SCD

"One-to-Two" Compact Dryers

Date: Jan. 2024

Version: Ver.A

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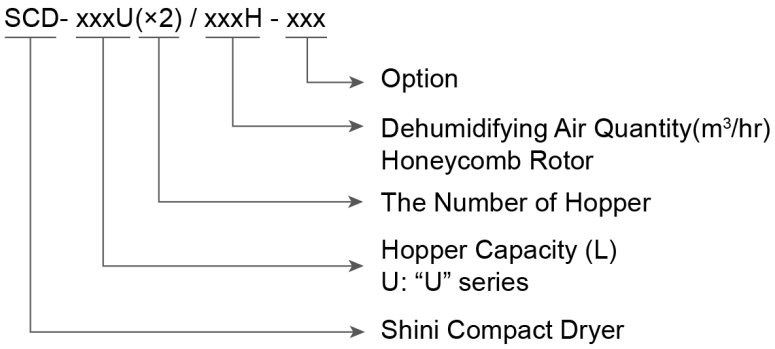
1. General Description

Read this manual carefully before operation to prevent damage of the machine or personal injuries.

“One-to-Two” “All-in-One” Compact Dryer SCD-80Ux2/80H possesses three functions of dehumidification, drying and four-stage conveying in one unit. It utilizes one dehumidifier to dry materials in two different hoppers simultaneously, and control each hopper temperature separately. It mainly collocated with double-shooting injection molding machine and is very suitable for drying engineering plastics materials with hygroscopicity such as PA, PC, PBT, PET, providing dew-point of below -40℃under ideal condition.

Model: SCD-80Ux2/80H

1.1 Coding Principle



1.2 The main features

- Combine the function of dehumidifying, drying and four-stage conveying into single unit.
- It equips with two drying hoppers, and controls each hopper temperature separately, which can dehumidify and dry two different materials simultaneously and is mainly used with double-shooting injection molding machine.
- Digital P. I. D temperature control with LED display.
- Adopt molecular sieve structure honeycomb, which provides low dew point dry air and gives better drying effect.
- Use multi-stage Turbo blower, with large air flow and high coefficient of performance.
- With in-built return air filter, and the recycled dry air can be reused after filtering to reduce the energy consumption, which can avoid temperature rise in the working area and keep clean air clean in the workshop.
- Overheat protector ensures machine reliable operation.
- Down-blow air pipe and new storage hopper cover for easy cleaning.

All service work should be carried out by a person with technical training or corresponding professional experience. The manual contains instructions for both handling and servicing. Chapter 6, which contains service instructions intended for service engineers. Other chapters contain instructions for the daily operator.

Any modifications of the machine must be approved by SHINI in order to avoid personal injury and damage to machine. We shall not be liable for any damage caused by unauthorized change of the machine.

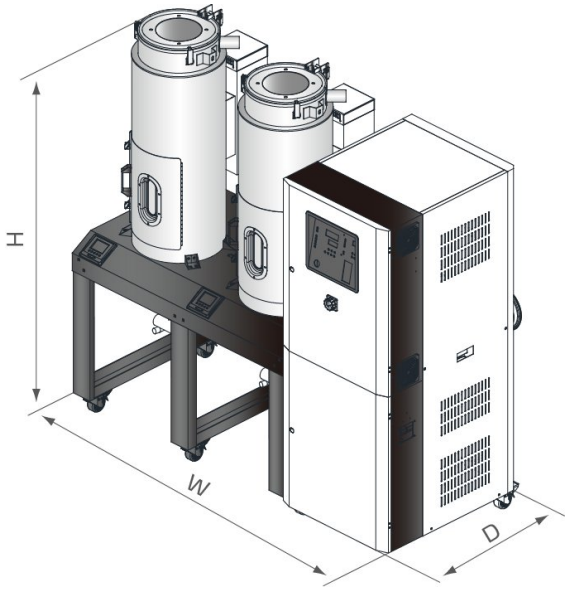
Our company provides excellent after-sales service. Should you have any problem during using the machine, please contact the company or the local vendor.

Headquarter and Taipei factory：
Tel: (886) 2 2680 9119

Shini Plastics Technologies (Dongguan), Inc：
Tel: (86) 769 8111 6600

Shini Plastics Technologies India Pvt.Ltd.：
Tel: (91) 250 3021 166

1.3 Technical Specifications



Picture 1-1: Outline drawings

Table 1-1: Specifications

Model SCD-	40Ux2/80H	80U×2/80H	120Ux2/120H	160U×2/200H
Ver.	A	A	A	A
Process Heater Power (kW)	3x2	3.9x2	3.9x2	6x2
Process Blower Power (kW)	0.75	0.4	0.75	1.5
Drying Hopper Capacity (L)	40x2	80×2	120x2	160×2
Regenerating Heater Power (kW)	3	3	4	4
Regenerating Heater Power (kW)	0.4	0.4	0.4	0.4
Dehumidifying Air Quantity (m^3/hr)	80	80	120	200
Conveying Blower Power (kW)	1.5	1.5	1.5	1.5
Cooling Water Flow (L/min)	10	10	15	30
Loader Pipe Dia. (inch)	1.5	1.5	1.5	1.5
SVH Hopper (L)	6	6	6	6
SHR-U Hopper (L)	3	6	6	6
Ext. Dimensions W x D x H (mm)	1422x853x1655	1890×920×1870	2100×920×1730	2150×930×2120
Weight (kg)	320	400	500	565

Note: 1) All plastic materials can be dried completely even the dry air dew-point temperature ≤-20°C.
2) Power: 3Φ, 230/400/460/575VAC, 50/60Hz.

We reserve the right to change specifications without prior notice.

1.4 Safety Regulations

1.4.1 Safety Regulations for the Blowers

1) Under normal operation, the blowers will generate high temperature. Do not touch blower's case to avoid any physical injury.
2) Under normal operation, the blower motor's current loading will increase or reduce according to air pressure's change accordingly. While installation, an adequate motor overload protection switch should be installed with full loading test, to ensure operating safely under full-loading to avoid motor's damage.
3) To avoid any block materials, dust, powder, fiber particles and water drops entering the blower, and hence cause the deficiency of its performance. This machine is well designed with air filters, so please clean up the filter with any foreign particles (recommended to clean up this filter weekly).
4) Clean the blowers both internal and external parts (especially for the fan cooling path), and remove surface dust if necessary. If more dusts are accumulated, it will cause deficiency for ventilation, temperature rising, vacuum power reduced, vibration increased and so it will cause machine broke down.
5) Ball bearing, oil seal and soundproof are belonging to consumable parts and so it has a life period and equires regular replacement. Meanwhile, blade, external case, and metallic screen etc. should be replaced regularly for best performance.
6) Under normal operation, if the blowers are not running smoothly or abnormal noise appeared. Please immediately shut down the machine for repair.

Pciture 1-2: Blower

1.4.2 Safety Signs and Labels

Danger!

High voltage danger!

This label is stuck on the electrical boxes.

Attention!

This label means that this area should be taken care!

Warning!

High temperature, take care of hands!

This label should be stick to the shell of heater.

Attention!

No need for regular inspection because all the electrical parts in the control unit are fixed tightly!

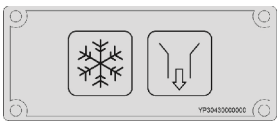
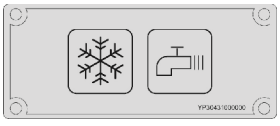
Note!

The EGO over-temperature protection is only for process heater protection, not for material protection usage, the default setting should not be changed.

Note!

To prevent over-temperature alarm from causing machine shutdown, don’t randomly adjust EGO setting temp.

1.4.3 Lable Description

	Water outlet: cooling water outlet
	Water inlet: cooling water inlet

1.4.4 Transportation and Storage of the Machine

Transportation

1) SCD series "One-to-Two" compact dryers are packed in crates or plywood cases with wooden pallet at the bottom, suitable for quick positioning by fork lift.
2) After unpacked, castors equipped on the machine can be used for ease of movement.
3) Do not rotate the machine and avoid collision with other objects during transportation to prevent improper functioning.
4) The structure of the machine is well-balanced, although it should also be handled with care when lifting the machine for fear of falling down.
5) The machine and its attached parts can be kept at a temperature from -25℃ to +55℃ for long distance transportation and for a short distance, it can be transported with temperature under +70℃.

Storage

1) SCD series " One-to-Two" compact dryers should be stored indoors with temperature kept from 5℃ to 40℃ and humidity below 80%.
2) Disconnect all power supply and turn off main switch and control switch.
3) Keep the whole machine, especially the electrical components away from water to avoid potential troubles caused by the water.
4) Plastic film should be used to protect the machine from dust and rains.

Working environment

1) Indoors in a dry environment with max. temperature +45℃ and humidity no more than 80%.

Do not use the machine

1) If it is with a damaged cord.
2) On a wet floor or when it is exposed to rain to avoid electrical shock.

3) If it has been dropped or damaged until it is checked or fixed by a qualified serviceman.
4) This equipment works normally in the environment with altitude within 3000m.
5) At least a clearance of 1m surrounding the equipment is required during operation. Keep this equipment away from flammable sources at least two meters.
6) Avoid vibration, magnetic disturbance at the operation area.

Rejected parts disposal

When the equipment has run out its life time and can not be used any more, unplug the power supply and dispose of it properly according to local code.
Fire hazard.

 In case of fire, CO_2 dry powder fire extinguisher should be applied.

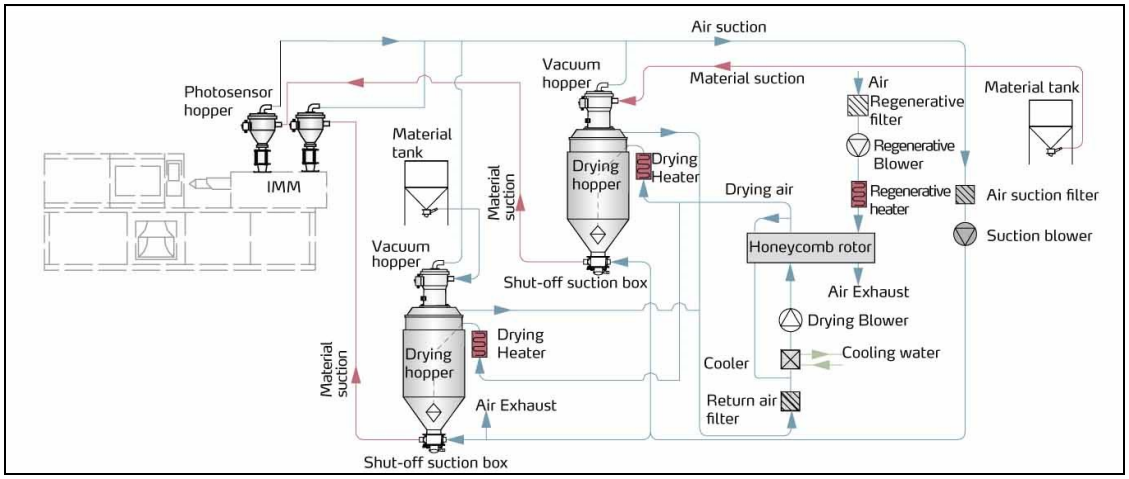
1.5 Exemption Clause

The following statements clarify the responsibilities and regulations born by any buyer or user who purchases products and accessories from Shini (including employees and agents).
Shini is exempted from liability for any costs, fees, claims and losses caused by reasons below:

1. Any careless or man-made installations, operation and maintenances upon machines without referring to the Manual prior to machine using.
2. Any incidents beyond human reasonable controls, which include man-made vicious or deliberate damages or abnormal power, and machine faults caused by irresistible natural disasters including fire, flood, storm and earthquake.
3. Any operational actions that are not authorized by Shini upon machine, including adding or replacing accessories, dismantling, delivering or repairing.
4. Employing consumables or oil media that are not appointed by Shini.

2. Sturcture Characteristics and Working Principle

2.1 Working Principle



Dehumidifying: damp and hot air from two drying hoppers is blown into rotor through the filter and cooler.

Moisture from the air is absorbed by rotor and is then adsorbed by regeneration heating air by rotor rotating before being discharged. Two strands of airflow function on the rotor. And with the rotation, moisture from the air is absorbed and expelled after continuously being absorbed by the rotor and by the regeneration hot air to form stable low dew-point air, which is dried by the heater and then sent to the two storage hoppers to dry and dehumidify the materials. After drying, the moisture is discharged from the storage hopper and then is blown into the rotor through the filter and cooler to form closed circle for next drying and dehumifying.

Suction: material is absorbed into the two drying hoppers from different storage hoppers or other storage containers. When the magnetic reed switch detects no material, suction motor runs to produce vacuum inside vacuum hopper. Material in storage hopper is absorbed into suction hopper due to air pressure difference. When the time is completed, suction motor stops. Materials drop into drying hopper due to gravity. The dried materials are transported from the drying hopper into the photosensor hopper receiver of the double-shot injection molding machine in the same way.

2.2 Relative Humidity and Dew-point

Relative humidity: Relative air humidity means real vapor content to saturated vapor at the same temperature in percentage.

Dew point: it means that temperature when the saturation vapor begins to dew. When the relative humidity is 100%, the ambient temperature is the dew point temperature. The more lower of dew point temperature (than the ambient temperature) is, the more less possible to dew, that also means the more drier the air is. The dew point will not be influenced by temperature, but influenced by pressure.

3. Installation and Debugging

Before installation, please read through this chapter carefully. Install the machine according to following steps. The power connection should be completed by professional technicians!

Notes!

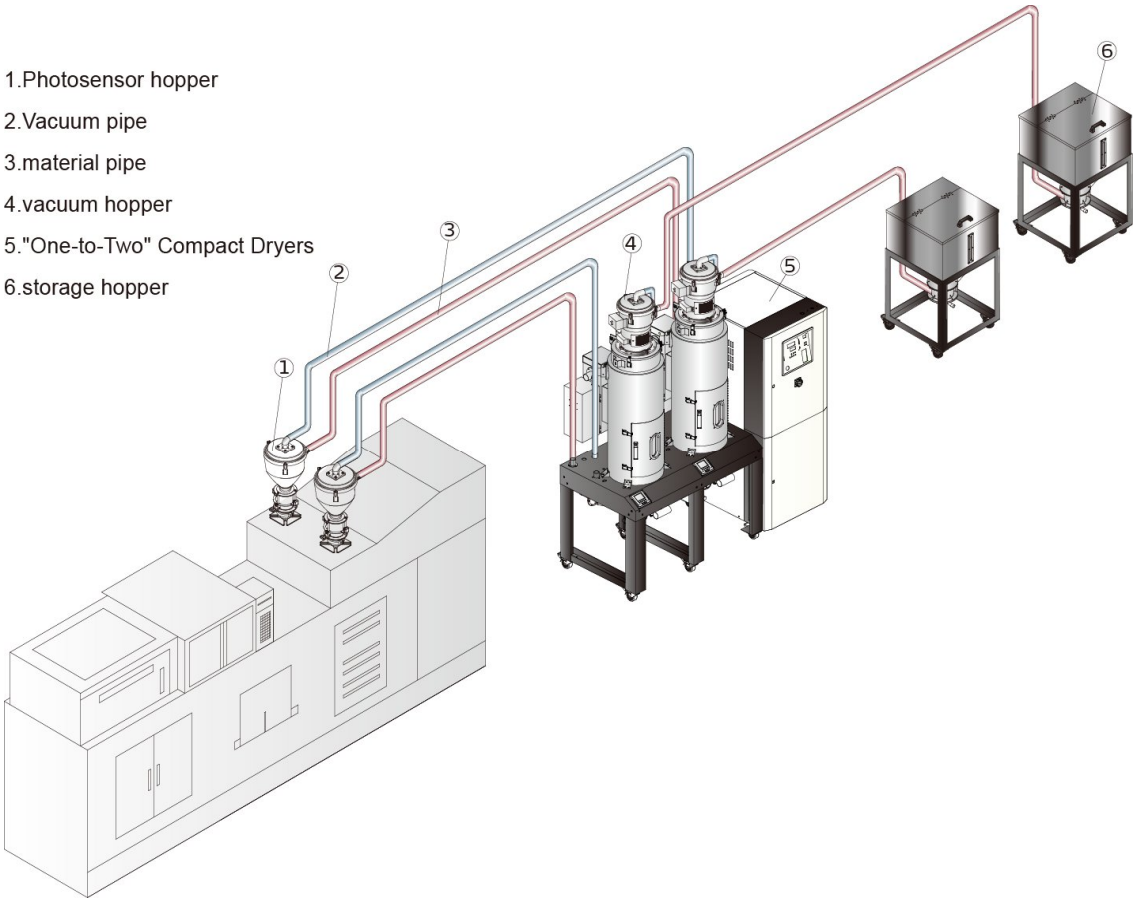
Keep 2m distance between the machine and the combustibles.

3.1 Machine Allocation

Please ensure 1m installation space around the machine at least to facilitate machine maintenance and repair.

Picture 3-1: Installation Drawing 1

3.2 Duct and Feed Tube Connection

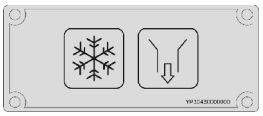
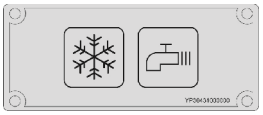


Picture 3-2: Installation Drawing 2

3.3 Water Connection

Cooling water pressure is 3~5kgf/cm^{2,} the water inlet & outlet pressure difference is 3~5kgf/cm^{2,} cooling water temperature is at 10~30℃.

Table 3-1: Cooling Water Label Description

Label	Description
	Water outlet: cooling water outlet.
	Water inlet: inlet for replenishing water and cooling water.

3.4 Air Source Connection

Table 3-2: Air Pipe Connection

Items	Specificaiton
Quality grade	335 (The concentration of solid particles is not greater than 5mg/m3, the dew-point temperature is -20℃, and the oil content doesn't exceed 25mg / m3)
Air supply pressure (bar)	3~5
Air flow (L/hr)	10
Pipe size	PM20

3.5 Electrical Connection

1) Make sure voltage and frequency of the power source comply with those indicated on the manufacturer nameplate, attached to the machine.
2) Power cable and earth connections should conform with your local regulations.
3) Use independent electrical wires and power switch. Diameter of electrical wire should not be less than those used in the control box.
4) The power cable connection terminals should be tightened securely.
5) The machine requires a 3-phase 4-wire power source, connect the power lead (L1, L2, L3) to the live wires, and the earth (PE) to the ground.
6) Power supply requirements:
   Main power voltage: +/- 5%
7) Main power frequency: +/- 2%

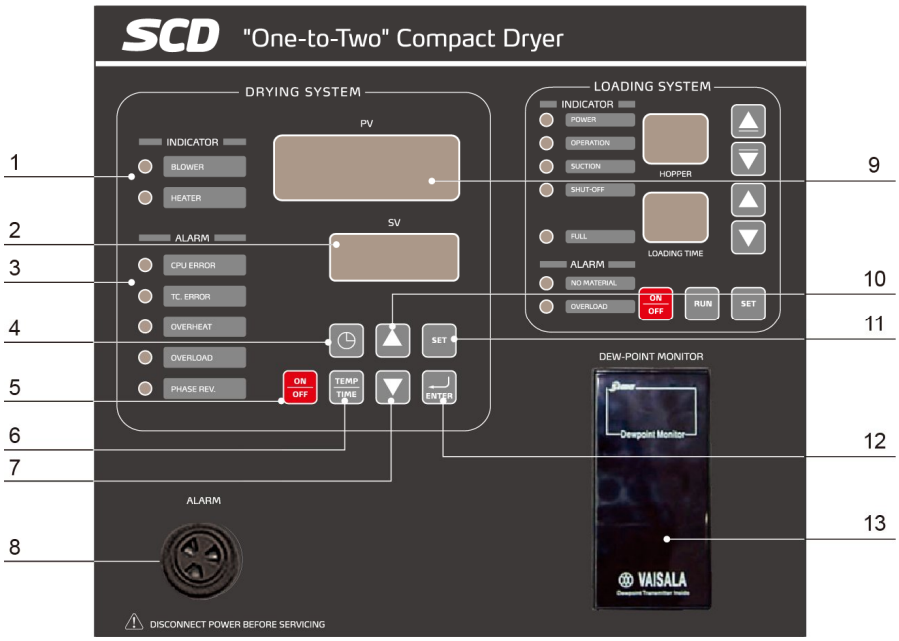
8）Refer to the electrical wiring diagram to complete the electrical Installation.

4. Application and Operation

Turn on the main switch to ON status, and connect power supply on the control panel.

4.1 Dehumidifying System Operation

4.1.1 Control Panel



Picture 4-1: Control Panel

Table 4-1: Control Panel Description

No.	Name	Function Descripton	Remarks & Notices
1	Running display area	It indicates the working status of blower and heater.	The green light on means the running state he green light off means the stop state
2	LED set value display area	It displays the set drying temperature or parameter value	-
3	Fault display area	It means current alarm information of the machine	The red light on means there is fault.
4	Timer start key	One weak timer start or intermittent running start	After setting the time parameters, press this key to select timing start mode
5	Running stop key	Controller start and stop	When at stop state, press it to start the machine. When at running state, press it to stop the

			machine.
6	Temp./ time display switch key	Alternative switch temp. and time diplay makes easy setting of time or temperature parameters.	-
7	Set value down key	Decrease the value of the parameter	
8	Buzzer	When the machine has fault, the buzzer sound lasts	After troubleshooting, then the buzzer stops buzzing.
9	Actual value LED display area	Display actual regen. temp. or parameter code	When optional with the drying heater, the temperature is the drying temperature.
10	Set value up key	Increase the value of the parameter	-
11	Setting key	Enter or exit the parameter setting mode	-
12	Confirm key	Confirm the input date	-
13	Dew-point monitor (option)	Dew-point display	Real-time display of direct moisture content of the material.

4.1.2 Panel Operation

1) Open the main switch.
2) Press <RUN/STOP>key to start loading.

4.1.3 Temperature Setup

1) The setup number will flicker after pressing<SET> key, add or decrease temperature by pressing <Up>or<Down> key.
2) Press <Enter> key to confirm the input value.

4.1.4 PID Auto-tuning Setting

1) Press<SET>and the digits flash. At this time press<SET>and <Enter> meanwhile for 1.5 seconds to enter auto-tuning mode. Then two values of “At” and “Present temperature” will display alternatively in PV and the set temperature value displays in SV till auto-tuning is finished. After that, system goes back to the normal operation directly.
2) If auto-tuning setting could not be finished within 1 hour, the parameters will not be altered and system goes back to normal operation.
3) Pressing <ON/OFF>to go back normal operation amid automatic calculation would not alter the original parameters.

Note: When the machine is delivered from the factory, PID parameters have been debugged, so it's unnecessary to run PID auto tuning when it is not necessary.

4.2 Intermittent Running Setup

Drying periods(0-ON ⇄ Stop periods(0-OFF)

1) Press <SET> key to change temp. setup value into time setup value，press <TEMP/TIMER> key to enter into setup mode, at this time "SV/setup value" flickers，"PV/setup value"displays"0-ON".

Picture 4-1: Intermittent Running Setup 1

2) PV displays "0-ON" to stand for drying periods. "0-OFF" stands for machine stop time. Press <Up>or<Down> key to add or decrease time value of "SV/setup value". Each press of <Up>or<Down> can add or decrease 15 mins set time.
3) Press <Enter> to confirm the input time value and enter into "0-OFF" time setup items, then repeat step 2.

Picture 4-2: Intermittent Running Setup 2

Note：If set 0-ON as 04:00, 0-OFF as 05:00, which means drying periods is 4 hours stop time is 5 hours，then working for 4 hours and being stopped for 5 hours and repeat this so long.

4) Cancel intermittent running by entering 00.00 at "0-ON" or "0-OFF" press <Enter> to confirm input value after time setup and enter into time setup items from "1-ON" "week-ON".

Picture 4-3: Intermittent Running Setup 3

4.3 Weekly Time Start Setup

1) After setting intermittent operation type, here comes Weekly Time. Press <Up>or<Down> key to add or decrease the time value in "SV/setup value " from "1-ON". Press <Enter> to confirm the input value and comes into the time setup items of "1-OFF" "MON-OFF".

Picture 4-2: Weekly Time Start Setup 1

2) Press <Up>or<Down> key to add or decrease the time value in "SV/setup value " from "1-OFF" . Press <Enter> to confirm the input value and comes into the time setup items of "2-ON""TUE-ON".

Picture 4-3: Weekly Time Start Setup 2

3) Do the same setup again and again to setup the ON/OFF time from Monday to Sunday.

Picture 4-4: Weekly Time Start Setup 3

4) Press <SET> key to back to normal status, after finish all the setup.

5) Setup all the "ON" to 00:00 if it is not for weekly time start/stop.

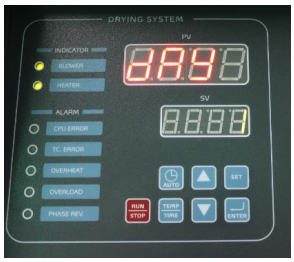
4.4 Present Time Modification

1) After 7-OFF setting is finished, press <Enter>key, it displays “TIME” that is the present time.

Picture 4-5: Weekly Day Setup

2) Press <Up>or<Down> key to increase and decrease the time.

3) Press<Enter>key, PV displays“DAY”that is the day in a week.



Picture 4-6: Weekly Day Setup

4) Press <Up>or<Down> key to increase and decrease the day, press<Enter>to confirm.

5) After the setting is finished, press<SET>key to return the normal mode.

4.5 Weekly Time Start/Stop

1) Activate the weekly time start after finish the time setup and the present time setup.

2) Press "AUTO" key at working or stop status to preset the time start/stop, the "PV" will display the time and temp. alternatively.

3) Press "AUTO" again if want to cancel that weekly time setup.

4.6 Temperature Unit Selection

1) Hold on<SET>till“PV”displays F-20, F-20 works mainly as a password lock.

Picture 4-7: Temp. Unit Selection 1

2) Press <Up>or<Down> key，input 0021 at SV, then press<Enter>to select F-03 temp. unit.

Picture 4-8: Temp. Unit Selection 2

3) Press <Up>or<Down> key to switch between℃/℉, after the selection press <Enter> to confirm.

4.7 Lock Setup

1) After F-03 setting is finished, press <Enter> key. At the time, PV displays F-04.

Picture 4-9: Data Lock Screen

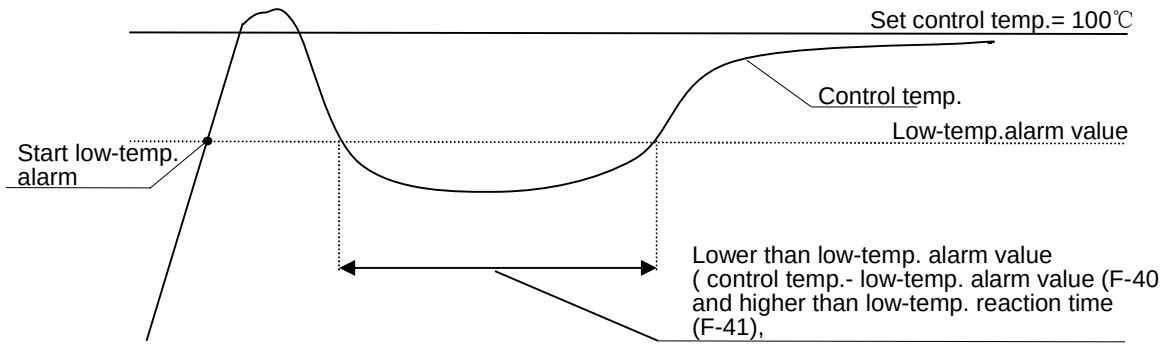
2) F-04 is a LOCK function, press <Up>or<Down> key to select LOCK or OFF function.
3) After selection, press<Enter>key to confirm; press<SET>key, do not save the value then exit.
4) When selects LOCK, press<SET>key during temp. setup, the SV would display “LOCK”.
5) Default value is OFF.

4.8 Low-temp. Alarm Setup

1) When machine starts up, the low-temp. alarm function doesn’t work until it gets to set alarm temperature.

2) During normal operation, if temperature long time lowers than the alarm value and reaches alarm reaction time, low-temp. alarm would sound.

3) Low-temp. alarm value is a relative value.



4.8.1 The Value of Low-temp. Alarm

1) After F-05 setting is finished, press<Enter>key, at this time PV displays F-40.

Picture 4-10: Value of Low-temp. Alarm

Note: F-05 is to set over-temp. alarm, the default value is 15℃. It is not allowed to modify the value.

2) F-40 is to set low-temp. alarm, press <Up>or<Down> key to modify the value of low-temp. alarm.
3) After the setting, press<Enter>key to confirm, press<SET>key, do not save the value then exit.
4) The default value is 20℃.

4.8.2 Reaction Time of Low-temp. Alarm

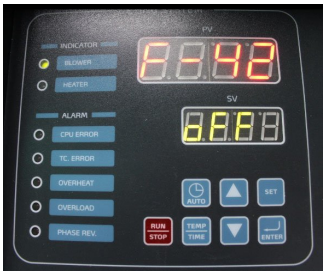
1) After F-40 setting is finished, press<Enter>key, at this time, PV displays F-41.

Picture 4-11: Reaction Time of Low-temp. Alarm

2) F-41 is the reaction time of low-temp. alarm, press <Up>or<Down> key to modify the reaction time and start it. When the reaction time is OFF, low-temp. alarm function is closed.
3) The default value is OFF.

4.9 Heater Alarm

1) After F-41 setting is finished, press<Enter>key, at this time, PV displays F-42.



Picture 4-12: Heater Alarm

2) F-42 is heater alarm, press <Up>or<Down> key to modify the alarm time and start it. When heater alarm is OFF, heater alarm function is closed. When it works, if the heater doesn't below the set temperature minus 5℃ within alarm set time, the alarm would sound. If temperature is set as 100℃, alarm time is 30min, after heater starts, the temperature doesn't get to 95℃ within the first 30min, the alarm would sound.
3) The default value is OFF.

4.10 Parameter Setting Instruction

Table 4-2: Parameter Setting Description

Code	Function	Range	Reset Value	Remarks
F-03	Temp. unit	℃, ℉	℃	-
F-04	Data lock	OFF, LOCK	OFF	LOCK is for data lock, it disables input data
F-05	Overheat protection temp.	0-100℃	20℃	Actual temp. > set temp. + overload protection temp., it sounds alarm
F-40	Low temp. alarm value	0-100℃	20℃	Actual temp. < set temp.- low temp. alarm value, it sounds alarm
F-41	Low temp. response time	OFF-99 Sec	OFF	When response time is OFF, low temp. alarm=OFF
F-42	Heater alarm	OFF-99 Min	OFF	The temp. not reach set value in time unit

4.11 Alarm Description (Dehumidifying System)

Table 4-3: Error Code

Error Code	Description
E-01	Heater thermocouple
E-02	Anti- phase, default phase
E-03	Blower overload
E-04	Drying temp. is higher than EGO protection set value
E-05	Drying temp. is higher than system set max. temp.
E-07	Over-temp protection (PV≥SV+ set value, system sounds alarm)
E-08	Memory error
E-09	Honeycomb rotor fault
E-10	Regenerative temp. is higher than EGO protection set value.
E-11	Thermocouple of “+,-”connect wrongly.
E-12	PID auto-turning fault
E-13	Low temp. alarm
E-12	Heater alarm

4.12 Drying System Operation

4.12.1 Control Panel

Picture 4-1: Control panel

4.12.2 Operation Step

1) Open the main power switch of control box.
2) Press <RUN/STOP> key, start drying process at first, the state indicator is green;
3) Press <RUN/STOP> key once again, stop drying process, the state indicator is yellow.

4.12.3 Temperature Setting

1) After pressing<SET>key, the figure flicks, meanwhile press <Up>or<Down> key to add or decrease temperature value.
2) After temperature setting, then press<SET>key again to confirm the input value.

4.12.4 Temperature Lock Setting

1) After pressing the <Menu> key for 2 secs, it displays “TIME”.
2) Repeat to press <Up> Key, till it displays “LOCK”;
3) Press” SET” key, the letter flickers, at this time press <Up>or<Down> key to select “YES” (lock temp. value) or “No” (Not lock).
4) Press<SET>key, and confirm the value.

5) Press <Menu> key, it returns operation screen.

Note" When "LOCK" set as "YES", temperature setting is locked, unable to modify.

4.12.5 PID Setting

1) Press <menu> and <Down> keys together for 3 secs., it displays "P" (proportional band);

2) Press<SET>key, the value flickers, meanwhile press <Up>or<Down> keys to add or decrease the value.
3) Press<SET>key, and confirm the value.
4) Press <Up> in turn, it displays "I" (Integration time) and "D" (Differential time);
5) Repeat above step 2 and step 3, input and confirm the related parameter.
6) Press <Menu> key, and return the running screen.

Note: the PID parameter value directly affects the temperature control accuracy, please adjust it carefully.

Table 4-4: PID Setting Parameter

Parameter	Code	Default Value
Proportional band	P	5
Integration time	I	200
Differential time	D	30
Overheat alarm	OTP	15℃
Control cycle	HCLE	15
Blower delay	FDLY	180
Temp. unit	UNIT	℃

4.12.6 Intermittent Running Setup

1) Press <Menu> key for 2 secs. to set current time and week. Press <Up>or<Down> key to set AUTO start/stop timer, initial running time of RONE setup, ROFF intermittent running OFF time , RON intermittent running ON time.

4.12.7 Weekly Time Start Setup

1) After present time set up, press <Menu> key for 5 secs. ,and press <Up>or<Down> key to set OFF1(Mon. Off Time), OFF2(Tue. Off Time), OFF3 (Wed. Off Time). OFF4 (Thu. Off Time), OFF5(Fri. Off Time), OFF6(Sat. Off Time), and OFF7(Sun. Off Time) .

2) Press <Menu> key for 7s, press <Up>or<Down> key to set ON1(Mon. On Time), ON 2 (Tue. On Time), ON 3 (Wed. On Time), ON 4 (Thu. On Time), ON5 (Fri. On Time), ON6(Sat. On Time), ON7(Sun. On Time).

4.12.8 Communication Setup (Option)

1) Press <Menu> + <Up> keys together for 3 secs, it displays “PRO” (communication protocol) ;

Note: communication protocol set as Modbus RTU —“RTU”

2) Press <Up> key，it enters “ID”(communication address) setting.

Note: In the same system, the communication address of each controller should be only, without repeat. Basically: the communication address of hopper 1 set as 1, the communication address of hopper 2 set as 2, and so on;

3) Press<SET>key, the value flickers, at this time, press <Up>or<Down> key to add or decrease the value;
4) Press<SET>key, to confirm the input;
5) Press <Up> key, it display “Baud” and “PAR” options (as below picture);
6) Repeat step 3 and step 4, input and confirm the parameter;
7) Press <Menu> key, it returns running screen.

Table 4-5: Common Setting Parameters

Communication Parameter	**Communication Code**	**Default**
Communication Protocol	PRO	RTU
Communication Address	Id	1（according to actual setting）
Baud	Baud	19.2K
PAR	PAR	none
Data length	Data	8
Stop bit	Stop	1

Table 4-6: Comm. Address Parameter

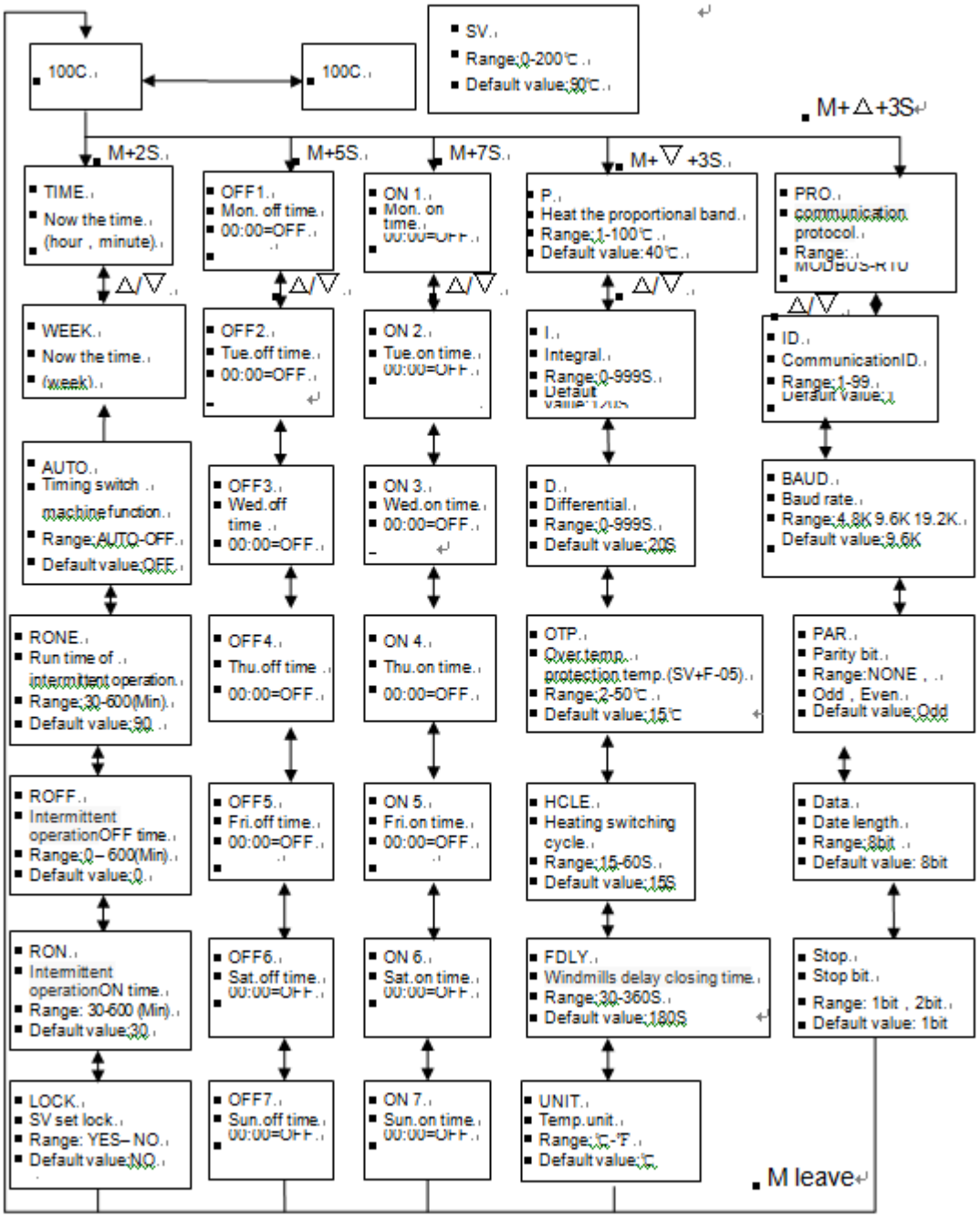
Position (40000+i)	**Parameter Contents**	**Type**	**Para. Min.**	**Para. Max.**	**Initial Value**
1	PV （actual temp. display value）	R			
4	SV （set temp. display value）	R			

8	current time(week)	R			
9	present time(hour)	R			
10	present time(min.)	R			
13	TS-01 status（output status） bit0 on/off status: 1=ON 0=OFF bit1 timing on/off status: 1=ON 0=OFF bit2 intermittent running status: 1=ON 0=OFF bit3 temp. unit: 1= ℉ 0=℃ bit4 Heater status 1=on 0=off bit5 Blower status 1=on 0=off bit6 Release staus 1=on 0=off bit7Alarm status 1=on o=off	R			
16	Alarm signal（input signal） bit0: temp. sensor breaks bit1:overheat bit2: temp. sensor reversedly connected bit3:overload input bit4: run out of battery bit5:EGO input	R			
25	present countdown time (intermittent running)	R/W			
26	present timing time (min.) (reserved on/off)	R/W			
27	present timing time (hour) (reserved on/off)	R/W			
28	system stop delay	R/W			
103	on/off button (Set=0x01)	R/W			
200	SV（temp. set value）	R/W	0	200	90
201	P	R/W	1	100	40
202	I	R/W	0	999	140
203	D	R/W	0	999	20

205	Heating switch cycle	R/W	15	60	15
207	SV setting lock 0:OFF 1:ON	R/W	0	1	0
208	Blower stop delay	R/W	30	360	180
209	Overheat protective temp.	R/W	2	50	15
502	Temp. unit 0:℃ 1:℉	R/W	0	1	0
603	Present time setting (week)	R/W	1	7	
604	Present time setting (time)	R/W	0	23	
605	Present time setting (min.)	R/W	0	59	
613	Timing switch on / off 0:OFF 1:ON	R/W	0	1	0
614	First run time of intermittent running	R/W	30	600	90
615	Intermittent running OFF time	R/W	0	600	0
616	Intermittent running ON time	R/W	30	600	30
617	Monday on / off time (min.)	R/W	0	59	0
618	Monday on / off time (hour)	R/W	0	23	0
619	Tuesday on / off time (min.)	R/W	0	59	0
620	Tuesday on / off time (hour)	R/W	0	23	0
621	Wednesday on / off time (min.)	R/W	0	59	0
622	Wednesday on / off time (hour)	R/W	0	23	0
623	Thursday on / off time (min.)	R/W	0	59	0
624	Thursday on / off time (hour.)	R/W	0	23	0
625	Friday on / off time (min.)	R/W	0	59	0
626	Friday on / off time (hour.)	R/W	0	23	0
627	Saturday on / off time (min.)	R/W	0	59	0
628	Saturday on / off time (hour.)	R/W	0	23	0
629	Sunday on / off time (min.)	R/W	0	59	0
630	Sunday on / off time (hour.)	R/W	0	23	0
631	Monday start time (min.)	R/W	0	59	0
632	Monday start time (hour.)	R/W	0	23	0
633	Tuesday start time (min.)	R/W	0	59	0
634	Tuesday start time (hour.)	R/W	0	23	0
635	Wednesday start time (min.)	R/W	0	59	0
636	Wednesday start time (hour.)	R/W	0	23	0
637	Thursday start time (min.)	R/W	0	59	0

638	Thursday start (hour.)	R/W	0	23	0
639	Friday start time (min.)	R/W	0	59	0
640	Friday start time (hour.)	R/W	0	23	0
641	Saturday start time (min.)	R/W	0	59	0
642	Saturday start time (hour.)	R/W	0	23	0
643	Sunday start time (min.)	R/W	0	59	0
644	Sunday start time (hour.)	R/W	0	23	0

4.12.9 Operation process



M express: Menu key

△/▽ express: Up/Down key

4.12.10 Wrong Codes Remarks

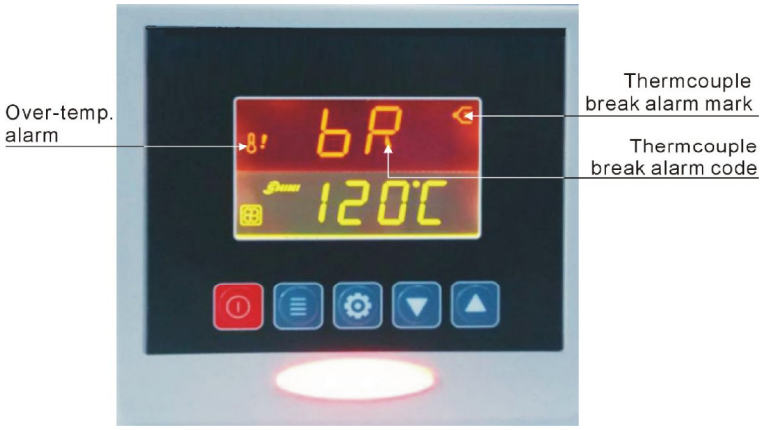
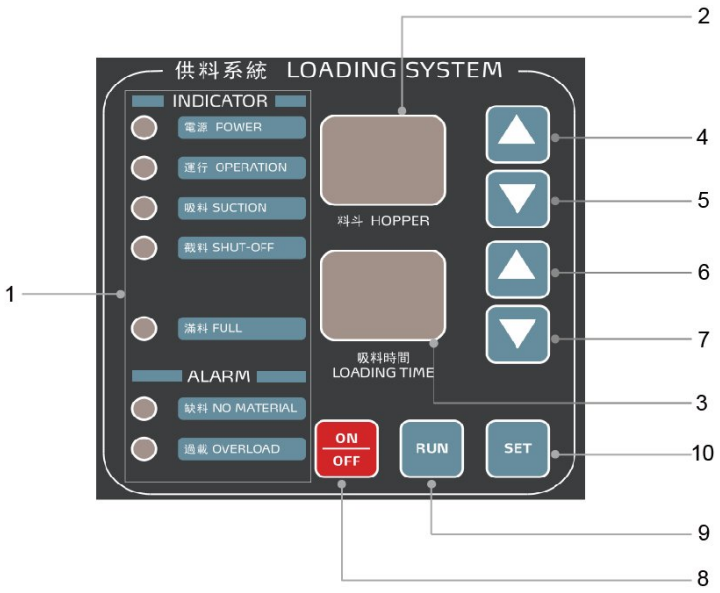


Table 4-7: Wrong Codes Remark

Wrong codes	Remark
bR	Temp.sensitive line disconnection alarm
oH	Over temp.alarm
oL	Overload alarm
EGO	EGOOvertemperature electric power supply is cut off

4.13 Panel and Keys Instruction (Suction system)



Picture 4-2: Panel (Suction system)

Table 4-8: Panel and Keys Instruction (Suction system)

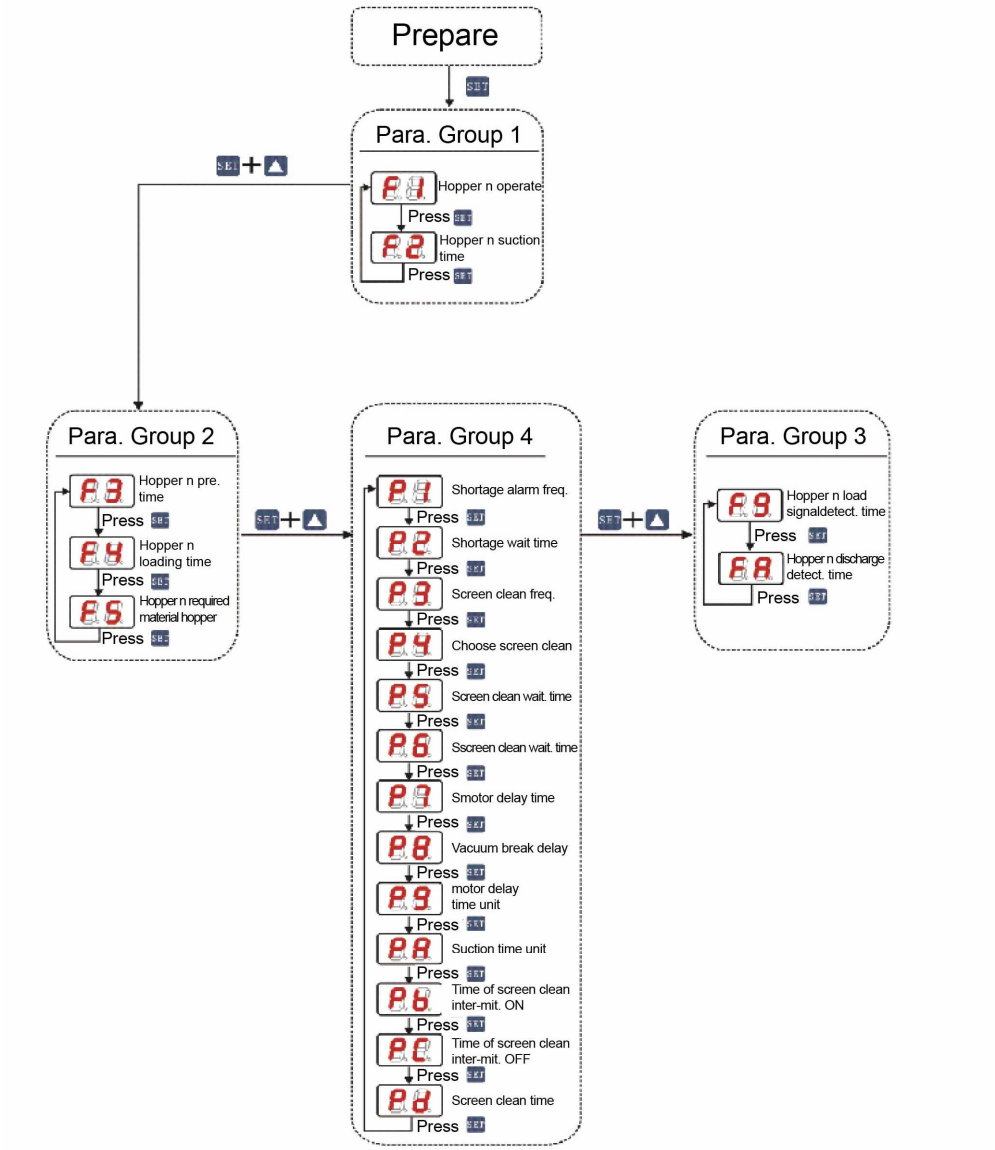
No.	Instruction
1	Action indicating area
2	Hopper displaying area (first display)
3	Time setting area (second display)
4	Hopper setting key (add up)
5	Hopper setting key（lessen）
6	Parameter setting key（add up）
7	Parameter setting key（lessen）
8	ON/OFF key
9	RUN key
10	SET key

4.13.1 Machine Start/Stop

1) Power on machine, it displays the [version], and then it disappears; “power indicator “lights on, but there’s no display, the machine is at “OFF” state.

2) The machine is at “OFF state”, press <ON/OFF> key once”, hopper displaying area shows "ON", it enters the “preparation state”; when machine is ready, press <RUN> again, the screen displays”r n”, once

shortage indicator appears, press <ON/OFF> again to return preparation state.



4.13.2 Operation Time Setting

1. Parameter Group 1

Display	Code	Name	Function Description	Parameter	
				Default	Range
	F1	hopper n on-off	ON: start hopper n OFF: stop the loading of hopper n	ON	ON/OFF
	F2	Hopper n loading time	set hopper n loading time	Hopper 1: 15 sec. Hopper 2: 10 sec. Hopper 3: 15 sec. Hopper 4: 10 sec.	0 — 99

Operation Instruction:

1) When machine is at any state, press <SET> key, it enters into setting and displays [F1], and alternatively displaying with the hopper Number.

2) Press the < Select Hopper (Increase) > key or < Select Hopper (Decrease) > key to select the required hopper station number.

3) Then press <SET> to select the parameter code, it display [F2] and alternatively displaying with hopper Number. Repeat to press <SET> key, it displays parameter code as [F1]->[F2]--> [F1].

4) Press < Modify Parameter (Increase) > key or < Modify Parameter (Decrease) > key to reduce or increase the set parameters.

5) According to step 2 to set other parameters.

6) If parameter setting finished, press <SET> or <ON/OFF> key, it ends parameter “setting state” and return “operation state” or “preparation state.

2. Parameter Group 2

Display	Code	Name	Function Description	Parameter	
				Default	Default
	F3	hopper n preparation time	preparation time of hopper n	3 secs.	0 — 99

	F4	hopper n shut-off time	Set shut-off time of hopper n (Note: it adds up to total loading time, such as loading time of hopper 2 =F2+F4)	斗 1:0S 斗 2:5S 斗 3:0S 斗 4:5S	0 — 99
	F5	hopper n shut-off valve selection	hopper n is available to select any of the shut-off valve for output	斗 1:0 斗 2:2 斗 3:0 斗 4:4	0 — 4

3. Parameter Group 3

Display	Code	Name	Function Description	Parameter	
				Default	Default
	P1	the number of shortage alarm	when no material for loading after several suctions, it sends shortage alarm, and display [A1]	3 times	0 — 99
	P2	shortage waiting time	when no material for loading, it processes next suction or sent shortage alarm once reaching the time.	10 secs.	0 — 99
	P3	the number of screen cleaning	the required frequence for screen cleaning	0 times	0 — 99
	P4	screen cleaning selection	set screen cleaning before or after suction 0: before 1: after	0	0 — 1
	P5	screen cleaning waiting time	waiting time before screen cleaning	0 secs	0 — 99
	P6	screen cleaning waiting time	waiting time after screen cleaning	0 secs	0 — 99
	P7	motor delay time unit	set required time for motor delay	90 secs	0 — 99
	P8	vacuum break delay	delay time of vacuum breaking valve start after the loading	2 secs	0 — 99
	P9	motor delay time unit	set [P7] time unit [01]: unit is 1 sec., [02]: unit is 2 secs. [10]:unit is 10 secs.	1 secs	1 — 10

	PA	loading time unit	1.1sec 2.2ec 3.3sec … 10.10sec	1 secs	1 — 10
	Pb	intermittence ON time of screen cleaning	0: constantly ON	0 secs	0 — 99
	Pc	Intermittence OFF time of screen cleaning	0: constantly ON	0 secs	0 — 99
	Pd	screen cleaning time	screen cleaining time < Note 1>	0 secs	0 — 99

Note 1: Screen cleaning time =Pd+P5+P6 , when P2 > Pd+P5+P6 , the screen cleaning time =Pd+P5+P6 , when P2 < Pd+P5+P6, the screen cleaning time=P2

Note 2: Repeat (RESET) and when it selects P6, press <SET> +<Up> + <Down> simultaneously.

4. Parameter Group 4

Display	Code	Name	Function Description	Parameter	
				Parameter	Default
	F9	hopper n shortage signal detecting time	hopper 1-4 shortage signal detecting time (0.01sec) (Note 1) (Note 2)	64	0 — FF
	FA	hopper n discharge detecting time	hopper 1-4 discharge detecting time; (0.01sec)(Note 1)(Note 3)	1E	0 — FF

Note 1: A=10 B=11 C=12 D=13 E=14 F=15 （hexadecimal）

Note 2: 64=(6*16)+4=100 100*0.01=1 sec

Note 3: 1E=(1*16)+14=30 30*0.01=0.3 sec

4.14 Alarm Instruction

1. After several loadings in shortage of material or motor overloads, the machine stops and sends the alarm. At the moment, press <ON/OFF> key to stop the machine. Wait till the material re-filling or trouble-shooting then start the machine.
2. The alarm is signal output of the intermittent time
3. Alarm Code:

No.	Fault	Alarm Code
1	hopper material shortage	NM
2	motor overload	A1
3	over pressure	A2
4	abnormal power off（abnormal shutdown）	A3

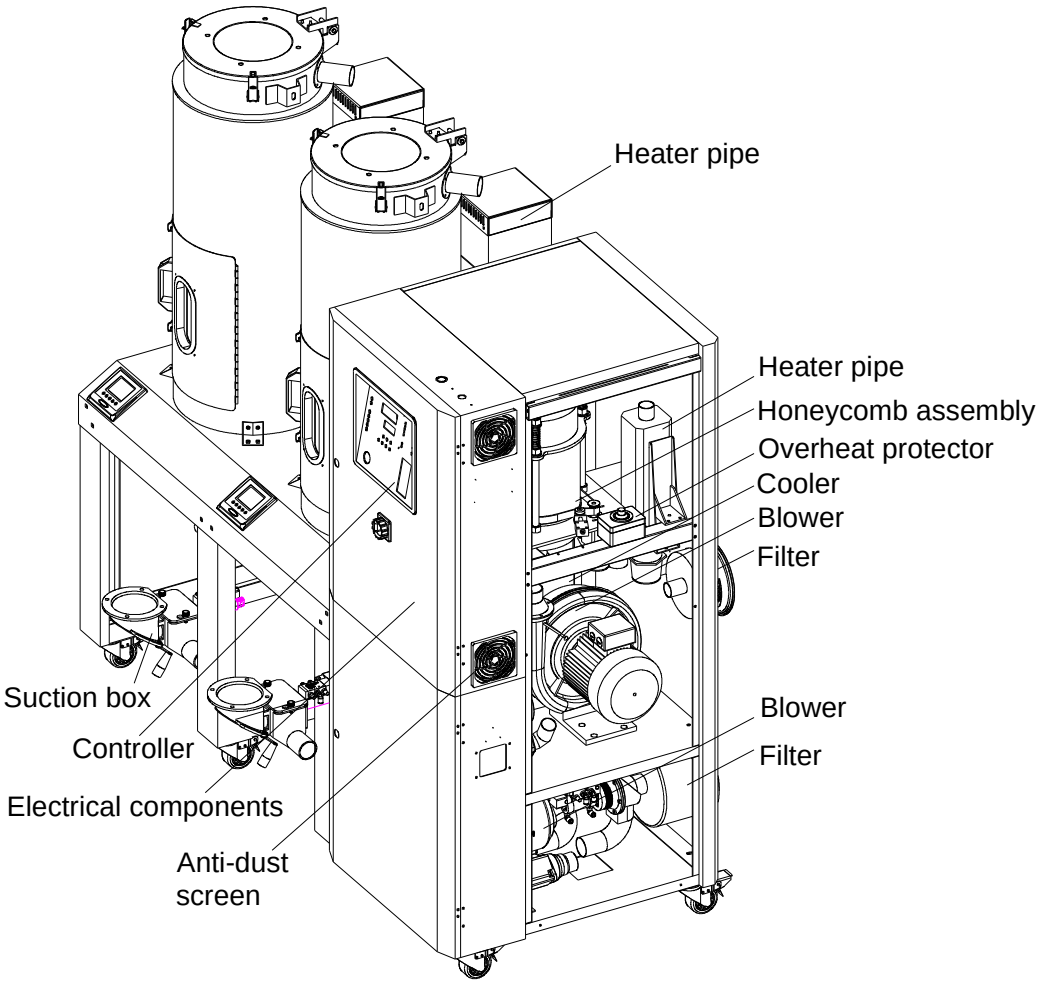
5. Trouble-shooting

Table 5-1: Trouble-shooting

Symptom	Possible causes	Actions taken
Alarm light for high dew point bleaks	1. Return air temperature too high	1.Check cooling water temperature (below 40℃)
	2. Return air temperature too high	2. Adjust electric conveyer (Default value is 4)
	3. Abnormal setting of regenerating temperature	3. Reset the regeneration temperature (Factory set the H5 to 80 ℃ and H4 to 150 ℃)
	4. Rotation wheel blocked	4. Clean up or clean the rotor.
	5. Filter is blocked	5. Clean or replace
	6. Leakage of heat-resistant hose	6. Check the air pipe or connector.
	7. Operating time is less than 30 minutes.	7. Confirm after it running 30 mins.
	8. Rotation wheel is not working	8. Wait until 30 minutes later for confirmation.
	9. Motor's direction is wrong	9. Check motor, conveyer, belt is damage or not.
	10. System drying capacity insufficient	10. Replace with a large system.
	11. Honey-comb upper/lower lid is leaking	11.Service or change the seal components
System cannot operate	1.Main AC power supply unconnected	1. Close main AC power supply
	2. Put timer switch into ON status.	2. Reset timer button and restart again.
	3. Motor overload or Phase reverse	3. Check close-loop, regenerative motor and AC power source are connected correctly.
Long lack time but suction fan not work	1.Main AC power source unconnected or touch button is not in ON position	1. Close main AC power source
	2.Hopper sensor, micro switch are bad contact	2. Adjust or replace.
	3. Signal cable is broken	3. Re-connect or replace.
Motor does not run	1. Heat relay off load	1. Check reason and reset.
	2. Connector is not working	2. Check it is burnt out or not.
	3. Power source lack of phase or motor is burnt out	3. Check and replace.
Material is full but suction fan still working	1. LED sensor or micro switch is On status	1. Adjust or replace.
	2. Signal's cable is broken	2. Check signal cable.
	3. Mechanical problem or connector point is melt	3. Repair or Replace.
	4. PLC problem	4. Check and replace.

Continuous running but cannot fill up funnel	1. Material is used up	1. To add more materials.
	2. Pipe is leakage	2. Repair or replace.
	3. Filter is blocked	3. Clean
	4. Diaphragm valve or shutoff valve is closed	4. Check diaphragm valve or shutoff valve's pressure, electric valve may be burnt out, circuit is well connected or not
	5. Motor's blade problem	5. Check and repair.
E-13low-temp. alarm	1.Pipe heater fault	1.Check and replace.
	2. Improper parameter setting	2.Adjust the parameters of F-40 and F-41.
E-12 Heater alarm	1.Poor heater power or fault	1.Check and repair.
	2. Improper parameter setting	2.Adjust the parameters of F-42.

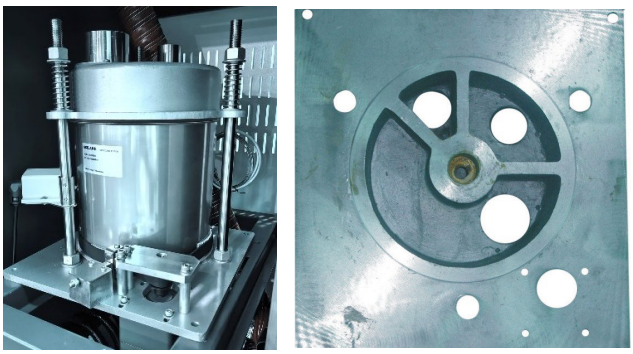
6. Maintenance and Repair



6.1 Honeycomb-rotor

6.1.1 What is Honeycomb-rotor

The main body of the honeycomb-rotor is a honeycomb, made by ceramic fibre and organic additives, sintered under high temperature with molecular sieve and silica gel, to be strongly bonded together and form a solid and hard surface. Not like common cylinder or rotary molecular sieve, which will produce dusts and fines to pollute raw materials when aging or become saturated requiring regular replacement, the moisture of return air is quickly absorbed by numerous tunnels before coming out of the rotor to form low dew-point air. At the same time, regenerating blower takes dry air into the honeycomb-rotor from an opposite direction to regenerate the rotor.

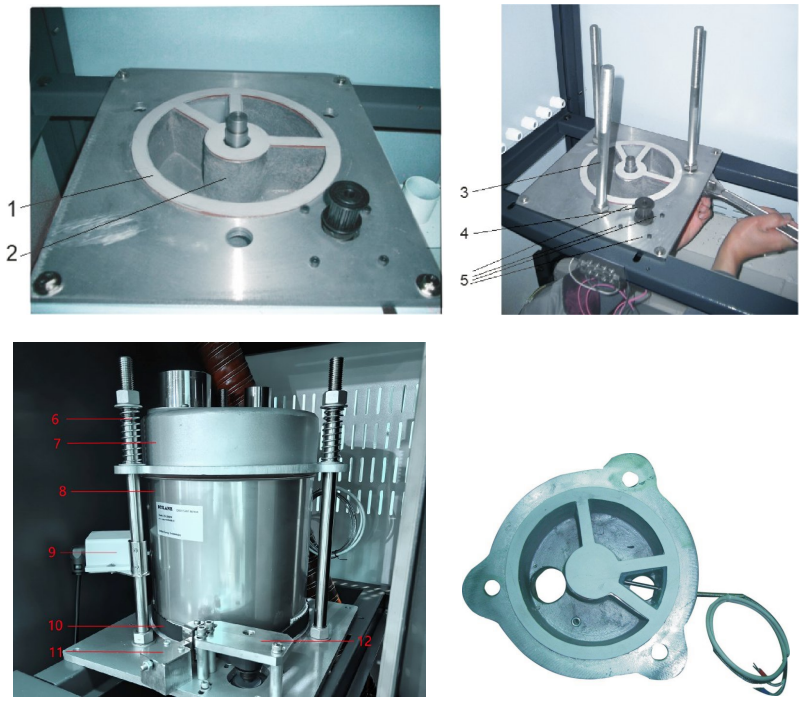


Picture 6-1: Honeycomb Rotor

6.1.2 Installation Steps of the Rotor

1) The upper and lower lid of honey-comb should install Teflon gasket (Fig. 1).
2) Use 4 screws to fix the rotor base on the machine frame firmly, and then install the shaft accordingly (Fig. 2).
3) Install the gearmotor and transmission gear (Fig. 4).
4) Install and fix the main support screws (Fig. 3).
5) Install the honeycomb rotor (marked 8 in the picture) and the synchronous belt (marked 10 in the picture).
6) Insert the micro switch fixing plate into the double headed screw, and install the limit switch and micro switch cover (marked 9 in the picture).
7) Install the honeycomb upper cover (marked 7 in the picture).

8) Install the compression spring (marked 6 in the picture) and tighten the nut.
9) Install the gear motor fixed end(marked 12 in the picture).
10) Adjust the position of the gear motor to tighten the synchronous belt before installing the belt adjuster (marked 11 in the picture).



Picture 6-2: Rotor Installation Diagram

6.1.3 Honeycomb Rotor Cleaning

The honeycomb rotor should to be cleaned as follows:

1. Use a vacuum-cleaner with brush to suck up the dust on rotor surface.
2. Blow off the dust in the rotor channels with compressed air.
3. If there is dirt sticking to the channel walls inside the rotor, cleaning steps as follows:

a. Saturate the rotor by blowing humid air (higher than 60%RH) through the rotor without having regeneration circuit on. This can be done by just turning the regeneration heater off and still have the process blower running if process air has high humidity. If the process air is too dry try to put a humidifier in the air stream. Do this for one hour.

b. Depending on the character of the dirt, sink the rotor into water with cleaning agent in it (PH value 3~2 liquid is applied to silica gel, PH value 7~10 applied to molecular valve). Greasy dirt should be put into a detergent solution with xylene. 15 minutes cleaning is suggested.

c. Take the rotor out of the liquid and let it rest with the channels vertically for 5 minutes so the liquid can run out.

d. Blow off the residual liquid in the channels with compressed air.

e. Put the rotor back into the dehumidifier and run the unit with regeneration circuit (the regeneration temperature between 50℃ and 60℃) on for at least one hour.

 *Note:*

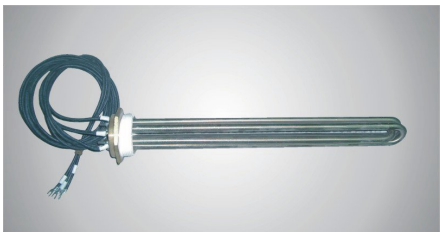
1. In the dry air and wet air outlets, there will be high concentrations liquid out for some time. If a solvent has been used, there will be a residual smell for several days.

2. For some dirt which is greasy and sticky in the rotor, 100% elimination is impossible. The only one thing you can do is to replace the rotor for the cleaned rotor performance can only be recovered partly.

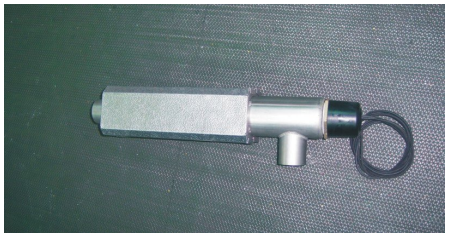
6.2 Pipe Heater

1) Install the heating pipe 1 into the heater 2.
2) Install it on the machine.

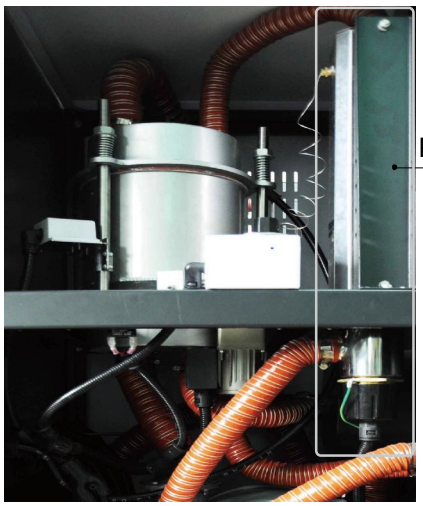
Warning: The high-temp. surface is hot when touched by hands
Please attach labels on the shell of the pipe heater.



1



2



Picture 6-3: Pipe Heater Installation Diagram

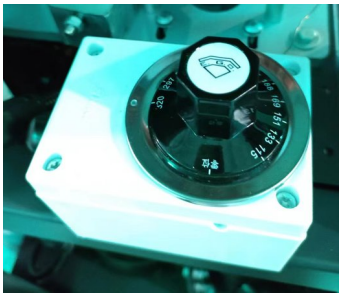
6.3 Blower Motors

To clean blower both internal and external parts (especially the fan cooling path), by removing surface dust. If more dusts are accumulated, it will cause deficiency for ventilation, temperature rising up, blower power reduced, vibration increased and so it will cause machine broke down.

Ball bearing, oil seal and sound-proof are belonging to consumable parts and so it has a life period and requires regular replacement.

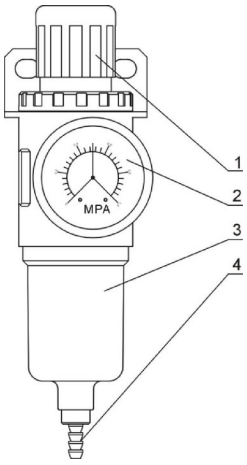
6.4 EGO

The EGO value has been setting before out factory, don't modify it.



Picture 6-4: EGO

6.5 Filter & Pressure Regulating Valve



Parts list:

1. Pressure adjusting knob 2. Pressure gauge 3. Cup 4. Water outlet

Picture 6-7: Filter & Pressure Regulating Valve Drawing

6.5.1 Filter & Pressure Regulating Valve Operation steps

1) Switch on the air source.
2) Pull the black pressure adjusting knob 1 upward and rotate it, observe the pressure gauge 2, generally a 0.5 Mpa pressure is advisable.
3) Push back the black knob 1.

6.6 Air Filters

Please periodically clean the dust on the air filters, once per week.

Cleaning steps:

1) Take out the air filter carefully.
2) Blow off the dust on the air filter screen and the cover with pressure air.
3) Wipe off the barrel wall of air filter with cloth.
4) After cleaning, place all parts in reversed order carefully.

Picture 6-5: Air Filters

Note!

Don't let sundries fall into the barrel, when taking out the air filter.

6.7 The Useful Life of the Key Parts of the Product

Table 6-1: The Useful Life of the Key Parts of the Product

Name of the parts	Useful life
Blower	Above 5 years
Process heater	Above 1 year
Regen. herter	Above 1 year

Contactor	Above 100,000 act
Honeycomb	5~10 years

6.8 Cooler

1) Clean the cooler and eliminate the leakage regularly.
2) It's recommended to clean once a month when using the chilled water for cooling;
3) It's recommended to clean once a quarter when using normal temp. water for cooling;

6.8.1 Cooler Clean Step

1) Disassemble the cooler's pipe and screw, and remove the cooler out of the chiller.
2) Release the fixed screw on the upper and lower cover of cooler and disassemble the cover.
3) Use brushes, compressed air or low pressure water to clean the dust and sundries on the cooler fan and copper pipe. Notes: water residue on the cooler fan and copper pipe should be dried with compressed air.
4) Make the cooler's upper and lower cover junction clean enough and smear the silica gel then fixed the covers with screws.
5) Put the cooler on the air at least 4 hours to make the silica gel drying enough then fix the cooler on the chiller and connect all pipes.

6.9 Maintenance Schedule

6.9.1 General Machine Information

Model _____ SN _____ Manufacture date _____

Voltage_____Φ_____V Frequency _____ Hz Power _____ kW

6.9.2 Installation & Inspection

☐Check if the air pipes are tightly connected.

☐Check if the material cleanrance door tightly closed.

☐Check if the air pipes are correctly connected.

☐Check if there are damages of the honeycle.

Inspection of electrical components

☐Voltage _____ V _____ Hz

☐Fuse melt current:_____ 1 Phase_____ A 3 Phases_____ A

☐Check phase sequence of the power supply.

☐Check the rotating direction of regeneration blower.

☐Check the rotating direction of conveying blower.

Check air supply of compressor

☐Compressed air pressure _____ bar

☐ Air flow_____ L/nun

☐Check if the compressed air purified or not

6.9.3 Daily Check

☐Check whether the temperature controller works well.

☐Check whether the dew point of the controller is correct (when random dew-point is optional).

6.9.4 Weekly Check

☐Check whether the power cable is loose.

☐Check whether the cylinder and solenoid valve work normally.

☐Check whether the blower filter and phase reverse function work normally.

☐Check whether the air pipe is loose or air leaked.

6.9.5 Monthly Check

☐Check whether the fixing nut of the suction box diaphragm valve is tightened.

☐Clean the exhaust fan and the anti-dust screen.

☐Check whether the synchronous belt and honeycomb synchronous gear belt is worn or loose.

☐Check whether the gear motor works normally.

☐Check whether the honeycomb is air leaked.

6.9.6 Half-year Check

☐Check whether the pipe heater works normally.

☐Check whether the blower works normally.

☐Clean the cooler.

6.9.7 Yearly Check

- ☐ Check whether the contract is normal.
- ☐ Replace the PC plate every three years.
- ☐ Replace the fuse switch every three years.