SEHD

Energy-efficient Hopper Dryer

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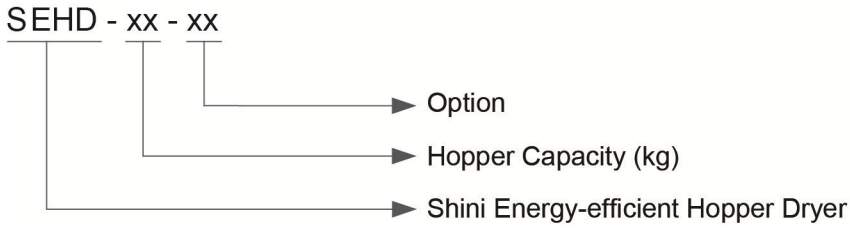
1. General Description

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

SEHD-200

1.1 Coding Principle



1.2 Feature

Optimal structure

- Down-blowing structure design reduces the different between inlet air temperature and heater temperature to ensure stable inlet air temperature.
- Adopt heat-insulated blower to prolong blower lifespan.
- The heating tank adopts double-layer insulation structure which not only can reduce the power consumption but also can avoid too high of the ambient temperature.
- All material contact surfaces are made of stainless steel to eliminate material contamination.
- Hopper separated from its base with cleaning door (except SEHD-12&25) for easy cleanliness.
- Models above SEHD-200 are equipped with the magnetic base.
- The SEHD-200~600 models are equipped with standard magnet bases, and SEHD-800~1000 models adopt manual butterfly valve with standard floor stand

User-friendly design

- SEHD-25-150 pipe heater with lead sheet connected and all series are equipped with the temperature protector as to prevent the pipe heater from dry burning.
- With overheat release function, when the drying temperature exceeds the set deviation value, the main power supply will be automatically cut off.
- All series are standard equipped with the one-week timer and intermittent operation function.
- All series are equipped with microcomputer control and RS485 communication interface.

- The max. drying temperature can reach 160˚C.

Energy efficient

- Compared with the test of standard SHD hopper dryer, the drying effect of SEHD increased by 60% on average, while the power consumption decreased by 40%.

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.

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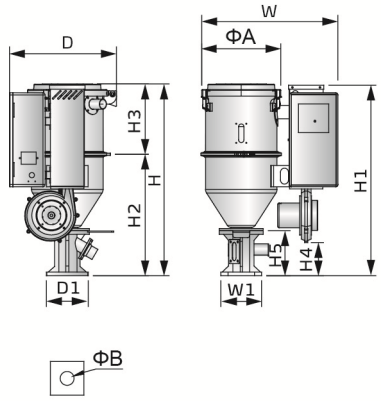
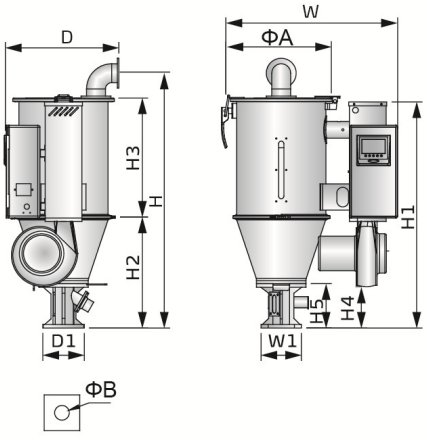
1.3 Technical Specifications

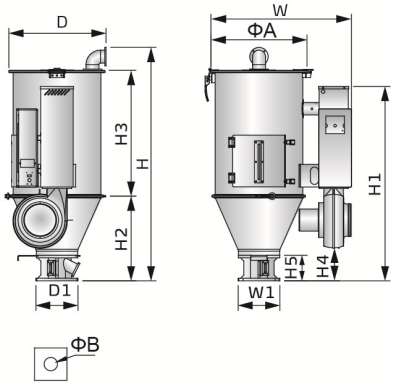
1.3.1 External Dimensions



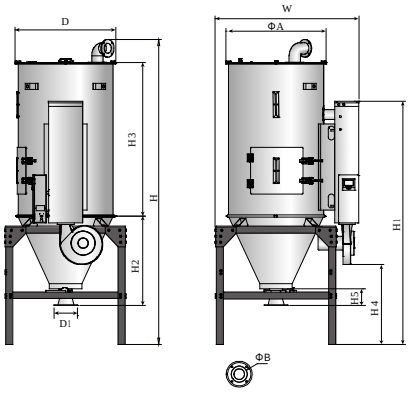
SEHD-12



SEHD-25



SEHD-50~600



SEHD-800~1000

Picture 1-1: External Dimensions

1.3.2 Specification

Table 1-1: Specification

Model SEHD-	12	25	50	75	100	150	200	300	400	500	600	800	1000
Ver.	B	A	A	A	A	A	A	A	A	A	A	B	B
Heater(kW)	2.2	3	3.9	4.2	6	6.6	8.4	9.6	18	19.2	21	21	24
Blower(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)	668	1010	1196	1476	1442	1782	1675	2038	2266	2382	2586	3060	3502
H1(mm)	668	754	939	939	1201	1201	1363	1363	1618	1618	1618	2442	2442
H2(mm)	430	404	452	452	523	523	617	617	844	844	844	2898	2898
H3(mm)	265	454	609	890	778	1118	820	1182	1183	1300	1504	1543	1975
H4(mm)	70	138	184	184	201	201	285	285	546	546	546	800	800
H5(mm)	115	150	150	150	158	158	231	231	288	288	288	167	167
W(mm)	514	638	709	720	864	864	986	986	1176	1176	1176	1448	1448
D(mm)	403	430	477	477	600	600	767	767	935	935	935	1012	1012
D1(mm)	130	158	158	158	238	238	218	218	345	345	345	234	234
W1(mm)	130	148	148	148	238	238	218	218	345	345	345	234	234
ΦA(mm)	299	387	470	470	594	594	750	750	910	910	910	1006	1006
ΦB(mm)	52	55	55	55	90	90	90	90	110	110	110	161	161
Weight (kg)	35	40	45	75	85	95	100	120	165	170	240	360	400

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

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

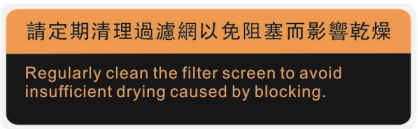
1.4 Safety Regulations

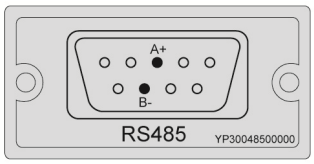
1.4.1 Safety Signs and Labels

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 presscure! 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.
	Protection device activates when overheat occurs； after faults are discharged,press blue key to reset and turn on the switch to Restart operation.
	Push-and-pull switch for shut-off plate: I: Means "Pull" O: Means "Push"
	Regularly clean the filter screen to avoid insufficient drying caused by blocking

	Communication interface RS485

1.5 Exemption Clause

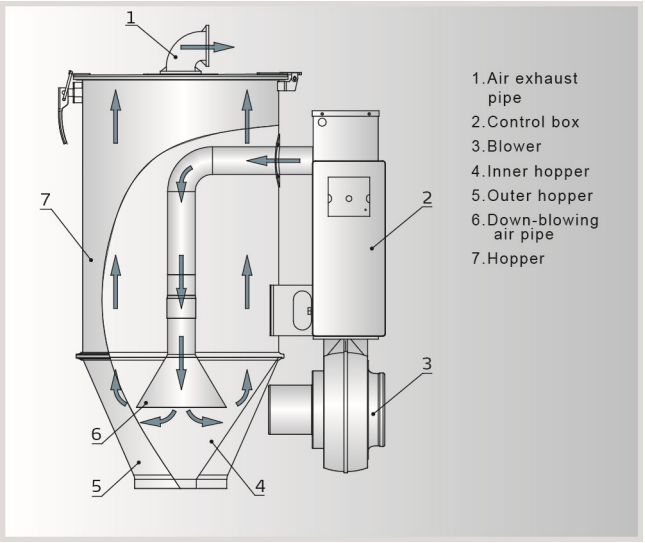
The following statements clarify the responsibilities and regulations born by any buyer or user who purchases products and accessories from Shini (including employees and agents).

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

The air blown out by the blower is heated by electric heating to form the high-temperature dry hot air. Through down-blowing air pipe and hopper bell, the hot air can be evenly blown upward from the hopper bottom. The plastic materials absorb the heat in the air, and the drying air temperature gradually decreases, so the temperature of materials at lower part of the drying hopper is higher than that in the upper part. The material enters the drying hopper from the upper part and is excluded from the bottom as to ensure the drying effect.

2.2 Options

2.2.1 Air Filter

Model	Diameter(mm)	Height(mm)	Applied to
ADC-2	205	728	SEHD-25~150
ADC-3	246	1024	SEHD-200~1000

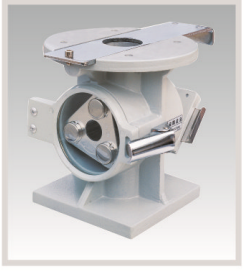
Effectively filter 99% of dust-contain air discharged from dryer to avoid air pollution.

2.2.2 Blower Inlet Filter

Model	Diameter(mm)	Height(mm)	Applied to
AIF-12	157	195	SEHD-12
AIF-25	157	195	SEHD-25
AIF-50	177	201	SEHD-50/75
AIF-100	219	191	SEHD-100/150
AIF-200	249	268	SEHD-200~300
AIF-600	221	380	SEHD-400~600
AIF-800	221	380	SEHD-800~1000

Notes: refill air input of the blower is adjustable.

2.2.3 Magnetic Base



Model	Applied to	Magnetic Frame	Height(mm)	Aluminum Holder×2
MB-12	SEHD-12	MR-3	193	88.5 × 78 × 2.3
MB-50	SEHD-25~75		231	
MB-100	SEHD-100~150		193	118.5 × 105 ×

Made of aluminum with built-in hopper magnet, can effectively separate metal scraps out to avoid material contamination. (The SEHD-200 and above models are equipped with the standard magnetic base.)

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		SEHD-12
HAR-25EH	157	2.5		SEHD-25
HAR-50 EH	175	3		SEHD-50/75
HAR-100 EH	219	3		SEHD-100/150
HAR-200 EH	245	4		SEHD-200~300
HAR-600 EH	245	4		SEHD-400~600
HAR-800	245	4		SEHD-800~1000

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

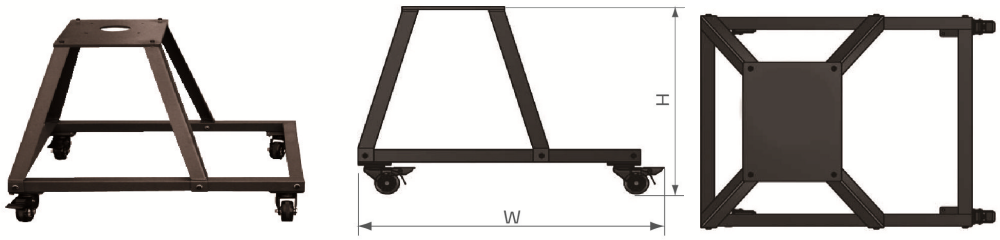
1) Hot air recycling and circulating avoids indoor temperature rising up.
2) Keep air in factory clean and ensure good product quality.
3) Heating by fast hot air circulation can lower energy consumption by 40%.

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)

2.2.6 N-Type Floor Stand



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

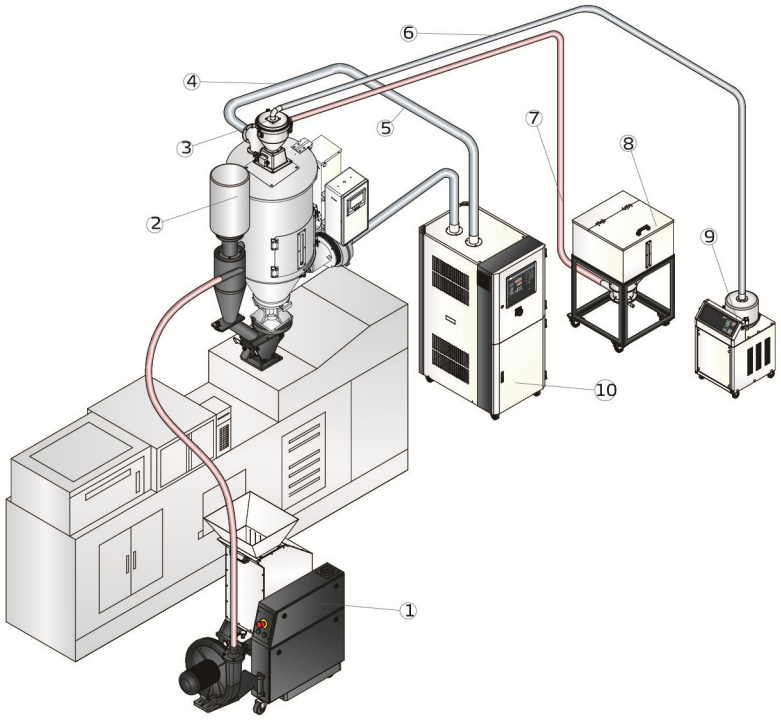
With which machines can be easily moved out of workplace which is suitable for the factories with height limited workshops, also it can make operations more convenient.

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



1. Low-speed granulator
2. 30-sec instant recycle
3. Vacuum hopper
4. Return air
5. Dehumidifying air
6. Vacuum pipe
7. Material pipe
8. Material tank
9. Auto loader
10. Honeycomb dehumidifier
11. Proportional valve
12. Photosensor hopper

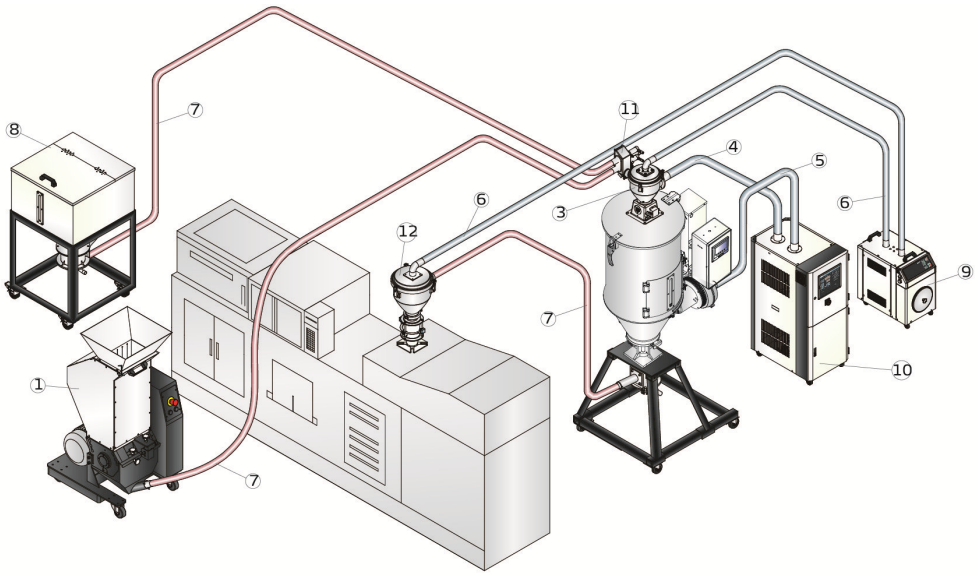
Picture 3-1: Direct Installation

Direct installation type is to mount the hopper dryer directly on the molding machine via a standard base. SEHD-12~300 is suitable for this mounting method

as well as floor stand installation type; SEHD-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



1. Low-speed granulator	2. 30-sec instant recycle	3. Vacuum hopper
4. Return air	5. Dehumidifying air	6. Vacuum pipe
7. Material pipe	8. Material tank	9. Auto loader
10. Honeycomb dehumidifier	11. Proportional valve	12. Photosensor hopper

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 derection 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

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, the heater stops heating. The blower shutdown is delayed until the drying process is stopped, and indicator turns yellow.

4.1.2 Temperature Setting

1) The setup number will flicker after pressing <Meun> 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>or<Down>key repeatly, till it display “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 <Set Key> to confirm if the temperature is locked.
5) Press<Menu>key to return operation menu.

Note: When the "LOCK" is set to "YES", the temperature setting will be locked that can’t be changed, and the Icons will appear on the interface.

4.1.4 PID Setting

1) Press both <Menu> and <Down> keys for 3 seconds, it shows “P” (heating proportional band) 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
Heating proportional band	P	5
Integral time	I	200
Differential time	D	30
Temperature for overheat protection	OTP	15℃
Heating switch cycle	HCLE	15
Blower shutdown delay	FDLY	180
Temp. unit	UNIT	℃

4.1.5 Intermittent Operation Setting

Hold<Menu> for about 2 secs. to set current time. Press <Up> or <Down> key to set the WEEK, AUTO (timer on/off), RPNE (the first time for intermittent operation), ROFF (the OFF time for intermittent operation), and RON (the ON time for intermittent operation).

4.1.6 One-week Timing Setting

1) Hold the <menu> for 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”.

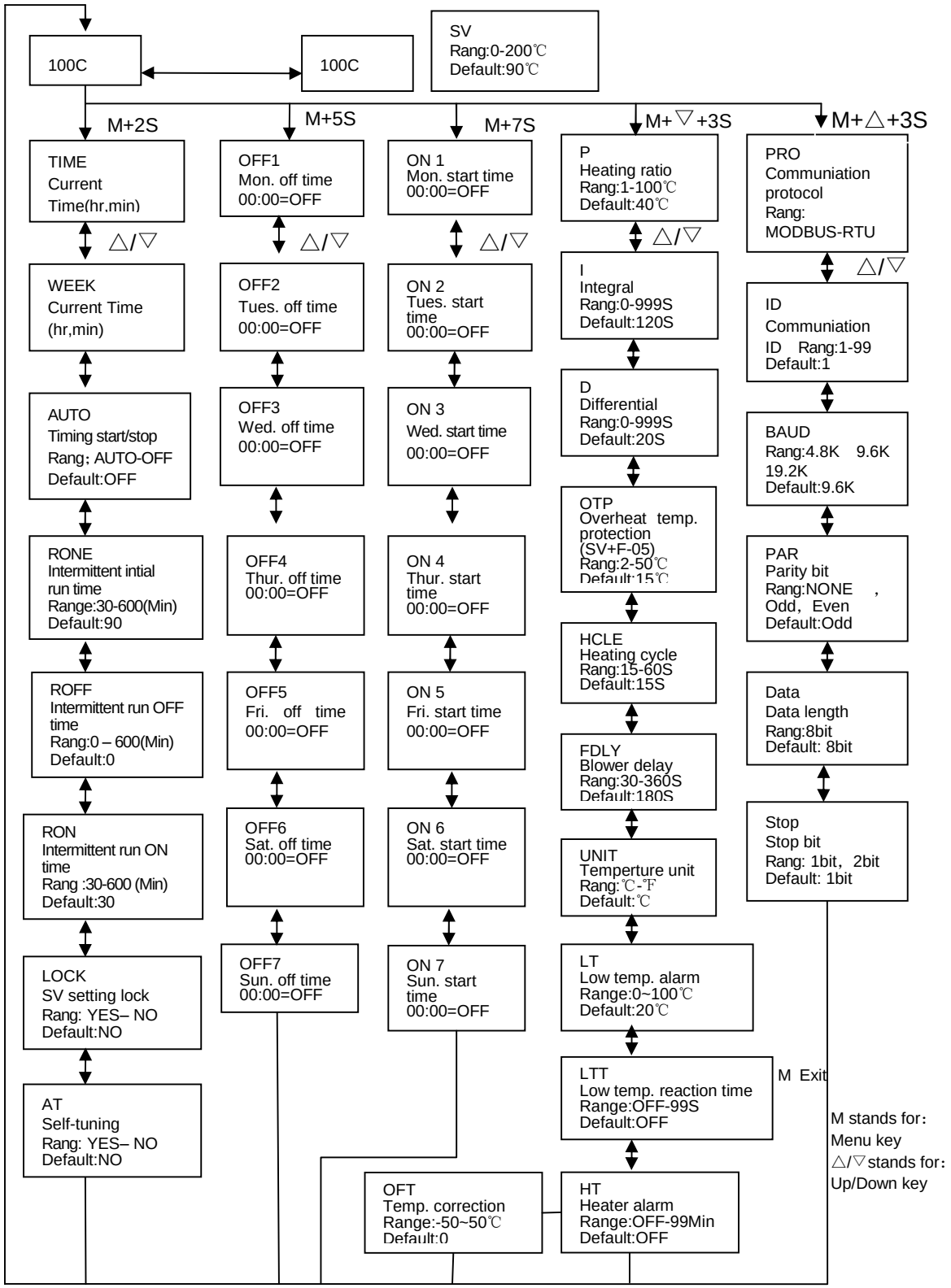
2) Press <Up>or <Down>key to enter “ID” (communication address) setting.

   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.

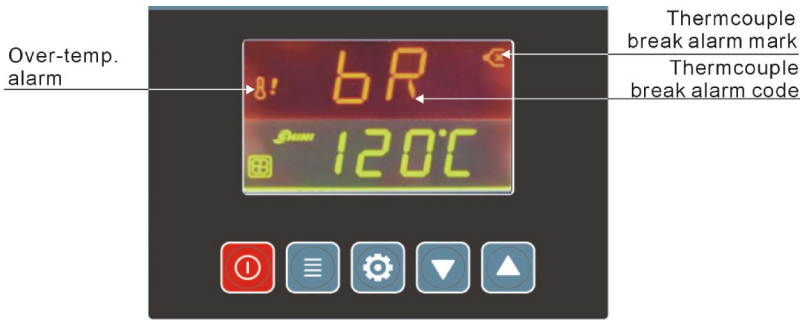
3) Press <Setup> key, the set value flickers, then press <Up>or <Down>key to add or decrease the value.
4) Press<Setup>key to confirm the input value;
5) Press <Up> key again and again, it displays “Baud” and “PAR” settings, (as below)
6) Repeat step 3 and step 4, then confirm the related input parameters.
7) Press<Menu> key to return operation menu.

Communication Parameters	Communication Codes	Factory Default
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
LT	Low temp. alarm
HT	Heater alarm

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.	Replace any two of the three power live wires.
Blower not turning	1. Motor fault. 2. Blower contactor is not closed.	1. Check and change. 2. Change or repair.
Blower not rotating and not heating	1. Overload jumped. 2. The blower and pipe heater don't work 3. The transformer circuit breaker fault.	1. Overheat reset 2. Whether the blower works normally. 3. Check the replacement
No temperature for blower runs while	1. Lead sheet of heater pipe melted. 2. Heater contactor fault. 3. Heater fault. 4. Controller fault. 5. Thermocouple fault.	1. Check and change. 2. Check and change. 3. Check and change. 4. Check and change. 5. Check and replace the thermocouple.
The blower can run but temperature is too low	1. Lead sheet of heater pipe fault. 2. EGO breaked. 3. The heater contactor is in phase shortage. 4. Controller is damaged .	1. Check and change. 2. Check or re-set. 3. Check and change. 4. Check the controller output and replace.
The blower can run but temperature is too high	1. Hot-air pipe is jam. 2. Controller is fault. 3. Magnetic switch contacts stuck up.	1. Cleaning. 2. Replace the controller 3. Check the wiring.

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