

Speed Exhaust Controller

Series ASV

Size: M3, M5, 1/8, 1/4, 3/8

Integration of a quick exhaust valve and an exhaust restrictor permits high-speed cylinder operation.

- The effective area is two times larger. (In comparison with control by speed controller)
Applicable model: ASV310F, ASV410F, ASV510F
- Silencer and One-touch fittings are installed.
- Flame resistant resin body as standard. (UL standard V-0)
Applicable model: ASV310F, ASV410F, ASV510F
- Brass parts are all electroless nickel plated.

How to Order

ASV 3 1 0 F - 01 - 06 S K

Speed exhaust controller

Body size

1	M3
2	M5
3	1/8
4	1/4
5	3/8

Type

1	Tee
2	Elbow Note)

Note) "Elbow": M3, M5 only

With One-touch fitting

Thread type

Nil	M3, M5, U10/32
N	R NPT

Option

Nil	None
C	With spatter cover
K	Hexagonal lock nut

Note) Option should be indicated in order of C and K. Available only for ASV310F, 410F and 510F.

Seal

Symbol	Seal	Applicable model
Nil	None	ASV120F/E220F
S	With seal	ASV310F/410F/510F

Applicable tubing O.D.

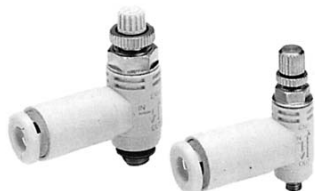
Metric size	Inch size
04	ø4
06	ø6
08	ø8
10	ø10
12	ø12
03	ø5/32"
07	ø1/4"
09	ø5/16"
11	ø3/8"
13	ø1/2"

Port size

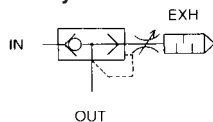
M3	M3 x 0.5
M5	M5 x 0.8
U10/32	10-32 UNF
01	1/8
02	1/4
03	3/8
04	1/2

Model

Model	Port size	Applicable tubing O.D. (mm)										Effective area (mm ²)	
		4	6	8	10	12	5/32"	1/4"	5/16"	3/8"	1/2"	IN → OUT	OUT → EXH.
ASV120F-M3	M3 x 0.5	●										0.3	0.3
ASV220F-M5	M5 x 0.8	●	●									1.3	1.3
ASV310F-01	R 1/8		●	●								7	8
ASV310F-02	R 1/4		●	●								7	8
ASV410F-01	R 1/8			●	●							13.5	14
ASV410F-02	R 1/4			●	●							13.5	14
ASV410F-03	R 3/8			●	●							13.5	14
ASV510F-02	R 1/4				●	●						23	27
ASV510F-03	R 3/8				●	●						27	29
ASV510F-04	R 1/2				●	●						27	29
ASV220F-U10/32	10-32 UNF					●	●					1.3	1.3
ASV310F-N01	NPT 1/8							●	●			7	8
ASV310F-N02	NPT 1/4							●	●			7	8
ASV410F-N01	NPT 1/8								●	●		13.5	14
ASV410F-N02	NPT 1/4								●	●		13.5	14
ASV410F-N03	NPT 3/8								●	●		13.5	14
ASV510F-N02	NPT 1/4									●	●	23	27
ASV510F-N03	NPT 3/8									●	●	27	29
ASV510F-N04	NPT 1/2									●	●	27	29



JIS Symbol



Specifications

Series	ASV120F	ASV220F	ASV310F/410F	ASV510F
Fluid	Air			
Proof pressure	1.5 MPa			
Max. operating pressure	1 MPa			
Min. operating pressure	0.1 MPa			
Ambient and fluid temperature				
Number of needle rotations	10 turns	8 turns	12 turns	15 turns
Applicable tubing material Note)	Nylon, Soft nylon, Polyurethane			
Option	Hexagonal lock nut		With spatter cover, Hexagonal lock nut	

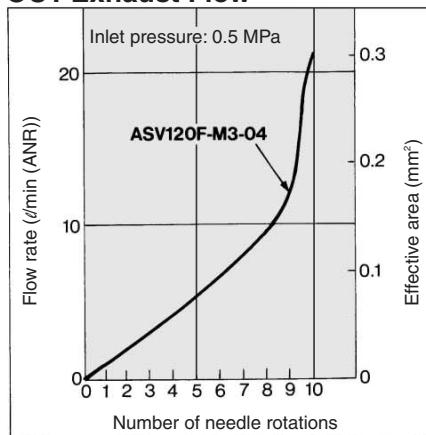
Note) Use caution regarding the max. operating pressure when soft nylon or polyurethane tubing is used.
(Refer to pages 15-6-3 to 15-6-5 for details.)

Series ASV

Needle Valve/Flow Characteristics

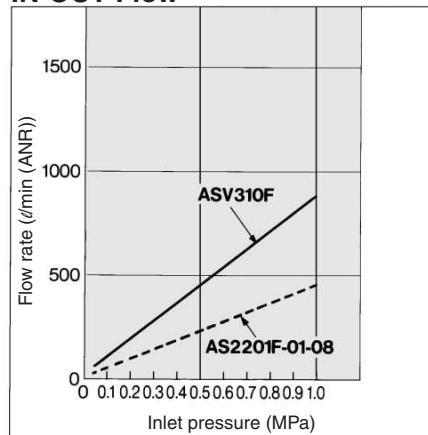
ASV120F

OUT-Exhaust Flow

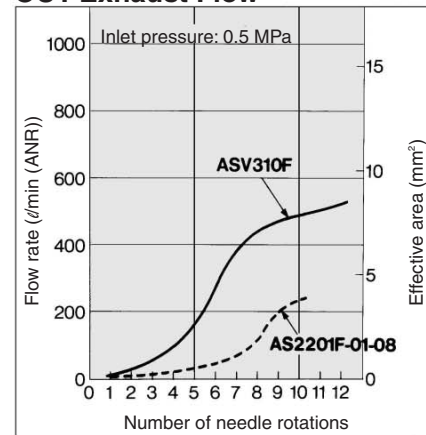


ASV310F

IN-OUT Flow

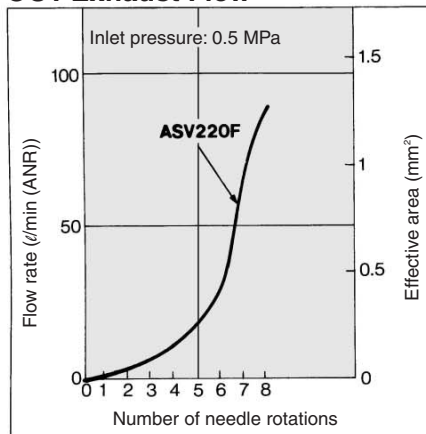


OUT-Exhaust Flow



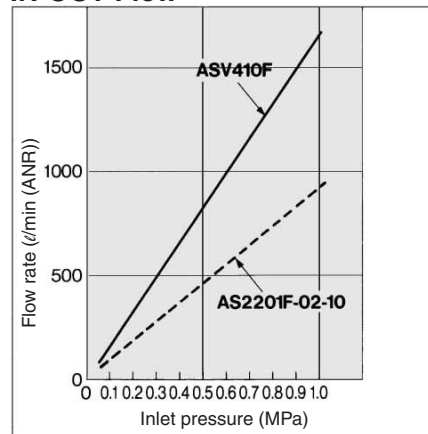
ASV220F

OUT-Exhaust Flow

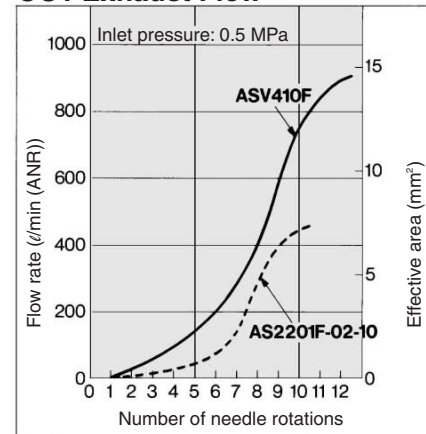


ASV410F

IN-OUT Flow

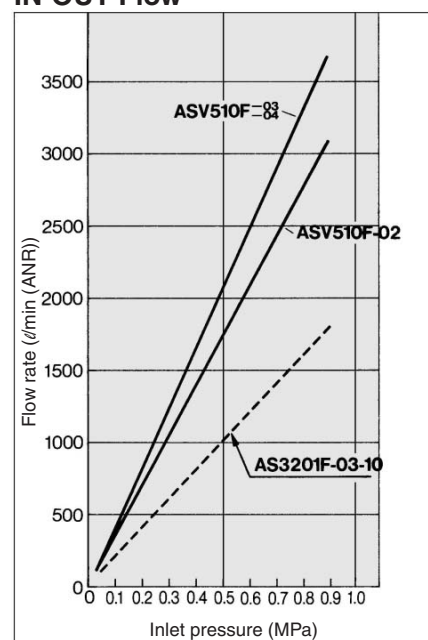


OUT-Exhaust Flow

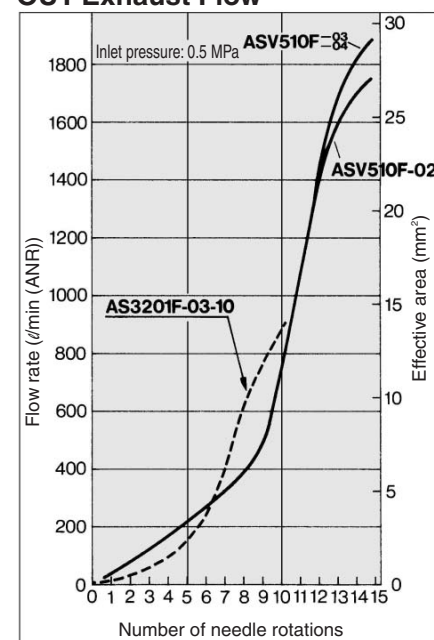


ASV510F

IN-OUT Flow

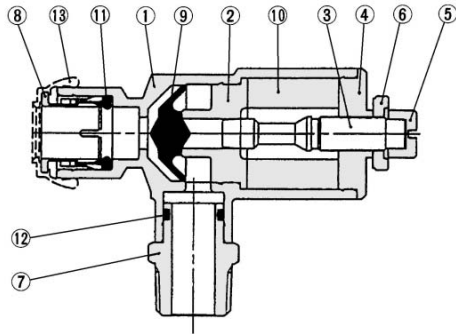


OUT-Exhaust Flow



Construction

ASV120F/220F

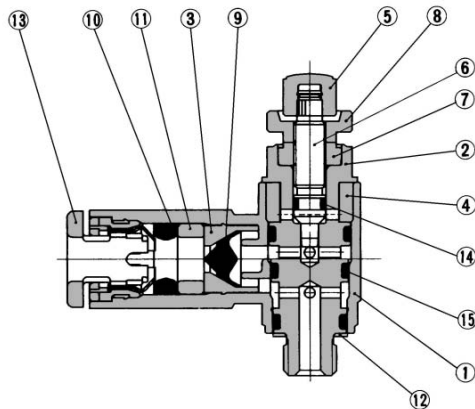


Component Parts

No.	Description	Material	Note
①	Body A	PBT	UL94V-0
②	Seat ring	Aluminum alloy	Chromate plated
③	Needle	Aluminum alloy	Electroless nickel plated
④	Needle guide	Aluminum alloy	Electroless nickel plated
⑤	Handle	Brass	Electroless nickel plated
⑥	Lock nut	Brass ^{Note)}	Electroless nickel plated
⑦	Needle guide	Brass	Electroless nickel plated
⑧	Cassette	PBT, Stainless steel	
⑨	Valve	Urethane rubber	
⑩	Silencer	PVA sponge	
⑪	Seal	NBR	
⑫	O-ring	NBR	
⑬	Cover	Flame proof CR	UL94V-0

Note) ASV310F, ASV410F types are made of steel.

ASV310F/410F/510F



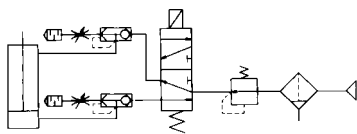
Component Parts

No.	Description	Material	Note
①	Body A	PBT	
②	Body B	Brass ^{Note)}	Electroless nickel plated
③	Seat ring	Brass	Electroless nickel plated
④	Silencer	PVA sponge	
⑤	Handle	PBT	M3 type: Electroless nickel plated brass
⑥	Needle	Brass	Electroless nickel plated
⑦	Needle guide	Brass	Electroless nickel plated
⑧	Lock nut	Brass	Electroless nickel plated
⑨	Valve	HNBR	
⑩	Seal	NBR	
⑪	Spacer	POM	
⑫	Gasket	Stainless steel/NBR	M3 port : PVC
⑬	Cassette	POM/Stainless steel	
⑭	O-ring	NBR	
⑮	O-ring	NBR	

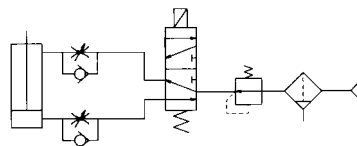
Note) M3 type is made of stainless steel.

Circuit

Circuit of speed exhaust controller



Controlled by speed controller

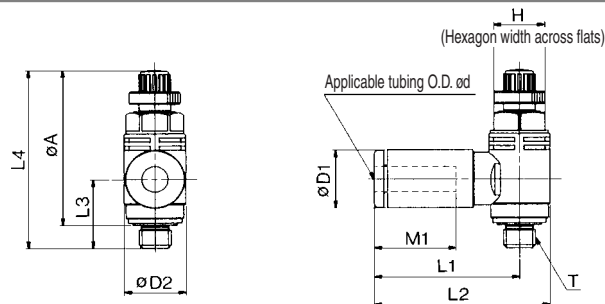


Caution

Be sure to read before handling. Refer to pages 15-18-3 to 15-18-4 for Safety Instructions and Common Precautions on the products mentioned in this catalog, and refer to pages 15-8-6 to 15-8-8 for Precautions on every series.

Series ASV

Dimensions



Metric Size

Model	Applicable tubing O.D. ød	T	H	D1	D2	L1	L2	L3	L4		A *		M1	Weight (g)
									Max.	Min.	Max.	Min.		
ASV120F-M3-04	4	M3 x 0.5	5.5	9.3	7.2	21.4	25	9.8	28.6	26.1	25.8	23.3	12.7	5
ASV220F-M5-04	4	M5 x 0.8	8	9.3	9.6	22.8	27.6	11.1	31.4	28.6	27.7	24.9	12.7	8
ASV220F-M5-06	6	M5 x 0.8	8	11.6	9.6	23.6	28.4	11.1	31.4	28.6	27.7	24.9	13.5	9

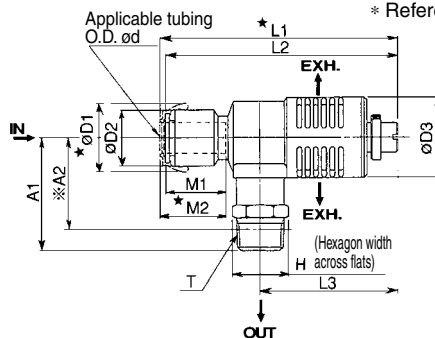
Inch Size

* Reference dimensions of M thread after installation.

Model	Applicable tubing O.D. ød	T	H	D1	D2	L1	L2	L3	L4		A *		M1	Weight (g)
									Max.	Min.	Max.	Min.		
ASV220F-U10/32-03	5/32"	10-32 UNF	8	9.3	9.6	22.8	27.6	11.1	31.4	28.6	27.7	24.9	12.7	8
ASV220F-U10/32-07	1/4"	10-32 UNF	8	12	9.6	23.6	28.4	11.1	31.4	28.6	27.7	24.9	13.7	9

ASV310F/410F/510F

* Reference "U10/32" thread dimensions after installation.



Metric Size

Model	Applicable tubing O.D. d	T	H	D1 *	D2	D3	L1 *		L2		L3		A1	A2 *	M1	M2 *	Weight (g)
							Max.	Min.	Max.	Min.	Max.	Min.					
ASV310F-01-06S	6	R 1/8	10	16.8	12.8	17.6	71.9	65.9	69.9	63.9	45.8	39.8	27.4	23.4	17	19	22
ASV310F-01-08S	8			19.3	15.2		73.8	67.8	71.8	65.8					19	21	23
ASV310F-02-06S	6	R 1/4	14	16.8	12.8	17.6	71.9	65.9	69.9	63.9	45.8	39.8	31.4	25.4	17	19	30
ASV310F-02-08S	8			19.3	15.2		73.8	67.8	71.8	65.8					19	21	31
ASV410F-01-08S	8	R 1/8	12	19.3	15.2	24	83.1	75.6	81.1	73.6	52.8	45.3	30.7	26.7	19	21	39
ASV410F-01-10S	10			23.3	18.5		85.2	77.7	83.2	75.7					21	23	41
ASV410F-02-08S	8	R 1/4	14	19.3	15.2	24	83.1	75.6	81.1	73.6	52.8	45.3	34.7	28.7	19	21	47
ASV410F-02-10S	10			23.3	18.5		85.2	77.7	83.2	75.7					21	23	49
ASV410F-03-08S	8	R 3/8	17	19.3	15.2	24	83.1	75.6	81.1	73.6	52.8	45.3	36.7	30.4	19	21	61
ASV410F-03-10S	10			23.3	18.5		85.2	77.7	83.2	75.7					21	23	63
ASV510F-02-10S	10	R 1/4	17	23.3	18.5	30	90.2	84.2	88.2	82.2	55.6	49.6	39.8	33.8	21	23	69
ASV510F-02-12S	12			25.7	20.9		91.8	85.8	89.8	83.8					22	24	74
ASV510F-03-10S	10	R 3/8	17	23.3	18.5	30	90.2	84.2	88.2	82.2	55.6	49.6	41.8	35.5	21	23	73
ASV510F-03-12S	12			25.7	20.9		91.8	85.8	89.8	83.8					22	24	78
ASV510F-04-10S	10	R 1/2	22	23.3	18.5	30	90.2	84.2	88.2	82.2	55.6	49.6	45.8	37.6	21	23	95
ASV510F-04-12S	12			25.7	20.9		91.8	85.8	89.8	83.8					22	24	100

Inch Size

★ Dimension with cover * Reference dimension of "R" thread after installation.

Model	Applicable tubing O.D. d	T	H	D1 *	D2	D3	L1 *		L2		L3		A1	A2 *	M1	M2 *	Weight (g)
							Max.	Min.	Max.	Min.	Max.	Min.					
ASV310F-N01-07	1/4"	NPT 1/8	12.7	17.2	13.2	17.6	73	67	71	65	45.8	39.8	27.4	23.4	16.8	18.8	22
ASV310F-N01-09	5/16"			19.3	15.2		73.8	67.8	71.8	65.8					19	21	23
ASV310F-N02-07	1/4"	NPT 1/4	14.3	17.2	13.2	17.6	73	67	71	65	45.8	39.8	31.4	25.4	16.8	18.8	30
ASV310F-N02-09	5/16"			19.3	15.2		73.8	67.8	71.8	65.8					19	21	31
ASV410F-N01-09	5/16"	NPT 1/8	12.7	19.3	15.2	24.4	83.1	75.6	81.1	73.6	52.8	45.3	30.7	26.7	19	21	39
ASV410F-N01-11	3/16"			23.3	18.5		85.2	77.7	83.2	75.7					21	23	41
ASV410F-N02-09	5/16"	NPT 1/4	14.3	19.3	15.2	24.4	83.1	75.6	81.1	73.6	52.8	45.3	34.7	28.7	19	21	47
ASV410F-N02-11	3/16"			23.3	18.5		85.2	77.7	83.2	75.7					21	23	49
ASV410F-N03-09	5/16"	NPT 3/8	17.5	19.3	15.2	24.4	83.1	75.6	81.1	73.6	52.8	45.3	36.7	30.4	19	21	61
ASV410F-N03-11	3/16"			23.3	18.5		85.2	77.7	83.2	75.7					21	23	63
ASV510F-N02-11	3/16"	NPT 1/4	17.5	23.3	18.5	30	90.2	84.2	88.2	82.2	55.6	49.6	39.8	33.8	21	23	69
ASV510F-N02-13	1/2"			26.5	21.7		91.9	85.8	89.9	83.8					21.8	23.8	74
ASV510F-N03-11	3/16"	NPT 3/8	17.5	23.3	18.5	30	90.2	84.2	88.2	82.2	55.6	49.6	41.8	35.5	21	23	73
ASV510F-N03-13	1/2"			26.5	21.7		91.9	85.8	89.9	83.8					21.8	23.8	78
ASV510F-N04-11	3/16"	NPT 1/2	22.2	23.3	18.5	30	90.2	84.2	88.2	82.2	55.6	49.6	45.8	37.6	21	23	95
ASV510F-N04-13	1/2"			26.5	21.7		91.9	85.8	89.9	83.8					21.8	23.8	100

★ Dimension with cover * Reference dimension of "NPT" thread after installation.

Flow Control Equipment Precautions



Be sure to read before handling. Refer to pages 15-18-3 to 15-18-4 for Safety Instructions and Common Precautions on the products mentioned in this catalog, and refer to main text for more detailed precautions on every series.

Precautions

Selection

Warning

1. Products mentioned in this catalog are not designed for the use as stop valve with zero air leakage.

A certain amount of leakage is allowed in the product's specifications.

Mounting

Warning

1. Check that the lock nut is tightened.
A loose lock nut may cause actuator speed changes.
2. Confirm the degree of rotation of the needle valve.
Products mentioned in this catalog are retainer type so that the needle is not removed completely. Over rotation will cause damage.
3. Do not use tools such as pliers to rotate the handle.
It can cause idle rotation of the handle or damage.
4. Confirm air flow direction.
Mounting backwards is dangerous, because the speed adjustment needle will not work and the actuator may lurch suddenly.
5. Adjust needle by opening the needle slowly after having closed it completely.
Loose needle valves may cause unexpected sudden actuator extension. When needle valve is turned clockwise, it is closed and cylinder speed decreases. When needle valve is turned counter clockwise, it is open and cylinder speed increases.
6. Do not apply excessive force or shock to the body or fittings with an impact tool.
It can cause damage or air leakage.

Series AS-F/FE/FG/FM

Selection

Warning

1. Confirm that PTFE can be used in application.

PTFE powder (Polytetrafluoroethylene resin) is included in the seal material. Confirm if the use of it may cause any adverse effect in the system.

Mounting

Warning

1. To install/remove the Flow Control Equipment, tighten/loosen at wrench flat B as close to the thread as possible using the appropriate wrench.
Do not apply torque at other points as the product may be damaged. Rotate Body A manually for positioning after installation.
2. Do not use universal type fittings for applications involving continuous rotation.
The fitting section may be damaged.

Tightening Torque

Caution

1. The tightening torque for pipe fittings is as shown in the table. As a rule, they should be tightened 2 to 3 turns with a tool after first tightening by hand.
Be careful not to cause damage by over-tightening.

Male thread	Suitable screw torque (N·m)	Hexagon width across flats (mm)	Adjustable spanner nominal (mm)
M3	1/4	4.5	—
M5 10/32-UNF	1/6 turn after hand tightening	8	100
1/8	7 to 9	14	150
1/4	12 to 14	17	200
3/8	22 to 24	21	200
1/2	28 to 30	24	200

Lock Nut Tightening Torque

Caution

1. Suitable screw torque for a hexagon lock nut is shown in the table below. For standard installation, turn 15 to 30° using tool, after fastening by hand. Pay attention not to over torque the product.

Body size	Suitable screw torque (N·m)
M3	0.07
M5	0.3
1/8	1
1/4	1.5
3/8	4
1/2	10

⚠ Precautions

Handling of One-touch Fittings

⚠ Caution

1. Refer to page 15-1-11 for One-touch Fitting.

Series ASD

Operation

⚠ Caution

1. Single acting cylinder

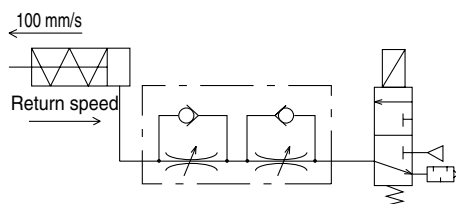
When controlling a single acting cylinder, the cylinder's return speed will differ depending on the operating conditions. Operate after confirming the maximum return speeds shown in the table below.

Speed Controller	Cylinder	Solenoid valve	Tubing	Silencer	Maximum return speed (mm/s)		
					100	200	300
ASD230F	CJ2	VJ500	TU0604 1 m	AN110-01			
ASD330F	CM2	VZ500	TU0604 1 m	AN110-01			

<Operating conditions>

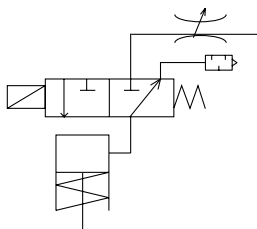
- Cylinder extension speed: 100 mm/s
- Meter-out needle fully open

* Values at 0.5 MPa and 20°C.



(Reference) Recommended circuit for high return speed

When low extension speed and high return speed are desired, the following circuit using 3-port is recommended.



Note) Use Series AS-F with -X214 for the throttle valve.

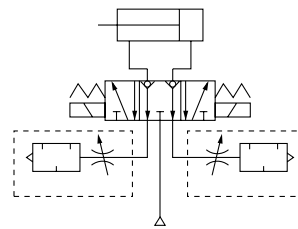
Series ASN2

Selection

⚠ Warning

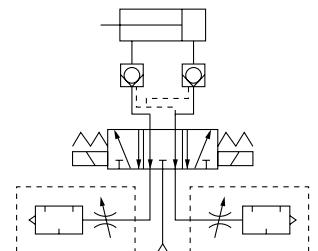
1. Inappropriate Circuits

(a) "Perfect Valve"
(VF66□□, VS7-6-FPG, VS7-8-FPG)



Residual pressure behind the exhaust needle may cause check valve malfunction in the "Perfect Valve".

(b) Pilot check valve between Actuator and Valve



Residual pressure behind the exhaust needle may cause check valve to malfunction.

Mounting

⚠ Caution

1. If installing flow controls to valve ports, interference may occur with the fittings. Please consult the catalog before installing.

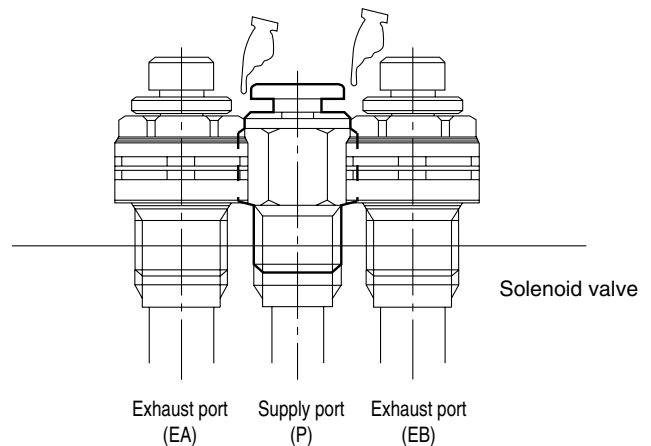


Fig. Example of the interference with fittings

Series AK

⚠ Caution

1. Vibrations may generate due to operating conditions, etc., even if the specifications are in the range mentioned in the catalog. Please consult with SMC.
2. Cracking pressure is a pressure at which the valve starts opening and not a pressure at which the valve is fully open.

Precautions

Series ASS

Selection

Warning

1. **Use meter-out controlling type after confirming the initial speed to prevent sudden actuator extension.**

Due to its specifications, the extension preventing function does not have speed control capability so that adjustments are limited. Use the meter-in controlling type if desired speed is less than set speed.

2. **Circuit pressure remaining in cylinder is not usable.**

Extension prevention works when pressure has been exhausted in cylinder. Therefore, prevent the extension by meter-in control using a speed controller in such a case.

Mounting

Warning

1. **Install Actuator and SSC valve as close as possible.**

Extensions prevention in the initial operation and standard speed control may not function.

2. **Do not use for relatively small capacity actuators. i.e. short stroke cylinders (less than 100 mm), rotary actuators, etc.**

SSC valve may not properly operate.

3. **Use in load factor less than 50%.**

Speed control under normal operations may not function.

Series AQ

Operation

Caution

1. **In the following cases, insufficient exhaust or vibration may cause noise.**

- a) With residual pressure or back pressure on the IN side
- b) When the differential pressure between the IN and OUT sides is smaller than the min. operating pressure.

Series ASP

Caution on Design

Warning

1. **This product cannot be used for accurate and precise intermediate stops of the actuator.**

Due to the compressibility of air as a fluid, the actuator will continue to move until it reaches a position of pressure balance, even though the pilot check valve closes with an intermediate stop signal.

2. **This product cannot be used to hold a stop position for an extended period of time.**

Pilot check valves and actuators are not guaranteed for zero air leakage. Therefore, it is sometimes not possible to hold a stop position for an extended period of time. In the event that holding for an extended time is necessary, a mechanical means for holding should be devised.

3. **Consider the release of residual pressure.**

Actuators may move suddenly due to residual pressure, which can be dangerous during maintenance procedures.

Selection

Warning

1. **When used in a balance control circuit, there are instances in which the check valve cannot release, even though the pilot pressure is 50% of the operating pressure. In these cases, the pilot pressure should be the same as the operating pressure.**

2. **For reference, SMC has conducted endurance tests in which ON, OFF operation of the check valve was performed at the maximum operating pressure, with a confirmed endurance of 10 million operations. Since the tests were performed under limited conditions, use caution in evaluating the results.**



Safety Instructions

These safety instructions are intended to prevent a hazardous situation and/or equipment damage. These instructions indicate the level of potential hazard by labels of "Caution", "Warning" or "Danger". To ensure safety, be sure to observe ISO 4414 ^{Note 1)}, JIS B 8370 ^{Note 2)} and other safety practices.

⚠ Caution : Operator error could result in injury or equipment damage.

⚠ Warning : Operator error could result in serious injury or loss of life.

⚠ Danger : In extreme conditions, there is a possible result of serious injury or loss of life.

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

Note 2) JIS B 8370: General Rules for Pneumatic Equipment

⚠ Warning

1. The compatibility of pneumatic equipment is the responsibility of the person who designs the pneumatic system or decides its specifications.

Since the products specified here are used in various operating conditions, their compatibility for the specific pneumatic system must be based on specifications or after analysis and/or tests to meet your specific requirements. The expected performance and safety assurance will be the responsibility of the person who has determined the compatibility of the system. This person should continuously review the suitability of all items specified, referring to the latest catalog information with a view to giving due consideration to any possibility of equipment failure when configuring a system.

2. Only trained personnel should operate pneumatically operated machinery and equipment.

Compressed air can be dangerous if an operator is unfamiliar with it. Assembly, handling or repair of pneumatic systems should be performed by trained and experienced operators.

3. Do not service machinery/equipment or attempt to remove components until safety is confirmed.

1. Inspection and maintenance of machinery/equipment should only be performed once measures to prevent falling or runaway of the driver objects have been confirmed.
2. When equipment is to be removed, confirm the safety process as mentioned above. Cut the supply pressure for this equipment and exhaust all residual compressed air in the system.
3. Before machinery/equipment is restarted, take measures to prevent shooting-out of cylinder piston rod, etc.

4. Contact SMC if the product is to be used in any of the following conditions:

1. Conditions and environments beyond the given specifications, or if product is used outdoors.
2. Installation on equipment in conjunction with atomic energy, railway, air navigation, vehicles, medical equipment, food and beverages, recreation equipment, emergency stop circuits, clutch and brake circuits in press applications, or safety equipment.
3. An application which has the possibility of having negative effects on people, property, or animals, requiring special safety analysis.



Common Precautions

Be sure to read before handling.

For detailed precautions on every series, refer to main text.

Selection

Warning

1. Confirm the specifications.

Products represented in this catalog are designed for use in compressed air applications only (including vacuum), unless otherwise indicated.

Do not use the product outside their design parameters.

Please contact SMC when using the products in applications other than compressed air (including vacuum).

Mounting

Warning

1. Instruction manual

Install the products and operate them only after reading the instruction manual carefully and understanding its contents. Also keep the manual where it can be referred to as necessary.

2. Securing the space for maintenance

When installing the products, please allow access for maintenance.

3. Tightening torque

When installing the products, please follow the listed torque specifications.

Piping

Caution

1. Before piping

Make sure that all debris, cutting oil, dust, etc., are removed from the piping.

2. Wrapping of pipe tape

When screwing piping or fittings into ports, ensure that chips from the pipe threads or sealing material do not get inside the piping. Also, when the pipe tape is used, leave 1.5 to 2 thread ridges exposed at the end of the threads.

Air Supply

Warning

1. Operating fluid

Please consult with SMC when using the product in applications other than compressed air (including vacuum).

Regarding products for general fluid, please ask SMC about applicable fluids.

2. Install an air dryer, aftercooler, etc.

Excessive condensate in a compressed air system may cause valves and other pneumatic equipment to malfunction.

Installation of an air dryer, after cooler etc. is recommended.

3. Drain flushing

If condensate in the drain bowl is not emptied on a regular basis, the bowl will over flow and allow the condensate to enter the compressed air lines.

If the drain bowl is difficult to check and remove, it is recommended that a drain bowl with the auto-drain option be installed.

For compressed air quality, refer to "Air Preparation Equipment" catalog.

4. Use clean air

If the compressed air supply is contaminated with chemicals, synthetic materials, corrosive gas, etc., it may lead to break down or malfunction.

Operating Environment

Warning

1. Do not use in environments where the product is directly exposed to corrosive gases, chemicals, salt water, water or steam.

2. Do not expose the product to direct sunlight for an extended period of time.

3. Do not use in a place subject to heavy vibrations and/or shocks.

4. Do not mount the product in locations where it is exposed to radiant heat.

Maintenance

Warning

1. Maintenance procedures are outlined in the operation manual.

Not following proper procedures could cause the product to malfunction and could lead to damage to the equipment or machine.

2. Maintenance work

If handled improperly, compressed air can be dangerous.

Assembly, handling and repair of pneumatic systems should be performed by qualified personnel only.

3. Drain flushing

Remove drainage from air filters regularly. (Refer to the specifications.)

4. Shut-down before maintenance

Before attempting any kind of maintenance make sure the supply pressure is shut of and all residual air pressure is released from the system to be worked on.

5. Start-up after maintenance and inspection

Apply operating pressure and power to the equipment and check for proper operation and possible air leaks. If operation is abnormal, please verify product set-up parameters.

6. Do not make any modifications to be product.

Do not take the product apart.

Quality Assurance Information (ISO 9001, ISO 14001)

Reliable quality of products in the global market

To enable our customers throughout the world to use our products with even greater confidence, SMC has obtained certification for international standards “ISO 9001” and “ISO 14001”, and created a complete structure for quality assurance and environmental controls. SMC products pursue to meet its customers’ expectations while also considering company’s contribution in society.

Quality management system ISO 9001

This is an international standard for quality control and quality assurance. SMC has obtained a large number of certifications in Japan and overseas, providing assurance to our customers throughout the world.

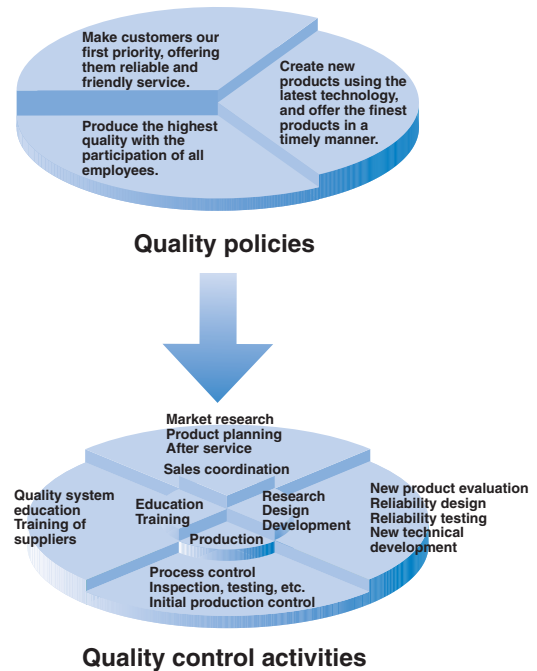


Environmental management system ISO 14001

This is an international standard related to environmental management systems and environmental inspections. While promoting environmentally friendly automation technology, SMC is also making diligent efforts to preserve the environment.



SMC's quality control system



SMC Product Conforming to Inter

SMC products complying with EN/ISO, CSA/UL standards are supporting



The CE mark indicates that machines and components meet essential requirements of all the EC Directives applied.

It has been obligatory to apply CE marks indicating conformity with EC Directives when machines and components are exported to the member Nations of the EU.

Once "A manufacturer himself" declares a product to be safe by means of CE marking (declaration of conformity by manufacturer), free distribution inside the member Nations of the EU is permissible.

■ CE Mark

SMC provides CE marking to products to which EMC and Low Voltage Directives have been applied, in accordance with CETOP (European hydraulics and pneumatics committee) guide lines.

■ As of February 1998, the following 18 countries will be obliged to conform to CE mark legislation

Iceland, Ireland, United Kingdom, Italy, Austria, Netherlands, Greece, Liechtenstein, Sweden, Spain, Denmark, Germany, Norway, Finland, France, Belgium, Portugal, Luxembourg

■ EC Directives and Pneumatic Components

• Machinery Directive

The Machinery Directive contains essential health and safety requirements for machinery, as applied to industrial machines e.g. machine tools, injection molding machines and automatic machines. Pneumatic equipment is not specified in Machinery Directive. However, the use of SMC products that are certified as conforming to EN Standards, allows customers to simplify preparation work of the Technical Construction File required for a Declaration of Conformity.

• Electromagnetic Compatibility (EMC) Directive

The EMC Directive specifies electromagnetic compatibility. Equipment which may generate electromagnetic interference or whose function may be compromised by electromagnetic interference is required to be immune to electromagnetic affects (EMS/immunity) without emitting excessive electromagnetic affects (EMI/emission).

• Low Voltage Directive

This directive is applied to products, which operate above 50 VAC to 1000 VAC and 75 VDC to 1500 VDC operating voltage, and require electrical safety measures to be introduced.

• Simple Pressure Vessels Directive

This directive is applied to welded vessels whose maximum operating pressure (PS) and volume of vessel (V) exceed 50 bar/L. Such vessels require EC type examination and then CE marking.

national Standards

you to comply with EC directives and CSA/UL standards.



■ CSA Standards & UL Standards

UL and CSA standards have been applied in North America (U.S.A. and Canada) symbolizing safety of electric products, and are defined to mainly prevent danger from electric shock or fire, resulting from trouble with electric products. Both UL and CSA standards are acknowledged in North America as the first class certifying body. They have a long experience and ability for issuing product safety certificate. Products approved by CSA or UL standards are accepted in most states and governments beyond question.

Since CSA is a test certifying body as the National Recognized Testing Laboratory (NRTL) within the jurisdiction of Occupational Safety and Health Administration (OSHA), SMC was tested for compliance with CSA Standards and UL Standards at the same time and was approved for compliance with the two Standards. The above CSA NRTL/C logo is described on a product label in order to indicate that the product is approved by CSA and UL Standards.

■ TSSA (MCCR) Registration Products

TSSA is the regulation in Ontario State, Canada. The products that the operating pressure is more than 5 psi (0.03 MPa) and the piping size is bigger than 1 inch. fall into the scope of TSSA regulation.

Products conforming to CE Standard

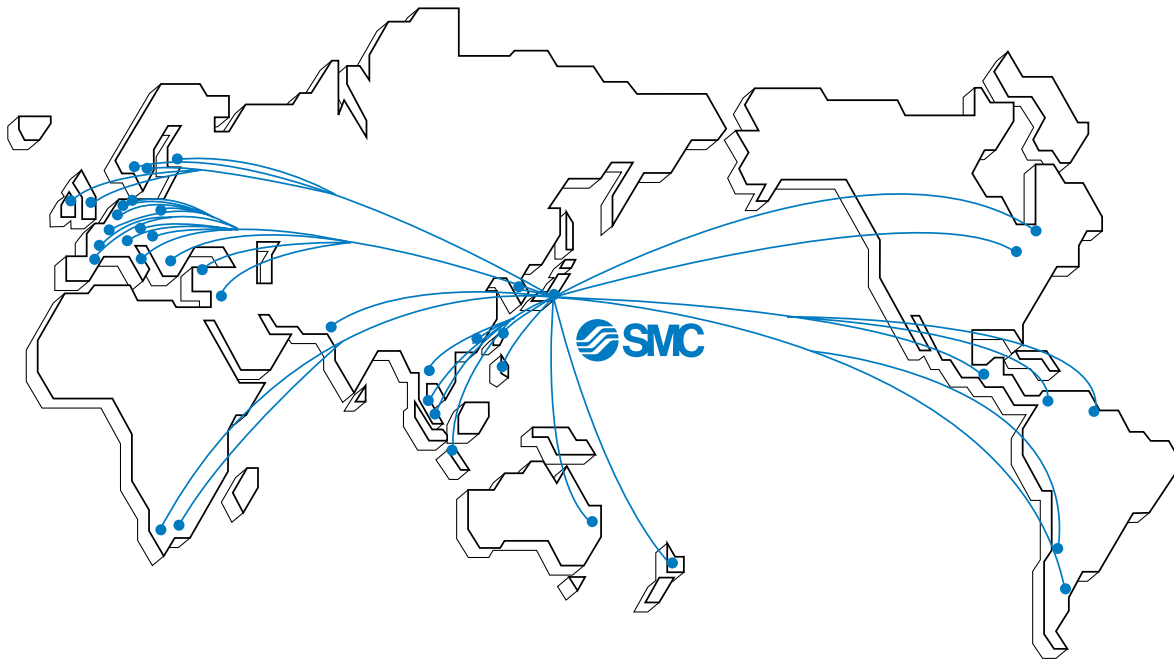


With CE symbol for simple visual recognition

In this catalog each accredited product series is indicated with a CE mark symbol. However, in some cases, every available models may not meet CE compliance. Please visit our web site for the latest selection of available models with CE mark.

<http://www.smcworld.com>

SMC's Global Service Network



America

U.S.A. **SMC Corporation of America**

3011 North Franklin Road Indianapolis, IN 46226, U.S.A.
TEL: 317-899-4440 FAX: 317-899-3102

CANADA **SMC Pneumatics (Canada) Ltd.**

6768 Financial Drive Mississauga, Ontario, L5N 7J6 Canada
TEL: 905-812-0400 FAX: 905-812-8686

MEXICO **SMC Corporation (Mexico), S.A. DE C.V.**

Carr. Silao-Trejo K.M. 2.5 S/N, Predio San Jose del Duranzo
C.P. 36100, Silao, Gto., Mexico
TEL: 472-72-2-55-00 FAX: 472-72-2-59-44/2-59-46

CHILE **SMC Pneumatics (Chile) S.A.**

Av. La Montaña 1,115 km. 16,5 P. Norte Parque
Industrial Valle Grande, Lampa Santiago, Chile
TEL: 02-270-8600 FAX: 02-270-8601

ARGENTINA **SMC Argentina S.A.**

Teodoro Garcia 3860 (1427) Buenos Aires, Argentina
TEL: 011-4555-5762 FAX: 011-4555-5762

BOLIVIA **SMC Pneumatics Bolivia S.R.L.**

Avenida Beni Numero 4665
Santa Cruz de la Sierra-Casilla de Correo 2281, Bolivia
TEL: 591-3-3428383 FAX: 591-3-3449900

VENEZUELA **SMC Neumatica Venezuela S.A.**

Apartado 40152, Avenida Nueva Granada, Edificio Wanlac,
Local 5, Caracas 1040-A, Venezuela
TEL: 2-632-1310 FAX: 2-632-3871

PERU (Distributor) **IMPECO Automatizacion Industrial S.A.**

AV. Canevaro 752, Lince, Lima, Peru
TEL: 1-471-6002 FAX: 1-471-0935

URUGUAY (Distributor) **BAKO S.A.**

Galicia 1650 esq. Gaboto C.P. 11200, Montevideo, Uruguay
TEL: 2-401-6603 FAX: 2-409-4306

BRAZIL **SMC Pneumaticos Do Brasil Ltda.**

Rua. Dra. Maria Fidelis, nr. 130, Jardim Piraporinha-Diademã-S.P.
CEP: 09950-350, Brasil
TEL: 11-4051-1177 FAX: 11-4071-6636

COLOMBIA (Distributor) **Airmatic Ltda.**

Calle 18 69-05 Apart. Aereo 081045 Santa Fe de Bogotá, Colombia
TEL: 1-424-9240 FAX: 1-424-9260

Europe

U.K. **SMC Pneumatics (U.K.) Ltd.**

Vincent Avenue, Crownhill, Milton Keynes, MK8 0AN, Buckinghamshire, U.K.
TEL: 01908-563888 FAX: 01908-561185

GERMANY **SMC Pneumatik GmbH**

Boschring 13-15 D-63329 Egelsbach, Germany
TEL: 06103-4020 FAX: 06103-402139

ITALY **SMC Italia S.p.A.**

Via Garibaldi 62 I-20061 Carugate Milano, Italy
TEL: 02-9271365 FAX: 02-9271365

FRANCE **SMC Pneumatique S.A.**

1 Boulevard de Strasbourg, Parc Gustave Eiffel, Bussy Saint Georges, F-77600
Marne La Vallée Cedex 3 France
TEL: 01-64-76-10-00 FAX: 01-64-76-10-10

SWEDEN **SMC Pneumatics Sweden AB**

Ekhagsvägen 29-31, S-141 05 Huddinge, Sweden
TEL: 08-603-07-00 FAX: 08-603-07-10

SWITZERLAND **SMC Pneumatik AG**

Dorfstrasse 7, Postfach 117, CH-8484 Weisslingen, Switzerland
TEL: 052-396-3131 FAX: 052-396-3191

AUSTRIA **SMC Pneumatik GmbH (Austria)**

Girakstrasse 8, A-2100 Korneuburg, Austria
TEL: 0-2262-6228-0 FAX: 0-2262-62285

SPAIN **SMC España, S.A.**

Zuazobidea 14 Pol. Ind. Jundiz 01015 Vitoria, Spain
TEL: 945-184-100 FAX: 945-184-510

IRELAND **SMC Pneumatics (Ireland) Ltd.**

2002 Citywest Business Campus, Naas Road, Saggart, Co. Dublin, Ireland
TEL: 01-403-9000 FAX: 01-466-0385

NETHERLANDS (Associated company) **SMC Pneumatics BV**

De Ruyterkade 120, NL-1011 AB Amsterdam, Netherlands
TEL: 020-5318888 FAX: 020-5318880

GREECE (Distributor) **S.Parianopoulos S.A.**

7, Konstantinoupoleos Street 11855 Athens, Greece
TEL: 01-3426076 FAX: 01-3455578

DENMARK **SMC Pneumatik A/S**

Knudsminde 4 B DK-8300
Odder, Denmark
TEL: 70252900 FAX: 70252901

Europe

FINLAND **SMC Pneumatics Finland OY**

PL72, Tiistiniityntie 4, SF-02231 ESP00, Finland
TEL: 09-8595-80 FAX: 09-8595-8595

NORWAY **SMC Pneumatics Norway A/S**

Vollsveien 13C, Granfoss Næringspark N-1366 LYSAKER, Norway
TEL: 67-12-90-20 FAX: 67-12-90-21

BELGIUM (Distributor) **SMC Pneumatics N.V./S.A.**

Nijverheidsstraat 20 B-2160 Wommelgem Belgium
TEL: 03-355-1464 FAX: 03-355-1466

POLAND **SMC Industrial Automation Polska Sp.z.o.o.**

ul. Konstruktorska 11A, PL-02-673 Warszawa, Poland
TEL: 022-548-5085 FAX: 022-548-5087

TURKEY (Distributor) **Entek Pnömatik San.ve Tic. Ltd. Sti**

Perpa Tic. Merkezi Kat:11 No.1625 80270 Okmeydani Istanbul, Türkiye
TEL: 0212-221-1512 FAX: 0212-221-1519

RUSSIA **SMC Pneumatik LLC.**

36/40 Sredny prospect V.O. St. Petersburg 199004, Russia
TEL: 812-118-5445 FAX: 812-118-5449

CZECH **SMC Industrial Automation CZ s.r.o.**

Hudcova 78a, CZ-61200 Brno, Czech Republic
TEL: 05-4121-8034 FAX: 05-4121-8034

HUNGARY **SMC Hungary Ipari Automatizálási kft.**

Budafoki út 107-113 1117 Budapest
TEL: 01-371-1343 FAX: 01-371-1344

ROMANIA **SMC Romania S.r.l.**

Str. Frunzei, Nr. 29, Sector 2, Bucharest, Romania
TEL: 01-3205111 FAX: 01-3261489

SLOVAKIA **SMC Priemyselná automatizácia, s.r.o.**

Nova 3, SK-83103 Bratislava
TEL: 02-4445-6725 FAX: 02-4445-6028

SLOVENIA **SMC Industrijska Avtomatila d.o.o.**

Grajski trg 15, SLO- 8360 Zuzemberk, Slovenia
TEL: 07388-5240 FAX: 07388-5249

LATVIA **SMC Pneumatics Latvia SIA**

Šmerļa ielā 1-705, Rīga LV-1006
TEL: 777 94 74 FAX: 777 94 75

SOUTH AFRICA (Distributor) **Hyflo Southern Africa (Pty.) Ltd.**

P.O.Box 240 Paardeneland 7420 South Africa
TEL: 021-511-7021 FAX: 021-511-4456

EGYPT (Distributor) **Saadani Trading & Ind. Services**

15 Sebaai Street, Miami 21411 Alexandria, Egypt
TEL: 3-548-50-34 FAX: 3-548-50-34

Oceania/Asia

AUSTRALIA **SMC Pneumatics (Australia) Pty.Ltd.**

14-18 Hudson Avenue Castle Hill NSW 2154, Australia
TEL: 02-9354-8222 FAX: 02-9894-5719

NEW ZEALAND **SMC Pneumatics (New Zealand) Ltd.**

8C Sylvia Park Road Mt.Wellington Auckland, New Zealand
TEL: 09-573-7007 FAX: 09-573-7002

TAIWAN **SMC Pneumatics (Taiwan) Co.,Ltd.**

17, Lane 205, Nansan Rd., Sec.2, Luzhu-Hsiang, Taoyuan-Hsien, TAIWAN
TEL: 03-322-3443 FAX: 03-322-3387

HONG KONG **SMC Pneumatics (Hong Kong) Ltd.**

29/F, Clifford Centre, 778-784 Cheung, Sha Wan Road, Lai Chi Kok, Kowloon, Hong Kong
TEL: 2744-0121 FAX: 2785-1314

SINGAPORE **SMC Pneumatics (S.E.A.) Pte. Ltd.**

89 Tuas Avenue 1, Jurong Singapore 639520
TEL: 6861-0888 FAX: 6861-1889

PHILIPPINES **SHOKETSU SMC Corporation**

Unit 201 Common Goal Tower, Madrigal Business Park, Ayala Alabang Muntinlupa, Philippines
TEL: 02-8090565 FAX: 02-8090586

MALAYSIA **SMC Pneumatics (S.E.A.) Sdn. Bhd.**

Lot 36 Jalan Delima1/1, Subang Hi-Tech Industrial Park, Batu 3 40000 Shah Alam Selangor, Malaysia
TEL: 03-56350590 FAX: 03-56350602

SOUTH KOREA **SMC Pneumatics Korea Co., Ltd.**

Woolim e-BIZ Center (Room 1008), 170-5, Guro-Dong, Guro-Gu, Seoul, 152-050, South Korea
TEL: 02-3219-0700 FAX: 02-3219-0702

CHINA **SMC (China) Co., Ltd.**

7 Wan Yuan St. Beijing Economic & Technological Development Zone 100176, China
TEL: 010-67882111 FAX: 010-67881837

THAILAND **SMC Thailand Ltd.**

134/6 Moo 5, Tiwanon Road, Bangkok, Amphur Muang, Patumthani 12000, Thailand
TEL: 02-963-7099 FAX: 02-501-2937

INDIA **SMC Pneumatics (India) Pvt. Ltd.**

D-107 to 112, Phase-2, Extension, Noida, Dist. Gautaim Budh Nagar, U.P. 201 305, India
TEL: (0120)-4568730 FAX: 0120-4568933

INDONESIA (Distributor) **P.T. Riyadi Putera Makmur**

Jalan Hayam Wuruk Komplek Glodok Jaya No. 27-28 Jakarta 11180 Indonesia
TEL: 021-625 5548 FAX: 021-625 5888

PAKISTAN (Distributor) **Jubilee Corporation**

First Floor Mercantile Centre, Newton Road Near Boulton Market P.O. Box 6165 Karachi 74000 Pakistan
TEL: 021-243-9070/8449 FAX: 021-241-4589

ISRAEL (Distributor) **Baccara Automation Control**

Kvutza Geva 18915 Israel
TEL: 04-653-5960 FAX: 04-653-1445

SAUDI ARABIA (Distributor) **Assaggaff Trading Est.**

P.O. Box 3385 Al-Amir Majed Street, Jeddah-21471, Saudi Arabia
TEL: 02-6761574 FAX: 02-6708173