Honeycomb DMZ2

DMZ2-500, 700

INSTRUCTION MANUAL

⚠ WARNING

Thank you very much for purchasing our product.
Please carefully read this instruction manual for correct use.
During operation, keep this manual close at hand so that it can be referred to whenever necessary.

MATSUI

Issued in December, 2008

Introduction

Thank you for purchasing our Honeycomb DMZ2. Please read this manual carefully for proper and safe operation. This instruction manual constitutes a warranty. So, please carefully store this manual after you have read it.

1. Warranty Period

If any defect is found in our equipment under normal operating conditions, and we determine it to be a defective, we will repair it or replace the parts free of charge within the following period and terms:

1) This warranty shall remain valid for twelve (12) months from the date when the new products you purchased are delivered to you.
2) Only the following parts are subject to the warranty period of six (6) months after such delivery date.
   Electromagnetic contactors and mechanical seals
3) The warranty period for any parts replaced for repair shall be three (3) months from the date of repair.

2. Scope

This warranty shall be limited to repair of our equipment or replacement of its parts, and shall not cover any products manufactured by means of our equipment and defects in manufacturing such products.

3. Exceptions

This warranty shall not apply to the following defects:

1) Defects caused by remodeling or repair made by any party other than our company;
2) Defects resulting from natural disasters such as earthquakes, typhoons and floods, accidents and fires;
3) Defects resulting from use exceeding limitations in the specifications set forth in the instruction manuals or catalogs;
4) Defects resulting from non-performance of maintenance and inspection by not observing manual instructions.
5) Defects in the equipment caused by outside factors such as peeling of coating caused by generated gas and malfunction due to electrical noise;
6) Defects resulting from non use of genuine parts (oil, medium, filters, etc.)
7) Consumables (hoses, filters, packings, O-rings, etc.).

4. In the case where the warranty period expires

We will make repairs for value, upon request, if the performance of our equipment can be maintained by such repairs.

5. Period during which parts can be supplied

As an approximate standard, service parts for our equipment can be supplied for eight (8) years after the equipment is discontinued. However, some parts may be supplied even after the period elapses. So, please make an inquiry at our service department about the availability of service parts.

Contents

Since the items marked with ⚠ are especially important, carefully read and understand these items before using the product.

Chapter 1 For Your Safe Operation

This chapter describes precautions for operation, maintenance inspection and repair, identification of headings of precautions and labels affixed to the product for using this product correctly and safely.

⚠ WARNING

When performing operation and maintenance inspection of this product, be sure to follow the safety precautions described in this manual.
We shall assume no liability for any injury or accident caused by failing to follow these precautions.

1. Precaution headings and their meanings

In this manual, indications are classified according to the degree of danger as follows:

Heading	Meaning
⚠ DANGER	This heading is used for cases where there is a possibility that mishandling will lead to the user's death, and precautions to prevent any such occurrence are described below the heading.
⚠ WARNING	This heading is used for cases where there is a possibility that mishandling will lead to the user suffering a serious injury, and precautions to prevent any such occurrence are described below the heading.
⚠ CAUTION	This heading is used for cases where there is a possibility that mishandling will lead to the user suffering a slight injury or damage to the product, and precautions to prevent any such occurrence are described below the heading.
NOTE	Operating procedures and explanations requiring special attention and emphasized information are described below this heading.
⚠	This mark is used for handling procedures requiring special attention.
※	This mark is used for exceptional conditions and notes in figures and tables.

2. Observing items for safety

Be sure to observe the precautions in this section for use of this equipment.

Precautions	Contents of precaution
Surface temperature ⚠ DANGER	Since this is drying equipment, the surface of the equipment reaches high temperatures. Proximity of recycle exhaust port and drying filter reaches a temperature of approximately 100°C. (Refer to "4. Name of each part.") In the case of high temperature specification, the surfaces of the hot air pipe for the drying hopper and exhaust filter case exceed a temperature of 130°C during continuous operation at the maximum control temperature (180°C). Do not unnecessarily approach the equipment body during operation. When touching the equipment in an emergency, do not touch with bare hands, and make sure that skin does not touch. Normally, stop the equipment and naturally cool it for five hours or longer, then perform a check and cleaning.
Application of this equipment	This is a dehumidifying type drying equipment for resin pellets. Other materials are not suitable for this equipment and will cause a failure. Note that trouble caused by use of materials other than resin pellets is not covered by our warranty.
	Even in drying resin pellets, materials containing large amounts of water, special materials and water absorbed nylon materials cannot be dried.
	Honeycomb rotor (absorbent) may be clogged with material which generates gas, and if clogging occurs, this will deteriorate the dehumidifying performance and drying performance.
	Do not use materials containing volatile ingredients and other flammable materials. Explosion or fire may occur.
	For materials which may generate gas when drying, refer to the "Technical Manual-3."
Use environment	This equipment should be used indoors. This equipment should be used at an ambient temperature from 0°C to 40°C and an ambient humidity of 25-85%. Some humidity conditions may not allow for sufficient performance. For the relationship between humidity and drying air dew point, refer to the "Technical Manual-4."
Drying temperature	Set the drying temperature within a range of maximum use temperature described in the specification. Operation above the maximum use temperature may lead to a failure and/or accident, therefore, never operate above the temperature.
Precautions for operations	Do not open the direct cell part, cleaning port door and residual material unloading port. Material and hot air are blown out, which are very dangerous.
	This equipment requires a water supply. Operate with the source fully opened. And, confirm the status of flowing water periodically.

Precautions	Contents of precaution
Opening/closing cleaning port door	Confirm that there is no material inside from the level window, then open/close the door.
Maintenance and check	Before performing maintenance and check work, be sure to turn "OFF" the power breaker on the front of the control panel.
Control panel Temperature adjustor	Do not strongly impact or do not splash water. Failure or fire may occur.
	Do not unnecessarily open the door. Failure or accident may occur.
Overheat preventing device ⚠ CAUTION	This equipment is equipped with a safety device (overheat preventing device) as a standard, and when the safety device trips, the heater stops. For this reason, the heater may reach an extremely high temperature. To restart, after cooling the heater part sufficiently, pay careful attention to the set temperature so that the overheat preventing device does not sense again. For details, refer to Chapter 4 Preparations for Operation.
Warning label and equipment name plate	Keep labels and name plates legible until disposing of this equipment.
Wiping cleaning	Do not wipe with petroleum solvent. Benzene, thinner and abrasive powder will damage the surfaces. When dirt is severe, moisten a soft cloth with hot water or water at a temperature of 40°C or lower, and sufficiently squeeze to wipe.
Maintenance and repair	Never allow a person who does not have expert knowledge of electricity or this machine to disassemble for maintenance or repair, as operation includes the possibility of failure or danger. To request maintenance or repair, contact your nearest service division.. representative. (described on the back cover).
Drying facility work supervisor	Facilities of which heater capacities are 10kw or more are covered by statutory regulations of the Labor Safety Hygiene Law (Article 4) and ordinance (Article 6) of the law. Employer is obliged to assign drying facility work supervisor and to make the supervisor lead workers who are engaged in the work and to carry out items specified by the labor ordinance. And, due to the Occupational Health and Safety Law, Article 88, when installing a drying facility, relocating or changing the main structure, an employer is obliged to notify the head of relevant labor standards supervision office before 30 days of the construction work together with the specified form and drawing. If you have not applied to the relevant labor standards supervision office, immediately submit an application. For details, contact the relevant labor standards supervision office.
When disposing of product and parts	Theses are handled as industrial waste, and are regulated by the "Waste Management and Public Cleansing Law." Commission disposal to collectors who have obtained "Industrial waste collection and transportation permission" or "Industrial waster disposal permission." For details, contact the environment service related department of each prefecture.

Chapter 2 Description of Equipment

1. Outline of equipment

This is drying equipment for resin pellets.

This equipment removes water in air by absorbent as drying air, and heats the dried air, then feeds it into the hopper, where by drying the resin in the hopper.

Since water contained in the ambient air is removed by absorbent, water quantity contained in the dried air does not change, therefore, a stable drying condition is obtained.

Further, since the dew point is low, water contained in the air is small. Therefore, water in material evaporates quickly.

For circulation specifications, as the exhaust air in the drying hopper is recycled as drying air, the exhaust air does not come out of the system, therefore, odor and large amounts of hot air are not blown out, and power consumption is reduced.

However, for material which generates a gas when drying, one path specification is used in order to protect absorbent. In the one pass specification, after powdered dust is removed from the exhaust air in the drying hopper, the exhaust air is released to the atmosphere.

To classify material which generates gas and material which does not generate gas for use, a semi-circulation specification is used, in this case, circulation specification and semi-specification can be independently used by exchanging the hose.

2. Equipment configuration

This equipment consists of the following device specifications. Confirm which model you have purchased by referring to the models in this section and model on the name plate.

<Example of model>

DMZ2-500 (700) ①

→ Dehumidifying unit drying wind amount (m^3/h)

NOTE

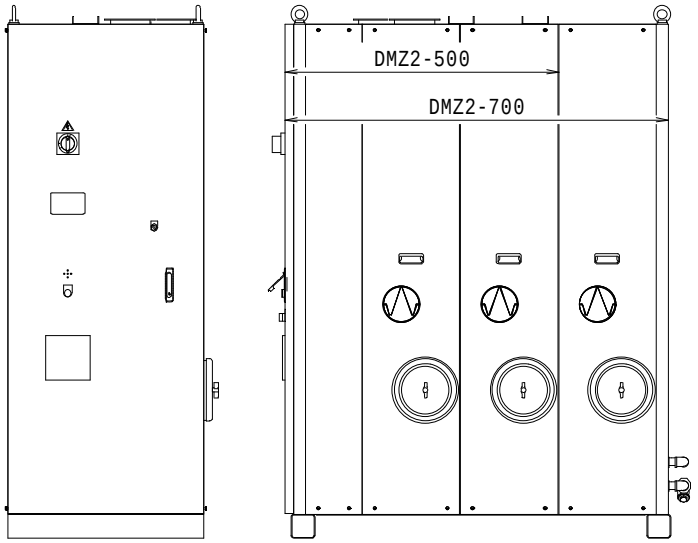
① **Drying temperature specification**
(Drying temperature upper limit set value)

Symbol	Drying temperature	Upper limit set value
No symbol	Standard type	130°C
H	High temperature type	180°C

② **When a specification other than the standard is included, OP or OM is indicated.**

3. Confirmation of delivered products

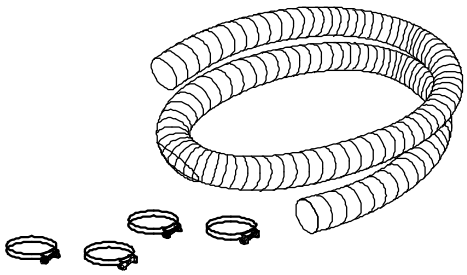
Confirm if the delivered product includes all the types of equipment which you have purchased.

Equipment name	Delivered state
○ Equipment body Dehumidifying unit	

○ Attachment(Option)

Connecting hose: 3m × 2

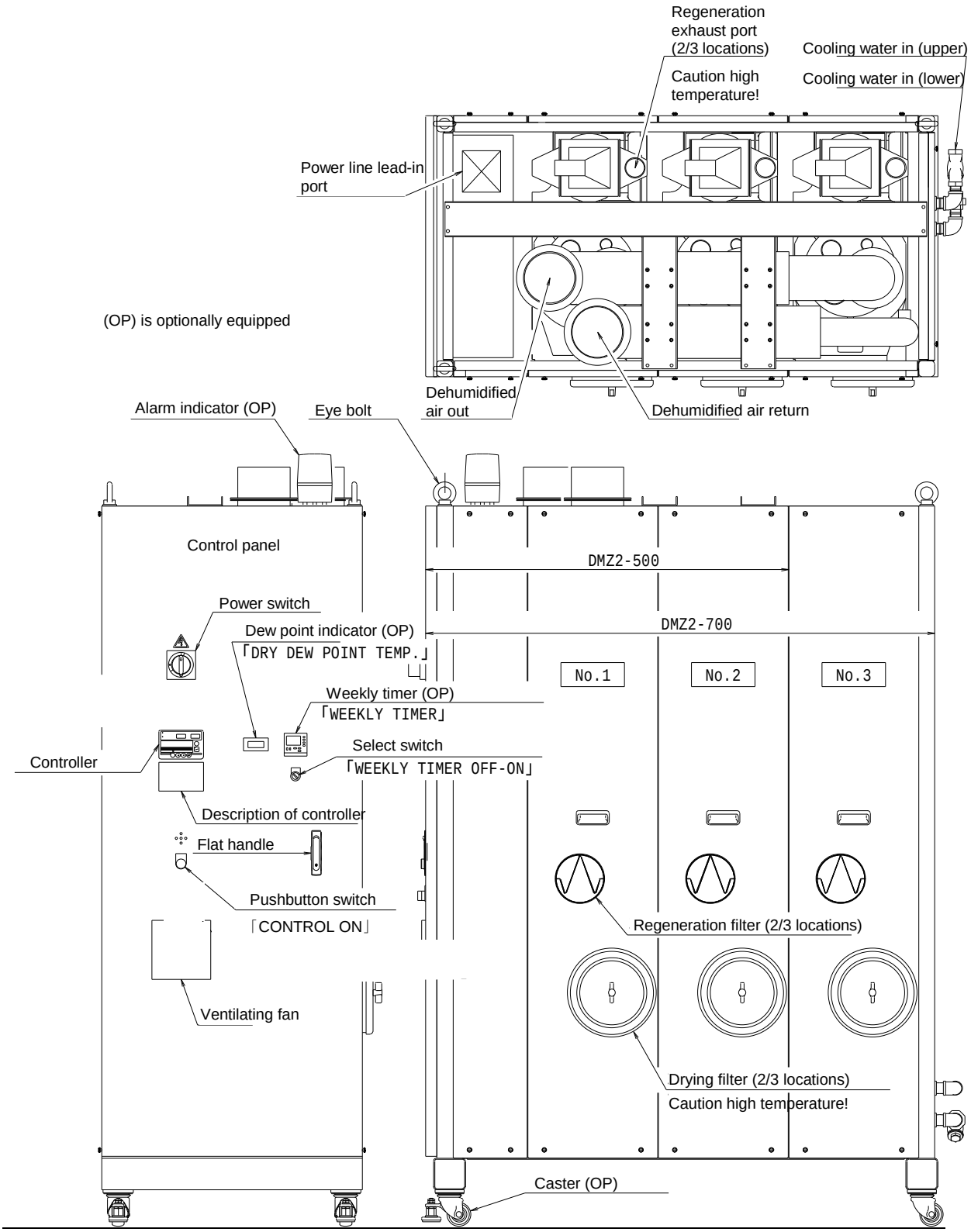
Hose band: 8



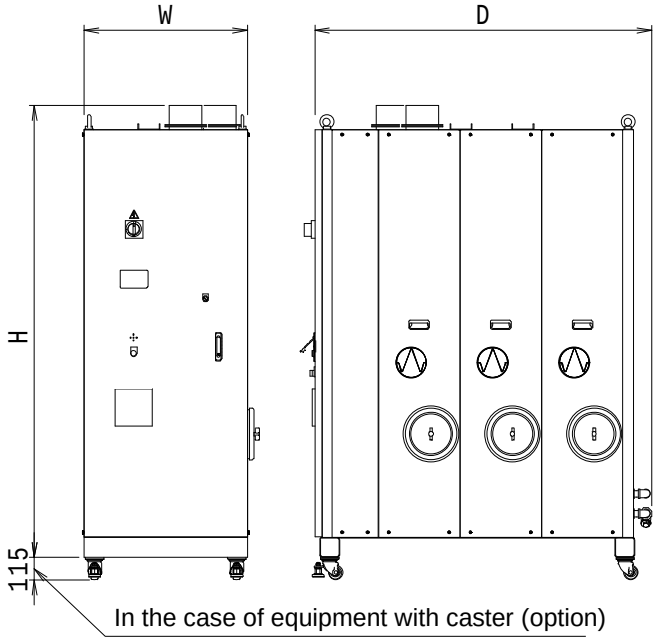
* These are contained in a cardboard box.

* These connecting hoses are hoses to be connected to dehumidified air IN and OUT sides of the dehumidifying unit, and suction port and exhaust port of the drying hopper.

4. Name of each part

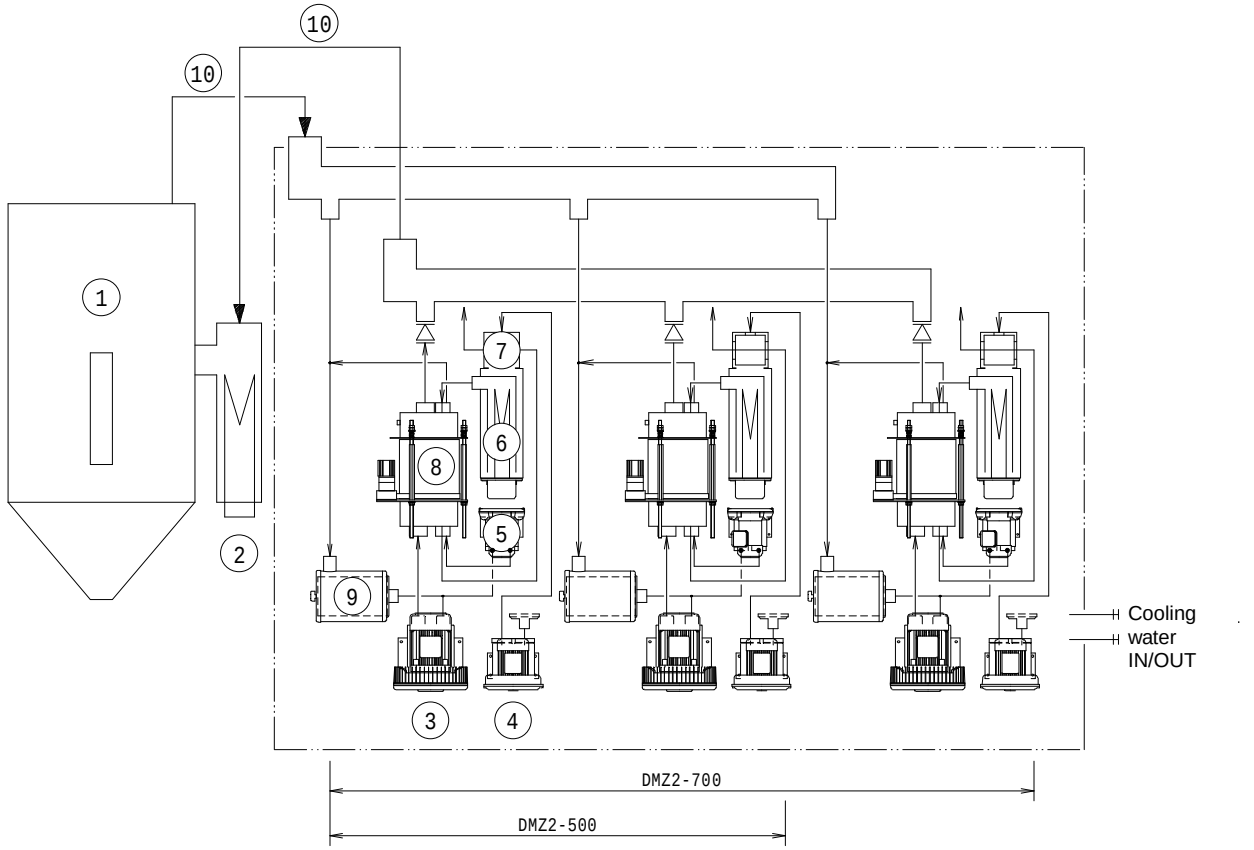


5. External dimensional drawing



Model	W	D	H
DMZ2-500	820	1285	2272
DMZ2-700	↑	1695	↑

6. Configuration flow chart



Configuration flow is based on this chart.

[Name of each part]

Part No.	Name	Part No.	Name
1	Drying hopper	7	Heat exchanger
2	Drying heater	8	Honeycomb rotor
3	Drying blower	9	Drying filter, cooler
4	Regeneration blower	10	Duct hose
5	Cooling blower (50Hz specification)		
6	Regeneration heater		

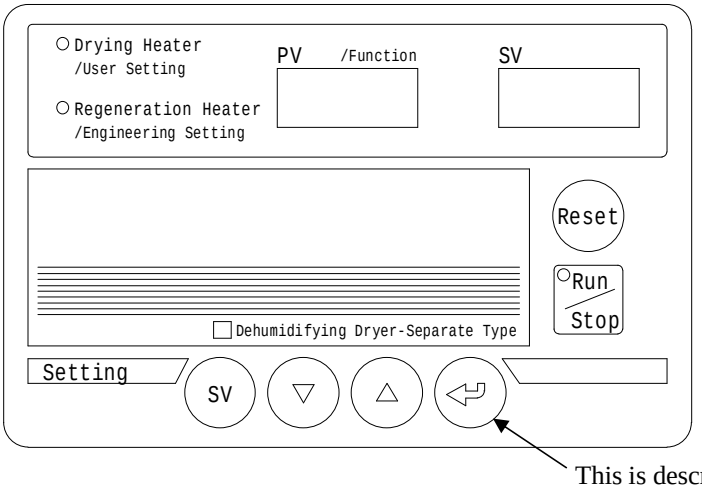
[Features]

This dehumidifying unit consists of a number of dehumidifying mechanisms connected in parallel. DMZ2-500 connects two systems, and DMZ-2-700 connects three systems. It is possible to run part of them or all of them.

7. Name of each part on control panel and their functions

The control panel has a controller which performs run setting and timer setting. Display and operating surface of the controller are made of resin. Do not operate with hard objects such as a pen or metal as the operating surface will damage or break.

7-1 Configuration of operation panel and displaying characters



This is described as Enter in this Manual.

Indication lamp, displayer

Drying Heater / User Setting:	Drying heater operation indication lamp (This flashes when user sets)
Regeneration Heater / Engineering Setting:	Regeneration heater operation indication lamp (This flashes when engineering sets)
PV/Function:	Present temperature indication, error code is indicated when alarm occurs (Each item character is displayed when setting)
SV:	Set temperature indicated (Set value corresponding to each item is indicated when setting)

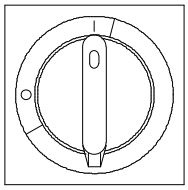
Indication lamp, switch

Run/Stop:	Drying start/stop switch, indication lamp

Switch

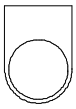
Reset:	Alarm or buzzer reset switch
SV:	Parameter select switch
△:	Set value rise switch
▽:	Set value lower switch
Enter:	Setting change status transition and set value write switch

7-2 Power switch



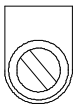
: The main power switch for the dehumidifying unit.

7-3 [CONTROL ON] pushbutton switch



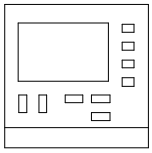
: Control circuit switch for dehumidifying unit.

7-4 [WEEKLY TIMER OFF-ON] select switch (optionally equipped)



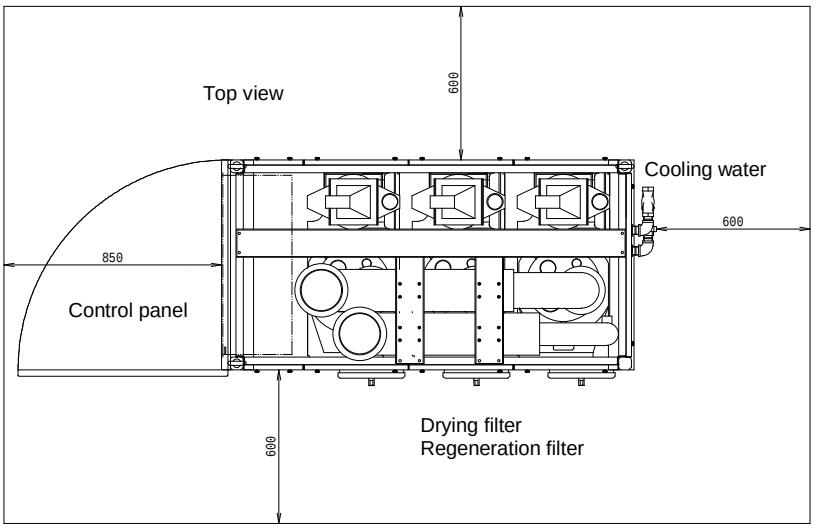
: The switch to select enabling or disabling of weekly timer.

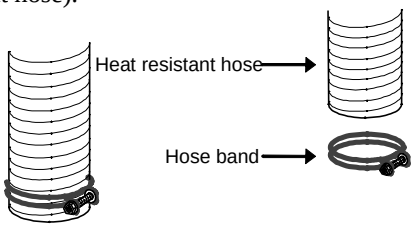
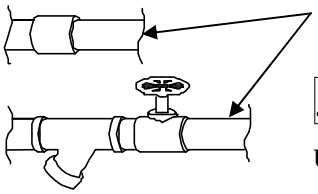
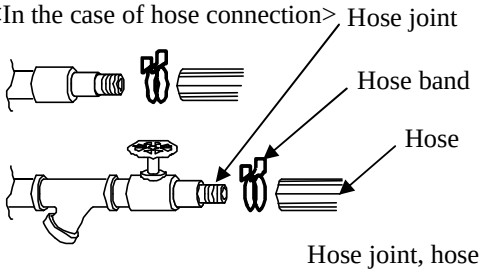
7-5 Weekly timer (optionally equipped)



: The timer to automatically run the dehumidifying unit in units of one week.

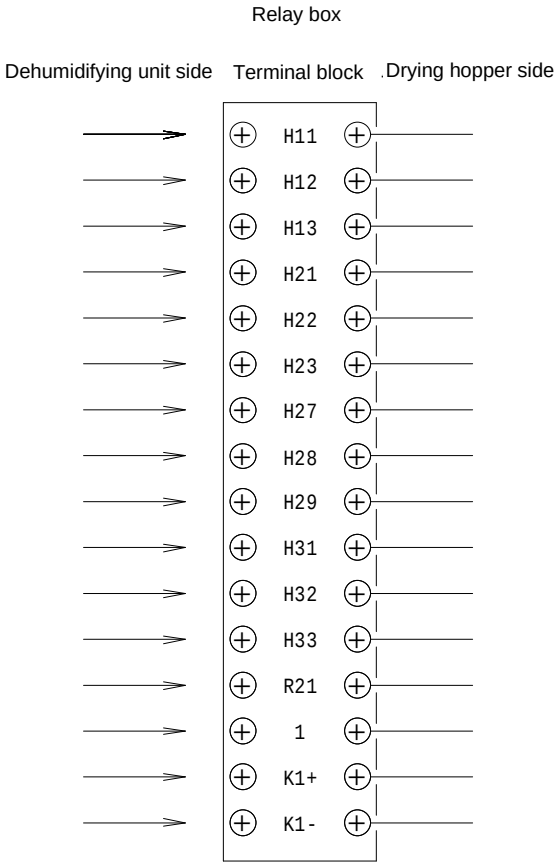
1. Installation of equipment

Step	Item	Description
1	Installation of the dehumidifying unit	Install the unit on a stable level floor. Secure an installation place for maintenance and checks to be made as shown in the drawing. 
2	Status conformation of the dehumidifying unit	Peel tape which blocks the dehumidified air exit port, dehumidified air return port and regeneration exhaust port. Refer to “4. Name of each part.”
3	Transportation of the dehumidifying unit	Before lifting the dehumidifying unit for transportation, be sure to check the following locations. ◊ The eye bolts (4 locations) are firmly screwed in. ◊ The flat handle for the control panel is closed. Refer to “4. Name of each part.” **CAUTION** Be sure to hook load lifting rope (with hook) to the eye bolts at four locations to lift up. **CAUTION** Use a load lifting rope (with hook) that can sufficiently withstand the mass of the dehumidifying unit.

Step	Item	Description
4	Connection of connecting hose between the dehumidifying unit and the drying hopper	Connect the dehumidifying unit and the drying hopper with the connecting hose (heat resistant hose).  Securely connect the connecting part with the hose band to prevent air leakage. Dehumidified air out **à** Drying hopper heater box upper air suction pipe Dehumidified air return **ß** Drying hopper top lid exhaust pipe Refer to "4. Name of each part."
5	Connection of feed and drain water to the dehumidifying unit Connecting bore 1B (Rc 1)	<In the case of piping connection>  **⚠ CAUTION** Use seal tape to securely tighten in order to prevent water leakage. <In the case of hose connection>  Hose joint, hose band and hose are sold separately. **⚠ CAUTION** Securely tighten the connecting part to prevent water leakage.

2. Connection of power supply

Step	Item	Description
1	Connection of relay cord	Connect the relay cords coming out from the dehumidifying unit to the relay box on the drying hopper side.

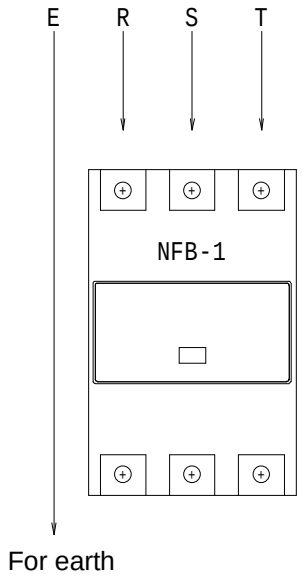


NOTE

Wiring depends on the model and specification. Match the wiring with the marks on the terminal block to connect them.

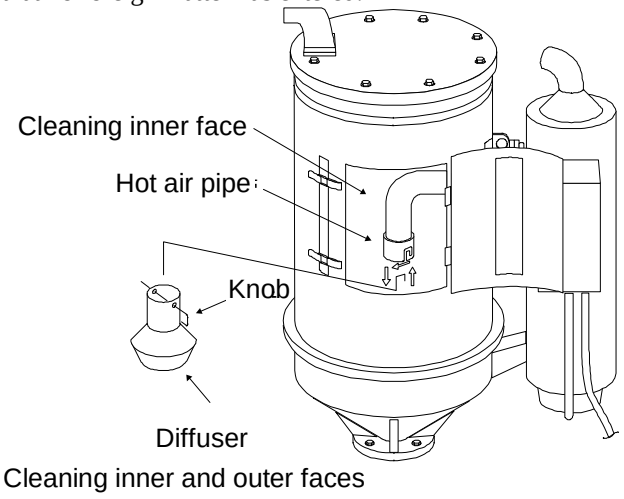
CAUTION

Securely tighten connections to each terminal in the relay box with screws to prevent looseness.

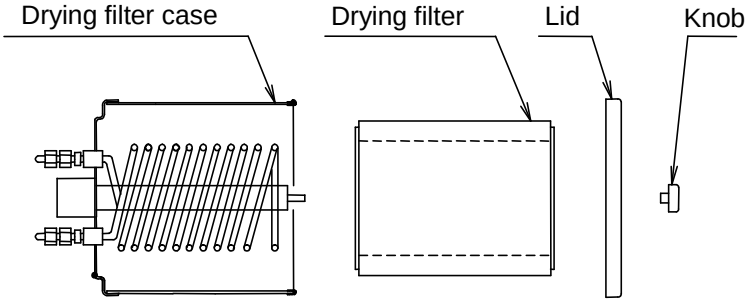
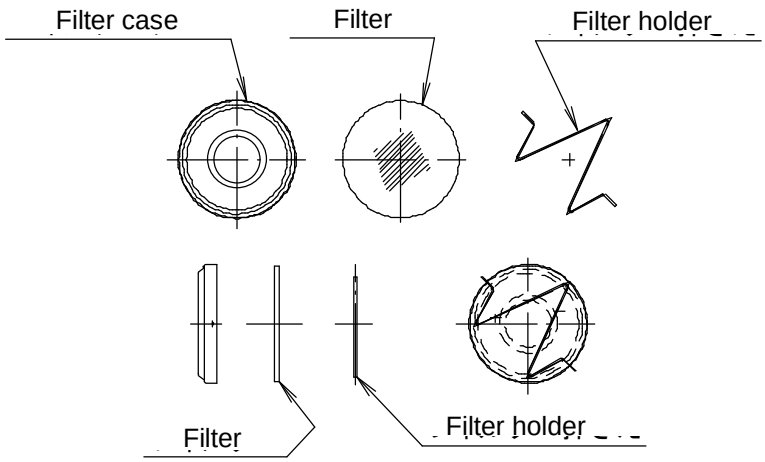
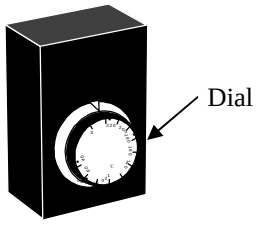
Step	Item	Description
2	Connection of power supply	Connect your power source to the power breaker in the control panel. Turn the power switch to "OFF" (0), loosen the flat handle for the control panel and open the control panel door. NFB-1 on the upper left in the control panel is a power breaker. Connect your power source to the terminal block (M8) on the power breaker.  The earth terminal is on the lower left in the control panel, therefore, be sure to connect the earth line. **CAUTION** • Before connecting the power cord, be sure to turn "OFF" the power breaker in the control panel. • Fasten securely so that connection parts are not loosened. • Be sure to connect the earth.

Step	Item	Description
3	Check of positive phase or negative phase	Turn "ON" the primary power supply in your facility. ↓ Turn "ON" (1) the power switch on the operation panel. ↓ Press the CONTROL ON switch on the control panel face. Indication on the controller lights up. ↓ Confirm that negative phase error (E1) is not indicated on the operation panel. Unless negative phase error is indicated, it is a positive phase, then connection of the power cord is completed. When negative phase (E1) is indicated, turn "OFF" (0) the power switch to change R phase (L1) and T phase (L3) among the three power cords.

1. Check inside drying hopper

Step	Description
1	Remove the adjust fastener or knob shown in the drawing, and open the cleaning port door to confirm that no foreign matter has entered.  * Hold the knob on the diffuser to raise and lower the diffuser along the groove in the hot air pipe, and rotate to remove the diffuser. **NOTE** Appearance of the drying hopper depends on the model.
2	After confirming or cleaning the inside, return the removed parts to the previous state, close the cleaning port door, and securely set the adjust fastener or knob.

2. Status confirmation of each equipment and resin feed

Equipment name	Confirming device and confirming items
Drying line filter	Securely tighten the filter with the knob to prevent air leakage. 
Regeneration filter	Confirm that the filter is set to the regeneration blower suction port as shown in the drawing. 
Hose	Confirm that each hose is connected as described in the item of installation. Particularly, confirm that they are securely tightened with hose bands so as to prevent air leakage and water leakage.
Drying overheat setter	Set the drying overheat setter installed in the relay box for the drying hopper. The set value should be drying temperature + 15-20°C. 
Slide damper Residual material unloading port	Confirm that the slide damper and residual material unloading port at the lower part of the drying hopper are securely closed, and feed material into the drying hopper.

3. Setting controller

Step	Contents of operation
Turning on power	Turn "ON" (1) the power switch on the control panel face.
Preparation of operation	Press the CONTROL ON switch on the control panel face. Indication on the controller lights up.
Setting of drying temperature	Press the SV switch. "Sv" is displayed on the PV displayer. ↓ Press the Enter switch. Drying temperature set value on the SV displayer flashes. ↓ Press the ▲ (up) or ▼ (down) switch to change the set value if necessary. Every time these switches are depressed, a numeric value is sequentially added or subtracted. Further, if either switch is kept pressed, a numeric value is continuously added or subtracted. ↓ Press the Enter switch to confirm the inputted set value. Note that, unless this is confirmed, the stored set value is not updated to the indicated value. 1. Setting range: 0-160°C 2. Set value at factory: 80°C 3. Standard setting range: 70-130°C
Setting of drying automatic start Setting of timer	Keep pressing the SV switch until "dLY" is displayed on the PV displayer. ↓ Press the Enter switch. Present set value on the SV displayer flashes. ↓ Set time until drying operation is started. Press the ▲ (up) or ▼ (down) switch to change the set value. Every time these switches are depressed, a numeric value is sequentially added or subtracted. Further, if either switch is kept pressed, a numeric value is continuously added or subtracted. ↓ Press the Enter switch to confirm the inputted set value. Note that, unless this is confirmed, the stored set value is not updated to the indicated value. 1. Setting range: 0.0-99.5 hours (0.1 is handled as a unit of 10 min.) 2. Set value at factory: 0.0 hour 3. When a power failure occurs while the start timer is counting, automatic start is not performed. Manually start. For how to manually start, refer to the operation of "Run" described later.

Step	Operation	Contents of operation
1	Turning on power	Turn “ON” (1) the power switch on the control panel face.
2	Preparation of operation	Press the CONTROL ON switch on the control panel face. Indication on the controller lights up.
3	Drying start	When the Run/Stop switch is depressed, the Run/Stop indication lamp lights up, and drying operation starts. If the start timer (dLY) is set, drying operation starts after the set time. If you attempt to start drying before the set time, press the Reset switch and Enter switch simultaneously.
4	Drying stop	Press the Run/Stop switch. The heater is turned OFF, and cooling operation to operate the blower only is turned on. The Run/Stop indication lamp changes from lighting to flashing. After cooling timer time up (ten minutes), the Run/Stop indication lamp turns off, and the unit stops. Except for an emergency, do not turn off the power supply until the Run/Stop indication lamp lights off.
5	Power supply OFF	Turn “OFF” (0) the power switch on the control panel. ⚠ CAUTION In the stop operation in the step 5, do not turn “OFF” (0) the power switch while the blower is running. When the power switch is turned “OFF” (0) while the blower is running, the blower immediately stops and heat in the heater becomes trapped in the unit, which may cause defects such as failure of the unit and accumulation of material.
6	Recovery at power failure	Run stops if power failure occurs during running. Confirm that there is no problem even if the unit is restarted after recovery from power failure, and restart the unit if necessary.

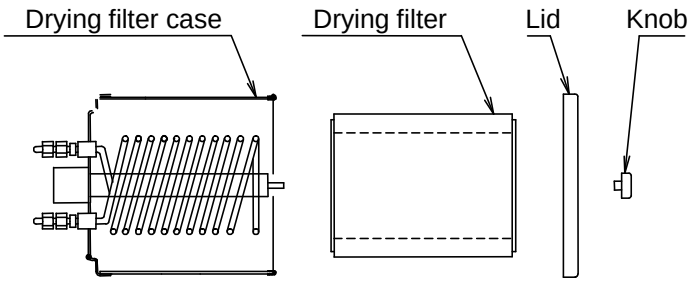
Caution high temperature

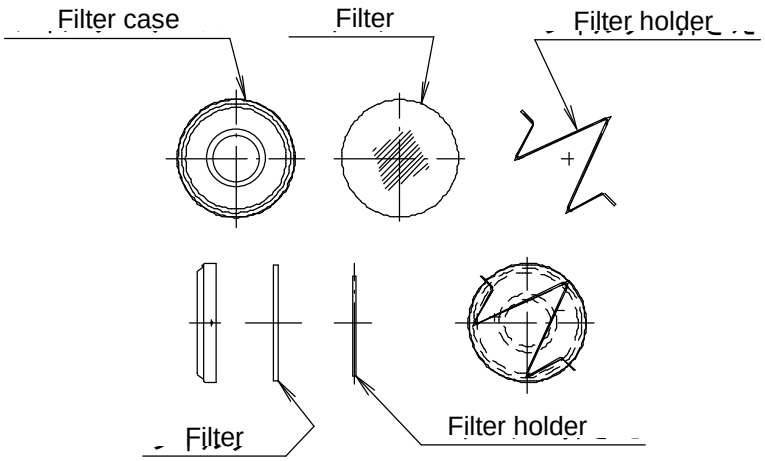
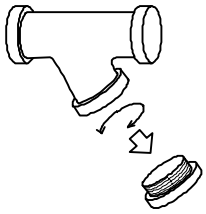
Even if the unit is stopped running, the hot condition will continue for a while, therefore, wait until it cools sufficiently. (It takes five hours to naturally cool as a guide.) Sufficiently note that even if the outside of the unit is cooled, inside of the unit and drying material are still very hot.

1. Daily maintenance and check

Inspection items	Contents of work
Cooling water confirmation	Check that cooling water flows through inlet and outlet for cooling water. Refer to "4. Name of each part." It is also recommended to install a flow meter in order to check the flow rate of the cooling water. **NOTE** If cooling water does not flow, drying dew point does not lower, which may cause a drying failure. And a lower temperature may not be set.
Temperature confirmation	Confirm whether the drying temperature and regeneration temperature are temperature-controlled with the set temperature. (Confirmation method) [For drying temperature] During running, drying set temperature is displayed on the SV display, and drying present temperature is displayed on the PV display. If the present temperature is the set temperature ±2 to 3°C approximately, it is normal. [For regeneration temperature] Regeneration temperature set value is 220°C. Regeneration present temperature is displayed on the PV display (upper stage) on the regeneration temperature adjustor. If the temperature is 200°C or higher, it is normal.

2. Weekly maintenance and check

Inspection items	Contents of work
Disconnection of hose and air leakage from hose	Connecting hose between the dehumidifying unit and drying hopper (heat resistant hose) Check that the hose between the dehumidifying unit and drying hopper is disconnected, and there is no air leakage. * If the hose is broken, replace it with a new one. [Example of how to check air leakage] Air leakage can be confirmed by hanging a thin string or fiber near the hose, and checking if the string or fiber runs out.
Cleaning of filter	**CAUTION** 1. Wear a mask to clean by blowing dry air because adherents to the filter fly in the air. 2. Note that, when the filter is clogged, operating temperature and air quantity is caused to vary, and this could lead to a fire. * When the filter is clogged, remove the filter and blow clean dry air to remove adherents. * Extent of filter contamination depends on ambient environment of the unit, therefore, check and clean the filter frequently. * Set the filter as previously after a check, and securely fasten. * When the filter is severely clogged, replace it with new one.
Electromagnetic switch, contactor	Confirm that the contact points of the electromagnetic switch and contactor installed in the control panel are burned or consumed. * When the contact points are fused or consumed, replace the parts. **CAUTION** Before starting to check, be sure to turn off the power switch on the front.
Cleaning of drying filter	Remove the filter to check that it is not clogged and clean. [Disassembling and cleaning the filter] 

Inspection items	Contents of work
Cleaning of regeneration filter	Remove the filter to check that it is not clogged and clean. 
Cleaning of cooling line	Clean the strainer for the cooling line. When cooling water does not flow due to contaminants, drying dew point temperature does not lower, causing a drying defect. 

3. Monthly maintenance and check

Inspection items	Contents of work
Retightening terminal	Confirm presence/absence of looseness wiring connection in the control panel and of electric devices in the unit, and retighten connections. **⚠ CAUTION** Before starting to check, be sure to turn off the power switch on the front of the control panel, and also turn off your primary power source.

4. Every six months maintenance and check

Inspection items	Contents of work
Bolts and nuts for each part in unit	Check whether bolts and nuts for each part are loosened, and retighten.
Rotor driving belt, tension plate spring	- Confirm that the belt is not cracked, damaged and loosened, and the rotor properly rotates. - If any abnormality is found, replace the belt. We will replace the belt, so contact us.

CAUTION

Before checking and recovering the cause of an abnormality, be sure to turn "OFF" (0) the power switch on the front of the control panel.

Never perform work in a state that the power is "ON" (1), which may lead to a failure and/or accident.

If any abnormality occurs due to any cause during operation of this unit, the protective device trips and an alarm character is displayed on the control panel, and the alarm buzzer sounds to inform of an abnormality.
When the Reset switch is depressed, the buzzer sound stops.

Alarm indication	Contents of alarm	Remedies
Memory error (E0)	Set value stored in the controller is not correctly read.	Turn off the power once, and turn on the power again after some time.
Power supply negative phase (E1)	Power phases are different. Or a phase is missing.	Confirm that three-phase power is supplied without a missing phase. Turn off the primary power source, and exchange R phase (red) and T phase (black) of the power cord.
Dryer overload (E2)	Thermal relay for electromagnetic switch for drying blower trips, or regeneration relay for electromagnetic switch for drying blower trips. There is the following possibility in the case of an operation circuit 100V specification (option). Circuit protector for honeycomb rotor rotation motor trips.	Check that foreign matter is not caught in the movable parts. Check that the filter is not clogged. Check that the piping is not blocked. Restart after pressing the reset button for the electromagnetic switch in the panel.
Overheat (E4)	Thermostat attached to the heater detected overheat.	Confirm whether the heater relay is kept in the ON state even if it stops (SSR-), and replace it if it is ON. Refer to "Blower does not rotate" and "Blower air quantity is small" in the "Causes of Trouble and Remedies."

Alarm indication	Contents of alarm	Remedies
Drying temperature sensor wire breakage (E5)	Wire of sensor for drying temperature control is broken or the sensor is in temperature detection abnormality.	Confirm whether the drying temperature sensor (thermocouple) is properly connected. And confirm whether the wire is broken or short-circuited. Replace the drying temperature sensor (thermocouple) if necessary.
Drying loop wire breakage (E7)	If any time is set for drying loop wire breakage detection time "dLP," the loop wire breakage is informed when drying heater output 100% status continues for the set time (temperature of drying hot air does not rise even by heating operation) after drying starts.	Confirm whether the drying loop wire breakage time "dLP" is too short. Confirm that the drying blower properly blows. Turn off the power supply to confirm that there is no wire breakage of the thermocouple (K1), heater relay (SSR-) and connecting wires, and no malfunction, and repair wire breakage and replace defective parts.
Upper limit temperature (E9)	This is informed when the detected temperature "PV" exceeds the deviation of the upper limit temperature set value "dUS" from the set value "SV" during drying operation. Operation follows a standby sequence, and even when the set value "SV" is lowered, this functions after the temperature lowers to the set temperature once.	Confirm whether the drying set temperature "SV" is within a standard setting range, and the drying upper limit temperature deviation "dUS" is proper. Confirm whether the drying blower properly blows, and the filter is not clogged. The temperature returns to normal temperature and recovery is made by "Reset" switch operation.
Lower limit temperature (E10)	This is informed when the detected temperature "PV" lowers below the deviation of the lower limit temperature set value "dLS" from the set value "SV" during drying operation. Operation follows a standby sequence, and even when the set value "SV" is raised, this functions after the temperature reaches the set temperature once.	Confirm whether the drying set temperature "SV" is within a standard setting range, and the drying lower limit temperature deviation "dLS" is proper. Check that the wire for the heater is not broken. Confirm whether the drying blower properly blows, and the filter is not clogged. The temperature returns to normal temperature, and then recovery is automatically made.

Chapter 8 Causes of Trouble and Remedies

⚠ CAUTION

Before performing a check, stop the unit, and after confirming that the unit completely stops, turn “OFF” the power switch, then start a check after the heating part cools to a temperature which does not cause burns.

This section describes the following abnormalities.

Abnormal point	Contents	Description page
Drying blower	The blower does not rotate.	28
	The blower causes overload operation, and the thermal relay trips.	29
	Air quantity which the blower blows is small.	30
Drying temperature	Drying temperature varies largely.	30
	Drying temperature does not rise, or does not lower.	31
Drying defect	Water ratio of resin does not lower.	31
Controller	The controller does not display even when the power switch is turned “ON” (1) and the CONTROL ON switch is depressed.	32
Power breaker	The power breaker trips.	32
Overheat	Overheat alarm occurs.	32
Thermal set value for every model		33

The following pages describe check points and remedies, so please check before you request a repair.

For how to remove the filter, refer to “Chapter 6 Maintenance and Check.”

Drying blower does not rotate		
Check point	Remedy	Precaution
Confirm whether the indication lamp on the controller is lit.	Turn "ON" (1) the primary power supply and the power switch on the control panel.	If it is not corrected even when the remedy described at the left is taken, perform a remedy of the "The controller does not display even when the power switch is turned "ON" (1) and the CONTROL ON switch is depressed" on page 32.
Confirm whether the Run/Stop indication lamp on the controller is lit.	If it is unlit, press the Run/Stop switch. If the indication lamp does not light up even when the switch is depressed, replace the controller.	When the start timer is set, drying operation starts after the set time has elapsed.
Check that the contact point of the magnet of the electromagnetic switch in the control panel is not fused, or not consumed, or the magnet performs opening/closing operation when power is "ON."	If it is fused or consumed, or it does not perform normal operation, replace the electromagnetic switch.	Opening/closing endurance 2 million times
Confirm that the abnormality character (E2) is not displayed on the controller displayer.	After repairing the cause of an overload on the blower, press reset button for the thermal relay in the control panel.	For cause of overload on the blower, refer to the "Blower causes overload operation, and thermal relay trips" on page 29.

Blower causes overload operation, and thermal relay trips		
Check point	Remedy	Precaution
Take out the cartridge filter in the filter case, and check that it is not clogged.	If it is contaminated or clogged, blow clean dry air to the inside of the cartridge filter to remove adherents.	If the cartridge filter is severely deteriorated and adherents cannot be removed, replace it with a new cartridge filter.
Check that the contact point of magnet of the electromagnetic switch in the control panel is not fused, or not consumed, or the magnet performs opening/closing operation when power is "ON."	If it is fused or consumed, or it does not perform normal operation, replace the electromagnetic switch.	Opening/closing endurance 2 million times
Check whether the thermal in the control panel is set to the rated value.	Refer to the "Thermal set value for every model" to set the thermal to the rated value.	Turn "OFF" (0) the power switch to perform work.

Air quantity from blower is small		
Check point	Remedy	Precaution
Take out the cartridge filter in the filter case, and check that it is not clogged.	If it is contaminated or clogged, blow clean dry air to the inside of the cartridge filter to remove adherents.	If the cartridge filter is severely deteriorated and adherents cannot be removed, replace it with a new cartridge filter.
Check that the connecting hose in the dehumidifying unit, and the connecting hose between the dehumidifying unit and the drying hopper are not broken, or connections are not loosened.	If the hoses are broken replace with new hoses. If the connections of the hoses are loosened, securely fasten the hose bands.	Confirm the air leakage position, then stop the unit, wait until the heating part sufficiently cools to a temperature which does not cause burns, and perform work.

Drying temperature varies largely		
Check point	Remedy	Precaution
Take out the cartridge filter in the drying filter case, and check that it is not clogged.	If it is contaminated or clogged, blow clean dry air to the inside of the cartridge filter to remove adherents.	If the cartridge filter is severely deteriorated and adherents cannot be removed, replace it with a new cartridge filter.
Remove the regeneration filter, and check that it is not clogged.	If it is contaminated or clogged, blow clean dry air to the inside of the filter to remove adherents.	If the filter is severely deteriorated and adherents cannot be removed, replace it with a new cartridge filter.
Refer to the Technical Manual to confirm each set value for the controller special mode.	If the set value is deviated, change it to the correct set value.	

Drying temperature does not rise, or does not lower		
Check point	Remedy	Precaution
Check that the connecting hose in the dehumidifying unit, and the connecting hose between the dehumidifying unit and the drying hopper are not broken, or connections are not loosened.	If the hoses are broken, replace with new hoses. If the connections of the hoses are loosened, securely fasten the hose bands.	Confirm the air leakage position, then stop the unit, and wait until the heating part sufficiently cools to a temperature which does not cause burns, and perform work.
Check that cooling water flows, and water quantity is not insufficient.	If cooling water does not flow, confirm opening of each valve.	Depending on operating status of the unit, temperature of air coming out from the dehumidifying unit rises, and drying temperature may not be set to around 80-90°C. In this case, be sure to flow cooling water.
Check that the wire for the drying heater is not broken.	If the wire for the heater is broken, replace the heater.	Stop the unit, then turn “OFF” (0) the power switch, and wait until the heating part sufficiently cools to a temperature which does not cause burns, and perform work.

Water ratio of resin does not lower		
Check point	Remedy	Precaution
Check that cooling water flows, and water quantity is not insufficient.	If cooling water does not flow, confirm opening of each valve.	Do not raise pressure on the water feed side above 0.49MPa.
Take out the cartridge filter in the drying filter case, and check that it is not clogged.	If it is contaminated or clogged, blow clean dry air to the inside of the cartridge filter to remove adherents.	If the cartridge filter is severely deteriorated and adherents cannot be removed, replace it with a new cartridge filter.
Remove the regeneration filter, and check that it is not clogged.	If it is contaminated or clogged, blow clean dry air to the inside of the filter to remove adherents.	If the filter is severely deteriorated and adherents cannot be removed, replace it with a new filter.
Check that the connecting hose in the dehumidifying unit, and the connecting hose between the dehumidifying unit and the drying hopper are not broken, or connections are not loosened.	If the hoses are broken replace with new hoses. If the connections of the hoses are loosened, securely fasten the hose bands.	Confirm the air leakage position, then stop the unit, and wait until the heating part sufficiently cools to a temperature which does not cause burns, and perform work.
Check that the wire for the drying heater is not broken.	If the wire for the heater is broken, replace the heater.	Stop the unit, then turn “OFF” (0) the power switch, and wait until the heating part sufficiently cools to a temperature which does not cause burns, and perform work.

Controller does not display even when power switch is turned “ON” (1) and CONTROL ON switch is depressed.		
Check point	Remedy	Precaution
Check that the power switch on the front of the control panel is “ON” (1).	If it is not “ON” (1), turn “ON” (1) the power switch and press the CONTROL ON switch again.	
Check that the fuse (F1) in the control panel is burned out. Check that electric wires in the control panel are not disconnected.	After checking the fuse and electric wires, turn “ON” (1) the power switch and press the STANDBY switch again.	Turn “OFF” (0) the primary power supply and the power switch on the front to check.

Power breaker trips		
Check point	Remedy	Precaution
Check that the circuit is not short.	Remove short-circuit.	

Overheat alarm occurs		
Check point	Remedy	Precaution
Check that the set value of the drying overheat setter has not deviated. Set value Drying overheat setter: Drying temperature +20°C	If the set value has deviated, return it to the correct value.	In order to prevent electric shock, turn “OFF” (0) the power switch to check.
Take out the cartridge filter in the drying filter case, and check that it is not clogged.	If it is contaminated or clogged, blow clean dry air to the inside of the cartridge filter to remove adherents.	If the cartridge filter is severely deteriorated and adherents cannot be removed, replace it with a new cartridge filter.
Remove the regeneration filter, and check that it is not clogged.	If it is contaminated or clogged, blow clean dry air to the inside of the filter to remove adherents.	If the filter is severely deteriorated and adherents cannot be removed, replace it with a new filter.
Output from the heater relay continues.	The heater relay (solid state relay) may be defective. Check and replace it if necessary.	In order to prevent electric shock, turn “OFF” (0) the power switch to check.

Thermal set value for every model (A)

DMZ2-500/700

Power supply	Drying blower (OCR-*1 1)			Regeneration blower (OCR-*1 2)			Cooling blower (OCR-*1 3)		
	Range (A)	Set value (A)		Range (A)	Set value (A)		Range (A)	Set value (A)	
		50Hz	60Hz		50Hz	60Hz		50Hz	60Hz
200V AC – 220	9 – 13	9.8	10.7	4 – 6	4.2	4.4	0.95 – 1.45	1.1	—
380V AC – 415	5 – 8	5.7	6.2	2.2 – 3.4	2.4	2.5	0.48 – 0.72	0.6	—

*1 DMZ2-500 : 1 – 2 DMZ2-700 : 1 – 3

1. Controller default set value

User setting value

Each time the SV switch is depressed, parameter display is switched in the following sequence. However, note that the mode moves to the engineering setting mode if the SV switch is kept depressed for five seconds or longer.

Application	Character	Setting range	Initial set value	Special note
Drying temperature	Sv	0 – 160°C or 32 – 320°F	80°C or 176°F	
Drying automatic start timer	dLY	oFF, 0.1 – 99.5 hrs	oFF	Function stops at "oFF"

Engineering setting mode

If the SV switch is depressed for five seconds or longer, the mode enters the engineering setting mode. Each time the SV switch is depressed in the engineering setting mode, the character is switched in the following sequence.

Title	Character	Setting range	Initial set value	Special note
Upper temperature alarm detection delay time	ULt	0 – 999 sec	5 sec	
Drying upper limit temperature deviation	dUS	oFF, 1 – 40°C or oFF, 1 – 72°F	10°C or 18°F	Function stops at "oFF"
(Regeneration upper limit temperature deviation *1)	rUS	oFF, 1 – 40°C or oFF, 1 – 72°F	oFF	Function stops at "oFF"
Drying lower limit temperature deviation	dLS	oFF, 1 – 40°C or oFF, 1 – 72°F	10°C or 18°F	Function stops at "oFF"
(Regeneration lower limit temperature deviation *1)	rLS	oFF, 1 – 40°C or oFF, 1 – 72°F	oFF	Function stops at "oFF"
Drying loop wire breakage detecting time	dLP	oFF, 1 – 999 min	oFF	Function stops at "oFF"
(Regeneration loop wire breakage Detecting time *1)	rLP	oFF, 1 – 999 min	oFF	Function stops at "oFF"
Negative phase/missing phase detecting function	rSt	on/oFF	on	Function stops at "oFF"

*1 This unit is not used because regeneration temperature adjustment is performed by the other temperature adjustor.

2. How to start auto tuning

This controller does not display auto tuning error.
Even if an auto tuning error (sensor wire breakage, or three hours or longer of auto tuning time has passed) occurs, the display or the buzzer does not move to alarm operation. Further, if any auto tuning error occurs once, auto tuning cannot be started unless the power supply is turned on again.
Regeneration temperature is adjusted by thermostat in this unit, therefore, auto tuning cannot be performed. (There is no need to perform it.)

① If the ▲ switch is kept depressed for five seconds during operation of the dryer and while drying temperature is displayed, auto tuning for drying temperature control starts.
(Measured temperature for drying and "At" are alternately displayed at a frequency of one second.)

② When the auto tuning has ended, the display returns to the normal PV display, and PID control by adjustment result is started.

③ An operation to compulsorily stop the auto tuning is the same as that in ①.
(Set value for P.I.D. in this case is set to be the same as that before auto tuning, and not changed.)

3. Influence of gas generated from resin

Information about influence of gas generated from resin

The unit may not normally function due to influence of gas generated from resin.
It is required to take remedies to suppress the influence of gas for resin which may possibly generate gas.
As remedies, there are some methods such as employing a one path method and installing gas collecting equipment, however, it is necessary to select a method depending on the material to be dried.
Further, there is no complete measure at the present time for each resin. For this reason, some resins need certain periodic maintenance and replacement of parts as consumables.
If the following phenomena are identified, the unit may be influenced by gas, therefore, contact us.

1) Oily liquid seeps through the filter box, piping connection or drying hopper, etc.
2) There are some discolorations in the filter box. Or oily ingredients adhere to the filter box.
3) Thin smoke comes out from the regeneration exhaust port.
4) Whole of the unit becomes oily.
5) Oil starts to adhere to the floor.

Refer to the list on the next page for resins which may generate gas.

● List of resins which require measures for the unit due to influence of gas is considered
(Resin marked with ○ in gas measure column in the table requires some measure. Resin marked with × is judged to require no measure, however, it may require some measure depending on the type of substances to be mixed.)

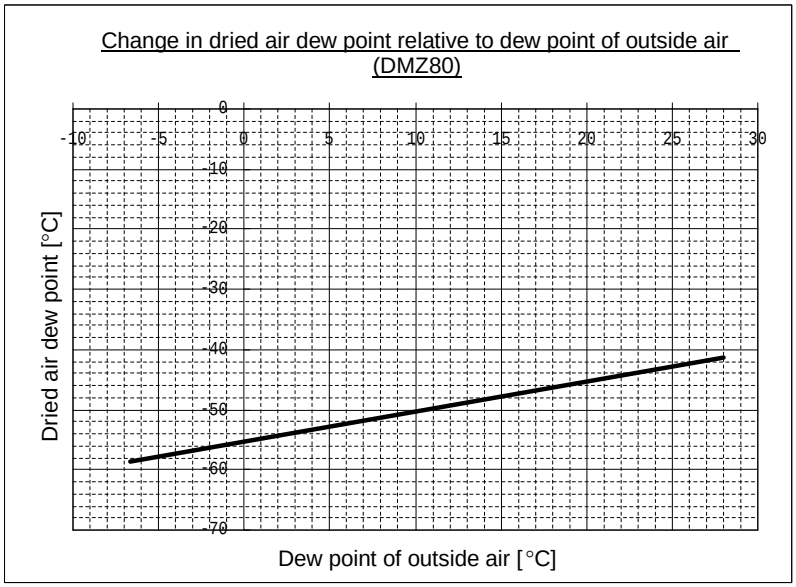
(Researched in 2002)

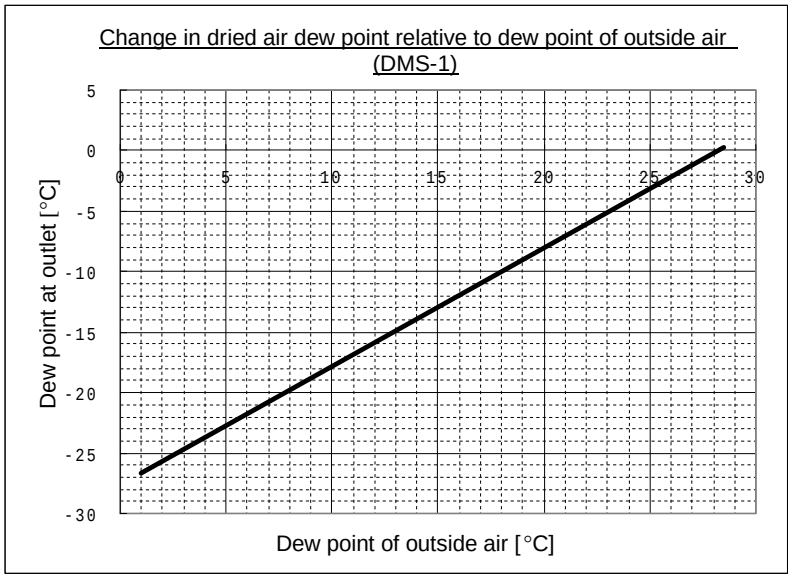
Resin name	Necessity of measure for gas	Resin name	Necessity of measure for gas	Resin name	Necessity of measure for gas
ABS	×	PAR		PPO	×
ABS+PBT		PBT	○	PPS	○
APEL		PBT+PC		PSF	
A-PET		PBT+PET		PTFE	
AS	×	PC	×	PU	○
BTP		PC+ABS		PUR	
CA		PC+PET		PVC Special grade	○
CAB		PCT+PET		SPS	
CAP		PCTFE		TPE	
CN		PC Optical grade	×	TPO	
COP		PDAP		TPX	
CP		PEEK		Reinforced PET	○
DL		PEI		Fire-resistant ABS	○
EC		PES			
EVA		PETG			
EVOH		PET Bottle grade	×		
LCP		PET Fiber grade	×		
MTPA		PFA			
PA+POM		PMMA	×		
PA + Carbon fiber		PMMA Optical	×		
PA6,66	×	POAM			
PA6,66+G	○	POLYSUL			
PA612		POM	×		
PAMXD6		PP + Filler	○		
PAN		PPE			

4. Relationship between dry air dew point and ambient condition

The following shows the relationship between the status of outside air and the dried air dew point.

Dried air dew point is influenced by the condition of outside air (dew point).
It is necessary to note that dried air dew point adversely depends on the status of outside air.
The following graph shows how the dried air dew point changes with a change in dew point of outside air for our representative models, DMZ and DMS.





Chapter 10 Machine consumable parts list

Part name	Maker	Model	Q'ty	
			DMZ2-500	DMZ2-700
Drying blower	HOUSHIN	RB60-520	2	3
Regeneration blower	HOUSHIN	RB40-520	2	3
Cooling blower *1	HOUSHIN	RB20-520	2	3
Regeneration heater	MATSUI	5.5kW	2	3
Drying filter	MATSUI	ϕ200×350	2	3
Regeneration filter	MATSUI	ϕ150×t10 PS/150	2	3

*1 Cooling blower is mounted for the 50 Hz specification only.

Chapter 11 Option

1. Leakage breaker

The power breaker is provided with a leakage breaker, which protects against ground faults, overloads and short-circuits, and prevents leakage.

Symbol	Name	Maker	Model
ELB-1	Leakage breaker	Mitsubishi Electric	See drawing

* If a leakage breaker is provided, no fuse breaker (NFB-1) can be installed.

2. Weekly timer

This is a timer to automatically operate and stop the dehumidifying unit on a weekly basis.

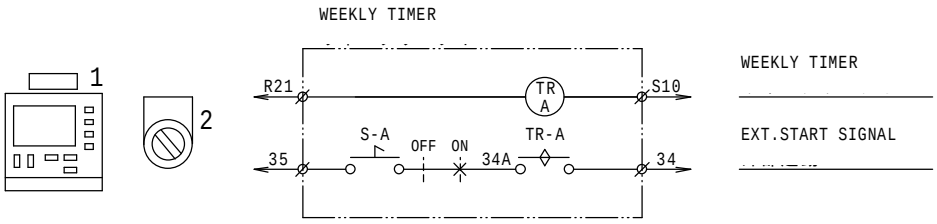
Set the weekly timer, and turn “ON” the select switch, then the timer automatically performs “Start” and “Stop.”

Press the CONTROL ON switch to put the controller into a displaying status.

For how to operate the weekly timer, refer to the Operation Manual (OMRON, H5S-A) prepared by the maker.

NOTE

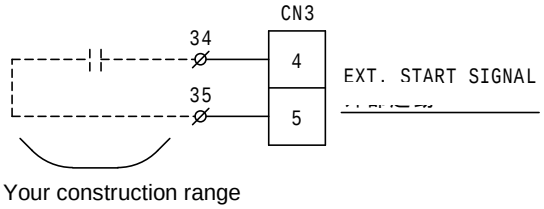
When not using the weekly timer, turn “OFF” the select switch (S-A).



No.	Symbol	Name	Maker	Model
1	TR-A	Weekly timer	Omron	H5S-A
2	S-A	Select switch	Fuji Electric	AR22PR-210B

3. External start and stop

This dryer can be “operated and stopped” by external signal.
(For external start signal, prepare non-voltage a-contact.)
For external start signal, connect a signal line to the terminal box in the control panel.
The dryer starts when the external start signal is turned “ON,” and stops when the signal is turned “OFF.”
Press the CONTROL ON switch to put the controller into a displaying status.

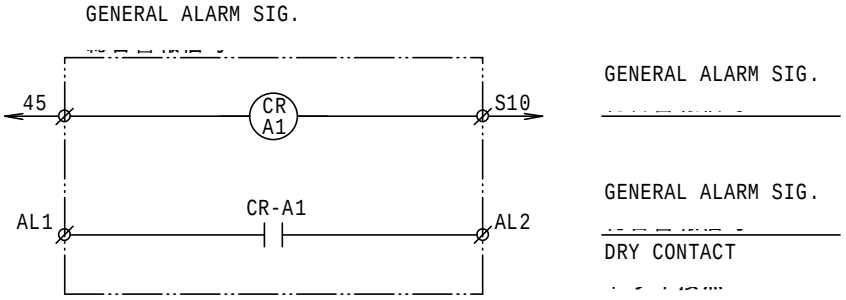


NOTE

The dryer cannot be stopped by the control panel during external start input.
(Turn “OFF” the external start signal to stop the dryer.)

4. General alarm output

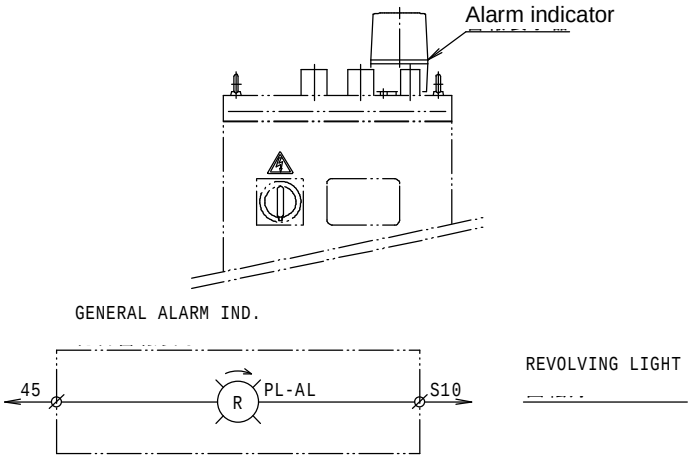
General alarm is outputted from the terminal block in the control panel.
Contact point is in the “ON” status when an alarm is outputted. (No voltage relay output, resistance load 5A Max.)



5. Alarm indicator

1) Rotating lamp

This rotating lamp lights up when all alarms operate, and can be confirmed in a wide area.



Symbol	Name	Maker	Model
PL-AL	Rotating lamp	Q. Light	S100UA-220-R (AC200V)
			ASD-100-R (AC100V)

6. Ready for different voltage

This dryer can be made compatible for different voltages as a special specification.
(For compatibility when an order is received and modification after delivery, contact us separately.)

7. Operation Power Supply [100V]

This dryer can be ready for operation power supply of 100V as a special specification.
(For compatibility when an order is received and modification after delivery, contact us separately.)

Chapter 12 Specifications

1. DMZ2-500/700

Unit model		DMZ2-500	DMZ2-700
Installing environment	Temperature	2-40°C (Temperature at which cooling water is not frozen)	
Dried air Average dew point	Ambient condition: Temperature 30°C Relative humidity 75% (DP+25%) Outside air mixing 10%	-40	
		Dried air dew point depends on operating condition.	
Dried air quantity	m^3/h	500	700
		Dried air quantity depends on operating condition.	
Drying temperature	°C	80 ~130 (180 for high temperature specification option)	
Drying blower	Model	RB60-520 (×2 units)	RB60-520 (×3 units)
	Electric motor output [kw] 50/60Hz	2.2/2.55 (×2 units)	2.2/2.55 (×3 units)
Regeneration blower	Model	RB40-520 (×2 units)	RB40-520 (×3 units)
	Electric motor output [kw] 50/60Hz	0.9/1.15 (×2 units)	0.9/1.15 (×3 units)
Cooling blower In the case of a 50 Hz specification	Model	RB20-520 (×2 units)	RB20-520 (×3 units)
	Electric motor output [kw] 50/60Hz	0.22/— (×2 units)	0.22/— (×3 units)
Regeneration heater	Capacity [kW]	5.5 – 6.6 (×2 units)	5.5 – 6.6 (×3 units)
		Capacity depends on power voltage.	
Adsorption tower	Name	Honeycomb rotor	
	Model	MZC-300H40 (×2 units)	MZC-300H40 (×3 units)
	Diameter [mm]	300	
	Height [mm]	400	
Adsorption tower motor	Adsorption tower motor output [W]	25 (×2 units)	25 (×3 units)
Drying filter	Model	ϕ200×350 (×2 units)	ϕ200×350 (×3 units)
	Filtering area [m^2]	0.84 (×2)	0.84 (×3)
Regeneration filter	Model	VILEDON	
	Filtering area [m^2]	0.015 (×2)	0.015 (×3)
Circulation cooler	Heat transfer area [m^2]	0.7 (×2)	0.7 (×3)
	Cooling water quantity [L/min]	40	60
	Connecting bore B	1	
	Cooling water temperature	32°C or lower (Temperature at which cooling water is not condensed)	

Unit model		DMZ2-500	DMZ2-700
Control	Drying temperature adjustment	PID control	
	Regeneration temperature adjustment	PID control	
	Alarm protective circuit	Proper temperature (drying, regenerative)	
		Thermal trip	
		Motor reverse prevention	
		Cooling delay at stop	
	Power voltage	① AC200/200,220V 50/60Hz 3-phase ② AC380,400,415/380V 50/60Hz 3-phase Designate any one of ①, ②. (Or designated voltage other than the above)	
	Operating circuit voltage	AC200V single phase	
	Power breaker rated current (A) 200V/220V/380~ 415V (High temperature specification)	125/80 (150(200V),175(220V)/100)	175(200V),200(220V)/100 （225/125）
Applicable options		Weekly timer	
		Leakage breaker	
		Alarm indication lamp	
		Dew point indicator	
		High temperature specification	
		Caster	
Hopper connection	Heat-resistant duct hose diameter [mm]	140	165
Outer dimension	W [mm]	820	820
	D [mm]	1285	1695
	H [mm]	2226	2226
Approximate mass	[kg]	690	900
Capacitance (Max)	KVA (High temperature specification)	39.78(52.38)	58.23(72.73)