

Instruction Manual
for
GSIM II Series Pneumatic Spray Nozzles

GSIM II Series with SN-adaptor

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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.

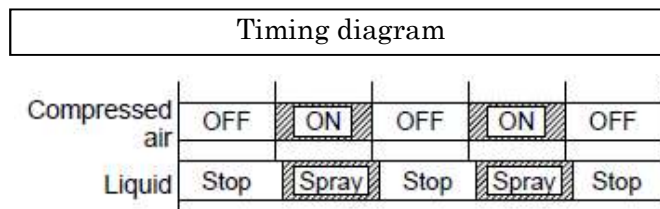


Ensure that the nozzle is firmly installed.

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

1. Suggestions & Cautions

- (1) Nozzles may be heavy and need to be handled carefully.
- (2) Screw threads, edges and corners may be sharp. Wearing safety gloves is recommended.
- (3) Operate the nozzles under the specified pressures.
If the pressure is not specified, refer to the provided flow-rate diagram.
- (4) Avoid damaging or scratching the nozzles. When replacing a nozzle tip or disassembling the nozzle for maintenance, always use a spanner and milling vice.
DO NOT use a pipe vice, pipe wrench or pliers.
- (5) ON/OFF function of the spray is controlled by compressed air.
This nozzle has a built-in shutoff piston that operates on compressed air (spray air) pressure. The spray is turned ON/OFF by turning the compressed air ON/OFF.
Use with compressed air pressure of 0.2 MPa or higher.



- (6) Air and liquid piping
 - Use piping and valves large enough to prevent the pressure from dropping.
 - Use new stainless steel pipes as dust and debris in old pipes may clog the nozzles.
Never use pipes that can 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.
 - If a nozzle is clogged, its performance is impacted. Installing strainers helps prevent nozzle clogging.

- When used with high liquid pressure, only stopping the compressed air will not lower the pressure enough to activate the shutoff piston, resulting in spraying only liquid. To prevent this, use a 3-way solenoid valve for the air pipe. If the pressure loss is too high due to the 3-way solenoid valve, use two 2-way solenoid valves instead as shown below. Stop the liquid supply when not spraying for a long time.

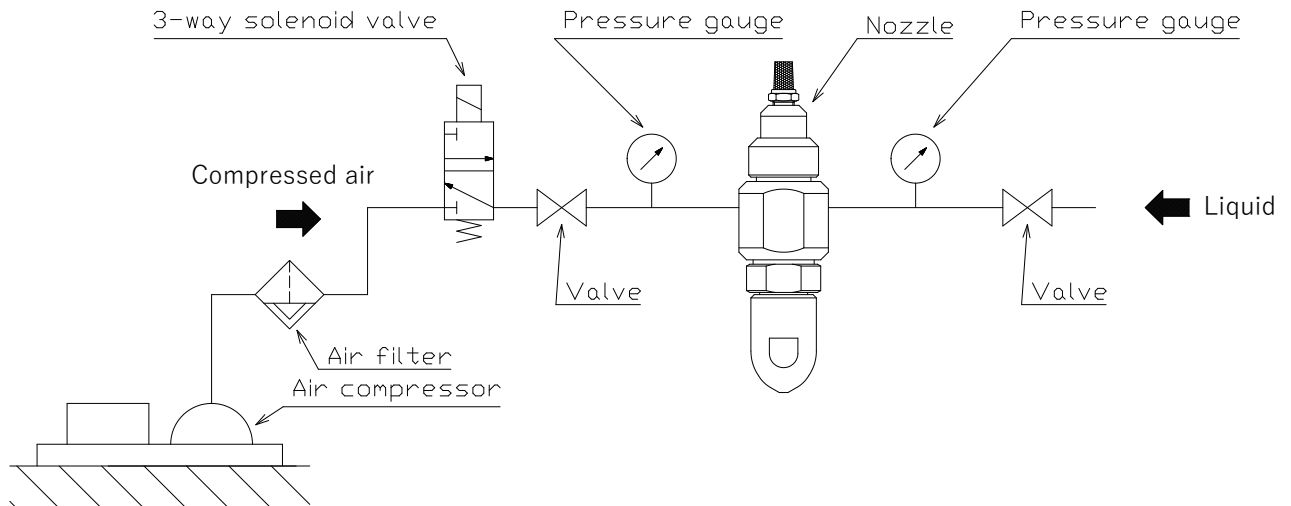


Fig. 1 Piping example using 3-way solenoid valve

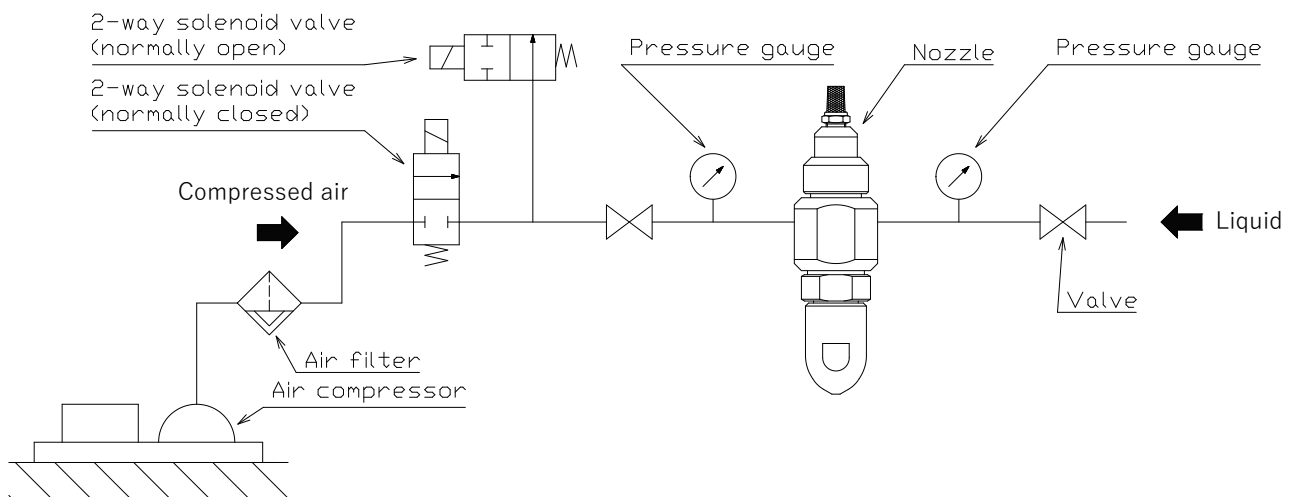


Fig. 2 Piping example using two 2-way solenoid valves

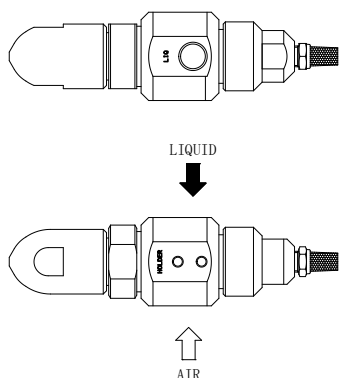
- (7) Prior to shipment all parts are firmly tightened. However, due to temperature changes during transport and especially if the nozzles are exposed to repeated heating and cooling during operation, parts such as screws may loosen and should therefore be inspected regularly. Take special care when screwing in and unscrewing to prevent damage.

Always apply an anti-seizing or sealing agent to the threads before assembly.

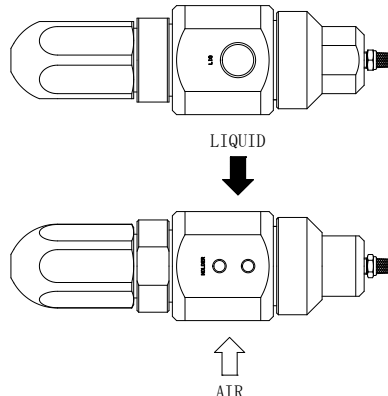
2. Components of Nozzle

(1) Nozzle Assembly

Air Consumption Code:
37II, 55II, 75II, 110II

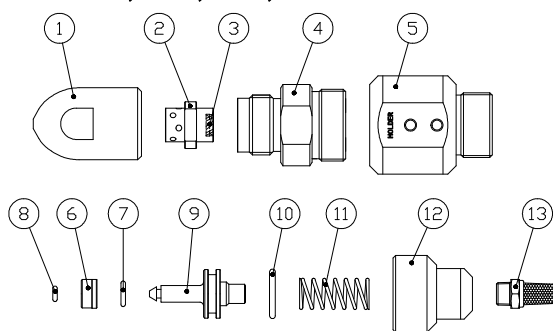


Air Consumption Code:
150II, 220II

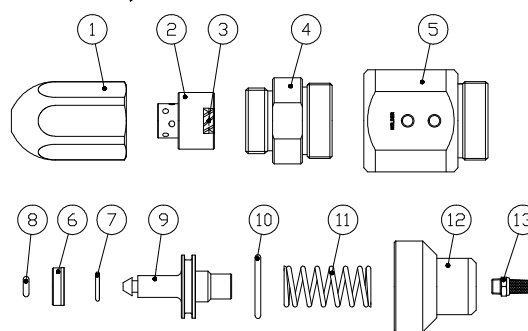


(2) Component Parts and Materials

37II, 55II, 75II, 110II



150II, 220II



Part No.	Component	Material	Remark	Part No.	Component	Material	Remark
1	Nozzle Tip	S316L	Consumable	8	O-ring	FKM	Consumable
2	Nozzle Core	S316L	Consumable	9	Piston	S303	
3	Whirler	S316L equiv.	Consumable	10	O-ring	FKM	Consumable
4	Nozzle Adaptor	S303		11	Spring	S304	
5	Adaptor	S303		12	Spring Cap	S303	
6	Piston Guide	S303		13	Silencer	Brass, etc.	Consumable
7	O-ring	FKM	Consumable				

Table 1. O-ring size (depends on nozzle air consumption code)

	37II, 55II	75II, 110II	150II, 220II
O-ring (#7)	P7	P10A	P14
O-ring (#10)	P16	P22A	P34

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 or other parts is found and/or nozzle performance significantly deteriorates.

(2) Dimensions and materials may differ depending on product codes.

(3) In the material code, "S" represents "stainless steel".

For example, S303 stands for stainless steel 303.

(4) The silencer (part #13) is used to prevent dust or foreign particles from entering the spring cap (#12). Regularly clean the surface of the silencer to avoid blockage.

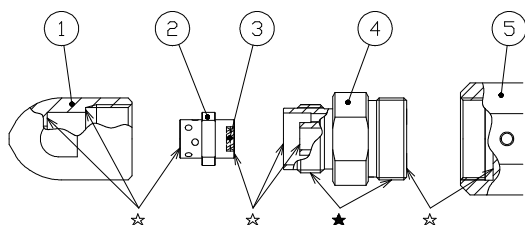
3. Disassembly

- (1) Hold the adaptor (#5) in a milling vice and unscrew the nozzle adaptor (#4) with a spanner. Then unscrew the nozzle tip (#1) with a spanner to take out the nozzle core (#2).

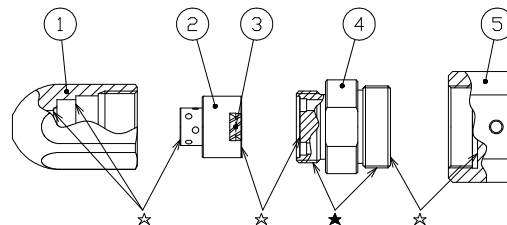
Necessary tools:

Milling vice, spanners (see Table 2 below for spanner size)

Air Consumption Code:
37II, 55II, 75II, 110II



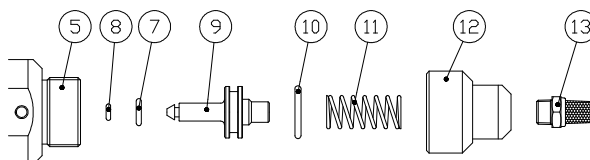
Air Consumption Code:
150II, 220II



- (2) Hold the adaptor (#5) in a milling vice and unscrew the spring cap (#12) with a spanner to take out the spring (#11), piston (#9), and O-rings (#10, #8 and #7). Then, hold the spring cap (#12) in a milling vice and unscrew the silencer (#13) with a spanner.

Necessary tools:

Milling vice,
spanners (see Table 2 below)



If any of O-rings (#7, #8, and #10) is damaged, replace them with new ones.

Note:

- (1) Make sure not to drop, damage or lose any of the small parts.
- (2) The nozzle tip and orifice are the most important and delicate parts. Take extreme care when handling them.

Table 2. Spanner/wrench size

Part	Air Consumption Code of GSIM II Nozzles		
	37II, 55II	75II, 110II	150II, 220II
Nozzle Tip (#1)	27 mm	32 mm	46 mm
Nozzle Adaptor (#4)	30 mm	41 mm	50 mm
Adaptor (#5)	41 mm	50 mm	65 mm
Spring Cap (#12)	21 mm	26 mm	36 mm
Silencer (#13)	12 mm		

4. Assembly

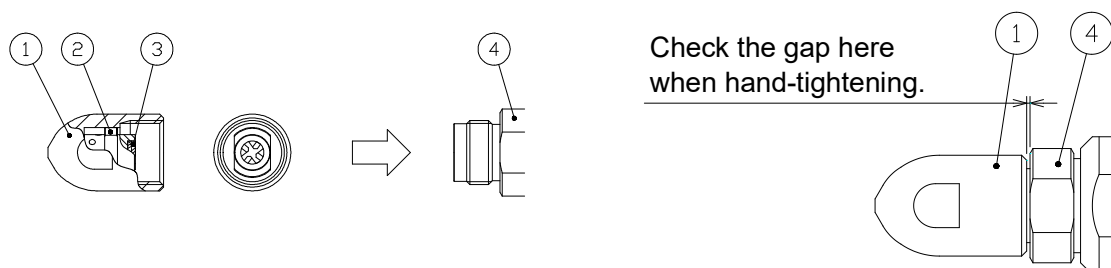
Assemble in the reverse order of the 3. Disassembly.

Procedures for air consumption codes 37II, 55II, 75II, and 110II

Insert the nozzle core (#2) into the nozzle tip (#1), making sure the whirler (#3) faces outward towards the nozzle adaptor (#4). Pay special attention that the nozzle core (#2) is NOT inserted backwards.

Hand-tighten the nozzle tip (#1) into the nozzle adaptor (#4).

Prior to tightening with a spanner, check the gap between the nozzle tip (#1) and the nozzle adaptor (#4). See the note (5) and Table 3 below.



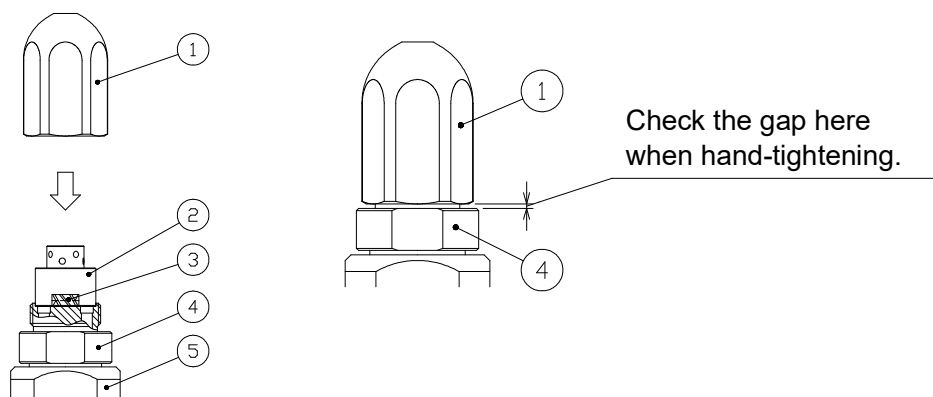
Procedures for air consumption codes 150II and 220II

Hold the nozzle adaptor (#4) in an upright position and insert the nozzle core (#2) into the groove of the nozzle adaptor (#4) as shown in the figure below.

The nozzle core (#2) does NOT fit into the adaptor if the adaptor is turned sideways.

Hand-tighten the nozzle tip (#1) into the nozzle adaptor (#4).

Prior to tightening with a spanner, check the gap between the nozzle tip (#1) and the nozzle adaptor (#4). See the note (5) and Table 3 below.



Note:

- (1) Before assembly, confirm that the sealing surfaces (indicated with ☆ on page 5) and the orifice are clean and undamaged.
- (2) Remove dust and debris carefully from the orifice and sealing surfaces (indicated with ☆ on page 5) with a brush not to damage these important surfaces.
- (3) Always apply anti-seizing agent to the threads (indicated with ★ on page 5) before assembly.
- (4) Grease O-ring (#7), O-ring (#10), and piston (#9).
- (5) Measure the gap between the nozzle tip (#1) and the nozzle adaptor (#4). If the gap measures ± 0.5 mm or more than the specified value below, the parts are assembled incorrectly or the nozzle core is missing. In this case, disassemble, clean the parts, and then reassemble, following the above instructions. Measure the gap again and if the gap is less than ± 0.5 mm of the specified value, tighten everything with a spanner.

Table 3. Specified gap value

37II, 55II	75II, 110II	150II, 220II
1 mm	2 mm	2 mm

The gap must be less than ± 0.5 mm of the above values.

5. Maintenance

Check	Item	Check points
Daily	Spray	Visually check the spray pattern. Confirm that the spray pressure is normal if the nozzles cannot be seen.
	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 orifice.
	Connection	Confirm that nozzle tip, nozzle adaptor, adaptor, and spring cap are screwed tightly.

6. Troubleshooting

Troubles	Probable causes		Solutions
No spray is being created	Control	<ul style="list-style-type: none"> • Controller is not switched on. • Valves are not opened. 	<ul style="list-style-type: none"> • Switch it on. • Open the valves.
	Nozzle	<ul style="list-style-type: none"> • Nozzle or pipe is clogged. • Nozzle or pipe is clogged due to damage. • Liquid orifice and/or air orifice is clogged. • Piston does not work. 	<ul style="list-style-type: none"> • Check and clean the nozzle and pipe. • Replace the damaged part. • Clean the clogged part. a) Increase the compressed air pressure to 0.2 MPa or higher. b) If (a) is not effective, change the pipe and solenoid valve to larger ones to supply an enough amount of air. c) Replace the worn-out O-ring. d) Clean the silencer.
Air leaks Liquid leaks	<ul style="list-style-type: none"> • Dust/foreign particles adhered to the piston and/or sealing surface. • Damage or wear on the piston, O-ring, or the sealing surface. (Sealing surfaces are indicated with ☆ on page 5.) • The spring is missing. 		<ul style="list-style-type: none"> • Disassemble and clean the inside of nozzle. • Replace the part. • Set the spring.
	<ul style="list-style-type: none"> • Some parts are loose or not tightened. 		<ul style="list-style-type: none"> • Tighten the connections.
	<ul style="list-style-type: none"> • Nozzle or pipe is cracked. • Nozzle or pipe is corroded. 		<ul style="list-style-type: none"> • Replace the cracked part. • Replace the corroded part.
Intermittent spray	<ul style="list-style-type: none"> • Seal failure between the nozzle tip, nozzle core, whirler, nozzle adaptor and adaptor (air or liquid leaks due to dust/foreign particles adhered or damage on the sealing surface). • O-ring is damaged. • Seal failure between the piston and O-rings. 		<ul style="list-style-type: none"> • Clean the sealing surface. Replace the part. • Replace O-ring. • Disassemble and clean the part before re-assembly.
Irregular spray pattern	<ul style="list-style-type: none"> • Nozzle or pipe is clogged. • Nozzle is corroded. • Dust or foreign particles have adhered to the orifices. 		<ul style="list-style-type: none"> • Check and clean the nozzle and pipe. • Replace the corroded part. • Clean the part.

7. Disposal

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

8. Inquiries

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

H. IKEUCHI & CO., LTD.
Daiichi Kyogyo Bldg., 1-15-15, Awaza, Nishi-ku,
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