SD-H Series

Honeycomb Dehumidifiers

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Version: Ver.E (English)

SHINI

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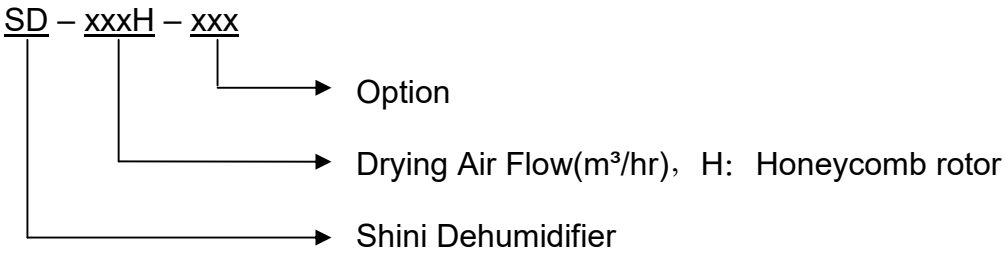
1. General Description

Please read through this operation manual before using the machine to prevent damages of the machine or personal injuries.

SD-H series honeycomb dehumidifiers are mainly used to dry hygroscopic engineering plastics. A honeycomb-rotor is used to offer effective drying, which under ideal conditions, can supply dehumidified dry air with a dew-point lower than -40℃.This series comprises 13 models of honeycomb dehumidifiers, the largest of which can provide dry air up to a quantity of 4,000 m^3/hr.

Model: SD-40H-D

1.1 Coding Principle



1.2 Feature

- Adopts P.I.D. temperature controller to accurately control regenerative temperature.
- The dehumidifying system of the SD-H series features two coolers to ensure a low return air temperature and low dew-point.
- Inbuilt return air filter ensures no contamination to the honeycomb.
- It is better to adopt molecular sieve structure honeycomb than silica gel adsorption one in dehumidifying.

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.

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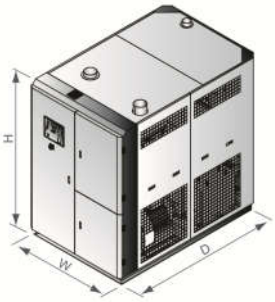
1.3 Technical Specifications

1.3.1 Durline Drawing

SD-40H~700H



SD-1000H~2000H

SD-3000H~4000H

Picture 1-1: Durline drawing

1.3.2 Specifications

Table 1-1: Specifications

Model SD-	40H	80H	120H	200H	400H	700H	1000H	1500H	2000H	3000H	4000H
Ver.	C	C	C	C	B	E	E	E	E	D	A
Regen. Heater (kW 50Hz/60Hz)	3 / 3	3 / 4	3 / 4	4 / 6	7.2 / -	10 / -	15 / -	28 / -	28 / -	32 / -	56 / -
Regen. Blower (kW，50 / 60Hz)	0.12 / 0.12	0.4 / 0.4	0.4 / 0.4	0.4 / 0.5	0.75 / 0.9	1.5 / 1.8	3.75 / 4.7	7.5 /8.6	7.5 /8.6	9 / 11	5.5×2 / 6.3×2
Process Heater* (kW)	4	6	6	12	18	24	32	58	80	96	128
Process Blower (kW，50 / 60Hz)	0.18 / 0.18	0.75 / 0.9	0.75 / 0.9	1.5 / 1.8	3.75 / 4.5	7.5 / 8.6	13 / 16	9×2 / 11×2	13×2 / 15×2	13×3 / 15×3	13×4 / 15×4
Dry Air Capacity (m^3 / hr，50 / 60Hz)	40 / 45	80 / 95	120 / 130	200 / 220	400 / 450	700 / 780	1000 / 1150	1500 / 1750	2000 / 2300	3000 / 3400	4000 / 4500
Pipe Dia. (inch)	2	2	2	2.5	3	4	5	6	8	8	12
Cooling Water Quantity (L/min)	5	10	15	30	50	80	120	180	240	360	480
Dimensions											
H (mm)	1260	1360	1360	1560	1745	1935	2145	2060	2060	2240	2060
W (mm)	510	530	530	660	700	900	1300	1410	1410	2035	2750
D (mm)	860	820	820	1050	1255	1380	1550	2150	2150	2160	2250
Weight (kg)	145	170	170	265	330	480	700	1010	1300	1600	2200

Note: 1) Plastic materials can be fully dried by drying air with dew-point temperature ≤-20℃.
When ambient temperature ≤-25℃ and relative humidity≤-60%, the drying air dewpoint temp. ≤-40℃.
2) "*" Stands for drying heater is optional equipment for working with "European type" hoppers.
3) Power: 3Φ, 230 / 400 / 460 / 575VAC, 50 / 60Hz.

We reserve the right to change specifications without prior notice.

1.3.3 Drying Capacity

Table 1-2: Specifications

Material	Drying temp. (℃)	Time (hr)	Specific Heat (J/kg.℃)	Material Specific Gravity (kg/dm^3)	Moisture Content Before Drying (%)	Moisture Content After Drying (%)	Drying capacity (kg/hr)										
							SD-40H	80H	120H	200H	400H	700H	1000H	1500H	2000H	3000H	4000H
ABS	80	2-3	0.34	0.6	0.3	0.02	16	27	35	105	210	355	425	710	1065	1500	1600
CA	75	2-3	0.5	0.5	1	0.02	12	22	30	90	180	295	355	590	885	1200	1330
CAB	75	2-3	0.5	0.5	0.8	0.02	12	22	30	90	180	295	355	590	885	1200	1330
CP	75	2-3	0.6	0.6	1	0.02	16	27	35	106	210	355	425	710	1060	1500	1600
LCP	150	4	0.6	0.6	0.04	0.02	11	20	27	80	160	265	320	530	800	1150	1200
POM	100	2	0.35	0.6	0.2	0.02	24	40	53	160	320	530	640	1060	1600	1800	2400
PMMA	80	3	0.35	0.65	0.5	0.02	17	29	38	115	230	383	460	767	1150	1530	1730
IONOMER	90	3-4	0.55	0.5	0.1	0.04	10	17	22	66	133	220	265	442	663	750	1000
PA 6/6.6/6.10	75	4-6	0.4	0.65	1	0.05	9	14	19	58	115	192	230	383	575	960	1040
PA11	75	4-5	0.58	0.65	1	0.05	10	17	23	69	138	230	275	460	690	780	1150
PA12	75	4-5	0.28	0.65	1	0.05	10	17	23	69	138	230	275	460	690	780	1150
PC	120	2-3	0.28	0.7	0.3	0.01	19	31	41	124	250	413	495	826	1238	1400	1860
PU	90	2-3	0.45	0.65	0.3	0.02	17	29	38	115	230	383	460	767	1150	1530	2080
PBT	130	3-4	0.3-0.5	0.7	0.2	0.02	13	23	31	93	186	310	372	620	930	1100	1600
PE	90	1	0.55	0.6	0.01	< 0.01	47	80	106	318	637	1062	1275	2125	3185	3600	4800
PEI	150	3-4	0.6	0.6	0.25	0.02	11	20	27	80	160	265	320	530	800	1030	1370
PET	160	4-6	0.3-0.5	0.85	0.2	0.02	11	19	25	75	150	250	300	500	750	1150	1360
PETG	70	3-4	0.6	0.6	0.5	0.02	11	20	27	80	160	265	320	530	800	1030	1370
PEN	170	5	0.85	0.85	0.1	0.05	13	23	30	90	180	300	360	600	900	1150	1360
PES	150	4	0.7	0.7	0.8	0.02	13	23	30	90	180	300	360	600	900	1050	1400
PMMA	80	3	0.65	0.65	0.5	0.02	17	29	28	115	230	385	460	765	1150	1530	1730
PPO	110	1-2	0.4	0.5	0.1	0.04	19	33	44	133	265	440	530	885	1330	1730	2660
PPS	150	3-4	0.6	0.6	0.1	0.02	11	20	27	80	160	265	320	530	800	1030	1370
PI	120	2	0.27	0.6	0.4	0.02	24	40	53	160	320	530	640	1060	1600	1800	2400
PP	90	1	0.46	0.5	0.1	0.02	39	66	88	265	530	885	1060	1770	2655	3500	4000
PS(GP)	80	1	0.28	0.5	0.1	0.02	39	66	88	265	531	885	1062	1770	2655	3500	4000
PSU	120	3-4	0.31	0.65	0.3	0.02	12	22	29	85	173	290	345	575	865	1300	1485
PVC	70	1-2	0.2	0.5	0.1	0.02	19	33	44	135	265	442	530	885	1330	1730	2660
SAN(AS)	80	1-2	0.32	0.5	0.1	0.05	19	33	44	135	265	442	530	885	1330	1730	2660
TPE	110	3	0.7	0.7	0.1	0.02	18	30	40	125	250	413	495	826	1238	1650	1860

Notes: 1) Use separated drying hopper.

2) Specific model selection, please consult the letter easy service personnel.

1.4 Safety Regulations

Note!

Electrical installation of the machine should be done by qualified electricians.

Before connect through power supply, make sure that power switch specifications and security ratings are suitable and reliable, and also the main switch is turned to OFF. Turn off main switch and auto-start switch before service and maintenance.

1.4.1 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!

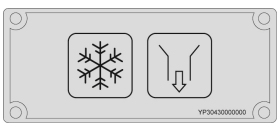
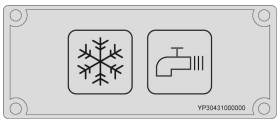
High temperature, take care of hands!

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!

1.4.2 Signs and Labels

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

1.4.3 Transportation and Storage of the Machine

Transportation

1) SD-H series honeycomb dehumidifiers 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) SD-H series honeycomb dehumidifiers 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

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.

1.4.4 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 requires 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.
7) Don't manual discharge material inside the hopper while its not or opening cleaning door while the material is not.

Picture 1-2: Safety Regulations for The Blowers

1.5 Exemption Clause

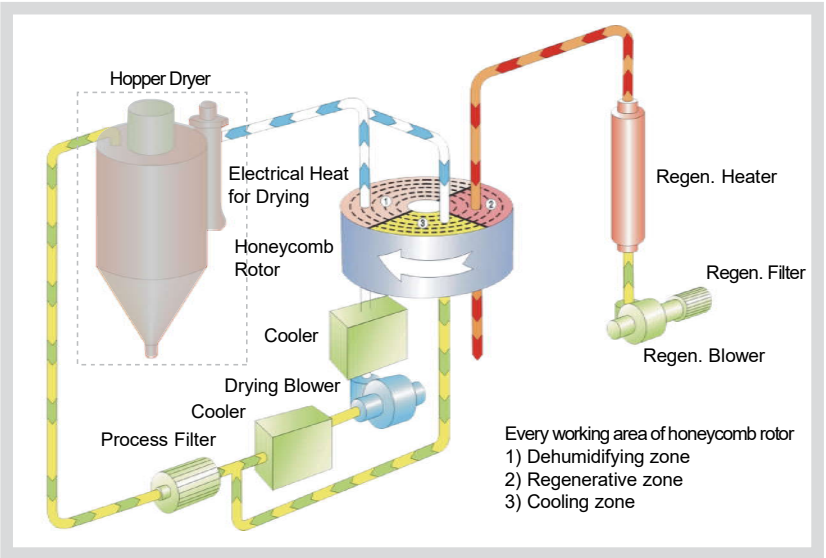
The following statements clarify the responsibilities and regulations born by any buyer or user who purchases products and accessories from Shini (including employees and agents).

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. Structure Characteristics and Working Principle

2.1 Working Principle



Picture 2-1: Working Principle Illustration

The moisture contained in the air which is waited for treating) will be absorbed by hygroscopic materials, hereafter, be de-absorbed by the regenerated hot air. And the two airstream work together in the rotation wheel. So, with the rotation of the wheel, moisture will be absorbed and de-absorbed continuously, and drain out via de-absorbing by regenerated air to form a steady low dew point airstream for using.

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.

2.3 Why Choose SD-H

For these quality deficiencies as bubble, crazing, cracking, poor transparency are due to insufficient drying of plastic materials before molding, and the engineering plastics such as: PC, PA, PBT, PET, Nylon, etc. The hygroscopic materials used in the plastics industry such as PC, PA, PBT, PET, Nylon, etc. cannot be dried effectively by conventional hot air drying systems because the moisture enters inside the particles. According to suggestion of the manufacturer, the plastic materials can be completely dried by drying air with dew-point temperature ≤-20℃. However, the SCD sufficiently dehumidifies and dries the air inside the closed-loop system, and the dry air eliminates the moisture fast and completely as to reach the drying and dehumidifying effect.

2.4 Options

● Built-in type, which meas that dew-point monitor is installed on the machine, is convenient to monitor dew-point temperature. Add "D" at the end of the model code.

● Portable type, which meas that dew-point monitor is separate from the machine, is convenient to test dew-point temperature of different machines. Add "PD" at the end of the model code.

Dew-point Monitor (installed on machine)

Dew-point Monitor (portable)

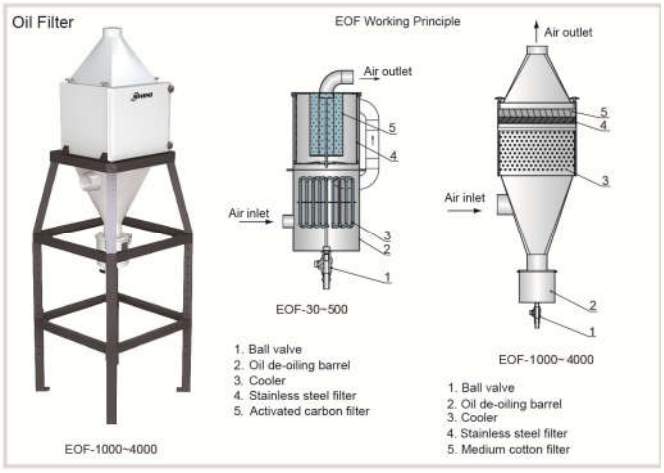
●For models optional with dew-point control, add “DC” at model behind. “ES” by setting if dew-point value to control the regeneration required temperature automatically and lowers power consumption of the regenerative heater; According to -40OC~+10OC of dew-point value, the total power consumption can save 0~10%.

● Models select controllable drying heater, add "C" at the end of the model code. (Only Applicable for SD-1000H~4000H)

● Models optional with drying heater inside, add "PHC" at the end of the model code.

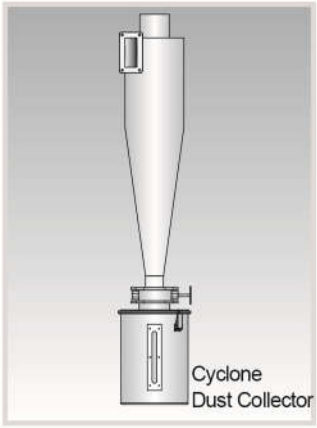
● For models optional with intelligent airflow regulating function, please add the SM4, SM8 or SM12 at the end of the model code, in which the figure after SM is on the basis of the collocated Modular Dryer's quantity. For example, if the Dryer quantity is not more than 4, please select SM4 and so on. The touch panel is standard equipped if this function is selected. This optional function should be worked with MHD-U Modular Hopper Dryer, please refer to the dehuidfying and drying modularization.

● Oil filter is available to filter the oil substance in return air for honeycomb protection.



Model	Applied to
EOF-30	SD-40H~120H
EOF-150	SD-150H / 200H
EOF-300	SD-300H / 400H
EOF-500	SD-700H
EOF-1000	SD-1000H
EOF-1500	SD-1500H
EOF-2000	SD-2000H
EOF-3000	SD-3000H
EOF-4000	SD-4000H

● Cyclone dust collector is optional to collect the dust in return air.



Model	Applied to
ACF-3"	SD-300H / 400H
ACF-4"	SD-700H
ACF-5"	SD-1000H
ACF-6"	SD-1500H
ACF-8"	SD-2000H / 3000H
ACF-12"	SD-4000H

3. Installation Testing

This series of models only could be applied in working environment with good ventilation.

3.1 Machine Location

Picture 3-1: Installation Drawing

Installation Notice:

1) The machine can only be installed in the vertical position, make sure there's no pipeline, fixed structure and other object which may obstruct machine installation or cause items, human injuries above the selected location and adjacent areas.
2) For easy maintenance, leaving 1m space around machine is suggested. Keep machine 2m away from the inflammable materials.
3) The machine must be placed on the ground level to ensure balance state, and to remove the accumulated condensing water. If machine is need to install on a higher level (scaffolding or interlayer), it should make sure that the structure and size could withstand the machine.

3.2 Power Connectors

1) Make sure voltage and frequency of the power source comply with those indicated on the manufacturer nameplate, which is attached to the machine.
2) Power cable and earth connections should conform to your local regulations.
3) Use independent power cable and ON/OFF switch. The cable's size should not smaller than those wired in the electrical requirement of control panel.
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:

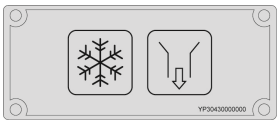
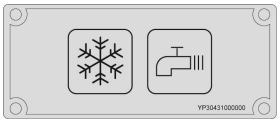
Main power voltage: ± 5%

Main power frequency: ± 5%

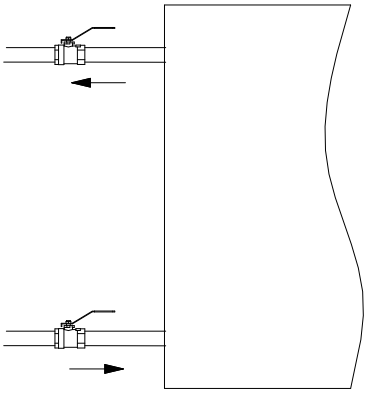
7) Refer to the electrical wiring diagram to complete the electrical installation.

3.3 Water connections

The cooling water pressure is 3~5bar and the cooling water temperature should be 10~30℃.

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

cooling water needs to be connected the before operation. The water port is at the back of the machine.



Picture 3-2: Cooling Water Connection

3.3.1 Cooling Water Connection

Connect through the cooling water before machine operation. For the efficiency, please follow below suggestions:

1) For easy maintenance and safety, install the ball valve at cooling water inlet and outlet.

2) Water pipe diameter should not less than the diameter of cooling water inlet and outlet.

3) For water quality, it needs to sediment or filter the water before it gets into the pipe, to prevent the deposits accumulated on pipeline of cooler and performance degradation.

Cooling Water Specifications			
Model	**Flowrate of Cooling Water (L/min)**	**Model**	**Flowrate of cooling Water (L/min)**
SD-30H	4	SD-400H	50
SD-40H	5	SD-500H	60
SD-50H	6	SD-700H	80
SD-80H	10	SD-1000H	120
SD-120H	15	SD-1500H	180
SD-150H	20	SD-2000H	240
SD-200H	30	SD-3000H	360
SD-300H	40	SD-4000H	480

Note: 1.Difference in temperature: 5℃
2.Cooling water pressure: 3~5Kgf/cm²

3.3.2 Condensation Drainage Pipe

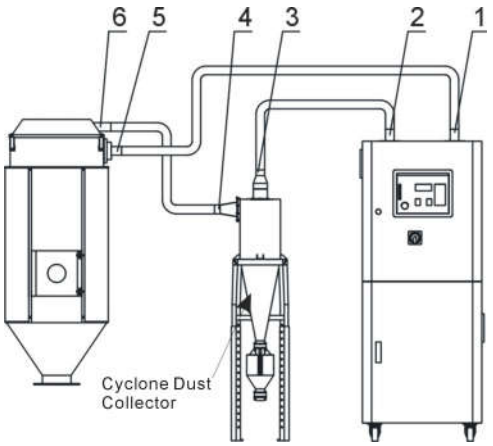
During normal operation, it will generate condensation water. Connect the water pipe at drainage outlet to remove the condensation water is necessary.

1) Drainage pipe inner diameter should not less than the diameter of drainage outlet.

2) Drainage pipe should be long enough to approach the drainage channel, and be the hose. Be careful not to press or bend the pipe for smooth water flow (Use the rigid pipe if there's need to press or bend the hose).

3) As condensation water drainage is in terms of gravity, make sure the drainage outlet is above the pipe. Otherwise the water can't be drained out and will flow back to the machine.

3.4 Cyclone Dust Collector

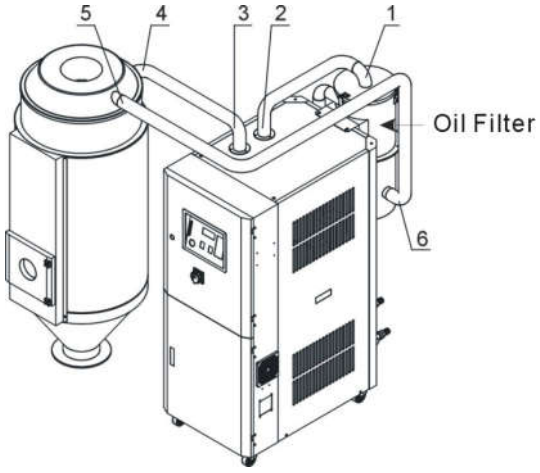


Picture 3-3: Installation Diagram of Cyclone Dust Collector

Cyclone Dust Collector Installation steps:

1. Connect 1 and 5 with a heat-resistant duct and fixed both the ends with stainless steel tube.
2. Connect 2 and 3 with a heat-resistant duct and fixed both the ends with stainless steel tube.
3. Connect 4 and 6 with a heat-resistant duct and fixed both the ends with stainless steel tube.

3.5 Oil Filter

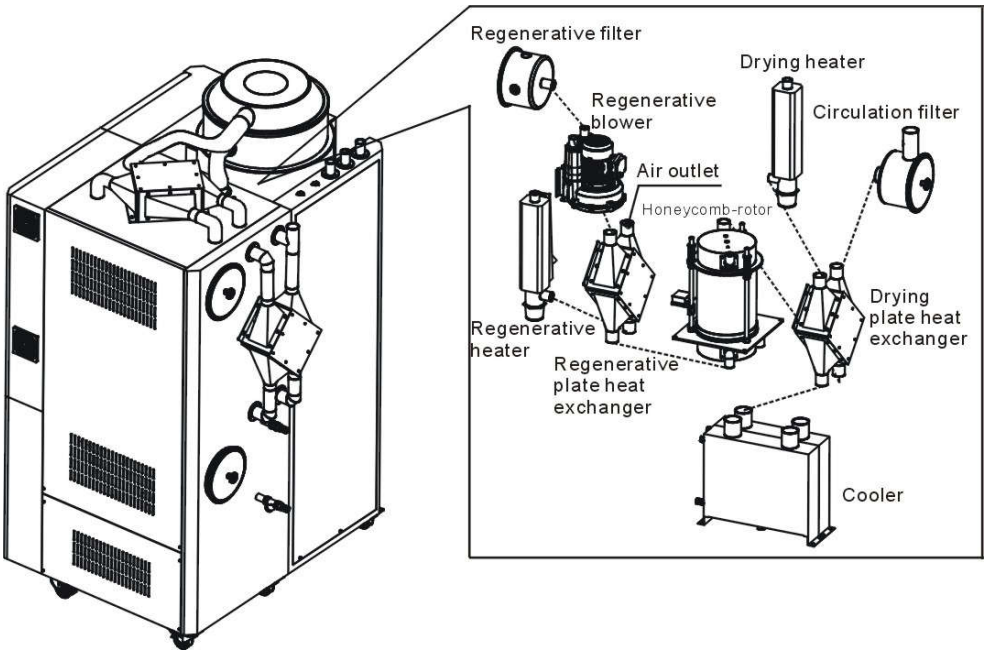


Picture 3-4: Installation Diagram of Oil Filter

Oil filter installation steps:

1. Screw the oil filter on the top plate of the honeycomb dehumidifier.
2. Connect 1 and 2 with a heat-resistant duct and fixed both the ends with stainless steel tube.
3. Connect 3 and 4 with a heat-resistant duct and fixed both the ends with stainless steel tube.
4. Connect 5 and 6 with a heat-resistant duct and fixed both the ends with stainless steel tube.

3.6 Plate Heat Exchanger



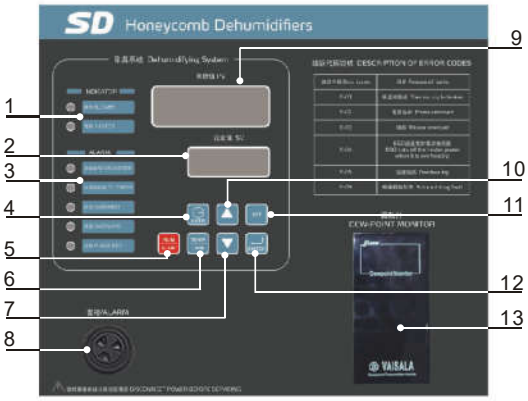
Picture 3-5: Plate Heat Exchanger Over Figure

Each part is connected by heat-resistant air pipes and fixed by stainless steel pipes as shown in the diagram.

4. Operation

4.1 Dehumidifying System Operation

4.1.1 Control Panel



Picture 4-1: Control Panel

Table 4-1: Control Panel

No.	Name	Function description	Remarks
1	LED indicator	Indicates the working status of blower and heater	Green light on indicates working status. Green light off indicates stop status
2	Set drying temperature	Display the set temperature	-
3	Alarm indicating	Indicates current alarm message	Red light on indicates fault occurs
4	Timer	Set weekly start or intermittent start/stop	When time has been set, press this key to set time start mode
5	Run/stop key	Control the start and stop of the machine	Press to start at stop status. Press to stop at working status.
6	Temp/time shift key	Display alternatively in between temp. And time for temp or time set up	
7	Decrease set value	Decrease the set value	
8	Buzzer	Buzzer keeps on when fault exists.	Buzzer only silence after trouble shooting
9	Actual drying temperature	Display real drying temperature or parameter code	It displays drying temperature when optional with drying heater.
10	Increase set value	Increase set value	
11	Set key	Enter or exit value setting	
12	Confirm key	Confirm the input of data	
13	Dew-point(Option)	Dewpoint display	Display real timely the moisture content withi material

4.1.2 Steps for starting machine

1) Open the main switch.
2) Press "RUN/STOP "key to start dehumidifying working.

4.1.3 Temperature Setup

Drying temperature for SDD/SCD. Regeneration temperature for SD-H(default regeneration temperature 180℃/356℉).

1) The setup number will flicker after pressing "SET" key, add or decrease temperature by pressing▲▼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“RUN/STOP”to interrupt PID Auto-turning and resume normal operation. PID Auto-turning would not alter the original parameters.

Note: Before delivery, PID parameter has been already set. Don’t process the PID auto-tuning function unless it is necessary.

4.1.5 Intermittent Running Setup

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

1) Press “SET” key to enter setting mode, press“TEMP/TIMER”key , the temperature set value switches to time set value. In this time,“SV/set value”flickers, and“PV/ set value”displays“0-ON”.
2) PV displays "0-ON" to stand for drying periods. Press ▲▼ key to add or decrease time value of "SV/setup value". Each press of ▲▼ 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. "0-OFF" stands for machine stop time.

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 “1-ON” of weekly timing setup.

4.1.6 Weekly Timing Setup

1) Press ▲▼ key to add or decrease the time value in "SV/setup value" of "1-ON". Press "ENTER" to confirm the input value and enter into timing setup items of "1-OFF".
2) Press ▲▼ key to add or decrease the time value in "SV/setup value” of "1-OFF". Press "ENTER" to confirm the input value and enter into timing setup items of "2-ON".
3) Do the same setup again and again to setup the ON/OFF time from Monday to Sunday.
4) Press "SET" key to back to normal status, after finish all the setup.
5) Setup all the "ON" to 00:00 to cancel timing function.

4.1.7 Present Time Modification

1) After 7-OFF setting is finished, press“ENTER”key, it displays “TIME” that is the present time.
2) Press ▲▼key to increase and decrease the time.
3) Press“ENTER”key, PV displays“DAY”that is the day in a week. Press ▲▼ key to increase and decrease the day, press“ENTER”to confirm. The range of this parameter is from 1 to 7, they separately stand for one day in one week, for example, if today is Tuesday, set this parameter as 3.
4) After the setting is finished, press“SET”key to return the normal mode.

4.1.8 Weekly Time Start/Stop

1) Activate the weekly timing 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 temperature alternatively.
3) Press "AUTO" again if want to cancel that weekly time setup.

4.1.9 Temperature Unit Selection

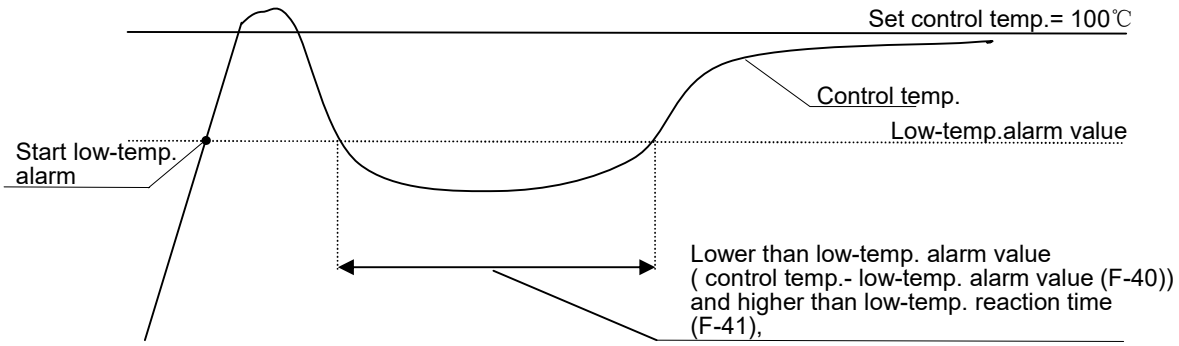
1) Hold on “SET” till “PV” displays F-20, F-20 works mainly as a password lock.
2) Press ▲▼ key，input 0021 at SV, then press “ENTER” to select F-03 temp. unit.
3) Press ▲▼ key to alternate between℃/℉, after the selection press “ENTER” to confirm.

4.1.10 Lock Setup

1) After F-03 setting is finished, press "ENTER" key. At the time, PV displays F-04.
2) F-04 is a LOCK function, press ▲▼ 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.

4.1.11 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 alarm time reaches alarm reaction time, low-temp. alarm would sound.
3) Low-temp. alarm value is a relative value.



4.1.11.1 The value of low-temp. alarm

1) After F-05 setting is finished, press“ENTER”key, at this time PV displays F-40.

Note: F-05 is to set over-temp. alarm, the default value is 15℃. For example, if PV of dyring temperature is 100℃, the over temperature alarm will be automatically activated after SV of dyring temperature exceeds (100+15)115℃. It is not allowed strongly to modify the value.

2) F-40 is to set low-temp. alarm, press ▲▼ 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℃.

4.1.11.2 Reaction Time of Low-temp. alarm

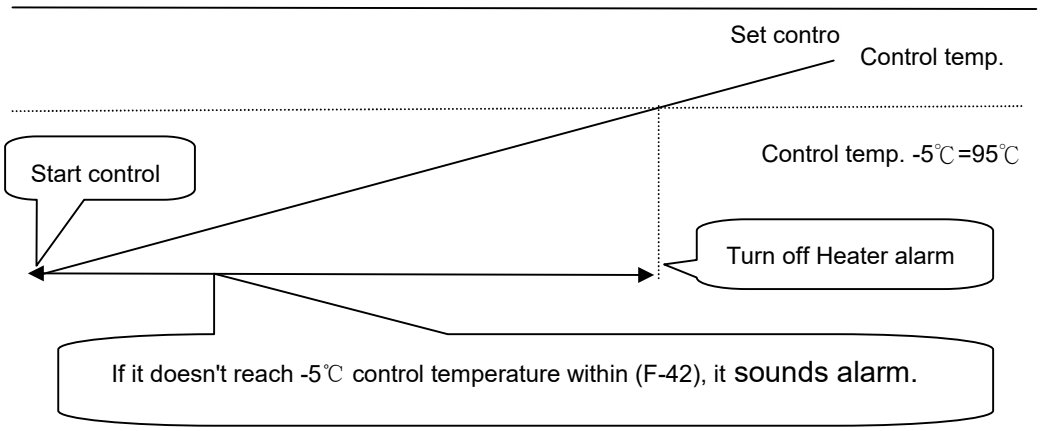
1) After F-40 setting is finished, press“ENTER”key, at this time, PV displays F-41.

2) F-41 is the reaction time of low-temp. alarm, press ▲▼ 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.

4.1.12 Heater Alarm

1) After F-41 setting is finished, press“ENTER”key, at this time, PV displays F-42.



2) F-42 is heater alarm, press ▲▼ key to modify the alarm time and start it. When heater alarm is OFF, heater alarm function is closed. When it works, if the dyring temperature can not reach up to the set temperature minus 5℃ within alarm set time, the alarm would sound. For example, if drying temperature is set as 100℃，alarm time is 30min，after heater starts, the temperature doesn't reach up to 95℃ within the first 30min, the alarm would sound.
3) The default value is OFF.

4.1.13 Parameter Setting Instruction

Code	Function	Range	Default 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. + over temp. set value, over temperature alarm sounds, alarm code is E-07.
F-40	Low temp. alarm value	0-100℃	20℃	Actual temp. < set temp.- low temp. alarm value, it sounds alarm
F-41	Low temp. reaction 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

4.1.14 Alarm Description (Dehumidifying System)

Table 4-2: Error Code

Error Code	Description
E-01	Heater thermocouple off line
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 setting max. temp.
E-07	Over-temp protection (PV≥SV+ over temperature set value F-05, 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-14	Heater Alarm

4.1.15 Temperature controller(Not available on SD-H)

Open the control box to check the temperature controller, set the regenerative temperature by rotating the transparent cover. The scale that red indicator aligns is the set value of regenerative temperature.

Regenerative temperature should be set correctly. Honeycomb rotor made of Silica gel has to be regenerated at 150~160℃ and that made of molecular sieve has to be regenerated at 180℃.

Remark: If the temp. is set as 150℃ or 180℃.The indicator of "ON" lights on all the time, which means that the drying heater is works continuously the regenerative temperature can not reach the set value. It is possible that the regenerate heater is damage.

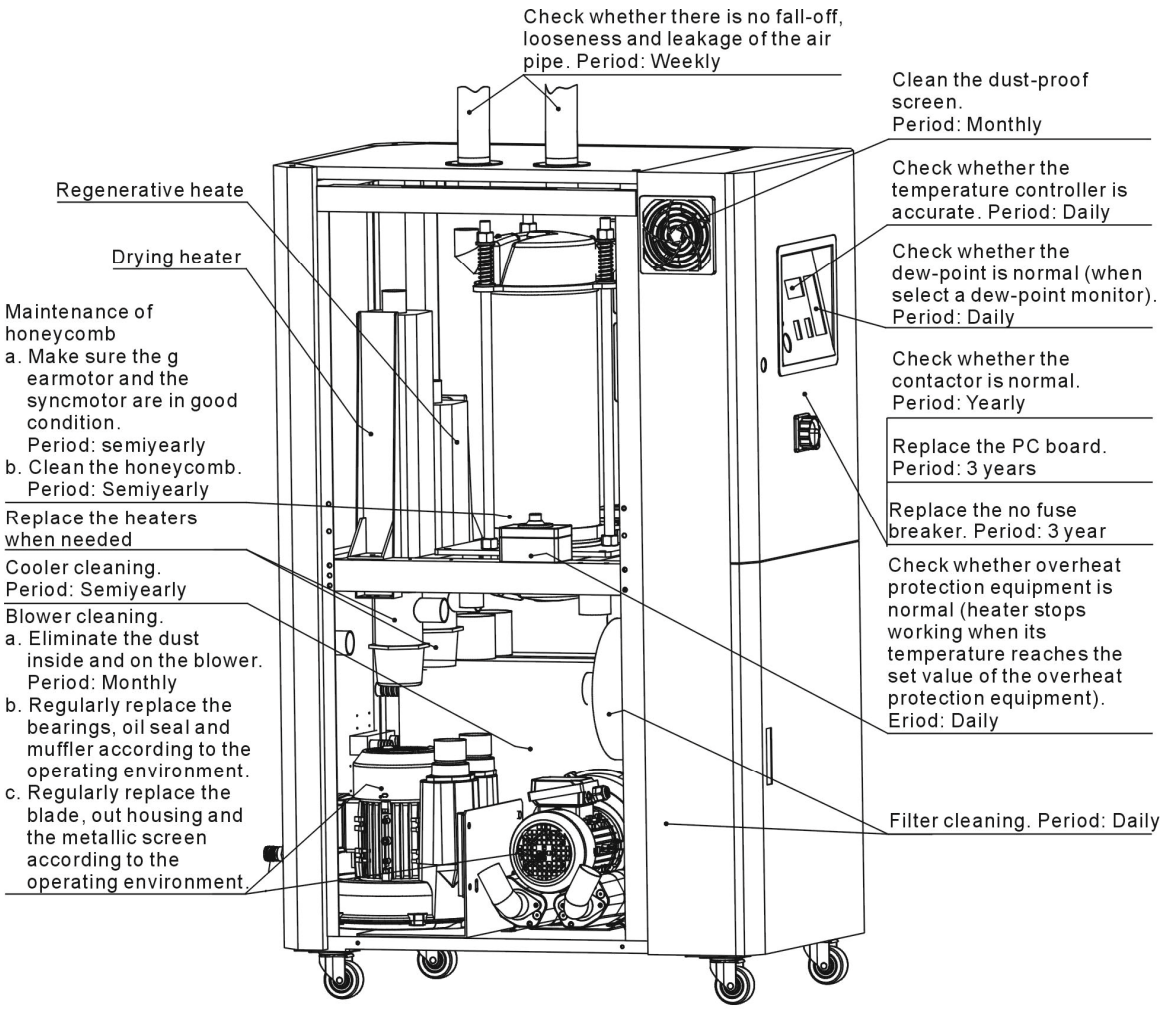
Picture 4-2: Temperature Controller

5. Trouble-shooting

Troubles	Possible causes	Solutions
Main power indicator does not light after turn on main power switch.	1. Does not connect through power supply.	1. Connect through power supply.
	2. Main power switch breakdown.	2. Replace main power switch.
	3. Problems of electrical wires.	3. Check electrical wires.
	4. Fuse of control circuit melted.	4. Check electrical wires and replace fuse.
	5. Transformer problems.	5. Replace the transformer.
E-02 is shown at PV, buzzer sounds and machine stops.	1. Voltage of power supply is too low.	1. Check the power supply.
	2. Phase failure	2. Check the power supply.
	3. Phase frequency mistakes.	3. Exchange the connection of two of the electrical wires.
Overload alarm of blower lit up, buzzer sounds and machine stops.	1. Abnormal fluctuation of voltage.	1. Check power supply.
	2. Blower being stalled.	2. Check the blower.
	3. Failures of blower motor.	3. Check the motor.
	4. Setting current of overload relay (F1) is too low.	4. Set the current of overload relay 1.1 times of rated current of the motor. Reset overload relay: Press down the blue button on the relay after 1 minutes.
Peater overheat alarm is lit up, and the buzzer sounds and machine stops working.	1. Temperature setting mistakes.	1. Correctly set the parameters of temp.controller.
	2. Temp. measuring mistakes.	2. Replace thermocouple.
	3. Contactor failure: Process heater.	3. Replace the contactor.
E-04 is shown at PV, buzzer sounds and machine stops	1. Heater contactor seized up.	1. Check or replace the heater contactor.
	2. EGO parameter setting wrong.	2. Set EGO parameter correctly.
	3. EGO fault.	3. Replace EGO.
	4. Circuit fault.	4. Check circuit.
E-09 is shown at PV, buzzer sounds and machine stops	1. Problems of rotor motor.	1. Check or replace the motor.
	2. Rotor belt broken.	2. Replace the belt.
	3. Problems of electrical circuit.	3. Check the electrical circuit.
	4. Micro switch of the rotor failures.	4. Replace.
	5. Parameter mistakes of timer for control of rotor.	5. Reset the timer. (Set time should be bigger than rotor rotating time in one turn and plus 1 minute.)
Abnormal temp. fluctuations.	1. Too short of time since start of the machine.	1. Wait for a while.
	2. Improper parameters for temp. controller.	2. Check the parameters of temp. Controller.
Heater temp. can not rise up.	1. Temp. Setting is too high.	1. Set heater temp. under 180℃.
	2. Contactor of heater is bad.	2. Replace contactor.
	3. Heater is damaged.	3. Replace pipe heater.
	4. Problems of thermocouple.	4. Replace thermocouple.
	5. Parameter of temp. controller is set to STOP.	5. Set temp. controller under working mode.
	6. Temp. controller output problems.	6. Replace or repair temp. controller.
Breaker tripping off when connects with power supply.	1. Short circuits of main circuit.	1. Check the circuit.
	2. Short circuit of transformer.	2. Replace the breaker.
	3. Problems of breaker.	3. Replace the breaker.

Troubles	Possible causes	Solutions
Circuit breaker trips right after system switch on.	1. Blower short circuits	4. Please check the blower
	2. Problems of the breaker.	5. Replace the breaker.

6. Maintenance and Repair



Note!

1) Turn off the main switch and control switch and unplug the cord from power supply before service and maintenance.
2) Be sure not to modify electrical wiring or reassemble the electrical components inside of the control box.
3) Always refer to the electrical diagram of this manual to check and maintain the electrical wiring problems.
4) Service and maintenance of the electrical parts should only be carried out by qualified electricians.

6.1 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. heater	Above 1 year
Contactor	Above 2000,000 act
Honeycomb	5 years
Filter	1 year

6.2 Filter

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 dishcloth.
4) After cleaning, place all parts in reversed order carefully.
5) Please ensue that the filter is well seal with metal frame.

Picture 6-1: Filter

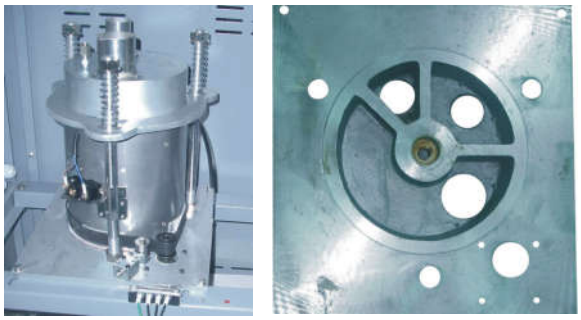
Note**!**

Don't let foreign object enter into the barrel, when taking out the air filter.

6.3 Honeycomb-rotor

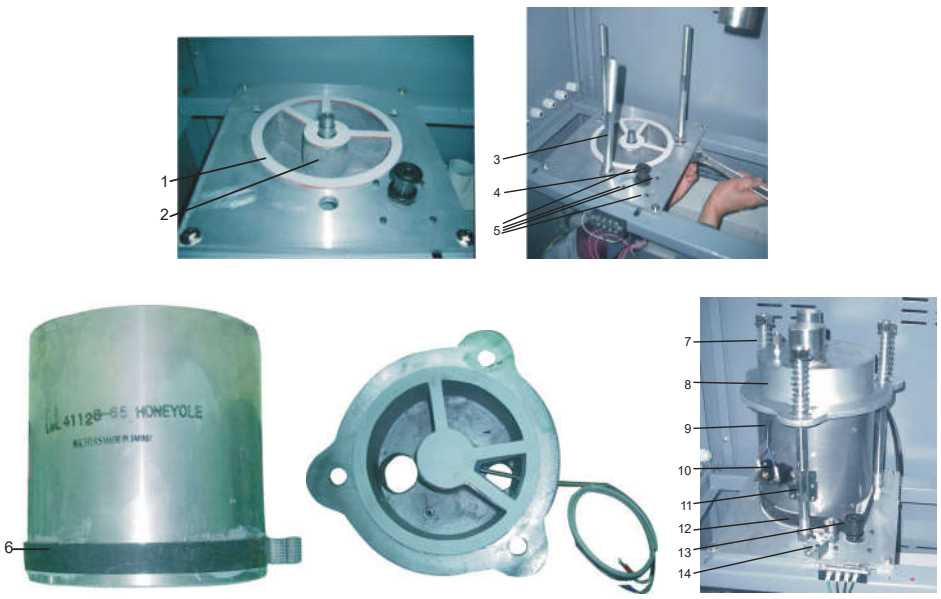
6.3.1 What is Honeycomb-rotor?

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 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 6-2: Honeycomb Rotor

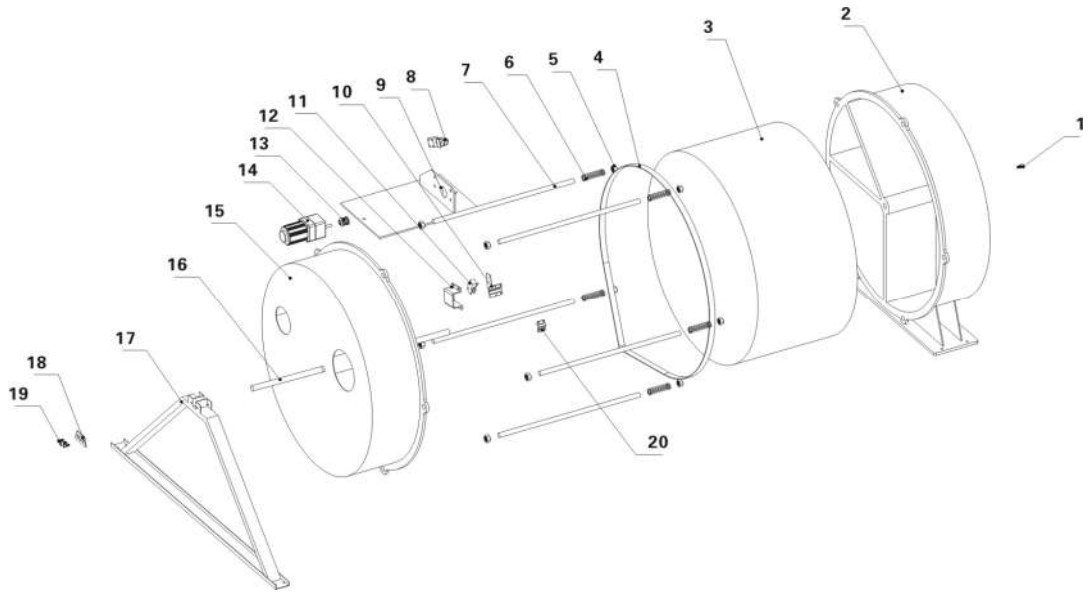
6.3.2 Installation of the Rotor (SD-40H~700H)



Picture 6-3: Installation of The Rotor (SD-40H~700H)

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) Fit the transmission belt in proper position (Fig. 6).
6) Install the honeycomb-rotor (Fig. 9) and transmission belt (Fig. 12).
7) Fix the rotor top cover (Fig. 8).
8) Fit all springs and tighten the screws (Fig. 7).
9) Install both the transmission belt (Fig. 13) and belt tension regulator (Fig. 14).
10) Install micro-switch and fixed board firmly (Fig. 10).

6.3.3 Installation of the Rotor (SD-1000H~4000H)



Picture 6-4: Installation of The Rotor (SD-1000H~4000H)

1) Use one solid strap or applicable washer to lifted or block up to the wheel 3 to align the wheel bearing bore and fixed honeycomb lid 2 center hole.
2) Use honeycomb shaft 16 to penetrate the wheel 3 and fixed honeycomb lid 2, and install synchronic belt 4 on the rotor 3.
3) Install removable lid 15 on the honeycomb shaft 16, and use honeycomb mounting bracket 17 to sustain the shaft.
4) Use inner hexagonal screw 1 to fix the plate 18 on the shaft 16.

5) Use hexagonal nut 5、double-headed screw bolt 7 and spring 6 to fix the removable lid 15, which ensures good seal at the ends of the honeycomb-rotor.
6) Use fixed iron sheet 20、fixed iron sheet 10 to fix microswitch 10, this ensures that the direction of shell fragment of microswitch 10 is the same as rotating rotor 3, and then install the box of microswitch 12.
7) Use two solid straps to fix honeycomb lid 2 and honeycomb mounting bracket 17, then install components on the bracket.
8) Install motor cabinet 9 on the bracket, then install gearmotor 14 and synchronic wheel 13 and synchronic belt 4.
9) Install belt tightener on the motor cabinet to make belt tightener rotate without slipping.

6.3.4 Honeycomb Cleaning Steps

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. Note that 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.

6.4 Cooler

1) Clean the cooler and eliminate the leakage regularly.
2) Please do the above-mentioned job once a month for cooling by chilled water. As for the cooling by normal water, do the same job once a quarter.

Cooler clear 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 ed 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.

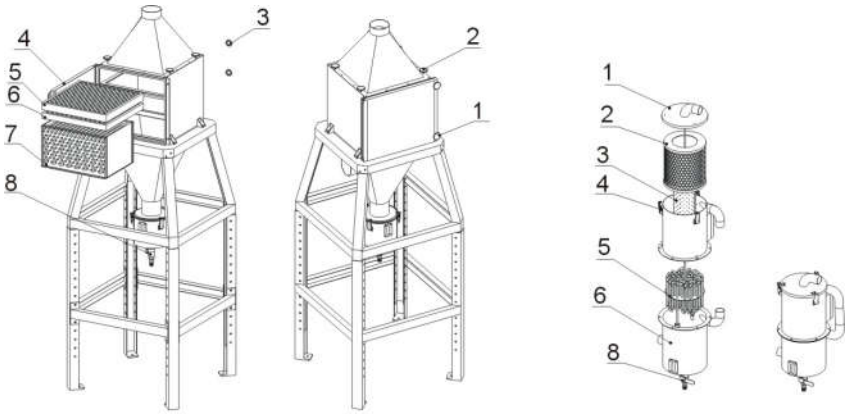
6.5 EGO

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

	Default Value
Drying	200℃
Regenerating	200℃

Picture 6-5: EGO

6.6 Oil Filter Cleaning



EOF-1000~4000 EOF-30~500

Picture 6-6: Oil Filter

1. Selection Aim:

There is much oil in dehumidifying air return, oil filter is selected to ensure dehumidifying function and prolong service life of honeycomb.

Note:

Please clean oil filter every week, can increase or decrease cleaning frequency according to oil quantity of return air. Oil filter equip with material clearance door, oil is discharged from ball valve 8 when full. The service life of activated carbon and middle efficient filter is generally two months. Service life can be adjusted properly according to oil quantity in return air.

2. Filter cleaning steps of EOP-30~500:

1) Open snap hook 4, take out tank cover 1, stainless steel filter 2 and activated carbon filter 3.
2) Loose butterfly nut, take out stainless steel filter 2, and remove away dust and oil from it by pressured air.
3) Loose butterfly nut, take out activated carbon filter 3 and replace activated carbon.
4) Open oil storage bin 6, take out cooler 5 and remove away dust and oil from it by pressured air.
5) Install oil filter after cleaning.

3. Filter cleaning steps of EOF-1000~4000:

1) Loose hexagon nut 1 and open material clearance door 4.
2) Loose hexagon nut 2, take out stainless steel filter 6 and middle efficient filter 5, remove away dust and oil from stainless steel filter and middle efficient filter by pressured air.
3) Loose fixed nut 3, take out cooler 7 and remove away dust and oil from it by pressured air.
4) Install oil filter after cleaning.

6.7 Installation for Dewpoint Monitor(Option)

1) Cut off the film on control panel. Slightly cut it with the blade as there reserved with the holes.

Picture 6-7: Hole Site

2) Check if there are complete parts for dewpoint monitor including:
Dew-point monitor

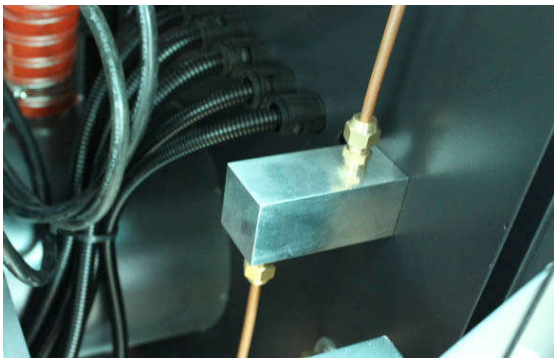
Dew-point transmitter assembly (dew-point detector, detection cable, washer and installation guide)

Copper joint, installation seat for dew-point monitor

Picture 6-8: Parts of Dew-point Monitor

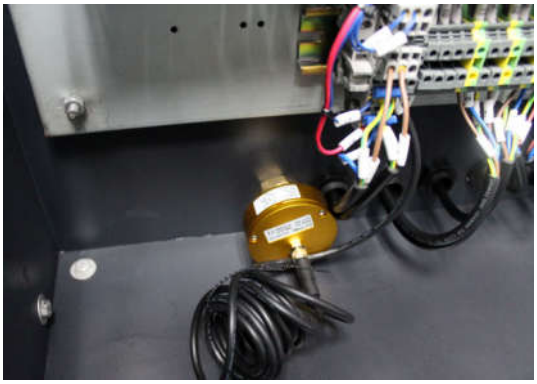
3) Remove the dew-point detector assembly from the machine, and mount it to another Φ28 hole on the controller. Install a dew-point monitor base on original hole, and mount two Teflon pipe connectors on the base. Via the copper pipe, one connector connects to the honeycomb and another connects to the dew-point detector assembly.

Picture 6-9: Copper Joint Assembly of Original Machine



Picture 6-10: Installation Seat

4) Install dew-point transmitter assembly to copper joint.



Picture 6-11: Installation for Transmitter

5) Insert the dew-point monitor into the hole on the panel and fasten it.

Picture 6-12: Connection of Signal Wire

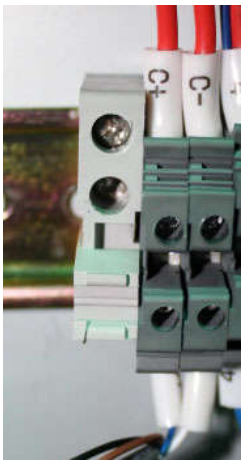
6) Connect signal wires of the transmitter and power lines of dew-point monitor with the according terminals.

Connet contact No.1 and No.2 with power, supply is 220VAC.

Contact No.3, No.4 and No.5 are idle.

Connect contact No.6 and No.7 with the signal of transmitter. (C- Connects contact No.6, C+ connects contact No.7

Dew-point transducer wiring (white connect to C-, blue connect to C+)



Picture 6-13: Connection of Dew-point Monitor

6.7.1 Dew-point monitor setting

1. Common mode functional setting (adjust dew-point alarm setting value):
   1) Press “S” key to enter setting (after entering, the displayer flickers);
   2) Adjust dew-point alarm setting value, and press “U” and “D” to adjust the value.
   3) Press “E” and save setting value.
   4) Press “S” to leave setting mode.

2. Special mode functional setting:

Enter this mode. Firstly hold “U” “D” for three secs. and enter (after enter special mode, it displays F-X in which X means that different number.);

Menu functions:

F-3: ℃ or ℉ in unit

F-5: it is +20℃when input 20 ampere

F-6: it’s in min. temp. when signal input is 4 ampere. For example, if the measuring range of dew-point transmitter is -60~+20℃(this range always marks on the transmitter), therefore F-6 should be -60℃, F-5 should be +20℃.

F-7: the upper limit value (99-99)

F-8: the lower limit value (99-99)

6.8 Maintenance Schedule

6.8.1 General Machine Information

Model _____ SN _____ Manufacture date _____

Voltage_____Φ_____V Frequency _____ Hz Power _____ kW

6.8.2 Check After Installation

☐Check that pipe connections are firmed locked by clips.

☐Check that the piping system is correct.

☐Check if the honeycomb-rotor is damaged or not.

Electrical Installation

☐Voltage: _____ V _____ Hz

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

☐Check phase sequence of the power supply.

☐Check the rotating direction of blower fans.

6.8.3 Daily Checking

☐Check power supply wires.
☐Check the start/stop function.
☐Check the temperature controller.
☐Clean the filter.
☐Check whether overheat protection is normal.
☐Check whether dew-point is normal.

6.8.4 Weekly Checking

☐Check if there are loose connections of electrical components.
☐Check and clean air filter.
☐Check the function of solenoid valve.
☐Check motor overload relay and anti-phase function.
☐Check whether air pipe is shed, leaked and loose.

6.8.5 Monthly Checking

☐Check if the transmission belt is loose or not.
☐Check the performance of gear motor.
☐Check if there are leakages in honeycomb-rotor.

6.8.6 Half-yearly Checking

- ☐Check if there are damages of heat-resistant hoses.
- ☐Check the pipe heaters.
- ☐Check regen./process blower and blower fans.
- ☐Check whether honey-comb rotor belt is damaged.
- ☐Clean the cooler.

6.8.7 Yearly Checking

- ☐Check whether the contactor is normal [1].

6.8.8 3 year Checking

- ☐PC board renewal.
- ☐No fuse breaker renewal.

Note: 1. Manufacturer laboratory data for AC contactor is two million times in life. we suggest service life for one million four hundred thousand times, if work eight hours per day, recommended replacing frequency is 1.5 years, if work day and night, replacement is suggested to be done every six months.