Manual No. AE-SETO_231001E

Humidifiers

AKIMist®"E"

SETO 05B, 075B

Instruction Manual

CONTENTS

"The Fog Engineers"
H. IKEUCHI & CO., LTD.

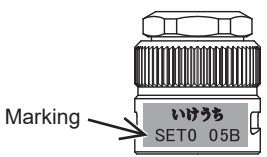
1 Introduction

Thank you for purchasing the AKIMist "E" Humidifier with SETOJet nozzles.

Please read this Instruction Manual carefully for information about the construction and use of the AKIMist "E" Dry Fog Humidifier in order to ensure optimal performance.

After reading, please keep this manual close to the AKIMist "E" system for easy reference.

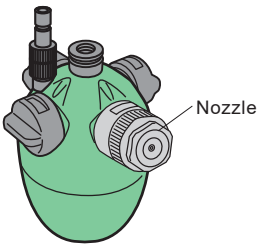
AKIMist "E" SETOJet Version has two types of SETOJet nozzles, SETO 05B and SETO 075B, with either SETO 05B or SETO 075B marked on the nozzle adaptor. Confirm the nozzle type mounted on your AKIMist "E" before use.



2 List of Enclosed Items

★Check that all the items below are enclosed.

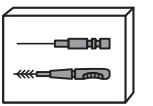
AKIMist "E"



Liquid Coupler (Socket)

This socket will be included in the optional pipe connection kit if you purchased it.

Special Cleaning Kit



Pages 16–17 show how to use this cleaning kit.
Specify the code #421901 to order the cleaning kit.

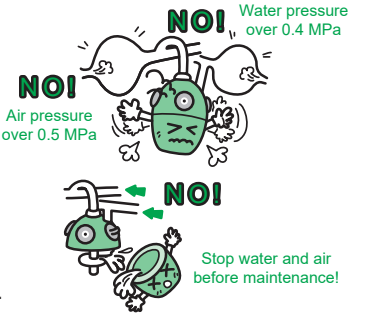
- The number of nozzles mounted differs by AKIMist "E" model No.
  - · AE-1: Nozzle 1 pc.
  - · AE-2: Nozzles 2 pcs.
  - · AE-3: Nozzles 3 pcs.
  - · AE-4: Nozzles 4 pcs.
- 3 stop plugs are included with each AKIMist "E" unit.
- Protective caps are placed on the air and water inlets of the AKIMist "E" to prevent damage during shipment. Please remove before use.

3 Precautions

WARNING

Keep air pressure at 0.2–0.5 MPa (29–73 psi) and water pressure at 0.05–0.4 MPa (8–58 psi).

AKIMist "E" may detach from pipes under high pressure. Use a pressure regulator to keep the air pressure within the appropriate operating range.
Water may leak under high pressure. Use a pressure regulator to keep the water pressure between 0.05–0.4 MPa.
The recommended setting is at approximately 0.1 MPa.
(Please see page 34 Water pressure range.)



WARNING

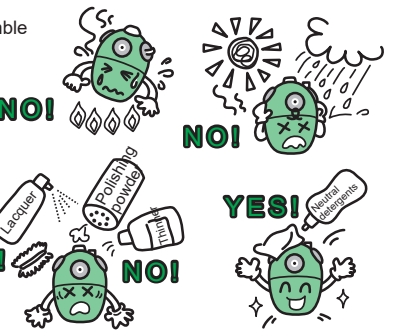
Never disassemble while air and water valves are open.

Before disassembling, close both air and water valves.
If water valve is open, water will leak. It is dangerous to disassemble while air and water valves are open.

WARNING

Never use under the following conditions.

Temperature exceeding 60°C (140°F)
Direct exposure to sun or rain



WARNING

Clean AKIMist "E" with soft cloth and neutral detergents.

Never use a scrubbing brush, polishing powder, lacquer, or thinner.

WARNING

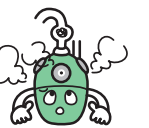
Make sure stop plugs ⑦' are properly fixed to the upper body ① and never remove them during operation.

If the plug ⑦' is loose, air leaks and AKIMist "E" may not function properly. (Note: No Plug ⑦' for AE-4.)

CAUTION

If one of the SETOJet nozzles is clogged, the other nozzles may not spray properly.

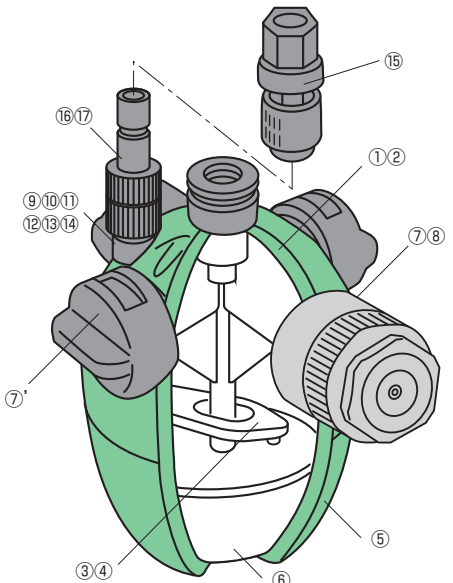
Clean SETOJet nozzles as shown on pages 15–19.



CAUTION

Never disassemble AKIMist "E" except for maintenance.

4 Construction and Components

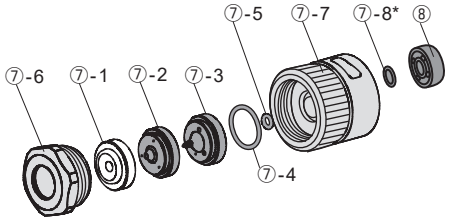


Note: No Stop Plugs are included for AE-4.

No.	Description	Materials	Code No.
①	Upper Body	PP, S303	#208638 [①–④]
②	Top Cover	PP	
③	Valve Lever	PP	
④	Lever Pin	S304	
⑤	Lower Body	PP	#205890
⑥	Float	PP	#205888
⑦	SETO 05B or SETO 075B nozzle	See next page	05B: #420498 075B: #420977
⑦'	Stop Plug	PPS	#208662
⑧	Packing for Body	FKM	#243353
⑨	Needle Valve	S303	#208642 [⑨+⑩]
⑩	Valve Seat	NBR	
⑪	Liquid Nipple	S303	#214724
⑫	O-ring	NBR	#211782
⑬	Strainer Holder	S303	#269608
⑭	Strainer Screen	S316	#17973
⑮	Liquid Coupler (Socket)	POM, S304, NBR	#15778
⑯	Liquid Coupler (Plug)	S303	#216627 [⑯+⑰]
⑰	O-ring	NBR	

Materials S303/S304/S316's "S" means stainless steel in this manual.

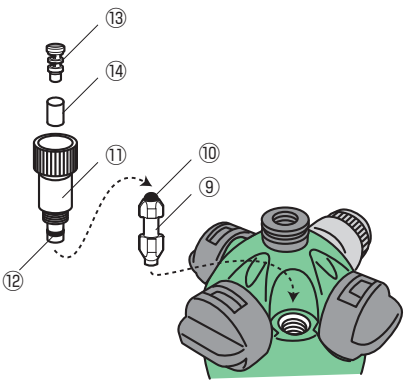
SETOJet Nozzle Assembly (Part No. ⑦)



*Strainer ⑦-8 is pressed in Nozzle Adaptor ⑦-7 and is not detachable.

No.	Description	Materials	Code No.
⑦-1	Purge Cap	PTFE	Nozzle Tip Set [⑦-1–⑦-3] 05B: #423032 075B: #423105
⑦-2	Nozzle Body	S303	
⑦-3	Nozzle Tip	S303	
⑦-4	O-ring (S14)	FKM	#200902
⑦-5	O-ring (S3)	FKM	#211771
⑦-6	Cap	PVC	#420505
⑦-7	Nozzle Adaptor	PVC	[⑦–7+⑦-8] 05B: #423033 075B: #423106
⑦-8	Air Strainer	S304	
⑧	Packing for Body	FKM	#243353

Nipple and Valve Assembly (Parts Nos.⑨–⑭)



5 Before Installation

1. Ensure there is enough compressed air

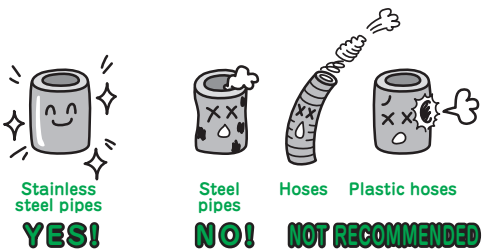
AKIMist "E" with one SETOJet nozzle consumes about 45–60 L/min, Normal of compressed air.
Supply enough compressed air to produce a very fine fog, in order to avoid wetting of floor and machines.

2. Use stainless-steel pipes

Never use pipes that may rust, or nozzles will clog.

3. Use clean air and water

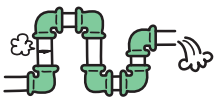
Supply clean air and clean water free of impurities.



CAUTION Make sure there are no loose connections or cracks in pipes and plastic hoses!

4. Select appropriate air pipes

Pipes that are too thin, too long, or have too many bends may cause a loss in air pressure, preventing the creation of a fine fog. For very long and bent pipes, it is recommended to use pipes one size larger, to make up for a drop in pressure.

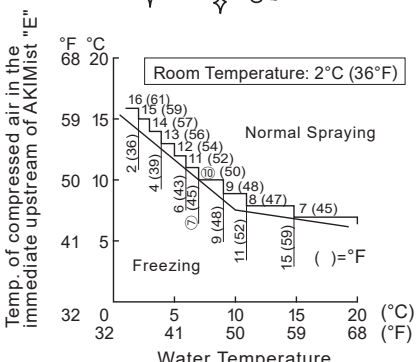


5. Keep piping clean

Rust, dirt and debris clog SETOJet nozzles.
Purge all pipes before use. Purge air pipes with clean water.

6. Prevent nozzle freezing

In a cold environment, the nozzles can freeze because of adiabatic expansion.
Refer to the chart on the right for compressed air and water temperatures to keep the nozzles from freezing when the room temperature is 2°C (36°F).
For example: At a room temperature of 2°C (36°F) and a water temperature of 7℃, the temperature of the compressed air will need to be 10°C or higher to prevent the nozzles from freezing.

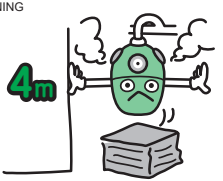


6 Installation

1.For Installation

Layout

WARNING



Make sure no wall or pillar is within four meters (13 ft) in front of spraying nozzles. Nothing should be placed under the AKIMist "E".

Install the AKIMist "E" upright.

As main parts are made of plastic, handle AKIMist "E" gently

WARNING

Do not hold the AKIMist "E" in place with the water hose. The AKIMist "E" should be held in place with the air connection.

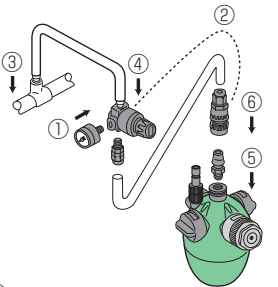
Avoid screwing too tight.

2. Air Line (Connect to the air inlet first.)

WARNING

Mounted in the center on the top is the air inlet (1/4″).
If connected wrong, water will leak from the nozzles.

Connect in this order ①→②→③→④→⑤→⑥.



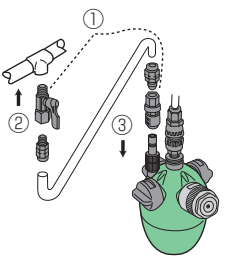
Make sure to attach the regulator in the correct direction

3. Water Line

WARNING

The smaller inlet (1/8″) is for the water supply.

Connect in this order ①→②→③.

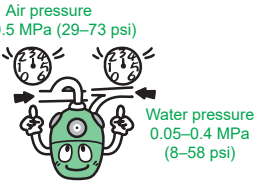


Note:

- Pipe connection kits are optional and available for purchase.
- The instructions above show how to assemble one type of pipe connection kit. For any other pipe connection kits available, please refer to the manual for the specific kit.
- Remove the protective caps from the air and water inlets before installation.

4. Operation

- Keep the air pressure between 0.2–0.5 MPa (29–73 psi).
- Keep the water pressure between 0.05–0.4MPa (8–58 psi).

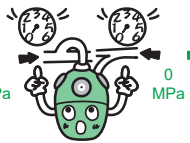


WARNING

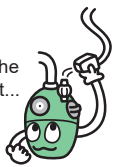
Tap water pressure often increases at night. If the water pressure is over 0.4 MPa, water will leak. Make sure to install a pressure regulator to keep the water pressure below 0.4 MPa (58 psi).

When you detach the AKIMist "E" for maintenance…

... close the air and water valves...



... disconnect the water hose first...



...then disconnect the air hose.

Note: Before re-installing, make sure the air and water valves are closed. First connect the air hose, then the water hose.

5. Storing

The AKIMist "E" should be stored in a dry and dust-free location when not in use for extended periods of time. Before storing, drain the water, disassemble the AKIMist "E" and clean the nozzles, then put it back together.

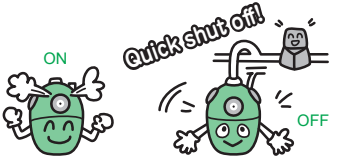
7 Operation

★Inspect equipment periodically!

Perform maintenance on the compressor and air/water purification equipment according to their instruction manual.

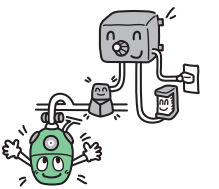
★Quick spray ON/OFF

Install a solenoid valve immediately before the AKIMist "E" for quick ON/OFF.
In case a solenoid valve cannot be installed near the AKIMist "E", install an air relief circuit. See page 25 Selecting Ancillary Devices for an air relief circuit.



★Automatic humidity control!

Install a humidity controller, which maintains the required humidity automatically.



★Direct humidification to desired areas with AE-UT adaptor!

The AE-UT adaptor, available for purchase separately, allows for the spray direction to be adjusted as needed, both horizontally and vertically. It can easily be attached and removed by hand.

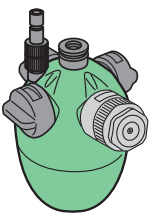
8 Maintenance

WARNING

For safety, close both air and water valves before any maintenance.

★Disconnect the AKIMist "E" from the pipes to perform maintenance in a safe place.

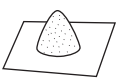
★Tools required for maintenance



AKIMist "E" with SETOJet

Flat-head screwdriver

Soft cloth



Neutral detergent

1. Disassembling AKIMist "E"

① Close the air pressure regulator to stop the air.

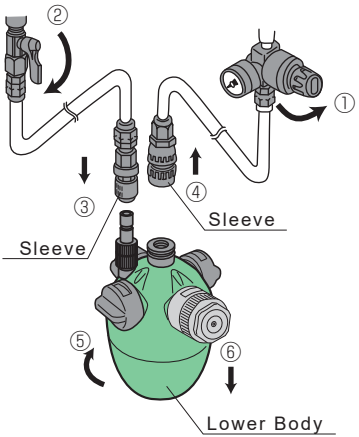
② Close the valve to stop the water.

③ Disconnect the air coupler by pulling the sleeve up.

④ Disconnect the water coupler by pushing the sleeve down.

⑤ Turn the lower portion of body (lower body) clockwise.

⑥ Pull down the lower body.

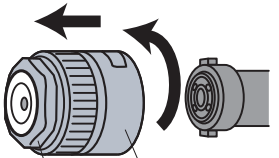


Note:
- For details of connecting/disconnecting the air and water couplers, please refer to the pipe connection kit manual.
- Be careful as the lower body contains water.

<Assembling>

Reverse the disassembly procedure.

2. Cleaning SETOJet Nozzle with Enclosed Cleaning Kit

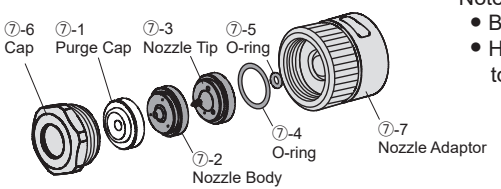


<How to disassemble a SETOJet nozzle>

① Turn the nozzle adaptor ⑦-7 counter-clockwise to detach the nozzle assembly.

② Turn the cap ⑦-6 counterclockwise with a 24 mm spanner to remove it.

③ Disassemble parts ⑦-1 to ⑦-5 by hand.

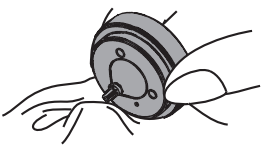


Note:

- Be careful not to lose the small parts.
- Handle the nozzle tip cautiously, ensuring not to hit the top of the nozzle tip.

Open the cleaning kit and take out the needle and brush after step ❶.

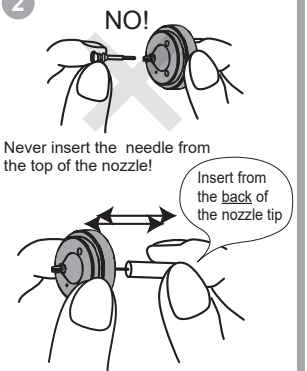
❶



Gently wipe the nozzle tip with a cloth moistened with neutral detergent.

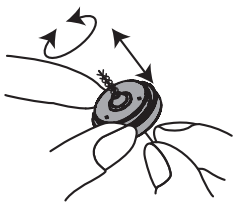
The nozzle tip, especially the extreme tip and orifice, is the most delicate part. Rough handling can damage it and harm the nozzle performance.

❷



Always push the needle through from the back of the nozzle tip to remove dirt and debris, then purge with compressed air.

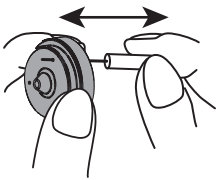
❸



Insert the brush into the nozzle body as shown, twist it inside and push in and out several times to remove dirt and debris. Then, purge with compressed air.

If dirt and debris are hard to remove, wet the brush with neutral detergent and repeat the process.

4



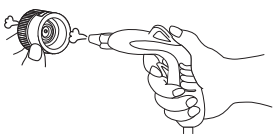
Push the needle through each of the three purge holes of the nozzle body to remove dirt and debris, then purge with compressed air.

5

Gently wipe the purge cap with a cloth moistened with neutral detergent.

Handle the plastic cap with special care, as rough handling may damage it.

6



Clean the nozzle adaptor with compressed air.

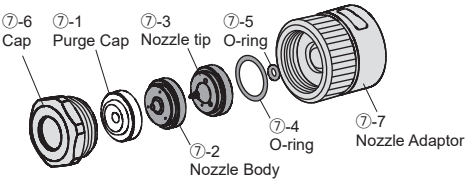
<How to assemble SETOJet nozzle>

First, attach the nozzle tip ⑦-3 to the nozzle body ⑦-2, and attach the purge cap ⑦-1 to them.

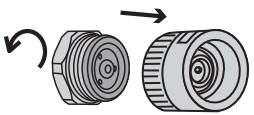
Next, insert them into the cap ⑦-6.

Then, fit the O-rings ⑦-4 and ⑦-5 in the provided grooves of the nozzle tip ⑦-3.

After that, screw the assembled parts ⑦-1 to ⑦-6 into the nozzle adaptor ⑦-7 by hand.



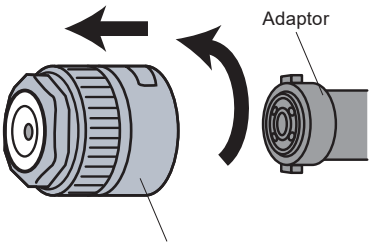
After hand-tightening securely, use a 24 mm torque wrench to tighten the cap ⑦-6 with 1.5 N-m torque.



CAUTION

- The nozzle tip is thin and delicate. Be careful not to hit it on a hard object.
- Do not use a broken or damaged nozzle tip, this will cause coarse atomization and water leakage.
- The tightening torque of 1.5 N-m is equivalent to the force of firm hand-tightening. Use a torque wrench to finish tightening and avoid using any other tools, such as a spanner, to prevent damaging the plastic parts.

3. Cleaning Air Strainer



① Twist SETOJet nozzle counterclockwise to detach it from the adaptor.

② To clean the air strainer ⑦-8 in the nozzle adaptor ⑦-7, wipe off dust with a soft cloth.

Note: The air strainer ⑦-8 is fixed inside the nozzle adaptor ⑦-7 and is NOT detachable.

<How to connect the nozzle to the adaptor>

Fit the grooves of the nozzle over the guides of the adaptor, push the nozzle down, and then twist it clockwise until tight.

4. Component Service Life

Components		Code No.	Estimated Service Life
O-ring S14 for Nozzle	⑦-4	#200902	Two years
O-ring S3 for Nozzle	⑦-5	#211771	
Packing for Body	⑧	#243353	Five years

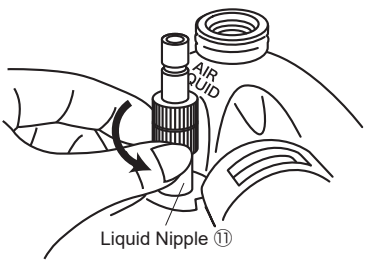
Note:

- Service life varies depending on operational conditions.
- It is recommended to replace parts ahead of the end of service life.

5. Cleaning Water Strainer

AKIMist "E" has a water strainer installed in the liquid nipple.

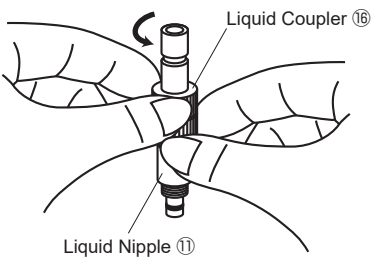
❶ Remove Liquid Nipple.



Hold the humidifier body firmly and turn the liquid nipple ⑪ counterclockwise to remove.

The liquid nipple ⑪ will come off with the liquid coupler ⑯ attached.

❷ Remove Liquid Coupler.



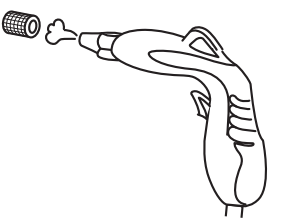
Hold the liquid nipple ⑪ and turn the liquid coupler ⑯ counterclockwise to remove.

❸ Remove Strainer.

With a flat-head screwdriver unscrew the strainer from inside the liquid nipple.

- Outside of strainer screen may be dirty.
- Be careful not to lose strainer.

❹ Clean Strainer Screen.



Purge the strainer screen ⑭ with compressed air or wash with water until clean.

6. Cleaning Liquid Nipple and Needle Valve

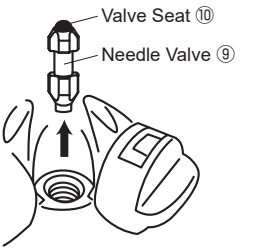
The needle valve is located under the liquid nipple, inside the upper body of the humidifier.

❶ Cleaning Liquid Nipple

Remove any dirt on the thread of the liquid nipple with a tooth-pick and/or compressed air.

Wipe the top part of the liquid nipple, which is in contact with the needle valve, with a soft cloth and purge with compressed air.

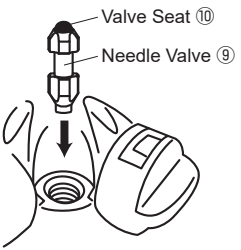
❷ Cleaning Needle Valve



Remove the needle valve, with the valve seat, from the humidifier body for cleaning. Wash with water or wipe with a soft cloth, then purge with compressed air.

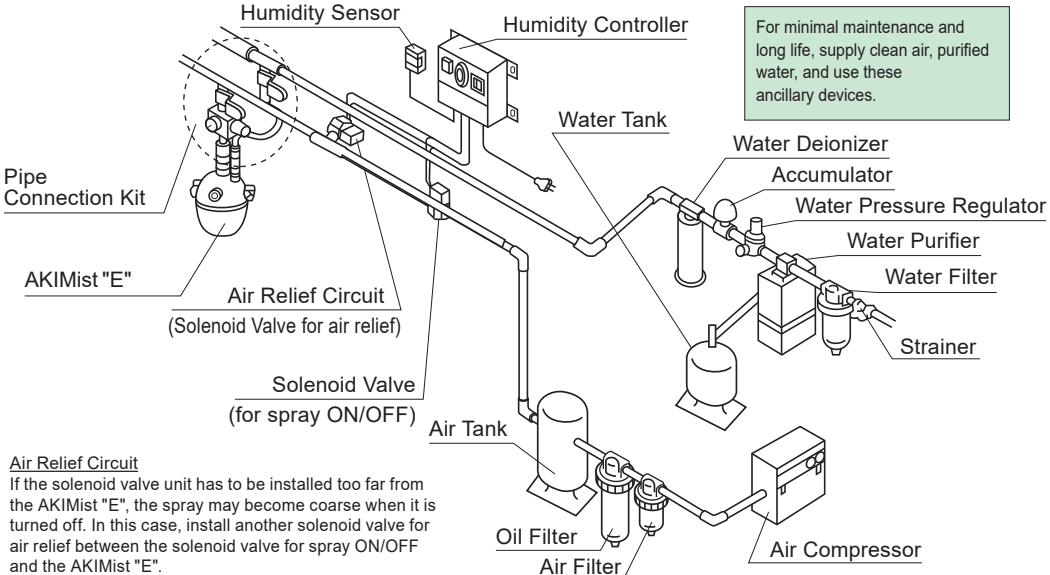
7. Reassembling Water Strainer and Needle Valve

Insert the needle valve, with the valve seat, into the upper body of the humidifier and reverse the disassembly instructions on pages 21 and 22.



Use caution with the needle valve orientation when inserting as shown above.

9 Selecting Ancillary Devices



Air Relief Circuit

If the solenoid valve unit has to be installed too far from the AKIMist "E", the spray may become coarse when it is turned off. In this case, install another solenoid valve for air relief between the solenoid valve for spray ON/OFF and the AKIMist "E".

The solenoid valve for air relief should operate in reverse to the spray-ON/OFF solenoid valve.

☆For easy installation	Pipe Connection Kits We have three types of connection kits: Hanging down type that comes with or without a plate; and Wall mounting type.	Please see pages 29 and 30.
☆Must be installed	・Air Compressor ・Air Filter (Filtration: 0.3 μm) ・Oil Filter (Filtration: 0.3 μm) ・Air Tank ・Water Strainer (150 mesh) ・Water Filter (Filtration: 5 μm) ・Water Pressure Regulator	For supply of clean compressed air. For removal of foreign particles from compressed air. For removal of oil mist, dust and moisture contents from compressed air. For stable air supply. For removal of foreign particles from water. For water filtration. For control of proper water pressure.
☆For easier maintenance	・RO Water Purifier	For removal of calcium, magnesium and silica from water.
☆For high grade purified water	・Water Deionizer (using ion-exchange resin)	For high grade purified water in clean room.
☆For automatic humidity control	・Humidity Controller ・Solenoid Valve Unit	For maintaining desired relative humidity.

10 Ancillary Devices

Humidity Controller

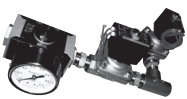
Compact Digital Type (RHC-C11)

- Digital display of present humidity and target humidity.
- Compact size to fit anywhere.
- Includes a humidity sensor.
- Accuracy: ±3%
- Voltage: 100–240 VAC

Humidity Sensor

- For sensing humidity and transmitting a signal to the controller.

Solenoid Valve Unit



2-way solenoid valve unit

3-way solenoid valve unit

- Used with a humidity controller and sensor, it manages compressed air supply to humidifiers and removes residual air from pipes when the air supply stops.

Water Filter

- For removal of foreign particles over 5 µm.
- Available in a variety of sizes

Air Filter

- For removal of moisture contents and dust over 0.3 μm from compressed air to make air clean.
- Available in a variety of sizes

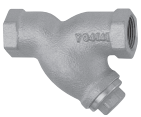
Oil Filter

- For removal of oil mist, dust and moisture contents over 0.3 μm from compressed air with micro-fiber.
- Filter element must be replaced if differential pressure increases to 0.1 MPa.
- Available in a variety of sizes

Water Pressure Regulator

- For control of water pressure.
- Set pressure: 0.01–0.35 MPa

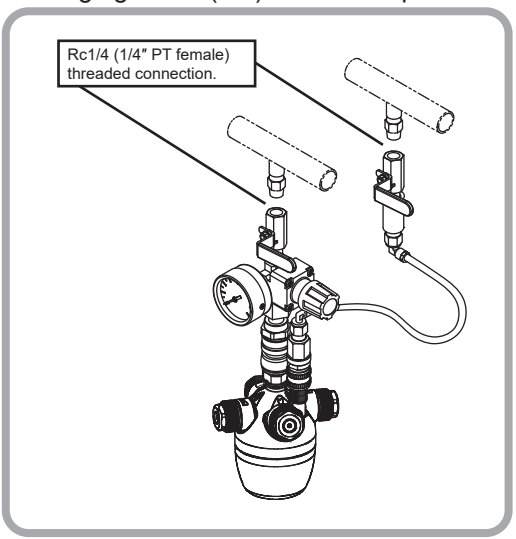
Water Strainer



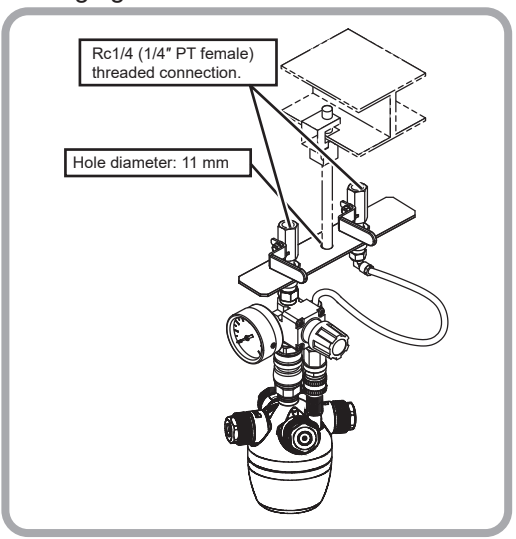
- For removal of foreign particles over 0.1 mm from water. (Mesh size 150)

11 Optional Pipe Connection Kits for Easy Installation

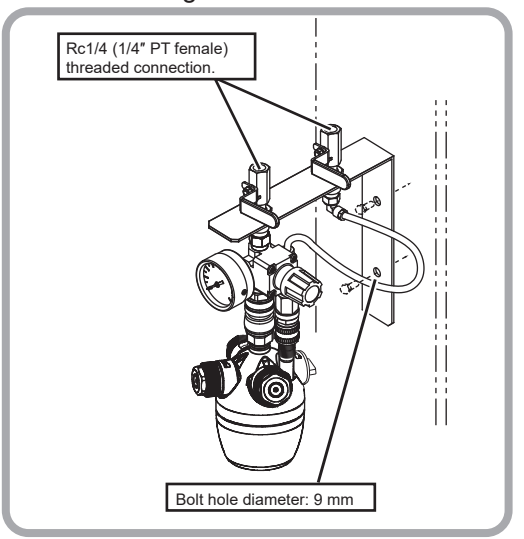
□Hanging-down (NP) Kit without plate



□Hanging-down Kit



□Wall Mounting Kit



12 Troubleshooting

If you have trouble, stop air and water supply and check the following.

Troubles	Probable Causes	Solutions
1. No spray or stops spraying after a short time	1) Air pressure is too low.	Set air pressure to 0.2–0.5 MPa (29–73 psi).
	2) Stop plug ⑦' is loose.	Tighten stop plug ⑦' properly.
	3) Pressure regulator is not functioning properly.	Check flow direction of pressure regulator.
	4) Solenoid valve is not functioning properly.	Check power source, wiring, and flow direction of solenoid valve or replace.
	5) Strainer in liquid nipple is clogged.	Clean strainer screen ⑭ (see p.21–22).
	6) O-rings inside the nozzle are improperly seated.	Fit O-rings ⑦-4 and ⑦-5 correctly or replace (see p.6, 15, 18).
2. Irregular or intermittent spray	7) Nozzle is clogged.	Clean nozzle (see p.15–18).
	8) Packing between nozzle and adaptor is improperly set or worn.	Set packing ⑧ properly or replace.
	9) Nozzle orifice is frozen.	Install air heating equipment.
3. Liquid dripping from nozzle orifice	1) Dust around the nozzle orifice.	Clean the nozzle orifice (see p.15–18).
	2) Liquid pressure is too high.	Reduce liquid pressure below 0.4 MPa [58 psi] (see p.11).
	3) Nozzle tip is deformed.	Replace nozzle tip set. (see p.6, 15, 18).
	4) Solenoid valve is not installed near AKIMist "E".	Install solenoid valve immediately before AKIMist "E", or install an air relief circuit.

Troubles	Probable Causes	Solutions
4. Spray is coarse	1) Air and liquid connection is reversed.	Connect correctly (see p.10).
	2) Stop plug ⑦' is loose.	Tighten stop plug ⑦' properly.
	3) Air piping is inadequate, twisted or throttled.	Make sure the pipe size is correct, and that there are no twists or throttles (see p.8).
	4) Air pressure is too low.	Set air pressure to 0.2–0.5 MPa (29–73 psi).
	5) Air filter on air pipe is clogged.	Clean or replace air filter.
	6) Air strainer ⑦-8 is clogged.	Clean air strainer (see p.19).
	7) Solenoid valve is dirty or clogged.	Clean or replace solenoid valve.
	8) Nozzle tip is deformed.	Replace nozzle tip set (see p.6, 15, 18).
5. Coarse spray/ dripping when stopped	1) Solenoid valve is not installed near AKIMist "E".	Install solenoid valve immediately before AKIMist "E", or install an air relief circuit.
6. Liquid dripping from humidifier body	1) Liquid pressure is too high.	Reduce liquid pressure below 0.4 MPa.
	2) Needle valve ⑨, with valve seat ⑩, not functioning properly.	Make sure the needle valve is set properly, or replace it (see p.24).
	3) Liquid nipple ⑪ is loose.	Tighten liquid nipple properly.
	4) O-rings in inside nozzle are improperly set or worn.	Fit O-rings ⑦-4 and ⑦-5 correctly or replace (see p.6, 15, 18).

If the above solutions do not work, please contact your local distributor.

13 Inspection and Maintenance

Maintain all equipment according to their instruction manuals.

Cycle	Inspection Item	Content
Daily	1) Air pressure gauge	Confirm that air pressure is 0.2–0.5 MPa (29–73 psi) during spraying.
	2) Air filter	Check drain water volume and confirm it is within upper limit.
	3) Solenoid valve	Confirm that ON/OFF control of solenoid valve is working correctly. Also check humidity controller operation at the same time.
Periodical	1) Elements of air filter and oil filter	Clean with neutral detergent once a month.
	2) Element of water strainer	Clean with water and purge with compressed air once a month.
Off-season	1) Purge air and water from pipes	Air and water must be purged at end of usage season.
	2) Elements of air filter and water strainer	Before and after use, wash and purge them with compressed air. Check there is no rust before use.
	3) Purge all pipes	Before and after use, purge them with compressed air.

★Consumable Parts

Components	Estimated service life
Elements of air filter and oil filter	Two (2) years
Element of water strainer	Four (4) years
Diaphragm of pressure regulator	Two (2) years
Plunger of solenoid valve	Five (5) years

14 Specifications

*at air pressure of 0.3 MPa

Model No. (Nozzle type)		Unit	AE-1		AE-2		AE-3		AE-4	
			SETO 05B	SETO 075B	SETO 05B	SETO 075B	SETO 05B	SETO 075B	SETO 05B	SETO 075B
Number of nozzle(s) mounted		*piece*	1		2		3		4	
Dimensions [width x height]		*mm (inch)*	106 × 110 (4.2 × 4.3)		119 × 110 (4.7 × 4.3)					
Weight	Net	*g (lb)*	310 (0.68)		330 (0.73)		360 (0.79)		390 (0.86)	
	Loaded		330 (0.73)		350 (0.77)		380 (0.84)		410 (0.90)	
Spray volume*		*L/hr (GPH)*	2.4 (0.63)		4.8 (1.27)		7.2 (1.90)		9.6 (2.54)	
Air consumption*		*L/min, Normal (SCFM)*	45 (1.68)	60 (2.24)	90 (3.36)	120 (4.48)	135 (5.04)	180 (6.72)	180 (6.72)	240 (8.96)
Air compressor motor power		*kW [per unit]*	0.75	0.75	1.5	1.5	1.5	2.2	2.2	2.2

Max. of 4 SETOJet nozzles can be mounted on one AKIMist "E".

Air Pressure Range

0.2–0.5 MPa (29–73 psi)

- Humidifier's required air pressure. Please use within given pressure range. Exceeding pressure range causes water leaks and coarse, irregular spray.

Water Pressure Range

0.05–0.4 MPa (8–58 psi)

- Humidifier's required water pressure. Please use within given pressure range. Exceeding pressure range causes water leaks and irregular spray.
- Even when set within the given range, supply water pressure may exceed this range due to water and operating conditions. The recommended setting is about 0.1 MPa (15 psi).

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