

Instruction Manual

Products: Spray Nozzles
KB Series

1/4M KB * CV-RW**
1/4M KB *N CV-RW**
(KB Series with Check Valve)

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 (100°C).

(2) Installation Instructions

- Be sure to flush the pipes before installing the nozzle to remove any dirt and foreign matter.
- It is recommended to use optional O-ring P11 when connecting the nozzle to the pipe. However, if the applied pressure is 0.5 MPa or less, the nozzle can be used without O-ring. In such cases, use metal seals or apply sealant to the threaded part.
When using an adaptor from our product line, the necessity of an O-ring depends on the specific adaptor used. Refer to the optional parts assembly on page 3 for more information. For further details, contact our sales representative.
- Avoid installing the nozzle immediately on or after a bend in the pipe or an elbow. Turbulence may affect the nozzle performance.
- Install the nozzle with a tightening torque of 10 N·m.

(3) Operation

- Start spraying at a water pressure of 0.05–0.1 MPa to avoid water hammer and then gradually increase to operating pressure.
- After spraying chemical solution, spray clean water for a while to clean the nozzle orifice and the inside of the nozzle.
- To prevent the nozzle from clogging, install filters or use a water treatment system, depending on the water quality.

(4) Handling Instructions

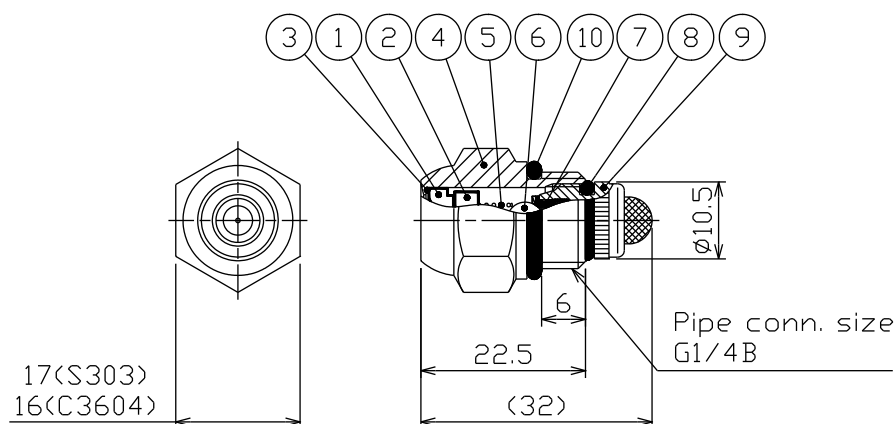
- Do not damage or scratch the nozzle.
- Do not poke the ceramic parts including nozzle orifice with nails, metal pins or other hard objects.
- Do not apply any strong force, shock or vibration to the nozzle.
- The maximum allowable working pressure is 2 MPa for the KB series without an "N" in the spray capacity code, and 10 MPa for those with an "N". To prevent a water hammer, avoid a sudden increase in liquid pressure.
- Store the nozzle in a clean, dust-free place.

(5) Check Valve

The standard operating pressure for check valves is 0.4 MPa. Since the check valve activation pressure has an error of +/- 0.1 MPa, a supply pressure of 0.5 MPa or higher is required to start reliable spraying.

2. Component of Nozzle

(1) Components and Materials



(Unit: mm)

Note: Shapes may differ depending on nozzle codes.

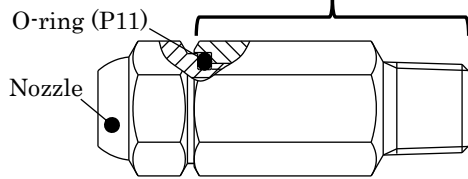
No.	Component	Material*	Remarks
1	Orifice Disc	AL ₂ O ₃ (99%)	Spray capacity code: 063N, 10N, 125N, 16N, 20N, 22N
		Ceramic	Spray capacity code other than above
2	Closer	Polyester elastomer	Spray capacity code: 063N, 10N, 125N, 16N, 20N, 22N
		Ceramic	Spray capacity code other than above
3	Orifice Packing	PTFE	
4	Nozzle Body	S303 or C3604	
5	Spring	S304	
6	Ball	S304	
7	Packing	NBR	
8	O-ring	NBR	
9	Strainer	S303, S304, and S316 or C3604, S304, and S316	Spray capacity code: 063N to 38 (Strainer mesh size: #150, #200)
		S303 and S304 or C3604 and S304	Spray capacity code: 45 to 320 (Strainer mesh size: #100)
10	O-ring (P11)	NBR	Optional

*In our material code, "S" represents "stainless steel". For example, S303 stands for stainless steel 303.

(2) Optional Parts Assembly

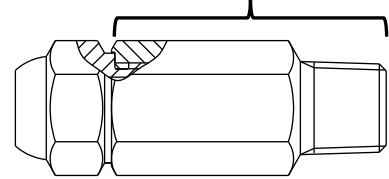
[ID #168846]

1/4M(R)x1/4F(G) KB Adaptor (O-ring required) S303



[ID #1011]

1/4M(R)x1/4F(G) KB Adaptor S303



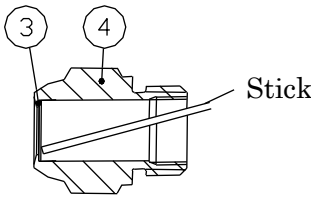
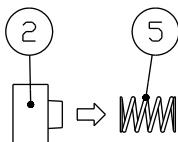
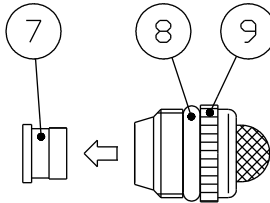
- Adaptor #168846 requires an O-ring for connection, while adaptor #1011 does not due to their different internal structures. Use adaptor #168846 when operating at pressures above 0.5 MPa. (Note: These adaptors do not include O-ring P11.)
- We also offer the 13AKB Adaptor and Two-way Adaptor, both requiring an O-ring for connection.

3. Disassembly

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.

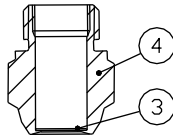
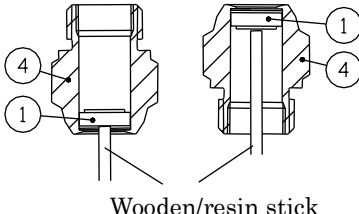
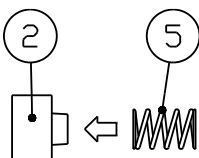
No.	Procedure	Diagram	Caution
1	Loosen and remove the strainer (#9). If the strainer cannot be removed by hand, hold the knurled portion of the strainer (#9) with pliers to loosen it.		Be careful not to dent or damage the strainer mesh.
2	Turn the nozzle body (#4) over into a clean container and remove the internal parts.		Be careful not to lose any parts.
3	If the orifice disc (#1) is stuck inside the body (#4), straighten it out by using a small straight, not too hard stick (bamboo skewer, toothpick or such) and then remove it.		Do not use metal rods, nails, needles, or other hard sticks as those may chip/crack the orifice disc (#1).

Note: Shapes may differ depending on nozzle codes.

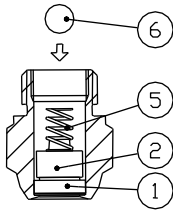
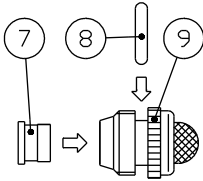
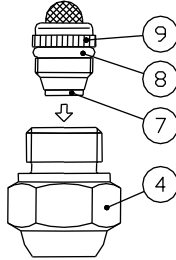
No.	Procedure	Diagram	Caution
4	If the orifice packing (#3) is stuck to the nozzle body (#4), carefully dislodge it with a small, not too hard stick (bamboo skewer, toothpick, or such).		Do not use metal rods, nails or needles as they may damage the sealing surface of the packing (#3) and nozzle body (#4), resulting in water leakage. Since the packing is as thin as 0.3 mm, be careful not to damage it. Replace any bent or deformed packing with new ones to prevent water leakage.
5	Detach the spring (#5) from the closer (#2).		
6	Remove the packing (#7) from the strainer (#9).		The O-ring (#8) cannot be removed intact due to the depth of the O-ring groove in the strainer (#9). If it is necessary to replace the O-ring, cut it with a cutter and then take it out.

Note: Shapes may differ depending on nozzle codes.

4. Reassembly

No.	Procedure	Diagram	Caution
1	Insert the orifice packing (#3) into the nozzle body (#4). Make sure it is set all the way at the bottom.		Packing (#3) can get caught and stuck at an angle on the way down the nozzle body (#4).
2	Insert the orifice disc (#1) into the nozzle body (#4), using a wooden or resin stick to push it straight up.		Pay attention to the orientation of the orifice disc (#1). If the orifice disc (#1) gets stuck, correct it carefully with a wooden/resin stick from the front or back. Do not use a metal rod, nail, needle or such as it can damage the orifice disc (#1).
3	Attach the spring (#5) to the closer (#2).		

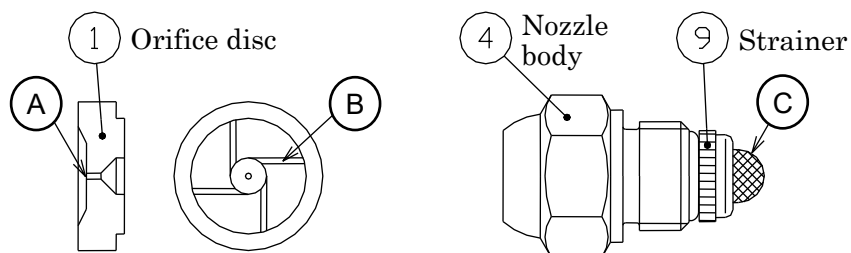
Note: Shapes may differ depending on nozzle codes.

No.	Procedure	Diagram	Caution
4	Put the closer (#2) with spring (#5) on the orifice disc (#1), and set the ball (#6) on the spring (#5).		
5	Attach the packing (#7) and O-ring (#8) to the strainer (#9).		O-ring (#8) will remain attached if not removed during disassembly.
6	Hand tighten the strainer (#9) with the packing (#7) and O-ring (#8) onto the nozzle body (#4). (Reference tightening torque: 0.2 to 0.5 N·m)		Dust on the packing (#7) or O-ring (#8) may cause water to drip from the nozzle when spraying is stopped.

Note: Shapes may differ depending on nozzle codes.

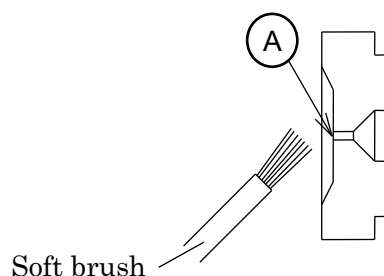
- If water leaks during spraying, the orifice packing (#3) may be broken, missing or dirty.
- If water drips after the nozzle has been shut off, the packing (#7) or O-ring (#8) may be damaged, missing or dirty.

5. Maintenance

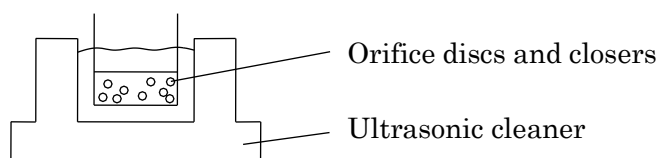


(1) Clogging

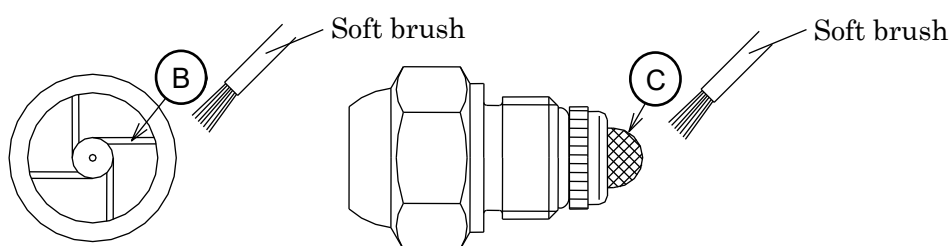
- Any deposits on the outlet side (A) of the nozzle orifice may disturb the spraying. Clean with compressed air or a soft brush to remove any dirt.



- Use a small ultrasonic cleaner for frequent cleaning or cleaning large quantities of nozzles. Disassemble the nozzle, then clean the orifice disc (#1) and closer (#2).



- Remove any dirt/deposits on the liquid inlet side (B) and (C) as well, using compressed air, a soft brush or such.



Note: Shapes may differ depending on nozzle codes.

6. Troubleshooting

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

Problem	Possible reason	Solution
Nozzle not spraying	Liquid pressure is too low.	Check the pressure in the pipe and apply the proper pressure.
	Nozzle and/or strainer (#9) is clogged.	Clean with ultrasonic cleaner and air blower.
Water dripping from the nozzle	Liquid pressure is too low.	Check the pressure in the pipe and apply the proper pressure.
	Dust/foreign matter adhered to the nozzle orifice	Clean with ultrasonic cleaner and air blower.
	Residual pressure remains in the piping.	Take measures to remove residual pressure, such as securing a bypass for residual pressure removal.
	Packing (#3) for orifice is not in place.	Set the orifice packing (#3).
Does not form a hollow cone spray pattern	Liquid pressure is too low.	Check the pressure in the pipe and apply the proper pressure.
	Orifice disc (#1) is clogged at (A) and/or (B) shown on page 6.	Clean with ultrasonic cleaner and air blower.
Straight line spray (not forming a hollow cone spray)	Orifice disc (#1) is installed backwards.	Disassemble the nozzle and install it correctly.
	Closer (#2) is not included or closer used is not correct.	Ensure closer (#2) is installed correctly.

7. Replacement Parts

- Each part is sold separately. To order, please contact your supplier with the nozzle code and part number.
- Appearance and dimensions of parts may vary depending on the nozzle code.

8. Warranty

There is a one year warranty from the date of our 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 nozzles.