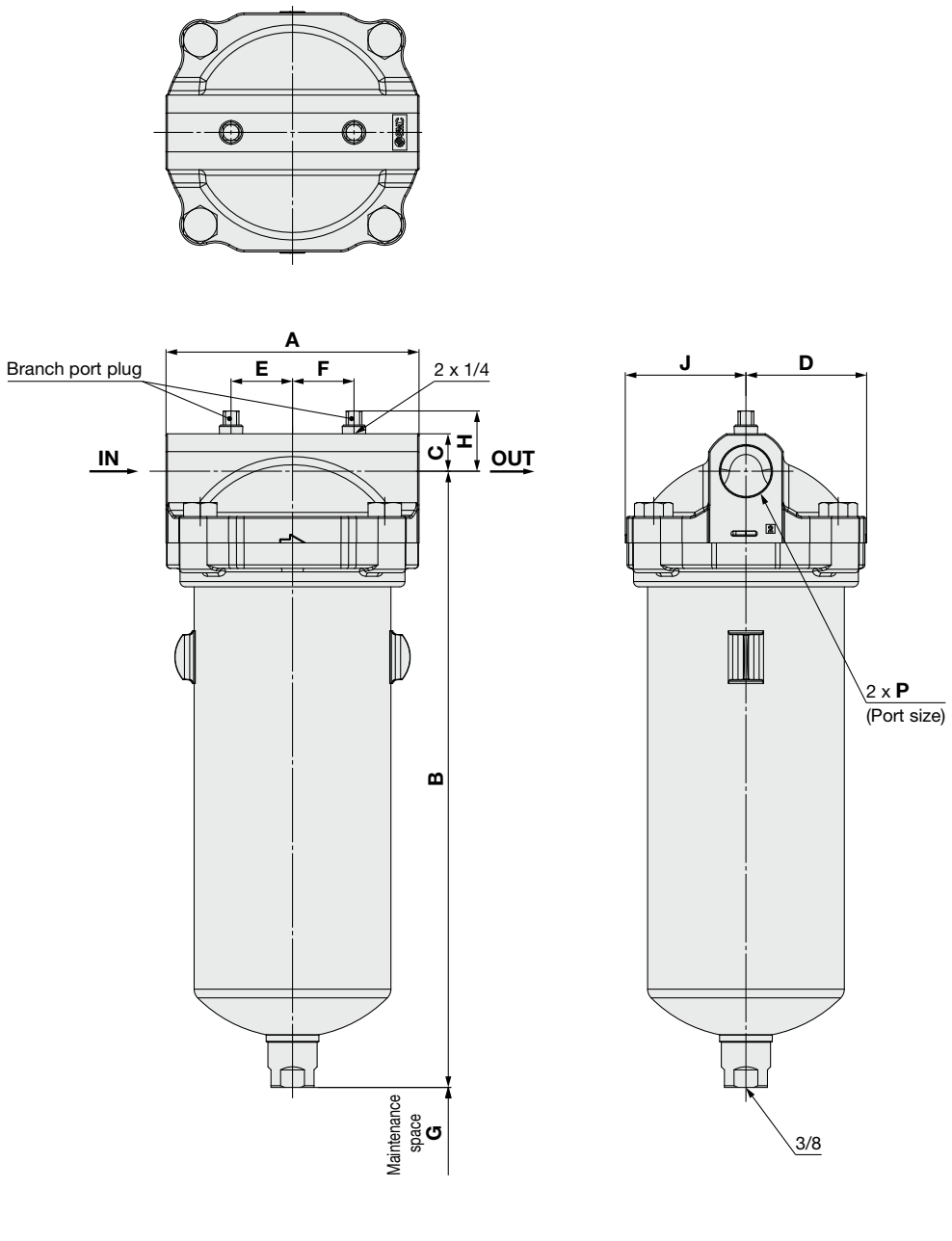
AMD80DS



AMD90DS



Dimensions: AFF, AM, AMD



Dimensions

[mm]

Model	P	A	C	D	E	F	G	H	J
AFF70DS/AM70DS/AMD70DS	1	144	21.3	68.7	35	35	40	34.3	68.7
AFF80DS/AM80DS/AMD80DS	1 1/2	170	30.3	80.7	45	45	40	43.3	80.7
AFF90DS/AM90DS/AMD90DS	2	170	36.6	80.7	45	45	40	49.6	80.7

∗ The thread type for each port will be the same as the selected thread type.

[mm]

Model	Drain exhaust		
	Drain guide	Drain cock	
		Rc, NPT	G
	B	**B**	**B**
AFF70DS/AM70DS/AMD70DS	350.7	410.5	414.5
AFF80DS/AM80DS/AMD80DS	356.7	416.5	420.5
AFF90DS/AM90DS/AMD90DS	422.4	482.2	486.2

AFF□DS/AM□DS/AMD□DS Series
Specific Product Precautions

Be sure to read this before handling the products. Refer to the back cover for safety instructions. For air preparation equipment precautions, refer to the "Handling Precautions for SMC Products" and the "Operation Manual" on the SMC website.

Air Supply

⚠Caution

1. This product is not applicable to gases other than compressed air.

This product is not applicable to gases other than compressed air (example: oxygen, hydrogen, flammable gas, mixed gas).

2. Do not use compressed air that contains chemicals, organic solvents, salt, or corrosive gases.

Do not use compressed gas containing chemicals, organic solvents, salt, or corrosive gas. This can cause rust, damage to rubber and resin parts, or malfunction.

Maintenance

⚠Caution

1. Compressed air over the max. flow capacity line may not meet the specifications of the product. Select a model that is either at or under the max. flow capacity line.

International Standard ISO 8573-1:2010
Compressed Air Purity Classes

Compressed air is used in a variety of manufacturing processes. In this age, compressed air with a high degree of purity is becoming increasingly necessary.
For this reason, it is necessary to remove contaminants from systems which supply compressed air and to secure the quality. The standard which stipulates the class according to the quantities of contaminants in compressed air is ISO 8573-1.

[Outline]
Stipulates the purity class of contaminants (particles, water, oil) mixed in with the compressed air

[Scope]
Can be used in various places in compressed air systems

[Terms and Definitions]
- Purity class: An index assigned for each classification obtained by dividing the concentration of each contaminant into ranges
- Particle: Small discrete mass of solid or liquid matter
- Humidity and liquid water: Water vapor (gas), Water droplets
- Oil: Liquid oil, Oil mist, Vapor

[Purity Classes]

Class	Particles				Humidity and liquid water		Oil
	Maximum number of particles per cubic meter as a function of particle size d [μm]			Mass concentration Cp	Pressure dew point	Concentration of liquid water Cw	Concentration of total oil
	0.1 < d ≤ 0.5	0.5 < d ≤ 1.0	1.0 < d ≤ 5.0	[mg/m³]	[°C]	[g/m³]	[mg/m³]
0	As specified by the equipment user or supplier and more stringent than class 1						
1	≤ 20000	≤ 400	≤ 10	—	≤ –70	—	≤ 0.01
2	≤ 400000	≤ 6000	≤ 100	—	≤ –40	—	≤ 0.1
3	—	≤ 90000	≤ 1000	—	≤ –20	—	≤ 1
4	—	—	≤ 10000	—	≤ +3	—	≤ 5
5	—	—	≤ 100000	—	≤ +7	—	—
6	—	—	—	0 < Cp ≤ 5	≤ +10	—	—
7	—	—	—	5 < Cp ≤ 10	—	Cw ≤ 0.5	—
8	—	—	—	—	—	0.5 < Cw ≤ 5	—
9	—	—	—	—	—	5 < Cw ≤ 10	—
x	—	—	—	Cp > 10	—	Cw > 10	> 5

[How to Perform a Test to Check the Performance]
ISO 12500, which sets out the test method to be used in order to check the filter performance for each of the three kinds of contaminants, is indicated below.
- Particle: ISO 12500-3:2009
- Liquid water: ISO 12500-4:2009
- Oil: ISO 12500-1:2007

* Measured using a dedicated evaluation system which has been certified according to ISO 12500-□ and also by a third party (Certified)

[Purity Class Designation Example]

ISO 8573-1:2010 [4 : 6 : 2]

Oil class

2	Concentration of total oil ≤ 0.1 mg/m³

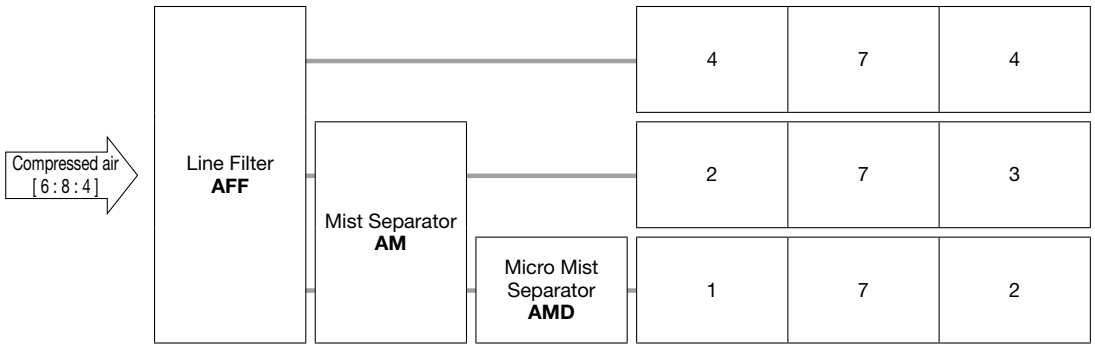
Particle class

4	1.0 μm < d ≤ Particles of 5.0 μm ≤ 10000 particles/m³

Humidity and liquid water class

6	Pressure dew point ≤ +10°C

List of systems which conform to the degree of purity required for compressed air



The class indicates the compressed air purity according to ISO 8573-1:2010 (JIS B 8392-1:2012) and indicates the maximum purity class which can be obtained using that system. Note, however, that this value will differ according to the inlet air conditions.

⚠ 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.

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

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

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

*1) ISO 4414: Pneumatic fluid power - General rules and safety requirements for systems and their components
ISO 4413: Hydraulic fluid power - General rules and safety requirements for systems and their components
IEC 60204-1: Safety of machinery - Electrical equipment of machines - Part 1: General requirements
ISO 10218-1: Robots and robotic devices - Safety requirements for industrial robots - Part 1:Robots
etc.

⚠ 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. SMC products cannot be used beyond their specifications. They are not developed, designed, and manufactured to be used under the following conditions or environments. Use under such conditions or environments is not allowed.

1. Conditions and environments outside of the given specifications, or use outdoors or in a place exposed to direct sunlight.
2. Use for nuclear power, railways, aviation, space equipment, ships, vehicles, military application, equipment affecting human life, body, and property, combustion equipment, entertainment equipment, emergency shut-off circuits, press clutches, brake circuits, safety equipment, etc., and use for applications that do not conform to standard specifications such as catalogs and operation manuals.
3. Use for interlock circuits, except for use with double interlock such as installing a mechanical protection function in case of failure. Please periodically inspect the product to confirm that the product is operating properly.

⚠ Caution

SMC develops, designs, and manufactures products to be used for automatic control equipment, and provides them for peaceful use in manufacturing industries.
Use in non-manufacturing industries is not allowed.
Products SMC manufactures and sells cannot be used for the purpose of transactions or certification specified in the Measurement Act of each country. The new Measurement Act prohibits use of any unit other than SI units in Japan.

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) **Suction cups (Vacuum pads) are excluded from this 1 year warranty.**
A suction cup (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 suction cup (vacuum pad) or failure due to the deterioration of rubber material are not allowed 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 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.

⚠ Safety Instructions	Be sure to read the "Handling Precautions for SMC Products" (M-E03-3) and "Operation Manual" before use.

SMC Corporation