SCD Series

"All-in-One" Compact Dryer

Date: Jan. 2024

Version: Ver. A

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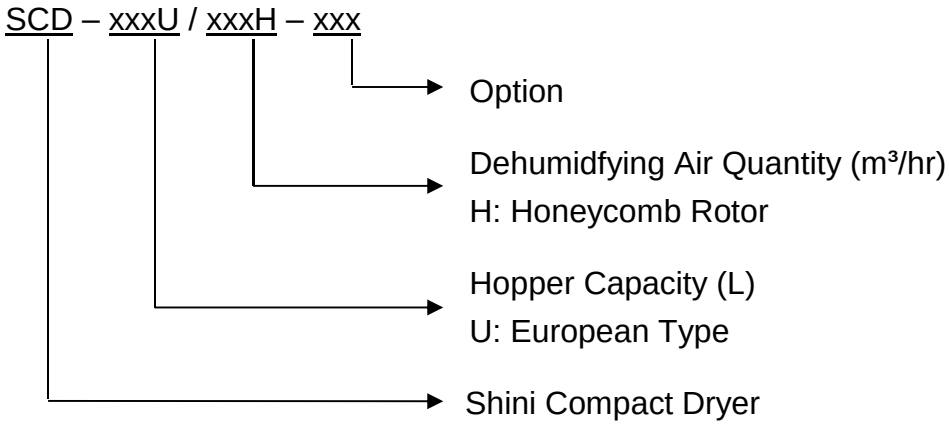
1. General Description

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

SCD Compact Dryer has three functions of dehumidification, drying and two-stage conveying, which is especially suitable for processing engineering plastics materials with high hygroscopicity, such as PA, PC, PBT, PET. The optical SCD-OP can be used for lens, LCD backlight board and discs productions that reaches the dew-point below -40℃ under ideal condiction.

Picture 1-1: SCD-230U/120H

1.1 Coding Principle



1.2 Features

- Combine the function of dehumidifying, drying and two-stage conveying into a single unit.
- SCD Dryer Loaders are equipped with honeycomb rotor to obtain stable low dew-point drying air, which have two models: semi-open and hermetic.
- Feeding system is equipped with shut-off valve to ensure no residuals in hopper tubes.
- Microprocessor is standard equipped for the control.
- Heat-preserved drying hopper adopts down-blow pipe design that collocates with cyclone air exhaust to avoid heat lost and improve drying efficiency.

All machine service should be performed by professional technicians. This manual is applicable to the operator and maintenance personnel on the field. The service instruction of Chapter 6 is intended for service engineers, and other chapters are for the operator.

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

Our company provides excellent after-sales service. If there’s any problem during the application, please contact the company or local vendor.

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Shini Plastics Technologies India Pvt.Ltd.:

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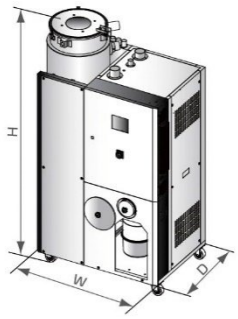
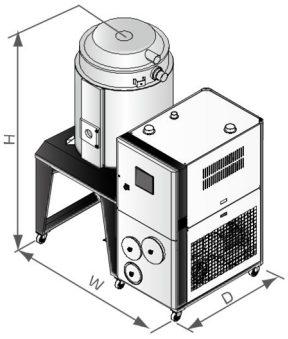
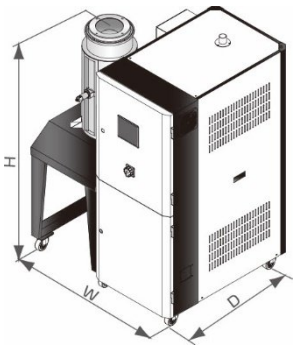
1.3 Technical Specifications



SCD Hermetic



SCD Semi-open



SCD-OP

Picture 1-2: Technical Specifications

Table 1-1: Specifications 1(Hermetic Design)

Model SCD-	20U/30H-OP	40U/30H-OP	80U/50H-OP	120U/80H-OP
Version	E	E	E	E
Drying System				
Drying Temp.℃	75~160			
Drying Heater Power (kW)	3	3	3.9	6
Drying Blower Power (kW)	0.4	0.4	0.4	0.75
Hopper Capacity (L)	20	40	80	120
Dehumidifying System				
Regen.Temp.℃	180			
Regenerating Heater Power (kW)	3	3	3	3
Regenerating Blower Power (kW)	0.4	0.4	0.4	0.4
Dehumidifying Air quantity (m^3/hr)	30	30	50	80
Feeding System				
Feeding Blower Power (kW)	1.5	1.5	1.5	1.5
Dia. of Material Pipe (inch)	1.5	1.5	1.5	1.5
SVH-L Hopper (L)	3*	3*	3*	3*
SHR-U Hopper (L)	3	3	6	6
Dimensions				
H(mm)	1400	1500	1670	1710
W(mm)	1050	1050	1240	1240
D(mm)	900	900	1000	1000
Weight (kg)	235	280	330	385

Note: 1) Plastic materials can be completely dried by drying air with dew-point temperature ≤-20℃. When the ambient temperature ≤-25℃, and

We reserve the right to change specifications without prior notice.

relative humidity≤-60%, the drying air dew-point temp. ≤-40℃.

2) "*" stands for hopper receiver SHR-CP-U.

3) Power supply: 3Φ, 230 / 400 / 460 / 575VAC, 50 / 60Hz.

Table 1-2: Specifications 2 (Hermetic Design)

Model SCD-	40U /40H	80U /40H	120U /80H	160U /80H	160U /120H	230U /120H	300U /200H	450U /200H
Version	E	E	F	F	F	E	F	F
Drying System								
Drying Temp.℃	75~160							
Drying Heater Power (kW)	4	4	4	4	6	6	12	12
Drying Blower Power (kW)	0.18	0.18	0.75	0.75	0.75	0.75	1.5	1.5
Hopper Capacity (L)	40	80	120	160	160	230	300	450
Dehumidifying System								
Regen.Temp.℃	180							
Regenerating Heater Power (kW)	3	3	3	3	4	4	4	4
Regenerating Blower Power (kW)	0.12	0.12	0.18	0.18	0.18	0.18	0.4	0.4
Dehumidifying Air quantity (m^3/hr)	40	40	80	80	120	120	200	200
Feeding System								
Feeding Blower Power (kW)	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Dia. of Material Pipe (inch)	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
SVH-L Hopper(L)	3	6	6	6	6	12	12	12
SHR-U Hopper (L)	3	6	6	6	6	12	12	12
Dimensions								
H(mm)	1672	1751	1957	2102	2102	2012	2160	2350
W(mm)	1051	1066	1125	1125	1125	1223	1460	1460
D(mm)	734	734	734	734	734	734	1020	1020
Weight (kg)	295	325	340	350	390	420	565	595

Note: 1) Plastic materials can be completely dried by drying air with dew-point temperature ≤-20℃. When the ambient temperature ≤-25℃, and relative humidity ≤-60%, the drying air dew-point temp. ≤-40℃.

2) "*" stands for hopper receiver SHR-CP-U.

3) Power supply: 3Φ, 230 / 400 / 460 / 575VAC, 50 / 60Hz.

Table 1-3: Specifications (Semi-open Design)

Model SCD-	600U/400H	750U/400H	900U/700H	1200U/700H
Version	E	E	H	H
Drying System				
Drying Temp.℃	75~160			
Drying Heater Power (kW)	18	18	24	24
Drying Blower Power (kW, 50/60Hz)	3.75 / 4.5	3.75 / 4.5	7.5 /8.6	7.5 /8.6
Hopper Capacity (L)	600	750	900	1200
Dehumidifying System				
Regen. Temp.℃	180			
Regenerating Heater Power (kW)	7.2	7.2	10	10
Regenerating Blower Power (kW, 50/60Hz)	0.75 / 0.9	0.75 / 0.9	1.5 / 1.8	1.5 / 1.8
Dehumidifying Air quantity (m^3/hr, 50/60Hz)	400 / 450	400 / 450	700 / 780	700 / 780
Feeding System				
Feeding Blower Power (kW)	1.5	1.5	3.75	3.75
Dia. of Material Pipe (inch)	1.5	1.5	2	2
SVH-L Hopper Receiver (L)	12	12	24	24
SHR-U Hopper Receiver (L)	12	12	24	24
Dimensions				
H(mm)	2380	2610	2640	3070
W(mm)	1745	1745	2140	2140
D(mm)	1255	1255	1380	1380
Weight (kg)	640	690	850	900

Note: 1) Plastic materials can be completely dried by drying air with dew-point temp. ≤-20℃. When ambient temperature ≤-25℃, and relative humidity ≤-60%, the drying air dew-point temp. ≤-40℃.

2) "*" stands for hopper receiver SHR-CP-U.

3) Power supply: 3Φ, 230 / 400 / 460 / 575VAC, 50 / 60Hz.

We reserve the right to change specifications without prior notice.

1.3.1 Drying Capacity

Table 1-4: Drying Capacity 1

Material	Drying Temp. (℃)	Drying Time (hr)	Drying Capacity (kg/hr)							
			40U /40H	80U /40H	120U /80H	160U /80H	160U /120H	230U /120H	300U /200H	450U /200H
ABS	80	2-3	16		27		35		105	
CA	75	2-3	12		22		30		90	
CAB	75	2-3	12		22		30		90	
CP	75	2-3	16		27		35		106	
LCP	150	4	11		20		27		80	
POM	100	2	24		40		53		160	
PMMA	80	3	17		29		38		115	
IONOMER	90	3-4	10		17		22		66	
PA6/6.6/6.10	75	4-6	9		14		19		58	
PA11	75	4-5	10		17		23		69	
PA12	75	4-5	10		17		23		69	
PC	120	2-3	19		31		41		124	
PU	90	2-3	17		29		38		115	
PBT	130	3-4	13		23		31		93	
PE	90	1	47		80		106		318	
PEI	150	3-4	11		20		27		80	
PET	160	4-6	11		19		25		75	
PETG	70	3-4	11		20		27		80	
PEN	170	5	13		23		30		90	
PES	150	4	13		23		30		90	
PMMA	80	3	17		29		28		115	
PPO	110	1-2	19		33		44		133	
PPS	150	3-4	11		20		27		80	
PI	120	2	24		40		53		160	
PP	90	1	39		66		88		265	
PS(GP)	80	1	39		66		88		265	
PSU	120	3-4	12		22		29		85	
PVC	70	1-2	19		33		44		135	
SAN(AS)	80	1-2	19		33		44		135	
TPE	110	3	18		30		40		125	

Note: 1) Please refer to above drying capacity of the SCD, and select right model based on material dosage and drying capacity.
2) Please consult Shini service staff for model selection.

Table 1-5: Drying Capacity 2

Material	Drying Temp. (℃)	Drying Time(hr)	Drying Capacity (kg/hr)			
			600U /400H	750U /400H	900U /700H	1200U /700H
ABS	80	2-3	210		355	
CA	75	2-3	180		295	
CAB	75	2-3	180		295	
CP	75	2-3	210		355	
LCP	150	4	160		365	
POM	100	2	320		530	
PMMA	80	3	230		383	
IONOMER	90	3-4	133		220	
PA6/6.6/6.10	75	4-6	115		192	
PA11	75	4-5	138		230	
PA12	75	4-5	138		230	
PC	120	2-3	250		413	
PU	90	2-3	230		383	
PBT	130	3-4	186		310	
PE	90	1	637		1062	
PEI	150	3-4	160		265	
PET	160	4-6	150		250	
PETG	70	3-4	160		265	
PEN	170	5	180		300	
PES	150	4	180		300	
PMMA	80	3	230		385	
PPO	110	1-2	265		440	
PPS	150	3-4	160		265	
PI	120	2	320		530	
PP	90	1	530		885	
PS(GP)	80	1	531		885	
PSU	120	3-4	173		290	
PVC	70	1-2	265		442	
SAN(AS)	80	1-2	265		442	
TPE	110	3	250		413	

Note: 1) Please refer to above drying capacity and material dosage to select the right model of the SCD.

2) Please consult Shini service staff for model selection.

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 current loading of blower motor will increase or reduce according to air pressure's change accordingly. During the wiring, adequate motor overload protection switch should be installed with full loading test, to ensure operating safely under full-loading and avoid motor damage.
3) As to avoid any block materials, dust, powder, fiber particles and water drops entering the blower that cause the deficiency of its performance. This machine is designed with air filter, clean up the foreign particles in the filter (recommended to clean up this filter weekly).
4) Clean the internal and external parts (especially for the fan cooling path) of the blower, and remove the dust on surface if necessary. If more dusts are accumulated, it will cause ventilation deficiency, temperature rising, vacuum power reduce, vibration increase that cause machine broke down.
5) Ball bearing, oil seal and soundproof are the consumable parts that have life period and equire regular replacement. Meanwhile, blade, external case, and metallic screen 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.

Picture 1-3: 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, and the default setting should not be changed.

1.4.3 Transportation and Storage of the Machine

Transportation

1) SCD series "All-in-one" compact dryer 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) Don’t 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 "All-in-One" compact dryer 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) Indoor, in 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

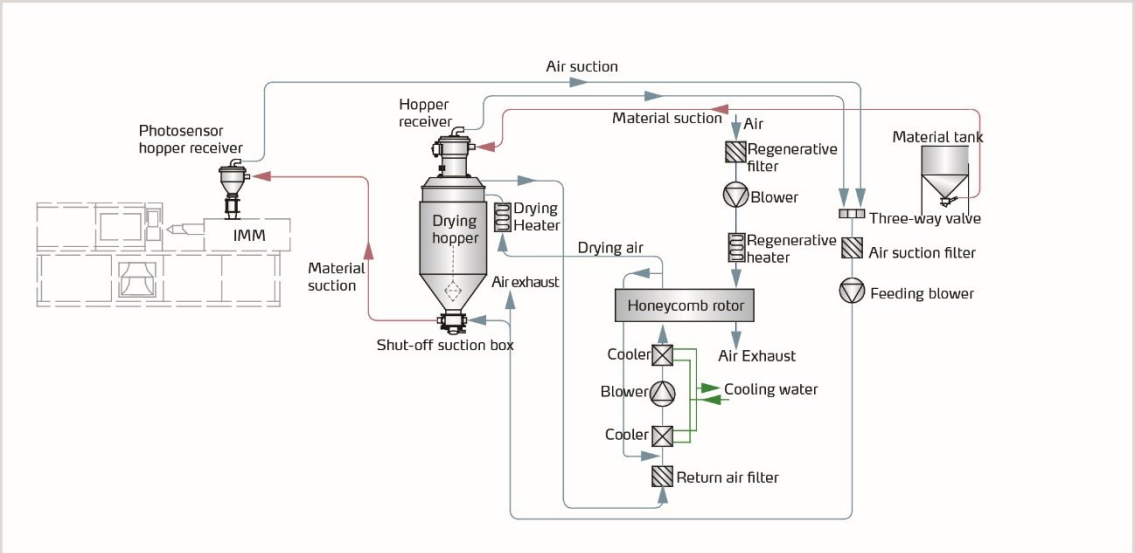
The following statements clarify the responsibilities and regulations born by any buyer or user who purchases products and accessories from Shini (including employees and agents).

Shini is exempted from liability for any costs, fees, claims and losses caused by reasons below:

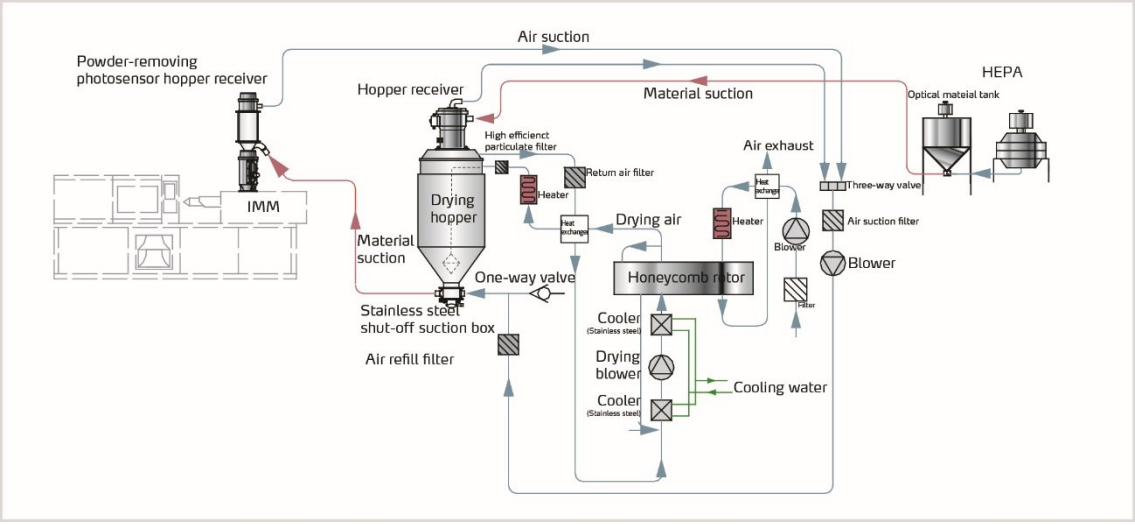
1) Any careless or man-made installations, operation and maintenances upon machines without referring to the Manual prior to machine using.
2) Any incidents beyond human reasonable controls, which include man-made vicious or deliberate damages or abnormal power, and machine faults caused by irresistible 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. Structure Characteristics and Working Principle

2.1 Working Principle



Picture 2-1: SCD Working Principle



Picture 2-2: SCD-OP Working Principle (With plate Heat Exchanger) (Option)

Dehumidifying: damp and hot air from dry material barrel is blown into rotor after cooled. Moisture from the air is absorbed by rotor and is then adsorbed by regeneration heating air. Two strands of airflow function on the rotor. And with the rotation, moisture from the air is absorbed and expelled after absorbed

regeneration air to form stable low dew-point air, which is dried to the drying temperature and then is blown into material barrel to closed circle to dry material.

Suction: material is absorbed into barrel from storage barrel or other storage containers. When the magnetic reed switch detects no material, suction motor runs to produce vacuum inside vacuum hopper. Raw material in storage barrels is absorbed into suction hopper due to air pressure difference. When the time is completed, suction motor stops. Raw materials drop into drying hopper barrel due to gravity. The dried raw material after drying is taken out to the hopper by photosensor installed on molding machine or other hopper form drying hopper barrel.

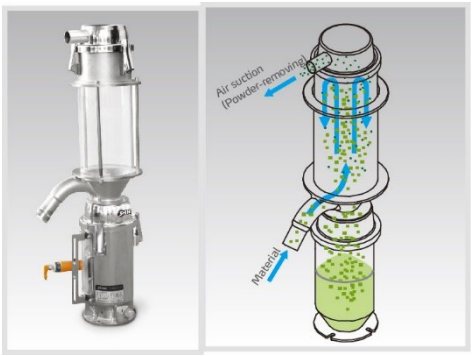
2.2 Relative Humidity and Dew-point

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 lower of dew point temperature (than the ambient temperature) is, the 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 "All-in-One" Compact Dryer

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



Optical Powder-removing Hopper

SCD-OP High-efficiency Filter

- Optical SCD-OP series equipped with powder-removing hopper which can avoid powders in production; material contact surfaces are stainless-steel polished that collocate conveying system with closed loop to avoid contamination and moisture regain; system has standard configuration of high-efficiency filter, which can filter tiny ion of 0.3μm with filter ratio of 99.995%. (Only Apply to SCD-20U/30H~SCD-120U/80H)

High-efficiency Filter HEPA (0.3μm)

Optical Material Tank (5μm)

- Available to option with human-machine interface (LCD control with HMI), and add "LC" at the end of the model code.
- 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.

- Optical-class models can select high-efficient filter (left) and optical-class storage hopper (right) to avoid material contamination in the conveying process.
- 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.

Dew-point Monitor (portable)

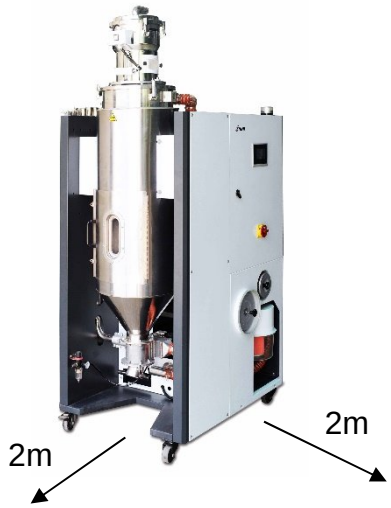
- For models with energy-saving drying management, add “ES” at model behind,and standard equipped with HMI touch control ,which can save up to 41% of total power consumption. Volume used per hour is settable between 40~100% as drying capacity to save the totally power consumption of 35%~0; Standard equipped with heat regenerative recycler which recycles the regeneration air exhausted heat via plate heat exchanger and can save 3%~6% of total power consumption.
- For models optional with drying heat recycler, add “HE” at model behind. Dehumidified low temperature air via plate heat exchanger to recycle the heat of hot-wet return air, which can higher the air temperature in drying heater and lower the power consumption of the heater, the total power consumption can save 0%~19%.
- Three-stage conveying function is available to feed two sets of injection molding machines. Add "M2" at the end of the model code.
- Three-stage conveying function is available to feed two sets of injection molding machines. Add "M2" at the end of the model code.
- Polished surface inside of hopper, Plus “P” at the end of the model code.

3. Installation Testing

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

Notes: After the new machine is put into operation or within two weeks after drying the virgin plastics, make sure to check whether there are a large amount of oily substances on the surface of the dry-air return filter. If there's the problem, stop using the machine and please contact Shini company to purchase the EOF oil filter to protect the honeycomb from being affected by the oil and gas separated from the material, so as to prolong the service life.

3.1 Machine Location



Picture 3-1: Installation Drawing

Installation Notice:

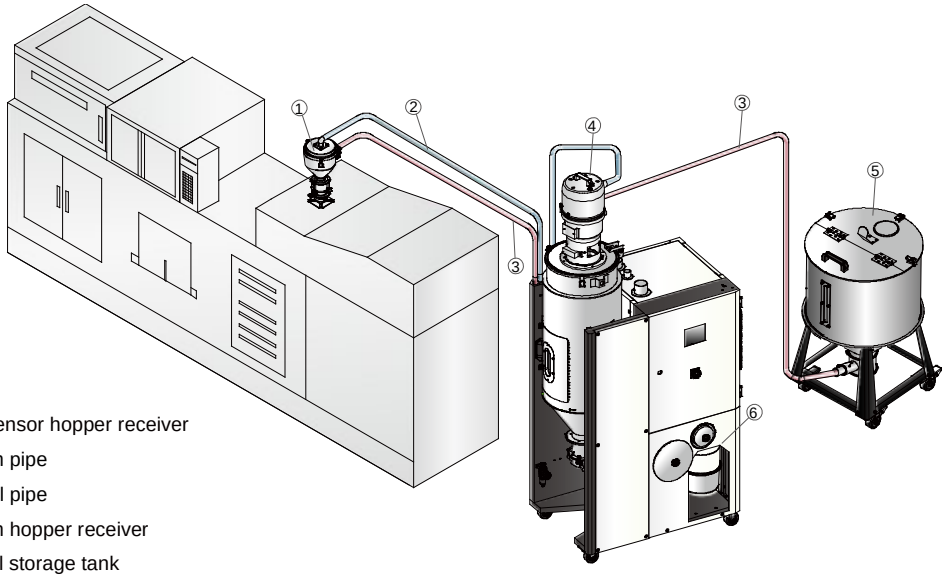
1) The machine can only be installed in vertical position, make sure there's no pipeline, fixed structure and other object that may obstruct machine installation or cause item damage, human injuries above the selected location and adjacent areas.
2) For easy maintenance, leaving 1m space around machine is suggested.

Important: Keep machine 2m away from the inflammable

materials.

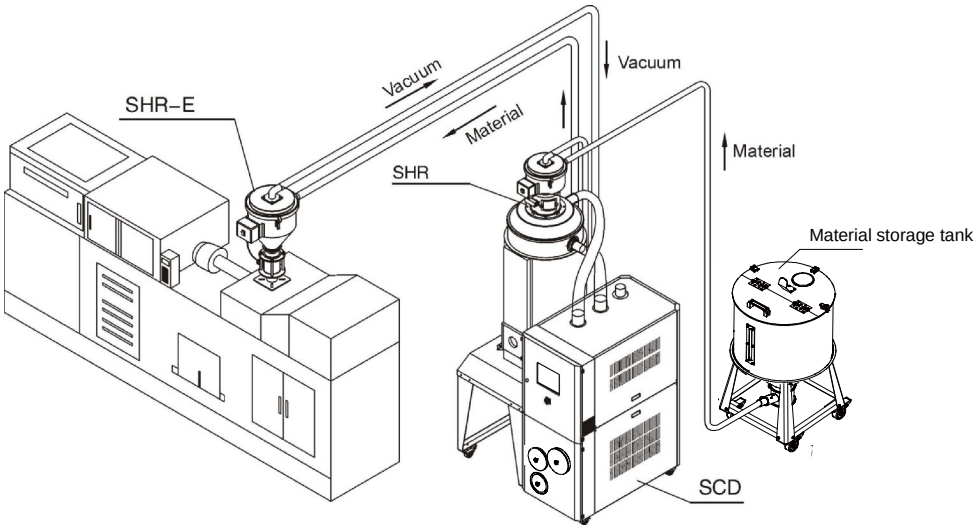
3) The machine must be placed on the ground level to ensure balance state, and to remove the accumulated condensing water. If machine is need to install on a higher level (scaffolding or interlayer), it should make sure that the structure and size could withstand the machine.

3.2 Air Pipe and Material Pipe Connection



1. Photosensor hopper receiver
2. Vacuum pipe
3. Material pipe
4. Vacuum hopper receiver
5. Material storage tank
6. SCD Main unit

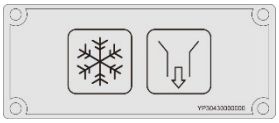
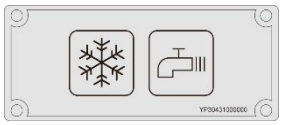
Picture 3-2: Schematic Drawing of Installation (Hermetic Design)



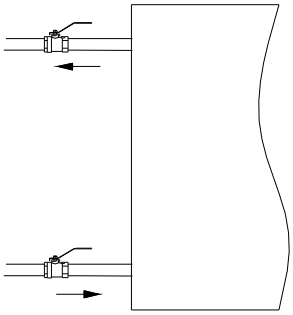
Picture 3-3: Schematic Drawing of Installation (Semi-integral Design)

3.3 Cooling Water Connection

Table 3-1: Cooling water connection table

	Cooling water outlet
	Cooling water inlet

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



Picture 3-4: 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.

Table 3-2: Cooling Water Specifications

Cooling Water Specifications							
Temperature Difference between Water Inlet and Outlet		Cooling Water Pressure		Cooling Water Temperature			
5℃		3~5kgf/cm^2		10~30℃			
Suggested cooling water flow rate and pipe diameter:							
Model	Flowrate of Cooling Water（L/min）	Interface specification		Model	Flowrate of Cooling Water（L/min）	Interface specification	
		Inlet	Outlet			Inlet	Outlet
30H	4	Ø23	Ø23	700H	80	Ø25	Ø25
40H	5	Ø23	Ø23	1000H	120	R$_2$1.5"	R$_2$1.5"
50H	6	Ø23	Ø23	1500H	180	R$_2$2"	R$_2$2"
120H	15	Ø23	Ø23	2000H	240	R$_2$2"	R$_2$2"
200H	30	Ø23	Ø23	3000H	360	R$_2$2"	R$_2$2"
400H	50	Ø23	Ø23	4000H	480	2X R$_2$2"	2X R$_2$2"

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. As to ensure high machine efficiency, following suggestions must be observed:

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.

Note: The size of discharging port for all models is Rc1/2".

3.4 Power Connection

1) Make sure the voltage and frequency of the power source comply with those indicated on the manufacturer nameplate that attached to the machine.
2) Power cable and earth connection should conform to 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 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: +/- 2%
7) Please refer to electrical drawing of each model to get the detailed power supply specifications

3.5 Compressed Air Supply

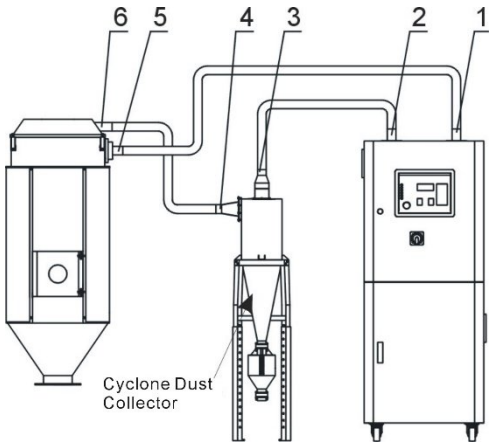
Table 3-3: Compressed Air Specification

Items	Value	Remark
Quality Grade	335	Solid particle content ≤ 5mg/m^3, dew-point temperature≤-20℃, oil content ≤ 25mg/m^3, oil content ≤ 25mg/m^3. (Chinese standard: GB/T 13277-1991)
Air pressure (bar)	3~5bar	
Air quantity (L/hr)	~10L/hr	
Pipe dimension	PM20	Quick coupler(Chinese standard)

3.6 Option Installation

3.6.1 Installation Steps of Cyclone Dust Collector

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

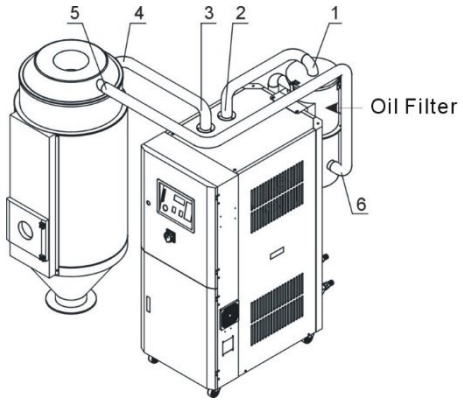


Picture 3-5: Installation Diagram of Cyclone Dust Collector

3.6.2 Installation Steps 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 tubes.
3) Connect 3 and 4 with a heat-resistant duct and fixed both the ends with stainless steel tubes.
4) Connect 5 and 6 with a heat-resistant duct and fixed both the ends with stainless steel tubes.



Picture 3-6: Installation Diagram of Oil Filter

3.6.3 Material storage bin (MST-80U-OP)

1) Check whether internal bin and connecting pipe are clean or not before using.
2) Optional with high-efficient HEPA to collocate with optional grade series.
3) If customer doesn't equip with HEPA, filter with accuracy of 5um is available, which is installed inside storage bin.

Picture 3-7: Material Stage Bin of Optical Grade MST-80U-OP

4. Application and Operation

4.1 Panel Description

4.1.1 System Initialization Screen

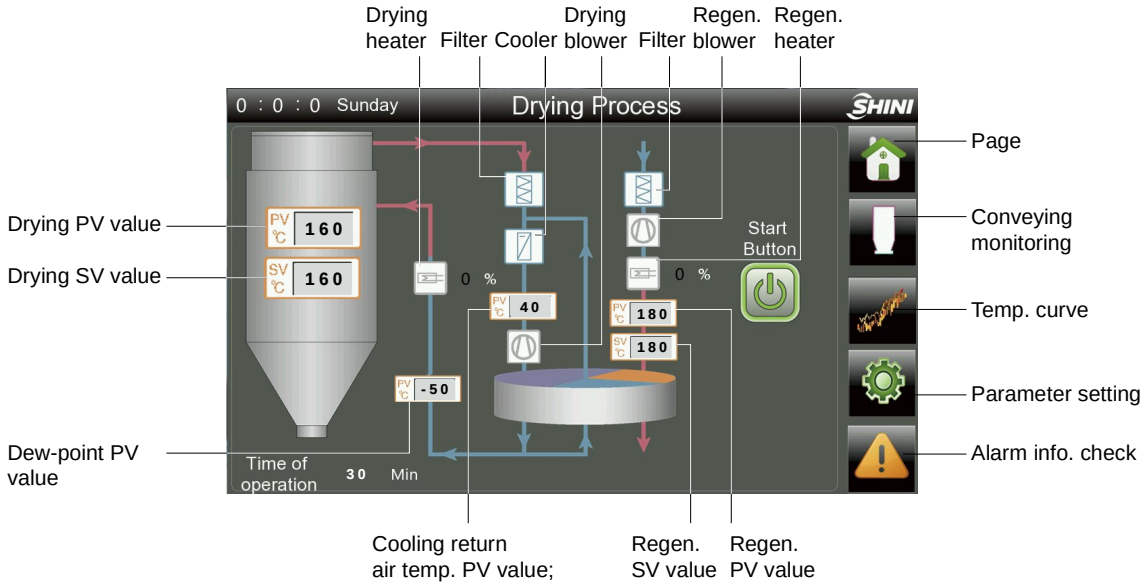
After the system is powered on, the touch screen displays the initial screen, as shown in the picture below:

Touch the <English> or <Chinese> button at the screen bottom to select the English or Chinese screen, and then enter the drying monitoring screen.

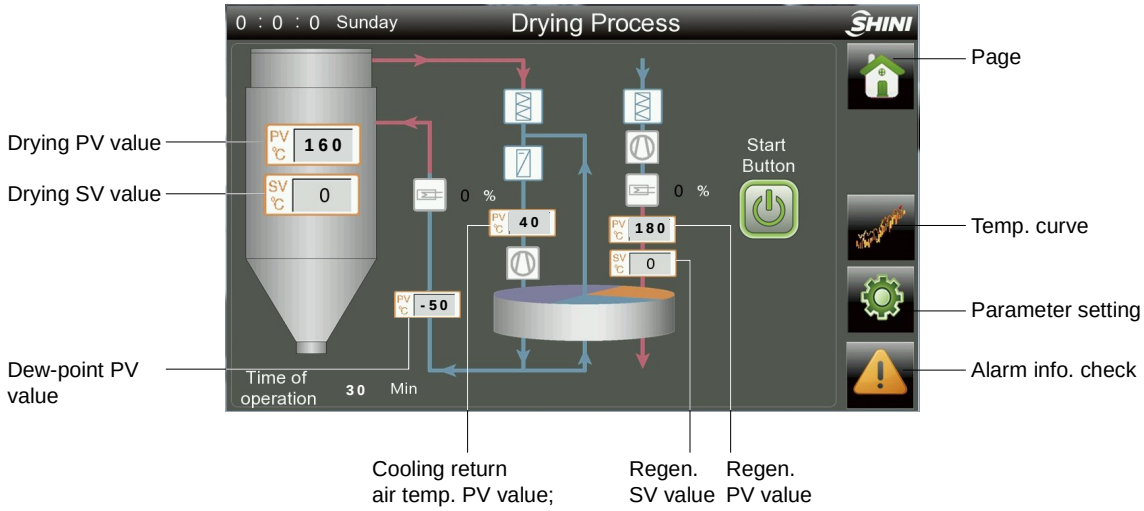
Picture 4-1: System Initial Screen

4.1.2 Drying Monitoring

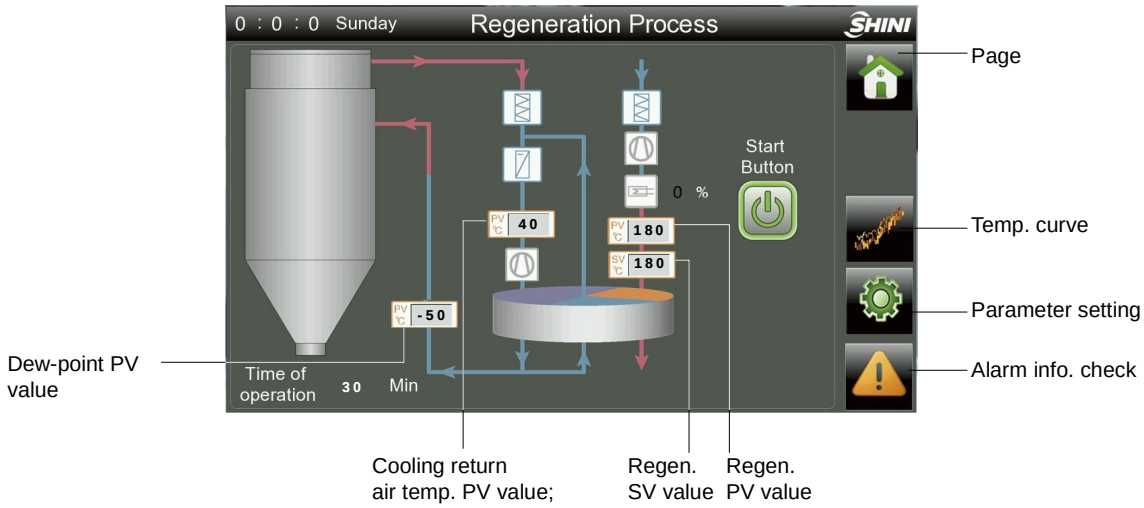
The drying monitoring screen is as shown in the Picture below:



Picture 4-2：SCD Series Drying and Monitoring Screen



Picture 4-3: SDD Series Drying and Monitoring Screen



Picture 4-4：SD Series Regenerating & Monitoring Screen

4.1.2.1 Opening System

Touch the <Running Switch> to make it display ON state, and the system is put into operation.

4.1.2.2 Shut down the system:

Click the running switch again to make it display the OFF status, and the system stops running.

Note: To improve the honeycomb's service life, the honeycomb

rotor needs a delayed shutdown cooling time after the system shutdown, which is generally set as 3 mins.

4.1.2.3 Set the Drying Temperature

Touch < drying SV value > on the drying barrel, and a numeric keyboard pops up, and enter the temperature value through the keyboard.

4.1.2.4 Set the Regen. Temperature

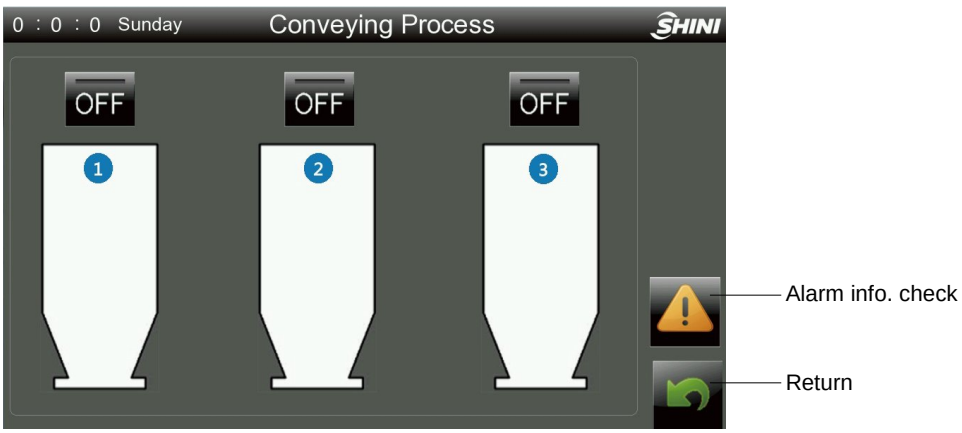
Touch the <regen. temp. set value SV> above the honeycomb, the system will pop up a numeric keyboard and input the temp.value through the keyboard.

Attention!

Drying temp. and regenerative temp. value are set within certain limits. The regenerating temp. value is already set to be 180℃ before being deliveried. Please don't reset it if no special occasion!

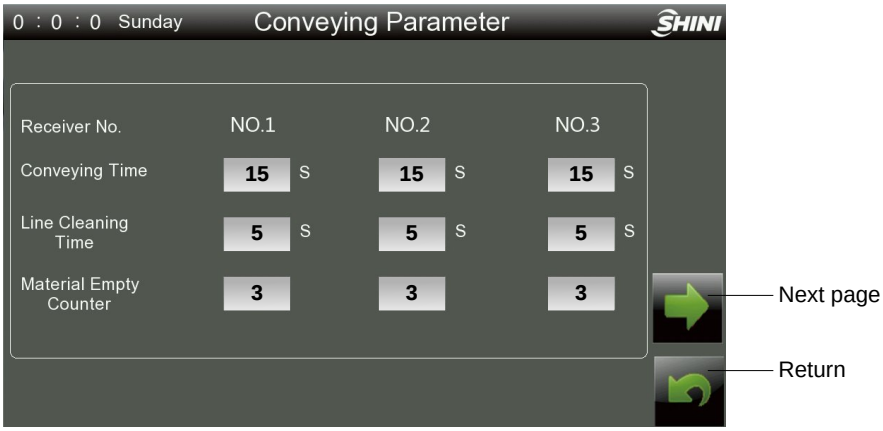
4.1.3 Conveying Monitor (Only for SCD model)

Touch the <Conveying Monitoring> button on the drying monitoring screen to enter the conveying monitoring screen, as shown in the picture below:

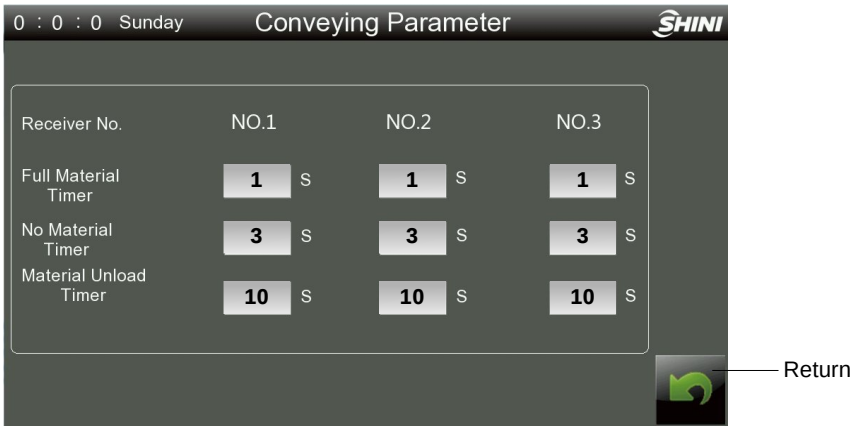


Picture 4-5：Conveying Monitoring

Click the middle area of any hopper on the "Conveying Monitoring" interface to enter the setting interface of conveying parameter.



Picture 4-6: Primary Conveying Parameter Setting



Picture 4-7: Advanced Conveying Parameter Setting

Attention!

The parameters have been set to preset values when the machine leaves the factory. No resetting is permitted without permission! The conveying time, especially, can not be set too long as to avoid pipeline blockage.

Conveying time (1~999S)

When the system detects the hopper lack of materials, it will time the material signal. When it lasts for 3 secs., the PLC outputs the driving signal to make the suction motor run and feed the injection molding machine. Meanwhile, when it times the suction, the conveying stops after the suction time is reached; and the suction times increase once.

Material shortage times (1~999 times)

When feeding the injection molding machine, it restricts the suction times in case of lasting shortage signal. After it reaches the set suction times, the system will stop feeding the machine; Meanwhile, it will give out the alarm signal of suction failure to remind users to check the storage hopper whether it is shortage or other suction failures.

Shut-off time (1~999S)

The opening time of corresponding shut-off valve during each suction.The length of time corresponds to the amount of materials discharged by the drying hopper, and the longer the time, more of materials will be discharged. Shut-off can avoid material residuals in the pipe and empty the material pipe.

In primary suction menu, click to enter the advanced suction parameters.In order to avoid abnormalities caused by operator misoperation, it's necessary to input the password when entering the advanced suction menu (3333).

Full material detection time (Unit: secs.)

After each suction, once the system detects the material level lasts for this time, it means the suction is successful (Default value: 1S);

Discharge detection time (unit: secs.)

When the system detects the hopper is short of materials, it will count down the shortage signal. When it lasts for the time, the system will judges whether is in the shortage state (Default value: 3S)

Discharge detection time (unit: secs.)

It is the time to judge the material level signal after once suction of the hopper (Default value:10S);

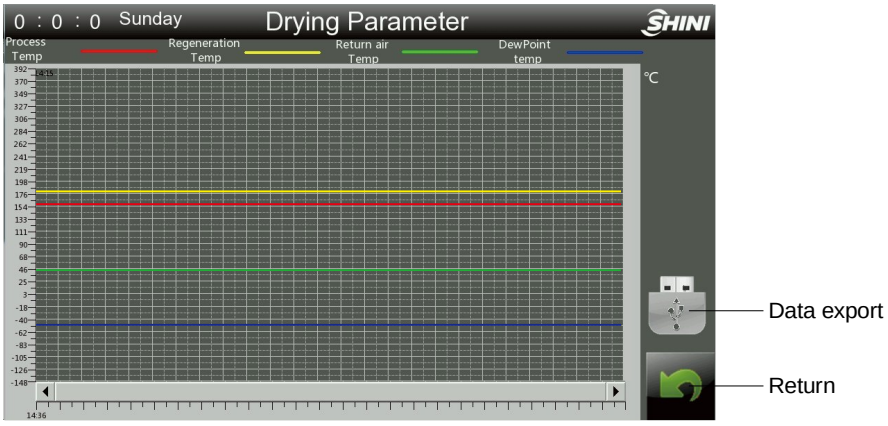
 Attention!

It's not recommend to leave long shut-off time, otherwise material residues will be left in the pipeline due to insufficient suction, thus affecting the drying effect.

4.1.4 Temperature Curve Monitoring

Touch the <Temp. Curve> button in the drying monitoring screen to enter the

temperature variation trend screen, as shown in the figure below:



Picture 4-8：Temperature Curve (Only for SCD/SDD model)

Picture 4-9：Temperature Curve (Only for SD model)

4.1.4.1 Data Export Steps

Click the < Data Export > button to export the temperature data to the USB disk.

U-disk Interface

Attention!

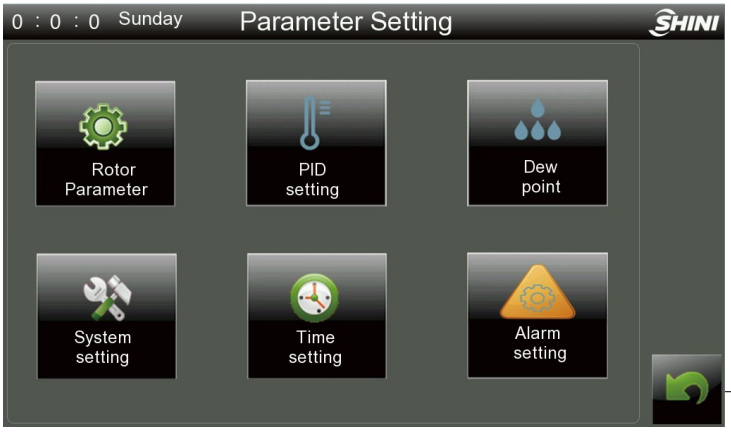
1) The data export takes 5 ~ 10s.

2) To prevent data loss, it's forbidden to plug and unplug the USB disk during data export.

4.1.5 Parameter Setting

Touch <Setting Button > on the "Drying Monitoring" interface to enter the parameter setting screen. When setting relevant parameters, it needs to enter the password to determine whether the user is qualified ((Operator: 3588, Administrator: 3333).

It's unavailable to enter the screen when the password is wrong, and the system will pop up the password box to let the user input the password again. Click to return to the drying monitoring interface.



Picture 4-10：Parameter Setting

Picture 4-11： Password Input

Picture 4-12：Password Keyboard

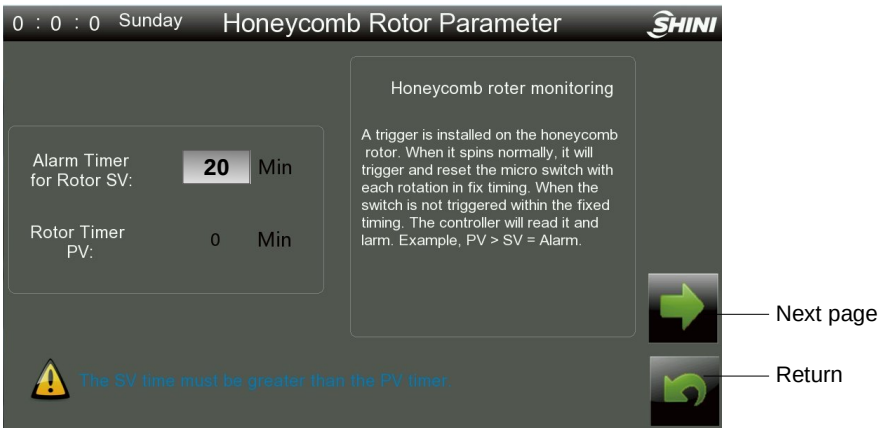
4.1.5.1 Rotor Parameter Setting Screen

Click the rotor parameter setting button in the parameter setting screen to enter

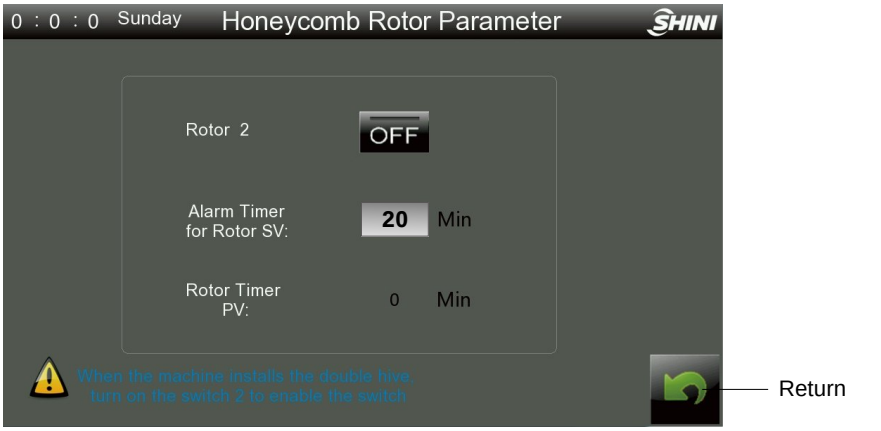
the screen:

According to the model, the warning time is set to 5-15 mins.

In the rotor parameter setting menu, click to enter the parameter setting screen of rotor 2 (Rotor 2 parameter setting interface is for SD model). In order to avoid abnormalities caused by operator misoperation, it's necessary to input the password when entering the advanced suction menu (3333). It's forbiddened to turn on the enabling switch of rotor 2 unless the machine is installed with double honeycombs. Otherwise, it will cause abnormal alarm and machine shutdown.



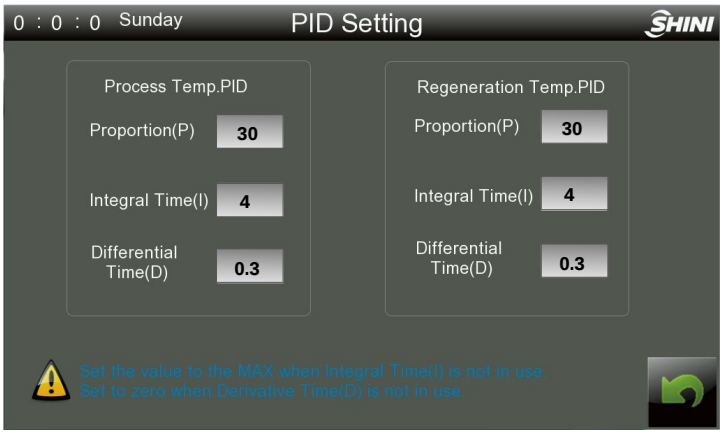
Picture 4-13: Rotor Parameter Setting



Picture 4-14: Rotor 2 Parameter Setting (Only for SD Series Model)

4.1.5.2 PID Setting

Click the "PID" button in the parameter setting screen, and the system will pop up the PID temp. control parameter screen as shown in the picture below.

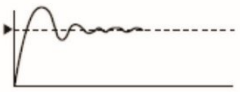
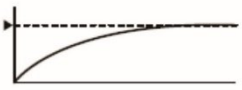


Picture 4-15: PID Parameter Setting

When the temperature control is incorrect, the user can adjust the P.I.D temperature control parameters by manual to achieve the best control effect.

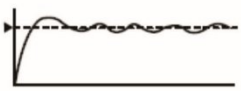
Adjustment of Proportion (P)

Table 4-1: Adjustment of Proportion

P increases		After the oscillation, the curve will be settled and back to setup point.
P decrease		The curve increases gradually in order to maintain a long reliable period against over oscillation.

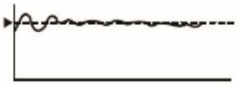
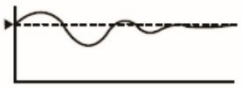
Adjustment of Integral Time (I)

Table 4-2：Adjustment of Integral Time

I increases		For default value requires a longer time for steady status. But, it still has over pulse/under pulse and oscillation occurs.
I decrease		After the occurrence of over pulse/under pulse and oscillation, but the curve tends to rise rapidly.

Adjustment of Differential Time (D)

Table 4-3: Adjustment of Differential Time

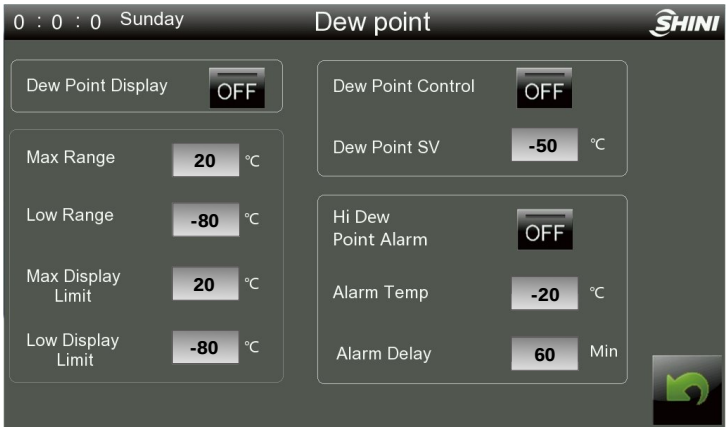
D increases		Over pulse/under pulse and steady time become less, but the curve has small oscillation.
D decrease		Over pulse/under pulse increases, the duration for setup value requires certain time.

4.1.5.3 Dew-point Parameter Setting

Click the dew-point setting button to enter the dew-point parameter setting interface, which can set:

1) Dew-point range and upper and lower limit of the dew-point value.
2) Dew-point display function: After it turns on the switch, it will display the dew-point PV value on the drying monitoring screen.
3) Dew-point temp. control function: Turn on the switch, set the dew-point SV value, and the system will control the heating function of the machine automatically according to the dew-point SV.
4) High dew-point temp. alarm function: Turn on the high dew-point alarm switch, and set the high dew-point alarm temp.and time;

High dew-point alarm function principle: Turn on the switch of the high dew-point alarm, input the high dew-point alarm temp. (Default value: - 20 ℃), and input the dew-point alarm time (Default value: 60Min). After the system continues to run the dew-point alarm time, once the system detects the dew-point PV value is greater than the high dew-point alarm temp., the system will send out the high dew- point alarm, and it will release the high dew-point alarm immediately till the dew-point PV value is less than the high dew-point alarm temp.



Picture 4-16: Dew-point Parameter Setting

4.1.5.4 System Setting

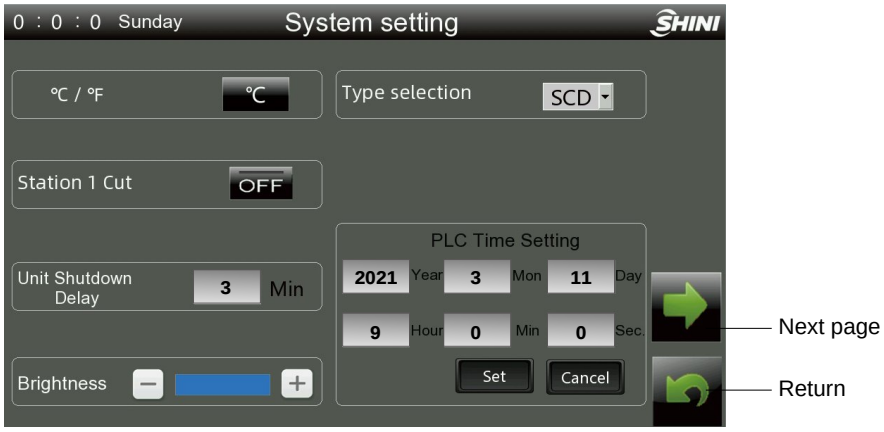
Click the system setting button in the parameter setting screen to enter the screen, which can set:

1) System delay stop time: the default min. time is three mins., if the input value is less than three mins., the system will prompt the user to enter the value again.
2) PLC system time
3) Temperature conversion between ℃ and ℉;
4) Adjust the brightness of the touch screen
5) Modbus Rtu comm. parameter（Click the <Next Page>button to enter）:
   (a) Station address: 1-247
   (b) Baud rate: 9600/19200
   (c) Parity check: no parity, odd parity, even parity
6) System model selection: SCD SDD SD

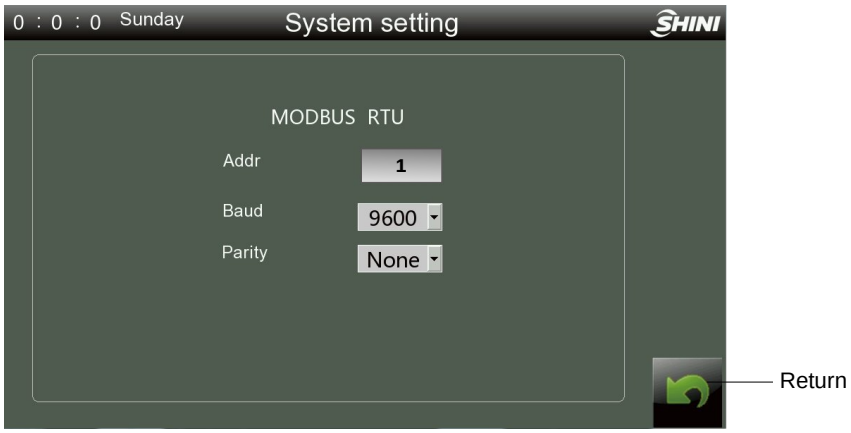
Note!

The model of the machine can't be changed during its operation.

7) Hopper 1 shut-off valve function（reserved）



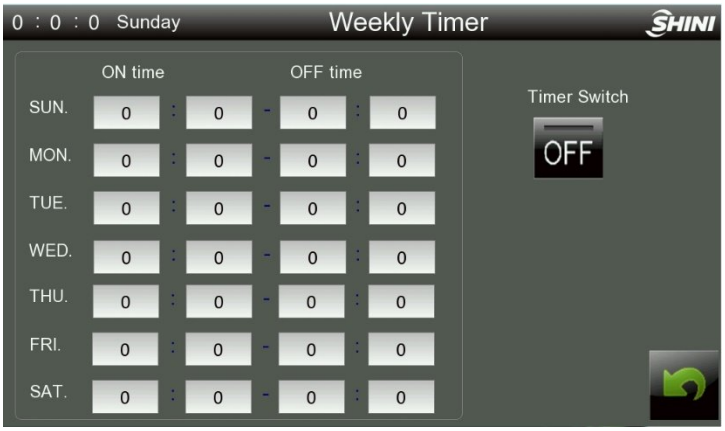
Picture 4-17: System Parameter Setting 1



Picture 4-18: System Parameter Setting 2

4.1.5.5 One-week Timer Setting Screen

Touch the “One-week Timer” button on the parameter setting menu to enter the timer parameter setting screen as shown in picture below:

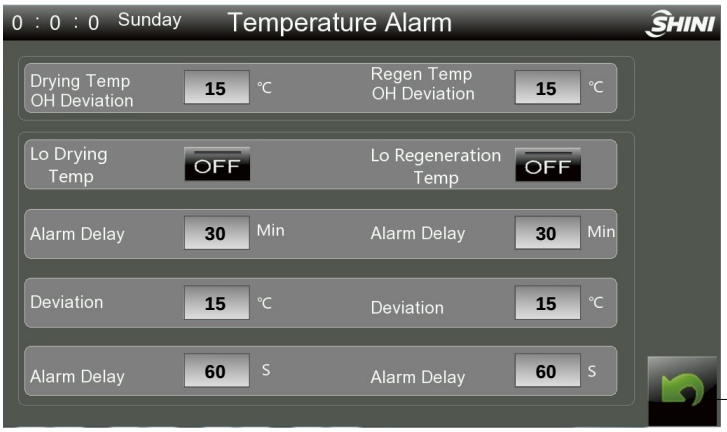


Picture 4-19: One-week Timer Setting

Prompt：After setting the auto-run time, pressing button "OFF" to activate one week timer.

4.1.5.6 System Alarm Setting

Click the alarm setting button in the parameter setting interface to enter the alarm setting, and then click to return to the parameter setting interface.



Picture 4-20: System Alarm Setting

Overheat deviation: Input the overheat deviation value (Default value is 15 ℃). In system running process, when it detects the PV value (drying or regeneration) exceeds the SV value (drying or regeneration) + overheat deviation value, the system will send out overheat alarm immediately.

Failure alarm function principle: Turn on the low temp. alarm switch, and input the

heating failure alarm delay time. Within the heating failure alarm delay time, if the control temp. PV value can't reach - 5 ℃ of the set SV value, the system will send out the heating failure alarm, which will not release the alarm until the control temp. PV value reaches or even exceeds - 5 ℃ of the set SV value;

Low temp. alarm: Input the low-temp. deviation value (Default value is 15 ℃) and input the low-temp. alarm delay time (Default value is 60s). After running the system and the PV value rises to SV value, if the system detects that the PV value (drying or regeneration) is lower than the SV value - low temp.deviation value, and lasts the low temp. alarm delay time, it will send out low temp.alarm. When the system detects that PV value (drying or regeneration) is greater than the SV value - low temp. deviation value, the system will cancel the low temp. alarm.

4.1.6 Alarms Fault Records

Touch the "Alarm Fault Records" button at the bottom of the dehumidification and drying monitoring screen or conveying monitoring screen to enter the alarm fault record screen, which is shown as below:

Click<Data Export> button to export the temp. data to U disk,

Picture 4-21: Alarm Fault Record

Attention!

It takes 5-10S to export the data.

In order to prevent data loss, it's forbidden to plug out the U disk when exporting the data.

1) When the aarm fault records exceed the display range, you can check all the alarm information by click the scroll down and up keys.
2) According to the displayed alarm information, check the troubleshooting methods of the faults to solve the troubles.
3) Press the <Return> button to exit the alarm fault record screen.
4) Press the < Reset > button to dismiss the alarm and reset to the normal state

Table 4-4: Alarm Information List

Alert Message	Results	Possible Causes
Auti-phase	System cannot operate, and the visible alarm is flickering.	Low voltage, phase shortage and phase error
Process blower overload.	Dehumidifier does not work and the visible alarm is flickering.	Low voltage, blower fault, thermal overload relay setting current is wrong.
Regenerating blower overload.	Dehumidifier does not work and red alert light is flickering.	Low voltage, blower fault, thermal overload relay setting current is wrong.
Conveying blower overload.	Material conveying stops and the visible alarm is flickering.	Motor overload setting error or motor fault.
No.1 receiver suction problem	No.1 receiver stop suction function and the visible alarm is flickering.	Material storage hopper shortage, suction detector fault, parameter setting error, shut-off valve fault;
No.2 receiver suction problem	No.2 receiver stop suction function and the visible alarm is flickering.	Drying material storage hopper shortage, suction box fault, parameter setting error, shut-off valve fault .
No.3 receiver suction problem	No.3 receiver stop suction function and the visible alarm is flickering.	Drying material storage hopper shortage, suction box fault, parameter setting error, shut-off valve fault.
Process temperature overheat	Dehumidifier does not work and the visible alarm is flickering.	Temp. control parameter setting error, contactor conglutinated, drying thermocouple failure, and drying blower failure.
Regenerating temp.overheat	Dehumidifier does not work and the visible alarm is flickering.	Temp. control parameter setting error, contactor conglutinated, drying thermocouple failure, and drying blower failure.
Temp. overheat	State information displays on the screen	The cooling water is disconnected or overheat.
Process temp. thermople broken	Dehumidifier does not work and the visible alarm is flickering.	Thermocouple disconnected or bad contact, thermocouple is reversely connected.
Regenerative thermocouple broken	Dehumidifier does not work and the visible alarm is flickering.	Thermocouple disconnected or bad contact, thermocouple is reversely connected.
Return air	Dehumidifier does not work and the	Thermocouple disconnected or bad

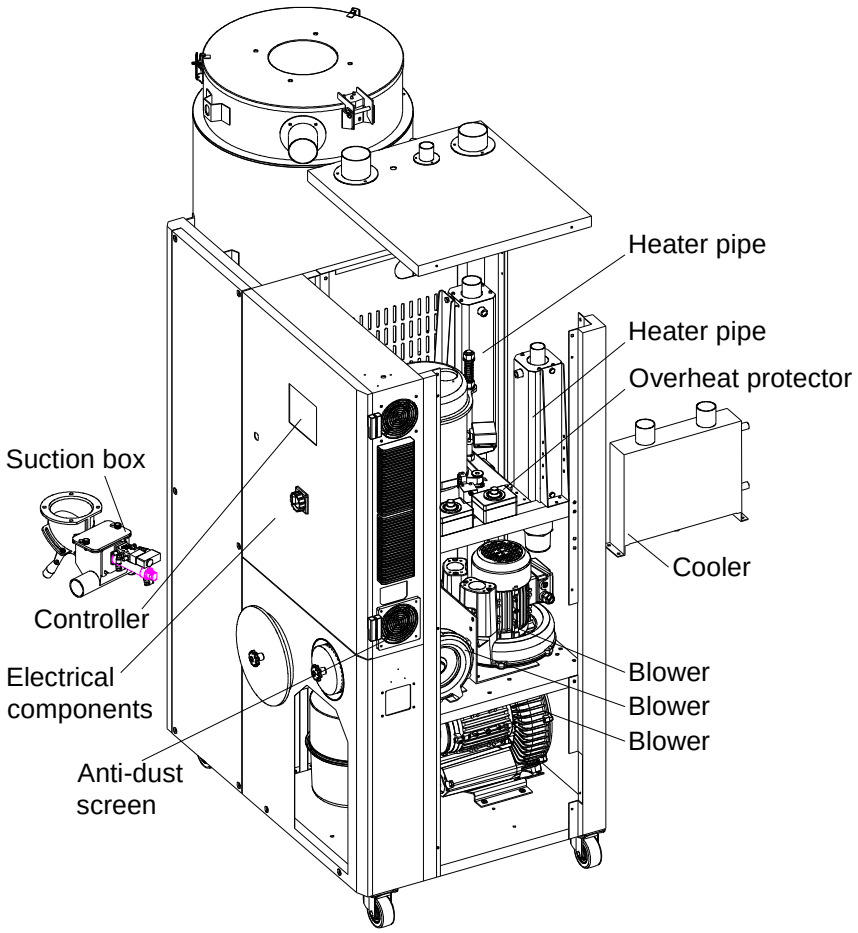
thermocouple broken	visible alarm is flickering.	contact, thermocouple is reversely connected.
Rotor is not working	Dehumidifier does not work and the visible alarm is flickering.	Motor blockaged or broken, belt broken, speed controller broken, rotor parameter setting error.

Note: 1) Overload Relay reset: Open control box, press "RESET" button on the corresponding overload relay.

2) Rotor Failure Alarm reset: Turn off the Drying Switch and then turn it "ON" again.

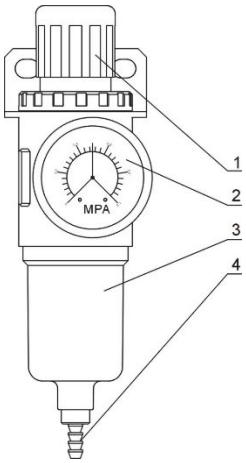
3) Over Temperature Alarm reset: Turn off the Drying Switch and then turn it "ON" again after the temperature drops down.

5. Maintenance and Repair



5.1 Filter & Pressure Regulating Valve

5.1.1 Filter & Pressure Regulating Valve Drawing



Picture 5-1: Filter & Pressure Regulating Valve Drawing

Table 5-1: Filter & Pressure Regulating Valve Assembly

No.	Component	Function
1	Pressure adjusting knob	Used for adjusting the air pressure at the outlet
2	Pressure gauge	Used for displaying air pressure at the outlet
3	Cup	Used for storage the moisture filtered from the air
4	Water outlet	Used for discharging the moisture in the glass

5.1.2 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.

5.2 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.

5) Please ensue that the filter is well seal with metal frame.

Picture 5-2: Filter Clearning

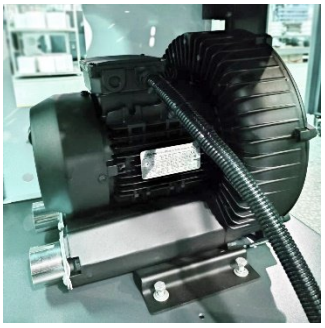
Note!

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

5.3 Blower Motors

5.3.1 Drying Blower

1) Fix inlet/outlet flange of blower, and tighten four screws securely.
2) Connect the blower with electrical source.
3) Install the blower on the Machine frame.



Picture 5-3: Installation of Blowers

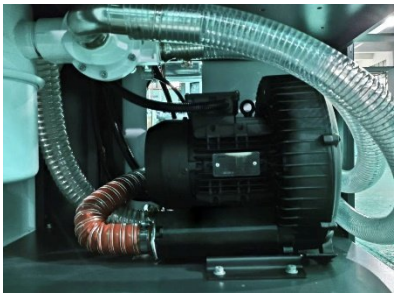
5.3.2 Regeneration Blower

1) Fix inlet/outlet flange of blower, and tighten 4 screws securely.
2) Install the blower on the machine frame.
3) Connect the blower with electrical source.

5.3.3 Conveying Blower

1) Fix inlet/outlet flange of blower, and tighten 4 screws securely.
2) Connect the blower with electrical power source.

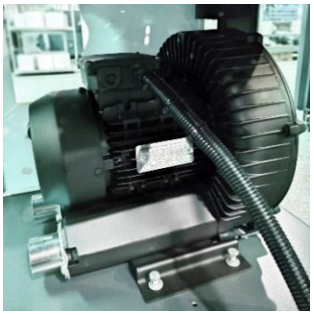
3) Install the blower on the machine frame.
4) Fix the three-way valve.



Picture 5-4: Conveying Blower

5.3.4 Blower Cleaning

1) 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.
2) Ball bearing, oil seal and sound-proof are belonging to consumable parts and so it has a life period and requires regular replacement.



Picture 5-5: Blower

5.4 The Service Life of the Key Parts of the Product

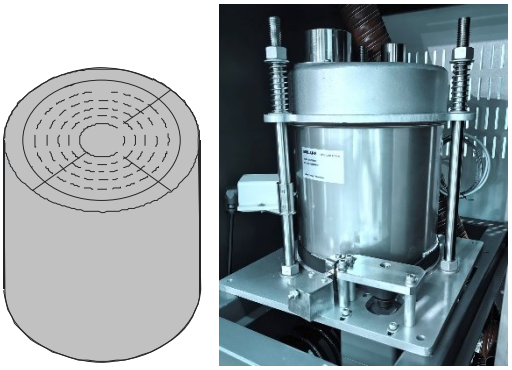
Table 5-2: The Service Life of the Key Parts of the Product

No.	Name of the Parts	Useful Life
1	Blower	Above 5 years
2	Process heater	Above 1 year
3	Regen. herter	Above 1 year
4	Contactor	Above 2000,000 act
5	Honeycomb	5 years
6	Filter	1 year

5.5 Honeycomb-rotor

5.5.1 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.

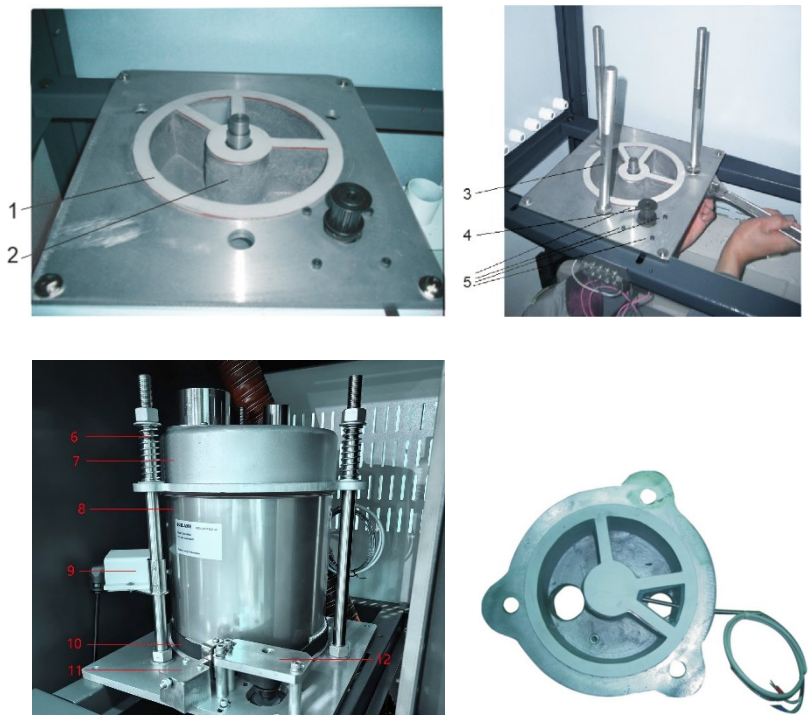


Picture 5-6: Honeycomb Rotor

5.5.2 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 5-7: Rotor Installation Diagram

Honeycomb Rotor Cleaning Steps:

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

1) 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.

2) 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.
3) Take the rotor out of the liquid and let it rest with the channels vertically for 5 minutes so the liquid can run out.
4) Blow off the residual liquid in the channels with compressed air.
5) 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.

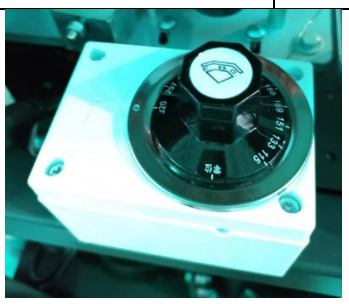
Note: In the dry air and wet air outlets, there will be high concentrations liquid out for some time. If a solvent has been used, there will be a residual smell for several days.

Note: 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.

5.6 EGO

Table 6-3: EGO Default Value

No.	Category	Default Value
1	Drying	200℃
2	Regenerating	200℃



Picture 5-8: EGO

Note: EGO is mainly used for protecting highest heating temperature, other than drying temperature. EGO has been set before delivery，unauthorized modification is not permitted!

5.7 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.
3) As for the cooling by normal water, do the same job once a quarter.

Cooler Cleaning 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.
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 four hours to make the silica gel drying enough then fix the cooler on the chiller and connect all pipes.

5.8 Maintenance Schedule

5.8.1 General Machine Information

Model _____ SN _____ Manufacture date _____

Voltage_____Φ_____V Frequency _____ Hz Power _____ kW

5.8.2 Installation & Inspection

☐Check if the air pipe are tightly connected.

☐Check if the material clearance door tightly closed.

☐Check if the air pipes are correctly connected.

☐Check if there are damages of the honeycle.

Inspection of Electric 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

5.8.3 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).

5.8.4 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.

5.8.5 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.

5.8.6 Half-year Check

☐Check whether the pipe heater works normally.

☐Check whether the blower works normally.

☐Clean the cooler.

5.8.7 Yearly Check

☐Check whether the contract is normal.

☐ Replace the PC plate every three years.

☐ Replace the fuse switch every three years.