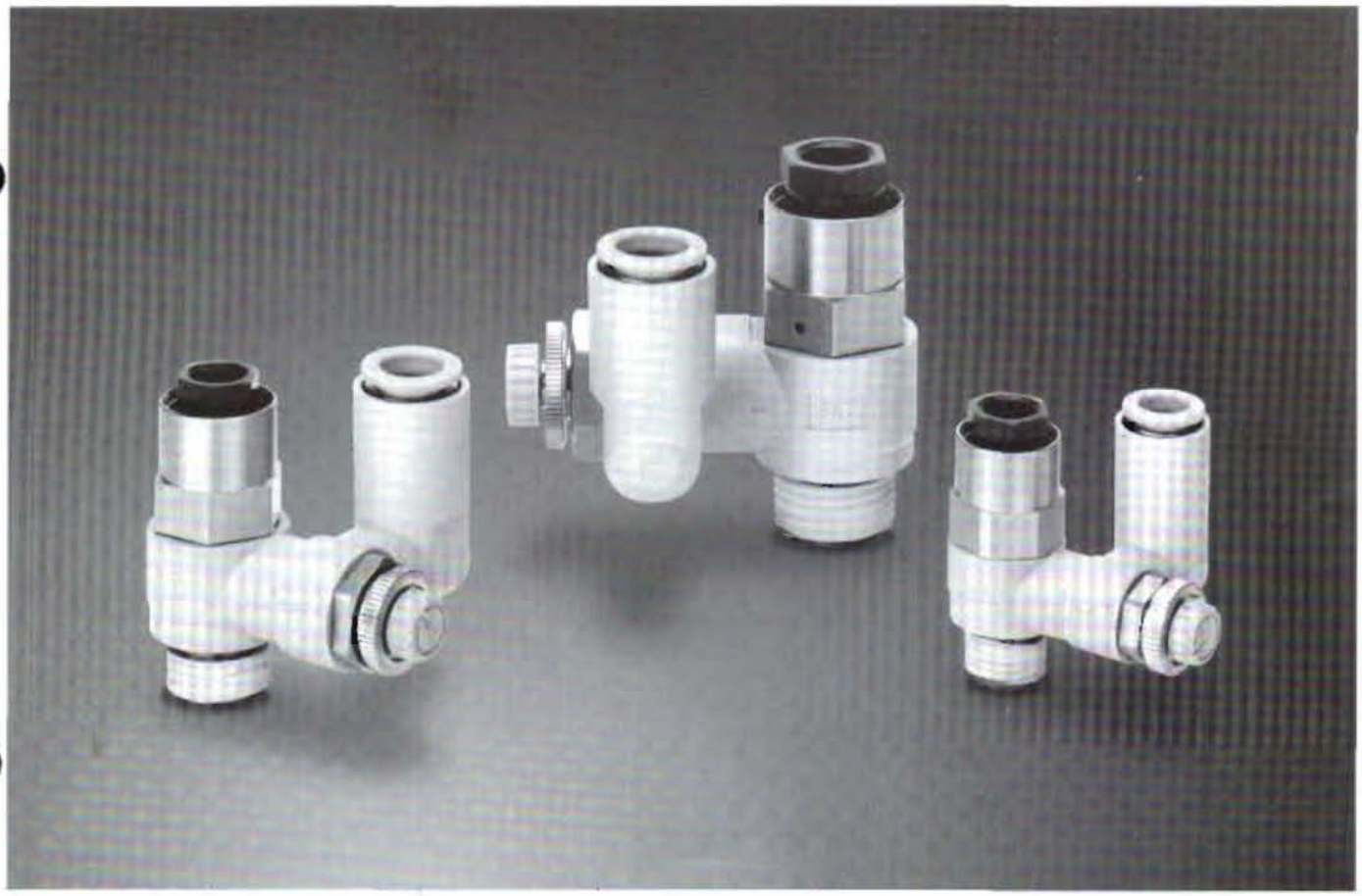
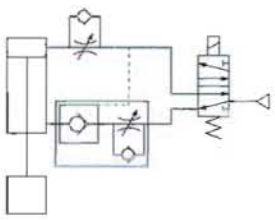
SMC

Speed Controller
with Pilot Check Valve

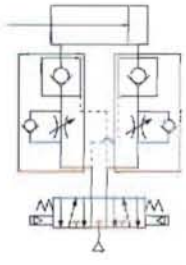
Series ASP



Integrated pilot check valve and speed controller
Temporary intermediate stop and speed control of cylinders is possible



Prevention of cylinder drop

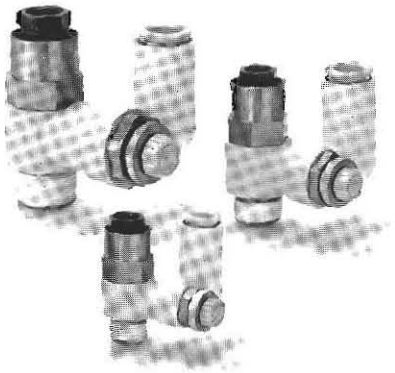


Emergency stop of cylinder

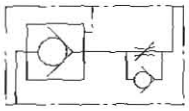
Speed Controller
with Pilot Check Valve
Series ASP

360° freedom for tube mounting direction

Standard electroless nickel plating specification



JIS Symbol



Model

Part No.	Port size	Pilot port	Applicable tube outside diameter							
			Millimeter size				Inch size			
			ø6	ø8	ø10	ø12	ø1/4"	ø5/16"	ø3/8"	ø1/2"
ASP330F-01	R(PT)1/8	M5 X 0.8	•	•						
ASP430F-02	R(PT)1/4	Rc(PT)1/8	•	•						
ASP530F-03	R(PT)3/8	Rc(PT)1/8		•	•					
ASP630F-04	R(PT)1/2	Rc(PT)1/4			•	•				
ASP430F-F02	R(PT)1/4	G(PF)1/8	•	•						
ASP530F-F03	R(PT)3/8	G(PF)1/8		•	•					
ASP630F-F04	R(PT)1/2	G(PF)1/4			•	•				
ASP330F-N01	NPT1/8	10-32UNF					•	•		
ASP430F-N02	NPT1/4	NPT1/8					•	•		
ASP530F-N03	NPT3/8	NPT1/8						•	•	
ASP630F-N04	NPT1/2	NPT1/4							•	•

Note) All brass parts are electroless nickel plated.

Specifications

Proof pressure	1.5MPa{15.3kgf/cm^2}
Maximum operating pressure	1MPa{10.2kgf/cm^2}
Minimum operating pressure	0.1MPa{1kgf/cm^2}
Pilot check valve actuation pressure	50% or more of operating pressure
Ambient & fluid temperature	-5 to 60°C (Without freezing)
Number of needle revolutions	10 revolutions
Applicable tube material	Nylon, Soft nylon, Polyurethane

Note) Use caution with soft nylon or polyurethane at maximum operating pressures.
For details, refer to the catalog on "Air Fittings & Tubing" for pneumatic piping CAT. E 501-B.

Flow Rate and Effective Sectional Area

Model		ASP330F	ASP430F		ASP530F		ASP630F	
Tube outside diameter	Millimeter size	ø6, ø8	ø6	ø8	ø8	ø10	ø10	ø12
	Inch size	ø1/4" ø5/16"	—	ø1/4" ø5/16"	ø5/16"	ø3/8"	—	ø3/8" ø1/2"
Controlled flow (Free flow)	Flow rate ℓ/min (ANR){N ℓ/min}	180	330	350	600	750	1100	1190
	Effective sectional area mm^2	2.9	5.2	5.4	9.3	11.6	17	18.4

Note) The indicated flow rate values are at a pressure of 0.5MPa and a temperature of 20°C.

How to Order

ASP 3 3 0 F – 01 – 06 S

- **ASP** — Pilot check valve
- **3** — Body size

3	1/8 standard
4	1/4 standard
5	3/8 standard
6	1/2 standard

- **3** — Type

3	Universal

- **0** — With One-touch fittings
- **F** — With seals
- **01** — Port size

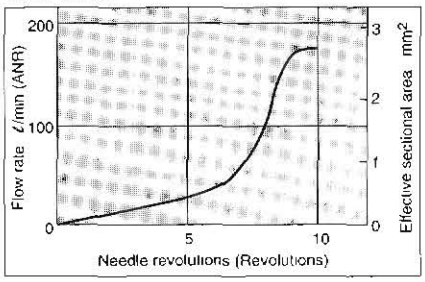
Symbol	Cylinder side	Pilot port
01	R(PT)1/8	M5 X 0.8
02	R(PT)1/4	Rc(PT)1/8
03	R(PT)3/8	Rc(PT)1/8
04	R(PT)1/2	Rc(PT)1/4
F02	R(PT)1/4	G(PF)1/8
F03	R(PT)3/8	G(PF)1/8
F04	R(PT)1/2	G(PF)1/4
N01	NPT1/8	10-32UNF
N02	NPT1/4	NPT1/8
N03	NPT3/8	NPT1/8
N04	NPT1/2	NPT1/4

- **06** — Applicable tube outside diameter

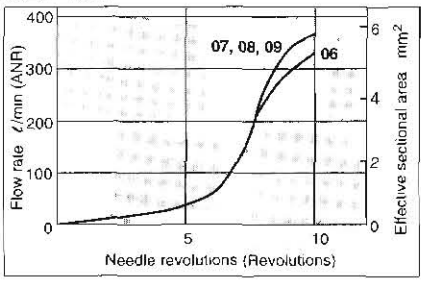
Millimeter size		Inch size	
06	ø6	07	ø1/4"
08	ø8	09	ø5/16"
10	ø10	11	ø3/8"
12	ø12	13	ø1/2"

Needle Valve/Flow Rate Characteristics

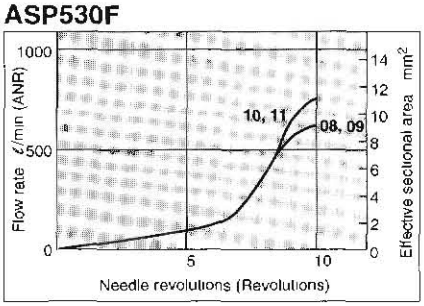
ASP330F



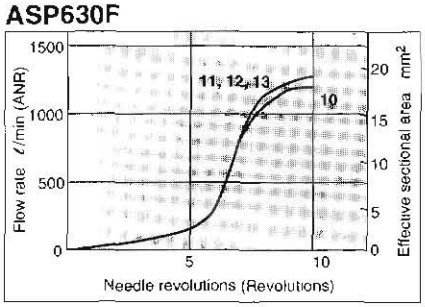
ASP430F



ASP530F

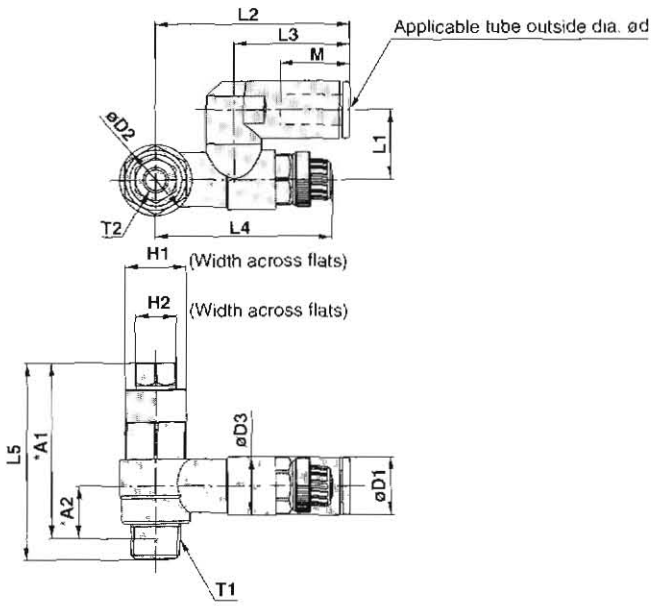


ASP630F



Dimensions

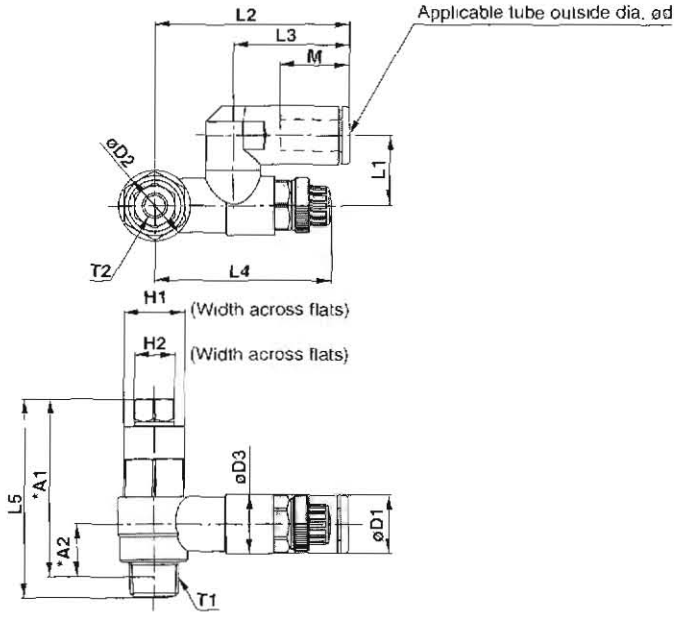
Millimeter size



Model	d	T1	T2	H1	H2	D1	D2	D3	L1	L2	L3	L4 MAX.	L4 MIN.	L5	*A1	*A2	M	Weight g
ASP330F-01-06S	6	R(PT)1/8	M5 x 0.8	12	8	11.6	14.2	11.8	14	38.4	22.9	39.6	34.6	39.5	35.2	10.5	13.7	32
ASP330F-01-08S	8					15.2			15.8	44.7	28.2	38.9	33.9				18.7	35
ASP430F-02-06S	6	R(PT)1/4	Rc(PT)1/8	17	12	12.8	18.5	15	18	43.4	25.2	41.7	36.7	48.7	42.4	10.9	16.8	65
ASP430F-02-08S	8					15.2			19.7	46.4	28.2						18.7	68
ASP530F-03-08S	8	R(PT)3/8	Rc(PT)1/8	19	12	15.2	23	19.8	20.3	51.3	28.2	46.9	41.9	56.2	50	14.4	18.7	107
ASP530F-03-10S	10					18.5			23.1	54.1	32.6						20.8	110
ASP630F-04-10S	10	R(PT)1/2	Rc(PT)1/4	24	17	18.5	28.6	26.5	25.9	64.2	32.6	64.8	57.3	70.3	61.8	18.3	20.8	212
ASP630F-04-12S	12					20.9				66	34.4						21.8	215

* Reference dimensions for R(PT) threads after installation.

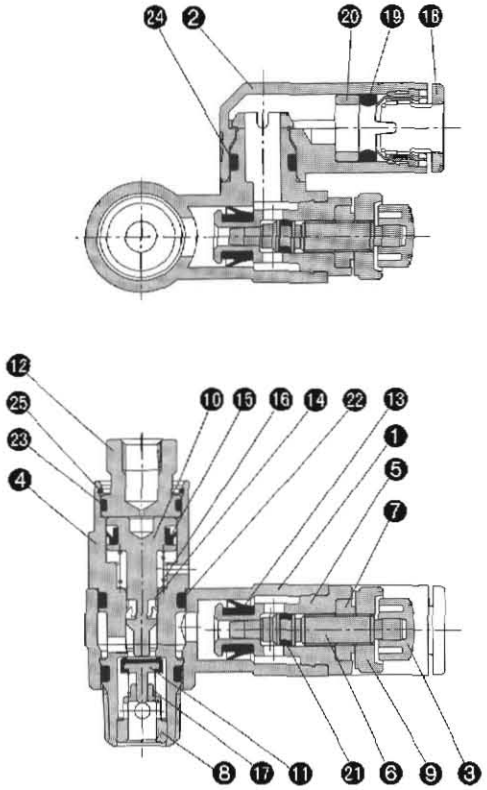
Inch size



Model	d	T1	T2	H1	H2	D1	D2	D3	L1	L2	L3	L4 MAX.	L4 MIN.	L5	*A1	*A2	M	Weight g
ASP330F-N01-07S	1/4"	NPT1/8	10-32UNF	1/2"	8	13.2	14.2	11.8	15.8	42.2	25.6	38.9	33.9	39.5	35.1	10.5	17	35
ASP330F-N01-09S	5/16"					15.2				44.7	28.2						18.7	
ASP430F-N02-07S	1/4"	NPT1/4	NPT1/8	11/16"	1/2"	13.2	18.5	15	18	43.9	25.6	41.7	36.7	48.7	42.6	10.9	17	68
ASP430F-N02-09S	5/16"					15.2				46.4	28.2						18.7	
ASP530F-N03-09S	5/16"	NPT3/8	NPT1/8	19	1/2"	15.2	23	19.8	20.3	51.3	28.2	46.9	41.9	56.2	50.3	14.4	18.7	107
ASP530F-N03-11S	3/8"					18.5			23.1	54.1	32.6						20.8	116
ASP630F-N04-11S	3/8"	NPT1/2	NPT1/4	15/16"	11/16"	18.5	28.6	26.5	25.9	64.2	32.6	64.8	57.3	70.3	61.8	18.3	20.8	220
ASP630F-N04-13S	1/2"					21.7			26.5	66.3	34.7						21.8	230

* Reference dimensions for NPT threads after installation

Construction



Parts list

No.	Description	Material	Note
1	Body A	PBT	
2	Elbow body	PBT	
3	Knob	PBT	
4	Pilot body	Brass	Electroless nickel plated
5	Body B	Brass	Electroless nickel plated
6	Needle	Brass	Electroless nickel plated
7	Needle guide	Brass	Electroless nickel plated
8	Guide	Brass	Electroless nickel plated
9	Lock nut	Brass	Electroless nickel plated
10	Piston	Brass	Electroless nickel plated
11	Valve	Stainless steel, NBR	
12	Cover	Brass	Black zinc chromated
13	U seal	NBR	

Parts list

No.	Description	Material	Note
14	DY seal	PBT	
15	DY seal	PBT	
16	Spring	Stainless steel	
17	Spring	Stainless steel	
18	Cassette	POM, Stainless steel Note 1)	
19	Seal	NBR	
20	Spacer	POM Note 2)	
21	O-ring	NBR	
22	O-ring	NBR	
23	O-ring	NBR	
24	O-ring	NBR	
25	Ring	Stainless steel	

Note 1) ø10, ø12, ø3/8", ø1/2" are POM, stainless steel and brass (electroless nickel plated)
Note 2) ø1/4", ø3/8" ø1/2" are brass (elctroless nickel plated).

Series ASP
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 label 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 – Recommendations for the application of equipment to transmission and control systems.

Note 2) JIS B 8370 : Pneumatic system axiom.

⚠ 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.

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 component until safety is confirmed.

1. Inspection and maintenance of machinery/equipment should only be performed after confirmation of safe locked-out control positions.
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 re-started, take measures to prevent shooting/out of cylinder piston rod etc. (Bleed air into the system gradually to create back-pressure.)

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 conjuction with atomic energy, railway, air navigation, vehicles. medical equipment, food and beverage, recreation equipment, emergency stop circuits, 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.

Series ASP
Drive Control Equipment Precautions

Be sure to read before handling.

Selection

⚠ Warning

1.Confirm the specifications.

The products appearing in this catalog are designed for use only in compressed air systems (including vacuum).

Do not use outside the specified ranges of pressure, temperature, etc., as this may cause damage or faulty operation. (Refer to specifications.)

Consult with SMC if fluids other than compressed air (including vacuum) are to be used.

Mounting

⚠ Warning

1.Read the instruction manual carefully.

The product should be mounted and operated with a good understanding of its contents. Also, keep the manual where it can be easily referred to at any time.

2.Ensure space for maintenance.

Ensure the necessary space for maintenance.

3.Strictly observe the fastening of screws and fastening torque.

When mounting, fasten screws with the recommended torque.

Piping

⚠ Caution

1.Preparation before piping.

Before piping is connected, it should be thoroughly blown out with air (flushing) or washed to remove cutting dust, cutting oil and other debris from inside the pipe.

2.Wrapping of pipe tape.

When screwing together pipes, fittings, etc., be certain that cutting dust from the pipe threads and sealing material do not get inside the piping.

Further, when pipe tape is used, leave 1.5 to 2 thread ridges exposed at the end.

Air Supply

⚠ Warning

1.Types of fluid.

This product is designed for use with pressurized air. Consult with SMC if a different fluid is to be used.

Consult SMC regarding products to be used with general purpose fluids, to confirm which fluids may be used.

2.When there is a large amount of condensate.

Pressurized air containing a large amount of condensate may cause the malfunction of pneumatic equipment. An air dryer or Drain Catch should be installed upstream from filters.

3.Drain management.

If the air filter drains are not flushed regularly, the condensate will flow downstream from the drains and this may lead to the malfunction of pneumatic equipment.

In cases where the management of drain flushing will be difficult, the use of filters with automatic drains is recommended.

For details on the qualities of compressed air mentioned above, refer to SMC's "Compressed Air Clean-up Systems."

4.Types of air.

Do not use compressed air containing chemicals, synthetic oil which includes organic solvents, salt, corrosive gases etc., as this may cause damage or faulty operation.

5.In cases where a large amount of carbon dust is generated from the compressor, it will adhere to valves and may cause faulty operation. In this situation, the use of a mist separator is recommended.

Series ASP
Drive Control Equipment Precautions

Be sure to read before handling.

Operating Environment

⚠ Warning

1. **Do not operate in an atmosphere of corrosive gases, chemicals, sea water, fresh water or water vapor, or where any of these may adhere to the product.**
2. **In locations which receive direct sunlight, the sunlight should be blocked .**
3. **Do not operate in situations where vibration or shock will occur.**
4. **Do not operate in a location near a heat source or where radiated heat will be received.**

Maintenance

⚠ Warning

1. **Maintenance should be performed in accordance with procedures in the instruction manual.**

   Improper handling may cause damage or malfunction of equipment or machinery.

2. **Maintenance operations.**

   Improper handling of compressed air is dangerous. Therefore, in addition to observing the product specifications, replacement of elements and other maintenance activities should be performed by personnel having sufficient knowledge and experience pertaining to pneumatic equipment.

3. **Drain flushing.**

   Condensate should be flushed from air filter and other drains on a regular basis.

4. **Pre-maintenance inspection.**

   When removing this product, turn off the electric power, and be certain to shut off the supply pressure and exhaust the compressed air in the system. Proceed only after confirming that all pressure has been released to the atmosphere.

5. **Post maintenance inspection.**

   After installing, repair or reconstruction, reconnect pressurized air and electric power, and then perform inspections for proper operation and air leakage. If the sound of air leakage can be heard, or if the equipment does not operate properly, stop operation and confirm that it is mounted correctly.

6. **Disassembly and alteration prohibited.**

   Do not disassemble the unit or make any alterations to it.

Series ASP
Specific Product Precautions

Be sure to read before handling.
Refer to pages 5, 6 and 7 for safety precautions and drive control equipment precautions.

Precautions 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. This product cannot be used as a stop valve requiring zero air leakage.

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

2. Confirm whether PTFE can be used.

PTFE (tetrafluoroethylene resin) powder is contained in the sealing agent. Confirm that there will be no operational problem.

3. 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.

4. 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.

Installing and Adjustment

⚠ Warning

1. Confirm that the lock nut is not loose.

If the lock nut is loose, there are sometimes changes in actuator speed which may become dangerous.

2. The number of opening and closing revolutions of the needle valve should be adjusted within the range of the specifications.

Since it has a pull-out stop mechanism, it will not revolve past the limit. Confirm the number of revolutions for the product to be used, as excessive turning of the needle will cause damage.

3. Mount after confirming the direction of flow.

Mounting backwards is dangerous, because the speed adjustment needle will not work and the actuator may pop out suddenly.

4. To adjust the speed, start with the needle in the completely closed position, and then adjust by opening gradually.

When the needle valve is opening, the actuator may pop out suddenly creating a dangerous situation.

Moreover, the needle valve is closed by turning to the right, and opened by turning to the left; and therefore, the actuator speed is reduced by turning to the right and increased by turning to the left.

5. Installing and removing should be performed by tightening or loosening the hexagon wrench flat on Body B with a suitable wrench.

Damage may occur if any other part is used. Positioning adjustment after mounting should be performed by turning Body A by hand.

6. Do not use a universal type fitting in cases of continuous rotation.

The fitting section may be damaged.

Series ASP
Specific Product Precautions

Be sure to read before handling.
Refer to pages 5, 6 and 7 for safety precautions and drive control equipment precautions.

Fastening Torque

⚠Caution

1.The proper screw-in 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	Proper fastening torque N·m	Width across flats mm Note)	Nominal size of adjustable angle wrench mm
1/8	7 to 9	2(12.7)	150
1/4	12 to 14	17(17.5)	200
3/8	22 to 24	19	200
1/2	28 to 30	24(23.8)	200

Note) Numbers inside ( ) are NPT thread dimensions

1N·m=10.2kgf·cm

Lock Nut Fastening Torque

⚠Caution

1.The proper fastening torque for the hexagon lock nut is as shown in the table. As a rule, it should be tightened an additional 15 to 30° with a tool after first tightening by hand.
Be careful not to cause damage by over-tightening.

Body size	Proper fastening torque N·m
1/8	1
1/4	1.5
3/8	4
1/2	10

1N·m=10.2kgf·cm

Handling of One-touch Fittings

⚠Caution

1.Tube attachment and removal of One-touch fittings.

1) Installation of tube.

1. Take a tube having no flaws on its periphery, and cut it off at a right angle. When cutting the tube, use tube cutters TK-1, 2 or 3. Do not use pinchers, nippers, scissors, etc. If the tube is not straight, is flattened or is damaged in any other way, connections may be impossible or other problems such as the tube pulling out after connection or air leakage may occur. Allow some leeway in the length of the tube.
2. Grasp the tube and push it in slowly, inserting it securely all the way into the fitting.
3. After fully inserting the tube, pull on it lightly to confirm that it will not come out. If it is not installed fully and securely, this may cause problems such as air leakage or the tube pulling out.

2) Removal of tube.

1. Push the release bushing in sufficiently. When doing this, apply pressure evenly around the collar so that it goes straight down.
2. Pull out the tube while holding down the release bushing so that it does not come out. If the release bushing is not pressed down sufficiently, there will be increased bite in the opposite direction, and it will become more difficult to extract the tube.
3. When the removed tube is to be reused, cut off the portion which has been chewed up before using it again. If the chewed up portion of the tube is used again, this can cause problems such as air leaks or difficulty in removing the tube again.

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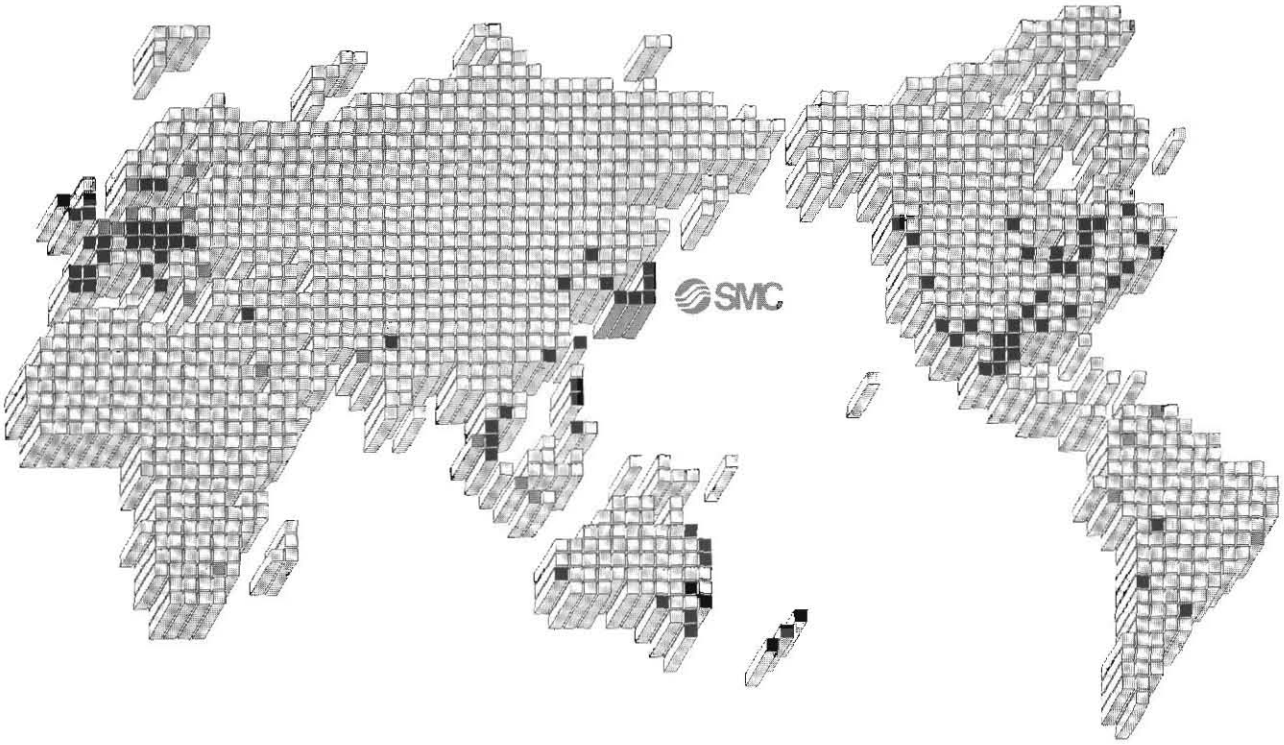

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