

SG-M

Medium Speed Granulator

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Version: Ver. B (English)



Contents

1. General Description	7
1.1 Coding Principle.....	8
1.2 Feature	8
1.3 Safety Regulations.....	10
1.3.1 Safety Signs and Labels.....	10
1.3.1 Transportation and Storage of the Machine	10
1.4 Exemption Clause.....	12
2. Structural Features and Working Principle.....	14
2.1 General Description	14
2.1.1 Working Principle.....	14
2.2 Safety System.....	14
2.2.1 Main Power Switch	15
2.2.2 Emergency Stop Switch	15
2.2.3 Safety Switch.....	15
3. Installation and Debugging	17
3.1 Installation Place.....	17
3.2 Power Connection.....	19
3.3 Installation Notice.....	19
3.4 Options	20
3.4.1 Manual collection bin.....	20
3.4.2 Regrind Conveying via Blower& Cyclone (PC type)	20
3.4.3 Feed Box with Cover	21
3.4.4 Magnet Feed Box	21
3.4.5 Food & Medical Grade.....	21
3.4.6 Auto Pneumatic Feeding Inlet	21
3.4.7 30-Sec Instant Recycling System- VR Type.....	22
3.4.8 30-sec. Instant Recycling System –PR Type	23
3.4.9 Multi-function Control Box	24
3.5 Options	24
3.5.1 Special screen.....	24
3.5.2 Slant hole screen.....	25
4. Use and Operation	26

4.1	Prestart Check	26
4.1.1	Before First Startup	26
4.1.2	Check the Motor Rotation Direction.....	26
4.1.3	Two Hours after First Start	27
4.1.4	20~30 Hours after the First Startup	27
4.2	Open the Feed Box, Screen and Collection Box.....	27
4.2.1	Open the Feed Box	27
4.2.2	Open the Storage Collective Hopper	28
4.2.3	Open the Screen	28
4.3	Multi-function Control Box Panel Description (Option).....	28
4.3.1	Multi-function Control Box Main Power Switch	28
4.3.2	Multi-function Control Box Home Page.....	28
4.3.3	Alarm Screen.....	29
4.3.4	Multi-function Control Box Display Screen Switching	29
4.3.5	Function Menu.....	30
4.3.6	User Parameter Table	31
4.3.7	Manufacturer Menu	32
4.3.8	Fault List.....	33
4.3.9	Manufacturer Parameter Table.....	34
4.4	Operation Instruction of Direct Drive Controller (Standard Model).....	36
4.4.1	Main Interface.....	37
4.4.2	Alarm Interface	37
4.4.3	Operation Instruction	38
4.4.4	Parameter Initialization	39
4.4.5	Current Inquiry.....	40
4.4.6	Quick Setting of Motor Rated Current.....	40
4.4.7	Factory Parameter Setting.....	40
4.4.8	Fault List.....	41
5.	Trouble-Shooting	43
5.1	Granulator Can Not Work	43
6.	Maintenance and Repair	45
6.1	Installation of the Motor and Blade Rest	45
6.1.1	Motor installation	45
6.1.2	Blade rest installation	46

6.2	Installation of Screen, Screen Bracket, and Storage Box	46
6.2.1	Blade Replacement	48
6.3	Installation of Cutters	49
6.4	Lubrication	51
6.4.1	Lubricating Oils (The following brands of lubricating oil can be used)	51
6.4.2	Lubricating Method	51
6.5	Maintenance	51
6.5.1	Daily Check	51
6.5.2	Weekly Check	52
6.5.3	Monthly Check.....	52
6.6	Cleaning.....	52
6.7	Maintenance Schedule	53
6.7.1	About the Machine.....	53
6.7.2	Check after Installation	53
6.7.3	Daily Check	53
6.7.4	Weekly Check	53
6.7.5	Monthly Check.....	53
6.7.6	Check Half-yearly or Every 1000 Running Hours	54
6.7.7	3 Year Checking	54

Table Index

Table 4-1: Function Menu Description.....	31
Table 4-2: User Parameter Description	31
Table 4-3: Manufacturer Menu Description	32
Table 4-4: Direct Drive Controller Panel Description	36
Table 4-5: Timer Mode Instruction.....	39
Table 6-1: Cutters and Other Fixing Screw Torque	50

Picture Index

Picture 1-1: Medium Speed Granulator SG-M23.....	7
Picture 2-1: Working Principle	14
Picture 2-2: Main Power Switch.....	15
Picture 2-3: Emergency Stop Switch	15

Picture 2-4: Safety Switch	16
Picture 3-1: Installation Place	18
Picture 3-2: Adjustable Foot Castor	18
Picture 3-3: Installation Space	19
Picture 3-4: Manual collection bin	20
Picture 3-5: Regrind Conveying Via Blower& Cyclone (PC type)	20
Picture 3-6: Feed Box with Cover	21
Picture 3-7: Magnet Feed Box	21
Picture 3-8: 30-Sec Instant Recycling System- VR Type	22
Picture 3-9: 30-sec. Instant Recycling System-PR Type	23
Picture 3-10: MFB Control Box	24
Picture 3-11: Special Screen	24
Picture 3-12: Slant hole screen	25
Picture 4-1: Multi-function Control Box Panel Diagram(option)	28
Picture 4-2: Main Power Switch	28
Picture 4-3: Home Page	29
Picture 4-4: Alarm Screen	29
Picture 4-5: VR Positive Pressure Conveying Screen, Proportional Valve State Screen, and Unit State Screen	29
Picture 4-6: Multi-function Control Box Quick Modification Running Stop Time	30
Picture 4-7: Multi-function Control Box Quick Modification of the Proportional Valve's Open and Close Time	30
Picture 4-8: Multi-function Control Box Inquiry/ Reset Fault	30
Picture 4-9: Manufacturer Function Menu	32
Picture 4-10: Factory Debugging	33
Picture 5-1: Cutting Chamber Cutter	44
Picture 6-1: Motor Installation	46
Picture 6-2: Blade Rest Installation Diagram	46
Picture 6-3: Screen and the Installation	47
Picture 6-4: Screen Bracket and the Installation	47
Picture 6-5: Lock the screen bracket push plate buckle	47
Picture 6-6: Installation of Storage Box	48
Picture 6-7: Open the Cutting Chamber	48
Picture 6-8: Blade Replacement	49
Picture 6-9: Installation of Fixed Blade	49

Picture 6-10: Fixed Blade Fixing Screw on the Case Block.....	50
Picture 6-11: Rotating Blade and Screws	50
Picture 6-12: Lubricating Method.....	51
Picture 6-13: Star Knobs	52

1. General Description



Please read this manual carefully before using this machine in order to operate correctly against any damage caused due to improper operation.



Note!

Always take great care when the knives are within reach, they are very sharp and can cause personal injury.



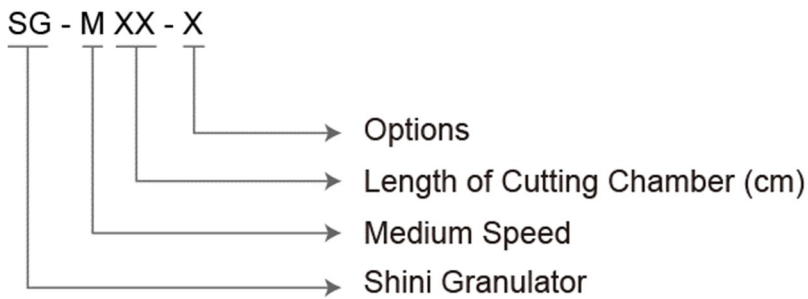
Forbidden to process flammable or toxic material!

The SG-M series granulators are economically efficient and applicable to granulator various kinds of plastic materials from injection moulding and blow moulding, and waste materials.



Picture 1-1: Medium Speed Granulator SG-M23

1.1 Coding Principle



1.2 Feature

- 1) Integrated microcomputer can monitor the granulator working, with timer running, phase sequence detection and current detection functions.
- 2) The machine can be set to run at intervals according to the actual demands, saving up to 50% energy.
- 3) Adopt brand gear motor that features stable performance, long service life and large torque.
- 4) Gear motor is connected with the main shaft with the coupling, making it easy to replace cutters and gear motor.
- 5) Staggered blades adopt V-type cutting technology, which pushes the feeding material into the center of the cutting rotor to prevent the material from adhering to the inner side of the cutting chamber while enhancing its durability.
- 6) Unique staggered shape with double edge design allows the cutters to be mounted directly without clearance adjustment and maintain a fixed cutting curve and clearance after wear, which can significantly reduce the downtime for cutter disassembly and assembly.
- 7) The staggered blade can be capsized if one side is blunt, and the fixed blade can be reshaped after being reused for four times, thus enhancing the cutter's durability.
- 8) Optimal cutting angle makes resistance small and avoid blockage to improve cutting efficiency.
- 9) The non-slip handle design, with leveling castors at the machine bottom enables seamless switching between mobile and stationary modes. To move the machine, rotate the upper foot pad to lower the castors on the ground for easy movement. To secure the machine, rotate the lower foot pad to lift the castors off the ground for deadlock, thus avoiding shaking.

- 10) The front and rear fixed cutter and staggered blade are in double-edged design, and the cutter or blade can be capsized if one side is blunt to double their service life.
- 11) Feed box with visual window, and double-layer sound proof are made of stainless steel.

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

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

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

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Shinden Precision Machinery (Chongqing), Inc.:

+86 (0)23 6431 0898

1.3 Safety Regulations

Follow the instructions in this manual to avoid personal injury and damage to machine components.

Note: The noise is 85~90dB (A) during granulating.

1.3.1 Safety Signs and Labels



Electrical installation must only be done by a competent electrician!

Otherwise, there is a risk of electric shock!



Before the granulator is opened for servicing and maintenance, always disconnect the power with both the main switch and the control switch on the granulator.



Don't put any part of the body to enter the granulator before the main switch and control switch are turned off!



High voltage! Danger!

This sign is attached on the control box and the wiring box.



Be careful with the rotating knives, they are very sharp and can cause personal injury!



If the rotor must be turned manually-do this with great care!



The granulator should not be able to start before the feeding box and storage boxes are properly closed.



Ear protection is used during granulating of plastic materials.



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

1.3.1 Transportation and Storage of the Machine

Transportation

- 1) SG-M series of granulators are packed in plywood cases with wooden pallet at the bottom, suitable for quick positioning by fork lift.
- 2) Equipped with castors for easy transport after package dismantling. As these are large machines without castor, which requires forklift for transport. Don't rotate the machine and avoid collision with other objects during transportation to prevent improper functioning.
- 3) 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.
- 4) The machine and its attached parts can be kept at a temperature from -25°C to $+55^{\circ}\text{C}$ for long distance transportation and for a short distance, it can be transported with temperature under $+70^{\circ}\text{C}$.

Storage

- 1) SG-M series should be stored indoors with temperature kept from 5°C to 40°C and humidity below 80%.
- 2) Disconnect all power supply and turn off main switch and exigency stop switch.
- 3) Keep the whole machine, especially the electrical components away from water to avoid potential troubles caused by the water.
- 4) Use plastic film to cover the machine tightly to prevent the machine from dust and rains.

Working environment

Indoors in a dry environment with max. temperature $+45^{\circ}\text{C}$ 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 electric 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 over 3,000m.
- 5) At least 1m surrounding space is requested when this equipment is running. Keep this equipment away from flammable sources at least two meters.
- 6) In the work area of vibration and strong magnetic force

Rejected parts disposal

When the equipment has run out its life time and can't be used any more, unplug the power supply and dispose of it properly according to local code.



Fire hazard!

In case of fire, CO₂ dry powder fire extinguisher should be applied.



Flammable materials or materials which are contaminated by flammable materials/liquid should not be processed in the granulator. Serious risk of fire or explosion may cause personnel injury.



The danger of blockage! Especially during manual feeding (plastic films, fibers, strips, or other similar items), please contact Shini company or local agent to confirm!



It is very important to tighten the screw as required torque.



If process item is longer than feed port, please cut long items into half until the length is shorter than the feed port before processing.



Please don't put materials into the granulator if they are thinner than 2 mm and are soft and flexible, like rubber.

1.4 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.

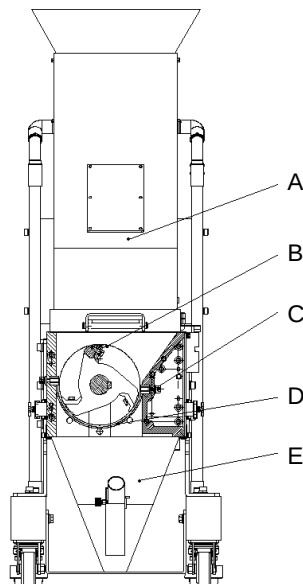
- 3) Any operational actions that are not authorized by Shini upon machine, including adding or replacing accessories, dismantling, delivering or repairing.
- 4) Employing consumables or oil media that are not appointed by Shini.

2. Structural Features and Working Principle

2.1 General Description

The SG-M series granulators are applicable to crushing waste materials for direct recycling and reuse. It's necessary to remove metal debris and impurities before crushing. The granulator is controlled through the control panel, main power switch, safety switch and emergence stop switch.

2.1.1 Working Principle



Parts name:

A. Feed box B. Rotating blade C. Fixed blade D. Screen E. Storage box

Picture 2-1: Working Principle

After the material drops into the cutting chamber from the feed box (A), the rotating blades (B) and fixed blades (C) will crush the materials, which will fall into the storage box (E) in the cutting chamber through the screen. The storage box, screen mesh, and screen bracket can be removed. The feed box is openable for cleaning and maintenance.

2.2 Safety System

To avoid accidental bodily injury during granulator running, a set of safety system has been designed.

High-speed rotating cutter is located in the granulator and subject to accident. So

safety system has been set up to protect bodily safety.

In any cases, the safety system cannot be changed at random. Otherwise the machine will be under dangerous condition and subject to accident happening. The maintenance and preservation of safety system shall be done by professional staff. In case the safety system of granulator is changed, our company will not perform our commitment. The replacement of all spare parts will be done by SHINI Company.

2.2.1 Main Power Switch

A main power switch is installed on the side the granulator control box. Rotating the knob as the arrow direction to power on or power off the machine.



Picture 2-2: Main Power Switch

2.2.2 Emergency Stop Switch

There is one red button on the control panel. Upon pushing it, the machine will stop running. Turn the button in the arrow direction as shown on the button, the button will reset (counter-clockwise).



Picture 2-3: Emergency Stop Switch

2.2.3 Safety Switch

There's a circuit breaker safety switch between the feed box and storage collective hopper of the granulator's cutting chamber. The power will be cut off to stop the machine if either or both blades are pulled out from the safety switch body. Ensure that both plugs are inserted back into the safety switch before re-powering on the machine.



Picture 2-4: Safety Switch

3. Installation and Debugging

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



Read through this chapter before installation.



Install as following orders to avoid any accident!



Be careful! Not to be cut by the sharp blade.



Power connection must be done by the professional electrician to avoid electrical shock.



Caution!

Cutters should be laid level, prevent the cutters from self-rotating during installation. Don't let your hands be near to the cutters to avoid personal injury.



Notice!

Do not install the cutters by working together, because this could bring personal injury. Use a thick wood block to stop the rotating knives from turning.



Attention!

Wear gloves to avoid being cut and be careful of the sharp blades!



Notice!

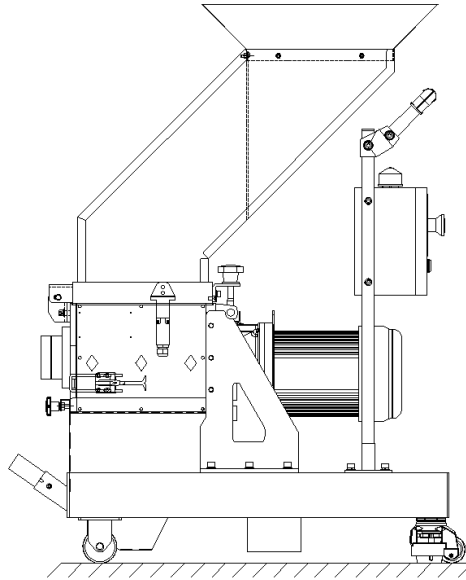
Please use new screws and gaskets when installing blades.

3.1 Installation Place



Make enough installation space to facilitate the repair and maintenance.

Check and make sure the installation ground is level, and there is enough intensity when it is running.



Picture 3-1: Installation Place

Make at least 1 meter clearance around the machine to facilitate repair and maintenance.

Fixation: When not moving the machine, it's necessary to use a wrench to rotate the fastening knob and extend the adjustable foot castor to fix the machine, in order to avoid shaking during operation.

Movement: When moving the machine, first loosen the knob by hand or a wrench, retract the adjustable foot castor, and then move it.



Picture 3-2: Adjustable Foot Castor

Keep a clearance space (at least one meter) around the machine for convenient maintenance and repair.



Picture 3-3: Installation Space

3.2 Power Connection

- 1) Make sure voltage and frequency of the power source comply with those indicated on the manufacture's plate, which is attached to the machine.
- 2) Power cable and earth connections should conform with local regulations.
- 3) Use independent power cable and ON / OFF switch. The cable's dia. Should not smaller than those applied in the control box.
- 4) The power cable connection terminals should be tightened securely.
- 5) This series of power supplies adopts three phase five wire, with power supplies (L1, L2, L3) connected to the live wire, neutral wire (N), and grounding wire (PE).
- 6) Power supply requirements:
Main power voltage: $\pm 5\%$
Main power frequency: $\pm 2\%$
- 7) ***Power connection refers to the circuit diagram of each model.***

3.3 Installation Notice

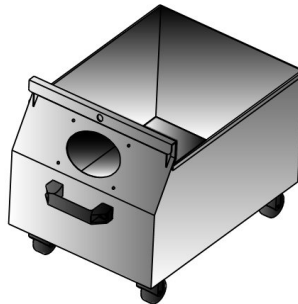
- 1) Check whether the main power switch and emergency stop switch are turned on.
- 2) Check that whether the star knobs on the hopper and screen frame locks are fully tightened, and the safety switch is close;
- 3) Start the machine, press the start button;
- 4) Check if the motor rotation is consistent with the arrow indicated on the cover.

- 5) If any direction of rotation should be incorrect:
 - a) Stop the machine.
 - b) Change the phase of power line, and any two of the three power lines.
 - c) Restart and recheck.

3.4 Options

3.4.1 Manual collection bin

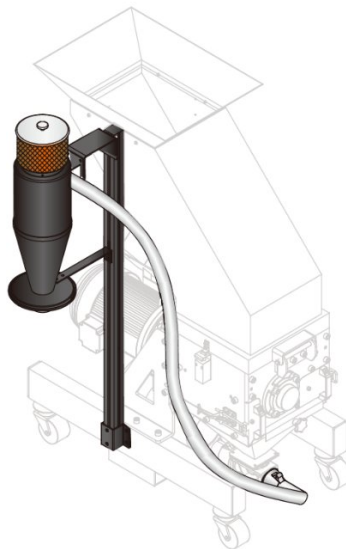
The manual collection bin is convenient for regrind recycling and storing. Add "SCB" at the end of the model code.



Picture 3-4: Manual collection bin

3.4.2 Regrind Conveying via Blower& Cyclone (PC type)

This machine utilizes high pressure blower to convey the regrinds into the cyclone dust collector and separate there grinds from the air and then the materials will fall into the material storage tank. Add "PC" at the end of the model code.



Picture 3-5: Regrind Conveying Via Blower& Cyclone (PC type)

3.4.3 Feed Box with Cover

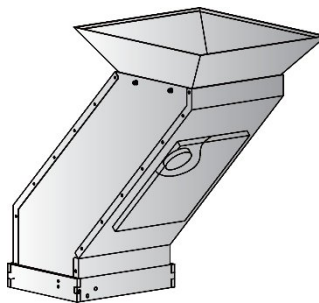
When the machine is idle, closing the cover helps prevent material contamination caused by dust or other debris entering into the cutting chamber after shutdown, and add “DPC” at the end of the model code.



Picture 3-6: Feed Box with Cover

3.4.4 Magnet Feed Box

Feed hopper with magnet is used to take out metal craps and impurities in the material. Add "FHM" at the end of the model code.



Picture 3-7: Magnet Feed Box

3.4.5 Food & Medical Grade

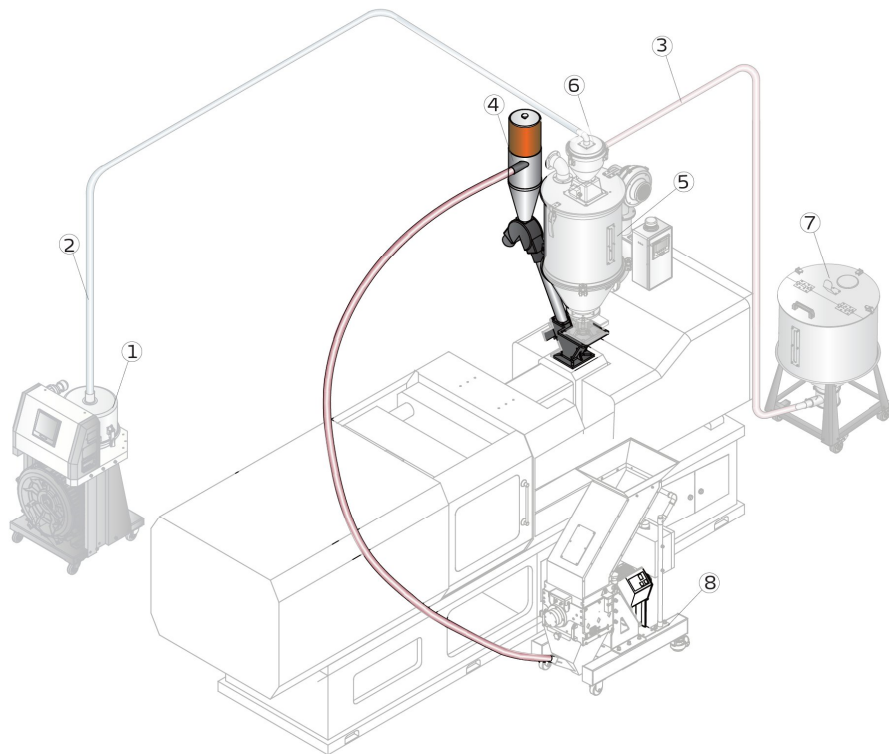
When processing food/medical grade regrinds, all material contacted surfaces are made of stainless steel to prevent material contamination, and add “FG” at the end of the model code.

3.4.6 Auto Pneumatic Feeding Inlet

When the equipment is used in demanding environments, such as food/medical-grade granulating or cleanroom production, the inlet is closed automatically once the material is fed through the inlet, thus preventing dust and foreign material from entering or spreading out of the hopper during the process, and add “FPD” at the end of the model code.

3.4.7 30-Sec Instant Recycling System- VR Type

The 30-sec. instant recycling system utilizes the high-pressure blower to blow the regrinds in the material storage tank to the proportional mixer and reuse the regrinds after mixing, so that the sprues will not have physical properties and color changes due to oxidation and humidification, thus improving the products quality.

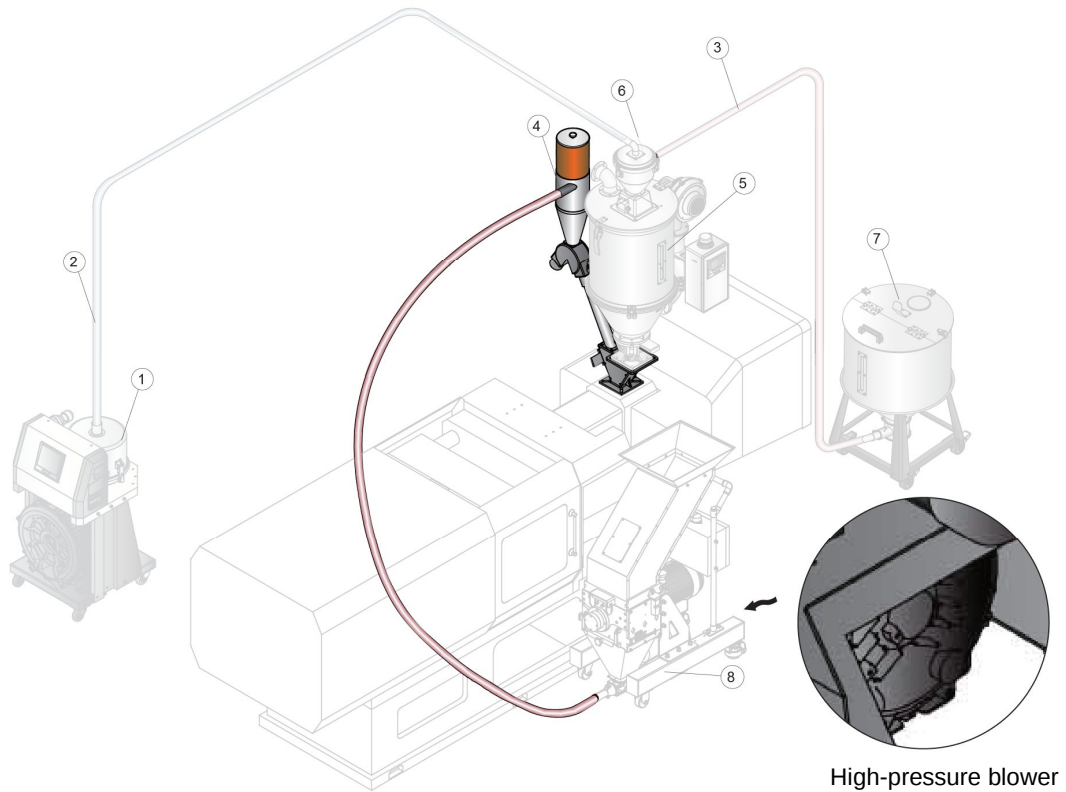


1. Vacuum Loader
2. Suction pipe
3. Material pipe
4. 30-Sec Instant Recycling System- VR Type
5. Dryer
6. Vacuum hopper receiver
7. Material storage tank
8. SG-M

Picture 3-8: 30-Sec Instant Recycling System- VR Type

3.4.8 30-sec. Instant Recycling System –PR Type

The 30-sec. instant recycling system utilizes the high-pressure blower to blow the regrinds in the material storage tank to the proportional mixer and reuse the regrinds after mixing, so that the sprues will have physical properties and color changes due to oxidation and humidification, thus improving the products quality.



1. Vacuum Loader
2. Suction pipe
3. Material pipe
4. 30-Sec Instant Recycling System- PR Type
5. Dryer
6. Vacuum hopper receiver
7. Material storage tank
8. SG-M

Picture 3-9: 30-sec. Instant Recycling System-PR Type

3.4.9 Multi-function Control Box

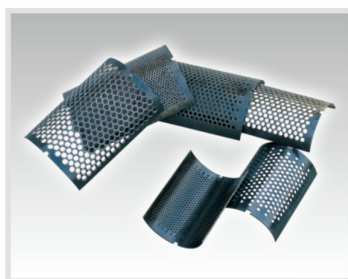
The granulator can be controlled through the integrated microcomputer, and it has an alarm and reverse running functions when the microcomputer detects an obstruction in the blade shaft. With proportional valve control function, the continuous mode or intermittent mode of the blade shaft can be selected as per the demand, and add “MFB” at the end of the model code. Besides, optional functions of PC/PR/VR are available, and add “MFB-PR” at the end of the model code.



Picture 3-10: MFB Control Box

3.5 Options

3.5.1 Special screen



Picture 3-11: Special Screen

Other special screen mesh size: Φ 5, Φ 8, Φ 10, Φ 12 are available for the users based on their demands. Add "SS+ screen hole diameter" after the model, for example, add “SS05” at the model for the size Φ 5.

3.5.2 Slant hole screen



Picture 3-12: Slant hole screen

Especially for the filtering long strips, the slant hole screen $\Phi 5\text{mm}$ and $\Phi 6\text{mm}$ are optional to meet the demands of some customers. The user can choose the option according to their demands. Add "SS+ screen hole dia. + S" at the end of the model code, such as add "SS05S" for screen $\Phi 5$.

4. Use and Operation



Wear earplugs during operating to avoid personal injury!



Wear gloves during operating to avoid personal injury!



Wear goggles during operating to avoid personal injury!



Because the blades and rotor may be loosen, check the following items before operating:

- 1) If the blades has any damage;
- 2) If the surface of the rotor is loosen;
- 3) Push or pull the rotor and blade to check whether there's any looseness.

If any of the above situations is found, please contact local representative or SHINI company for help.

4.1 Prestart Check

The unpainted parts of the machine are protected with oil prior to delivery and transport. Clean the granulator from rust protection agent before machine start.

- 1) Use dishcloth to clean firstly.
- 2) Then use dishcloth with water to clean.

4.1.1 Before First Startup

- 1) Check whether the granulator is at horizontal level. Adjust the leveling castors to sit firmly against the floor.
- 2) Check the cutter clearance, and whether the blade locking screws are tightened.
- 3) Check whether the storage collective hopper is closed, and the plug is inserted into the safety switch.
- 4) Check whether the screws of feed box and feed port are locked properly, and the plug is inserted into the safety switch.
- 5) Check whether the cables inside the control box are missing or disconnected.

Note: Confirm all above items are correct before powering on!

4.1.2 Check the Motor Rotation Direction

- 1) Power on to check whether the main power switch and emergency stop switch work normally.
- 2) Before material granulating, make sure that the granulator main shaft is running in the forward direction.
- 3) Turn on the main power switch and reset the emergency stop switch, and then start the granulator. Observe through the feed box visual window to check whether the main shaft is rotating in the specified direction.

Caution: If the motor rotates in the wrong direction, it may easily damage the blades and reduce the granulating capacity ! Please cut off the power, and exchange any two of the three wires of the main power supply.

Notice: Don't shut down the machine if there are materials inside the feed box and cutting chamber. Otherwise, the material residues will block the rotor, and the motor will trip due to overload after machine restart.

4.1.3 Two Hours after First Start

- 1) Check the cutter clearance again, including rotating blades and fixed blades, and check whether the blade screw is loosen again.
- 2) Check the motor set screw and whether the set bolt is tighten.

4.1.4 20~30 Hours after the First Startup

After the machine has been running for 20~30 hours at full load, it's necessary to check whether the gear motor will overload and overheat. Check whether the gearbox has oil leakage.

4.2 Open the Feed Box, Screen and Collection Box



It must turn off the main power switch of the SG-M series granulator before opening the feed box and removing the screen bracket and storage box.



Be careful! The blade is very sharp, please take care!



Caution!

Clean the inside surface of the feed box before closing it.

4.2.1 Open the Feed Box

- 1) Check that the feed box and cutting chamber are empty before shutdown.

- 2) Loosen the star screw on the feed box.
- 3) Open the feed box in the direction of the visual window.

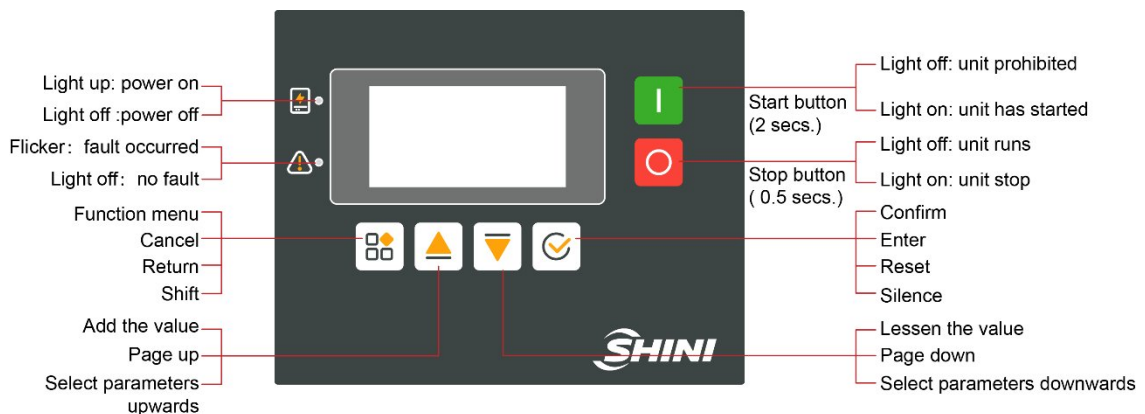
4.2.2 Open the Storage Collective Hopper

- 1) Loosen the star screw on the storage collective hopper.
- 2) Pull the storage collective hopper backward along the guide plate.

4.2.3 Open the Screen

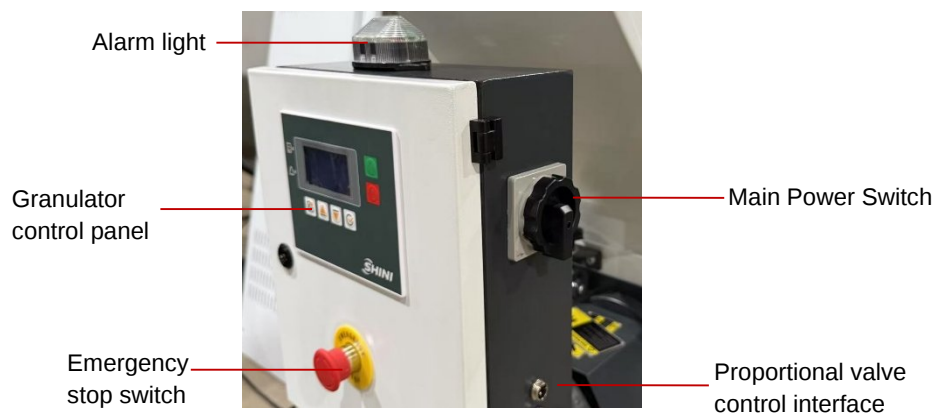
- 1) Loosen the buckle of screen bracket's push plate on the cutting chamber.
- 2) Grasp the handle on the push plate by hands and pull it out backwards.
- 3) Remove the screen.

4.3 Multi-function Control Box Panel Description (Option)



Picture 4-1: Multi-function Control Box Panel Diagram(option)

4.3.1 Multi-function Control Box Main Power Switch



Picture 4-2: Main Power Switch

4.3.2 Multi-function Control Box Home Page

After the countdown, it will enter the home page as shown below:



Picture 4-3: Home Page

Note: Press and hold the  button for two seconds to quickly start or stop the intermittent operation function, which also can be set in the user parameters.

4.3.3 Alarm Screen

When the unit fails, the alarm screen is as follows:



Picture 4-4: Alarm Screen

4.3.4 Multi-function Control Box Display Screen Switching

Press the  +  buttons together to switch to proportional valve state screen; If the manufacturer parameter 【 VR positive pressure conveying】 is set as enabled, press the  +  buttons on the proportional valve state screen to switch to VR positive pressure conveying screen. If the manufacturer parameter 【VR positive pressure conveying】 is set as disabled, press the  +  buttons together on the proportional valve state screen to switch back to unit state screen.

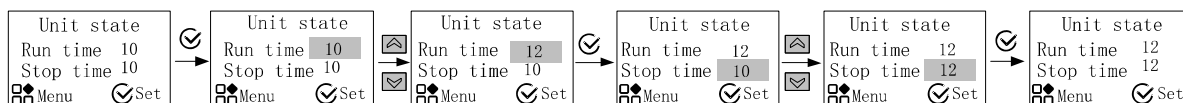


Picture 4-5: VR Positive Pressure Conveying Screen, Proportional Valve State Screen, and Unit State Screen

4.3.4.1 Multi-function Control Box Quick Modification Running Stop Time

If the user parameter【 Lock Time】is set as “No”, it can directly modify the set time

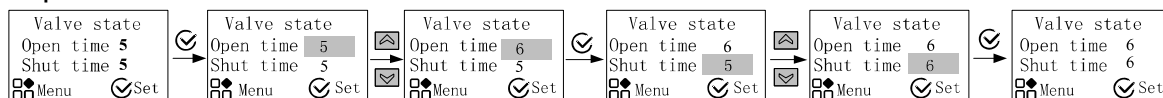
in shutdown on the unit state screen, as follows:



Picture 4-6: Multi-function Control Box Quick Modification Running Stop Time

Note: The operation time and stop time can also be modified in the user parameters. If the user has to modify the operation and stop time in the boot state, please enter the user parameters for modification.

4.3.4.2 Multi-function Control Box Quick Modification of the Proportional Valve's Open and Close Time

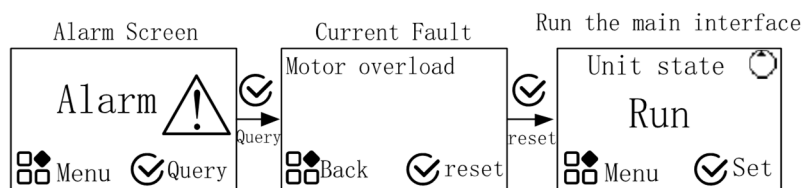


Picture 4-7: Multi-function Control Box Quick Modification of the Proportional Valve's Open and Close Time

Note: It also can adjust the proportional valve open time and close time in the user parameters. If the user has to modify the proportional valve open and close time when there is a proportional signal input, please enter the user parameters for modification.

4.3.4.3 Multi-function Control Box Inquiry/ Reset Fault

When there's a fault, an alarm interface will pop up automatically. The fault inquiry and reset are as follows:



Main Running Screen

Picture 4-8: Multi-function Control Box Inquiry/ Reset Fault

4.3.5 Function Menu

Press the  key on the main screen to enter function menu, which contains the five items as shown in the Table below:

Table 4-1: Function Menu Description

No.	Menu Item	Function	Remark
1	User setting	Display user parameters	The number of user parameters and their meanings: User Parameter Table
2	Unit status	Display current running status of the unit	No current value display when not using current modules.
3	History fault	It can inquire the faults that occurred the last 10 times	Press the <OK> key for 2 seconds to clear historical faults.
4	Equipment use ratio	It can inquire total running time of the motor.	
5	Version Information	Inquire currently used software version	

4.3.6 User Parameter Table

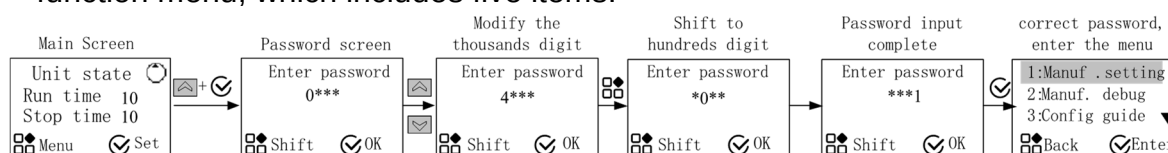
Table 4-2: User Parameter Description

No.	Parameter Name	Factory Default	Setting Range	Remarks
1	Lock time	No	Yes~No	Yes: After it is locked, the running time and shutdown time can't be modified on the main screen. No: (When the timer function is on under shutdown status), the running time and shutdown time can be modified on the main screen. If there's no proportional signal input, proportional valve open time and proportional valve close time can be modified on the proportional valve status screen.
2	Running time	10 secs.	1~999 secs.	The intermittent running function, stop time setting and time unit can be modified in the manufacturer's parameter 【intermittent function unit】.
3	Stop time	10 secs.	1~999 secs.	
4	Adjust contrast ratio	32	20~44	Adjust the LCD contrast
5	Backlight off time	0	0~255 Mins.	0: Not turn off the backlight
6	Proportional valve open time	5	0~100 secs.	Proportional valve open time during proportional signal input
7	Proportional valve close time	5	0~100 secs.	Proportional valve close time during proportional signal input

8	Intermittent running function	Enable	Enable ~ Disable	Whether it enables the intermittent running function
9	Multilingual	Chinese	Chinese ~ English	Select the language
10	Remote start	Local	Local \ remote \ local + remote	
11	Conveying time	5	0~100 secs.	Conveying blower open time, when the manufacturer parameter 【VR positive pressure conveying】 is set to disabled, this parameter is hidden.
12	Stop time	5	0~100 secs.	Conveying blower close time, when the manufacturer parameter 【VR positive pressure conveying】 is set to disabled, this parameter is hidden.
13	Blower stop delay	60	0~600 secs.	After shutdown, blower delayed close time.

4.3.7 Manufacturer Menu

In the home page, press the  +  buttons to enter the password screen, input correct default password (default value: 3588), and enter the manufacturer function menu, which includes five items.



Picture 4-9: Manufacturer Function Menu

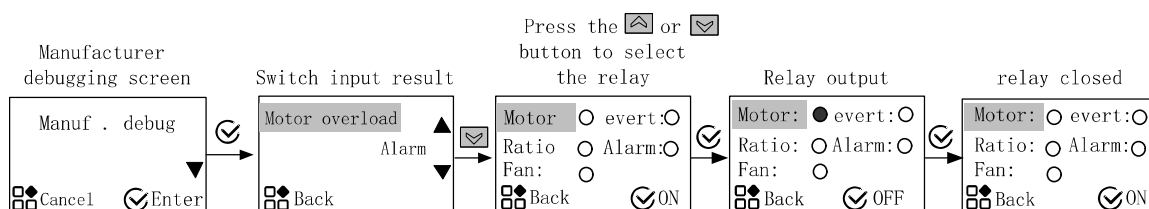
4.3.7.1 Manufacturer Menu Description

Table 4-3: Manufacturer Menu Description

No.	Menu Items	Function	Remarks
1	Manufacturer parameter setting	Set the manufacturer parameter	Please refer to the 13 Manufacturer Parameter Table for specific parameters.
2	Manufacturer debugging	Debug to check whether the electrical parts of the unit work normally	Inaccessible during unit operation.
3	Configuration guide	Configure common parameters of the unit	Inaccessible during unit operation. This screen will pop up during power on for the first time.
4	Parameter initialization	Restore user parameters to factory default values	Please refer to the 13 Manufacturer Parameter Table for default parameters.
5	Manufacturer password setting	Set the password to enter the manufacturer menu	The default value is 3588.

4.3.7.2 Manufacturer Debugging

The manufacturer debugging is mainly used to test whether electrical parts of the unit work normally, which is inaccessible during unit operation. This method can determine whether the unit work normally by testing the three-phase power input, six switch inputs and six relay outputs. It only displays the detection result for the switch input. If the result is normal, it indicates that the wiring is good and the parameter settings are correct. If alarm occurs, it flickers and displays the fault, please confirm whether the external wiring is in good condition and the parameter settings are consistent.



Picture 4-10: Factory Debugging

4.3.8 Fault List

Fault Name	Test Conditions	Treatment	Solutions
3-phase power fault	Power-on detection	Shutdown alarm	Check whether the three-phase power input is phase shortage or reverse.
Motor overload	Power-on detection	Shutdown alarm	Check the motor overload input is consistent with the switch input.
Blower overload	Power-on detection	Shutdown alarm	Check whether the blower overload input is consistent with the switch setting.
Safety door open	Running detection	Shutdown alarm	Check whether the safety door is closed.
Too high motor current	Motor running detection	Shutdown alarm	Check whether the motor rated current setting is reasonable and whether the motor is blocked.
Too low motor current	Motor running detection	Shutdown alarm	Check whether the motor current wiring is correct, and the interface is firm.
Too high blower current	Blower running detection	Shutdown alarm	Check whether the blower rated current setting is reasonable and whether the blower is blocked.
Too low blower current	Blower running detection	Shutdown alarm	Check whether the blower current wiring is correct, and the interface is firm.
Abnormal level alarm	Running detection	Select whether to shutdown and alarm according to factory parameters 【Level alarm】	Check whether the material level inside the shredder is too high.

4.3.9 Manufacturer Parameter Table

Manufacturer set parameters and the meanings are shown in the Table below:
(Items marked with "*" are the configuration lead parameters).

Settings	Parameter Value	Manufacturer Default	Setting Range	Remarks
Control Settings	*Power-on self-starting	disabled	Disable; enable	Enable: Power-on self-starting unit; Disable: Power-on no self-starting unit;
	Alarm output mode	Mute output retaining	Mute output retaining Mute output stop	Mute output retaining: In case of fault, it acts as per the "alarm output type" parameters; Mute output retaining: After silencing, it acts as per the "alarm output type" parameters when there's no fault.
	Alarm output type	normally open	normally close; normally open; pulse	Normally open: relay closes in case of failure; Normally close: relay breaks in case of failure; Pulse: relay intermittent output in case of failure
	*Current detection	enabled	Disable; enable	Enable: There is a current detection module; Disable: No current detection module;
	*Motor rated current	0.3A	0~35.0A	0A: Not detect the motor current fault. When the 【current detection】 is set as disabled, this parameter won't be displayed. Note: If the motor working current <1.0A, it's suggested to use a transformer winding for 2-3 turns. After winding, the motor rated current parameter should be set to n times of the actual value, as details in the Appendix.
	*Blower rated current	0.3A	0~35.0A	0A: Not detect the blower current fault. When the 【current detection】 is set as disabled, this parameter won't be displayed. Note: If the blower working current <1.0A, it's suggested to use a transformer winding for 2-3 turns. After winding, the motor rated current parameter should be set to n times of the actual value, as details in the Appendix.
	* 3-phase power detection	enabled	Disable; enable	Enable: Use the controller with built-in 3 phase power protection Disable: Not use the 3-phase power protection
	*Motor anti-blocking	Disable;	Disable; enable	Choose based on whether to install anti-blocking rotation sensors

	function			
	*Conveying blower output	enabled	Disable; enable	Whether the conveying blower relay is outputting in close.
	*Level alarm	normal running	Normal work / shutdown	
	*Blower motor mode	normal	Normal / simultaneous start and stop	Normal: The operating logic of the blower and motor remains unchanged. Simultaneous start and stop: blower and stop start and stop simultaneously
	*VR positive pressure conveying	disable	Disable; enable	Enable: Automatically enter VR positive pressure conveying mode after start-up Disable: Inaccessible to VR positive pressure conveying mode
Time setting	Motor current detection delay	2 secs.	2~10 secs.	Detect the motor current after the motor current becomes stabilized.
	Intermittent functional unit	seconds	second, minute	Intermittent time unit selection
Switch setting	*Motor overload	normally open	normally close, normally open	Switch normally open ~ normally close setting
	*Proportional signal	normally open	normally close, normally open	
	*safety door	normally open	normally close, normally open	
	*Remote switch	normally open	normally close, normally open	
	*Level signal	normally open	normally close, normally open	

4.4 Operation Instruction of Direct Drive Controller (Standard Model)

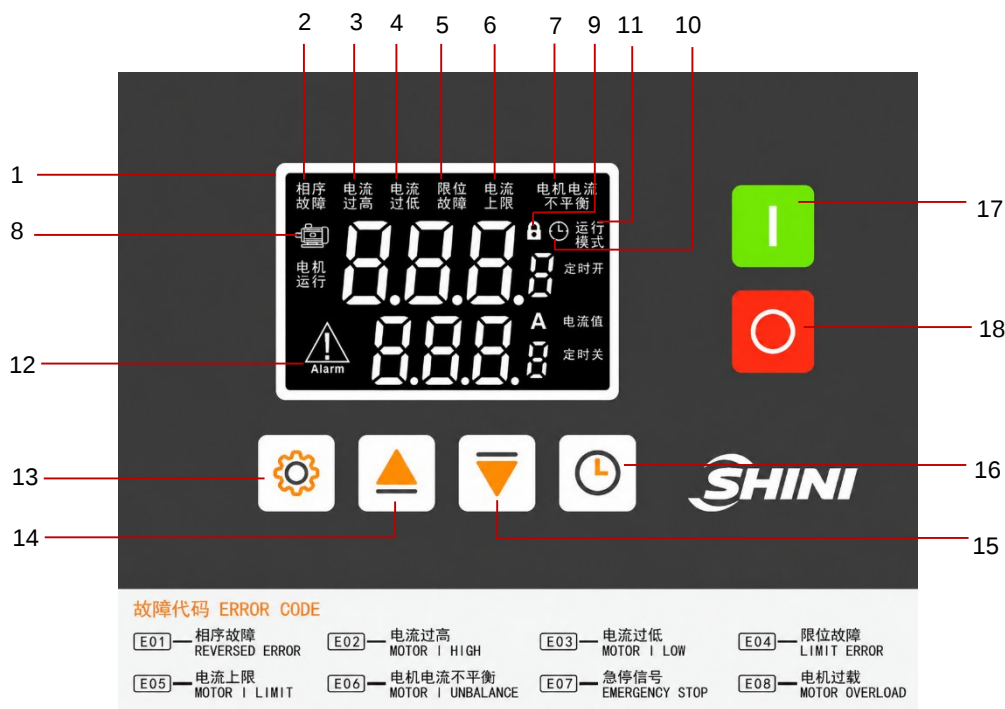


图 4-1: Direct Drive Controller Panel Diagram (Standard Model)

Table 4-4: Direct Drive Controller Panel Description

No.	Name	Function
1	Display window	Display current, run time, stop time
2	Display Phase sequence fault	Lighting up means phase sequence fault occurred
3	Too high current	Lighting up means high current fault
4	Too low current	Lighting up means low current fault
5	Limit fault	Lighting up means limit fault
6	Current upper limit	Lighting up means the current is greater than the maximum limit value
7	Unbalanced motor current	Lighting up means unbalanced motor current fault
8	 Motor output	Lighting up means the motor is outputting
9	 Lock	When it lights up, it is unable to operate, except for unlocking.
10	 Clock function	Lighting up means the system is in timer mode

11	Running mode	Lighting up means the system is in operation mode
12	 Alarm icon	Lighting up means the fault
13	 set key	Silence and reset when the fault alarm occurs
14	 Up key	Increase the value / page up / page up to select parameters
15	 Down key	Decrease the value / page down / page down to select parameters
16	 Timer function key	Enter/exit timer mode
17	 Start key(press and hold for two secs.)	a)Button function: start the unit b)Button indicator lights on: machine unit running
18	 Stop key	a) Button function: Stop the unit b)Button indicator lights on: machine unit stops

4.4.1 Main Interface

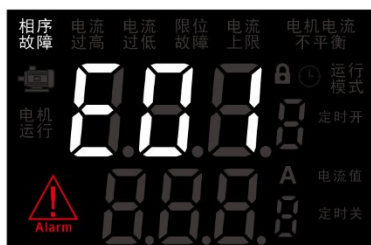
After the countdown ends, the system enters the main interface. When the machine is turned on and not in timer mode, the main interface will display "on" in the upper part and current value in the lower part.



Picture 4-1: Main Interface

4.4.2 Alarm Interface

When a fault occurs in the unit, the upper part of the alarm interface displays the fault code and corresponding text. Taking the "E01" fault as an example:



Picture 4-2: Alarm Interface

4.4.3 Operation Instruction

4.4.3.1 Password input

When the machine is not in running status, press the  and  buttons to enter the password input interface at the same time. Then, enter the correct password to enter the manufacturer parameter interface as per the steps shown in the following Picture (initial password 3588).



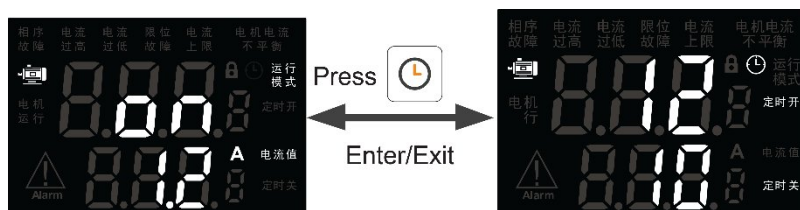
Flicker bit means being selected

Picture 4-3: Password Input

Press the  button to shift, press the  button to input the number, and press  to confirm the password.

4.4.3.2 Timer Mode On/Off

After the countdown ends, press the  button in the timer function on status to turn on or off the timer mode.



Picture 4-4: Timer Mode On and Off

4.4.3.3 Timing On/OFF Setting in Timer Mode

After the power-on countdown ends, press the button under the timer mode, and not in the locking and fault status, the upper part of the digital tube flashes to show the running time. At this time, press the or button to modify the running time. Then, press the button, the lower part of the digital tube flashes to show the stop time. At this time, press the or button to modify the running time. Then, press the button again or it will save and exit automatically when there's no button pressed within 10s.

Table 4-5: Timer Mode Instruction

Type	Setting Range	Factory Default	Unit	Remark
Running time	10~999	15	secs.	
Stop time	10~999	30	secs.	

4.4.4 Parameter Initialization

After powering on, if the interface displays “Err”, it indicates a controller parameter error. The parameters can be initialized according to the following steps as below. After initialization completed, power on the unit again to resume normal operation. If initialization fails after several times, please contact the manufacturer.



Picture 4-5: Parameter Initialization

4.4.5 Current Inquiry

After the power-on countdown ends, if [Enable Current Detection or Not] is set to "Use" and the [Motor Rated Current] is not 0, press the  and  buttons to enter the current inquiry interface. Press the  or  button to switch between displaying U-phase current and W-phase current. Cr1 means the U-phase current and Cr2 means the W-phase current. After checking, press the  and  buttons to exit or it will exit automatically when there's no button pressed within 10s.

4.4.6 Quick Setting of Motor Rated Current

After the power-on countdown ends, when the machine unit doesn't start, press the  button for three secs. to quickly modify the parameter **【Motor Rated Current】**. Press the  or  button to modify the parameter value, and press the  button for three secs. to save and return.

4.4.7 Factory Parameter Setting

After the power-on countdown ends, press the  and  buttons to input the password interface and correct manufacturer password (default: 3588) to enter the manufacturer parameter setting.

After entering the manufacturer parameter setting interface, press the  or  button to select the parameter. Press the  button to change the selected parameters to a modifiable state, press the  or  button again to modify the corresponding parameters, and press the  button to return to parameter selection after modification. Press the  +  buttons to save and exit the

parameter setting. The list of manufacturer parameter functions is as follows:

Parameter Name	Parameter Function	Factory Default	Setting Range	Remark
F01	Whether the current detection is enabled.	1	0~1	0: Disable, 1: Use
F02	Motor rated current	5.5	0~8.0 A	\
F03	Motor detection delay	3	1~15 secs.	\
F04	Current unbalanced degree	25	0~80 %	\
F05	Current balance detection delay	5	5~15 secs.	\
F06	Current upper limit alarm	15.0	10.0~20.0 A	\
F07	Phase sequence detection method	1	0 ~ 1	0: No detection, 1: On-board
F08	Alarm output type	0	0~2	0:Normally open, 1:Normally closed, 2: pulse
F09	Call self-starting	0	0~1	0: Disable, 1: Use
F10	Whether the timer function is disabled	0	0~1	0: Disable, 1: Use
F11	Display mode	1	0~1	0: Icon mode, 1: Text mode
P01	Emergency stop signal	1	0~1	0: Normally open, 1: Normally closed
P02	Limit signal	1	1~1	Normally closed, unable to set

4.4.8 Fault List

Code	Fault Name	Testing Conditions	Solutions	Fault Description
E01	Phase sequence fault	power-on detection	Stop the unit	Check whether the three-phase input is phase missing or error, switch quantity is correct.
E02	High current	motor running detection	Stop the unit	If the current detection is enabled, check if the current value is higher than the 【motor rated current】 .
E03	Low current	After the current detection is enabled, test after corresponding motor runs the 【current detection delay】 .	Stop the unit	Check the wiring is correct, and if the interface is firm.

E04	Limit fault	power-on detection	Stop the unit	Check the corresponding switching value input.
E05	Current upper limit alarm	motor running detection	Stop the unit	If current detection is enabled, check if the current value is higher than the 【current upper limit alarm】 .
E06	Unbalanced motor current	motor running detection	Stop the unit	If current detection is enabled, the rated current is not 0, check whether the absolute difference between the W-phase and U-phase currents is greater than the 【unbalanced current degree】 .
E07	Emergency stop signal	power-on detection	Stop the unit	Check corresponding switching value input.

5. Trouble-Shooting

5.1 Granulator Can Not Work

- 1) Check whether the circuit inside the control box is connected through.
- 2) Check whether the main power safety is connected through, and emergency stop switch is reset.
- 3) Check whether the feed box and storage box are properly installed. If the pin hasn't been plugged into the safety switch, the machine can't start.

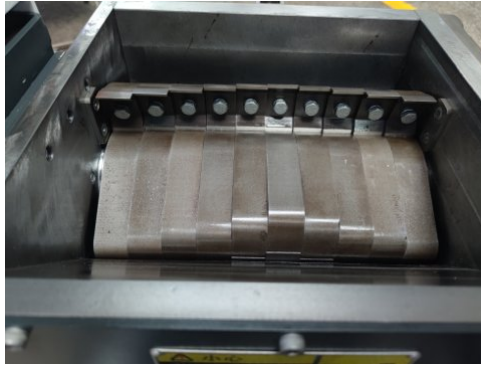


Picture 5-1: Feed Box Safety Switch Pin



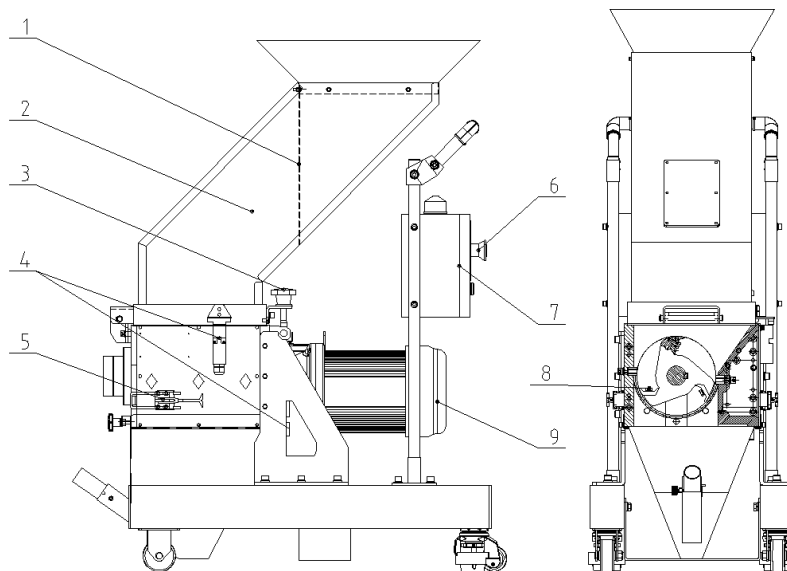
Picture 5-2: Storage Box Safety Switch Pin

- 4) Check the clearance between the blades. If the blade of the granulator is blunt or the blade gap is improper, the motor overload protector will trip. Check the blades and replace them or adjust the blade gap again.



Picture 5-1: Cutting Chamber Cutter

6. Maintenance and Repair



- 1) Check whether the material fender is complete before startup. Cycle: daily.
- 1) Check there's metal in the cutting chamber before machine start. Period: daily.
- 2) Before startup, check whether the star screw of the feed box is tightly locked. Cycle: Daily.
- 3) Check whether the screen bracket buckle locking with the cutting chamber is tightened up before machine startup. Cycle: Daily.
- 4) Check start button/emergency stop button works normally or not. Period: daily.
- 5) Check safety switch works normally or not. Period: daily
- 6) Power off and check whether the fixing screws of the fixed and rotating blades are loose. Cycle: Weekly.
- 7) Check whether there's any abnormal noise from the gear motor. Cycle: Monthly.

6.1 Installation of the Motor and Blade Rest

6.1.1 Motor installation

The motor shaft of SG-M series is the blade rest shaft, and the motor must be installed before installing the cutting chamber. Make sure the motor is horizontal

before installing the motor and place the shaft inside the cutting chamber horizontally. Otherwise, it may result in tilt blade rest due to un-horizontal motor shaft, and cutting chamber damage. Then, use a hexagonal spanner to lock the motor fixing screws.



Picture 6-1: Motor Installation

6.1.2 Blade rest installation

The blade rest is directly installed on the motor shaft. Clean the blade rest and shaft first thoroughly to remove the dust and debris before installation. Otherwise, the blade rest and shaft may not move forward or cause. After cleaning, place the blade rest sleeve on the motor shaft, keep the blade rest and shaft in level, and the blade rest is staggered in V-type cut shape. Apply lubricant to the shaft during processing to facilitate the blade rest being placed on the motor shaft.



Picture 6-2: Blade Rest Installation Diagram

6.2 Installation of Screen, Screen Bracket, and Storage Box

- 8) Lift the screen from the bottom to top, attach both sides of the screen circular arc onto the cutting chamber block and contact with the fixed blade.



Picture 6-3: Screen and the Installation

- 9) Align the main shaft of the screen bracket with the holes on the side plate of the cutting chamber, horizontally push in and press it tightly.



Picture 6-4: Screen Bracket and the Installation

- 10) Lock the buckle after the push plate of the screen bracket matches the plane of the cutting chamber side plate.



Picture 6-5: Lock the screen bracket push plate buckle

- 11) Insert the storage box into the slots on both sides of the rack, push the storage box into the machine horizontally, and lock the star screw.



Picture 6-6: Installation of Storage Box

6.2.1 Blade Replacement



Be careful!

The blade is very sharp, and it must wear gloves when holding it!



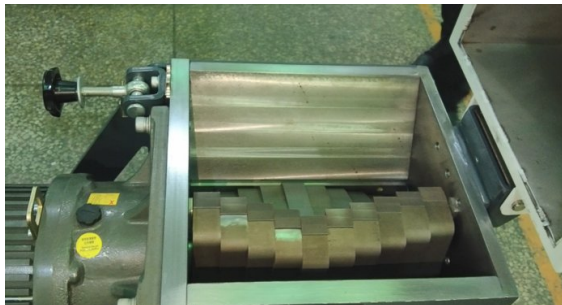
The blade fixing screws must be changed during each blade replacement.



Notice!

Don't install the cutters with the help of others to prevent personal injury. Lock the rotating shaft with a thick wooden block on the cutting chamber.

- 1) Loosen the star screw of the feeding box under the power off state to open the feed box.



Picture 6-7: Open the Cutting Chamber

- 2) Loosen the screws connecting the rotating blade and blade rest to remove the rotating blade.



Picture 6-8: Blade Replacement

- 3) After removing the blade, clean the installation point of the blade.
- 4) Replace the prepared new blade. Check whether the screen mesh hole has deformed during the replacement, and replace it at once if it finds the elliptic mesh hole. Check the blades and rotate the rotating blade rest till all blades rotate normally.

6.3 Installation of Cutters



The blade is very sharp, be careful! Please wear gloves before installation to avoid personal injury!

- 1) Firstly, clean the front and rear box blocks installed with the fixed blade, and then clean the blade rest.
- 2) Insert the fixed blade into the square groove of the front and rear box blocks.



Picture 6-9: Installation of Fixed Blade

- 3) Install an inner hex screw into the case block to fix it, and use the inner hex

set screw to push the fixed blade to adjust the clearance.



Picture 6-10: Fixed Blade Fixing Screw on the Case Block

- 4) Install the side blade and tighten the inner hex screw to lock the side blade onto the side plate.
- 5) First, place the screw on the rotating blade, then place the rotating blade on the blade rest, align it with the screw hole on the rest, then adjust the blade, then inject the screw agent and lock the screw on the blade.



Picture 6-11: Rotating Blade and Screws

- 6) Insert a feeler gauge into the gap between the fixed blade and the rotating blade, and adjust the set screw to adjust the clearance to 0.3~0.5mm (the clearance should not be too small to avoid blade damage).

Notes: The specification of the rotating blade fixed screw is: M8x20mm, strength 12.9, hardness HRC41.

Caution: The screw must be tightened firmly to avoid human injury and machine damage!

Attention: Blade gap can't be too closed to avoid cutter damage!

Table 6-1: Cutters and Other Fixing Screw Torque

Thread size	M8	M10	M12	M14	M16	M18	M20	M22	M24
Axial force(N)	15	23.8	34.5	47	65.5	78.5	103	129	149
Fixing torque (Nm)	27	50	86	135	215	290	420	570	730

6.4 Lubrication

6.4.1 Lubricating Oils (The following brands of lubricating oil can be used)

Xin Chang Long: FX-00

FX-000

Bp: BP Grease LGEP 2

ESSO: Beacon Ep2, Beacon EP2

Mobil: Mobilux EP2

Shell: Shell Alvania EP2

Texaco: Multifak Ep2, Novotex Grease EP2

6.4.2 Lubricating Method

Inject the lubricating oil to the oil inlet.



Picture 6-12: Lubricating Method

6.5 Maintenance

6.5.1 Daily Check

- 1) There is material fender in the feed-in box. If the material fender is damaged, replace it immediately.
- 2) Check whether the Emergency Stop works properly. Start the machine and then stop it via Emergency Stop. Rotate the button anti-clockwise to reset the Emergency Stop.
- 3) Check the star knob. Safety knob is a part of granulator's safety system. The length of it is set in advance. When the knob is loose, it would make cutting chamber open and cause human injury; the safety length is 55mm. If the knob is damaged, replace it immediately.



Picture 6-13: Star Knobs

6.5.2 Weekly Check

- 1) Check the power wire to see whether there is any damage. If so, replace it immediately
- 2) Check the safety switch.
- 3) Check the safety switch at the connection of feed box and cutting chamber.

6.5.3 Monthly Check

- 1) Check the motor use condition.

6.6 Cleaning



CAUTION!

Make sure the main power switch is closed before cleaning!.



The blade may do harm to human body when opening the feed box!

- 1) Check whether the feed-in box is emptied before stopping the machine.
- 2) Clean the exterior surface of the feed box.
- 3) Clean the material inlet.
- 4) Open the feed box back forwardly.
- 5) Remove the material fender and clean it from both sides.



CAUTION!

Take care not to be cut by sharp blade when rotating the blade rest!

- 1) Open and clean the collection box and screen bracket.
- 2) Clean the inside and outside of the cutting chamber.

- 3) Blow to the clear material holes on left/right side plate of cutting chamber with compressed air. Rotate the blade rest at the same time, and clean the pieces stuck inside the bearing base. Clean it daily.



CAUTION!

Use the safety contact switch with a protective shield to avoid anything.

6.7 Maintenance Schedule

6.7.1 About the Machine

Model _____ SN _____ Manufacture date _____
Voltage ____ Φ ____ V Frequency _____ Hz Power _____ kW

6.7.2 Check after Installation

- ☐ Check if pipe connections are firmly locked by clips.
- ☐ Check the gap between fixed blade and rotating blade (0.3~0.5mm)

Electrical Installation

- ☐ Voltage: _____ V _____ Hz
- ☐ Specs of the fuse: 1 Phase _____ A 3 Phase _____ A
- ☐ Check phase sequence of the power supply.
- ☐ Check the rotating direction of the conveying blower.

6.7.3 Daily Check

- ☐ Check main power switch.
- ☐ Check emergency stop button.
- ☐ Check start / stop button.
- ☐ Check material fender (strip) is perfect or not.
- ☐ Check whether emergency stop and safety switch works normally.
- ☐ Clean screen and feed box.
- ☐ Check whether start, stop and power switches are normal.

6.7.4 Weekly Check

- ☐ Check all the electrical cables.
- ☐ Check if there are loose connections of electrical components.
- ☐ Check all the cutters.
- ☐ Check the screws of fixed blade and rotating blade.
- ☐ Check if there is abnormal noise, vibration and heat in gear motor.

6.7.5 Monthly Check

- ☐ Check motor overload protective function.
- ☐ Check motor reverse function.
- ☐ Check if the cutters are tightened.

6.7.6 Check Half-yearly or Every 1000 Running Hours

- ☐ Check the bearings, motor and shaft lubrication.
- ☐ Check both ends of the plate.
- ☐ Valuation of machine performance.

6.7.7 3 Year Checking

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