

## Instruction Manual for SETOV-C Series Pneumatic Spray Nozzles

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“The Fog Engineers”  
**H. IKEUCHI & CO., LTD.**

## Preface

Thank you for purchasing the Spray Nozzle from H. Ikeuchi & Co., Ltd.

This manual gives detailed instructions for the basic handling, maintenance and cautions of the product.

Please be aware that due to continuing efforts to improve our products, some details in this manual may differ from the actual product.

After reading, keep this manual handy for quick reference.

## Safety Precautions

Prior to use, read this manual carefully and familiarize yourself with the proper operation of the product for optimal performance.

H. Ikeuchi & Co., Ltd. takes no responsibility for any accidents and/or injuries resulting from improper handling, installation and/or operation.



**Wear safety gloves.**

Screw threads, edges and corners may be sharp and could cause injury.



**Ensure that the nozzle is firmly installed.**

Loose screws may cause the nozzle to come off during operation and lead to serious accidents.

## 1. Suggestions & Cautions

- (1) Screw threads, edges and corners may be sharp. Wearing safety gloves is recommended.
- (2) Operate the nozzles under the specified pressures. If the pressure is not specified, refer to the provided flow-rate diagram. The flow-rate diagram is based on tap water. Adjust the air and liquid pressures as necessary when spraying viscous liquids.
- (3) Avoid damaging or scratching the nozzles and pipes. When replacing a nozzle tip or disassembling the nozzle for maintenance, always use a spanner, hexagon socket wrench, and milling vice. DO NOT use a pipe vice, pipe wrench, or pliers.

### (4) Operation Control

#### (a) Spray ON/OFF Control

This type has a built-in shutoff piston that operates on pilot air pressure. The spray is turned ON/OFF by turning the pilot air ON/OFF.

Use with pilot air pressure of 0.2 MPa or higher.

Timing diagram				
Compressed air			ON	
Pilot air	OFF	ON	OFF	ON
Liquid	Stop	Spray	Stop	Spray

#### (b) Supply of Liquid

Supply liquid to the nozzle by either siphon feed or pressurized feed.

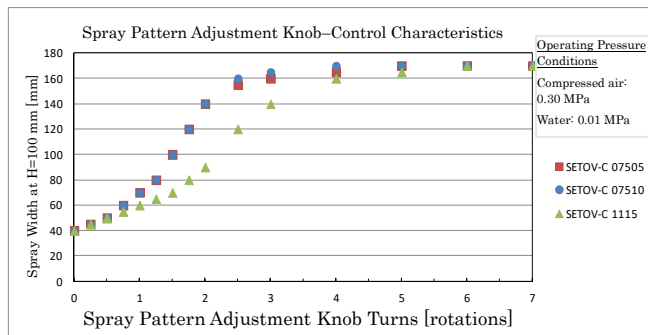
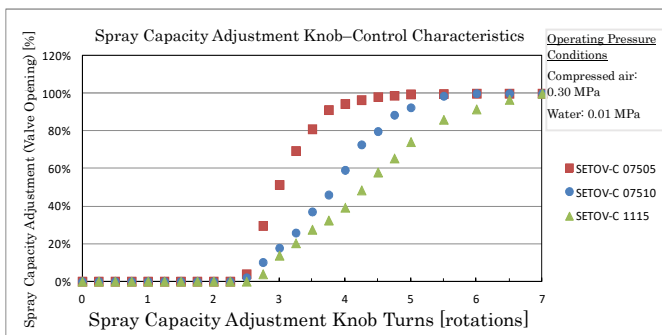
If the liquid pressure is too high, proper atomization will fail, and the liquid may come out as a continuous stream instead of a mist.

#### (c) Adjusting Spray Capacity (Spray Flow Rate) (Refer to the parts list on page 4)

- Adjust the spray capacity by either adjusting the liquid pressure or turning the spray capacity adjustment knob (part #20). Turning the knob counterclockwise from the fully closed (zero) position increases the spray capacity. (See the left figure below.)
- The spray capacity adjustment knob (#20) reaches maximum capacity after seven full turns.
- Loosen the spray capacity adjustment locknut (#17) before turning the spray capacity adjustment knob (#20). After adjustment, securely tighten the locknut (#17) to prevent the knob from moving. If the locknut remains loose, the knob (#20) may fall off during operation.

#### (d) Adjusting Spray Pattern (Refer to the parts list on page 4)

The spray pattern adjustment knob (#26) controls the spray width. Turning it clockwise narrows the spray into a full cone pattern. Turning it counterclockwise widens the spray into a flat fan pattern. (See the right figure below.)



### Note:

- (1) If the spray capacity adjustment knob (#20) is fully tightened, pilot air alone may not initiate spraying. In such cases, slightly loosen the knob (#20) to enable spray operation.
- (2) Stop the liquid supply when the nozzle is not in use for an extended period.

## (5) Air and liquid piping

- Use piping and valves large enough to prevent the pressure from dropping.
- Use new stainless steel pipes. Dust and foreign particles in old pipes may clog the nozzles. Never use pipes that may rust.
- Even new pipes may have chips, seal tape or other debris inside. ALWAYS flush pipes thoroughly before installing nozzles to remove any debris that could cause clogging.
- Install pressure gauges just before the nozzle to adjust air and liquid pressures appropriately. Installation of a valve is also recommended.
- Install strainers to prevent clogged nozzles. Clogging will impact nozzle performance.
- Only stopping the pilot air will not purge air from the pipe and thus will not lower the pressure enough to stop the spraying. To prevent this, use a 3-way solenoid valve for the pilot air pipe.

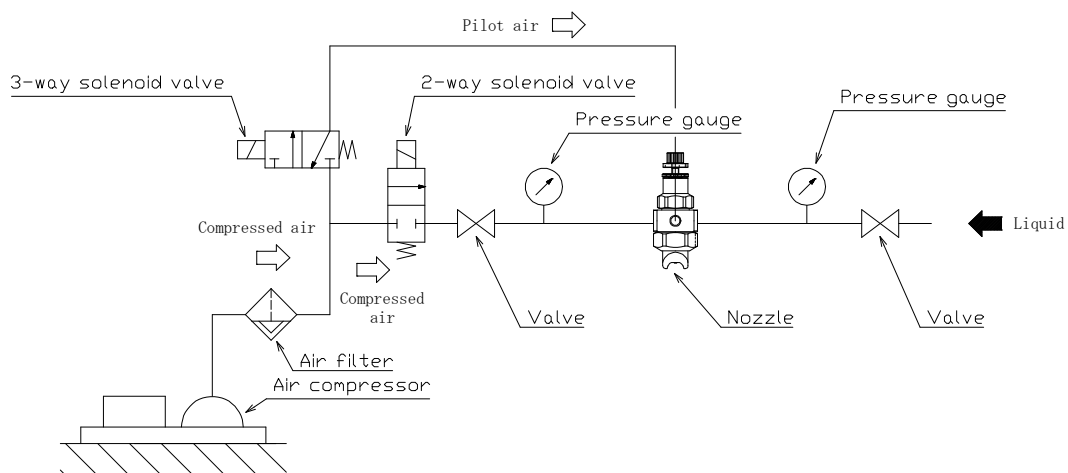
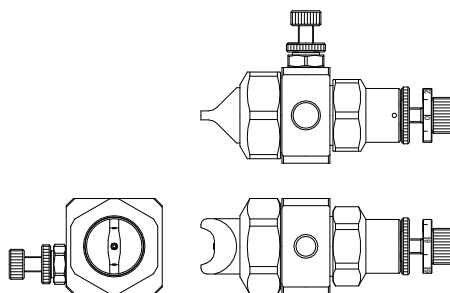


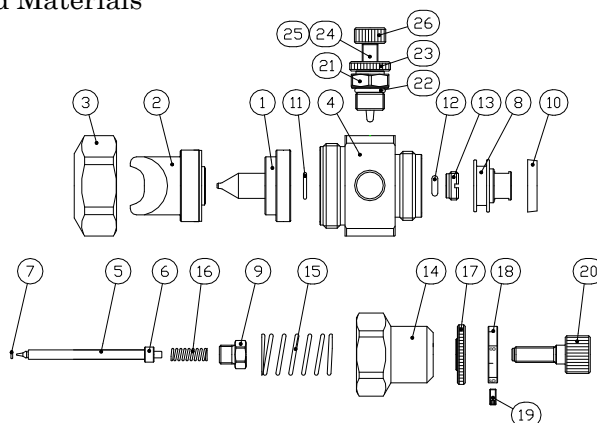
Fig. 1 Piping example using 3-way solenoid valve for the pilot air pipe

## 2. Components of Nozzle

### (1) Nozzle Assembly



### (2) Component Parts and Materials



No.	Component	Material	Remark	No.	Component	Material	Remark
1	Nozzle Tip	S303	Consumable	14	Spring Cap	S303	
2	Nozzle Body	S303	Consumable	15	Spring (ø13.2)	S304	
3	Cap	S303		16	Spring (ø4)	S304	
4	Adaptor	S303		17	Spray Capacity Adjustment Locknut	S303	
5	Water Stop Pin	S316	Consumable	18	Dial	S303	
6	Water Stop Pin Stopper	S303	Consumable	19	Hexagon Socket Screw (M2)	S304	
7	O-ring	FKM	Consumable	20	Spray Capacity Adjustment Knob	S303	
8	Piston	S303		21	Needle Pin Cap	S303	Consumable
9	Piston Plug	S303		22	O-ring (SS8)	NBR	Consumable
10	Y-packing	NBR	Consumable	23	Spray Pattern Adjustment Locknut	S303	Consumable
11	O-ring (SS5.5)	FKM	Consumable	24	Needle Pin	S303	Consumable
12	O-ring (P3)	FKM	Consumable	25	O-ring (S4)	FKM	Consumable
13	Locknut	S303		26	Spray Pattern Adjustment Knob	S303	Consumable

#### Note: (1) Consumables

The lifetime of a nozzle varies depending on the operational conditions.

Replace consumable parts when corrosion or pitting corrosion of a nozzle tip, cap, or other parts is found and/or nozzle performance significantly deteriorates.

(2) Dimensions and materials may differ depending on part number of the nozzle.  
 (3) In our material code, "S" represents "stainless steel". For example, S303 stands for stainless steel 303.

(4) Parts No. 5–7 and No. 21–26 cannot be disassembled and are sold as sets only.

### 3. Disassembly

#### (1) Shut-off Parts

Secure the adaptor (part #4) in a milling vice and unscrew the spring cap (#14) with a spanner. Then, remove the spring  $\phi 13.2$  (#15), piston plug (#9), spring  $\phi 4$  (#16), water stop pin with stopper and O-ring (#5–7), piston (#8), and Y-packing (#10).

Necessary tools: Milling vice, Spanner 24 mm

Recommended tightening torque for re-assembly: 40 N·m

Unscrew the locknut (#13) with a flat-head screwdriver and remove the O-ring P3 (#12).

Necessary tool: Flat-head screwdriver

Recommended tightening torque for re-assembly: 1.6 N·m

If any of the O-ring (#7), Y-packing (#10), or O-ring P3 (#12) is damaged, replace it with a new one. (Parts No. 5–7 cannot be disassembled and are sold only as sets.)

#### (2) Nozzle Tip Parts

Secure the adaptor (part #4) in a milling vice and unscrew the cap (#3) with a spanner. Then, remove the nozzle tip (#1), nozzle body (#2) and O-ring SS5.5 (#11).

Necessary tools: Milling vice, Spanner 29 mm

Recommended tightening torque for re-assembly: 40 N·m

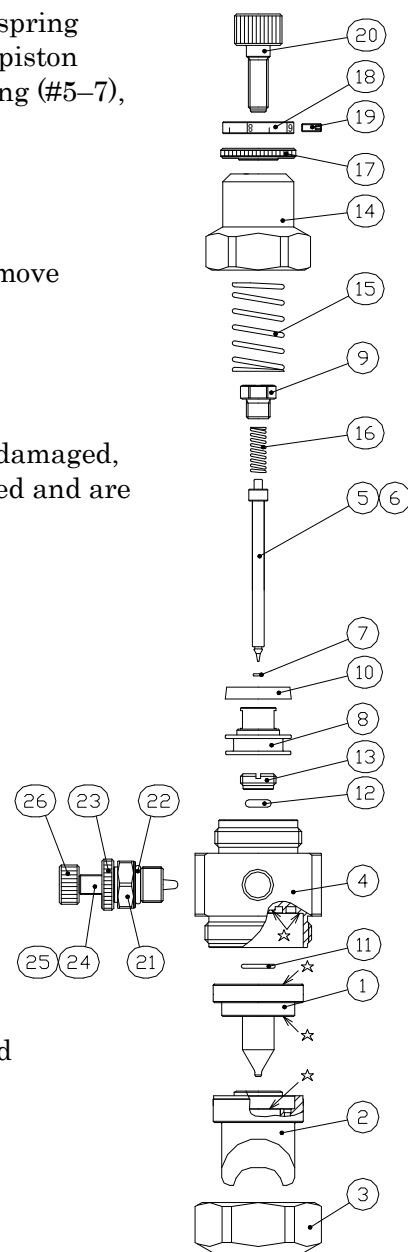
#### (3) Spray Pattern Adjustment Knob

Secure the adaptor (part #4) in a milling vice and unscrew the needle pin cap (#21) with a spanner.

The needle pin cap (#21), O-ring SS8 (#22), spray pattern adjustment locknut (#23), needle pin (#24), O-ring S4 (#25), and spray pattern adjustment knob (#26) cannot be disassembled.

Necessary tools: Milling vice, Spanner 12 mm

Note: Make sure not to drop, damage or lose any of the small parts.



## 4. Cleaning

After the disassembly inspect each part for damages of any kind.

Sealing parts include O-ring (part #7), Y-packing (#10), and O-ring P3 (#12).

Any damage or surface scratches on these parts may cause the nozzle to malfunction.

Remove any dirt on the surface with a soft cloth.

Using a brush, carefully remove dirt and debris from the other metal parts. Take special care not to scratch or damage the nozzle orifices when cleaning the nozzle tip and body.

### How to clean the inside of the nozzle

a. Impurities are most likely to adhere to the following areas:

- the liquid orifice at the center of the nozzle tip (#1)
- the outer rim of the nozzle tip (#1)
- the air orifice at the center of the nozzle body (#2)
- the spray pattern adjustment orifices at both ends of the nozzle body (#2)

Pay special attention to check the condition of these parts.

b. If you find any dust or debris in the orifices, carefully remove them with a brush, toothpick, or bamboo skewer. Clean the inside of each part thoroughly from any dirt and debris to maintain performance.

## 5. Assembly

Assemble in the reverse order of the 3. *Disassembly* on the previous page.

Note:

- (1) Before assembling, ensure that the sealing surfaces, indicated with ☆ (see the previous page), and the orifice are clean and undamaged.
- (2) Before attaching the spring  $\varnothing 13.2$  (part #15), confirm that the piston plug (#9) is properly seated in the inner diameter of the spring.
- (3) Pay attention to the orientation of the Y-packing (#10) when installing it to the piston (#8).  
Fit the Y-packing with the groove side facing the tip of the piston as shown in Fig. 2.

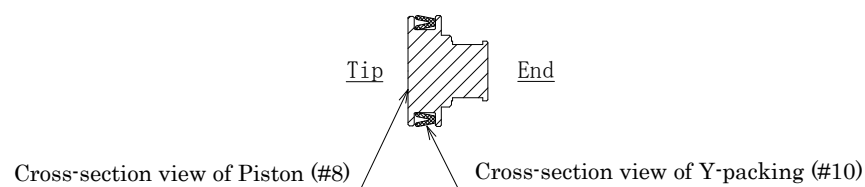


Fig. 2 Correct orientation of Y-packing

## 6. Maintenance

Check	Item	Check points
Daily	Spray	Visually check the spray pattern. If the nozzles are inside the equipment and cannot be seen, confirm that the spray pressure is normal.
	Pressure gauges and flow meters	Confirm that the air and liquid pressures and flow rate are correct during operation.
Periodically	Spray	Visually check the spray pattern.
	Appearance	Confirm that there is no corrosion or dust adhesion to the nozzle tip and orifices.
	Connection	Confirm that the cap, adaptor, and spring cap are tightened properly.

## 7. Troubleshooting

Troubles	Probable causes		Solutions
No spray is being created	Control	<ul style="list-style-type: none"> <li>• Controller is not switched on.</li> <li>• Valves are not opened.</li> </ul>	<ul style="list-style-type: none"> <li>• Switch it on.</li> <li>• Open the valves.</li> </ul>
	Nozzle	<ul style="list-style-type: none"> <li>• Nozzle or pipe is clogged.</li> <li>• Nozzle or pipe is clogged due to damage.</li> <li>• Liquid orifice and/or air orifice is clogged.</li> <li>• Piston (part #8) does not work.</li> <li>• Liquid viscosity is too high.</li> <li>• The spray capacity adjustment knob (#20) is not sufficiently open.</li> </ul>	<ul style="list-style-type: none"> <li>• Check and clean the nozzle and pipe.</li> <li>• Replace the damaged part.</li> <li>• Clean the clogged part.</li> <li>• Increase the pilot air pressure to 0.2 MPa or higher.</li> <li>• If increasing the compressed air pressure does not yield any results, replace the pipe and solenoid valve with larger ones to ensure an adequate air supply.</li> <li>• Replace the worn-out Y-packing.</li> <li>• Adjust the liquid viscosity to an appropriate level.</li> <li>• Loosen the spray capacity adjustment locknut (#17), turn the spray capacity adjustment knob (#20) counterclockwise more than 2.5 turns, and then re-tighten the locknut (#17).</li> </ul>
Liquid leaks from the nozzle tip	<ul style="list-style-type: none"> <li>• Dust/debris caught between the nozzle tip (#1) and water stop pin (#5).</li> <li>• Damage or wear on the piston, O-ring, or the sealing surfaces.</li> <li>• Springs (#15 and #16) are missing.</li> </ul>		<ul style="list-style-type: none"> <li>• Disassemble and clean the inside of nozzle.</li> <li>• Replace the parts.</li> <li>• Insert the springs.</li> </ul>
Air leaks Liquid leaks	<ul style="list-style-type: none"> <li>• Some parts are loose or not tightened.</li> </ul>		<ul style="list-style-type: none"> <li>• Tighten the connections.</li> </ul>
	<ul style="list-style-type: none"> <li>• Nozzle or pipe is cracked.</li> <li>• Nozzle or pipe is corroded.</li> </ul>		<ul style="list-style-type: none"> <li>• Replace the cracked part.</li> <li>• Replace the corroded part.</li> </ul>
Intermittent spray	<ul style="list-style-type: none"> <li>• Seal failure at the adaptor due to dust or surface damage.</li> <li>• Seal failure between the nozzle tip (#1) and adaptor (#4).</li> <li>• Seal failure between the piston and O-ring.</li> </ul>		<ul style="list-style-type: none"> <li>• Clean the sealing surface and replace the part.</li> <li>• Disassemble and clean the parts before re-assembly.</li> <li>• Disassemble and clean the parts before re-assembly.</li> </ul>
Irregular spray pattern	<ul style="list-style-type: none"> <li>• Nozzle or pipe is clogged.</li> <li>• Nozzle tip (#1) is deformed.</li> <li>• Nozzle tip (#1) is corroded.</li> <li>• Dust or foreign particles adhered to the orifices.</li> </ul>		<ul style="list-style-type: none"> <li>• Check and clean the nozzle and pipe.</li> <li>• Replace the deformed part.</li> <li>• Replace the corroded part.</li> <li>• Clean the part.</li> </ul>
Unable to adjust spray pattern	<ul style="list-style-type: none"> <li>• Seal failure at the needle pin (#24) due to dust or surface damage.</li> <li>• Seal failure between the nozzle tip (#1) and adaptor (#4) due to dust or surface damage, especially at the areas indicated with ☆ on page 5.</li> </ul>		<ul style="list-style-type: none"> <li>• Clean the sealing surface. Replace parts #21–26 as a set if necessary.</li> <li>• Clean the sealing surface. Replace the part if necessary.</li> </ul>

## 8. Disposal

Disposal should be practiced according to the regulations and codes of local authorities, or ask a disposal professional.

## 9. Inquiries

For spare parts or any trouble, contact your supplier or the following:

**H. IKEUCHI & CO., LTD.**

Email: [overseas@kirinoikeuchi.co.jp](mailto:overseas@kirinoikeuchi.co.jp)

<https://www.dry-fog.com/en/>