

Instruction Manual

SO-V Series Nozzles
SO-CM Series Nozzles

Thank you for purchasing this product.

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

H. Ikeuchi & Co., Ltd. takes no responsibility for any accidents and/or injuries resulting from improper handling, installation and/or operation. After reading, keep this manual handy for quick reference.

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

H. Ikeuchi & Co., Ltd.

1. Precautions

(1) Ceramic Parts

The ceramic parts used in spray nozzles feature high chemical and wear resistance, but the following restrictions need to be considered:

- Use of hydrofluoric acid and concentrated alkali will lead to corrosion.
- While the material is hard, it is also brittle which can cause chipping.
- The ceramic will crack if abruptly cooled down from high temperatures (200°C).

(2) Installation

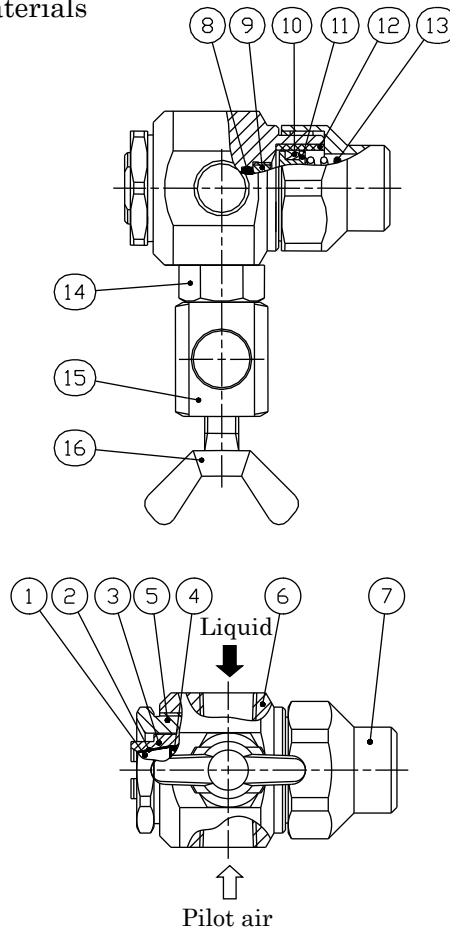
- Screw threads, edges and corners may be sharp and could cause injury. Wearing safety gloves is recommended.
- Be sure to flush the pipes before installing the nozzles to remove any dirt and foreign matter.
- Apply sealant or sealing tape to the threads of the pipes before installing the nozzles. Recommended tightening torque is 8 N•m.
- When installing, check the markings on the inlets of the adaptor (part #6) for "LIQ" (liquid) and "AIR" and connect with the appropriate liquid and pilot air piping.
- To prevent the nozzles from clogging, install strainers or use a water treatment system, depending on the water quality.
- Attach an air filter to the pilot air pipe to eliminate foreign particles, oil, and moisture.
- For better shut off and to prevent dripping, purge the air between the solenoid valve and the nozzle when it is shut off, using a 3-way solenoid valve.
- Position a 3-way solenoid valve as close as possible to the nozzle to prevent delays in the ON-OFF response.
- Pay attention to the spray direction when installing the SO-V series nozzle.

(3) Use

- Do not damage or scratch the nozzles.
- Do not clean the ceramic tip with nails, pins or other hard objects, which may damage the nozzles.
- Do not apply any strong force, shock or vibration to the nozzles.
- Store the nozzles in a clean, dust-free place.

2. Components of Nozzle

(1) Components and Materials



Note: Appearance and dimensions may vary depending on nozzle codes.

No.	Component		Material* ¹	Remarks
1* ³	Nozzle Tip	Orifice	Ceramic	
2* ³		Adhesive	Araldite (epoxy resin)	
3* ³		Tip Retainer	S303	
4* ³	Packing		PTFE	
5	Cap		S303	
6	Adaptor		S303	
7	Spring Cap		S303	
8	O-ring		FKM	
9	Lock Nut		S303	
10	Y-packing		NBR	
11	Piston		S303	
12	Sleeve		UPE	
13	Spring		S304	
14* ²	Nut		S304 equivalent	Optional
15* ²	Holder		S303	Optional
16* ²	Bolt		S304 equivalent	Optional

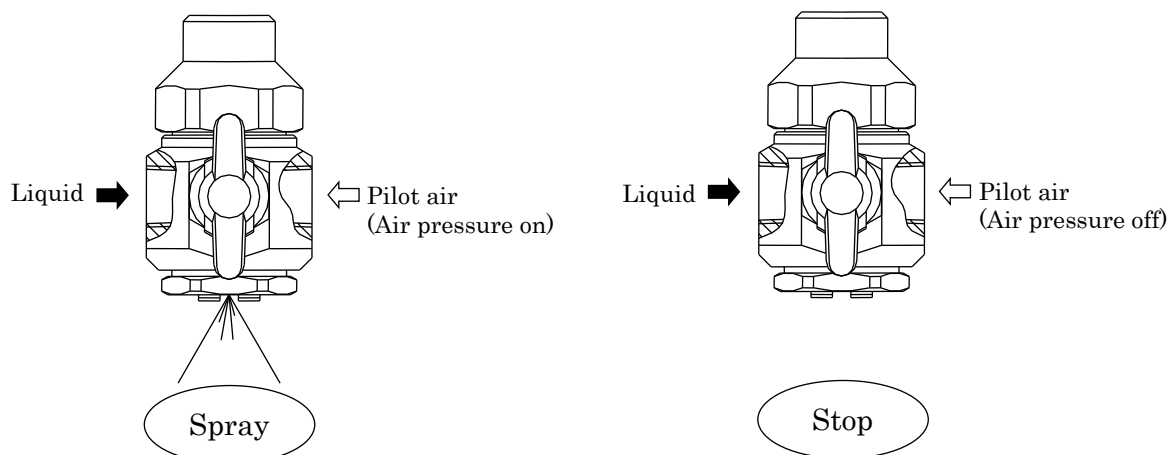
*1) In our material code, "S" represents "stainless steel".

For example, S303 stands for stainless steel 303.

*2) Parts No. 14, 15, 16 make up an optional mounting bracket which is sold separately.

*3) Parts No. 1, 2, 3 and 4 are only sold as set and cannot be purchased separately.

3. Operation Principle



Note: Appearance and dimensions may vary depending on nozzle codes.

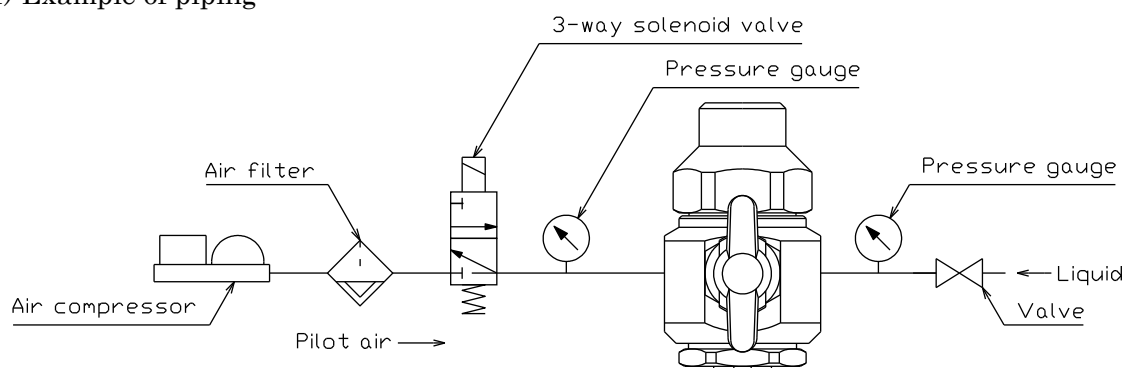
The pilot air activates an internal piston to regulate the spray.

Operation Time Chart

Pilot air	OFF	ON	OFF	ON	OFF
Liquid	Stop	Spray	Stop	Spray	Stop

4. Piping

(1) Example of piping



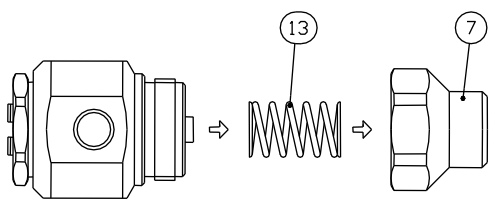
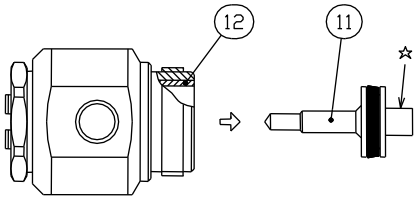
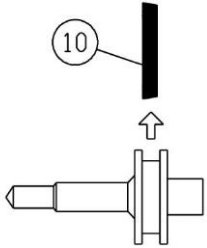
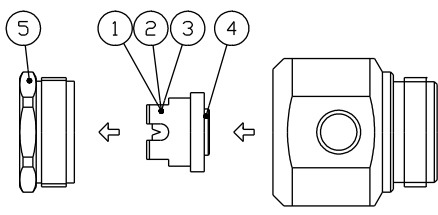
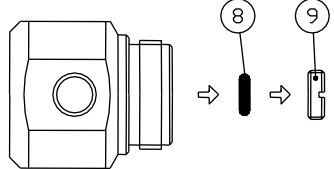
Note: Appearance and dimensions may vary depending on nozzle codes.

(2) Operating pressure range

Pilot air	0.2–0.5 MPa
Liquid	0.5 MPa or less

5. Disassembly (Please refer to the parts list on the previous page)

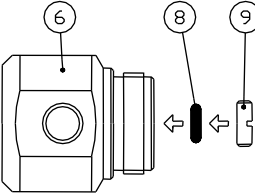
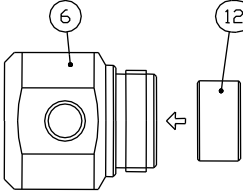
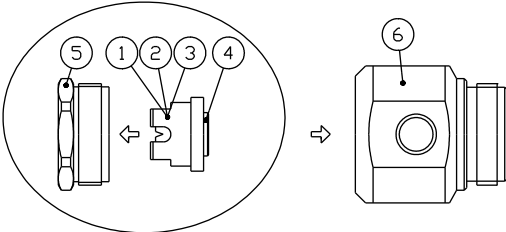
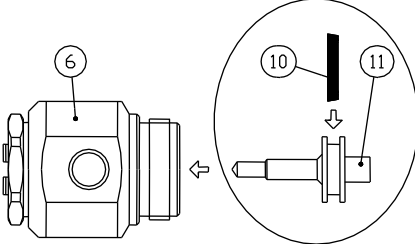
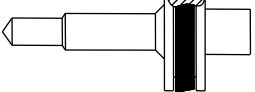
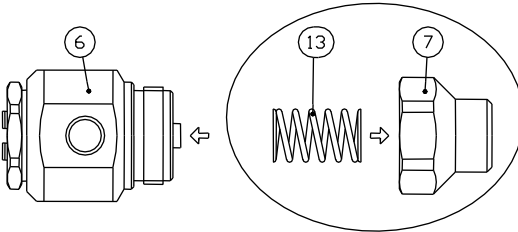
- Disassemble the nozzle in a clean, dust-free environment. Always clean the nozzle surface before disassembly to prevent any dust and dirt from entering the nozzle. Be careful not to lose any parts.
- Take special care not to scratch or damage the packing (#4), O-ring (#8), Y-packing (#10), piston (#11), and sleeve (#12). Any damage can cause leakage.
- ONLY remove the Y-packing (#10) and sleeve (#12) to replace them.

No.	Procedure	Diagram	Precautions
1	Loosen the spring cap (#7) and remove the spring (#13).		
2	Using needle-nose pliers to hold on to the part indicated with ☆, carefully pull out the piston (#11). Inspect the condition of the sleeve (#12), ONLY remove it if it is damaged in order to replace it.		Handle the piston (#11) CAREFULLY with pliers and ONLY on the part indicated with ☆ to avoid damage. DO NOT remove the sleeve (#12) unless it needs to be replaced: it is not reusable.
3	Inspect the condition of the Y-packing (#10) and only remove it if it is scratched or damaged and needs to be replaced.		There is no need to remove Y-packing (#10) unless it is scratched or damaged.
4	Loosen the cap (#5) and remove the nozzle tip with packing (#1, 2, 3 & 4). Inspect the condition of the packing (#4) and remove the entire set (#1, 2, 3 & 4) if the packing (#4) is damaged.		DO NOT remove packing #4 from the nozzle tip #1-3. To order a replacement nozzle tip set, use "nozzle tip SO-V or SO-CM **** S303" (including a packing #4). Fill **** with spray angle/capacity codes for SO-V or orifice diameter code for SO-CM.
5	Loosen the lock nut (#9) with a flat-blade screwdriver, and remove the O-ring (#8) using a thin plastic pick or other plastic tool.		Do not use metal rods, nails, needles or other hard objects as they may damage the O-ring.

Note: Appearance and dimensions may vary depending on nozzle codes.

6. Reassembly

Skip step 2 and the first action of step 4 if the sleeve (#12) and Y-packing (#10) are not replaced.

No.	Procedure	Diagram	Precautions
1	Insert the O-ring (#8) into the adaptor (#6). Then tighten the lock nut (#9) with a flat-blade screwdriver.		Tightening torque for lock nut (#9) is 0.2 N•m.
2	<i>*Insert the sleeve (#12) into the adaptor (#6) by press-fitting it with a milling vice or the like.</i>		Insert the sleeve (#12) slowly and carefully to avoid deformation. *This step is only needed if sleeve (#12) was removed during disassembly.
3	Attach the nozzle tip with packing (#1, 2, 3 & 4) to the cap (#5). Then screw them into the adaptor (#6).		Tightening torque for cap (#5) is 10 N•m.
4	<i>**Attach the Y-packing (#10) onto the Piston (#11).</i> Then insert them into the adaptor (#6).		Make sure the Y-packing (#10) is installed in the correct direction as shown below.  **This step is only needed if Y-packing (#10) was removed during disassembly.
5	Insert spring (#13) into the spring cap (#7) and attach them to the adaptor (#6).		Tightening torque for spring cap (#7) is 15 N•m.

Note: Appearance and dimensions may vary depending on nozzle codes.

Note:

- After assembling, check that the pilot air regulates the spray ON and OFF correctly. Be aware that it might take a few seconds for the spray to start and stop correctly immediately after assembling.
- For installation of the optional mounting bracket, please refer to the instruction manual for the BIM Mounting Bracket.

7. Troubleshooting

If there is a problem, please check the following items first.

If the problem persists, please replace the product.

Problem	Possible reason	Solution
Nozzle not spraying	Piston (#11) does not function properly.	Increase the pilot air pressure to 0.2 MPa or higher.
	Tip orifice (#1) is clogged.	Remove the nozzle tip with packing (#1, 2, 3 and 4) and clean them.
	Liquid viscosity is too high.	Adjust the liquid viscosity to an appropriate level.
Liquid leakage /dripping from nozzle tip	Clogging of piston (#11) and/or packing (#4).	Detach the piston (#11) and clean it. To clean the packing (#4), keep it attached to the nozzle tip (#1–3) and use compressed air or a similar method.
	Piston (#11) and/or packing (#4) is damaged or worn.	Replace the piston (#11). Replace the nozzle tip and packing (#1, 2, 3 and 4) as a complete set.
	Spring (#13) is missing.	Insert spring (#13).
	Cap (#5) is loose.	Tighten the cap (#5) firmly.
Air leaking from the bottom of nozzle (spring cap #7)	Y-packing (#10) is dirty.	Remove the piston (#11) and use compressed air to clean both the piston and the Y-packing while the Y-packing remains attached to the piston.
	Y-packing (#10) is damaged or worn.	Replace Y-packing (#10). Ensure Y-packing (#10) is installed in the correct direction. See page 5.
	Sleeve (#12) is damaged or worn.	Replace the sleeve (#12).
Liquid leakage from the bottom of nozzle (spring cap #7)	O-ring (#8) is damaged or worn.	Replace the O-ring (#8).
	Piston (#11) is damaged or worn.	Replace the piston (#11).

8. Warranty

There is a one year warranty from the date of shipment.

Seller shall be responsible for any damage due to design or production and will replace the item free of charge.

Neither this warrant nor any implied warranty applies to damage or harm caused by any or all of the following: 1. Damage due to misapplication and/or misuse, 2. Improper repair and/or modification, 3. Natural disasters, 4. Normal wear-and-tear of consumable parts including clogged nozzle tips.