Manual No. AETN-2_231010E

Dry Fog Humidifiers

AKIMist "E" TN

03C

Instruction Manual

C O N T E N T S

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

1 Introduction

Thank you for purchasing the Dry Fog Humidifier AKIMist "E" TN.

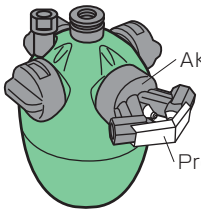
Please read this Instruction Manual carefully for information about the construction and use of the AKIMist Dry Fog Humidifier in order to ensure optimal performance.

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

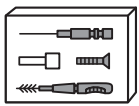
2 List of Enclosed Items

★Check that all items below are enclosed.

【AKIMist "E" TN】



【AKI03C-TN
Special Cleaning Kit】



Page 16 shows how to use this cleaning kit.
To place an order, use the code #243917.

- The number of nozzles mounted differs by AE 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" TN unit.
- Protective caps are placed on the nozzles. Please remove before use.

3 Precautions

WARNING

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

AKIMist "E" TN may detach from pipes under high pressure.
Use a pressure regulator to keep the air pressure within the appropriate operating range.
Liquid may leak under high pressure. Use a pressure regulator to keep the liquid pressure between 0.05–0.4 MPa.
The recommended setting is at approximately 0.1 MPa.

WARNING

Never disassemble while air and liquid valves are open.

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

WARNING

Never use under the following conditions.

Temperature exceeding 60℃ (140˚F)
Direct exposure to sun or rain

WARNING

Clean AKIMist "E" TN 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" TN may not function properly. (Note: No Plug ⑦' for AE-4.)

CAUTION

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

Clean AKIJet nozzle as shown on P.15-19.

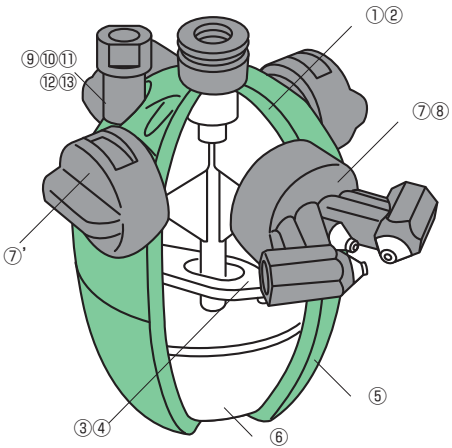
CAUTION

Never disassemble AKIMist "E" TN except for maintenance.

CAUTION

Do not remove nozzle protective caps until installation is completed. They protect the nozzle tips during installation.

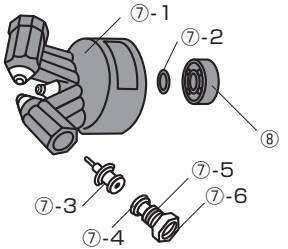
4 Construction and Component Parts



No.	Description	Materials	Code No.
①	Upper Body	PP, Titanium (TB340)	#244227 [①-④]
②	Top Cover	PP	
③	Valve Lever	PP	
④	Lever Pin	Titanium (TB340)	
⑤	Lower Body	PP	#243536
⑥	Float	PP	#205888
⑦	AKIJet 03C Nozzle AKI03C(AE)PPSOPFW-TN	See next page	#243518
⑦'	Stop Plug	PPS	#208662
⑧	Packing for body	FKM	#243353
⑨	Needle Valve	Titanium (TB340)	#244228 [⑨+⑩]
⑩	Valve Seat	FKM	
⑪	Liquid Nipple	Titanium (TB340)	#242080
⑫	O-ring	FKM	#202968
⑬	Filter	PP	#243662

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

AKIJet Nozzle Assembly (Part No.⑦)

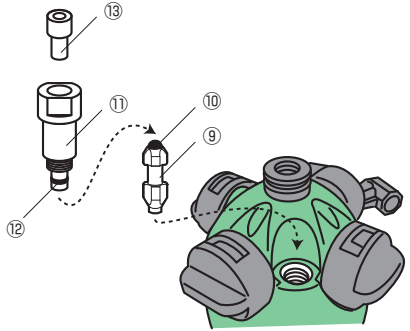


Note: Strainer ⑦-2 is pressed in Nozzle Body ⑦-1 and is not detachable.

No.	Description	Materials	Code No.
⑦-1	Nozzle Body	PPS, OPF-W®*, Titanium (TB340)	#243529
⑦-2	Air Strainer	Stainless steel 304	
⑦-3	Nozzle Tip	OPF-W®*	**Nozzle Tip Set** [⑦-3–⑦-6] #246596
⑦-4	Packing	FKM	
⑦-5	O-ring	FKM	
⑦-6	Hand-screw Plug	PPS	
⑧	Packing for body	FKM	#243353

*OPF-W is the registered trademark of Osakazyushi hanbai Co., ltd.

Nipple and Valve Assembly (Parts Nos.⑨–⑬)



Nozzle Tip Set (⑦-3 to ⑦-6) is supplied in sets of 10 pcs.

5 Before Installation

①Ensure there is enough compressed air

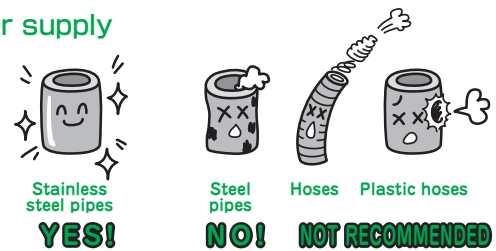
AKIMist "E" TN with one nozzle consumes about
29 L/min, Normal of compressed air.
Supply enough compressed air to produce Dry Fog,
in order to avoid wetting of floor and machines.

②Use stainless-steel pipes for air supply

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

③Use clean air and liquid

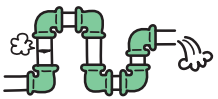
Supply clean air and clean liquid
free of impurities.



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

④Select appropriate air pipes

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

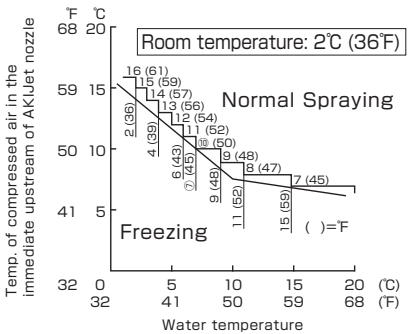


⑤Keep piping clean

Rust, grime and chips clog AKIJet nozzle.
Purge all pipes before use.
Purge air pipes with clean water.

⑥Prevent nozzle freezing

In a cold environment, AKIJet 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℃ (36℉).
For example: At a room temperature of 2℃ (36℉) and a water temperature of 7℃, the temperature of the compressed air will need to be 10℃ or higher to prevent the nozzles from freezing.

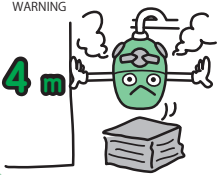


6 Installation

①For 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" TN.

Install the AKIMist "E" TN upright.

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

WARNING

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

Avoid screwing too tight.

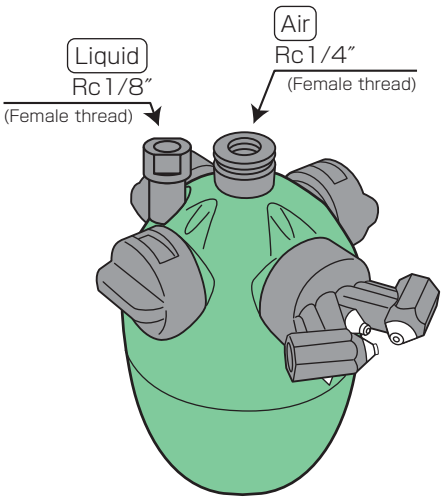
②Installation

Mounted in the center on the top is the air inlet (1/4″).

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

WARNING

If air and liquid connection is reversed, liquid (coarse spray) is spouted out from the nozzles.
Double check that air and liquid are connected correctly.



③Operation

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

When you detach the AKIMist "E" TN for maintenance…

Close both air and liquid valves before disassembling.

④Storing

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

7 Operation

★Inspect equipment periodically!

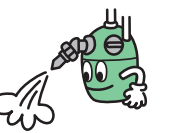
Perform maintenance on the compressor and air/liquid treatment equipment according to their instruction manual.

★Quick spray ON/OFF

Install a solenoid valve immediately before the AKIMist "E" TN for quick ON/OFF.

★Aim Dry Fog at specific area where humidity needs to be raised!

The AE-UT adapter, 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.

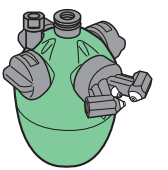


8 Maintenance

WARNING

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

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



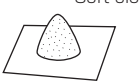
AKIMist "E" TN

★Tools required for maintenance

12 mm spanner (wrench)

Phillips-head screwdriver

Soft cloth



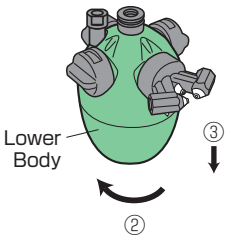
Neutral detergent

①Disassembling AKIMist "E" TN

① Close the valves to stop air and liquid, then disconnect AKIMist "E" TN.

② Turn the lower portion of body (lower body) clockwise.

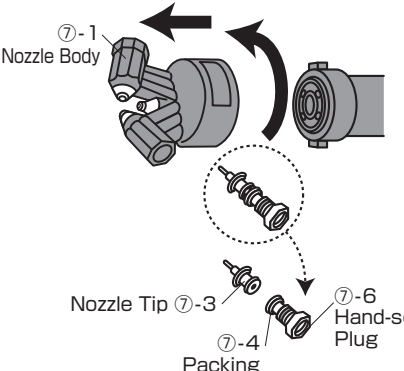
③ Pull down the lower body.



Note:
Be careful as the lower body contains liquid.

<Assembling> Reverse the disassembly procedure.

②Cleaning AKIJet with Enclosed Cleaning Kit



<How to disassemble an AKIJet nozzle>

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

② Turn the hand-screw plug ⑦-6 counterclockwise to remove it.

The nozzle tip ⑦-3 will be removed at the same time.

③ Pull the nozzle tip ⑦-3 off the hand-screw plug ⑦-6 by hand.

Note:

- Be careful not to lose the small parts.
- **The plastic nozzle tip is fragile and must be handled with care. Never hit the top of the nozzle tip with a hard object or on a hard surface.**
- Never remove the packing ⑦-4 from the hand-screw plug ⑦-6, it is impossible to reassemble.

Here is a quick video on cleaning of AKIMist nozzles. ➡

If the problem persists after cleaning, replace the nozzle or nozzle tip set.

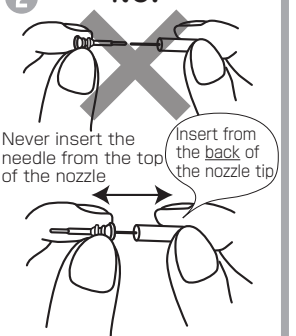
Open the cleaning kit and take out the needle and brush after step ❶.

❶

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

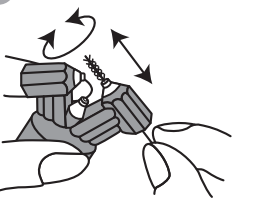
The nozzle tip, especially the extreme tip and orifice, is the most delicate part. Rough handling can damage the plastic tip and harm the nozzle performance.

❷



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

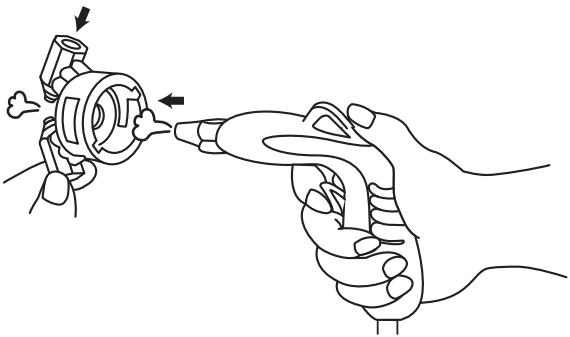
❸



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



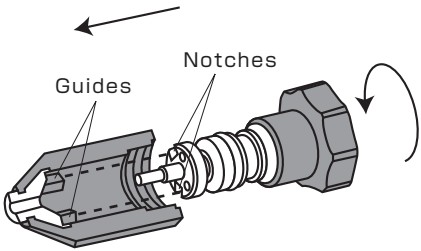
Purge the middle hole and the nozzle tip insertion area with compressed air.

<How to assemble AKIJet nozzle>

First attach the nozzle tip ⑦-3 to the plug ⑦-6, and screw them into the nozzle body ⑦-1.

Make sure the two notches of the nozzle tip slide over the guides inside the nozzle body, then screw it in.

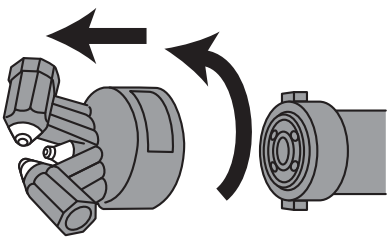
If the nozzle tip does not fit, stop twisting, reassemble and try again.



CAUTION

- The nozzle tip is made of very thin plastic. Be careful not to hit it on a hard object or surface.
- If there seems to be resistance or something inside the nozzle body, stop screwing, pull out the nozzle tip, and clean the nozzle body again. Do not force the nozzle tip in.
- Do not use a broken or damaged nozzle tip, this will cause coarse atomization and liquid leakage.

③Cleaning Air Strainer



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

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

Note:
The air strainer ⑦-2 is fixed inside the nozzle body ⑦-1 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.

④Component Service Life

Components		Code No.	Estimated Service Life
Packing for Nozzle	⑦-4	#208659	Two years
O-ring for Nozzle	⑦-5		
Hand-screw Plug	⑦-6		
FKM 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.
- Parts ⑦-4, ⑦-5, and ⑦-6 are sold as one component (Code #208659).

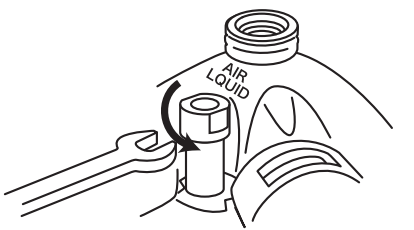
⑤Replacement of Filter

AKIMist "E" TN has a filter ⑬ installed in the liquid nipple ⑪.

When flow becomes partially clogged, replace the filter.

Dedicated cleaning kit (enclosed) includes a spare filter and a screw. Use the screw to remove and insert the filter.

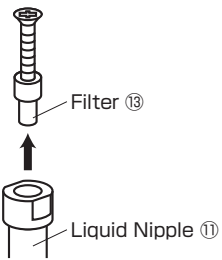
❶ Remove Liquid Nipple.



Hold the humidifier body firmly and turn the liquid nipple counterclockwise with a spanner to remove it.

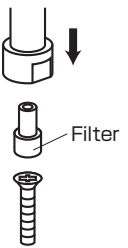
❷ Remove Filter.

Using a Phillips-head screwdriver, screw in the provided screw into the filter by 2–3 turns.



Hold the screw with pliers and pull out the filter.

❸ Insert Filter.



Place a new filter on the head of the screw and push the liquid nipple down to fit.

⑥Cleaning Liquid Nipple and Needle Valve

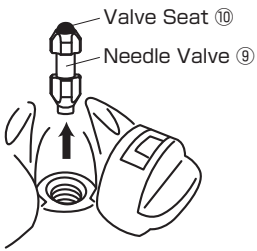
The needle valve is located under the liquid nipple, inside the upper body of the humidifier.

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.

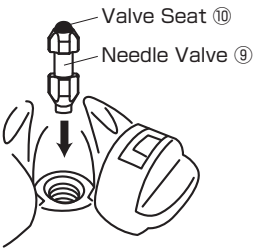
❷ Cleaning Needle Valve



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.

⑦Reassembling Needle Valve and Liquid Nipple

Insert the needle valve, with the valve seat, into the upper body of the humidifier before attaching the liquid nipple.



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

9 Troubleshooting

If you have trouble, stop air and liquid 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 at 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) Filter ⑬ in liquid nipple ⑪ is clogged.	Replace Filter ⑬. (See p.21-23)
2. Irregular or intermittent spray	6) Packing ⑦-4 inside the nozzle is improperly seated.	Replace a set of Part# ⑦-4-⑦-6 (CODE #208659). (See p.6, 15-18, 20)
	7) Nozzle ⑦ 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" TN.	Install solenoid valve at immediate before AKIMist "E" TN, 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 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 at 0.2-0.5 MPa (29-73 psi).
	5) Air filter on air pipe is clogged.	Clean or replace air filter.
	6) Air strainer ⑦-2 is clogged.	Clean or replace air strainer (see p.19).
	7) Solenoid valve is clogged.	Clean or replace solenoid valve.
	8) Nozzle tip is deformed.	Replace nozzle tip set. (See p.6,15,18)
5. Coarse spray or liquid dripping when stopping	1) Solenoid valve is not installed near AKIMist "E" TN.	Install solenoid valve at immediate before AKIMist "E" TN, 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 [58 psi] (see p.11).
	2) Needle valve ⑨, with valve seat ⑩, not functioning properly.	Make sure the needle valve is set properly, or replace it (see p.25).
	3) Liquid nipple ⑪ is loose.	Tighten liquid nipple properly.
	4) O-ring ⑦-5 in inside nozzle is improperly set or worn.	Replace nozzle tip set. (See p.6,15,18)

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

10 Maintenance and Inspection

Maintain all equipment according to their instruction manuals.

Inspection Cycle	Inspection Item	Content
Daily	1) Air pressure gauge	Confirm that air pressure is 0.2–0.5 MPa (29–73 psi) when spraying.
	2) Air filter	Check drain water volume and confirm it is within upper limit.
Periodical	1) Elements of air filter and oil filter	Clean with neutral detergent once a month.
Off-season	1) Purge compressed air and liquid from pipes	Air and liquid must be purged at end of usage season.
	2) Elements of air filter	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
Diaphragm of pressure regulator	Two (2) years
Plunger of solenoid valve	Five (5) years

11 Specifications

Model No.		AE-1	AE-2	AE-3	AE-4
		(03C) TN	(03C) TN	(03C) TN	(03C) TN
Number of nozzle(s) mounted		1	2	3	4
Dimensions (width x height)		109x110 mm (4.3″x4.3″)	125x110 mm (5.0″x4.3″)		
Mass	Net	230 g (0.50 Lb)	240 g (0.53 Lb)	250 g (0.55 Lb)	260 g (0.57 Lb)
	Loaded	250 g (0.55 Lb)	260 g (0.57 Lb)	270 g (0.60 Lb)	280 g (0.62 Lb)
Spray volume at air pressure of 0.3MPa (44psi)		2.4 L/hr (0.63 GPH)	4.8 L/hr (1.27 GPH)	7.2 L/hr (1.90 GPH)	9.6 L/hr (2.54 GPH)
Air consumption at air pressure of 0.3MPa (44psi)		29 L/min, Normal (1.08 SCFM)	58 L/min, Normal (2.16 SCFM)	87 L/min, Normal (3.24 SCFM)	116 L/min, Normal (4.32 SCFM)
Motor power of air compressor per unit		0.4 kW	0.75 kW	1.5 kW	

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

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 coarse, irregular spray.

Liquid Pressure Range

0.05–0.4 MPa (8–58 psi)

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

MEMO

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