SMC

Document No.: AS*-OMG0107 -A

OPERATION MANUAL

SPEED CONTROLLER

WITH ONE-TOUCH FITTING

PRODUCT NAME : ELBOW TYPE / UNIVERSAL TYPE

MODEL : A S * * * * F

- Read this operation manual carefully to understand before installation and operation.
- Pay extra attention on the clause concerning the safety.
- Keep this operation manual available whenever necessary.

SMC CORPORATION

CONTENTS

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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 systems 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 analyses 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 conjunction 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.

AIR SUPPLY

① **Use clean air**

If the compressed air supply includes chemicals, synthetic materials (including organic solvents), salinity, corrosive gas, etc. , it can be lead to damage or malfunction.

② **Install an air dryer, after cooler, etc.**

Air that includes excessive condensate may cause malfunction of valve and other pneumatic equipment. To prevent this, install an air dryer, after cooler, etc.

ENVIRONMENT

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

② Do not expose the switch to direct sunlight for an extended period of time. If the switch has to be mounted in an area where exposure to direct sunlight can not be avoided, the use of a protective cover is recommended.

③ Do not mount the switch in a location where it is subject to strong vibrations and/or shock. Check the product specifications for above ratings.

④ Do not mount the switch in a location where it is exposed to radiant heat.

PIPING

① **Preparation before piping**

Thoroughly flush the fittings to prevent dust or chips from entering the gripper.

② **How to wrap seal tape**

When piping and fittings are installed, care should be taken to prevent contamination (Chips from piping and seal materials). In addition, when wrapping seal tape, please leave 1.5 ～ 2 threads uncovered on the pipe end.

SELECTION

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

Products' specification allows small amount of air leakage.

② **Confirm adverse effect of PTFE**

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

MOUNTING - ADJUSTMENT

① **To install / remove 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 at the place that rotates all the time, or fittings might be damaged.**

③ **Adjust the number of rotations of the needle valve within the limited range.**

The retainer is attached to products mentioned in this catalog, so the needle does not rotate more than the specified torque range. Over rotation will cause damage.

④ **Install the fittings after check the flow direction.**

If the fittings were installed the opposite way, the needle for adjusting speed wouldn't work, and so cause the actuator to jump out suddenly.

⑤ **Adjust the speed by opening the needle slowly after having closed it completely.**

Loose of needle valve may cause unexpected sudden actuator extension. When needle valve is turned counter clockwise, it is open and cylinder speed increases.

⑥ **Check that the lock nut is tightened.**

Loose lock nut may cause actuator speed change.

⑦ **When the air leaks much enough to make sounds, or when the equipment doesn't operate normally, stop using it right away.**

⑧ **Make sure periodically that piping is not loose and that there is no air leakage.**

Actuators do not operate normally, if piping is loose and leaks air.

⑨ **Check regularly whether products do not have any external damage.**

Actuators do not operate normally, if they are damaged externally.

⑩ **Tightening torque**

Suitable torque for tightening fittings is shown in the table below. For standard installation, turn 2 to 3 turns with the tool after fastening by hand. Take care not to damage the product by over torque.

Thread	Tightening torque (N • m)	Hexagon width across flats (mm)	Nominal size of adjustable spanner (mm)
M3	1/4 rotation after tightening manually	4.5	———
M5 10/32-UNF	1/6 rotation after tightening manually	8	100
1/8	7~9	14	150
1/4	12~14	17	200
3/8	22~24	19	200
1/2	28~30	24	200

Suitable screw torque for hexagon lock nut is shown in the table below. For standard installation, turn 15 to 30° with the tool after fastening by hand. Take care not to damage the product by over torque.

Body Size	Applicable Tightening Torque N·m
M3	0.07
M5	0.3
1/8	1
1/4	1.5
3/8	4
1/2	10

MEINTENANCE

① **Maintenance procedures are outlined in the operation manual.**

If handling is wrong, it causes malfunction and damage of machine or equipment.

② **Maintenance**

If handled improperly, compressed air can be dangerous. Assembly, handling and repair of pneumatic systems should be performed by qualified personnel only.

③ **Drain**

Remove condensate from the air filter regularly.

④ **Shut-down before maintenance**

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

⑤ **Start-up after maintenance**

After mounting, repair, and remodel, apply operating pressure and power to the equipment and check for proper operation and possible air leaks. If operation is abnormal, please verify switch set-up parameters.

⑥ **Prohibition on disassemble and remodel**

Do not disassemble nor remodel the product.

2. APPLICATION

This equipment is for a use to control the speed of the actuator.

3. SPECIFICATIONS

Proof pressure	A 1.5 MPa
Max.operating pressure	A 1 MPa
Min.operating pressure	A 0.1 MPa
Ambient and fluid temperature	A −5～60℃{No freezing}
Number of needle rotations	10 turns(M5 : 8 turns)
Tube material	Nylon, soft nylon, polyurethane

4. MALFUNCTIONS and COUNTERMEASURES

Contents of failures	Causes	Countermeasures
Speed adjiusting	The direction of the check valve is opposite.	Confirm which operating condition should be used, meter-out contrlor or meter-in control.
	There are some dust inside.	Lock nut: is silver → open a needle to its full width, and flush (air blow) from the one touch fitting. Lock nut: is black → open a needle to its full width, and flush (air blow) from the male thread. When it can not adjust after air blow, attach air filter to piping and to a new article.
Air leaks from one touch fittings. a Tune comes off from one touch fitting.	The tube is cut with pliers, nipper, etc.	Use a tube cutter.
	The tolerance of the tube's outside diameter is over its specification range.	When different tubes from our brands are used, give attention to the accuracy of the tube's outside diameter. nylon tube within ±0.1mm soft nylon tube within ±0.1mm polyurethane tube within +0.15mm within −0.2mm

5. CONSTRUCTION

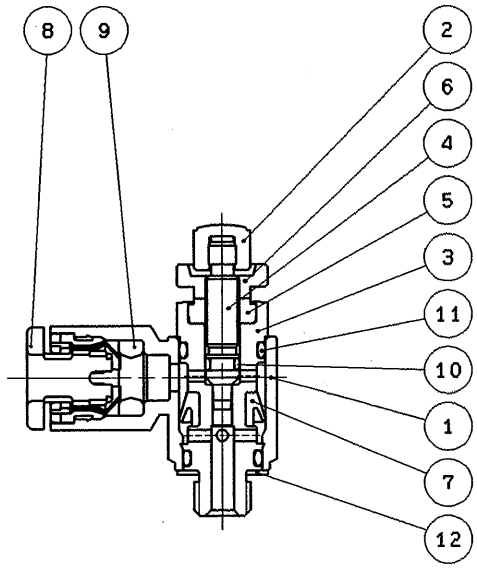
Elbow Type

<Meter-out Type>

M3 Type

M5 Type

U10/32 Type



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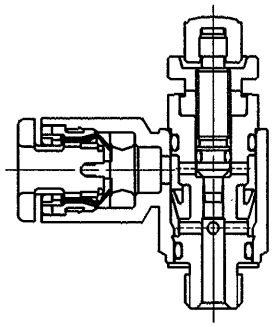
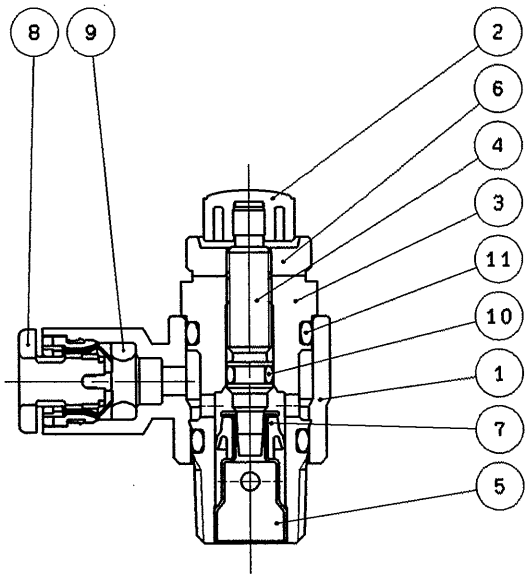


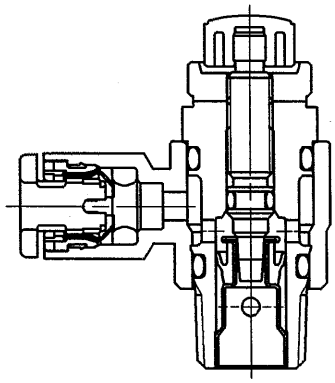
AS22※1F-01

AS22※1F-02

AS32※1F-03

AS42※1F-04





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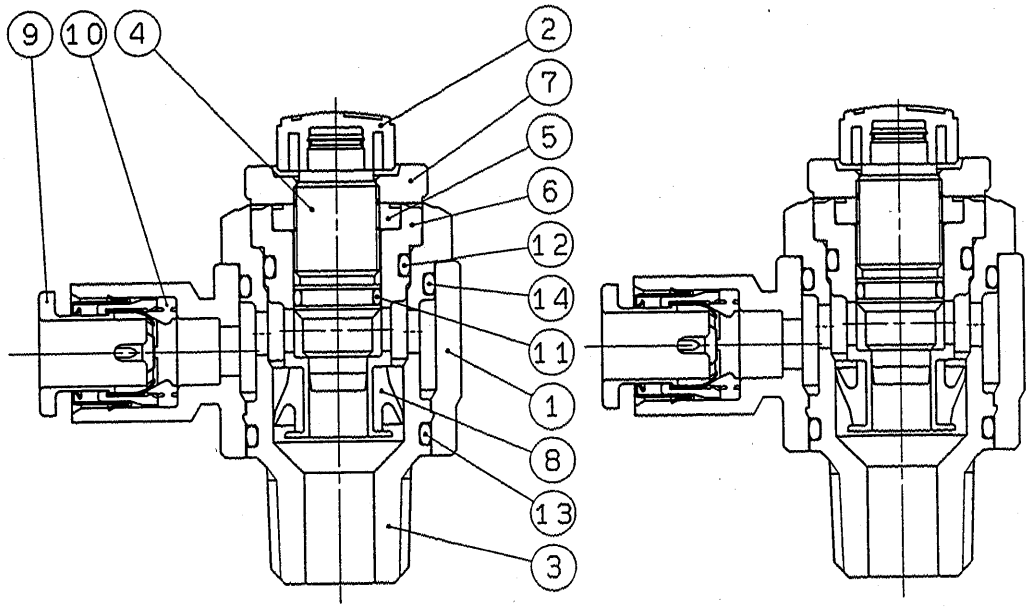


Parts List

No.	Description	Material	Notes
①	Body A	PBT	
②	Handle	PBT	
③	Body B	Brass ※1	Electroless nickel plated
④	Needle	Brass	Electroless nickel plated
⑤	Needle guide	Brass	Electroless nickel plated
⑥	Seat ring	Brass	
⑦	Lock nut	Brass	Electroless nickel plated ※2
⑧	U Packing	[A] HNBR	
⑨	Cassette	—	
⑩	Packing	NBR	
⑪	O ring	NBR	
⑫	O ring	NBR	
⑬	O ring	NBR	
⑭	Gasket	—	

Note) ※1: AS12□1F-M3: stainless

Note) ※2: Meter-in —— Black zinc chromate

A

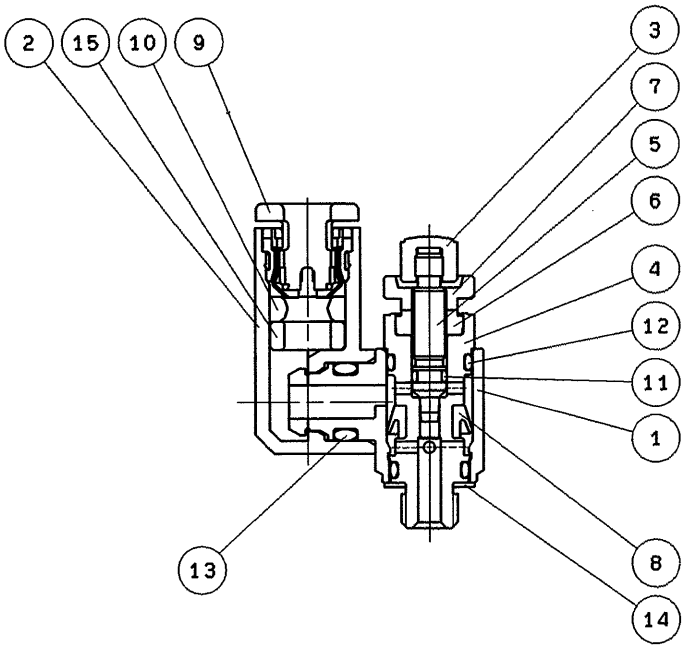
Universal Type

<Meter-out Type>

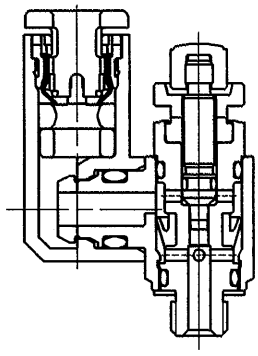
M3 Type

M5 Type

U10/32 Type



<Meter-in Type>



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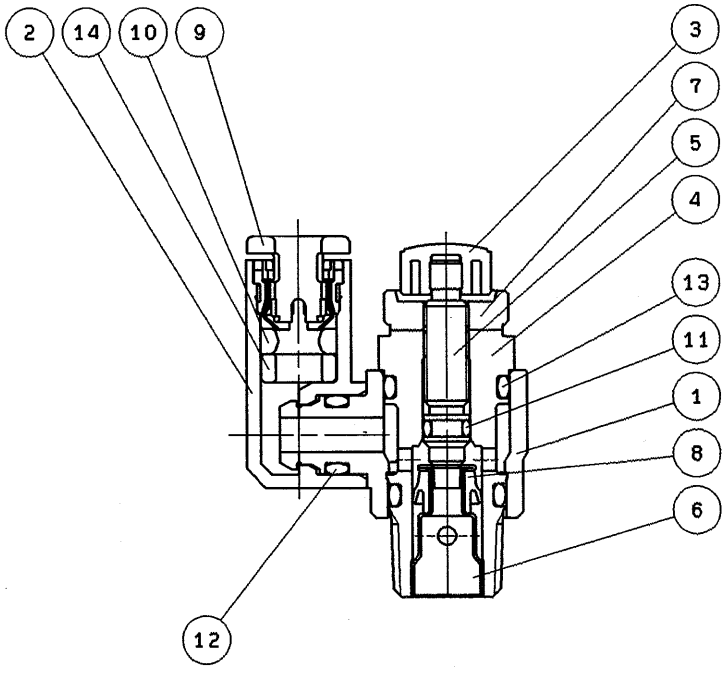
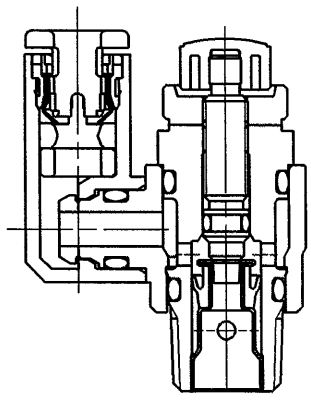
AS23※1F-02

AS33※1F-03

AS43※1F-04





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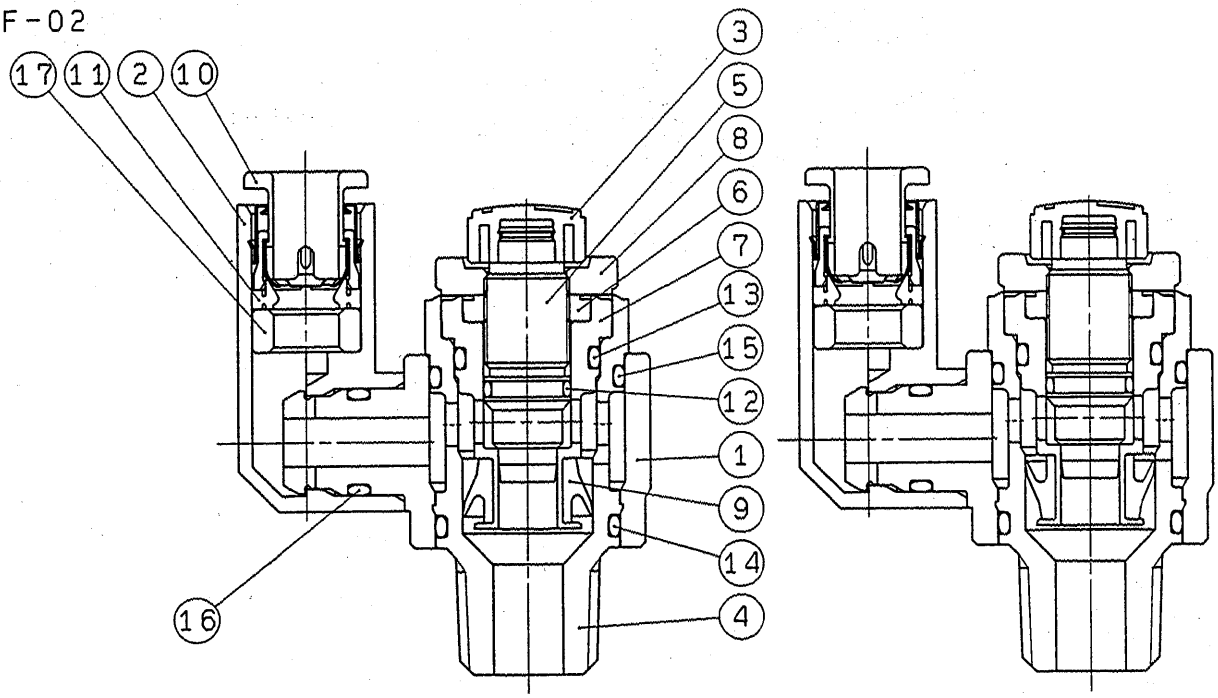

Parts List

No.	Description	Material	Notes
①	Body A	PBT	
②	Elbow body	PBT	
③	Handle	PBT	
④	Body B	Brass	Electroless nickel plated
⑤	Needle	Brass	Electroless nickel plated
⑥	Needle guide	Brass	Electroless nickel plated
⑦	Seat ring	Brass	
⑧	Lock nut	NBR	Electroless nickel plated ※2
⑨	U Packing	[A] HNBR	
⑩	Cassette	—	
⑪	Packing	NBR	
⑫	O ring	NBR	
⑬	O ring	NBR	
⑭	O ring	NBR	
⑮	O ring	NBR	
⑯	Spacer	—	Polycetarl ※3
⑰	Gasket	—	

Note) ※1: AS13□1F-M3: stainless

Note) ※2: Meter-in —— Black zinc chromate

Note) ※3: φ 3/16", φ 1/4", φ 3/8" — Brass