Manual No.NKG130452-3E

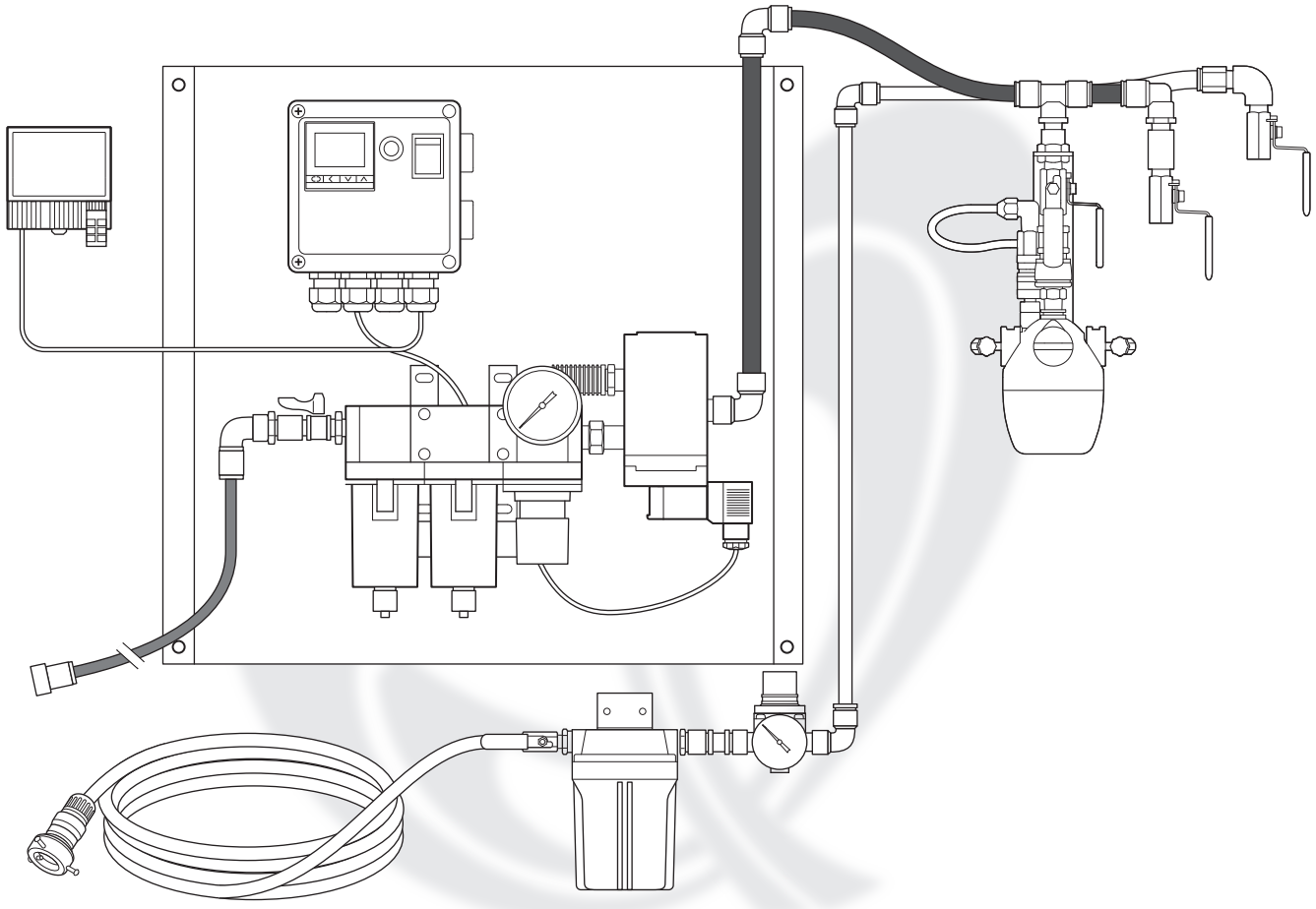
Dry Fog Humidification Kit

AE-KIT

Instruction Manual

Wall-mounting Type

Please also refer to the enclosed Instruction Manuals
on RHC-C11 Humidity Controller and AKIMist® Dry Fog Humidifier.



"The Fog Engineers"
いけうち H. IKEUCHI & CO., LTD.

CONTENTS

For safe operation

Please read carefully

Thank you for purchasing IKEUCHI's Dry Fog Humidification Kit "AE-KIT".
AE-KIT is comprised of the Control Unit, Nozzle Unit (Dry Fog Humidifier Unit), Water Unit and Piping Unit.
Before use, please read this manual thoroughly and follow the instructions when using this product.
Please also read the enclosed Instruction Manuals on RHC-C11 Humidity Controller and AKIMist® Dry Fog Humidifier when necessary.

Keep this manual in a handy place for quick reference.
Safety precautions in this manual are classified as "Warning" or "Caution".

WARNING ⚠ Improper operation may possibly result in severe injury or death.

CAUTION ⚠ Improper operation may possibly result in mild to moderate injury as well as physical damage to the unit.

Violation of the terms written in the cautions and warnings may lead to severe consequences depending on the conditions.
The contents of these warnings and cautions are critically important.
Please strictly adhere to the operating instructions and use this product in a safe manner.

WARNING ⚠

Are you using the proper power source and voltage?
This product can not be used at the supply voltage other than the rated supply voltage specified in the power source label on the solenoid valve. If the product is used with any other voltage, it may cause a serious accident such as fire or damage to the product.

Check the compressor capacity.
This product requires a compressor that draws 0.4−0.8 kW supplying 29−58 L/min (Normal) at air pressure 0.3 MPa per Nozzle Unit. Confirm the capacity of compressor before use.

Install electrical wiring securely.
Beware of electric shorting at any slack or exposed wiring at the terminals.

Install breakers (ground fault circuit interrupter and circuit breaker) between the Control Unit and the electrical junction box.
This reduces the possibility of an electric short. (We ask that customers provide breakers.)

Do not touch the inside of the Control Unit except for the purpose of making electrical connections during installation.
There is risk of electric shock. When making electrical connections, be sure to turn off the breakers.

CAUTION ⚠

Mount the unit securely.
Unstable mounting can lead to dropping and/or damage of the unit.

Use careful consideration when choosing a mounting point for the Humidity Sensor.
Do not mount the Humidity Sensor in places with organic solvents, acids, alkali(bases), and/or oils.
This can increase degradation and shorten the lifespan of the sensor.
Also avoid putting the sensor in places where water leaks and/or condensation occur.
To prevent malfunction due to noise, do not set up the product in the place where induction load or electromagnetic interference occurs.

Use careful consideration when choosing a mounting point for the Nozzle Unit.
Do not use the Nozzle Unit in hot or cold environments. Do not expose to direct sunlight or rain.

When cleaning the unit, please use a neutral detergent and a soft cloth.
Do not use organic solvents, polishing powder or scrubber brushes. Discoloration or scratching may result.

Keep the Humidity Sensor filter clean.
If the humidity sensor filter becomes dirty, it can lead to errors in sensed values and operation.
Clean the filter frequently. If the filter cannot be cleaned, replace it with a new filter.

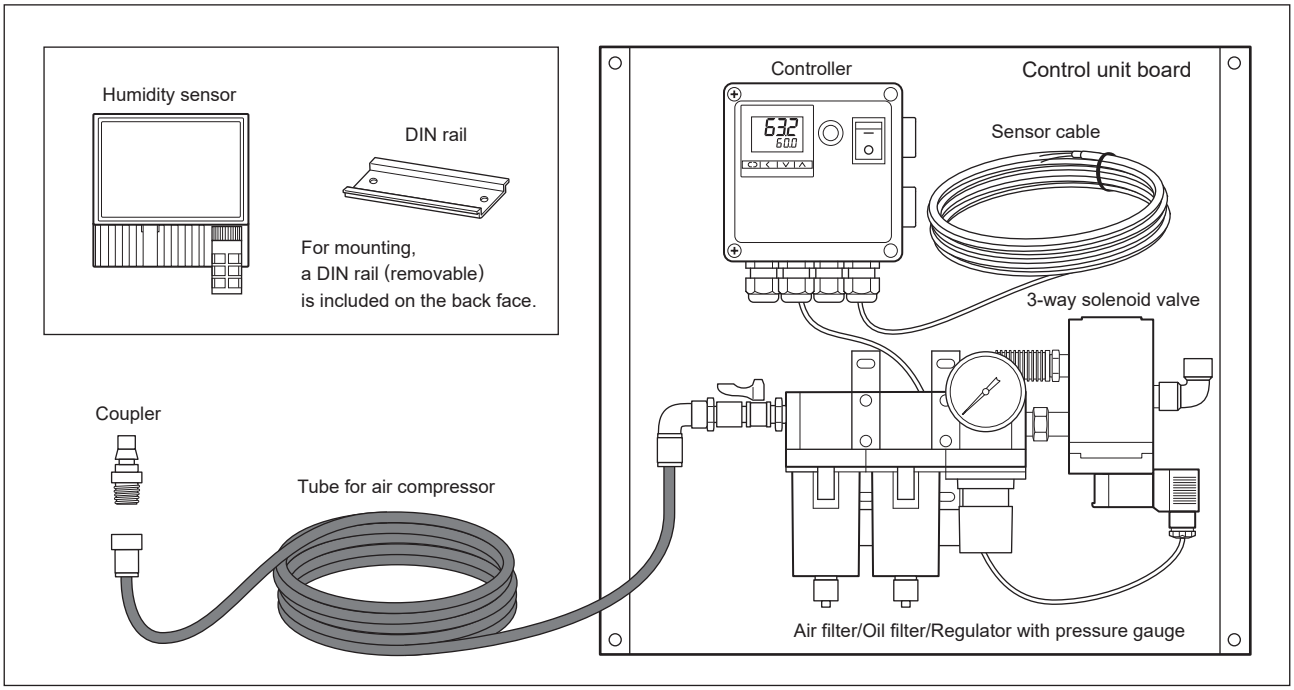
Take special care when handling spray nozzles.
The Nozzles are made of plastic. Never drop it or expose it to physical shocks, it may damage the nozzles.

- If you want to spray liquid other than water, consult with IKEUCHI or our local distributor beforehand.
- Water treatment equipment may be required in some areas. Consult with IKEUCHI or our local distributor.

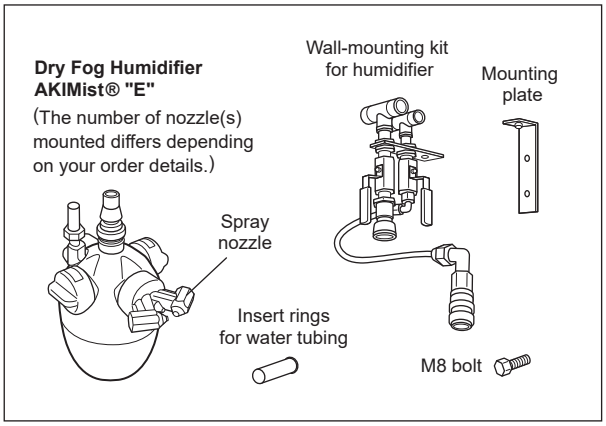
Parts list for confirmation

Make sure all items are in the package.
The parts below should be included if you order all complete units of AE-KIT (Control Unit, Nozzle Unit, Water Unit, Piping Unit). In the case a part is missing, please contact your supplier.
The number of parts and the length of tubes differ depending on your order details.
Check the insert "Parts list for confirmation".

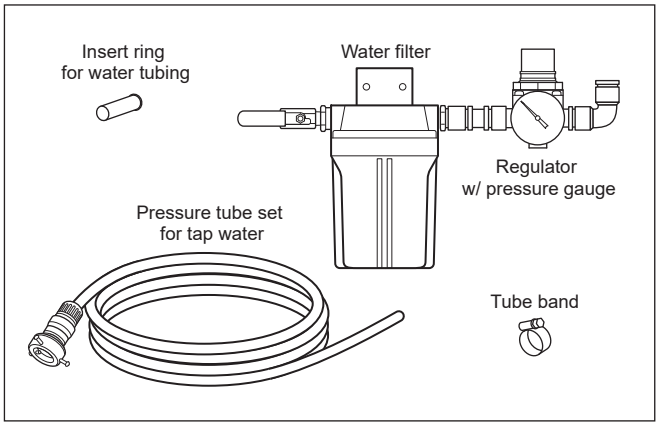
AE-KIT Control Unit



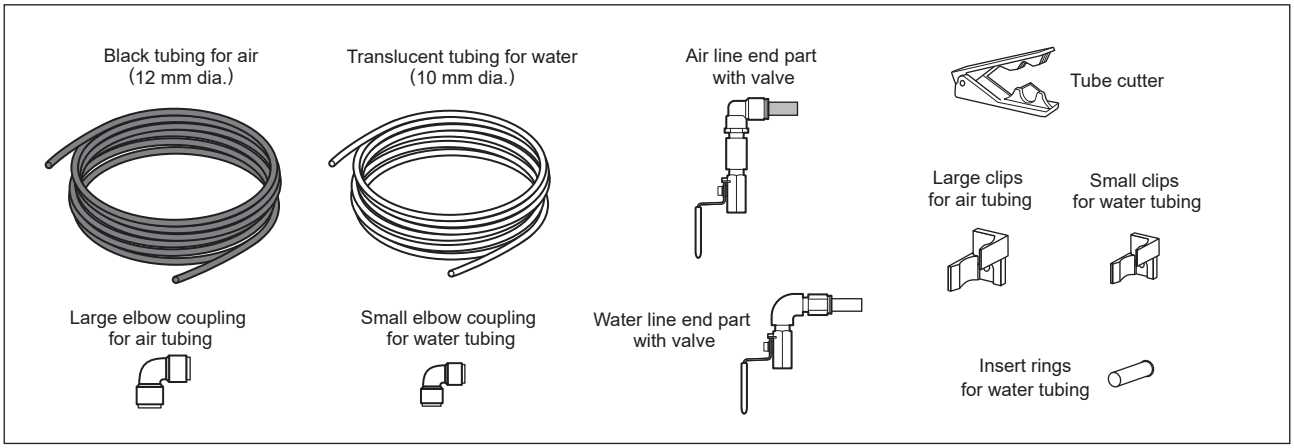
AE-KIT Nozzle Unit (The number of parts differs depending on order details.)



AE-KIT Water Unit

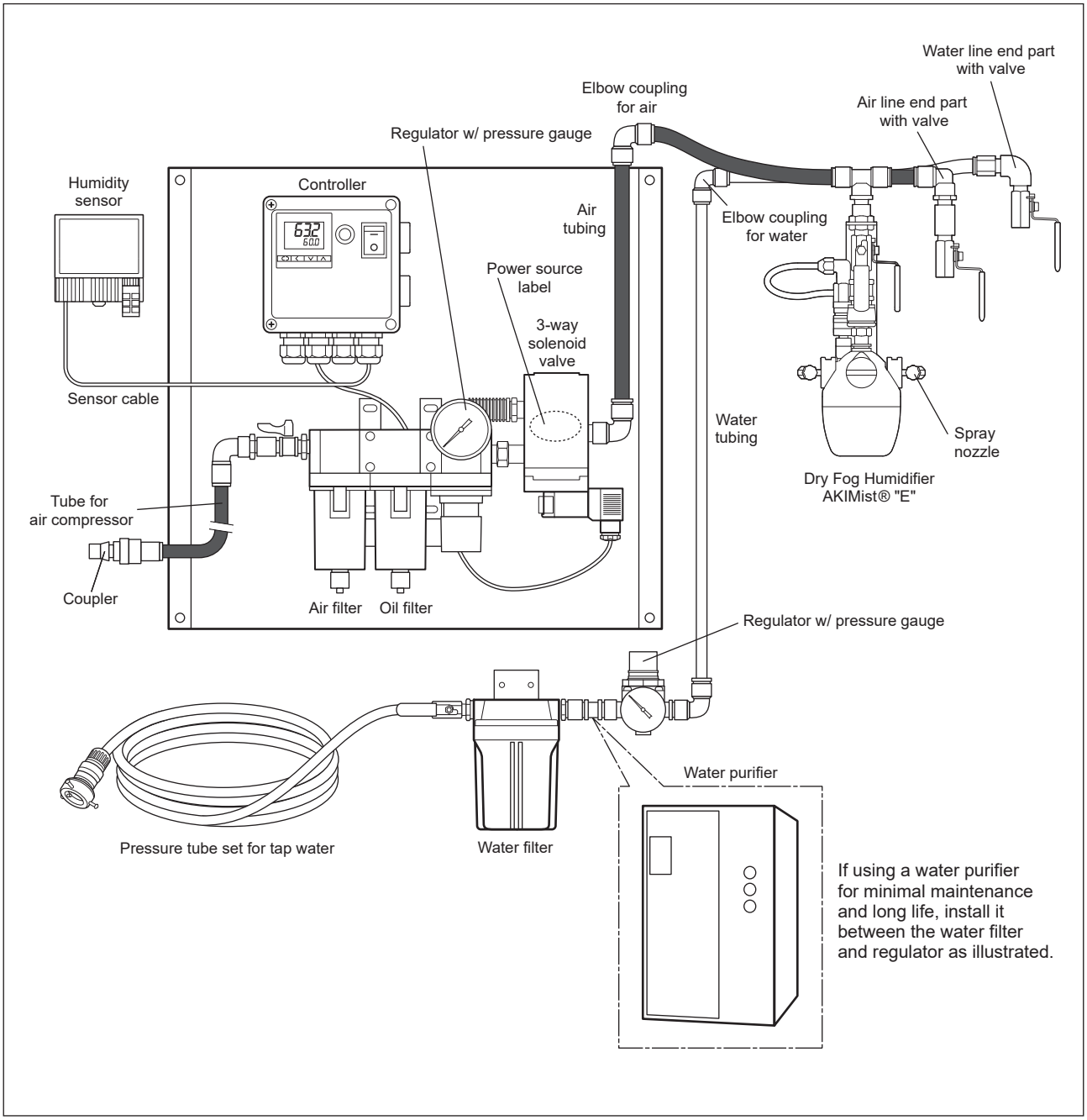


AE-KIT Piping Unit



Part names and installation example

Names (descriptions) of each part and example of position relation are shown below.

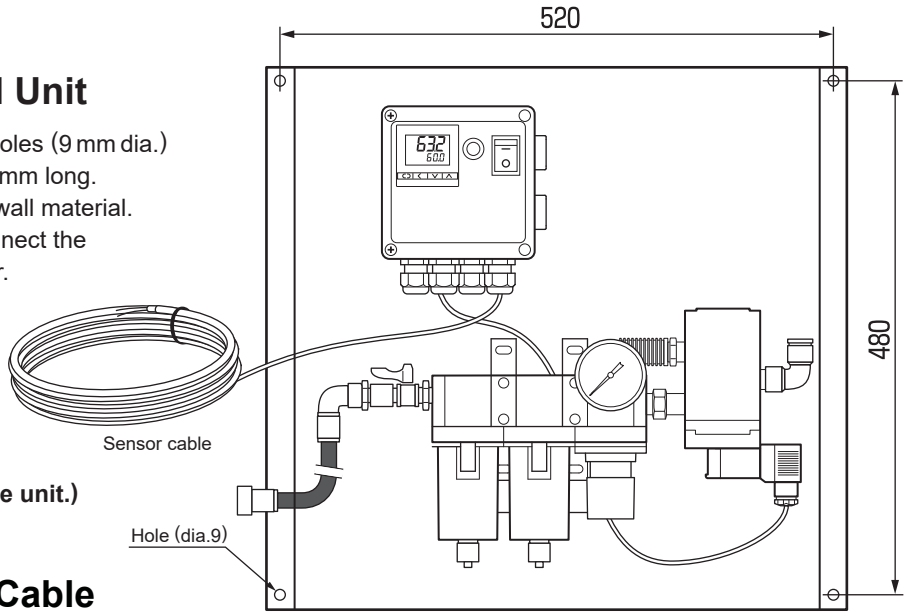


Installation

This unit does not include a power cable, or wall-mounting screws for each part. Please prepare the power cable and the screws suitable for the material of wall the unit will be fixed on.

Installation of Control Unit

Control unit board has 4 mounting holes (9 mm dia.) with spacing of 520 mm wide x 480 mm long.
Fix with 4 M8 screws suited for the wall material.
After installation of Control Unit, connect the sensor cable to the Humidity Sensor.



CAUTION ⚠

Do not connect the power cable of controller yet, at this point.
(Power cable is not included in the unit.)

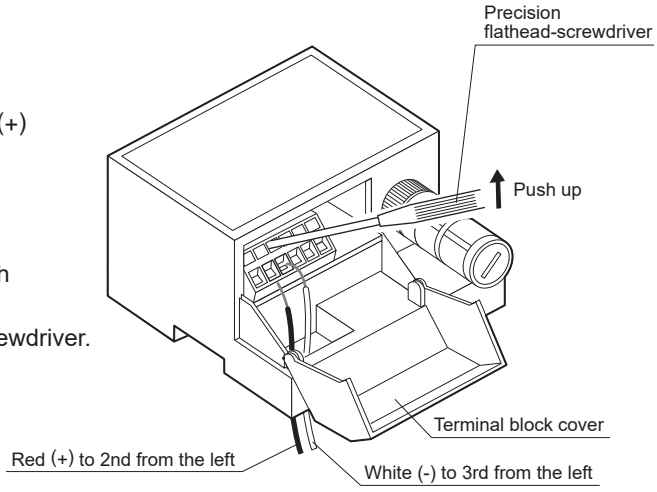
Wiring of the Sensor Cable

CAUTION ⚠ **Ensure the wiring is done correctly and securely.**
Do not provide the wiring for induction load (motor or solenoid valve) and the wiring for sensor cable inparallel or together in the same conduit tube.

1. Wiring at the sensor
   Open the terminal block cover of the humidity sensor, and put the sensor cable (2-core cable) through the square hole from the back. Connect the red sensor cord (+) to the second terminal from the left, and white sensor cord (-) to the third terminal from the left.

   Tips for connecting cables
   Insert a small flathead-screwdriver into the back and push up as shown in the figure. Then, terminal clip is open.
   Insert the sensor cords into the gap, then pull out the screwdriver.

2. Close the terminal block cover.

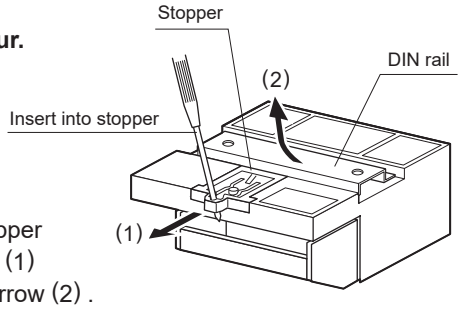


Installation of the Humidity Sensor

CAUTION ⚠

Do not install the Humidity Sensor in an area where organic solvents, acids, alkali (bases) or oils are present.
Rapid deterioration and decreased unit lifespan can result.
Also avoid installation in places where condensation or water leaks occur.

To mount the Humidity Sensor, first mount the DIN rail on a wall with screws, then slide the Humidity Sensor onto the rail.

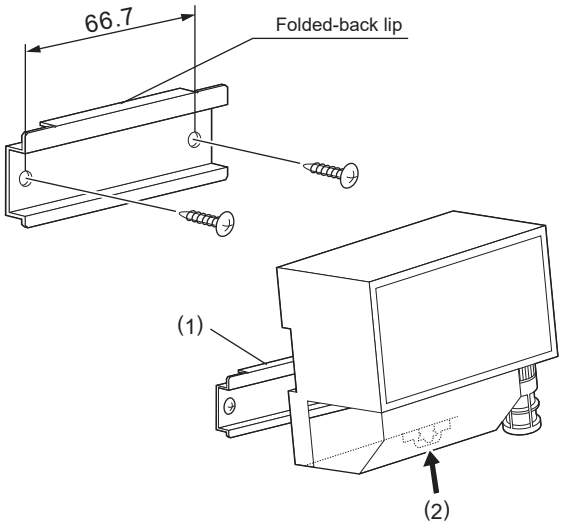


1. Remove the DIN rail from the Sensor body

   Insert a precision screwdriver or other fine-tipped tool into the DIN rail stopper on the back of the Humidity Sensor body and pull in the direction of Arrow (1) to release the DIN rail. Remove the DIN rail by pulling in the direction of Arrow (2) .

Installation

This unit does not include wall-mounting screws for each part. Please supply the screws suitable for the material of wall the unit will be fixed on.



2. Install the DIN rail

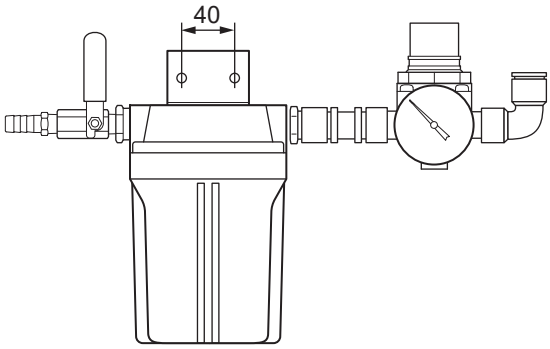
Use 2 M4 screws to mount the DIN rail on a wall, making sure the edge with the folded-back lip is on the top.

3. Mount the Humidity Sensor

Hook the back of the sensor body over the lip(1) of the DIN rail as shown at right, then secure the sensor to the DIN rail by pushing in the stopper in the direction of Arrow(2).

Installation of Water Filter

Mount with 2 M6 screws suited for the material of the wall the filter will be fixed on.



CAUTION ⚠

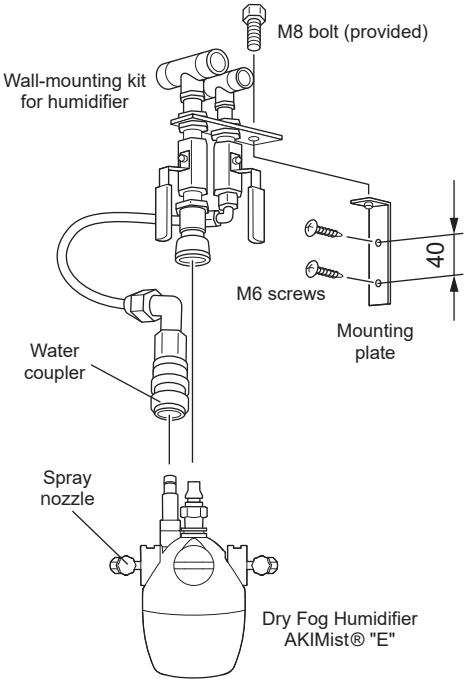
Insert ring is included in Water Unit.
Keep it until it is used when installing the piping.
Take care not to lose it.

Insert ring for water tubing 

Installation of Dry Fog Humidifier

First, attach the mounting plate on the wall.
Mount with 2 M6 screws suited for the material of the wall.
Then, attach the humidifier's Wall-mounting Kit with the provided M8 bolt.

Finally, attach Dry Fog Humidifier AKIMist® "E" and connect the water coupler of the kit to the humidifier.



CAUTION ⚠

The number of Nozzle Units differs depending on order details.
The number of nozzle(s) mounted also differs depending on your order.

CAUTION ⚠

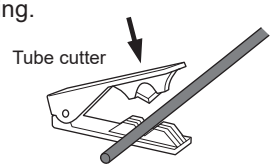
Insert rings are provided per Dry Fog humidifier.
Keep them until they are used when installing the piping.
Take care not to lose them.

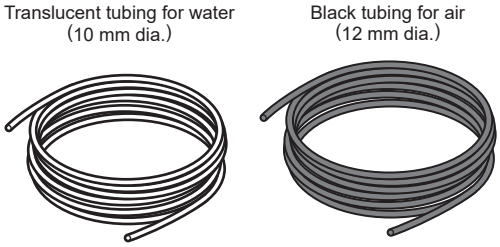
Insert rings for water tubing 

Installation

Tubing configuration

Use the provided tube cutter to cut the tubing.





CAUTION ⚠

Short tubes are supplied already attached to the air/water line end parts.

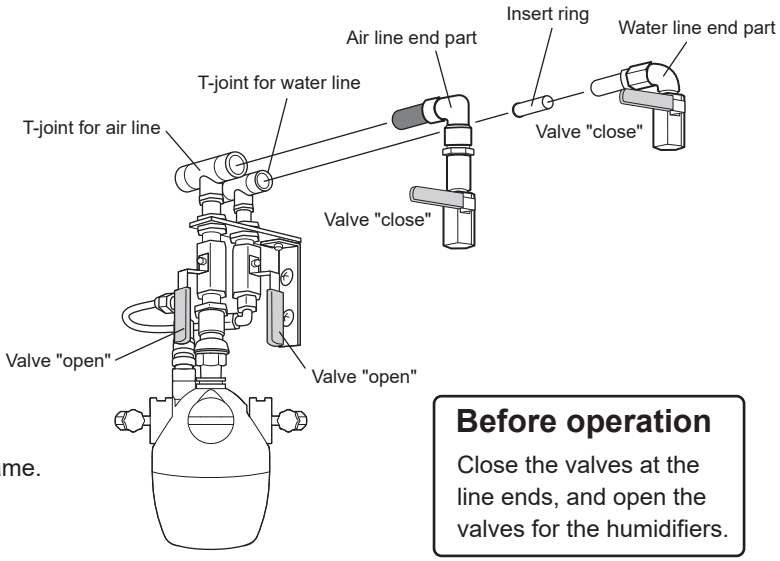
Connection of air/ water line end parts

Insert the air line end part into the T-joint for air of Nozzle Unit.

Insert the insert ring into the tip of the tube already attached with the water line end part, then insert the part into the T-joint for water.

CAUTION ⚠

Insert rings for water tubing are provided with each Unit, but the part shape of all rings is the same.

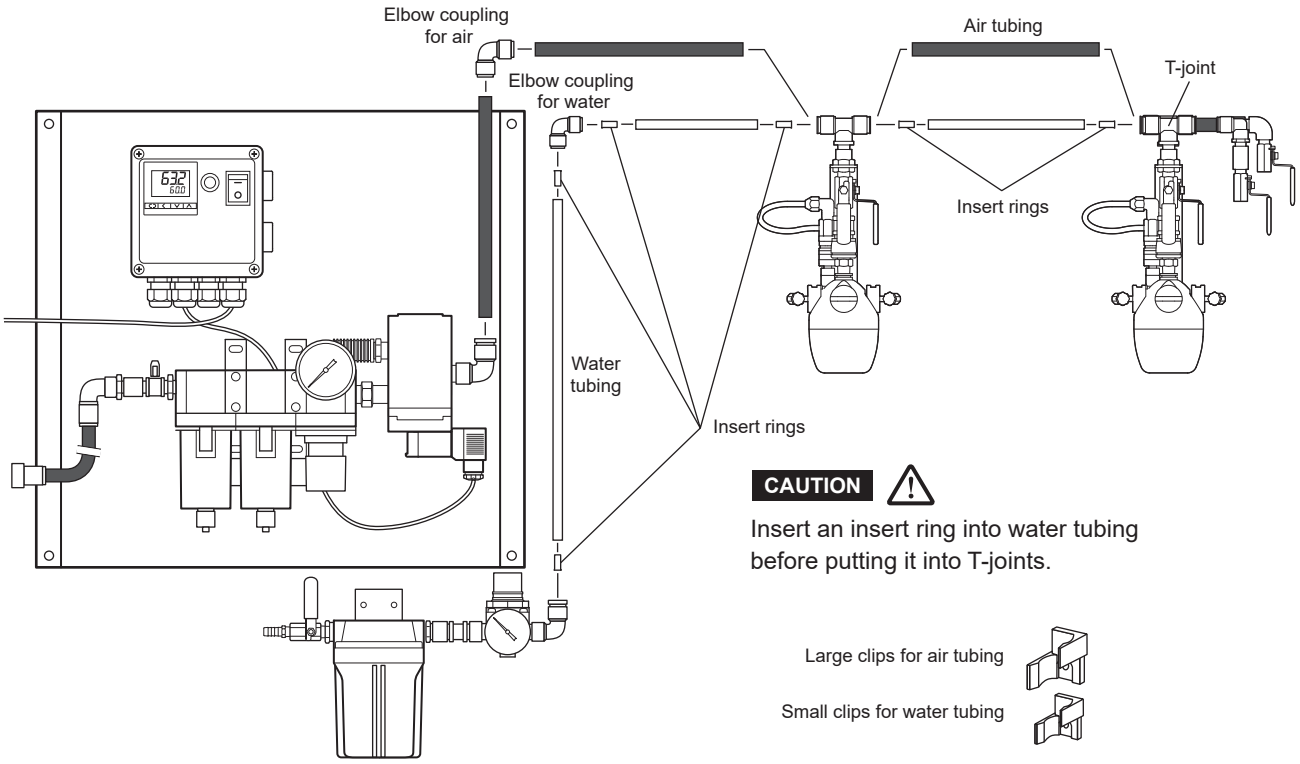


Before operation

Close the valves at the line ends, and open the valves for the humidifiers.

Tubing for Control Unit, Water Unit and Nozzle Unit

Below is an example of tubing when using 2 sets of Nozzle Units.
Cut the air tubing and water tubing depending on the installation spacing between the Dry Fog Humidifiers, and insert the tubing into the elbow couplings and T-joints.
After piping is done, fix the tubes on the wall at pivotal points with clips using screws.



CAUTION ⚠

Insert an insert ring into water tubing before putting it into T-joints.

Installation

Tubing to air compressor and water tap

WARNING

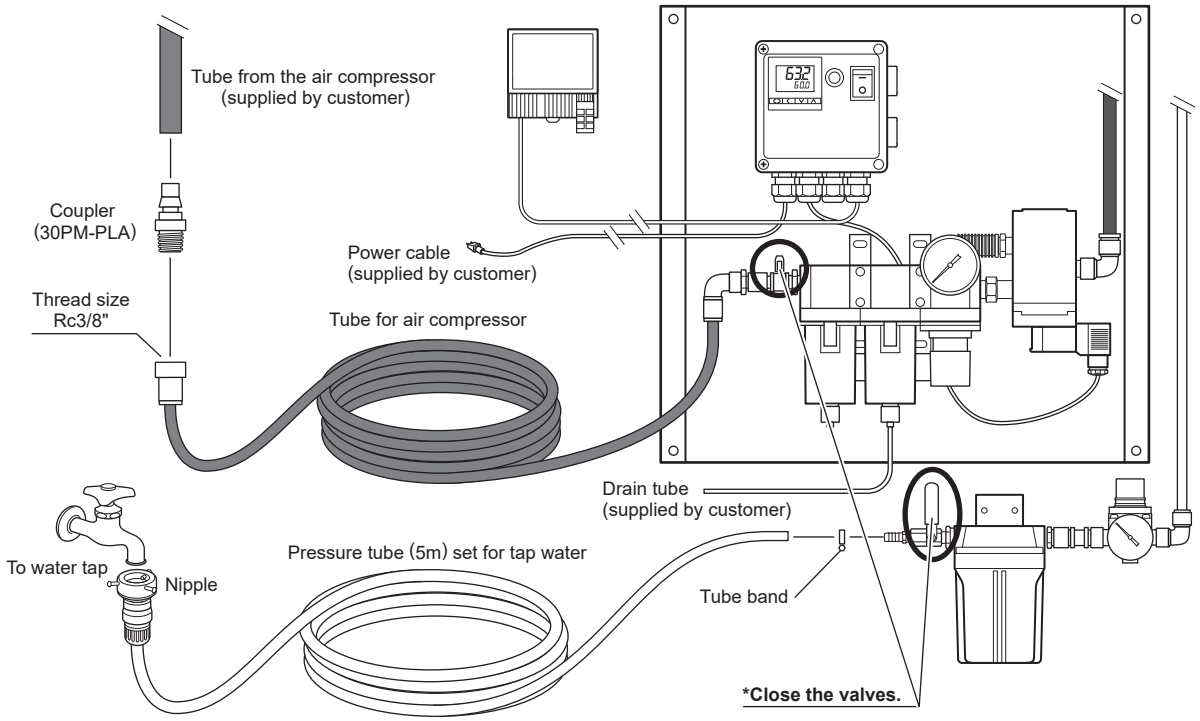
This product requires a compressor that draws 0.4−0.8 kW supplying 29−58 L/min (Normal) at air pressure 0.3 MPa per Nozzle Unit. Confirm the capacity of compressor before use.

CAUTION

Ensure that the valves of air filter and water filter are closed before connecting to the air compressor and water tap.

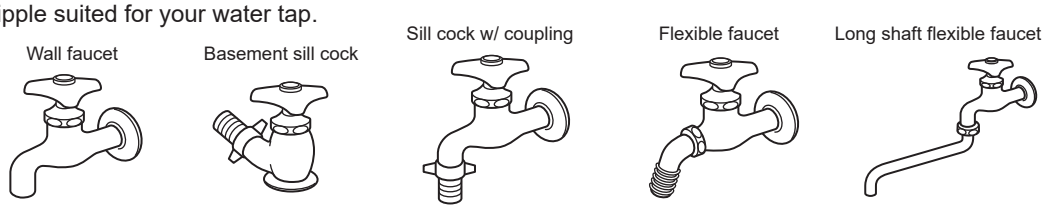
Air filter is already attached with a tube for air compressor connection.
A separate coupler (30PM-PLA) is also provided.
Using this provided coupler, connect the tube to a tube (supplied by the customer) from the air compressor.

For water supply, a tube set is provided. Put the tube through a tube band and insert the tube end into the water filter, then fix with the tube band. Connect the other end to the water tap and fix it with the nipple.



The provided nipple is for a water tap of 14−18 mm diameter. If the tap configuration is different, please purchase a nipple suited for your water tap.

Water taps that will fit with the provided nipple



Water taps that requires a nipple sold separately

Connecting drain tube

Oil filter discharges foreign particles from the filter automatically when the pressure is 0.
Prepare a 5−6 mm dia. drain tube and connect it to the filter and position the tube end at a place where discharge causes no trouble.

Connecting power cable

Finally, plug the power cable of the controller into a power source of 100−240 VAC.
For connecting the power cable to the controller, please refer to the Humidity Controller RHC-C11 Instruction Manual, page 5−6 "Wiring".

Installation

Pressure setting

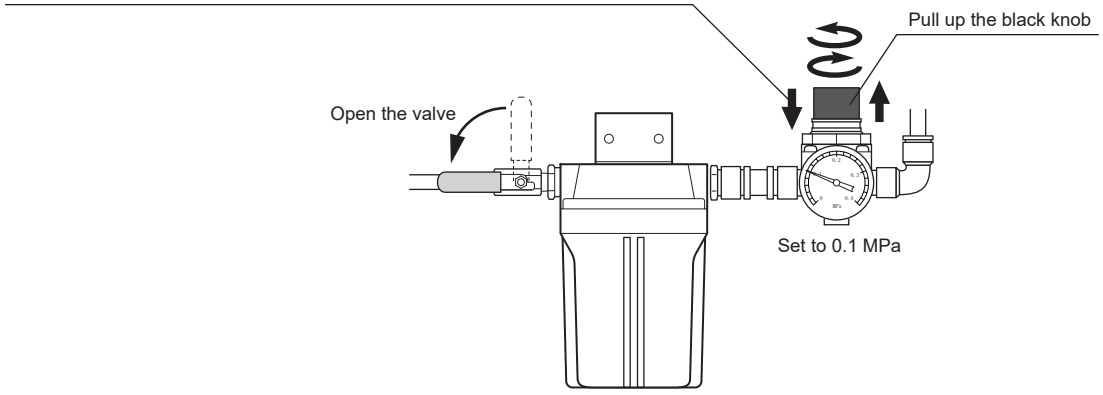
WARNING

Before opening the water and air valves, double check that the tubing is connected correctly and that there are no loose connections.

Setting water pressure

After turning the water faucet on, open the valve of the water filter.
Set the water pressure at 0.1 MPa this way. Pull up the black knob of the pressure reducing valve.
While checking the pressure gauge, turn the knob right and left little by little until the pressure is settled at 0.1 MPa.

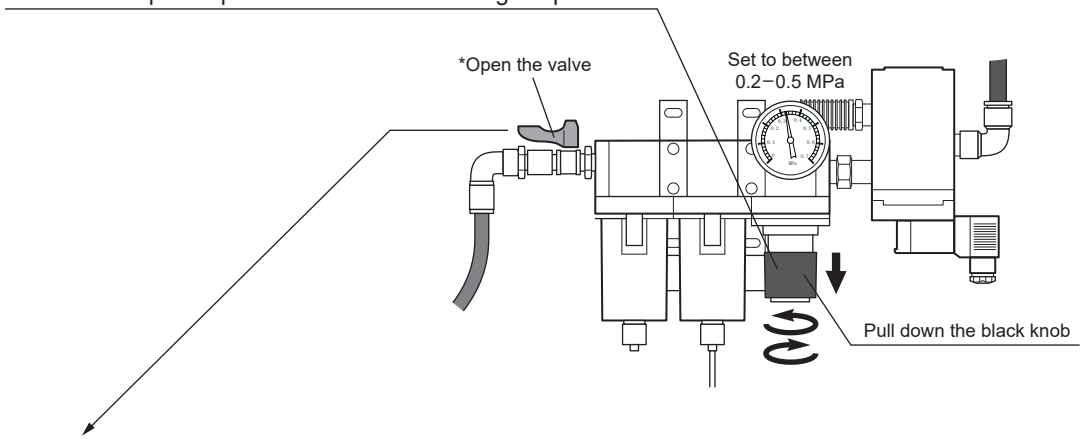
After the pressure adjustment is completed,
make sure to push down the black knob to the original position.



Setting air pressure

After switching on the air compressor, open the valve just before the air filter.
Set the air pressure at 0.2−0.5 MPa this way. Pull down the black knob of the pressure reducing valve.
While checking the pressure gauge, turn the knob right and left little by little until the pressure is settled at between 0.2−0.5 MPa.

After the pressure adjustment is completed,
make sure to push up the black knob to the original position.

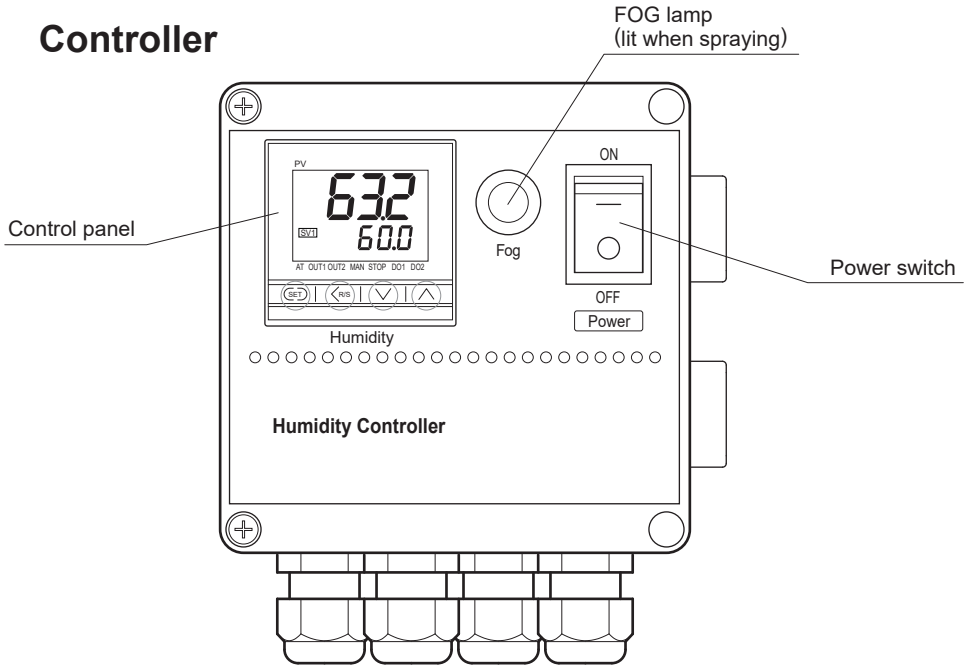


CAUTION

*After the air pressure is set, close the valve of the air filter again.
This valve should be opened after the controller setting is completed as shown on the next page.

Control panel terms and system operation

Controller



By setting the relative humidity set value (SV) in advance,
when the present value of relative humidity (PV) measured by the Humidity Sensor is less than SV,
the Dry Fog spray is activated. When PV becomes higher than SV, the Dry Fog spray stops.

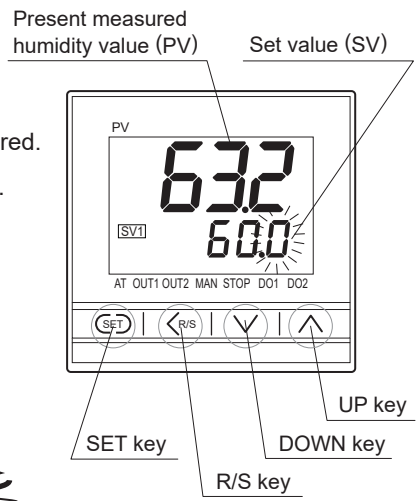
CAUTION ⚠

Ensure that the valve for the air filter and water tap are shut off before switching the power on.
When air and water valves are open, Dry Fog spray starts just by turning the power on, depending on the condition.

How to change the set value (SV)

1. Switch the power on, and the panel starts to display PV and default SV.
   This example display indicates that PV is 63.2% (RH), SV is 60.0% (RH).
2. Push the SET key, and the rightmost figure of SV (first decimal place) blinks.
   The blinking part can be changed.
   Push the UP or DOWN keys to change the set value (SV) of relative humidity as desired.
3. You can move to the next digit (the middle figure of SV) by pushing R/S key one time.
   Push the UP or DOWN keys to change the number as desired.
4. Push R/S key one more time, and the leftmost figure of SV (tenths place) blinks.
   Push the UP or DOWN keys to change the number as desired.
5. After changing the number to the desired value,
   push the SET key and the setting change is complete.

Control panel terms



Operation

After setting SV is completed, open water tap and the valve of the air filter.
Humidity Sensor measures the humidity in the room, and if PV is less than SV,
the Dry Fog spray is automatically activated.

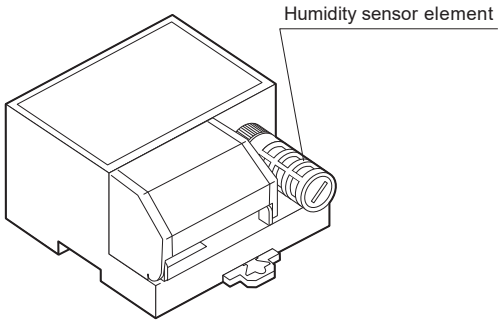
CAUTION ⚠

When stopping operation, make sure to turn the water faucet off after switching the power off.

Maintenance

Daily maintenance

Because this humidification system is activated by a signal from the Humidity Sensor, be sure to clean the Humidity Sensor as part of daily maintenance.



Humidity sensor maintenance

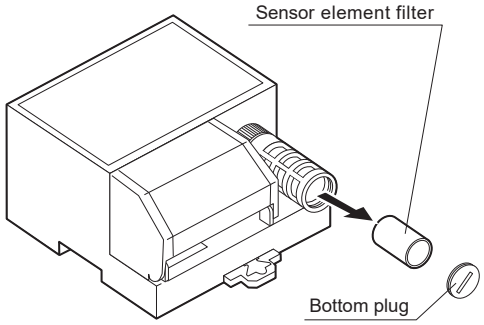
If the Humidity Sensor becomes dirty, wipe it down lightly with a soft cloth and a neutral detergent.
If dust or dirt is not cleaned from the filter of sensor element, continued use will lead to errors in the sensor readings.
Clear the filter of sensor element of dust as needed by using blown air.

Part replacement

Replacing the sensor element filter

When dust and dirt cannot be removed by blown air, replacement of the sensor element filter is necessary.
Replacement sensor element filters are sold separately.
Please inquire with an IKEUCHI sales representative.

As the right figure shows, unscrew the bottom plug of the sensor element with a coin or flathead screwdriver, and remove the old filter and insert a new one.
Put the plug back on the sensor.

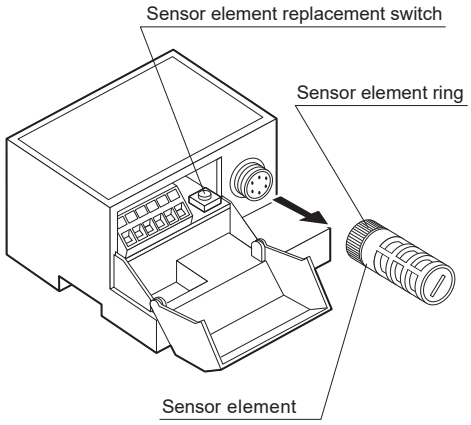


Replacing the sensor element

The Humidity Sensor element is a consumable part.

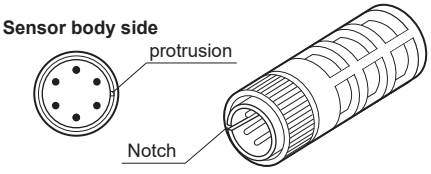
If the Controller seems to be frequently having problems, even though the sensor filter is free of dust and dirt, it is likely that the sensor element has reached the end of its operating lifespan.
Replacement sensor elements are sold separately.
Please contact an IKEUCHI sales representative.

1. Unscrew the sensor element ring (shown right) by turning counterclockwise to remove the old sensor element. Insert a new one and turn the ring clockwise.



CAUTION ⚠

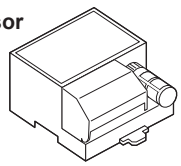
The sensor element has an alignment notch.
When inserting, align the notch of the sensor element with the protrusion in the sensor element socket in the sensor body.



2. After the replacement, make sure to push the "Sensor element replacement switch".

Replacement parts

1. **Humidity Sensor**
   Includes parts No.2 and No.3



Part Code #202511

2. **Humidity sensor element**
   Includes part No.3

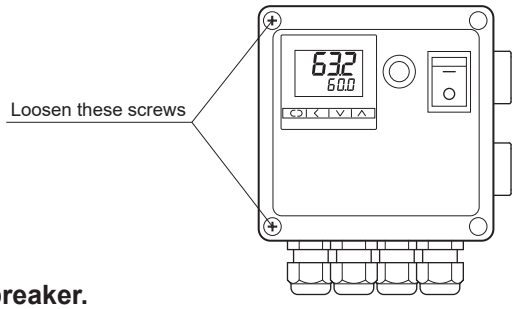
Part Code #205208

3. **Sensor element filter**

Part Code #217049

Replacing the fuse

The fuse is installed for safety precaution against troubles such as short circuit in solenoid valves.
If the solenoid valves do not work in the proper manner, it is likely the fuse has blown.
Please replace the fuse as shown below.

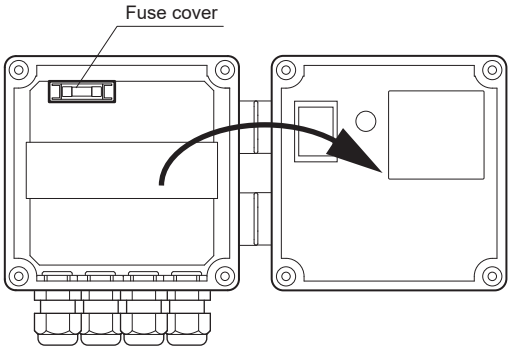


CAUTION ⚠

Before replacing the fuse, be sure to turn off the circuit breaker.
Perform the steps below while the unit is not connected to a power source.

1. Open the controller cover
   Loosen the 2 screws at the corners to open the cover.
   (Screws would not detach from the cover.)

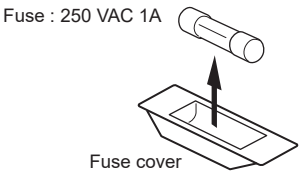
2. Replace the fuse
   Fuse is installed inside a fuse cover.
   Remove the fuse cover by hand, and the fuse comes off together.
   Remove the old fuse and replace with a new fuse.



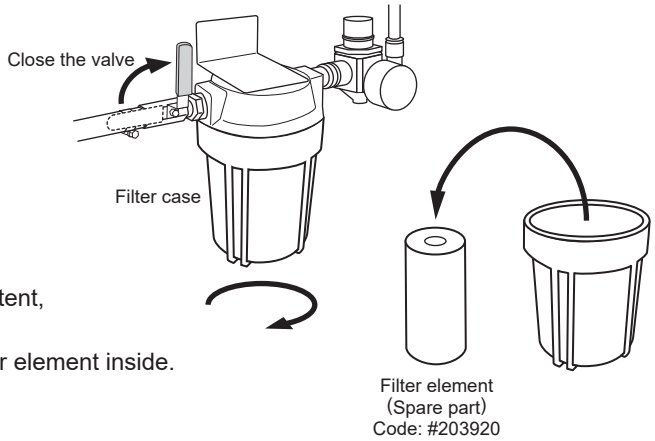
CAUTION ⚠

Use an 250 VAC 1A fuse.

3. After replacing the fuse, close the controller cover and tighten the 2 screws firmly.



Replacing the water filter



CAUTION ⚠

Ensure that the valve right before the filter is closed before replacing the water filter.

If spray capacity decreases and spray becomes intermittent, there may be dust or dirt inside the water filter.
In such case, remove the filter case and replace the filter element inside.

Replacing the oil filter/air filter

The oil filter automatically discharges foreign particles,
but if you find the oil filter clogged in a daily visual check, replace the element.
For information on how to replace the element, refer to the individual manual for the oil filter (model: M3000).
If the air filter is clogged, refer to the individual manual for the air filter (model: F3000) and replace the air filter element.

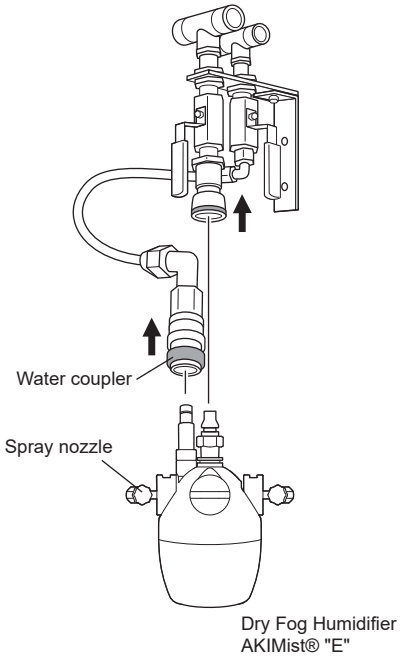
Replacing the spray nozzles

CAUTION ⚠

Make sure to close both air and water valves before replacing nozzles.

Replace the nozzle if no spray is being made even after the nozzle is cleaned.

1.First disconnect the humidifier AKIMist® "E" from the pipes and do replacements of nozzles in a safe, secure workspace. (Never replace the nozzles while the unit is in a high place as it is dangerous.)
Pull up the water coupler ring (gray part of the figure shown right) until the water tube is removed.
Pull up the air socket ring (gray part of the figure shown right) to detach from the humidifier.

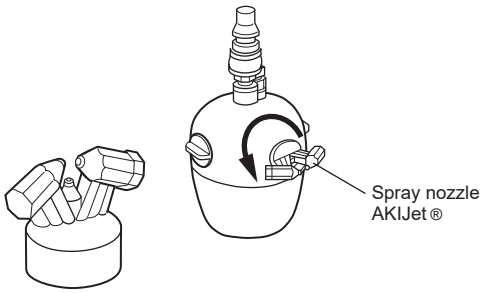


Dry Fog Humidifier
AKIMist® "E"

2.Turn the nozzle counterclockwise (in the direction of an arrow) and pull out.

Spare nozzles are sold separately.
To order, contact your nearest IKEUCHI sales office/distributor.

[Spare nozzle for AKIMist® "E"]
Code: #226214
AKIJet® 03C Nozzle
(or #211507 for AKIJet® 03B Nozzle*)
*If the nozzle is marked with "B", you are using 03B nozzle.
No "B" mark means 03C nozzle (but "03C" is marked on the nozzle tops.)



For details of the nozzles and humidifier, refer to the AKIMist® "E" Instruction Manual.

Troubleshooting

Before contacting us, please check the following points.

Troubles	Check points / Probable causes	Solution
It does not work when power switch is turned on	Fuse has blown	Replace the fuse (see p.11)
Current humidity value (PV) on the control panel shows “uuuu” and flashes	Humidity sensor and controller is unconnected or cut	Check the wiring for humidity sensor and controller
Accurate humidity is not shown on control panel	Location of humidity sensor is not appropriate (The place where sensor is located has different humidity and temperature from other place)	Review location of sensor (Relative humidity is effected by temperature of the place where sensor is located)
	Sensor element filter is dirty	Clean or replace the sensor element filter (see p.10)
	Sensor element is used-up (*)	Replace the sensor element (see p.10)
	Did you push “replacement switch” after replacement of sensor element?	Push “Sensor element replacement switch” (see p.10)
No spray while FOG lamp is lit	Compressed air and water are stopped	Check the pressure gauge and supply compressed air and water
	No electricity for solenoid valve	Check wiring for solenoid valve and controller
· No spray · Intermittent, irregular spray · Liquid dripping from nozzle · Spray is coarse	Air pressure is too low	Set air pressure at 0.2−0.5MPa for 03C nozzles (or 0.3−0.35MPa for 03B)
	Dust around nozzle orifice	Clean nozzle orifice
	Nozzle orifice is frozen	Install air heater equipment
	Valve for Nozzle Unit is closed	Open the valve
	Oil drainage is clogged	Clean or replace the oil filter

*For life test of the sensor element, follow the instructions below.

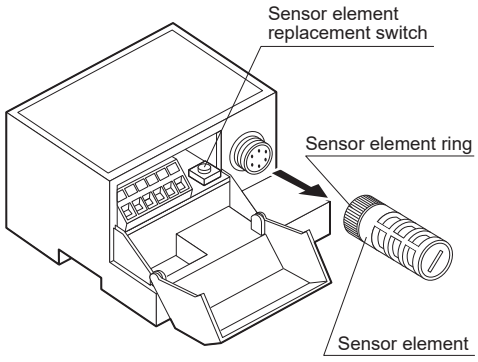
Test for the sensor faults

You can check the sensor faults with a “dummy element”.

For checking life test or cause of the sensor failure, “dummy element” is available for sale.

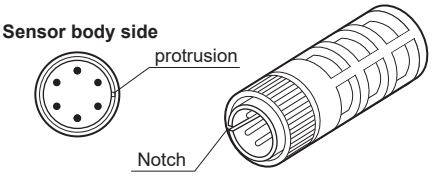
1. Installing a dummy element

   Unscrew the sensor element ring (shown right) by turning counterclockwise to remove the old sensor element, then insert a dummy element.



CAUTION ⚠

The sensor element has an alignment notch.
When inserting, align the notch of the sensor element with the protrusion in the sensor element socket in the sensor body.



2. After attaching the dummy element, make sure to push the “Sensor element replacement switch”.

After the dummy element is attached, if the operation is back to normal, something is wrong with the removed humidity sensor element, or the sensor element is used-up.
Replace the humidity sensor element as shown in page 10.

Dummy element and replacement sensor elements are sold separately.
Please contact an IKEUCHI sales representative.

Precautions for use of the Humidity Sensor

The Humidity Sensor element is an expendable part.

1. Precautions for selection of mounting location

When mounting the Humidity Sensor, avoid the locations listed below.

- Environments with high amounts of organic solvents including ketones and esters, halogens, highly-acidic substances, corrosive substances, oil mist and/or salt mist, can lead to rapid deterioration of the humidity sensing element, which consists of a highly-absorptive molecular film and an extremely thin vapor-transmissive electrode
- Places exposed to rainfall or where condensation (dew) occurs
- Places with high amounts of dust or particulates
- Places exposed to direct sunlight, or other places subject to strong or sudden changes in humidity
- Places where the air is stagnant or there is no air flow, or other places which tend not to match the average humidity of the target location
- Environments with explosive, corrosive, or inflammable gases
- Environments where the temperature goes beyond the range of 0−50℃ (Confirm that condensation does not occur at low temperatures)

2. Sensor error-correction and data transmission

This Humidity Sensor incorporates a chilled-mirror dew point hygrometer, which is precisely calibrated in a chamber of precise humidity before shipping. In contrast, other hygrometers listed in Item 3 below, such as the Assmann wet-bulb psychrometer, can easily yield errors due to handling. Unless some system of traceability into humidity measurements is taken into account, they are not useful in comparisons with this unit's readings.

3. Comparing the Humidity Sensor readings to other humidity sensors

When confirming with other humidity measuring devices, ensure the temperature conditions are the same. Keep in mind the following points regarding comparisons with of readings in typical environments.

(1) Assmann psychrometer

Be sure to operate in accordance with proper standards (i.e. JIS-Z8806). Readings can differ from the unit sensor by up to 10% RH.

(2) Hair hygrometer

Usually, it can take over 3 hours for hair to completely expand or contract. Further, the hair responds not only to humidity, but to temperature as well. Thus, this type of hygrometer is not thought to be a good standard. Readings may differ on the order of 10% RH from the unit sensor.

(3) Handheld electronic hygrometer

These devices derive readings from a polymer membrane and can quickly provide accurate readings. However, the performance of the sensing element will change over time, thus they should be recalibrated at least once per year.

4. Spot maintenance of the Humidity Sensor

Check the sensor filter for dirt or clogging at regular intervals. If used in areas with large amounts of airborne particles and dust, check, clean or replace the filter once per year, or more frequently in accordance with the environment. Further, for long-term accurate and dependable use, regular replacement of the sensor element is recommended.

5. Precautions when measuring humidity

(1) Changes in temperature influence relative humidity

When measuring relative humidity, the most important factor to consider is temperature. A change of just 0.1 degrees C will yield a change in relative humidity of about 1% RH. Take extra care if the temperature is changing at the measurement location.

(2) Responsiveness

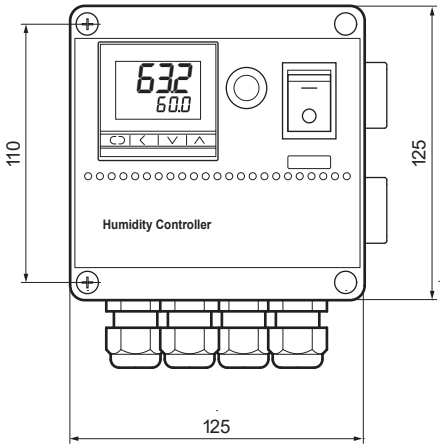
The unit sensor takes 5−15 minutes to respond to a change in temperature. If located near other objects, their influence can delay this response time. Also, when first activating the Humidity Sensor, allow at least 30 minutes for readings to stabilize.

Specifications of Controller and Humidity Sensor

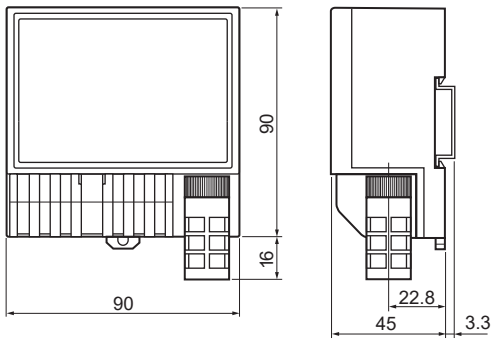
	Item	Specifications	Notes
Controller	Humidity setting range	0−100% RH	
	Rated power supply voltage	100, 110, 200, 220 or 240 VAC (50 or 60 Hz, single phase) The rated supply voltage is specified in the power source label stuck on the 3-way solenoid valve.	
	Power consumption	Approx. 20 W	
	Allowable temperature and humidity	0−50°C, 0−85% RH	Condensation is never allowed.
	Operation	Compares current humidity (PV) with required humidity (SV) and Spray when PV < SV, Stop spraying when PV > SV	
	Interlock	External signal from normal open relay contacts can bring the controller into operation.	Interlock can be invalid by connecting terminal COM to D22 with a cable
	Dimensions	125(W) x 125(H) x 100(D) mm	Excludes protrusion
	Mass	Approx. 700 g	
	Casing	Polycarbonate (cream color)	IP40
Humidity Sensor	Element	Polymer film	Capacitor
	Response time	Within 1 min.	
	Dimensions	90(W) x 90(H) x 48.3(D) mm	Includes DIN-rail, excludes protrusion

Please note that specifications may be changed without notice for product improvement purposes.

Controller dimensions (mm)



Humidity Sensor dimensions (mm)



"The Fog Engineers"

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