# Silencers/Exhaust Cleaner



**SMC** 

# Silencer Standard Type Series AN 00

#### How to Order

#### Over 30 dB (A) noise reduction Low back pressure Compact and easy mounting





#### Flow Characteristics (Initial conditions)

#### AN200 to 900



#### Noise Level (Initial conditions)

#### AN200 to 900

Condition: 0.5 MPa at inlet pressure of solenoid valve Measurement distance: AN200 to 500  $\rightarrow$  1 m, AN600 to 700  $\rightarrow$  2 m, AN800 to 900  $\rightarrow$  3 m





#### Specifications

Fluid	Compressed air				
Max. operating pressure <sup>(1)</sup>	1.0 MPa				
Noise reduction	30 dB (A)				
Ambient and fluid temperature	5 to 60°C <sup>(2)</sup>				
Note 1) It indicates the inlet pressure for solenoid valve. Note 2) It can operate in temperature between $-10$ to $60^{\circ}$ C if there is no risk of the moisture in					

Note 2) It can operate in temperature between -10 to 60°C if there is no risk of the moisture in the air freezing.

Refer to page 5-10-13 for Precautions on these products.

#### Model

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Madal	Port size	Effective	Recommended flow	Weight	Dim	ensions (	(mm)
woder	R	area (mm <sup>2</sup> )	(m <sup>3</sup> /min (ANR))	(g)	Α	В	D
AN200-02	1/4	35	3 or less	17	63	22	19
AN300-03	3⁄8	60	5 or less	25	84	25	22
AN400-04	1/2	90	8 or less	35	92	30	27
AN500-06	3⁄4	160	12 or less	165	107	46	36
AN600-10	1	270	20 or less	225	132	50	41
AN700-12	1 1⁄4	440	30 or less	490	200	74	55
AN800-14	1 1/2	590	50 or less	580	233	74	60
AN900-20	2	960	80 or less	820	263	86	70

#### **Construction/Parts/Dimensions**

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#### AN200 to 400 AN500 to 900 øΒ End plate End plate (SPCC) (POM) Œ Tension bolt 3 (20 Sound absorbing material V V V V V V (S20C) (PE sintered body) HH Sound absorbing material 6 C (PE sintered body) (da) Case (POM) Cover (3) (SPCC) 0.98 Body Hexagonal flats (ADC) D Hexagonal flats Port size D Port size ØB Note 1) About the display of product's material POM: Polyacetal PE: Polyethylene SPCC: Carbon steel S20C: Carbon steel ADC: Aluminum allov Note 2) Recommended flow rate is the flow at 0.5 MPa in the inlet pressure.



# Silencer **Compact Type** Series AN 03

#### How to Order

#### Over 25 dB (A) noise reduction Space-saving compact type



**JIS Symbol** 

#### Flow Characteristics (Initial conditions)

#### AN103 to 403



#### Noise Level (Initial conditions)

#### AN103 to 403

Condition: 0.5 MPa at inlet pressure of solenoid valve Measurement distance: 1 m



AN 403 -		4			
Body size 🖡	• Threa	d type	• Po	rt size	
103	Nil	R	01	1/8	
203	Ν	NPT	02	1/4	
303			03	3/8	
403			04	1/2	
ecifications					
Fluid			Cor	npressed a	lir
Max. operating pressure (1)				1.0 MPa	
Noise reduction				25 dB (A)	-

#### Spe

Fluid	Compressed air
Max. operating pressure <sup>(1)</sup>	1.0 MPa
Noise reduction	25 dB (A)
Ambient and fluid temperature	5 to 60°C <sup>(2)</sup>
Note 1) It indicates the inlet pressure for sole	naid valva

Note 1) It indicates the inlet pressure for solenoid valve.

Note 2) It can operate in temperature between -10 to 60°C if there is no risk of the moisture in the air freezing.

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 <ul> <li>Refer to page 5-10-13 for Precautions on these product</li> </ul>	IS.
/ •	<b>-</b>

#### Model

Madal	Port size	Effective	Recommended flow	Weight	Dime	ensions (	mm)
Model	R	area (mm <sup>2</sup> )	(m <sup>3</sup> /min (ANR))	(g)	Α	В	D
AN103-01	1⁄8	10	0.8 or less	1	23.5	11	
AN203-02	1⁄4	15	1.0 or less	3	36	16	14
AN303-03	3⁄8	35	2.0 or less	17	66	22	19
AN403-04	1/2	60	4.0 or less	25	84	25	22

#### **Construction/Parts/Dimensions**



Note 2) Recommended flow rate is the flow at 0.5 MPa in the inlet pressure.

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5-10-3

# Silencer Metal Case Type Series 25

#### How to Order

## **Exhaust in only one direction** Prevents scattering of mist and noise.





#### Flow Characteristics (Initial conditions)

#### 2504 to 2511



#### Noise Level (Initial conditions)

#### 2504 to 2511

Condition: 0.5 MPa at inlet pressure of solenoid valve Measurement distance: 1 m





#### **Specifications**

Fluid	Compressed air			
Max. operating pressure (1)	1.0 MPa			
Noise reduction	19 dB (A)			
Ambient and fluid temperature	5 to 60°C <sup>(2)</sup>			
Note 1) It indicates the inlet pressure for solenoid valve. Note 2) It can operate in temperature between -10 to 60°C if there is no risk of the moistry the air freezing.				
Refer to page 5-10-13 for Precautions on these	products.			

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#### Model

Madal	Port size	Effective	Recommended flow	Weight	Dime	nsions (r	nm)
Model	R	area (mm <sup>2</sup> )	(m <sup>3</sup> /min (ANR))	(g)	Α	В	D
2504-002	1⁄4	33.9	2.2 or less	111	62	30	24
2505-003	3⁄8	45.9	3.0 or less	106	64	30	24
2506-004	1⁄2	50.0	4.0 or less	113	68	30	24
2507-006	3⁄4	105.6	8.0 or less	310	88.5	48	35
2508-010	1	129.6	10.0 or less	514	97.5	60	41
2510-002	1⁄4	17.2	1.5 or less	57	54	22	19
2511-003	3/8	17.2	1.5 or less	55	56	22	19

#### **Construction/Parts/Dimensions**

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# Silencer **BC Sintered Body Type** Series AN

Specifications/Model

Model

#### Ideal for the exhaust of a compact valve or pilot air.





#### **Construction/Parts/Dimensions**





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# Silencer One-touch Fitting Connection Type Series AN

# Can connect with One-touch fitting directly.





#### Specifications

Fluid	Compressed air
Max. operating pressure Note)	1.0 MPa
Ambient and fluid temperature	5 to 60°C
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Note) It indicates the inlet pressure for solenoid valve.

Refer to page 5-10-13 for Precautions on these products.

#### Model

Madal	Applicable One-touch	Noise reduction	Effective	Recommended flow	Dimensions (mm)		
Model	fitting size	(dB (A))	area (mm²)	(m <sup>3</sup> /min (ANR))	Α	В	С
AN103-KM6	ø6 (Series KQ)						
AN103-X233	ø6 (Series KQ, KJ)	05	7	0.8 or less	37	11	15
AN103-X235	ø1/4" (Series KQ, KJ)	25					
AN203-KM8	ø8 (Series KQ)		14	1.0 or less	51	16	26
AN200-KM8	ø8 (Series KQ)		20		78	22	54
AN200-KM10	ø10 (Series KQ)	00	26	3.0 or less	81	22	54
AN300-KM10	ø10 (Series KQ)	30	30		97	25	70
AN300-KM12	ø12 (Series KQ)		41	5.0 or less	98	25	70

#### Construction/Parts/Dimensions





#### How to Order

#### Over 35 dB (A) noise reduction Case adopts UL94-V0 grade Flame resistant material



JIS Symbol

#### Flow Characteristics (Initial conditions)

#### AN202 to 402



#### Noise Level (Initial conditions)

#### AN202 to 402

Condition: 0.5 MPa at inlet pressure of solenoid valve Measurement distance: 1 m



AN 402 04				
Body size	Thread	type	Po	rt size
202	Nil	R	02	1/4
302	N	NPT	03	3/8
402			04	1/2

#### **Specifications**

opeometatione	
Fluid	Compressed air
Max. operating pressure (1)	1.0 MPa
Noise reduction	35 dB (A)
Ambient and fluid temperature	5 to 60°C <sup>(2)</sup>
Note 1) It indicates the inlet pressure for sole Note 2) It can operate in temperature betw moisture in the air freezing.	noid valve. een –10 to 60°C if there is no risk of the
Refer to page 5-10-13 for Precautions on these	e products.

AN AMC

VEX

#### Model

**AN202** 

Model	Port size	Effective	Recommended flow	Weight	Dime	ensions (mm)		
	R	area (mm²)	(m <sup>3</sup> /min (ANR))	(g)	Α	В	D	
AN202-02	1⁄4	35	3 or less	16	64	22	19	
AN302-03	3⁄8	60	5 or less	33	84	28	24	
AN402-04	1/2	90	8 or less	47	95	34	24	

AN302/402

#### **Construction/Parts/Dimensions**



Note 2) Recommended flow rate is the flow at 0.5 MPa in the inlet pressure.





# Silencer 40 dB (A): High Noise Reduction Type Series ANA1

A high noise reduction type silencer keeps the noise level inside a plant below 85 dB (A).



Por	t size	
Symbol	Port size	Connection
01	1/8	
02	1/4	
03	3/8	]
04	1/2	]
06	3/4	Screw-in *
10	1	1
12	1 1/4	]
14	1 1/2	]
20	2	]
C08	ø8 (Applicable One-touch fitting size)	One touch
C10	ø10 (Applicable One-touch fitting size)	fitting
C12	ø12 (Applicable One-touch fitting size)	inting
* Only	R is available.	

#### Series

Symbol Noise reduction

A1 40 dB (A)

#### Specifications

Fluid	Compressed air
Max. operating pressure Note)	1.0 MPa
Noise reduction	40 dB (A)
Ambient and fluid temperature	5 to 60°C
_	

Note) It indicates the inlet pressure for solenoid valve.

Refer to page 5-10-13 for Precautions on these products.

#### Model (Screw-in connection)

			,				
Model	Port size	Effective	Recommended flow	Weight	Dimensions (mm)		
Model	R	area (mm²)	(m³/min (ANR))	(g)	Α	В	С
ANA1-01	1⁄8	10	0.8 or less	4	37	16	—
ANA1-02	1⁄4	15	1.2 or less	14	64	22	18
ANA1-03	3⁄8	35	2.7 or less	22	84	25	21
ANA1-04	1/2	60	4.5 or less	36	98	30	24
ANA1-06	3⁄4	90	7.0 or less	110	111	46	36
ANA1-10	1	160	12.0 or less	180	132	50	41
ANA1-12	11/4	280	20.0 or less	544	200	74	60
ANA1-14	11/2	450	32.0 or less	612	230	74	60
ANA1-20	2	610	45.0 or less	873	271	86	70

#### **Construction/Parts/Dimensions**



#### PBT: Polybutylene terephthalate SWCH: Carbon steel PVF: Polyvinyl formal PP: Polypropylene ADC: Aluminum alloy SPCC: Carbon steel Note 2) Recommended flow rate is the flow at 0.5 MPa in the inlet

#### Model (One-touch fitting connection)

	Applicable One-touch	Effective	Recommended flow	Weight	Dimensio	ons (mm)
Model	fitting size	area (mm <sup>2</sup> )	(m <sup>3</sup> /min (ANR))	(g)	Α	B
ANA1-C08	ø8	11	0.8 or less	5	58	16
ANA1-C10	ø10	15	1.2 or less	13	76	22
ANA1-C12	ø12	33	2.5 or less	19	95	25

#### **Construction/Parts/Dimensions**

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Note 2) Recommended flow rate is the flow at 0.5 MPa in the inlet pressure.





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**SMC** 

Fluid	Compressed air
Max. operating pressure Note)	1.0 MPa
Noise reduction	38 dB (A)
Ambient and fluid temperature	5 to 60°C
Note) It indicates the inlet pressure	for solenoid valve.
Refer to page 5-10-13 for Precaut	ions on these products.

#### **Construction/Parts/Dimensions**



Note 1) About the display of product's material PBT: Polybutylene terephthalate

PVF: Polyvinyl formal

Note 2) Recommended flow rate is the flow at 0.5 MPa in the inlet pressure.



VEX

AN

AMC

# Series ANA1/ANB1



#### Noise Level (Initial conditions)



# **Exhaust Cleaner** Series AMC



Nil

Ν

F

Rc

NPT

G

Note 1) On the type for the

AMC220, an R 1/4 fitting can be attached

by removing the drain

cock. (It becomes the

match the threads on the product itself.

drain piping type.)

Note 2) Select the threads to

\* ANR: 20°C atmospheric pressure, relative humidity 65%

AMC220

12

200

1/4

0.12

AMC-EL2

BE20

\* ANR: 20°C atmospheric pressure, relative humidity 65%

AMC320

16

300

1/4, 3/8

0.2

AMC-EL3

**BE30** 

Model/Female Thread Type

Model

Specifications

Port size

Weight (kg)

Effective area (mm<sup>2</sup>)

Max. air flow (*t*/min(ANR))

Element model no.

Bracket model no.

AMC520

55

1,000

<u>1/2, 3/4</u>

0.5

AMC-EL5

BE50

### Series AMC

#### **Construction/Dimensions**



#### Flow Characteristics (Initial conditions)



How to read the graph: If the AMC510 is operated at a flow volume of 1000  $\ell/min$  (ANR), the inlet pressure will be 0.05 MPa.

#### How to Select Condition: At operating pressure 0.5 MPa

Select a model according to the air consumption of the circuit to be used.

 Obtain the air consumption of the actuator to be used. However, if an exhaust cleaner of the centralized piping type will be used, sum the air consumption of the actuators that operate simultaneously. Also add the capacity of the piping from the cylinder to the EXH.



#### Select a model that provides a maximum processing flow volume that exceeds the consumption volume obtained in step 1.

#### Dimensions





Silencers Precautions Be sure to read before handling.

#### **Caution on Design**

### \land Warning

1. The exhaust port could become blocked by the clogging of the exhaust cleaner.

Therefore, make sure to provide a safe design so as not to cause the whole system to malfunction.  $% \label{eq:constraint}$ 

### **A** Caution

2. Silencer is intended to reduce the noise of exhaust air of the compressed air emitted from pneumatic equipment. Noises other than exhaust air (noise generated inside piping, noise generated by vibration of equipment, noise of switching valves, etc.) cannot be reduced.

Take appropriate measures to find the cause of those noises other than those generated by exhaust air.

3. The inlet pressure obtained in the flow characteristic graph of silencer indicates the pressure (P1) prior to silencer. (Refer to the diagram below.)



Inlet pressure for silencer

4. If the compressed air supply is contaminated with fluids such as oil and oil mist, such fluids will be dispersed to the environment.

In such a case, an exhaust cleaner is recommended to recover fluids and reduce noise.

5. The silencing effect could vary depending on the pneumatic circuit or the pressure that is used.

#### Selection

### **▲** Caution

- 1. Select a model which has a bigger effective area than that of the solenoid valve (including compound effective area).
- 2. Be certain to use at or below the level of recommended flow.

#### Mounting

#### **▲** Caution

1. If the silencer body (case) is made of plastic and is tightened too much, the silencer may be damaged. Please follow the procedures below for mounting.

#### When the body (case) is made of resin

Hold the tip of the main body (side without thread) and screw in. At the point where the thread begins to feel tight, use a wrench on the hexagonal flats to tighten an additional 1/4 turn. Tighten securely by hand for AN103-01.

#### For BC element

Hold the tip of the main body (side without thread) with fingers and screw in tightly.

Do not hold the part of sintered metal with a wrench, etc. to tighten.

### When the main body is made of metal (Except BC element) [Series 25]

Within the recommended tightening torque shown in the chart below, use a wrench on the hexagonal flats and tighten.

Tightening by using a pipe wrench or pliers may cause damage to the silencer. This method is not recommended.

#### Tightening Torques for Silencers

Connection thread	Applicable tightening torque (N·m)
R 1⁄4	12 to 14
R 3⁄8	22 to 24
R 1/2	28 to 30
R 3⁄4	28 to 30
R 1	36 to 38
R 1 1⁄4	40 to 42
R 1 1/2	48 to 50
R 2	48 to 50

2. Make sure not to apply a lateral load to the body during or after the installation.

3. When the main body of the silencer is loosened by vibration, etc. of equipment on which a silencer is assembled, apply glue to threads to prevent from loosing and reattach.

#### Maintenance

#### \land Caution

- 1. Never disassemble the silencer.
  - The silencing material is not replaceable.
- 2. If the exhaust speed drops and the system performance decreases due to clogging, replace with a new silencer. Make sure to verify the operating conditions of the actuator at least once a day.



VEX

# Exhaust Cleaner (Series AMC) Specific Product Precautions

Be sure to read before handling.

#### **Caution on Design**

### \land Warning

1. The exhaust port could become blocked by the clogging of the exhaust cleaner.

Therefore, make sure to provide a safe design so as not to cause the whole system to malfunction.

2. The inlet pressure obtained in the flow characteristic graph of silencer indicates the pressure (P1) prior to exhaust cleaner. (Refer to the diagram below.)



Inlet pressure for exhaust cleaner

- 3. If compressed air exhausted from the solenoid valve is not clean clogging may occur,
- 4. Operate at a back pressure (inlet pressure) of 0.1 MPa or less.

#### Selection

### **A** Caution

1. Select an exhaust cleaner which is able to dispose of the maximum allowable flow capacity of compressed air exhausted from solenoid valve.

If the flow exceeds the maximum allowable flow for the exhaust cleaner, drainage and oil may be sprayed into the environment causing damage to equipment.

- 2. Select a model which has a bigger effective area than that of the solenoid valve (including compound effective area).
- 3. If this will be used with a centralized piping system, calculate the peak maximum air consumption by including the actuators that operate simultaneously and the capacity of the piping that is connected.

Then, select a model so that the calculated value will be less than the maximum flow volume of the exhaust cleaner. (Select a style with ample capacity because the exhaust speed will decrease when the element becomes clogged.)

#### Mounting

### **A** Caution

- 1. Make sure not to apply a lateral load to the body during or after the installation.
- 2. Take precautions so that the piping load is not be applied to the main body.

The attached bracket is for supporting the exhaust cleaner body only. Thus, it cannot support the piping or other items. If these items need to be supported, provide an additional support.

**3. Exhaust cleaner must be mounted vertically.** If it is mounted diagonally, laterally, or inverted, the oil that is separated by the element will splash on the surroundings.

#### Maintenance

### **A**Caution

- If the exhaust speed drops and the system performance decreases due to clogging, replace with a new element. Make sure to verify the operating condition of the actuator at least once a day.
- 2. The replacement interval for the element is before the internal pressure during exhaust reaches 0.1 MPa or after 1 year operation, whichever comes first.



- Provide a branch on the supply side of the exhaust cleaner to mount a valve and a pressure gauge.
- During inspection, open the valve and check the pressure at the time of exhaust discharge.

(The valve must remain closed except for inspection. The pressure gauge could break if the valve remains open.)



# **Related Products:**

#### **Exhaust Cleaner for Vaccum**

Over 99.5% of oil mist can be removed.

Piping to exhaust ducts from vacuum pump is unnecessary.



#### Exhaust Cleaner for Clean Room

Since it is possible to release exhaust air from pneumatic equipment directly into a clean room, piping to exhaust ducts is unnecessary.





#### Model

Standard size	Port size	Max. air flow (ℓ /min (ANR))
3	1	360
6	1 <sup>1</sup> /2	650
15	2	1,500
37	2	3,700
75	3 <sup>B</sup> flange	7,500
160	4 <sup>B</sup> flange	16,000

Mode								VLA
Standard	Thread		Port	size	-	Max. air flow	Accessory	AN
size	type	1/4	3⁄8	1/2	3⁄4	( <i>ℓ</i> /min (ANR))	Option	
2	Rc	•	•			200	<ul> <li>Bracket</li> </ul>	
3	NPT		•	٠	•	500	<ul> <li>Flow direction (Right → Down)</li> </ul>	AIVIC
4	G			٠		1,000	· With element service indicator	
	For det	ails, r	efer to	o indiv	idual	catalog (CAT: ES	613-7) separately.	

VEX