No. NKG26M006-2E

#435128

Humidity Controller RHC-D41C-B
Instruction Manual

Thank you for purchasing our product.
Please read this manual carefully and follow the instructions to ensure optimal performance.
Keep this manual handy for quick reference.
Parts of products may be changed without prior notice.
Please be aware that due to continuing efforts to improve our products, some details in this manual may differ from the actual product. Thank you for your understanding.

https://www.dry-fog.com/en/
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"The Fog Engineers"
H. IKEUCHI & CO., LTD.

Contents

Safety Precautions

Safety precautions in this manual are classified as “Warning” or “Caution”.
Please observe these safety precautions.

Warning	If the product is used without observing the information given under this symbol, serious injury or death may result.
Caution	If the product is used without observing the information given under this symbol, personal injury, physical and/or property damage may result.


This icon indicates warnings and/or cautions.


This icon indicates an action or actions which are required.


This icon indicates restrictions and prohibited actions.

Warning


Do not touch electrically live parts while power is on.
Touching live parts can result in an electric shock.


Do not position the unit in a place where the product is exposed to rain or water, or a place where the humidity could reach above 85%RH. It may cause electric shock or fire.


Never install the unit on an unstable surface. This may lead to electric shock or injury.


Do not disassemble or attempt to refit or improve the unit and parts.
This may lead to fire hazard, electric shock, or damage resulting from malfunction.


Use only with specified power supply to avoid the risk of fire, electric shock, or damage to the unit.


Do not damage or forcefully bend/pull/twist the power cable to avoid fire and/or electric shock.


Do not install the unit in high-temperature environments or near heat sources to avoid the risk of electric shock, electric short, or damage to the product.

Do not splash water on the unit. It may cause fire, electric shock, or damage.

Installation should only be performed by personnel with proper expertise.
Otherwise, fire, electric shock, injury, or damage may result.

Wiring should be performed by a licensed electrician in accordance with local technical standards for electrical installation and related regulations to avoid burns, potential fire, injury and/or damage to the product.

Perform electric wiring work securely.
Problems such as loose wiring at the terminals may cause a short circuit.

Select wiring that can handle the number of humidifiers used, so there is no drop in voltage and at an appropriate length to avoid potential fire.

Ensure proper grounding before use to avoid the risk of electric shock.

Always turn off the power before any cleaning, maintenance or inspection to avoid electric shock.

Stop the operation immediately if trouble occurs, and unplug the power cable from the electric outlet. Otherwise, fire, electric shock, injury may result.

Make sure children cannot come close to the product. It may result in electric shock and/or injury.

⚠ Caution


During operation, electro-pneumatic regulator unit can become very hot. Do not touch it with your hands or any part of the body to avoid the risk of burn injury.


Supply clean air free from dust and moisture.


Do not use the unit in areas where flammable or explosive gases could be present to avoid fire and/or explosions.


Do not operate in a dusty place to prevent overheating, which may lead accidents and motor damage.


Do not use for any purpose other than humidification.
Electric shock, injury, or damage may result.


Inspect the parts periodically. If any irregularity or damage is found, turn off the unit immediately and consult with your supplier.


Do not place flammable materials or anything that could restrict ventilation near the unit.
Overheating may result.


Only operate in an environment with a temperature range of 5–40ºC (41–104°F).
Do not use in freezing cold environments to prevent damage to the unit.


Do not install the humidity sensor in places with organic solvents, acids, alkali (bases), and/or oil. This can increase deterioration and shorten the lifespan of the sensor.
Also avoid installing the sensor in places where water leaks and/or condensation occur.


If the unit is installed in a cold environment with a risk of freezing, take measures to prevent water from freezing in the pipes.


Remove any dirt from the power plug with a dry cloth to prevent electric shock and/or potential fire.


Do not install the humidity sensor near a noise source to prevent malfunction. Also, do not install the controller near areas where induction load or electromagnetic interference can occur.


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.

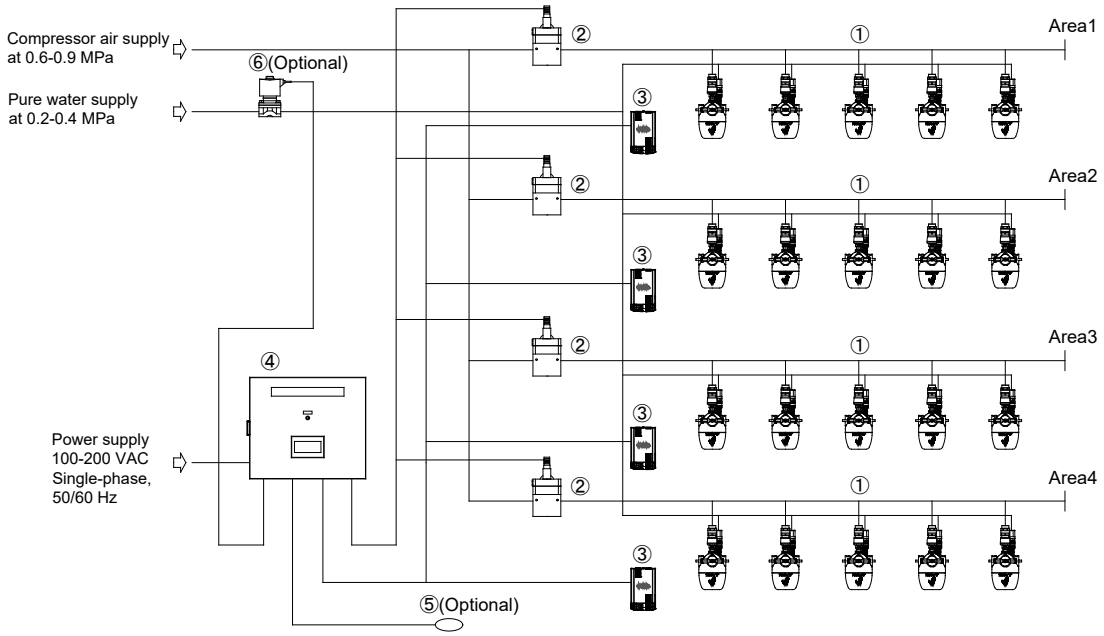
1. Features

(1) Overview

Humidity controller RHC-D41C-B is a device capable of adjusting humidification volume by controlling the spray pressure of humidifiers AKIMist®.
Using a single controller, up to four areas (zones) can be controlled individually.

(2) Humidification System Configuration

Humidity controller RHC-D41C-B and ancillary devices



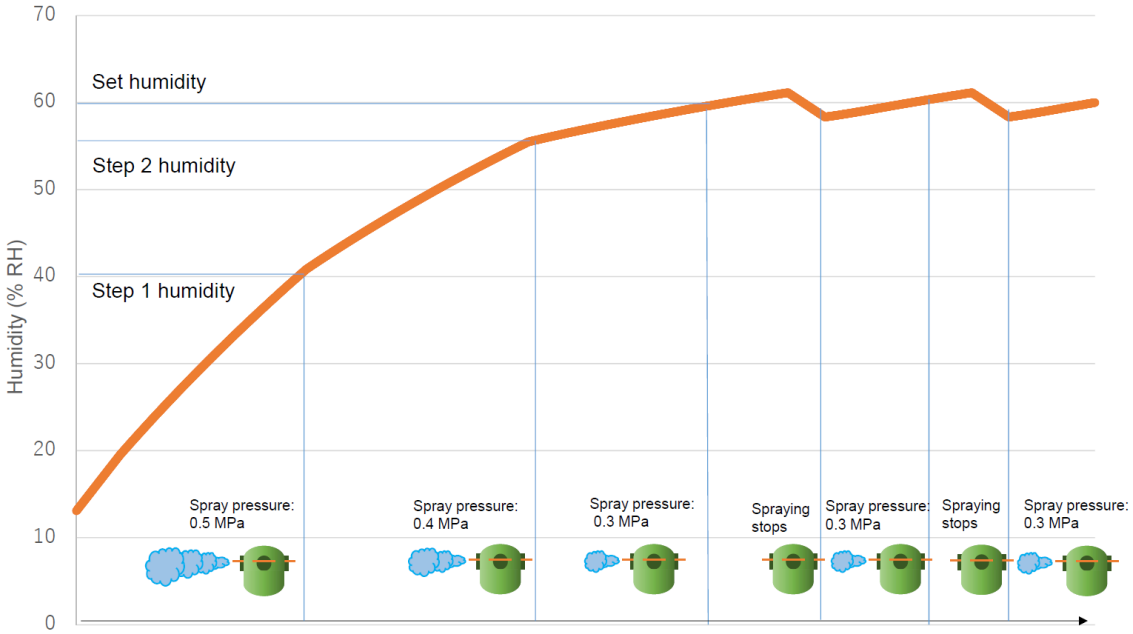
Note: The above system configuration is an image. The actual devices and quantities are different depending on the specifications of your order.

No	Description	Function
①	AKIMist® humidifier (sold separately)	Sprays Dry Fog to humidify.
②	Electro-pneumatic regulator unit (sold separately)	Adjusts the spray pressure (operating air pressure).
③	Humidity sensor (sold separately)	Measures the room humidity.
④	Humidity controller RHC-D41C-B (this product)	Controls the entire humidification system.
⑤	Water leakage sensor (optional)	Detects water leakage at the installation location.
⑥	Water supply solenoid valve (optional)	Shuts off the water supply when leakage is detected.

Note: This manual is based on the assumption that above goods ①, ② and ③ are purchased.

(3) Operation Specifications

Following is an operation graph of the humidity controller RHC-D41C-B.



The humidity controller RHC-D41C-B adjusts the spray volume by changing the spray pressure of the AKIMist® humidifiers according to the humidity.

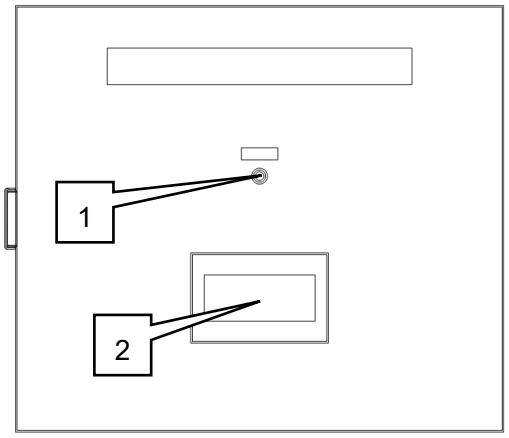
When the humidity is low, the controller increases the spray pressure to increase the spray volume. As the humidity approaches the target humidity, it reduces the spray pressure to reduce the spray volume. This control method reduces the time required to reach the target humidity and prevents humidity fluctuations caused by excessive spraying.

By preventing over-humidification, the humidification system can consistently save energy over time.

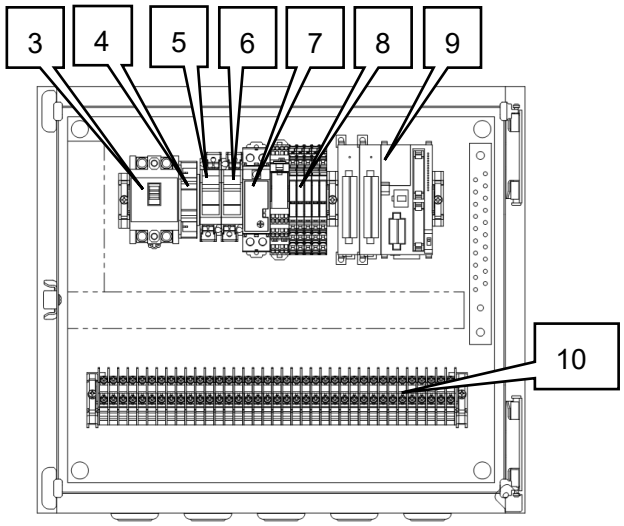
2. Part Description

(1) Controller

Appearance drawing

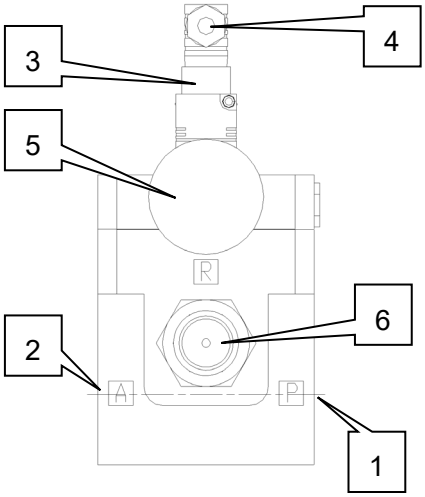


Inside



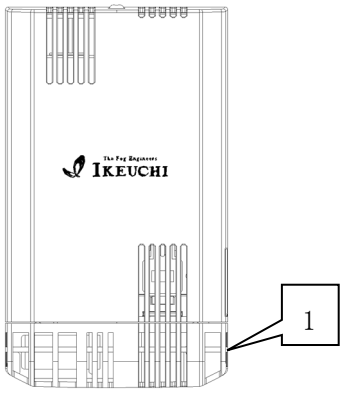
No	Description	Function
1	Power indicator	Lights when power is supplied to terminals R/L and S/N.
2	Touch panel	Displays the current humidity and allows for various operations and settings.
3	Ground-fault circuit interrupter	Interrupts the power supply in the event of electric leakage.
4	Fuse	Interrupts the circuit when excessive current flows through the power indicator.
5	Circuit protector for control devices	Provides overcurrent protection for the control devices.
6	Circuit protector for solenoid valves	Provides overcurrent protection for the solenoid valves.
7	Power unit	Generates 24 VDC used in this system.
8	Relay	Controls the electro-pneumatic regulator unit.
9	PLC	Controls all equipment.
10	Terminal block	Used for wiring connections.

(2) Electro-pneumatic Regulator Unit



No	Description	Function
1	Air inlet	Connect to the piping for air supply.
2	Air outlet	Connect to the piping for AKIMist® humidifiers.
3	Pilot solenoid valve	Regulates the spray pressure.
4	Wire port	Entry for wiring connections
5	Pressure gauge	Displays the present spray pressure.
6	Silencer	Reduces exhaust noise.

(3) Humidity Sensor

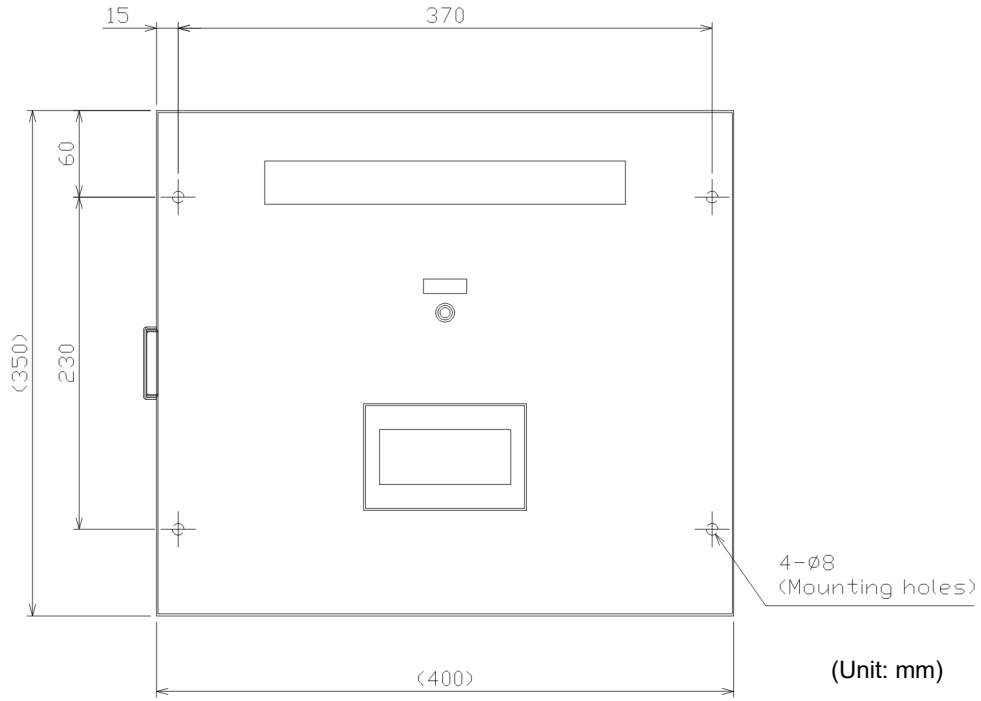


No	Description	Function
1	Humidity sensor element	Measures the room humidity.

3. Installation

(1) Installation of the Controller

The humidity controller RHC-D41C-B has 4 mounting holes (dia. 8 mm) on the back side.
Install it on the wall using M6 bolts.



(Unit: mm)

⚠ Caution

- Do not install outdoors.
- Make sure there is enough space for wiring and maintenance with its door open where you install the controller.
- Do not install in high-humidity or high-temperature places.
- Do not install in a place exposed to water.

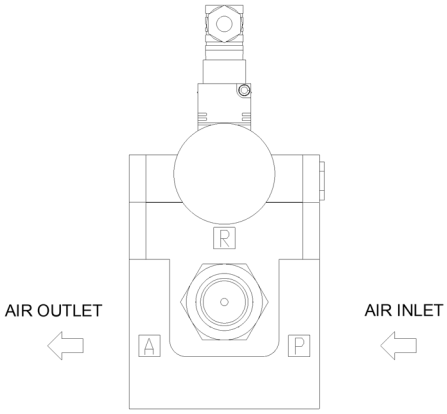
(2) Installation of the Electro-pneumatic Regulator Unit

The Electro-pneumatic Regulator Unit is an important device for controlling the spray pressure (operating air pressure) of the AKIMist® humidifier.

Before installation, read the enclosed manual for the Electro-pneumatic Regulator Unit carefully and familiarize yourself with the proper installation and operation of the unit.

Connect the air supply piping.

Supply clean compressed air to the Electro-pneumatic Regulator Unit. It is recommended to install an air filter and mist separator immediately before the Electro-pneumatic Regulator Unit to prevent foreign particles, water droplets, and oil mist from entering the unit.



Pipe connection size	Tightening torque
Rc3/4 (20A)	28–30 N-m

⚠ Caution

- Make sure there is enough space for maintenance where the unit is installed.
- It is recommended to install unions on both sides of the Electro-pneumatic Regulator Unit so that it can be easily removed for maintenance or replacement.
- Before installation, be sure to flush the piping thoroughly and purge dust and water droplets from inside the piping with compressed air. Failure of the Electro-pneumatic Regulator Unit due to moisture entering the unit is not covered by the warranty.
- When the Electro-pneumatic Regulator Unit is in use, air is constantly exhausted and noise is generated. This is not a malfunction. Install the unit in a location where the exhaust noise will not cause a problem.

(3) Wiring of the Controller and Electro-pneumatic Regulator Unit

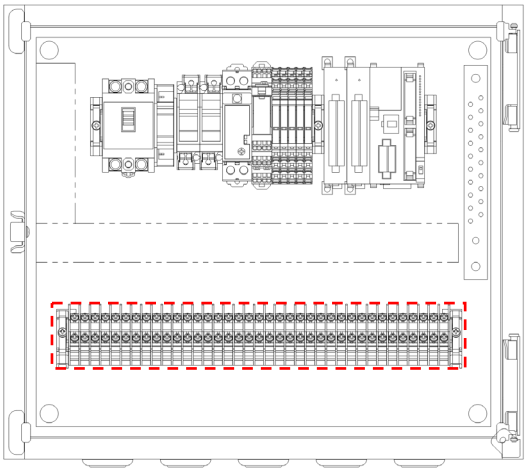
Use a 3-core shielded cable with conductors of 0.5 mm² or more, and connect it as shown in the table below.

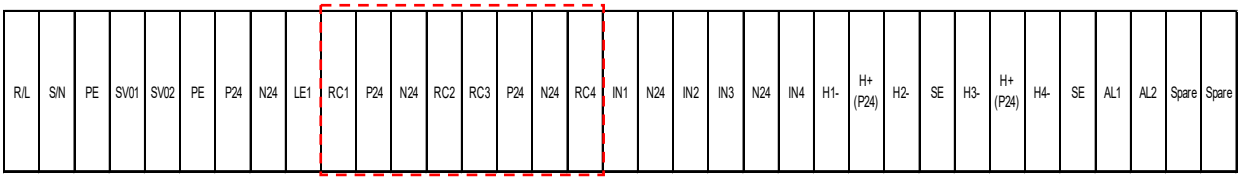
Controller (Terminal symbols)		Electro-pneumatic regulator unit (Wiring names)
P24	⇔	POWER [1]
N24	⇔	COM [3]
RC☐	⇔	SIGNAL [2]

Note: "□" denotes the area number 1, 2, 3 or 4.

Connect the shielded part of the cable to the ground if necessary.

Note: Install the signal line as far away as possible from other power lines so that it will not be affected by noise.





⚠ Caution

Pay close attention to prevent any mistake in the wiring. Turning on the power with incorrect wiring may damage the controller and the pilot solenoid valve of the electro-pneumatic regulator unit.

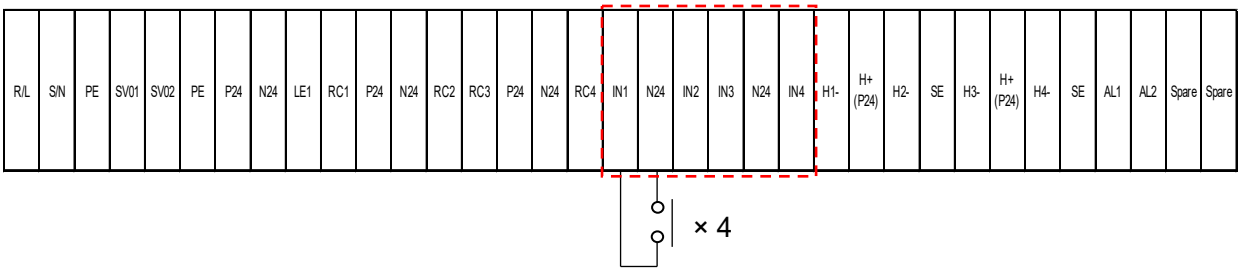
(4) Connection of the Controller and Interlock Signal

Before shipment, the interlock terminals are shorted with a jumper wire.

When controlling this system with an external operation signal, remove the jumper wire between IN□ and N24, and connect the external signal wires.

Note: "□" denotes the area number 1, 2, 3 or 4.

If external start/stop control is not used, leave the jumper wire in place.



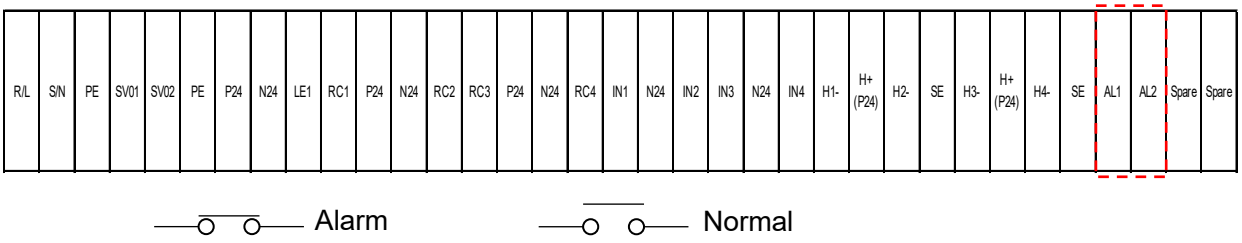
Use a no-voltage contact (dry contact) for the external operation signal.

During automatic operation, the unit runs when the external operation signal contact is closed and stops when it is open.

(5) Connection of Common Alarm Output Signal

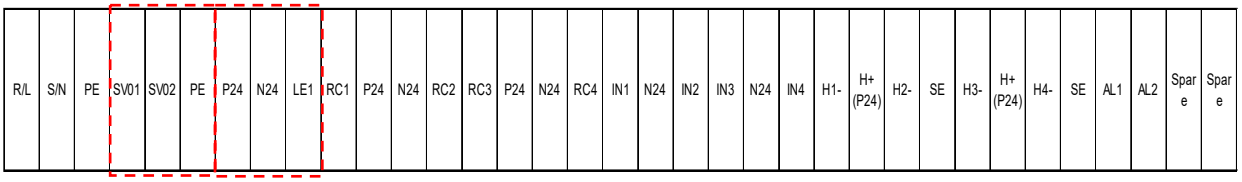
When an alarm occurs, a no-voltage contact output is provided at terminals AL1 and AL2.

Wire as needed for external alarm output.



(6) Connection of Water Leakage Sensor and Water Supply Solenoid Valve (Optional devices)

When the water leakage sensor detects leakage, the water supply solenoid valve closes and automatic operation stops. Wire these devices if used.



Use a water supply solenoid valve with the same voltage rating as the main power supply, and connect it to terminals SV01 and SV02.

Connect the grounding wire to PE.

Connect the water leakage sensor to terminals P24, N24, and LE1.

(7) Wiring of the Controller and Humidity Sensor

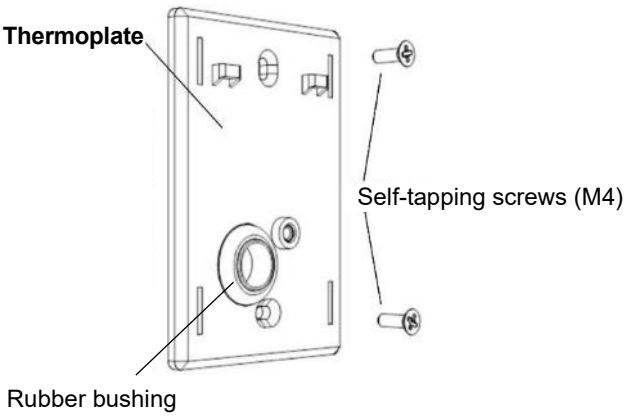
Connect the humidity sensor to the terminals of H+(P24) and H□-.

Note: "□" denotes the area number 1, 2, 3 or 4.

R/L	S/N	PE	SV01	SV02	PE	P24	N24	LE1	RC1	P24	N24	RC2	RC3	P24	N24	RC4	IN1	N24	IN2	IN3	N24	IN4	H1-	H+ (P24)	H2-	SE	H3-	H+ (P24)	H4-	SE	AL1	AL2	Spare	Spare

■ Installation of the Humidity Sensor

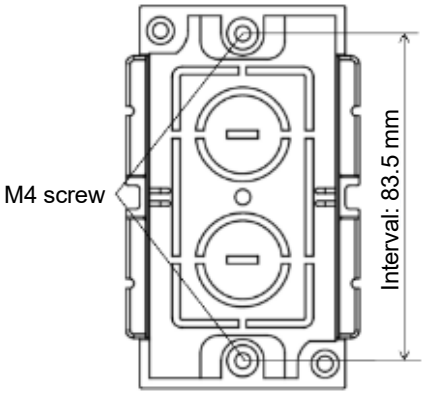
i. Remove the rubber bushing from the thermoplate and mount the thermoplate on the wall using self-tapping screws.

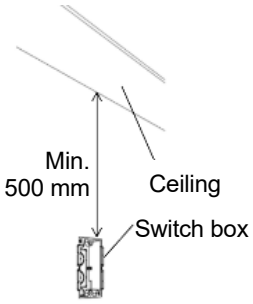


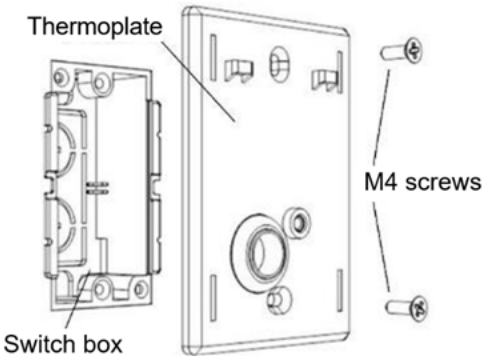
When using a switch box (not included)

Embed a compatible switch box (JIS C 8435-compliant with 83.5 mm screw spacing) into the wall, and attach the sensor's thermoplate to the switch box.

Note: The switch box is not included and should be prepared by the customer if needed. Also Ensure at least 500 mm of space between the top of the switch box and the ceiling.

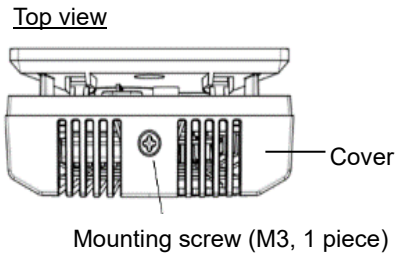


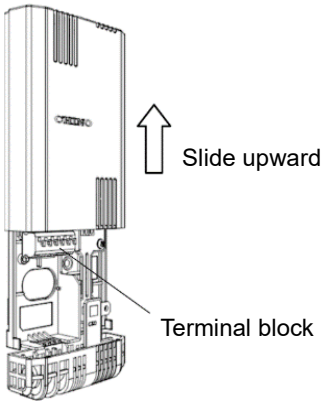




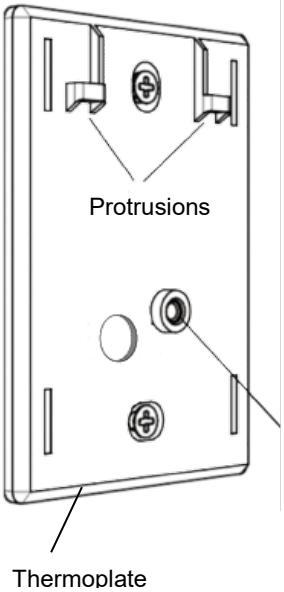
(No need to remove the rubber bushing from the thermoplate when using a switch box.)

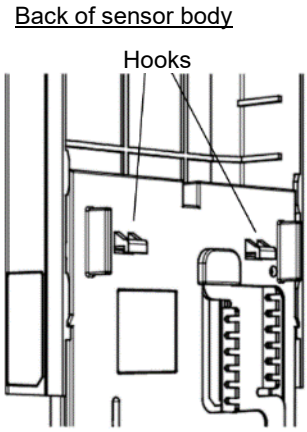
ii. Remove the screw at the top of the cover, and slide the humidity sensor cover upward until it clicks and the terminal block is exposed.



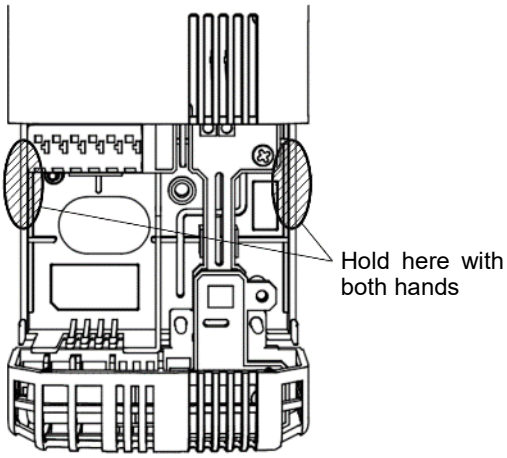


iii. Hook the back hooks of the humidity sensor onto the protrusions of the thermoplate mounted on the wall.

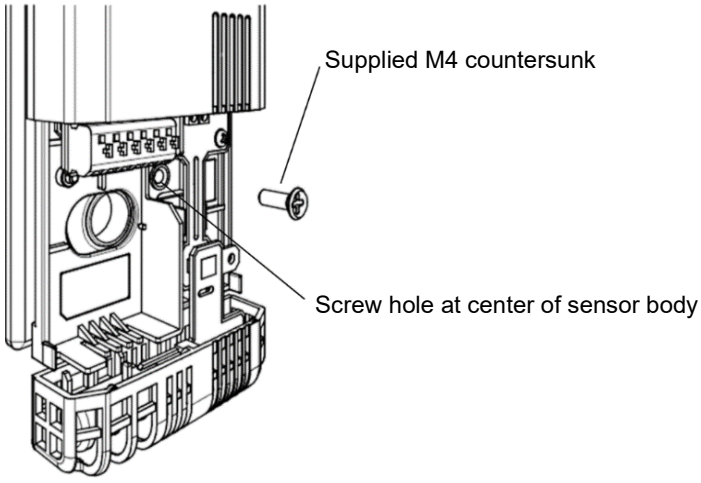




It is easier if you hold the sides of the sensor body with both hands, press down slightly, and slide it downward.

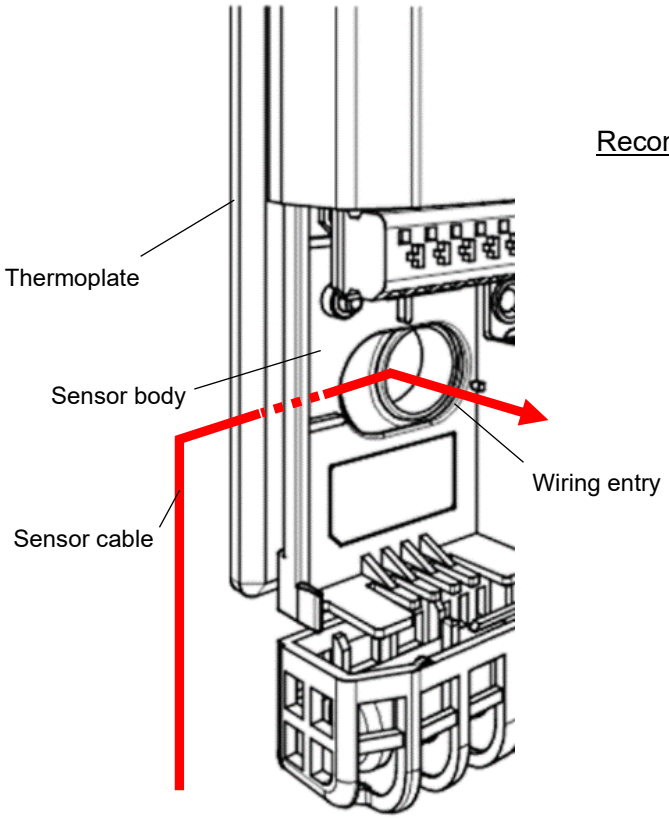


iv. Align the embedded screw (threaded insert) at the center of the thermoplate with the screw hole at the center of the humidity sensor, and secure them using the supplied M4 screw.

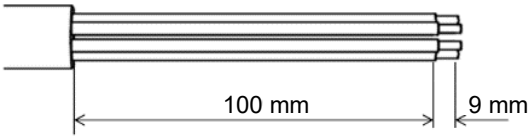


■ Wiring at the Sensor

i. Pass the included sensor cable through the gap between the thermoplate and the humidity sensor body, then pull it out through the wiring entry as shown below.



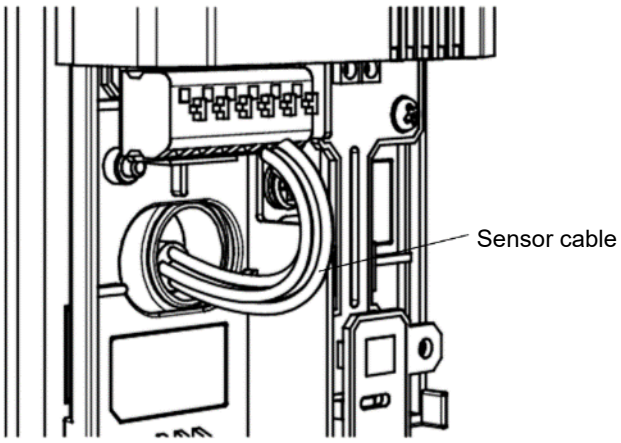
Recommended processing dimensions of sensor cable



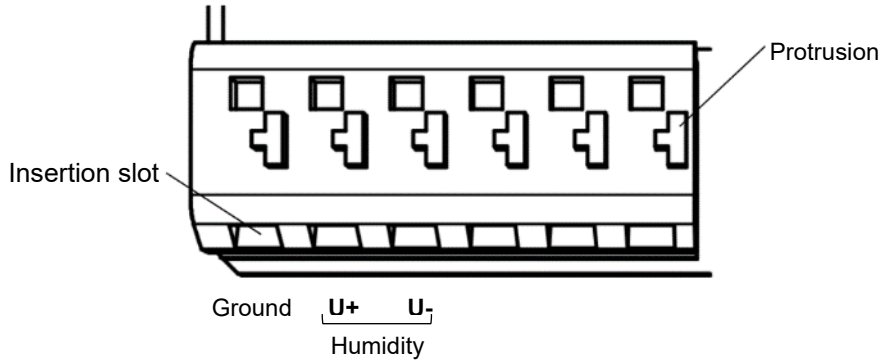
Please use the shielded wire cables.

When using a switch box (not included)

If the thermoplate is mounted on a wall-embedded switch box, pass the sensor cable from the back of the humidity sensor and pull it out through the wiring entry as shown below.



ii. Connect the sensor cable to the second and third terminal blocks from the left.
While pressing down on the protrusion in the upper part of the terminal block, insert the stripped end of the cable into the insertion slot and then release the protrusion.



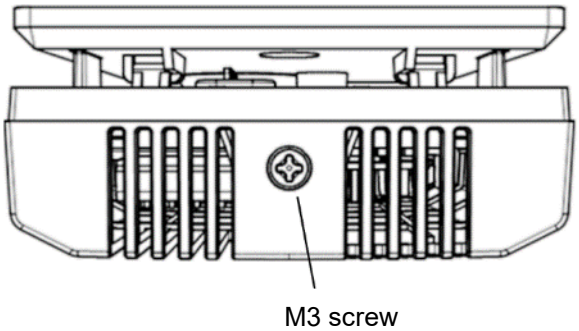
Connect the cables according to the table below.

Controller (Terminal symbols)		Humidity Sensor
H+(P24)	⇔	U+ (2nd terminal from the left)
H□-	⇔	U- (3rd terminal from the left)

Note: "□" denotes the area number 1, 2, 3 or 4.

iii. Slide the humidity sensor cover downwards until it is fully closed. Then, tighten the screw at the top of the cover.

Top view



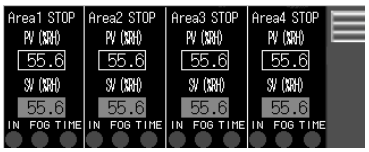
4. Touch Panel (Touch Screen)

(1) Screen Configuration

The screen configuration of the touch panel is as shown in the figure below.

Startup logo screen

Home screen



Area

Humidity setting screen for each area

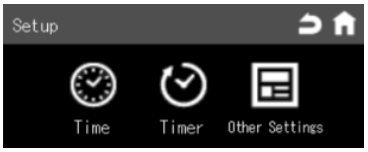
(For operation, see pages 24–26)
(For settings, see pages 28–32)

Menu screen

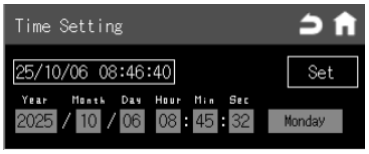
Alarm screen

(See pages 36–38)

Setup screen



Time setting screen

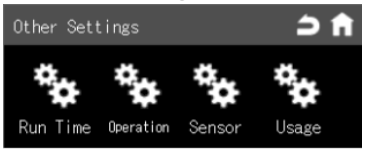


(See page 20)

Timer setting screen

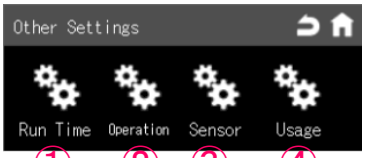
(See page 33)

Other settings screen



(Continued on the next page)

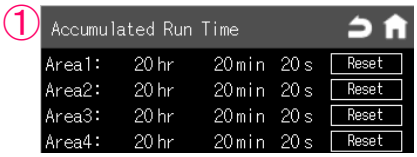
Other settings screen



Area usage setting screen

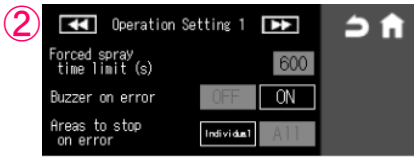
(See page 23)

Run time display screen



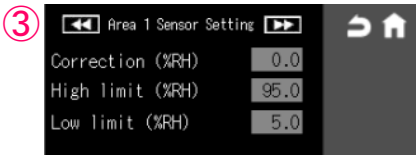
(See page 27)

Operation setting screen



(See pages 34–35)

Sensor setting screen



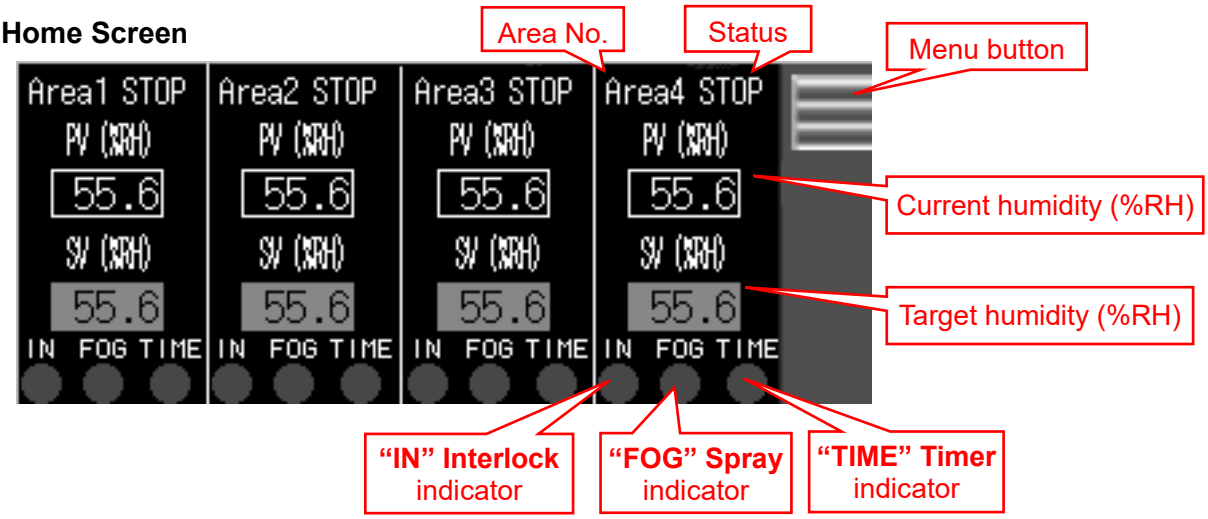
(See pages 23 & 34)

(2) Overview of Each Screen

Menu Screen

- Press the Home button to open the Home screen.
- Press the Setup button to open the Setup screen.
- Press the Alarm button to open the Alarm screen.
- Touch the JPN button to change the display to Japanese. Touch ENG to change the display to English.

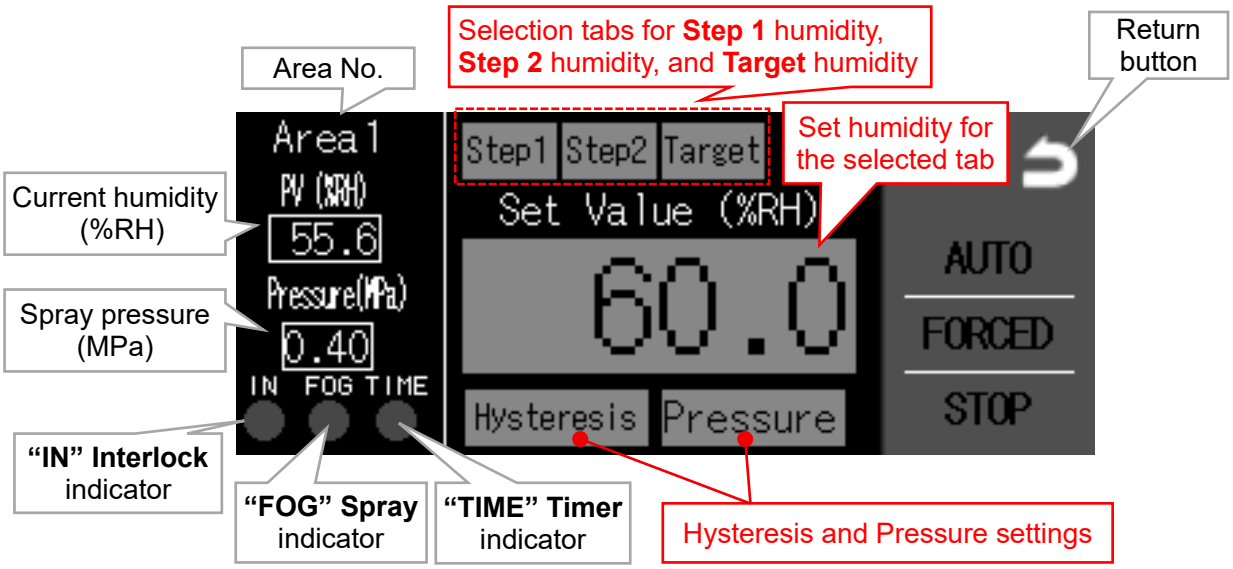
Home Screen



- Displays the current humidity, target humidity, and status of Areas 1 to 4.
- Press the numeric display for Areas 1 to 4 to open the humidity setting/operation screen for each area. (For operation, see pages 24–26. For settings, see pages 28–32.)
- Only the areas set to "In use" on the Area Usage Setting screen (see page 23) are displayed. Areas set to "Not used" are not displayed.
- **PV** (Present Value) indicates the current humidity, and **SV** (Set Value) on the home screen indicates the target humidity.
- **IN** indicator: Lights white when an interlock signal is present. (The factory-installed jumper wire between IN□ and N24 is also treated as an interlock input.)
- **TIME** indicator: Lights white when the current time is within the timer setting period.
- **FOG** indicator: Lights white during spraying.
- Press the Menu button to display the Menu screen.

Humidity Setting Screen

This screen is used for settings and operation control for each area.
(The example below shows the setting for Area 1.)



Operation

- Each area can be operated in **AUTO** (automatic operation), **FORCED** (forced operation), or **STOP** mode. For details of each operation mode, see pages 25–26.
- Press the Return button to return to the Home screen.

Setting

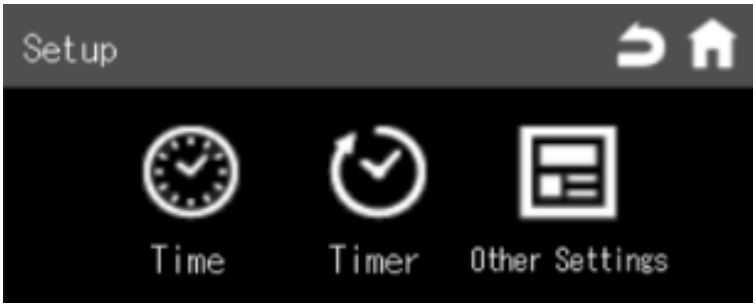
- Press the tabs to switch between Step 1, Step 2, and Target to set the humidity, hysteresis, and spray pressure for each stage. For setting instructions, refer to pages 28–32.

Display

- Current humidity (**PV**): Displays the humidity reading measured by the sensor, corrected by the set correction value. (The initial correction value is 0.0%RH. See page 34 for details.)
- Spray pressure: Displays the spray pressure output to the electro-pneumatic regulator unit.
- **IN** indicator: Lights white when an interlock signal is present.
- **TIME** indicator: Lights white when the current time is within the timer setting period.
- **FOG** indicator: Lights white during spraying.

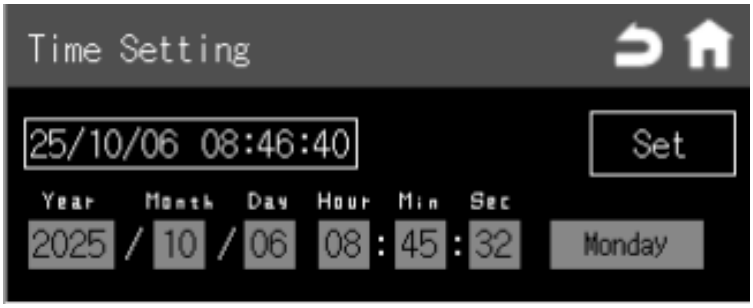
Lit

Setup Screen



- Press the Time button to open the current time setting screen.
- Press the Timer button to open the timer setting screen.
- Press the Other Settings button to open the advanced settings menu for operation, sensors, and area usage.

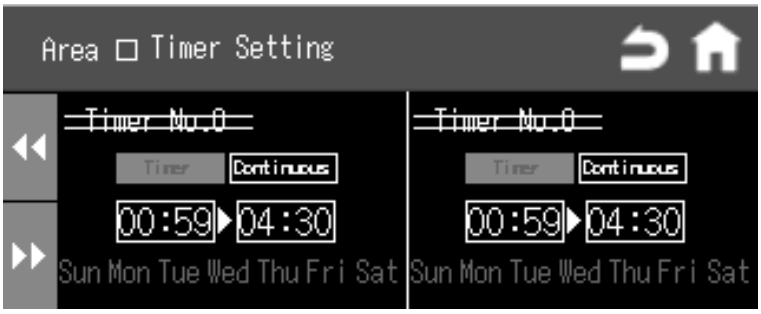
Current Time Setting Screen



- Displays the current time and the new time being set.
- Press and hold the Set button to apply the new time as the current time.

Timer Setting Screen

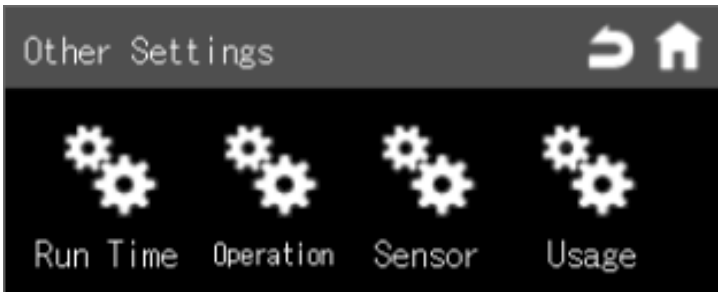
The timer can be set independently for each area (Areas 1 to 4).



- Up to 10 timer settings can be registered for each area.
- Unset timer numbers are crossed out with a double line.

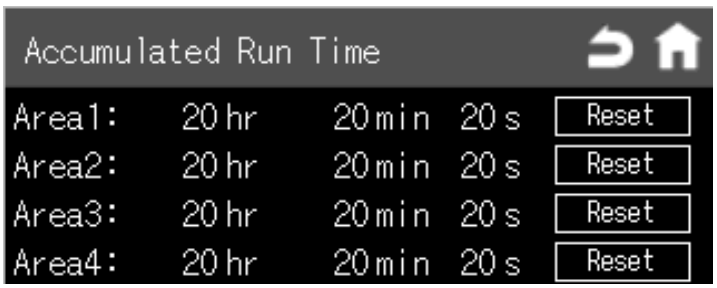
For details on timer setting, see page 33.

Other Settings Screen



- Run Time: Opens the screen that displays the accumulated operating time of the electro-pneumatic regulator unit.
- Operation: Opens the screen for configuring operation settings.
- Sensor: Opens the screen for setting humidity sensor correction values and alarm thresholds.
- Usage: Opens the screen for setting which areas are used.

Run Time Display Screen

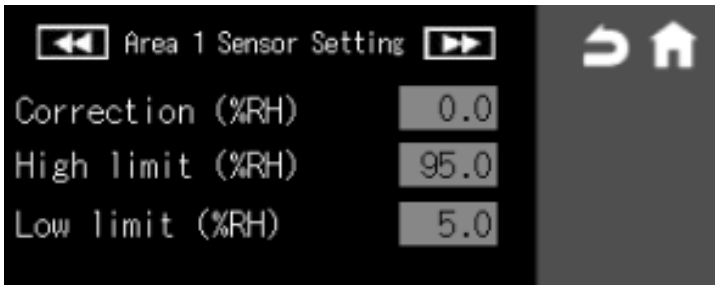


- Displays the accumulated run time for each area.
- To reset the accumulated run time to “0”, press the Reset button. See page 27 for details.

Operation Setting Screen

- Operation Setting 1 to 3 are used to configure operation settings for errors and the standby purge spray function. For details, see pages 34–35.
- Use the ◀◀ and ▶▶ buttons to switch between Operation Setting 1, 2, and 3.

Sensor Setting Screen



- The sensor settings can be configured for each area (Areas 1 to 4).
  Use the ◀◀ and ▶▶ buttons to switch between Areas 1 to 4. For details, see page 34.

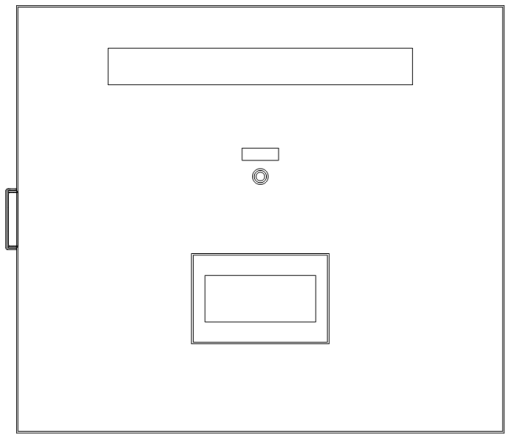
Area Usage Setting Screen

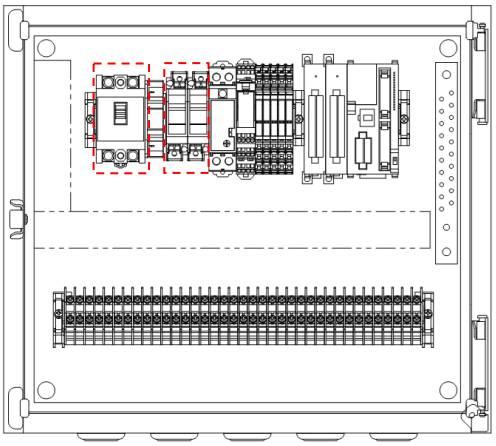
- Set areas to be used to “In use,” and areas not to be used to “Not used.”
- Use the ◀◀ and ▶▶ buttons to switch between Areas 1 to 4 and configure each area individually.

5. Operation

(1) Equipment Startup

When power is supplied to the controller, the power indicator lights.
Turn on the ground-fault circuit interrupter (ELCB1) and circuit protector (CBE1, 2) inside the controller.
The touch panel starts up.

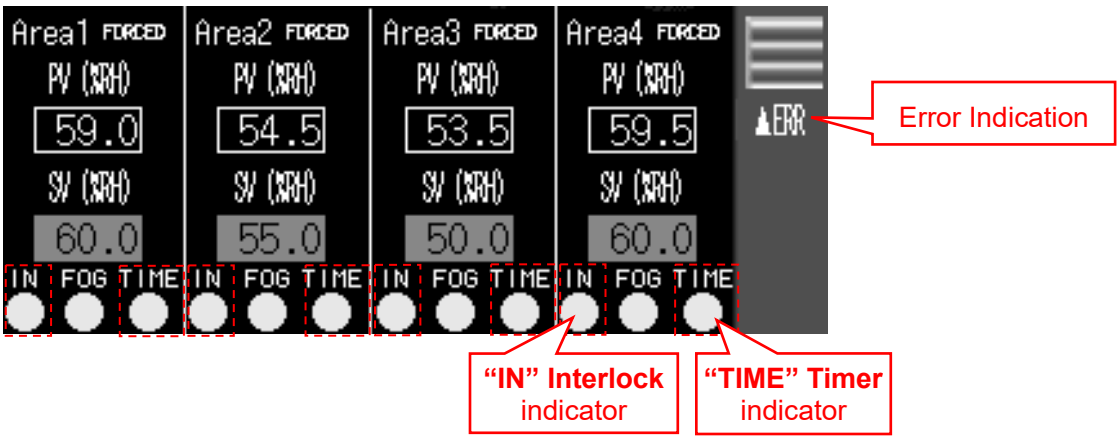




Checks Before Starting Operation

Before starting operation, make the following settings. After completing the settings, check the Home screen on the touch panel to confirm that the settings have been correctly applied.

- **Area usage setting (See page 23)**
  Only the areas set for use are displayed on the Home screen.
- Current time setting (See page 20)
- Humidity setting for each area (See pages 28–32)
- **Confirmation of interlock signal status (See page 11)**
  The IN indicator lights white when an interlock signal is present or when the factory-installed jumper wire keeps the terminals shorted.
- **Timer setting for each area (See page 33)**
  The TIME indicator lights white when the current time is within the timer setting period.



Note: If the ▲Error indication is flashing, refer to pages 36 to 38.

(2) Operation

Outline

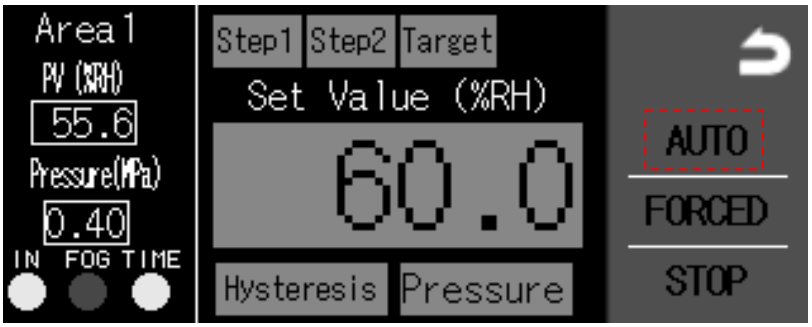
This unit controls the spray flow rate by changing the spray pressure in three steps according to the humidity. The operation modes are AUTO, FORCED, and STOP. Spraying stops if an error occurs.

Each area can be operated by pressing the **AUTO**, **FORCED**, or **STOP** button on the right side of the humidity setting screen.

Note: The example above shows the screen for Area 1. Select the operation mode individually for each area (Areas 1 to 4).

Automatic Operation Mode (AUTO)

Press the AUTO button to start automatic operation.



When all the conditions shown below are met for an area, spraying starts in that area.

In automatic mode, the spray pressure is regulated according to the current humidity.

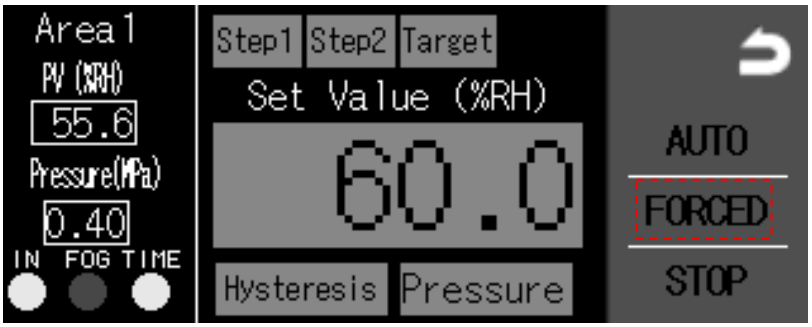
Spray conditions:

- The current humidity is below the target humidity setting minus the hysteresis value.
- The current time is within the weekly timer setting period.
- An external operation signal is present, or IN□ and N24 are connected with a jumper wire. (Before shipment, the interlock terminals are shorted with a jumper wire as shown on page 11.)

Refer to pages 28–32 for humidity, spray pressure, and hysteresis settings, and to page 33 for timer setting.

Forced Operation Mode (FORCED)

Press and hold the FORCED button for 2 seconds or more to start spraying.



- In FORCED mode, spraying continues in the selected area regardless of conditions such as the current humidity, external signals, or the timer setting.
- The spray pressure set on the Target tab for each area is applied in FORCED mode.
- If spraying in FORCED mode continues longer than the time limit set in Operation Setting 1, an error occurs and spraying stops. See page 34 for details.

Stop Mode (STOP)

- Spraying stops immediately in the selected area.
- This is also the state when operation stops due to an error.

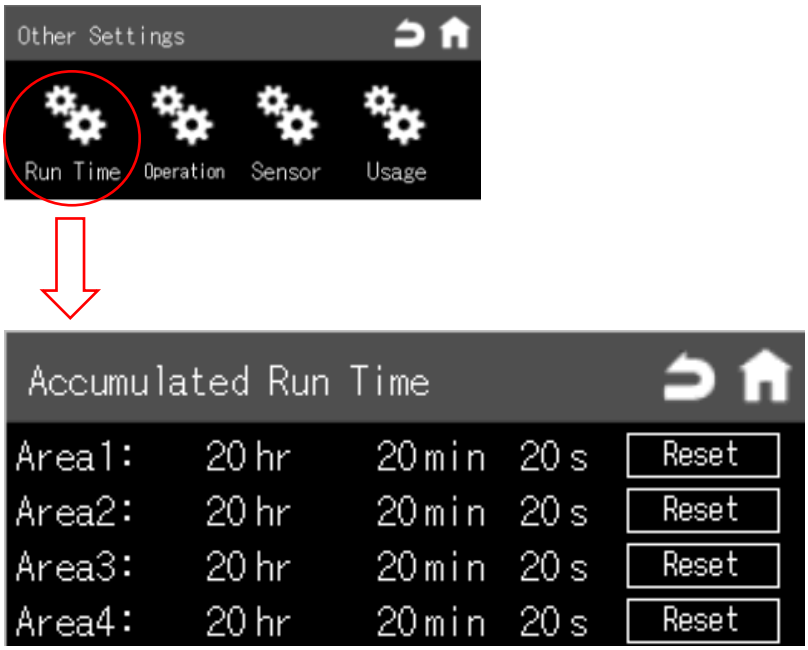
Error Cancellation

- If an error occurs, spraying stops and the error indication flashes.
- Remove the cause of the error and press the Reset button on the Alarm screen to cancel the error. For details of each error, see pages 36–38.

(3) Checking the Accumulated Run Time

The pilot solenoid valve in the electro-pneumatic regulator unit has a service life and must be replaced every 5,000 hours. If it continues to be used without replacement, spraying may not operate normally and the surrounding area may become wet.

Press the **Run Time** on the Other Settings Screen to display the accumulated run time of the pilot solenoid valve. Check this value periodically and replace the pilot solenoid valve before it reaches the end of its service life.

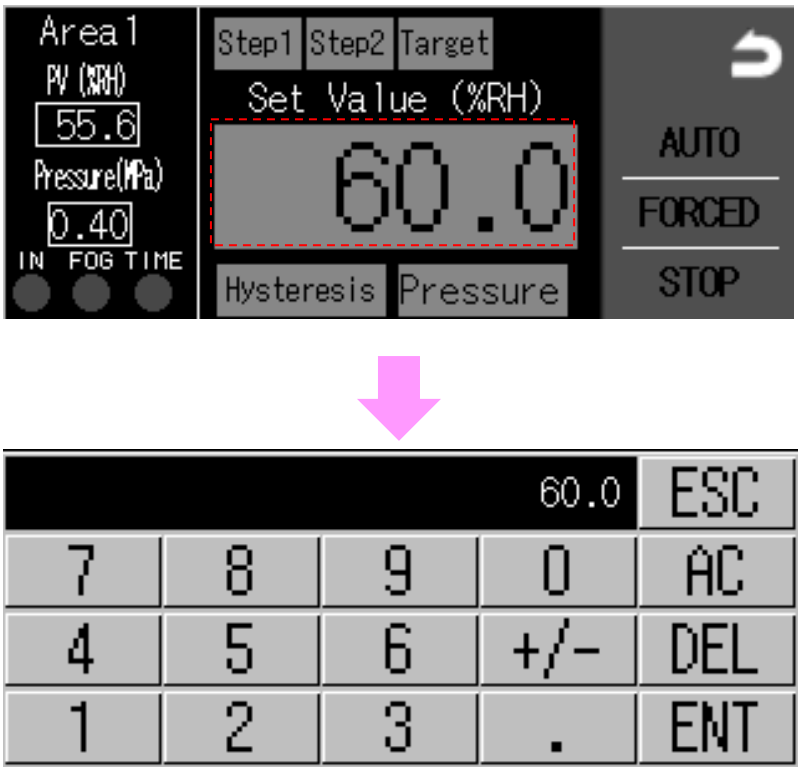


For replacement of the pilot solenoid valve, refer to the instruction manual for the electro-pneumatic regulator unit.

After replacing the pilot solenoid valve, press and hold the Reset button for 2 seconds or more to reset the accumulated run time to “0.”

6. Settings

This section explains how to enter numerical values on the touch panel.
First, select the tab to be set (see page 29). The selected tab label lights up in white.
Then touch the displayed numeric value to be changed. A numeric keypad appears.
Enter the desired value and press “ENT” to complete the setting.
If a value outside the allowable range is entered, it is automatically corrected to a value within the range.



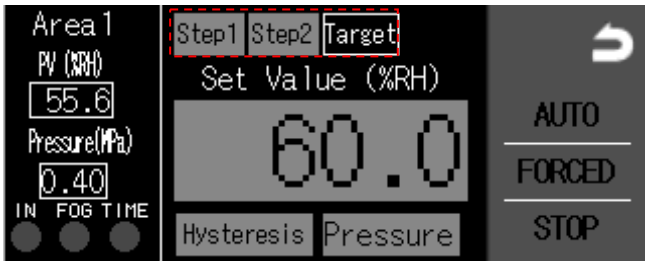
(1) Humidity, Hysteresis, and Spray Pressure Setting Screens

Switching the tabs displays the **Step 1**, **Step 2**, and **Target** screens.
On each tab, set the humidity value, hysteresis, and spray pressure for the corresponding stage.
The same settings are required for each area (Areas 1 to 4).
For detailed setting conditions, see pages 30–32.

Step 1 setting screen

Step 2 setting screen

Target setting screen

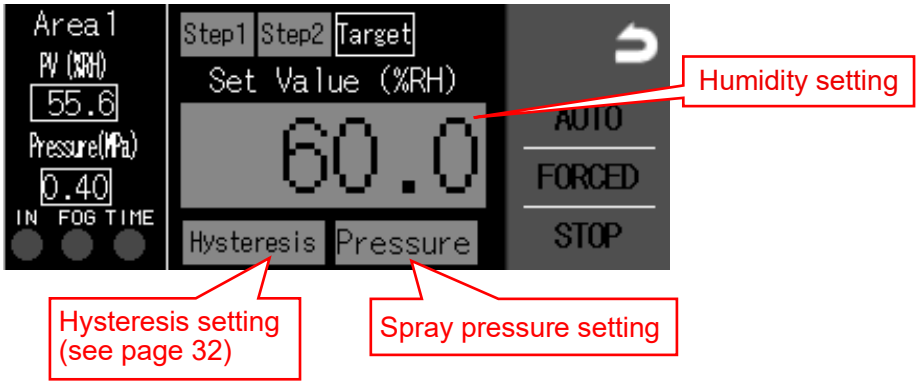


The above example shows the setting screen for Area 1. The same settings are required for Areas 2, 3, and 4.

(2) Humidity and Spray Pressure Setting

On the Step 1, Step 2, and Target tabs, set the humidity value, hysteresis, and spray pressure for each stage.

When making the settings, make sure the following relationships are satisfied.



Humidity setting

Set the values so that:

Step 1 < Step 2 < Target

Spray pressure setting

Press **Pressure** on the selected tab screen to set the spray pressure for that stage.

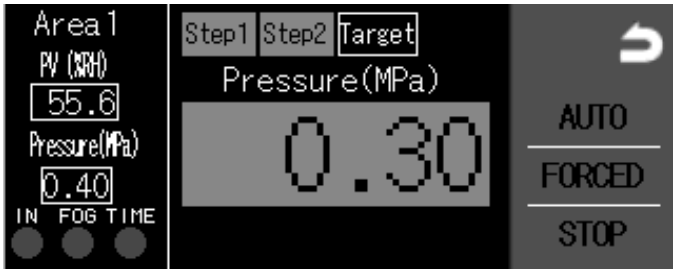
Set the values so that:

Step 1 > Step 2 > Target

Set the spray pressure so that it decreases as the humidity approaches the target humidity.

(See the setting example on the next page.)

As a general rule, set the spray pressure within the range of 0.2 to 0.5 MPa.



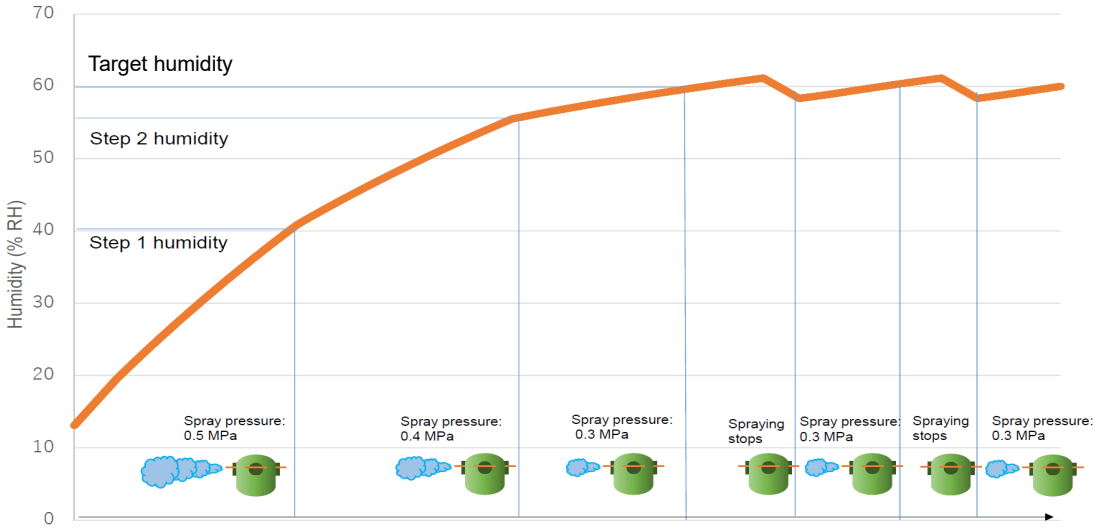
⚠ Caution

If incorrect setting values are entered, a Setting Error occurs.

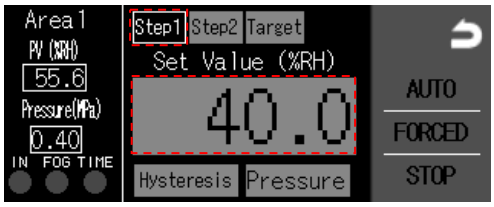
Setting example

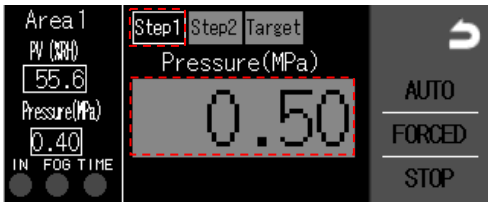
- Spray is on at 0.5 MPa until the humidity reaches 40%RH.
- Spray is on at 0.4 MPa when the humidity is between 40%RH and 55%RH.
- Spray is on at 0.3 MPa when the humidity is between 55%RH and 60%RH. Spray stops when the humidity is 60%RH or higher.

Operation graph

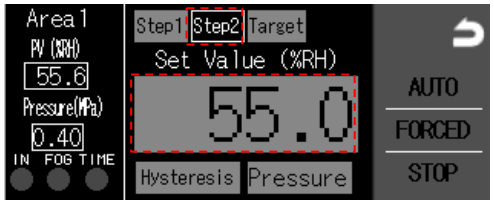


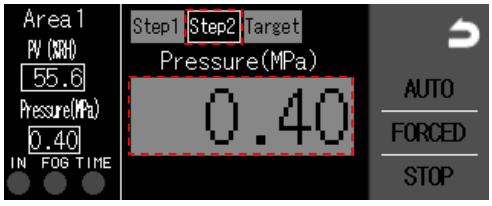
Humidity and spray pressure setting for “**Step 1**”



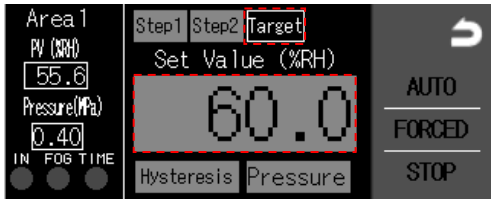


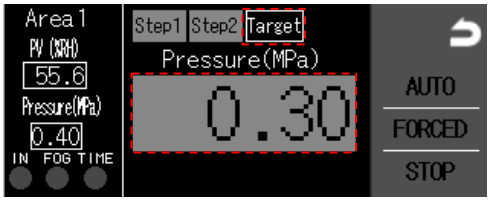
Humidity and spray pressure setting for “**Step 2**”





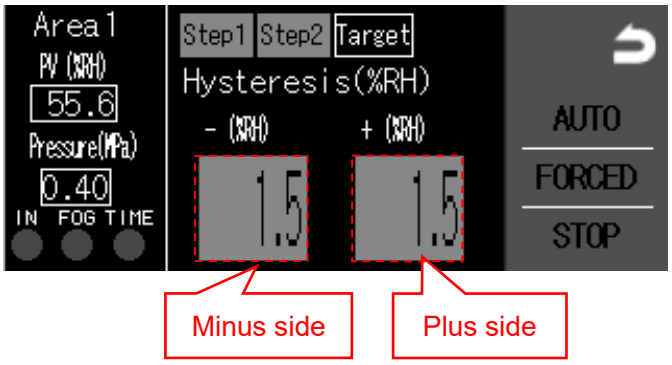
Humidity and spray pressure setting for “**Target**”





(3) Hysteresis Setting

Press **Hysteresis** on the selected tab screen to set the hysteresis value for that stage.
The minus side is the spray start side, and the plus side is the spray stop side.

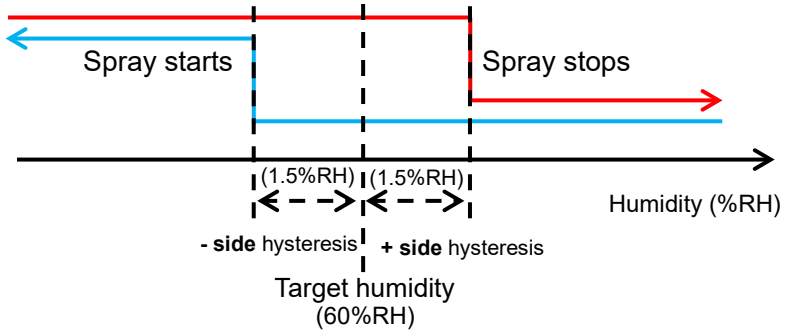


Spraying stops when the humidity exceeds [(set humidity) + (plus-side hysteresis value)].
Spraying starts when the humidity falls below [(set humidity) − (minus-side hysteresis value)].
Set the hysteresis value according to the operating environment.

Setting example

- Target humidity is 60%RH.
- Plus-side hysteresis is 1.5%RH.
- Minus-side hysteresis is 1.5%RH.

Spraying stops when the humidity exceeds 61.5%RH and starts when the humidity falls below 58.5%RH.



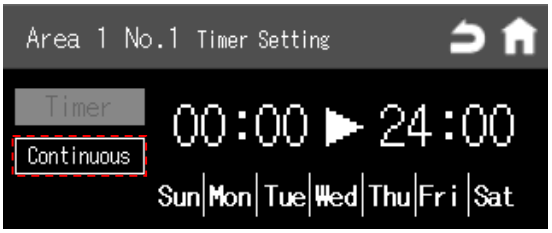
⚠ Caution

Be sure to set the hysteresis values so that the humidity at which spraying stops is higher than the humidity at which spraying starts.

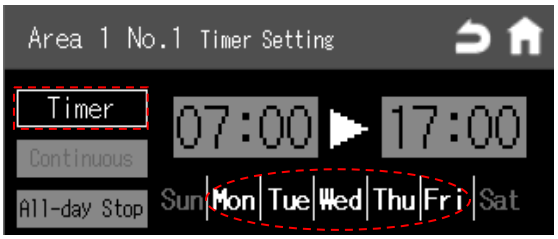
(4) Timer Setting

Set the automatic operation timer independently for each area (Areas 1 to 4).

Up to 10 timer settings can be registered for each area.
To make a setting, first select a timer No., then select either **Continuous** or **Timer**.
To set a timer for automatic operation continuously for 24 hours, touch **Continuous**, and then select the day(s) of the week to which the setting will apply.



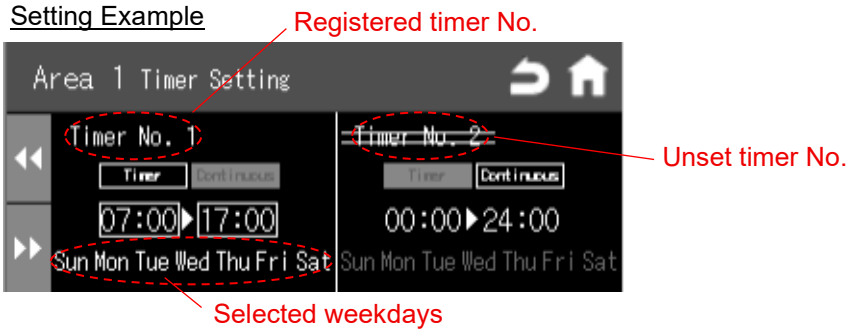
To set a timer for automatic operation during a specified time period, touch **Timer**, enter the operation start time and stop time, and then select the day(s) of the week to which the setting will apply.



When Timer is touched, the All-day stop button appears.
If **All-day stop** is selected, the time display changes to 00:00 ▸ 00:00.

- If All-day stop is set, it takes priority over other timer settings. For example, if All-day stop is set for Timer No. 1 on Monday and 07:00 ▸ 17:00 is set for Timer No. 2 on Monday, automatic operation on Monday remains stopped for the entire day (no spraying).
- A day of the week for which no timer setting is assigned (that is, a day not selected for any timer No.) is treated the same as All-day stop.
- One timer setting can be applied to multiple days of the week.
- To set multiple different time periods for the same day of the week, register them under different timer numbers.
- Unset timer numbers are crossed out with a double line.

Setting Example



Note: Timer settings are independent for each area.
Even when the same operation is required, the timer must be set separately for each area.

(5) Operation Settings for Errors

For details of each error, see Section 7, “Actions During a System Error,” on pages 36 to 38.

Operation Setting 1 Screen

Set the time limit for spraying in FORCED mode. (Default setting: 600 seconds)
If spraying in FORCED mode continues longer than the set time, an error occurs and spraying stops. (For details of FORCED mode, see page 26.)

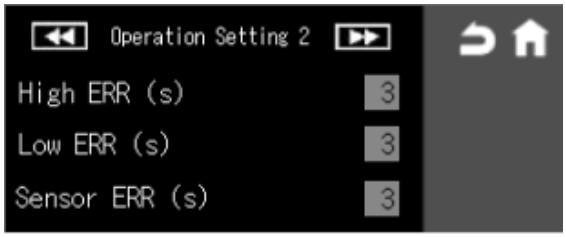
- Set the buzzer sound for errors. (Default setting: ON)
- Set which area(s) to stop when an error occurs. Select **“Individual”** to stop only the affected area, or “**All”** to stop all areas. (Default setting: Individual)

Operation Setting 1 Screen
(Setup > Other Settings > Operation > Operation Setting 1)

Operation Setting 2 Screen

Set the detection delay time for an upper humidity limit error.

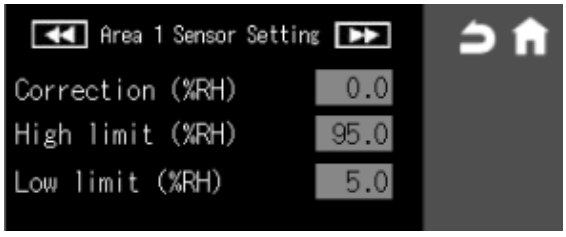
- Set the detection delay time for a lower humidity limit error.
- Set the detection delay time for a sensor unconnected error.
- The default setting for each is 3 seconds.



Operation Setting 2 Screen
(Setup > Other Settings > Operation > Operation Setting 2)

Sensor Setting Screen

- If the sensor reading is different from the displayed PV, set a correction value. (Default setting: 0.0%RH)
  Example: If the sensor reading is 60%RH and the correction value is set to -5%RH, the PV is displayed as 55%RH. If the sensor reading is 30%RH and the correction value is set to 10%RH, the PV is displayed as 40%RH.
- Set the upper and lower humidity limits for the sensor reading.
  An error is reported when the sensor reading exceeds the upper limit or falls below the lower limit. (Default setting: upper limit 95.0%RH, lower limit 5.0%RH)



Sensor Setting Screen
(Setup > Other Settings > Sensor)

Note: The above example shows the setting screen for Area 1. The same settings are required for Areas 2, 3, and 4.

(6) Standby Purge Spray Function

This function is used to replace pure water that has remained in the piping for a long time with fresh pure water.

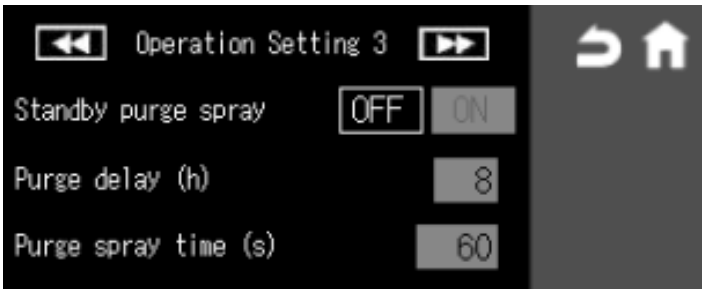
The default setting is OFF.

When set to ON, if no spraying has occurred for a certain period in Automatic Operation Mode (with an interlock signal present and within the timer setting period), the unit performs a short spray to replace the pure water in the piping.

Operation Setting 3 Screen

(Setup > Other Settings > Operation > Operation Setting 3)

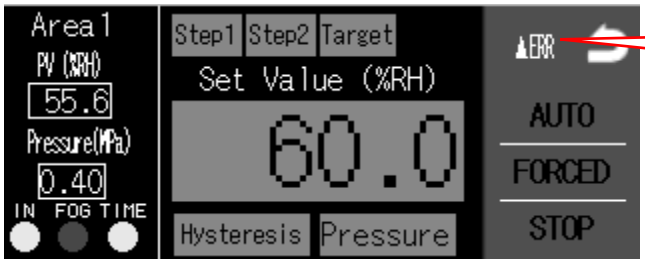
- Enables or disables the Standby Purge Spray function. (Default: OFF)
- When set to ON, you can set the time from when the no-spray condition continues until purge spraying starts (purge delay). (Default: 8 hours)
- When set to ON, you can set the duration of the purge spray. (Default: 60 seconds)

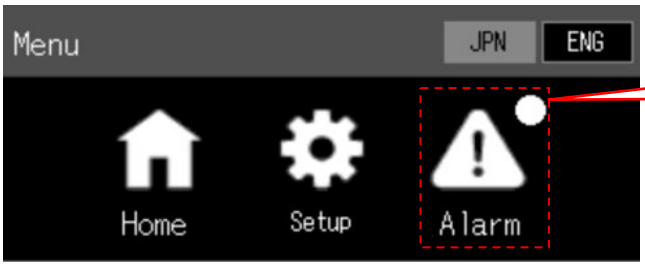


7. Actions During a System Error

(1) Error Indication

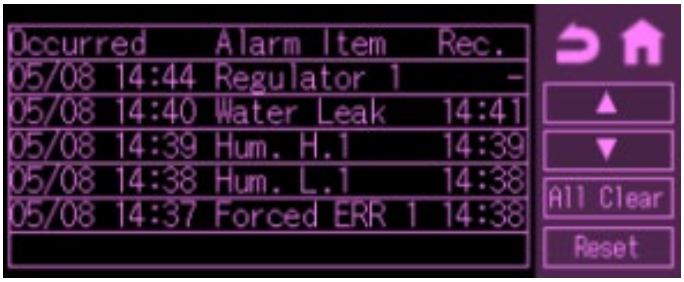
When an alarm occurs, the error indication flashes on the screens shown below and the buzzer sounds.





(2) Alarm Screen

Press the Alarm button on the Menu screen to open the Alarm screen, where you can check the alarm history.



- Displays the time when the alarm occurred, the alarm item, and the recovery time.
- Remove the cause of the alarm and press the Reset button to cancel the active alarm.
- Press and hold the All Clear button to delete the alarm history.

(3) Alarm Items

The table below shows the error messages and the behavior when each error occurs.

No	Error message	Behavior when the error occurs	Operation modes in which the error is detected		
			FORCED	**STOP**	**AUTO**
①	**Water Leak Error**	Operation stops in all the areas.	*Detect*	*Detect*	*Detect*
②	**Area □ Sensor Not Connected**	The affected area stops. (If the "All" stop setting is selected, all areas stop. See page 34.)	*N/A*	*N/A*	*Detect*
③	**Area □ Humidity Low Limit Error**		*Detect*	*N/A*	*Detect*
④	**Area □ Humidity High Limit Error**		*N/A*	*N/A*	*Detect*
⑤	**Area □ Setting Error**		*Detect*	*Detect*	*Detect*
⑥	**Area □ Forced Spray Time Exceeded**		*N/A*	*N/A*	*Detect*
⑦	**Area □ Pilot Solenoid Valve Maintenance**	Operation continues.	*Detect*	*Detect*	*Detect*

Note:

- *Detect* indicates that the error is monitored in that mode. *N/A* indicates that the error is not monitored in that mode.
- "□" denotes the area number 1, 2, 3 or 4.

① Water Leak Error [Alarm Item: Water Leak]

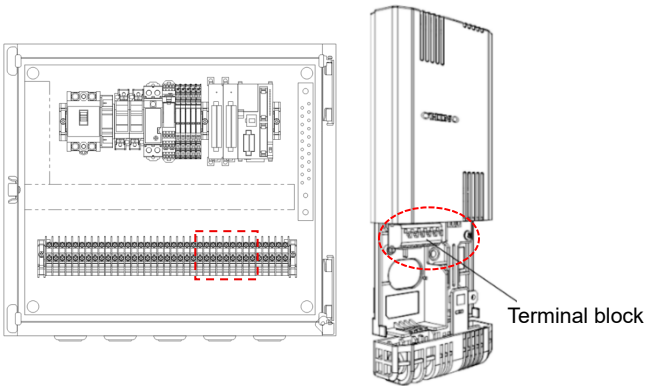
- If the optional water leakage sensor is installed and detects a leak, operation stops and the output to the optional water supply solenoid valve is shut off.
- Check the source of the leak.

② Area □ Sensor Not Connected [Alarm Item: Sensor ERR □]

- Check that the humidity sensor is connected properly.
- Confirm that there is no loose wiring at the terminals.

Check the parts as circled in red below.

- Control panel terminal block
- Humidity sensor terminal block



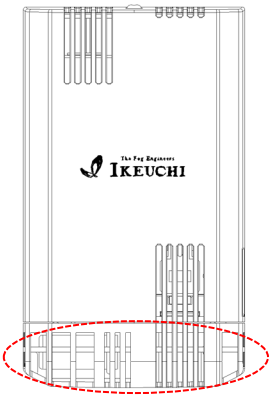
③ Area □ Humidity Low Limit Error [Alarm Item: Hum. L.□]

- Check the humidity sensor for dirt or condensation.
- If the humidity reading is abnormal, the sensor element may have reached the end of its service life. Replace the sensor element unit with a new one (see pages 40–41).

④ Area □ Humidity High Limit Error [Alarm Item: Hum. H.□]

- Check whether the humidity is locally high at the location where the humidity sensor is installed.
- Check that the sensor element unit is not wet.

Check the parts as circled in red below.



⑤ Area □ Setting Error [Alarm Item: Setting ERR □]

- Check the humidity and spray pressure settings and correct them (see page 30).

⑥ Area □ Forced Spray Time Exceeded [Alarm Item: Forced ERR □]

- This error occurs when spraying in FORCED mode continues longer than the time limit set in Operation Setting 1 (default setting: 600 seconds). Spraying then stops.
  After confirming that the area around the humidifier is not wet, press “Reset” to cancel the error.

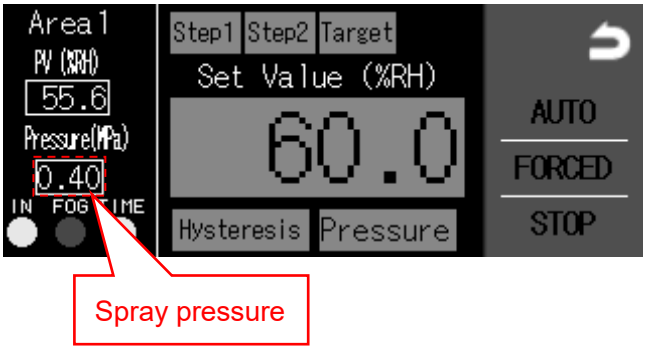
⑦ Area □ Pilot Solenoid Valve Maintenance [Alarm Item: Regulator □]

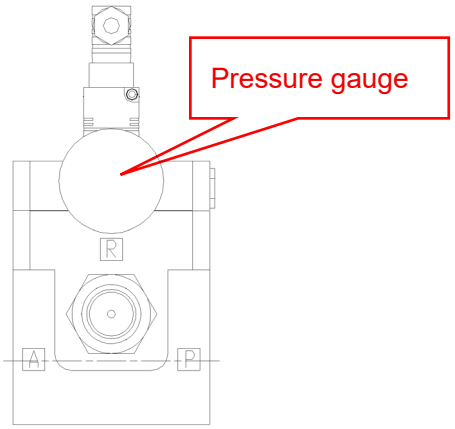
- Replace the pilot solenoid valve in the electro-pneumatic regulator unit, and then reset the accumulated run time on the touch panel to “0” (see page 27). After that, press “Reset” to cancel the error.

8. Maintenance

Daily Maintenance

(1) Check the Touch Panel





Electro-pneumatic regulator unit

Check that the spray pressure displayed on the touch panel is equal to the value on the pressure gauge of the electro-pneumatic regulator unit.

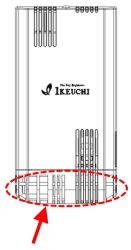
(2) Spray Nozzles on Humidifiers

Check the spraying condition for any problems such as no spray or water drips/leaks during the spraying.

(3) Humidity Sensor

Check that the value of the humidity sensor is correct by comparing it with the regularly calibrated humidity sensor.
If the difference from the value of the calibrated humidity sensor is 5%RH or more, correct it with the correction value. See page 34 for details.
If the difference is 10%RH or more, replace the sensor element unit with a new one (see pages 40–41).

- When dirty, gently wipe with a dry cloth.
- Periodically inspect the sensor for dirt or clogging.
- The sensor element is a consumable part, so regular replacement is recommended to maintain long-term accuracy and reliability.
  If the humidity reading is abnormal, the sensor element may have reached the end of its service life. In such cases, replacing the sensor element unit will restore normal operation. The sensor element unit of this product is compatible, so no recalibration is required after replacement.

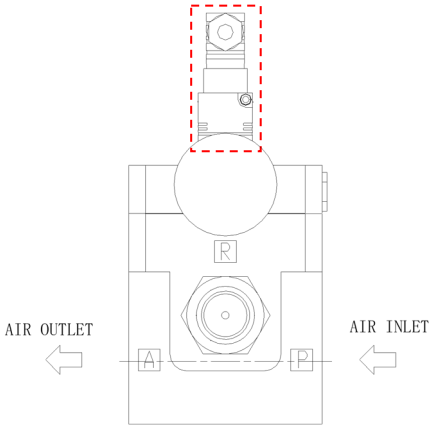


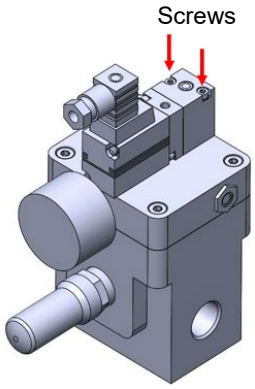
Humidity sensor element unit

9. Replacement of Consumable Parts

(1) Pilot Solenoid Valve

The pilot solenoid valve assembled in the electro-pneumatic regulator unit must be replaced every 5,000 hours.





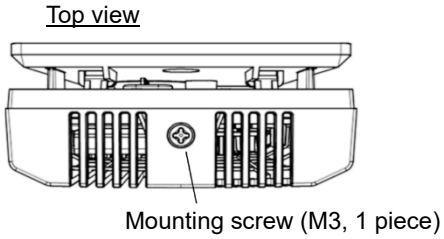
No	Part name	Part number	Remarks
1	Pilot Solenoid Valve	VY1B00-200-X57	Replace every 5,000 hours

Before replacing the pilot solenoid valve, shut off the power and turn off the ground-fault circuit interrupter in the controller.
Refer to the instruction manual of electro-pneumatic regulator unit for the replacement.

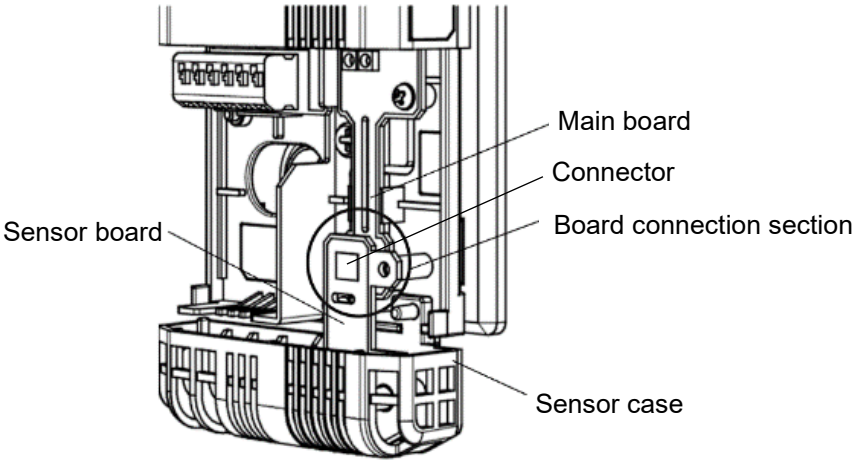
(2) Replacing the Humidity Sensor Element Unit

Always turn off the power before replacement.

a. Remove the screw at the top of the sensor cover, and slide the cover upward to expose the sensor board and main board.

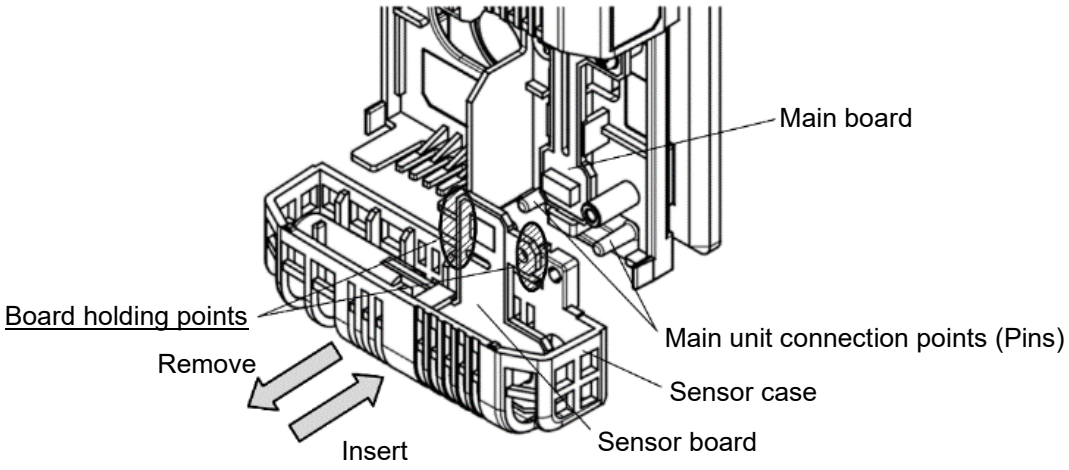


b. Hold the sensor board at the holding points (see figure below) and pull it out from the connector on the main board.



c. After confirming the sensor board is detached from the main board's connector, grasp the sensor case and remove it from the main unit by pulling it off the pins.
Note: If you pull out the sensor case before disconnecting the sensor board from the main board, it may result in damage to the main board. Always disconnect the connector first.

d. Insert the sensor case of the new sensor element unit into the main unit connection points, and then connect the sensor board to the connector on the main board.



e. Slide the humidity sensor cover downwards until it is fully closed. Then, tighten the screw at the top of the cover.

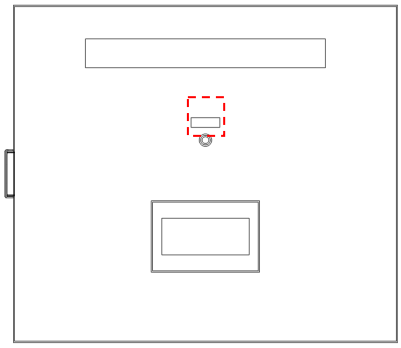
No	Part name	Part number	Part ID
1	Humidity Sensor Element Unit	HN-ESKB9NX04	#423791

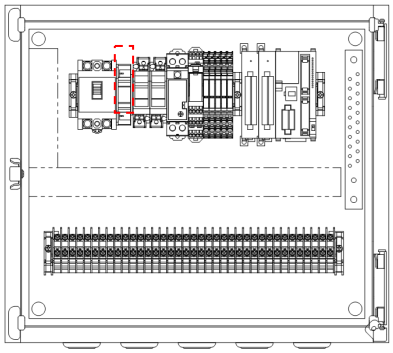
(3) Power indicator and Fuse

Replace the power indicator after approximately 30,000 hours of use.

When replacing the power indicator, replace the fuse at the same time.

Always turn off the power before replacement.



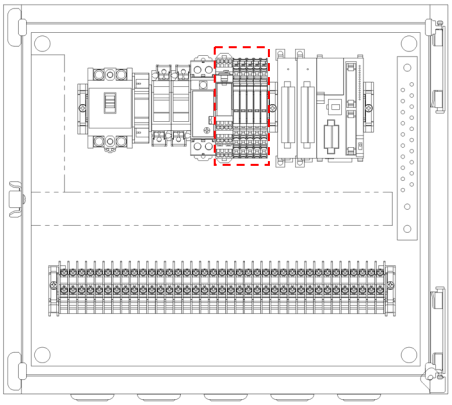


No	Part name	Part number
1	Power indicator	DF-10JPL-W 100–200 VAC
2	Fuse	BAF111S-1A

(4) Relay

Replace the relays every 10 years.

Always turn off the power before replacement.



No	Part name	Part number	Remarks
1	Relay	G2R-2-SND 24 VDC	1 piece required
2	Relay	G2RV-ST500 24 VDC	5 pieces required

10. Troubleshooting

If the unit is not operating properly, check the chart below.
If the problem is not listed below or cannot be solved, contact your supplier.

Problem	Probable Causes	Solutions
No spray, low spray flow	Power supply to the controller is disconnected. (Power indicator is off.)	Supply power to the controller, confirm that the power indicator is lit, and then resume operation.
	Power inside the controller is off. (Touch panel is off.)	Turn on the ground-fault circuit interrupter **(ELCB1)** and circuit protector **(CBE1)** inside the controller, and then resume operation.
		If the ground-fault circuit interrupter (ELCB1) has tripped, repair the source of the electrical leakage and then turn the ELCB1 on.
	The unit is in "STOP" mode due to a momentary power outage or similar event.	Restart operation from the touch panel. (See pages 24–26.)
	The interlock signal is inactive, or the current time is outside the time range set on the timer. (The **IN** and **TIME** indicators are off.)	Check the interlock signal status (external input or factory-installed jumper wire) and the timer setting, then start operation when both the **IN** and **TIME** indicators are lit. (See page 24.)
	The current humidity has already reached the set humidity value.	Check the humidity setting and change it if necessary.
	The error indication (see page 36) is flashing.	Check the alarm history, eliminate the cause of the error, and then restart operation.
	The electro-pneumatic regulator unit is not working.	Check the wiring of electro-pneumatic regulator unit. Also check that the current value of the valve opening signal is correct.
	Supply air pressure is too low.	Supply compressed air with a pressure of 0.6–0.9 MPa to the electro-pneumatic regulator unit.
	Supply water pressure is outside the proper range (0.2–0.4 MPa).	Adjust the water pressure appropriately.
	The spray nozzle is clogged.	Remove the humidifier from the tubing and remove any foreign matter with a soft brush. (See the humidifier manual for cleaning instructions.)
	Water leaks from the tubing or piping.	Check all water supply connections.

Problem	Probable Causes	Solutions
Humidifier and surroundings get wet	Dust or foreign matter is attached to the nozzle tip.	Gently wipe the nozzle tip with a soft cloth.
	Humidity is 80%RH or higher.	Check whether the humidity sensor element unit is wet. If it is, allow airflow through it and let it dry for at least half a day before use.
	Highly purified water is used.	If the conductivity of the spray water is too low, the fog may become electrically charged and adhere to the humidifier hanging plate or nearby parts. Consider using a water supply pump with a water receiving tank.
	The electro-pneumatic regulator unit is not operating normally.	If the exhaust port of the electro-pneumatic regulator unit is clogged, clean it.
		If the operating time of the pilot solenoid valve exceeds 5000 hours, replace it. (See pages 27 & 40.)
White powder adheres	High-hardness water is used.	Consider using a water purifier or a water deionizer. Since purified water lowers conductivity, also consider using a water supply pump with a water receiving tank.

11. Specifications

(1) Humidity Controller

Model	**RHC-D41C-B**
Supply voltage	100–200 VAC, 50/60 Hz
Power consumption	Approx. 30 W
Dimensions	(W) 400 mm (D) 170 mm (H) 350 mm
Weight	Approx. 15 kg

(2) Humidifier AKIMist® “E” (sold separately)

Model	**AKIMist “E” (03C)**	**AKIMist “E” (04E)**
Dimensions	(W) 109–125 x (H) 110 mm	
Weight*1	290–320 g	
Number of nozzles attached	1 to 4	
Operating air pressure	0.2–0.5 MPa	
Spray volume (at 0.3 MPa)*1	2.4–9.6 L/hr	3.0–12 L/hr
Air consumption (at 0.3 MPa)*1	29–116 L/min, Normal	36–144 L/min, Normal
Sauter mean droplet diameter	7.5 µm	10 µm

*1 Varies depending on the number of nozzles attached.

Model No.	**AE-1 (03C)** [AKIMist “E” (**03C**) with one nozzle]	
Air pressure	Spray volume	Air consumption
0.2 MPa	1.3 L/hr	22 L/min, Normal
0.3 MPa	2.4 L/hr	29 L/min, Normal
0.4 MPa	3.1 L/hr	36 L/min, Normal
0.5 MPa	3.6 L/hr	43 L/min, Normal

Model No.	**AE-1 (04E)** [AKIMist “E” (**04E**) with one nozzle]	
Air pressure	Spray volume	Air consumption
0.2 MPa	1.9 L/hr	27 L/min, Normal
0.3 MPa	3.0 L/hr	36 L/min, Normal
0.4 MPa	3.8 L/hr	45 L/min, Normal
0.5 MPa	4.5 L/hr	54 L/min, Normal

(3) Electro-pneumatic Regulator Unit (sold separately)

Model No.	**VY1500 20A 24VDC (Ozone-capable type)**
Connection size	Rc3/4
Dimensions	(W) 82 mm (D) 144 mm (H) 172 mm
Operating pressure range	0.6–0.9 MPa
Max. nozzle quantities*2	56
Supply voltage	24 VDC
Valve opening signal	4–20 mA
Weight	Approx. 1.5 kg

*2 The number of nozzles (on humidifiers) that can be controlled by one electro-pneumatic regulator unit.

(4) Humidity Sensor (sold separately)

Model No.	**HN-EKB1NX04**
Supply voltage	12–24 VDC
Type	Polymer capacitance type
Dimensions	(W) 85 mm (D) 38 mm (H) 145 mm
Allowable temperature	-10–55ºC
Measurement accuracy	+/-3%RH (at 25ºC, 0–95%RH)