

# **SGD-EB**

## **"Budget" Series Gravimetric Doser**

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Version: Ver.A (English)





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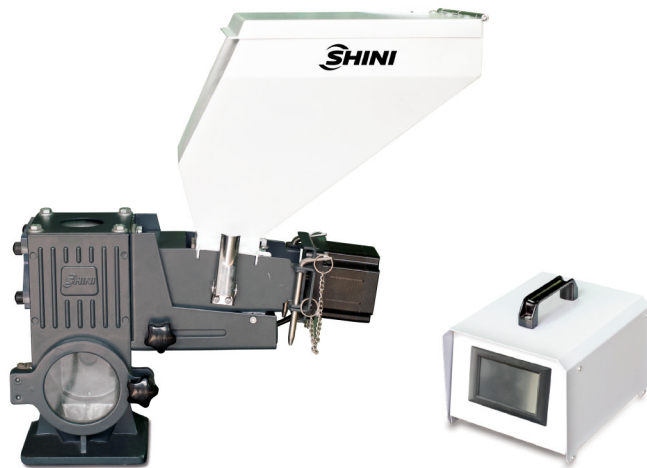
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# 1. General Description

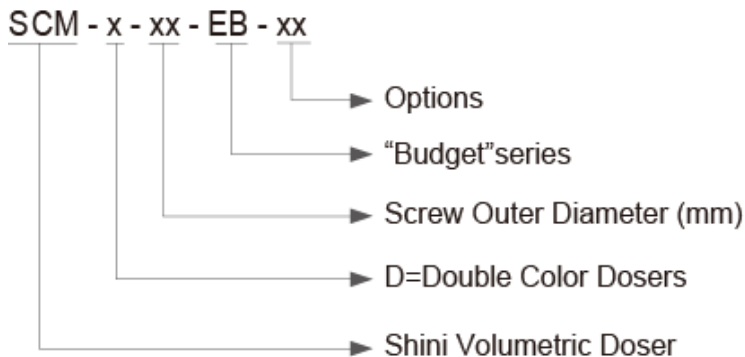


Please read this manual carefully before installation and using of the machine to avoid damage or personal injuries. SGD "Budget" Series Gravimetric Doser are suitable for auto-proportional mixing of virgin material, regrinds, masterbatch or additives. A stepping motor is coupled to a dosing screw of 12, 16, 20, and 30mm diameter to offer four models with different output ranging from 0.04 to 60kg/hr to clients. Double-color doser can be assembled from any two single color doser according to clients' requirements.



Model: Single Color Doser SGD-12-EB

## 1.1 Coding Principle



## 1.2 Features

- Dosing screws are chrome plated for durability.
- Unit is comprised of standard modules for ease of cleaning, disassembly and interchangeability.
- Three-tube hopper magnet is equipped at the base to absorb metal scraps in the material to avoid the damage of screw.
- The current operation mode can be recorded, unaffected by power failure so operation would be returned to normal when power is on.
- Set the manually discharging valve for easy replacement of master batch.
- SGD has weighing function that can automatically calibrate and monitor the master batch or additives, and automatically adjust when material bulk density changes.
- RS485 communication function that can transmit the data;
- Manipulate dosing process via integral weighing technology, satisfying the high requirement of production precision.
- Up to 100 groups of recipes can be stored.
- Suitable for extrusion or injection molding modes.
- Machine halts and sounds alarm when motor faults.

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

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

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

Headquarter and Taipei factory:

Tel: (886) 2 2680 9119

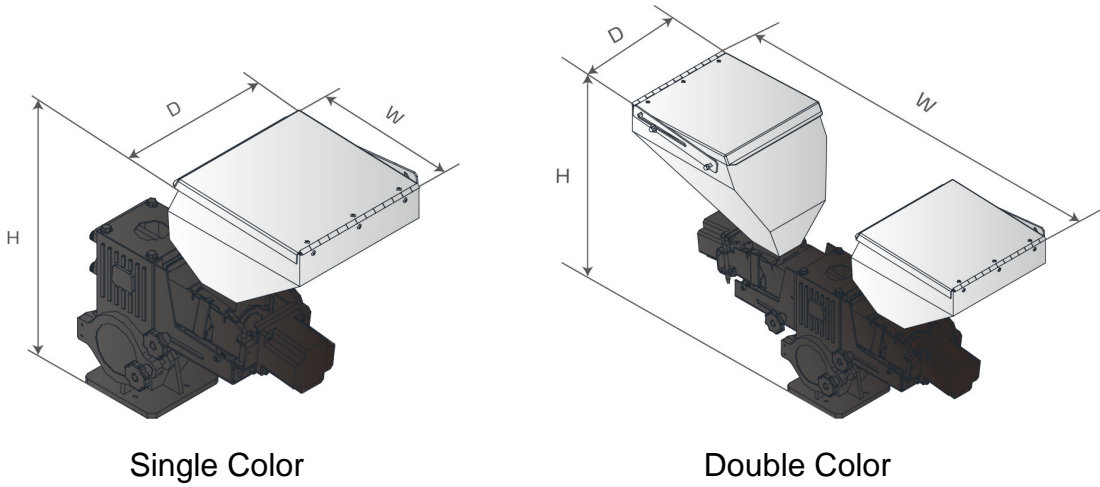
Shini Plastics Technologies (Dongguan), Inc:

Tel: (86) 769 8111 6600

Shini Plastics Technologies India Pvt.Ltd.:

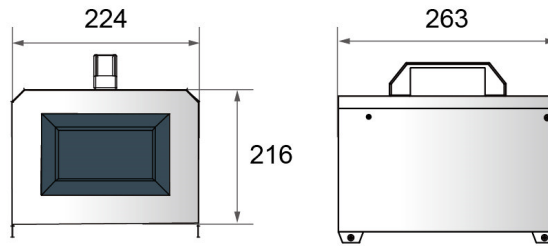
Tel: (91) 250 3021 166

### 1.3 Machine Specifications



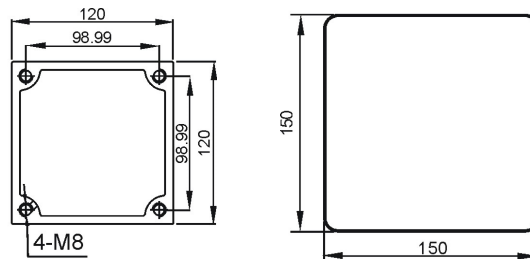
Picture 1-1: Dimensions

#### 1.3.1 Dimensions of Control Box



Picture 1-2: Dimensions of Control Box

#### 1.3.2 Base Installation Dimensions



Picture 1-3: Dimensions of Base



### 1.3.3 Specification List

Table 1-1: Specification List of Dimensions

Model	Single Color Unit				Double Color Unit
	SGD-12-EB	SGD-16-EB	SGD-20-EB	SGD-30-EB	SGD-D-EB
Ver. A	A	A	A	A	A
Motor Power (kW) (50/60Hz)	0.06	0.06	0.06	0.06	0.06×2
Mixer Power (kW, 50 / 60Hz)	0.25	0.25	0.25	0.25	0.25
Screw External Dia. (mm)	12	16	20	30	**
Output Capacity (kg/hr)	0.04~3.6	0.1~16	1.0~30	3.0~60	*
Storage Hopper (L)	10	10	10	10	10
Main Material Hopper (L)	Option (15)	Option (15)	Option (15)	Option (15)	Option (15)
Mixer	option	option	option	option	option
Floor Stand	option	option	option	option	option
H (mm)	535	535	535	535	535
W (mm)	550	550	550	550	970
D (mm)	290	290	290	290	290
Weight (kg)	17	17	17	17	30

Notes: 1) "\*" stands for the output capacity depends on model selected, We reserve the right to change specifications without prior notice.  
data of the single color doser can be a reference.

- 2) "\*\*" stands for external dia. of screw is up to model selected.
- 3) For additionally mount mixer on single color doser, add "MS" at the end of the model code.
- 4) When selecting screws with diameter of 30mm/1.2inch, the machine model should be followed by "L" to distinguish it from other three kinds of interchangeable screws.
- 5) All output capacities from above models are based on data from bulk density 1.2kg/L, dia. 2~3mm masterbatch in a test criteria of continuous running.
- 6) Power supply: 1Φ, 115/230V, 50/60Hz.

## 1.4 Safety Regulations

Strictly abide by the following safety guide to prevent damage of the machine or personal injuries.

Safety regulations should be abided by while operating the machine.

### 1.4.1 Safety Signs and Labels



All the electrical components should be installed by qualified electricians.  
Turn off the main switch and control switch during maintenance or repair.



Warning!

High voltage!

This sign is attached on the cover of control cabinet!



Warning! Be careful!

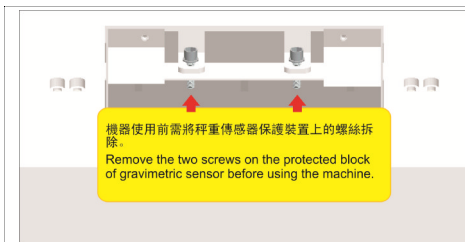
Be more careful at the place where this sign appears!



Attention!

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

### 1.4.2 Signs and Labels



Remove the two screws on the protected block of gravimetric sensor before using the machine.

## 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.

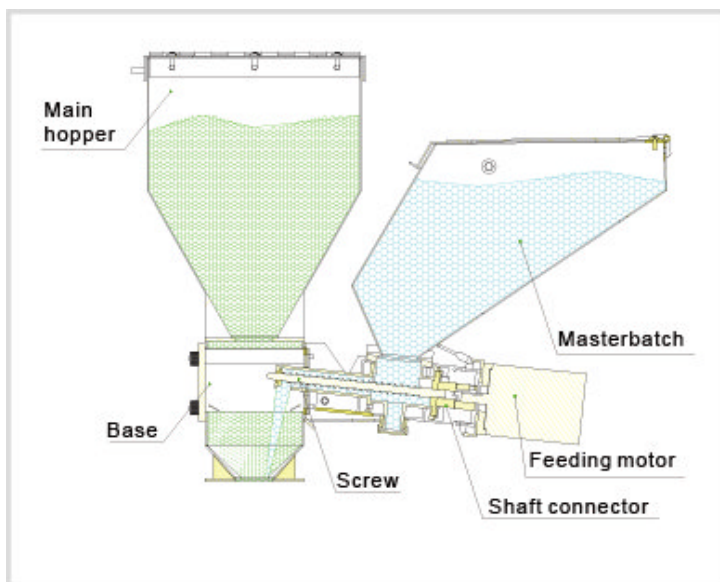
## 2. Structure Characteristics and Working Principle

### 2.1 Function Description

SGD-EB "Budget" Series Gravimetric Doser are suitable for auto-proportional mixing of virgin material, regrinds, masterbatch or additives. The motor with gear ratio of 38:1 is coupled to a dosing screw of 12,16,20 or 30mm in diameter to give a total of four models with the output ranging from 0.04~60kg/hr. Double color doser can be assembled from two single color doser according to customers, requirements.

### 2.2 Working Principle

#### 2.2.1 Working Principle of Single Color Gravimetric Doser



Picture 2-1: Single Color Doser Working Principle

Stepping motor is controlled via industrial PLC from the control box. The motor begins to work and the rotary force is transferred to dosing screw through shaft connector. Master batch in hopper falls into the groove of conveying screw, and then be taken to hopper base by rotating action of the screw. Load cell is adopted to precisely control master batch output to fulfill proportional dosing.

### 2.3 Options

#### 2.3.1 Main hopper

According to the main hopper required by customers.

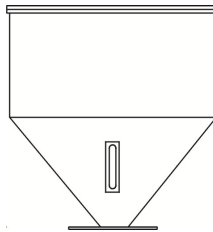
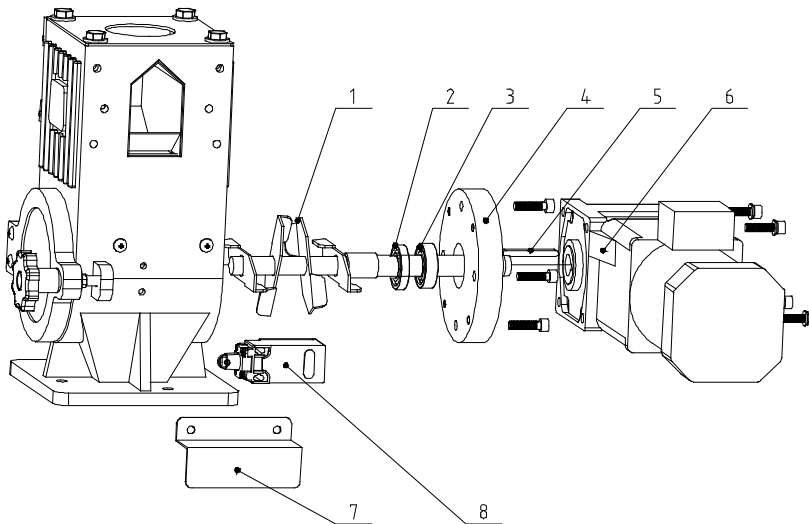


Fig. 2-2 Main hopper

### 2.3.2 Mixer system

According customer's demands to select the mixing system;



Notes: The Arabic numerals in the drawing refer to Parts List 2.3.3.

Fig. 2-3: Mixer system

### 2.3.3 Mixer Assembly Parts List

No.	Name	Material No.	No.	Name	Material No.
1	Mixing assembly	-	6	Gear box (220V)	YM50992200000
2	Framework oil seal	YR20172900000		Gear box(110V)	YM50991100000
3	NSK bearing 6003	YW11600300000	7	Safety switch fixed plate	-
4	Mixing fixed flange	-	8	Safety switch	YE16921200000
5	Square key C5*80	YW69058000000	9		

### 2.3.4 Floor stand

It requires SHD-100~300kg according to customer's demands, and SHD-160U~450U needs this optional floor stand.

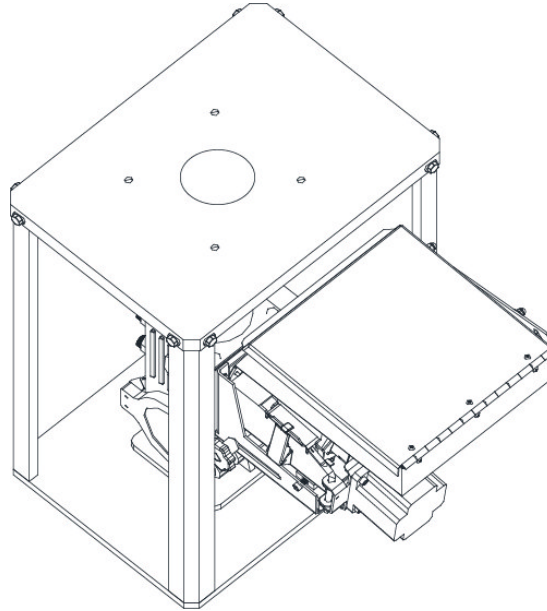


Fig. 2-4: Floor stand

### 3. Installation and Debugging

Please read through this chapter and install according to the order as below before installation!

This series of model can only be used in working environment with good ventilation.



The doser power connection must be done professional electrician!

#### 3.1 Power Connection

Connect power 1  $\Phi$  AC230V and earth wire to the control box of SGD, which also can be customized according to user's requirements.

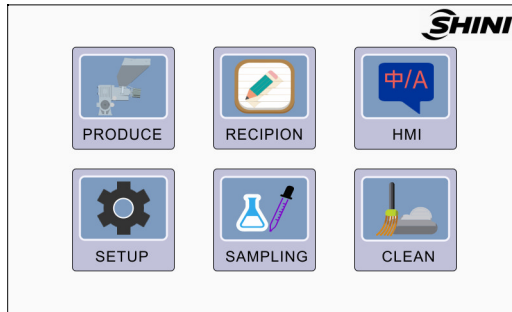
#### 3.2 Signal Connection

In injection mode, it receives the switch melt signal; in extrusion mode, it is the extruder 0 -10V running signal, as the circuit diagram for details.

## 4. Application and Operation

### 4.1 Operation Description

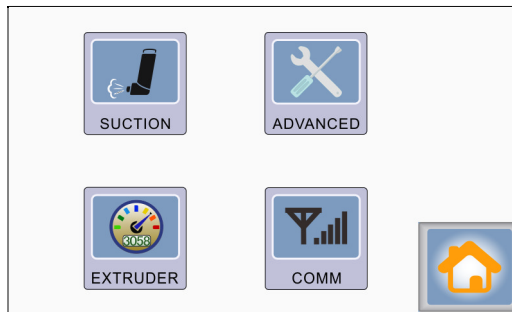
Turn on the power and enter the following screen:



#### 4.1.1 Configuration parameter settings

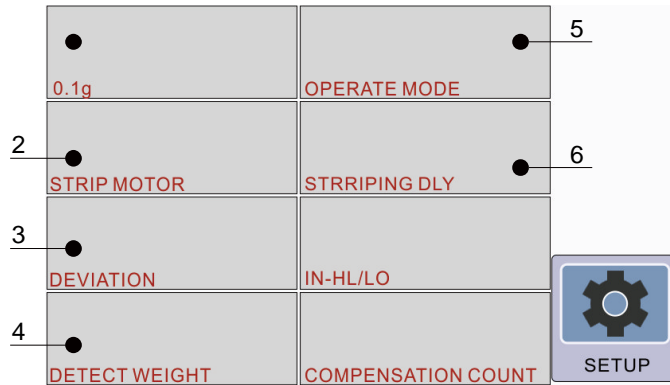
When users change parameter settings, it requires to input password: 55555

Click the parameter icon  to enter the screen as below:




Click machine parameter icon  to enter the screen as below:






- 1) It means whether the set finished weight has decimal point display;
- 2) Mixing motor: start this item when installing the mixing motor;
- 3) Deviation alarm: set the output weight deviation percentage, when the output weight is greater than the set value, it will alarm;
- 4) Weight detection: when started (ON), it will recalculate three times after it runs 20 times, and adjusts the speed automatically;
- 5) Working mode: continuous (as time operation - IMM mode), intermittent (stop when signal off), and synchronous (extruder mode) modes are available;
- 6) Mixing delay: continuous mixing after the suction;

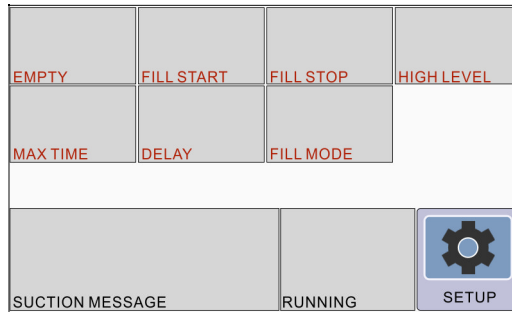


Press the parameter key  at the bottom right corner to return to the screen as below:






Click the loading parameter icon  to enter the screen as below:



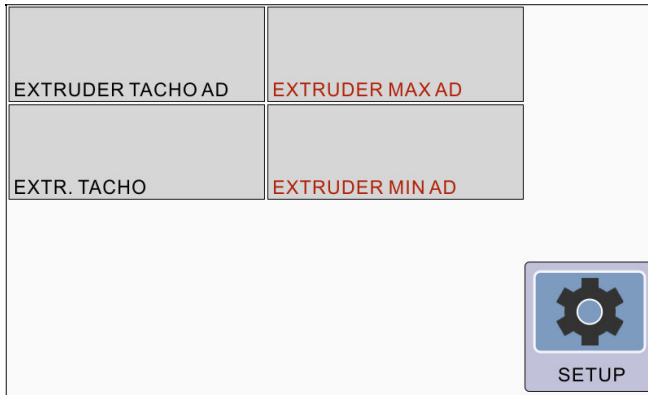
- 1) Low level: set the weight of hopper shortage alarm;
- 2) Feed supplement : Set auto feeding weight;
- 3) Feed supplement stop: set the weight of auto feeding
- 4) High level: set the weight of hopper over-weight alarm;
- 5) The maximum time: set the maximum time of feed supplement. It alarms shortage if overtime;
- 6) Delay: How long is the delay to start the automatic feeding function;
- 7) Feeding mode: AUTO (automatic), MAN (manual);




Press the parameter key  at bottom right corner to return to the screen as below:



Click the extruder calibration icon  to enter the screen as below:

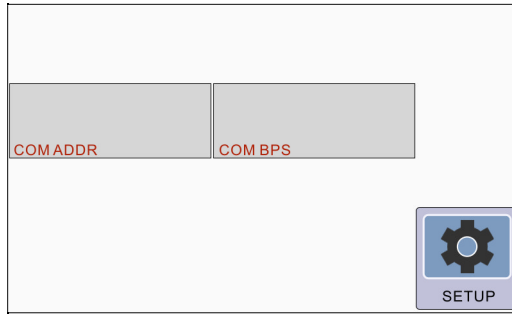


- 1) Adjust the "extruder" first, and adjust this production required maximum speed (DC 0 ~ 10V).
- 2) Press the extruder calibration, it will appear calibration page. First, stop the extruder, and add 2-3 to the value appearing in the "analog value of extruder tachometer".
- 3) Adjust the extruder to the maximum speed (the highest speed required for production), and fill the value appearing in the "analog value of extruder tachometer" into the "calibration value of extruder maximum rotating speed";


Press the parameter key  at the bottom right corner to return to the screen as below:

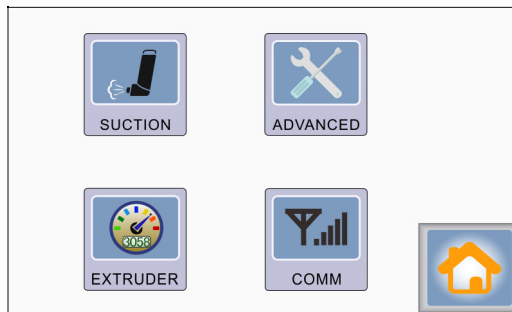



Click the communication icon  to enter the screen as below:

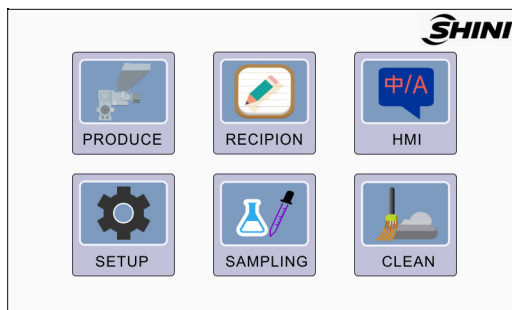


- 1) Protocol: MUDBUS-RTU
- 2) Address: 1(1-255)
- 3) Rate: 19200bps (9600bps,19200bps, 38400bps, 57600bps)
- 4) Data length: 8bit (The default can't be changed)
- 5) Stop bit: 1bit (The default can't be changed)
- 6) Check bit: None (The default can't be changed)

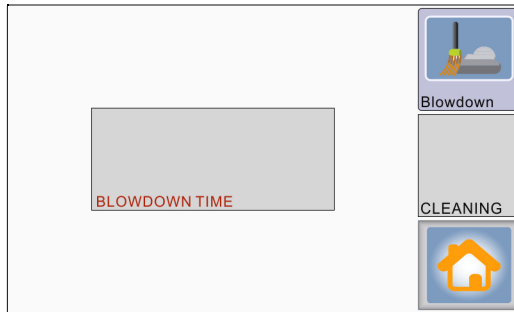
Press the parameter key  at the bottom right corner to return to screen as below:




Press the return button  at the bottom right corner to return to the screen as below:

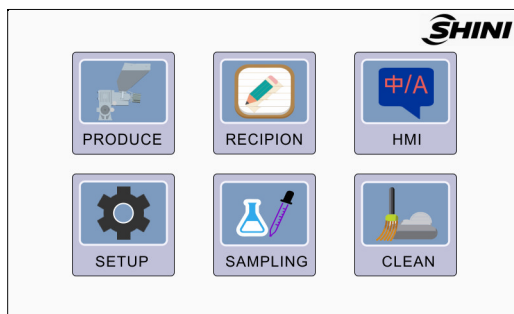


Click the cleaning icon  清扫 to enter the screen as below:

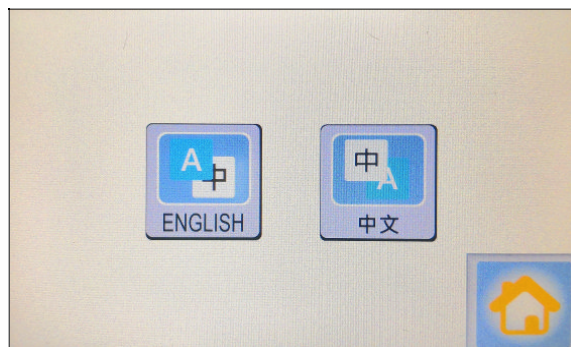


Press the cleaning time button, the cleaning time will be popped up in the window. Press the start cleaning button, the system will run according to the set time to remove the residues inside the screw.


Press the return key  at the bottom right corner, and return to the screen as below:

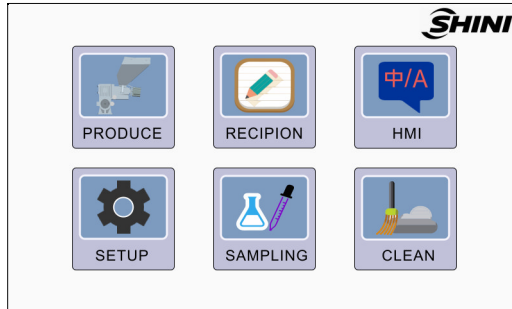


Click the icon  中/A 界面 to enter the screen as below:




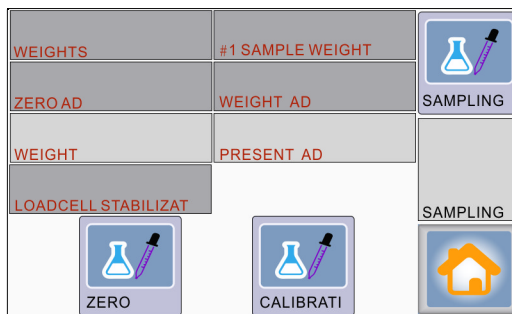
Select the Chinese/English screen according to demands;

Press the return button  at the bottom right corner to return to the screen as below:



#### 4.1.2 Calibration and Recipe Settings


Click the sampling icon  取样 to enter the following screen:

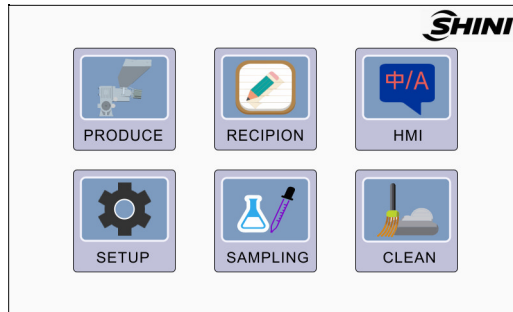


Scale calibration: If it enters this screen for the first or re-calibration, first clean the materials in the hopper, and input the weight to keep hopper cover opened or closed. Then, press the reset key after the scale stability of 15 secs. Place the weight into the hopper, and press the scale key after it becomes stable for 15 secs.

Sampling: press the sampling key at the upper right corner to sample and fill the sample weight automatically.

At this time, automatically sample 1 minute and delay 15 secs. It's necessary to ensure that the material in the hopper is sufficient, and the screw is fully filled with materials. Otherwise, it needs to sample again.

Press the return key  at the lower right corner to return to the screen as below:



Click the recipe icon  to enter the screen as below:

### Screen in extruder mode




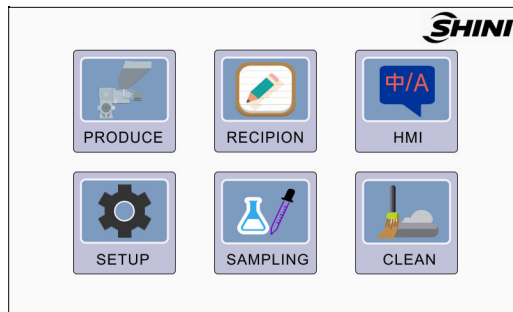
### Screen in injection mode

- 1) Finished weight  
After pressing it, the keyboard will pop up that can set the finished product weight of each mould (extruder capacity).
- 2) Masterbatch percentage  
After pressing it, the master-batch proportion can be set.
- 3) Injection melting (not included in extrusion mode)  
After pressing it, the operation time can be set.

- 4) Masterbatch additional unit  
After pressing it, the keyboard can be popped up that can set the unit of gram or percentage when adding the masterbatch;
- 5) Screw rotating speed setting  
After pressing it, the keyboard will pop up that can set the screw rotation speed.
- 6) Calculation

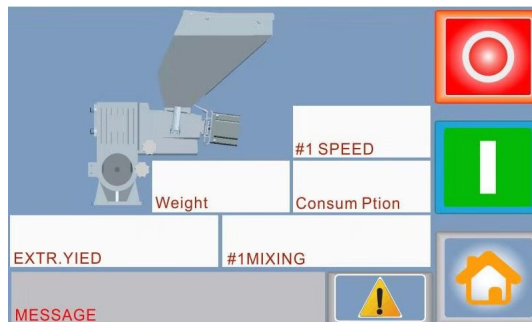
After pressing it, the system starts to rotate and automatically calculate six times according to the settings (the extruder mode will be longer).

Press the return key  at the lower button to return to the screen as below:



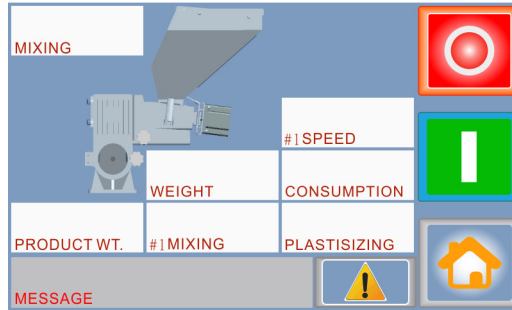
#### 4.1.3 Production operation

Click the production icon  to enter the screen as below:




Screen in injection mode







Screen in extrusion mode

After selecting the operation mode, relevant parameters can be set, and press the

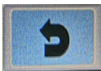
startup key. If  has signal in the injection mode, the machine will discharge the materials according to set melting time (in the extrusion mode- machine will discharge if there's 0-10V voltage input). Once error alarm occurs, press the

warning button  at the right corner to check relevant fault information in the figure as below:



Press the clear button  to clear the information on current screen; and

press the alarm key  to stop buzzer alarm output temporarily; Press the

return key  to return to production screen.

## 4.2 Material replacement

1. Loosen the hopper snap hook to pull out the hopper with the screw, rotate the screw fixed plate, loosen the screw, remove the screw and pour out the masterbatch. It also can use the compressed air to blow away masterbatch residuals.
2. Add masterbatch;

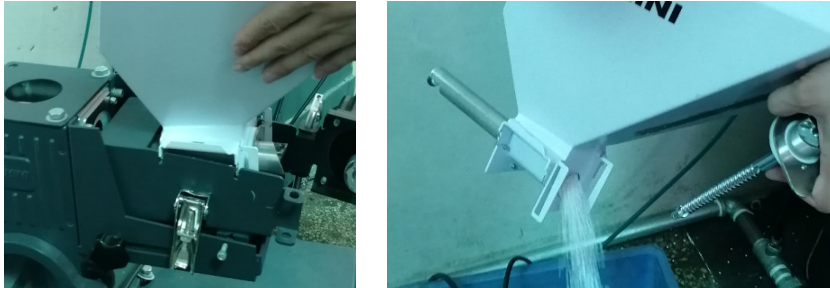


Fig. 4-1: Change the material

## 4.3 Screw replacement

1. Cut off the power and loosen the hopper snap hook to pull out the hopper and screw, rotate the screw fixed plate, loosen the screw, remove and replace the screw. When replacing the screws, the sleeves must also be replaced (Screws of different diameters are equipped with screw sleeves of different diameters).
2. Assemble according to the reverse order.

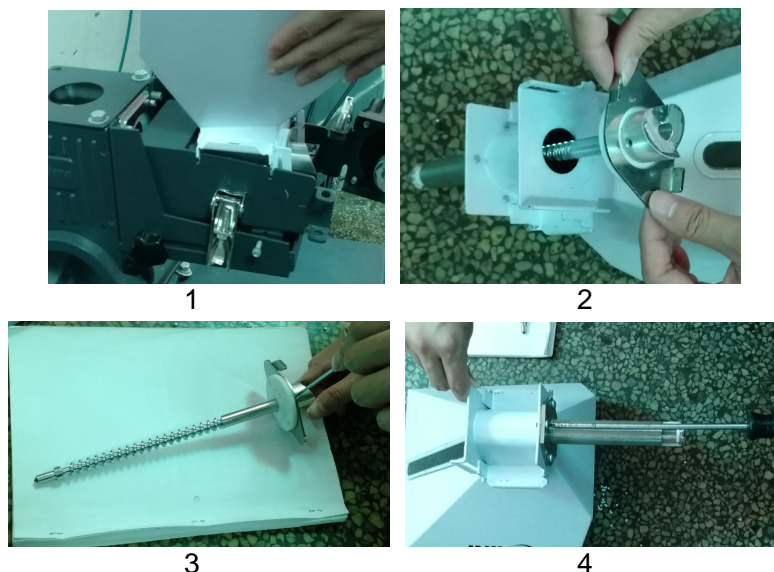


Fig. 4-2: Screw replacement

## 5. Trouble Shooting

Failures	Possible reasons	Solutions
No indicates on the control cabinet.	1. Power supply not connected	1. Connect power supply.
	2. Fuse burnt out or control board damaged	2. Replace the fuse or check control board.
Metering motor does not work.	Metering motor wire loose or motor failure.	Fasten motor wire or replace metering motor.
Load cell wire is broken.	Load cell not well connected or sensor failure.	Fasten wire or replace sensor.
Formula setting is wrong.	Exceed machine's output limit.	Reset formula.

## 6. Maintenance and Repair

### 6.1 Repair

All the repair work should be done by qualified technicians to prevent personal injuries and damage of the machine.

### 6.2 Maintenance

Keep the surface of machine clean.

### 6.3 Maintenance Schedule

#### 6.3.1 About the Machine

Model \_\_\_\_\_ No. \_\_\_\_\_ Manufacturing date : \_\_\_\_\_

Voltage \_\_\_\_\_  $\Phi$  \_\_\_\_\_ V Frequency \_\_\_\_\_ Hz

Total power: \_\_\_\_\_ kW

#### 6.3.2 Check after Installation

- Check that dosing screws are fitted correctly.
- Check the snap hook is tightly locked.
- Check if the mounting base is firmly locked.

#### Electrical Installation

- Voltage: \_\_\_\_\_ V \_\_\_\_\_ Hz
- Fuse melt current: 1 Phase \_\_\_\_\_ A 3 Phase \_\_\_\_\_ A
- Power supply and signal wire of control cabinet are correctly connected.

#### 6.3.3 Daily Checking

- Check the main switch.
- Check fastening screws of mounting base.

#### 6.3.4 Weekly Checking

- Check if there damaged electrical wires.
- Check snap hooks are loose or not.
- Check if the side holding plate is loose or not.