

# **SHD**

## **“Standard” Hopper Dryer**

Date: Dec, 2018

Version: Ver.E





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## 1. General Description

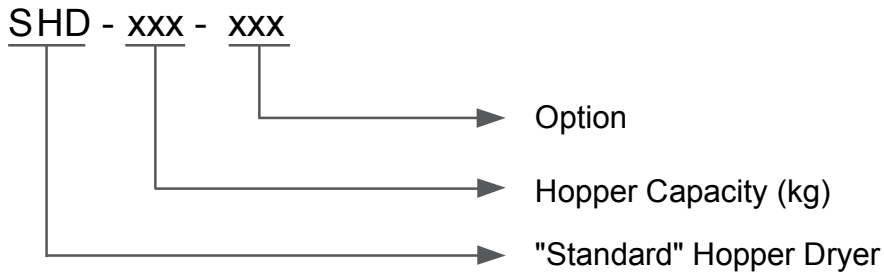


Please read through this operation manual before using the machine to prevent damages of the machine or personal injuries.



SHD-50

## 1.1 Coding Principle



## 1.2 Feature

- Adopt hot air diffuser to gain an even hot air flow to improve drying efficiency.
- Hot air inlet elbow design can prevent dust piling up at bottom of the pipe heaters so as to avoid burning.
- All material contact surfaces are made of stainless steel to eliminate material contamination.
- Hopper separated from its base, ensuring convenient cleaning.
- All series are equipped with exposed power switch.
- For SHD-25~150, heater pipes are connected by aluminum sheets and other models are equipped with temperature protection to prevent heater pipe from damaging by blower faults.
- Overheat tripping can automatically cut off power when drying temperature exceeds set deviation value.
- Adopts heat-insulated blower to prolong blower lifespan.
- All series of models standard equipped with 7-day timing and intermittent operation function.
- All series of models adopt microcomputer control and RS485 communication port.

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 5, which contains service instructions intended for service engineers. Other chapters contain instructions for the daily operator.

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

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

Headquarter and Taipei factory:

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Shini Plastics Technologies (Dongguan), Inc:

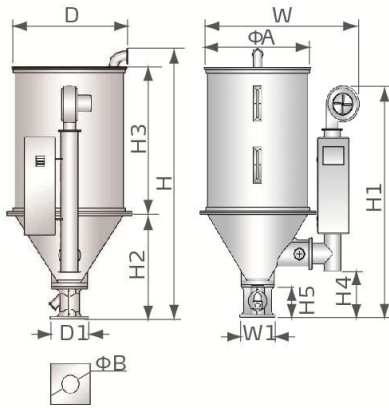
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Shini Plastics Technologies India Pvt.Ltd.:

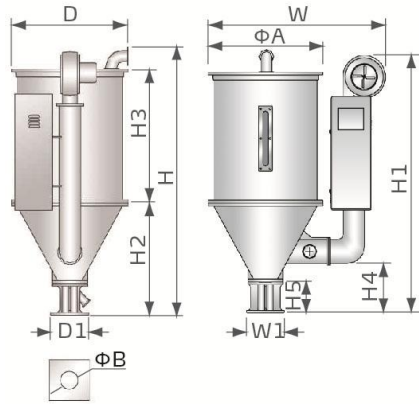
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# 1.3 Technical Specifications

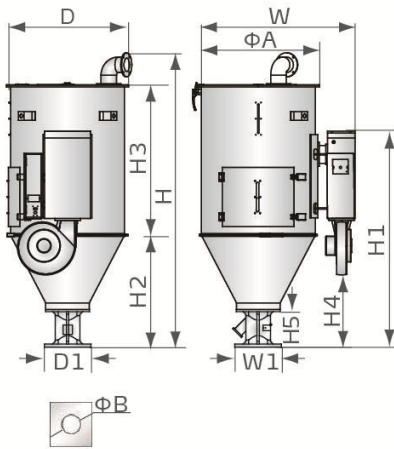
## 1.3.1 External Dimensions



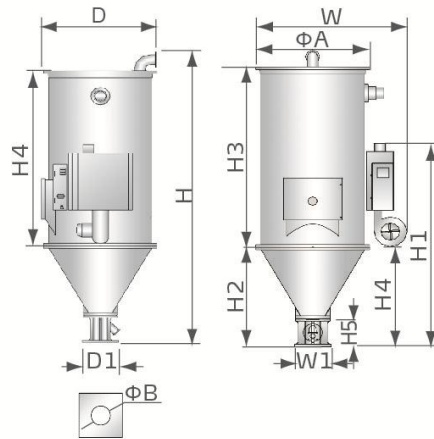
SHD-12



SHD-25~150



SHD-200~600



SHD-800/1000

Picture 1-1: External dimensions



## 1.3.2 Specification

Table 1-1: Specification

SHD-	12	25	50	75	100	150	200	300	400	500	600	800	1000
Ver.	D	C	C	C	C	C	D	D	E	D	D	D	D
Heater Power (kW)	2.2 / 3*	3 / 3.3*	3.9 / 4.2*	4.2 / 4.8*	6 / 6.6*	6.6 / 7.2*	8.4 / 9.6*	9.6	18	19.2	21	24	32
Blower Power (kW)	0.05	0.12	0.12	0.12	0.12	0.12	0.18	0.18	0.55	0.55	0.55	1.1	1.1
Loading Capacity (kg)	12	25	50	75	100	150	200	300	400	500	600	800	1000
H(mm)	790	1015	1145	1240	1340	1620	1580	1980	2170	2350	2570	2760	3060
H1(mm)	690	925	1045	1150	1340	1605	1332	1432	1900	1900	2075	2300	2530
H2(mm)	317	410	380	475	470	470	550	550	838	838	838	1010	1010
H3(mm)	370	460	520	620	725	970	975	1220	1220	1400	1545	540	540
H4(mm)	106	194	206	208	233	233	184	184	334	334	334	1550	1845
H5(mm)	115	150	150	150	158	158	158	158	283	283	283	283	283
W(mm)	660	725	840	900	955	955	1230	1230	1365	1365	1365	1420	1420
D(mm)	360	405	490	550	605	605	770	770	915	915	950	600	600
D1(mm)	130	158	158	158	238	238	238	238	345	345	345	345	345
W1(mm)	130	148	148	148	238	238	238	238	345	345	345	345	345
ΦA(mm)	325	385	470	530	595	595	750	750	910	910	910	960	960
ΦB(mm)	55	55	55	55	90	90	90	90	105	105	105	105	105
Weight (kg)	35	40	45	55	70	75	100	120	165	170	240	280	300

Note: 1) Above loading capacity is based on pellet material of 0.65kg/L in bulk density and 3~5mm in diameter.

2) "\*"Stands for high-temp.model, add "H" at the end of model code.

3) Maximum drying temperature of SHD-EH is 150°C.

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

Table 1-2: Dryer drying capacity(kg/hr)(Selection guide)

Material	Model SHD											Drying Time	Drying Temp.		
	12	25	50	75	100	150	200	300	400	500	600			800	1000
Polystyrene	8	20	50	75	100	150	200	300	400	500	600	800	1000	0.75hrs	80°C
Polyethylene	8	20	50	75	100	150	200	300	400	500	600	800	1000	0.75hrs	80°C
Polypropylene	8	20	50	75	100	150	200	300	400	500	600	800	1000	0.75hrs	80°C
Poly styrene H - D	6	14	38	57	80	115	150	225	300	375	440	600	750	1hrs	80°C
ABS	4	8	20	30	40	60	80	120	160	200	240	320	400	1hrs	80°C
Nylon 11,12	2	4	10	13	20	27	35	60	80	100	120	160	200	4hrs	75°C
Nylon6,6,6/10	1.5	3.2	8	11	16	22	30	45	65	80	100	130	165	5hrs	75°C
Nylon 6	1	2	5	7	10	15	20	35	50	60	70	90	110	7hrs	75°C
Acrylic fiber	2.5	6	12	22	30	45	60	100	140	165	200	365	330	2.5hrs	80°C
Cellulose acetate	2.5	6	17	26	35	52	70	110	150	180	220	300	375	2.25hrs	75°C
Butyrate	4	10	25	37	50	75	100	160	220	275	330	380	430	1.5hrs	-
Polycarbonate	1.5	4	10	15	20	30	40	75	90	105	120	160	200	3hrs	120°C
Rigid PVC	5	12	30	45	60	90	120	185	250	305	380	445	510	1.25hrs	70°C

Notes:Based on relative humidity 65% with ambient temperature of 20°C,moisure content after drying can be 0.2% ro less.

## 1.4 Safety Regulations

### 1.4.1 Safety Signs and Labels



Note!

Electrical installation should be done by qualified electrician only.  
Before connecting to AC Power Source, turn power switch to OFF position.  
While AC power source is connected, make sure specifications and overload protection rating of the power switch are suitable and reliable.  
When the machine is under care or maintenance, turn off both power switch and automatic operation switch.



Danger!

High pressure!

It is attached to the control box.



Warning!

High temperature surface may burn hands!

It is attached on the cover of pipe heater.



Attention!

This mark reminds you to be more careful!



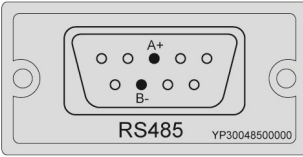


Warning!

High temperature surface may burn hands!

This label should be stick to the shell of electric heating box.

## 1.4.2 Signs and Labels

<p>⚠ 超溫時，保護裝置動作；解除故障後，按藍色鍵復位並合上開關，重新通電運行。 Protection device activates when overheat occurs; after faults are discharged, press blue key to reset and turn on the switch to restart operation.</p> <p>超溫保護裝置 Overheat protection device</p> 	<p>Protection device activates when overheat occurs; after faults are discharged, press blue key to reset and turn on the switch to Restart operation.</p>
	<p>Push-and-pull switch for shut-off plate: I: Means "Pull" O: Means "Push"</p>
<p>請定期清理過濾網以免阻塞而影響乾燥 Regularly clean the filter screen to avoid insufficient drying caused by blocking.</p>	<p>Regularly clean the filter screen to avoid insufficient drying caused by blocking</p>
	<p>Communication interface RS485</p>

## 1.5 Exemption Clause

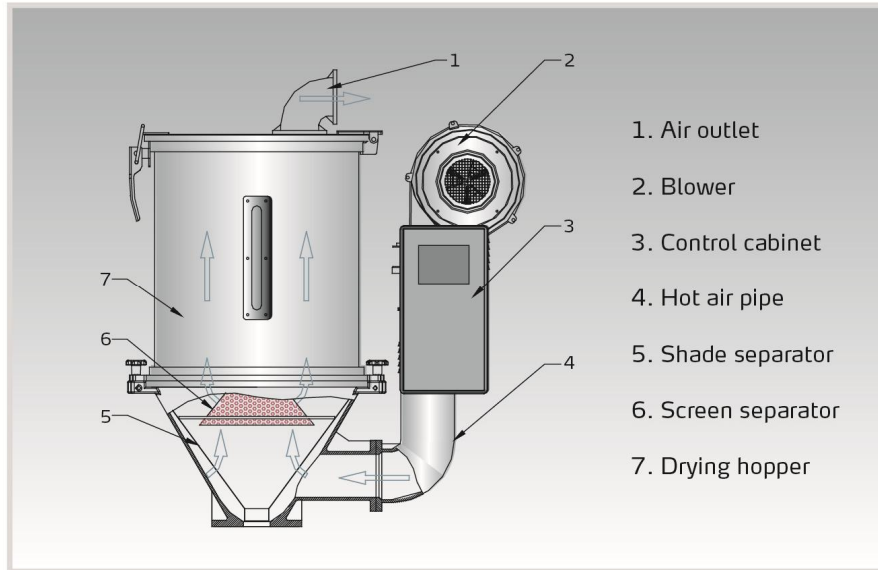
The following statements clarify the responsibilities and regulations born by any buyer or user who purchases products and accessories from Shini (including employees and agents).

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

In the drying process, hot air with constant temperature is blown by the drying blower 2 of SHD into the drying hopper 7 to dry the materials. Moisture will be separated out and taken away by hot air, thus to gain a satisfied drying effect.

Air blown out of blower via hot air pipe 4 became high temperature drying air after being heated. Through shade separator 5 and screen protector 6, hot air can be equably dispersed to the material in storage tank (see picture). Hot air recycler is optional so the air entered drying hopper 7 after being filtered by return air will get into the drying blower 2 to form a closed loop circle, which saves electricity.

## 2.2 Options

### 2.2.1 Air Filter



Model	Applied to
ADC-1	SHD-12
ADC-2	SHD-25~150
ADC-3	SHD-200~1000

Effectively filter 99% of dust-contain air discharged from dryer to avoid air pollution.

### 2.2.2 Blower Inlet Filter



Model	Applied to
AIF-12	SHD-12
AIF-25	SHD-25
AIF-50	SHD-50/75
AIF-100	SHD-100/150
AIF-200	SHD-200~500
AIF-600	SHD-600
AIF-800	SHD-800~1000

Notes: refill air input of the blower is adjustable.

### 2.2.3 Magnetic Base



Model	Applied to	Magnetic Frame	Aluminum Holder× 2
MB-12	SHD-12	MR-3	88.5 × 78 × 2.3
MB-50	SHD-25~75		
MB-100	SHD-100~300		118.5 × 105 × 2.3
MB-400	SHD-400 and above		147 × 130 × 2.3

Made of aluminum with built-in hopper magnet, can effectively separate metal scraps out to avoid material contamination. (MB-400 is standard configuration)

## 2.2.4 Hot Air Recycler



Model	Filtering Barrel Dia. (mm)	Inlet Air Pipe Dia. (inch)	Flange of Air Outlet (inch)	Applied to
HAR-12	157	2		SHD-12
HAR-25	157	2.5		SHD-15
HAR-50	175	3		SHD-50/75
HAR-100	217	3		SHD-100/150
HAR-200	245	4		SHD-200~500
HAR-600	245	4		SHD-600
HAR-800	245	4		SHD-800~1000

Work with hopper dryer to make the hot air form a semi-closed circulated loop and has features as follows:

- 1) Hot air recycling and circulating avoids indoor temperature rising up.
- 2) Keep air in factory clean and ensure good product quality.
- 3) Heating by fast hot air circulation can lower energy consumption by 40%.

## 2.2.5 Hopper Magnet



Absorb metal scraps in the material to avoid the damage of molding screw.

Model	Applied to	Aluminum Holder*2 (mm)
MR-5	SHD-12	(148 x 80 x 2.3)
MR-7	SHD-25~75	(190 x 80 x 2.3)
MR-9	SHD-100~400	(240 x 80 x 2.3)
MR-11	SHD-600 and above	(298 x 80 x 2.3)

## 2.2.6 Material Suction Box/Shut-off Suction Box



European style in appearance design, work with dryer that has a floor stand and vacuum loader, suitable for material suction and discharging.

Applied to	SHD-12~75	SHD-100 and above
Model		
SBU	-20-38S	-160-38S
SBU	-20-50S	-160-50S
SBU	-20-38D	-160-38D
SBU	-20-50D	-160-50D

- Notes: 1) Install pneumatic shut off valve (add " V " at the end of the model code).  
 2) Change into stainless steel material (add "S" at the end of the model code).  
 3) Stainless steel polishing (add "P" at the end of the model code).  
 4) "S" stands for single tube suction box and "D" stands for double tubes suction box.

## 2.2.7 N-Type Floor Stand



Model	Applied to	Dimension (mm) H×W×D	A / B / C (mm)
FSN-50	SHD-12~75	600 × 700 × 640	140/54/ 9
FSN-100	SHD-100/150	615 × 800 × 710	210/90/11
FSN-200	SHD-200/300	680 × 1000 × 840	210/90/11
FSN-400	SHD-400~600	700 × 1200 × 1010	260/116 /13
FSN-800	SHD-800/1000	700 × 1600 × 1180	260/116/13

With which machines can be easily moved out of workplace which is suitable for the factories with height limited workshops, also it can make operations more convenient.

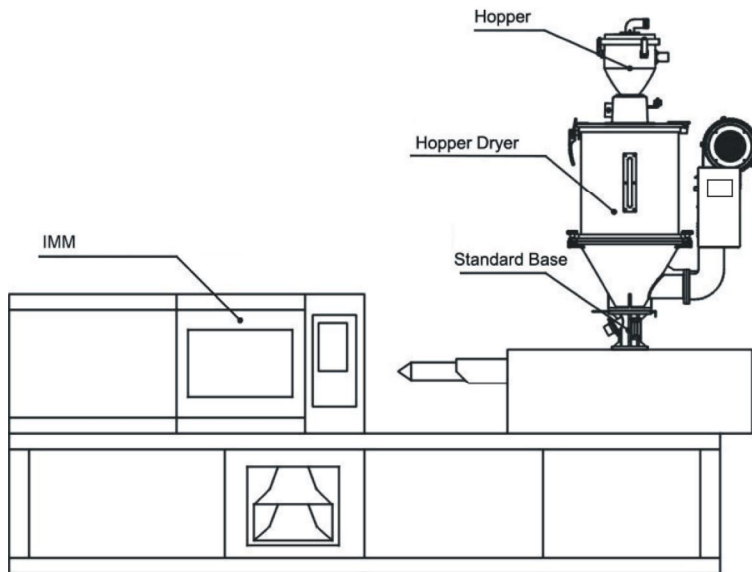


### 3. Installation and Debugging

Notes for Installation and Positioning:

- 1) Machine just can be mounted in vertical position. Make sure there's no pipe, fixed structure or other objects above the installing location and around the machine which may block machine's installation, hit objects or injure human person.
- 2) In order to maintain convenient operation, it's suggested to keep 1m space around the machine. Please keep at least 2m distance between the device and the inflammable goods.
- 3) This series of models only could be applied in working environment with good ventilation.

#### 3.1 Direct Installation

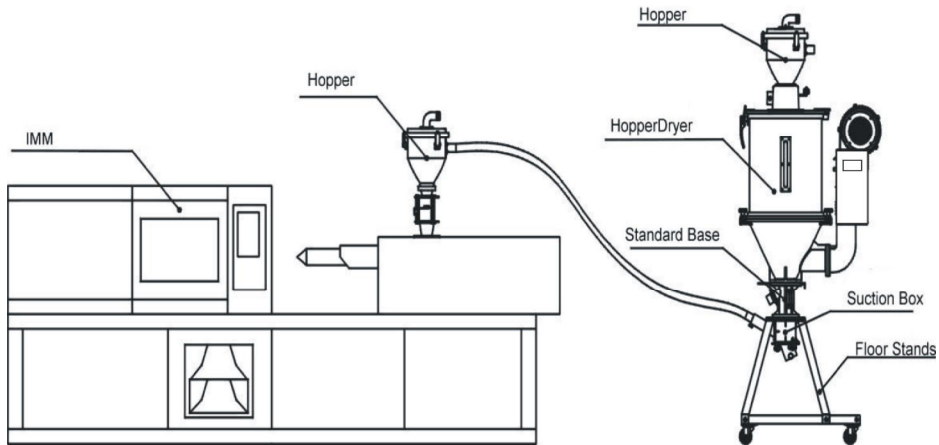


Picture 3-1: Direct installation

Direct installation type is to mount the hopper dryer directly on the molding machine via a standard base. SHD-12~300 is suitable for this mounting method as well as floor stand installation type; SHD-400 and models above should adopt floor stand installation type.

When using the method to mount the dryer, the equipped standard base must according to material inlet diameter of the molding machine mounting drill holes. Then use the screw to fasten the base and the molding machine inlet.

## 3.2 Floor Stand Installation



Picture 3-2: Floor stand installation

Floor stand installation type is to mount dryer on a floor stand, then via a photo-sensor hopper receiver to convey the material to the feed port of a molding machine. SHD-400 and above models should adopt floor stand installation type.

Machine should be placed on water-level floor to keep balance. If it is to be mounted on a high surface(e.g. on a scaffold or a interlayer), should ensure its structure and sizes can bear the weight and size of the machine.

## 3.3 Connecting the Power Source

According to circuit diagram of each machine to connect the power source. Notice should be taken concerning if the power voltage is in compliance with the required specifications, also if the switch and load are proper and safe.

Notes: Before connecting, the main switch should be off.

## 3.4 The Hopper Dryer Test

After ensuring all the circuits have been connected firmly, turn on the main switch to "ON" status and pressing the "RUN/STOP" button on control panel. Then blower runs, observe whether the rotating direction of the blower is same as the arrow indicated direction. If it is not, randomly exchange two of the three power firing lines and connect them firmly.



Picture 3-3: Blower

### 3.5 Installation of the Options

#### 3.5.1 Installation of Air-Exhaust Filter

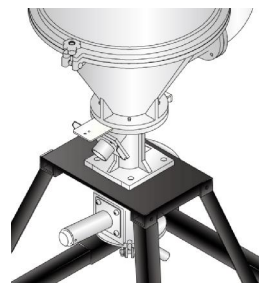
If the materials contain dust or to avoid the dust-contain air exhausted by dryer polluting the workshop's environment. Option with air-exhaust filter ADC can filter the exhausted air from the dryer. ADC can reach filter efficiency of 99%.

ADC is installed on air-exhaust elbow of the dryer. Point it to the installed holes then tighten up the screws, use rubber ring to seal the combined place.



Picture 3-4: Left: Air-exhaust elbow of dryer Right: Air-exhaust filter

#### 3.5.2 Suction Box Installation



Picture 3-5: European suction box

When SHD is mounted on the floor stand suction box should be equipped. To convey the dried plastic material conveniently. The installation of suction box is simple. Install them at bottom of the hopper, point to the holes and tighten up the screws.



Picture 3-6: Shut-off suction box

### 3.5.3 Blower Inlet Filter Installation

When dryers in the dust-contain environment or hot air requires high cleanliness, it can option with AIF blower inlet filter.



Picture 3-7: AIF blower inlet filter

Installing AIF at blower inlet port when installing it, firstly loosen screws of the blower inlet screen , take down the screen; then install the AIF at blower inlet port, point to the holes and tighten up the screws.

### 3.5.4 Hot Air Recycler Installation

Based on AIF blower inlet filter, using a hear-resistance pipe to connect the hopper exhausting air to AIF. Thus to form a hot air recycler. By recycling the hot air can at most save energy consumption by 40%.



Picture 3-8: Hot air recycler

## 4. Operation Guide

### 4.1 Control Panel



Picture 4-1: Control Panel

#### 4.1.1 Panel Operation

- 1) Turn on main switch of control box.
- 2) Press "ON/OFF" key, it starts drying process, indicator turns green;
- 3) Press "ON/OFF" key again, it stops drying process, indicator turns yellow.

#### 4.1.2 Temperature Setting

- 1) The setup number will flicker after pressing "Menu" key, add or decrease temperature by pressing "Up" or "Down" key.
- 2) Press "Setup" key again to confirm the input value.

#### 4.1.3 Temperature Lock

- 1) Press "menu" key for 2 seconds, it displays "TIME".
- 2) Press "Up" key repeatedly, till it displays "LOCK";
- 3) Press "Setup" key, the set value flickers, press "Up" or "Down" key to select "YES" (lock temperature setting) and "NO" (don't lock).
- 4) Press "Setup" key to confirm the input value.
- 5) Press "Menu" key to return operation menu.

**Notes: When "LOCK" is set as "YES, temperature setting value will be locked which not accessible to change.**



#### 4.1.4 PID Setting

- 1) Press both “Menu” and “Down” keys for 3 seconds, it shows “P” (proportion) setting;
- 2) Press “Setup” key, the set value flickers, then press “Up” or “Down” key to add or decrease the value.
- 3) Press “Setup” key to confirm the input value.
- 4) Press “Up” key again and again, it displays “I” (integral time ) and “D” (differential time) setting accordingly.
- 5) Repeat above step 2 and step 3, input and confirm related parameters.
- 6) Press “Menu” key, it returns operation menu.

**Notes: The PID parameter will directly influence the effect of temperature control, please be careful to set the value.**

Parameters	Codes	Factory Default
Proportion	P	5
Integral time	I	200
Differential time	D	30
Over-temp alarm	OTP	15°C
Control cycle	HCLE	15
Blower delay	FDLY	180
Temp. unit	UNIT	°C

#### 4.1.5 Intermittent Operation Setting

Hold “Menu” for about 2 secs. to set current time and week. Press “Up” or “Down” key to set start/stop function of AUTO timer, the time for RONE intermittent operation, the OFF time of ROFF intermittent operation, the ON time of RON intermittent operation.

#### 4.1.6 One-week Timing Setting

- 1) After current time is set, hold “menu” for about 5 secs, press “Up” or “Down” key to set OFF1 (Mon. off time), OFF2(Tues. off time), OFF3 (Wed. off time), OFF4(Thur. off time), OFF 5(Fri. off time), OFF6(Sat. off time), OFF7(Sun.off time).
- 2) Hold “Menu” for about 7S, press “Up” or “Down” key to set ON1(Mon. start time), ON2(Tues. start time), ON3(Wed. start time), NO4(Thur. start time), ON5(Fri. start time), ON6(Sat. start time), ON7(Sun. start time).

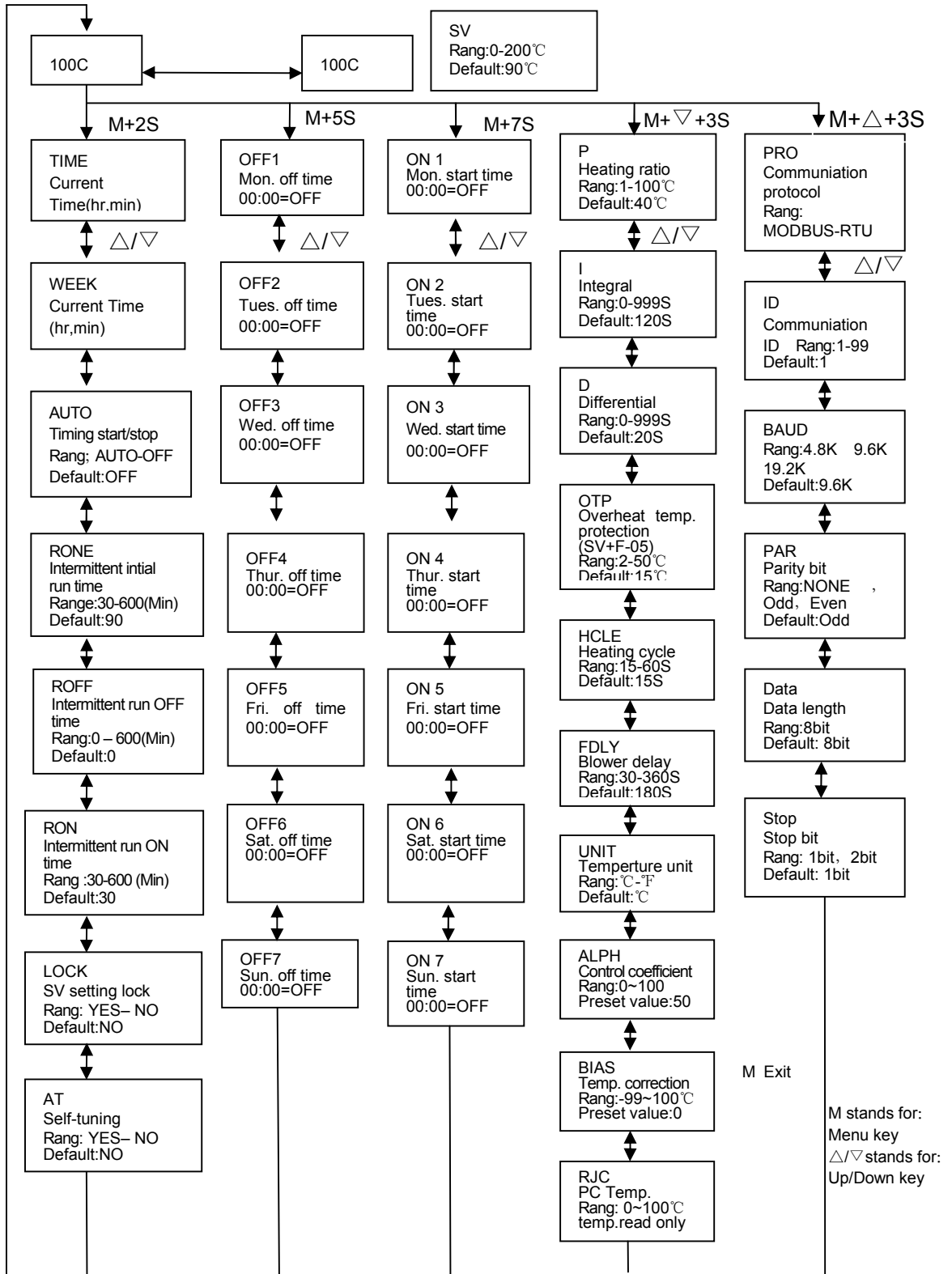
#### 4.1.7 Communication Setting (optional functions)

- 1) Press both “Menu” and “Up” for 3 seconds, it displays “PRO” (communication protocol) setting.  
**Notes: communication protocol is fixed to Modbus RTU protocol—“RTU”.**
- 2) Press “Up” key to enter “ID” (communication address) setting;  
**Notes: The communication address of every controller in the same system must be the only one, no repeat use. In principle: communication address of hopper 1 is 1, communication address of hopper 1 is 2, and so on.**
- 3) Press “Setup” key, the set value flickers, then press “Up”or “Down” key to add or decrease the value.
- 4) Press “Setup”key to confirm the input value;
- 5) Press “Up” key again and again, it displays “Baud” and “PAR” settings, (as below )
- 6) Repeat step 3 and step 4, then confirm the related input parameters.
- 7) Press “Menu” key to return operation menu.



<b>Communication Parameters</b>	<b>Communication Codes</b>	<b>Factory Default</b>
Communication Protocol	PRO	RTU
Communication Address	Id	1(current address)
Baud Rate	Baud	19.2K
PAR	PAR	none
Data Length	Data	8
Stop Bit	Stop	1

### 4.1.8 Operation Flow



### 4.1.9 Wrong Codes Remark



Wrong Codes	Remark
bR	Thermocouple break
oH	Overheat
REV	Temperature sensor reversely connected
oL	Overload
bAT	Battery error
EGO	EGO Over-temp
xATx	Auto-turning error

## 5. Maintenance and Repair

### 5.1 Blower

- 1) Clean the blower regularly (especially the air inlet path).
- 2) Eliminate the fan's dirt regularly to avoid the damage to the blower.

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

## 6. Troubleshooting

Fault	Possible Reasons	Solution
Blower rotating on the contrary with arrow	Blower circuit connection reverse phase.	Exchange two of the electrical wires.
Blower not turning	<ol style="list-style-type: none"> <li>1. Motor fault.</li> <li>2. Failures of solenoid switch.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check and change.</li> <li>2. Change or repair.</li> </ol>
Blower not rotating and not heating	<ol style="list-style-type: none"> <li>1. Overload jumped.</li> <li>2. Transformer fault.</li> <li>3. Fuse melted.</li> <li>4. Power supply fault.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check and change.</li> <li>2. Check and change.</li> <li>3. Check and change.</li> <li>4. Check if lack of phase.</li> </ol>
No temperature for blower runs while	<ol style="list-style-type: none"> <li>1. Lead sheet of heater pipe melted.</li> <li>2. Magnetic switch fault.</li> <li>3. Heater fault.</li> <li>4. Controller fault.</li> <li>5. Thermocouple fault.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check and change.</li> <li>2. Check and change.</li> <li>3. Check and change.</li> <li>4. Check and change.</li> <li>5. Change.</li> </ol>
The blower can run but temperature is too low	<ol style="list-style-type: none"> <li>1. Lead sheet of heater pipe fault.</li> <li>2. EGO broken.</li> <li>3. Magnetic switch is lack of phase.</li> <li>4. Controller is damaged .</li> </ol>	<ol style="list-style-type: none"> <li>1. Check and change.</li> <li>2. Check or re-set.</li> <li>3. Check and change.</li> <li>4. Change the temperature controller.</li> </ol>
The blower can run but temperature is too high	<ol style="list-style-type: none"> <li>1. Hot-air pipe is jam.</li> <li>2. Controller is fault.</li> <li>3. Magnetic switch contacts stuck up.</li> </ol>	<ol style="list-style-type: none"> <li>1. Cleaning.</li> <li>2. Change the controller or adjust PID.</li> <li>3. Change.</li> </ol>

Notes: Before inspecting or changing spare parts, ensure the main switch should be off.