

SG-L

Screenless Granulators

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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.



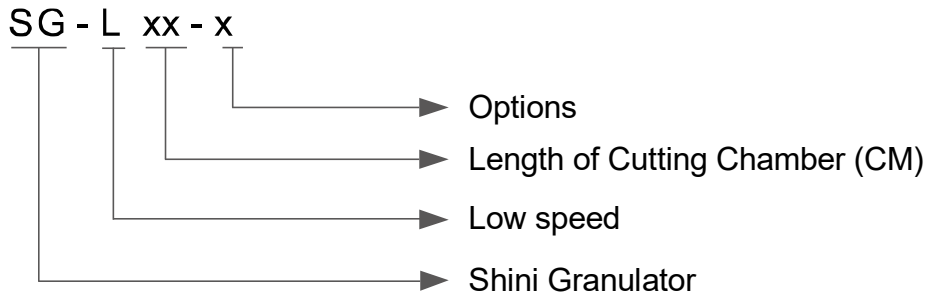
Forbidden to process flammable or toxic material !

SG-L Screenless Granulator is applicable to granulating hard long or strong flexible sprues for instant recycling and a few rejects. It features small size, low speed and wear, and super silence, with low speed structure, and particle granules of little dust. Use quick and easy cleaning methods to clean residues from the cutting chamber in just a few simple steps. Simple control mode and operability is user-friendly that makes it easy to operate. Besides, multiple options are available to meet different production processes and specific method.



Picture 1-1: Screenless Granulator SG-L27

1.1 Coding Principle



1.2 Feature

- I Adopt TECO brand gear motor that features stable performance, long service life and large torque.
- I Break large spurs into smaller pieces, and teeth cutter bites the materials into the desired size with less dust and ready to be reused
- I Screenless screen, even particle granules with little dust content.
- I Compact design, small footprint for fast cleaning and maintenance;
- I Feed box with visual window, and double-layer sound proof are made of stainless steel.
- I Gear motor is connected with the main shaft with the coupling, making it easy to replace cutters and gear motor.

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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1.3 Safety Regulations

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

The following safety measures shall be followed when operating the granulator.

1.3.1 Safety Regulations



Electrical installation must only be done by a competent electrician!



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.



Never put any part of your body through the granulator openings, unless both the main switch and the control switch on the granulator are in "OFF" position.



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!



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



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



Attention please!

Ear protection is used during granulating of plastic materials.



Make sure the power supply of the granulator has been cut off before opening the feed box.



Attention!

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

When operate the granulator, please notice the following signs.

	 Hazard High voltage! May lead to casualty or other serious danger. Please cut off the power before repairing. Circuit diagram should only be changed by professionals. Grounding is necessary.
	 Warning This shield is easy to catch hands and cause injury. Keep a certain distance between the hand and this catching point.
	 Warning The cutter are very sharp, can cause injury take out or open protective cover is not allowed when it is running. Keep some distance away from the cutters.
	 Notice Read the instruction manual carefully before operating. Before start, do the safety device test according to the instruction. It is not allowed to change the design of the machine unless it is approved from the manufacturer.

1.3.2 Transportation and Storage of the Machine

Transportation

- 1) SG-L series of granulators are packed in plywood cases with wooden pallet at the bottom, suitable for quick positioning by fork lift.
- 2) After unpacked, castors equipped on the machine can be used for ease of movement.
- 3) Do not rotate the machine and avoid collision with other objects during transportation to prevent improper functioning.
- 4) The structure of the machine is well-balanced, although it should also be handled with care when lifting the machine for fear of falling down.
- 5) The machine and its attached parts can be kept at a temperature from -25°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-L 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 control switch.
- 3) Keep the whole machine, especially the electrical components away from water to avoid potential troubles caused by the water.
- 4) Plastic film should be used to protect the machine from dust and rains.

Working Environment

The machine should be operated:

Indoors in a dry environment with max. temperature $+45^{\circ}\text{C}$ and humidity no more than 80%.

Do not use the machine:

- 1) This equipment works normally in the environment with altitude within 3000m.
- 2) At least a clearance of 1m surrounding the equipment is required during operation. Keep this equipment away from flammable sources at least two meters.
- 3) Avoid vibration, magnetic disturbance at the operation area.

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.

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 Alarm!

In case of fire, Co₂ dry powder fire extinguisher should be applied.



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



When process item is longer than feed port, please cut long item into half until the length is shorter 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:

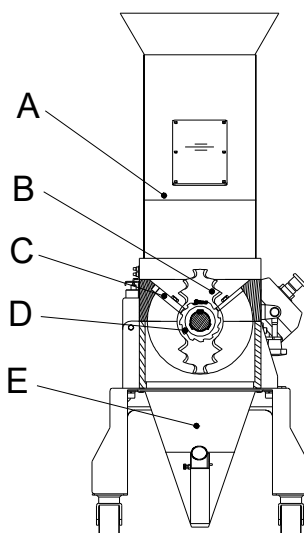
- 1) Any careless or man-made installations, operation and maintenances upon machines without referring to the Manual prior to machine using.
- 2) Any incidents beyond human reasonable controls, which include man-made vicious or deliberate damages or abnormal power, and machine faults caused by irresistible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

SG-L series belong to the granulator used beside the IMM, which are designed for injection molding machine to crush a small amount of materials. Don't put too many materials into crushing. The granulators are controlled by power switch, safety switches, emergency stop button.

2.1.1 Working Principle



Parts name:

- A. Feed box B. Staggered blade C. Fixed blade D. Teeth blade
E. Storage box

Picture 2-1: Working Principle

The materials are dropped into the cutting chamber via the feed box (A). The block materials are crushed by the staggered blades (B) and fixed blades (C) first, and then are granulated into even particles by the teeth blade (D) and fixed blade (C) without the screen. After granulating, the particles will directly drop into the storage box (E); The cutting chamber is easy to open for cleaning and maintenance. After this, the granules are ready for re-use in the production machine, or to be transported to a container for later use.

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 plug

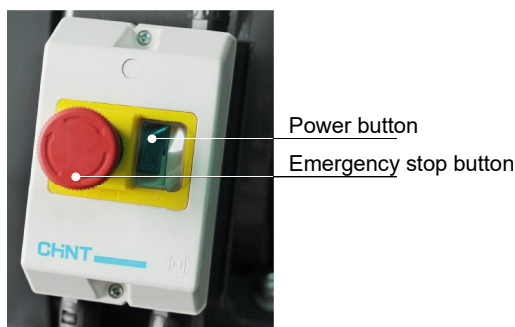
The granulator's main power supply has a 5P industrial plug, and plug-in and plug-out to archive the ON and OFF function.



Picture 2-2: Main power plug (CE is optional)

2.2.2 Emergency Stop Switch

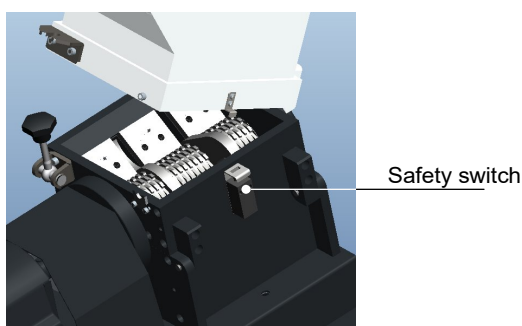
There is one red button on the control panel. Upon pushing it, the machine will stop running. Turn the button in the arrow direction as shown on the button, the button will reset (counter-clockwise).



Picture 2-3: Emergency Stop Switch

2.2.3 Safety Switch

The granulator equips with safety switch on circuit breaker. If feed box changes the position or circuit breaker trips, it will cut off the power and stop the machine. The granulator has two safety switches, one is between the feed box and cutting chamber, and the other one is between the storage box and machine.



Picture 2-4: Safety Switch

2.2.4 Door lock

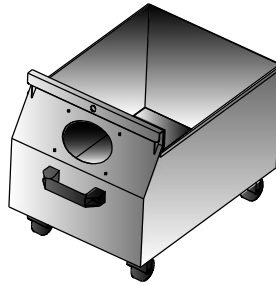
The machine's door lock is a star nut, which can extend the time to open the feed box to avoid human injury. When opening the feed box, loosen the star nut, and it will last for a period of time that is totally enough to stop the granulator, so as to avoid personal injury.

Please check whether the feed box is locked up before starting the machine.

2.3 Options

2.3.1 Manual collection bin

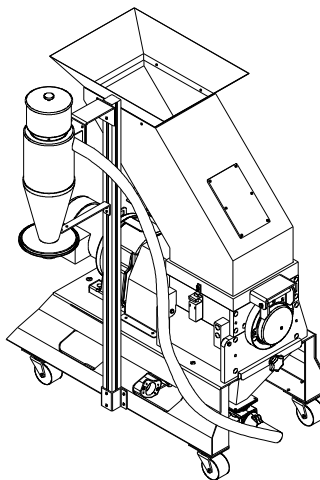
The manual collection bin is convenient for regrind recycling and storing.



Picture 2-5: Manual Collection Bin

2.3.2 Regrind Conveying via Blower & Cyclone (PC type)

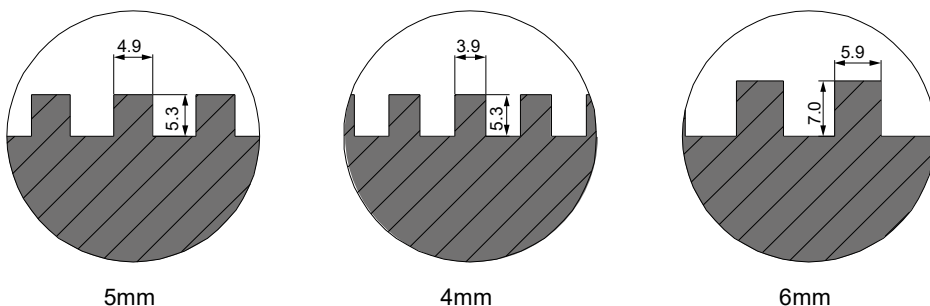
This device utilizes loading blower to convey regrind into the cyclone dust collector to separate the regrind from the air and then the regrind will fall into the material storage hopper.



Picture 2-6: Regrind Conveying via Blower & Cyclone (PC type)

2.3.3 Cutter

On the basis of standard cutter 5mm, cutter 4mm or 6mm is provided for option.



Picture 2-7: Cutter Dimension

2.3.4 Feed Box with Discharge Port Cover

When the machine doesn't work, cover the discharge port can reduce the material contamination caused by dust or other sundries dropped into the cutting chamber after machine shutdown, and add "DPC" at the end of the model code.



Picture 2-8: Feed Box with Discharge Port Cover

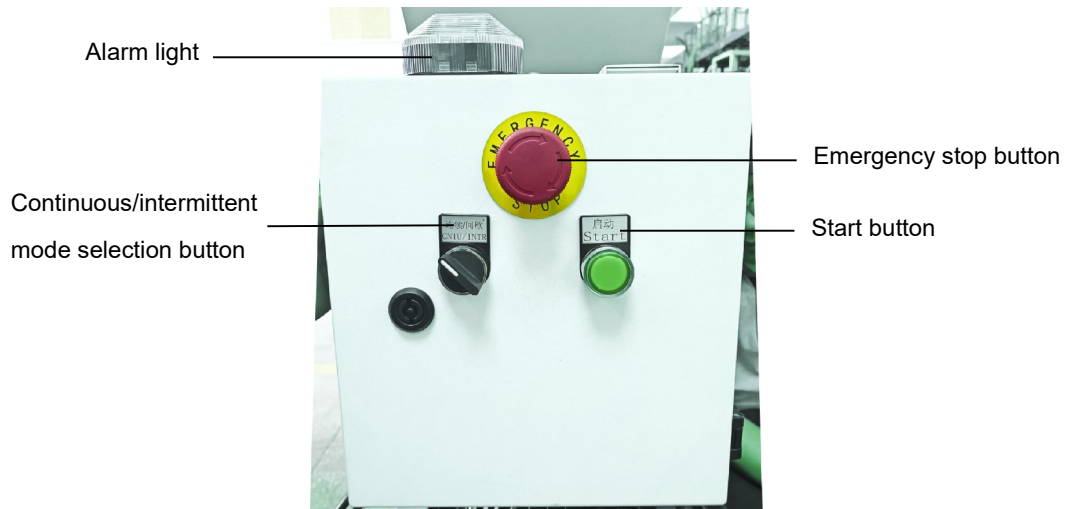
2.3.5 Control box with intermittent running function

The continuous or intermittent mode of the blade shaft can be selected as per the demand, and the intermittent running mode is suitable for granulating plastic nozzles with lots of dust or large electrostatic. Add "ICB" at the end of the model code. Optional functions of PC/PR/VR are available, and add "ICB-PR" at the end of the mode code.



Picture 2-9: Control box with intermittent running function

2.3.5.1 Control box with intermittent running function



Picture 2-10: Control Box Panel Function

- 1) Start button: press the start button and the machine starts to run
- 2) Continuous/ intermittent mode selection button: The default state is continuous mode. If it needs to switch to intermittent mode, adjust the knob to intermittent state.
- 3) Continuous mode: machine is in continuous running
- 4) Intermittent mode: After the machine runs for a period of time, it stops for a while, and keeps repeating the cycle.
- 5) Emergency stop button: After pressing the emergency stop button, the machine will stop immediately.
- 6) Alarm light: It will not light up when machine runs normally. The alarm light will light on when the granulating motor is overloaded and the cutting chamber's fixed nut is loose.

2.3.5.2 Intermittent mode time setting



Picture 2-11: Set the run time and pause time in intermittent mode

- 1) Run time: Set the machine run time when it is in intermittent mode.
- 2) Pause time: Set the machine pause time when it is in intermittent mode.

2.3.5.3 The main power switch of control box with intermittent running function



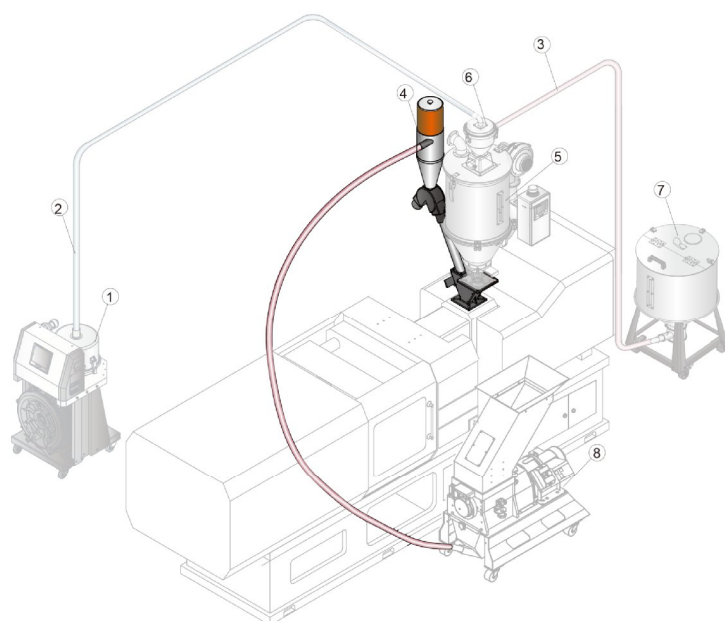
Main power switch

Picture 2-12: Control Box's Main Power Switch

Main power switch: main power switch closed, control box powered on, main power switch cut off, control box powered off.

2.3.6 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 have physical properties and color changes due to oxidation and humidification, thus improving the products quality.

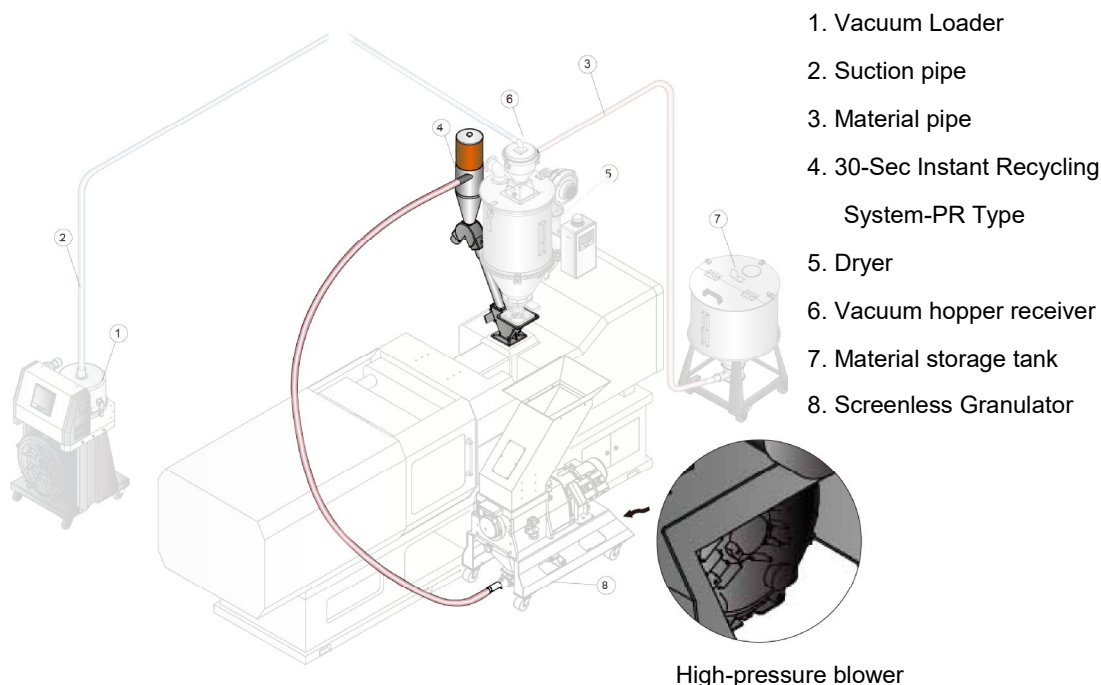


1. Vacuum Loader
2. Suction pipe
3. Material pipe
4. 30-Sec Instant Recycling System-VR Type
5. Dryer
6. Vacuum hopper receiver
7. Material storage tank
8. Screenless Granulator

Picture 2-13: Installation of 30-Sec. Instant Recycling System - VR Type

2.3.7 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.



Picture 2-14: Installation of 30-Sec. Instant Recycling System- PR Type

2.3.8 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 2-15: Multi-function Control Box Diagram

3. Installation and Debugging

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



Read through this chapter before installation.



Must abide the following installation steps to avoid personnel injuries or damage of the machine!



Take great care of handling the blades because they are very sharp and may cause cutting injuries!



Power supply of the machine should be handled by qualified electricians!



Caution!

The blades must be placed steady, and prevent the blades from self-rotating during installation.

The blades must be placed steady, and keep your hands away from the blades to prevent human injury.



Notice!

Don't install the blades with the help of others to prevent human injury.

Lock the rotating blades with a thick piece of wood block on the cutting chamber.



Notice!

Use protective gloves since the blades are very sharp.



Notice!

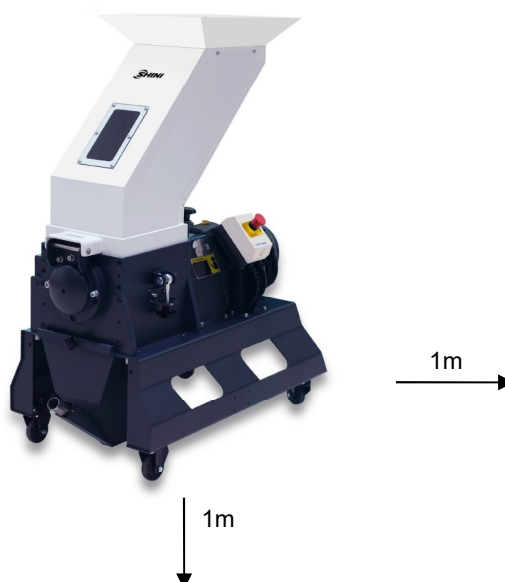
When installing the blades, be sure to use new screws and washers.

3.1 Power Connectors

- 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 diameter should not smaller than those applied in the control box.
- 4) The power cable connection terminals should be tightened securely.
- 5) The machine requires a 3-phase 4-wire power source, connect the power lead (L1, L2, L3) to the live wires, and the earth (PE) to the ground.
- 6) Power supply requirements:
Main power voltage: $\pm 5\%$
Main power frequency: $\pm 2\%$
- 7) ***Specific power supply specifications please refer to the circuit diagram of each model.***

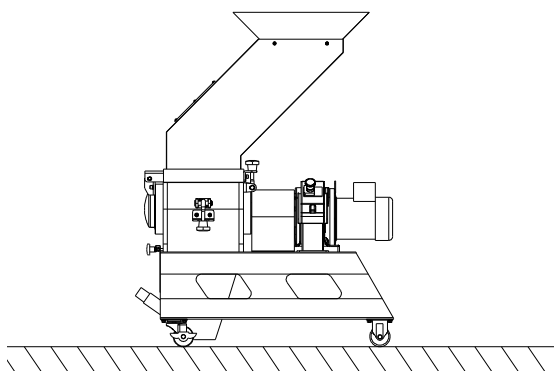
3.2 Machine Location

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



Picture 3-1: Installation Space

Move the granulator to suitable place, check and make sure the installation ground is level; there is enough intensity when it is running.



Picture 3-2: Installation Diagram

The machine must be installed in the environment with good ventilation.

4. Operation Guide

4.1 Clean the Anti-rust Oil

The unpainted parts of the machine have been greased with anti rust oil before delivery. Make sure to clean the anti rust oil before starting the machine.

- 1) Wipe with a rag first.
- 2) Then, dip the rag with Tianna water to clean it.

4.2 Open the Feed Box and Storage Box



Notice!

Before opening the feed box and the storage box, turn off the main power switch and the power switch of the granulator.



Please be noted to handle with care when opening with feed box!



Be careful!

The blade is very sharp, please take care.

4.2.1 Open the Feed Box

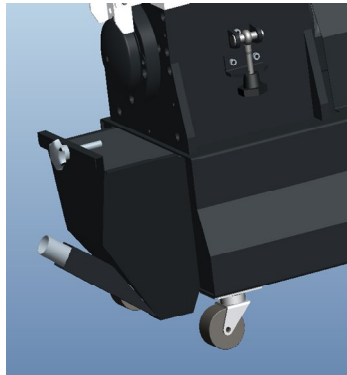
- 1) Check if the feed box has been emptied. If so, turn off the main power switch.
- 2) Loosen the long star screw and open the feed box.
- 3) Open the feed box.



Picture 4-1: Open the Feed Box

4.2.2 Open the Storage Box

- 1) Shut off the power of granulator.
- 2) Loosen the star screw.
- 3) Remove the storage box.



Picture 4-2: Open the Storage Box

4.3 Shut the Feed Box and Storage Box

4.3.1 Shut the Feed Box



Please be noted to handle with care when closing the feed box!



Notice!

Make sure the feed box is closed. Otherwise, the machine can't start.

- 1) Check to ensure there is no powder left in the interface or corners.
- 2) Close the feed box to the right.
- 3) Lock up the star screw and fix the feed box.

4.3.2 Shut the Storage Box



Note!

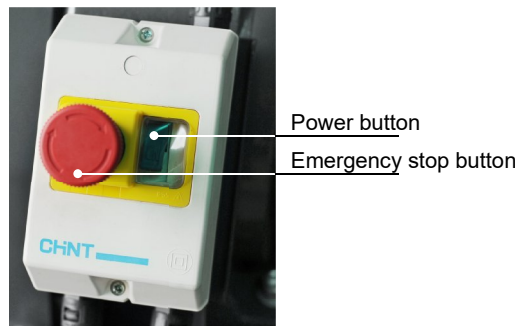
Before closing, clean the interface surface.

Be careful! Don't get squeezed and injured!

- 1) Check no powder or leftover material around the storage box; timely remove them if any.
- 2) Push the storage box into along its slide way.
- 3) Lock the star screw tightly and fix the storage box.

4.4 Start and Stop the Granulator

The granulator is controlled by the circuit breaker, make sure the feed box is closed before granulator startup.



Picture 4-3: Motor Circuit Breaker

CAUTION: If there are ungrinded materials in the feed box or cutting chamber, the granulator shall NOT be stopped, otherwise the crew materials will blockade the rotator and the motor will be overloaded next time you start the machine up.

4.4.1 Before the First Startup

- 1) Check whether the granulator is in the level state.
- 2) Check the space of the cutting tools to see whether the lockup screws of the blades are tightened.
- 3) Before crushing the materials, make sure the main shaft of the granulator is at forward rotating status.

4.4.2 Check the motor's running direction

- 1) Check whether the screws of the feed box and inlet are locked up.
- 2) Check whether the storage box is closed.
- 3) Press the power switch to start the granulator for about 2S, and press the Emergency Stop switch to turn off the granulator. Face the end of the motor, and check whether the motor blower's running direction is clockwise.

Note: If the motor's running direction is wrong, it's very easy to

damage the cutter and largely reduce the crushing capacity!
Please cut off the power and replace any two of the three wires
of the main power supply!

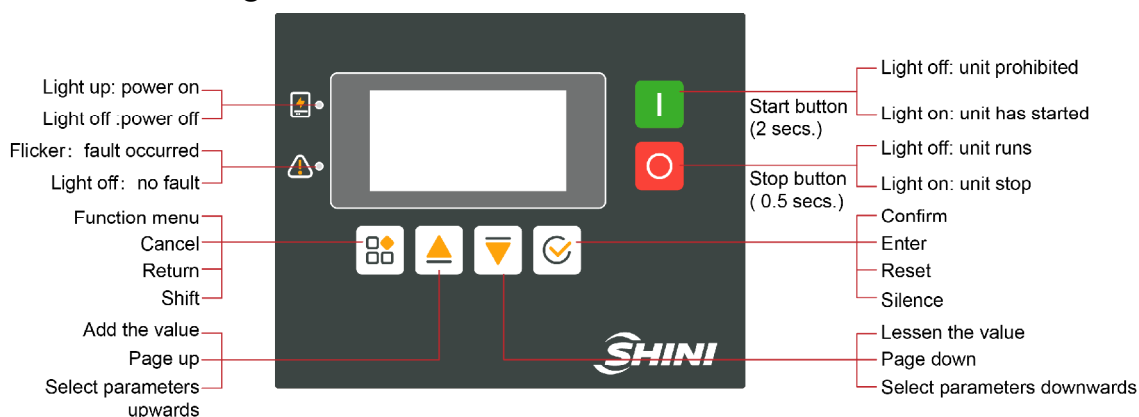
4.4.3 After Startup for 2 Hour

- 1) Check if the blade screws are loose again.
- 2) Check the set screw of the gear motor and whether the locking screw at the main shaft end is locked tightly.

4.4.4 After First Startup for 20~30 Hours

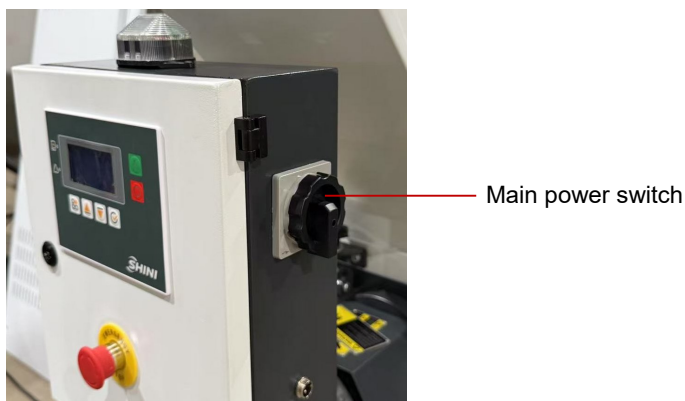
After the machine runs at full load for 20 ~ 30 hours, use a thermometer to test if the gear motor's surface temp. is $\leq 70^{\circ}\text{C}$, and check whether the gear motor leaks oil.

4.5 Panel Diagram



Picture 4-4: Panel Diagram

4.5.1 Multi-function Control Box Main Power Switch



Picture 4-5: Main Power Switch

4.5.2 Multi-function Control Box Home Page

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



Picture 4-6: 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.

4.5.3 Alarm Screen

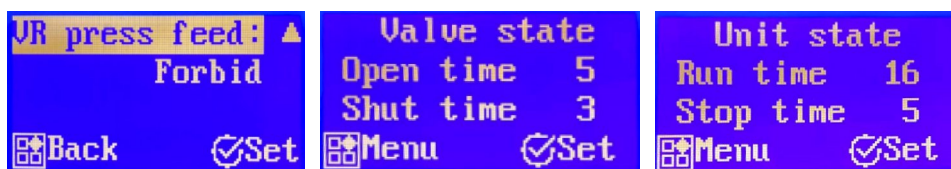
When the unit fails, the alarm screen is as follows:



Picture 4-7: Alarm Screen

4.5.4 Multi-function Control Box Display Screen Switching

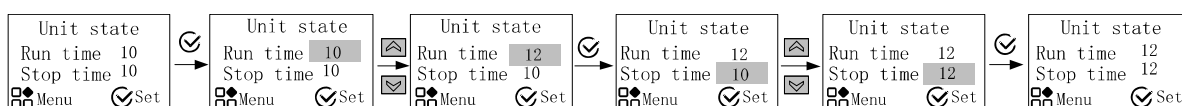
Press the  +  buttons together to switch to proportional valve state screen; If the manufacturer parameter 【VR positive pressure conveying】 is set as enabled, press the  +  buttons on the proportional valve state screen to switch to VR positive pressure conveying screen. If the manufacturer parameter 【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 4-8: VR Positive Pressure Conveying Screen, Proportional Valve State Screen, and Unit State Screen

4.5.4.1 Multi-function Control Box Quick Modification Running Stop Time

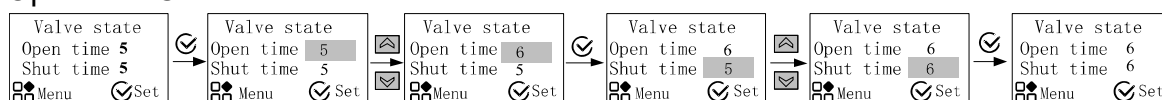
If the user parameter【 Lock Time】is set as “No”, it can directly modify the set time in shutdown on the unit state screen, as follows:



Picture 4-9: 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.

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

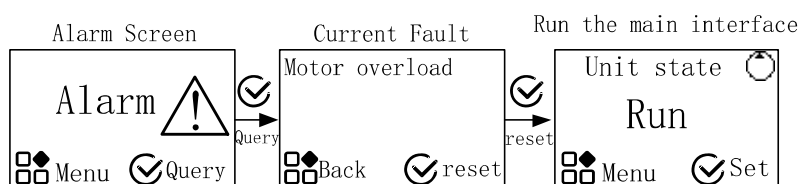


Picture 4-10: Multi-function Control Box Quick Modification of the Proportional Valve's Open and Close Time

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.

4.5.4.3 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 4-11: Multi-function Control Box Inquiry/ Reset Fault

4.5.5 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	

4.5.6 User Parameter Table

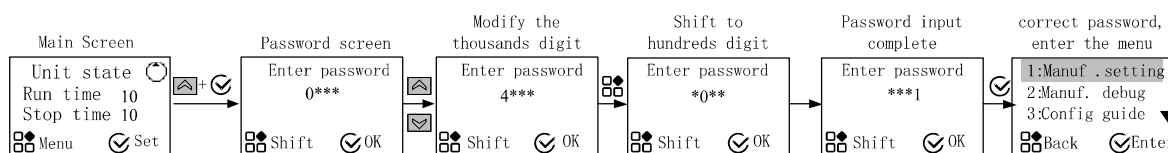
Table 4-2: User Parameter Description

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.

4.5.7 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 4-12: Manufacturer Function Menu

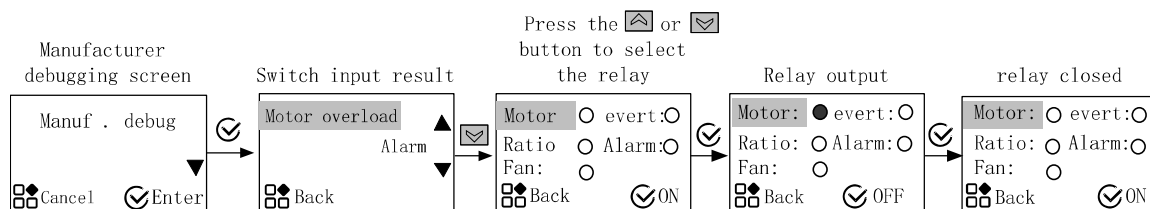
4.5.7.1 Manufacturer Menu Description

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.

4.5.7.2 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 4-13: Factory Debugging

4.5.8 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.
Motor blocked	Motor running monitoring	Shutdown alarm	Check whether the shredder is blocked.
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.

4.5.9 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 function	enabled	Disable; enable	Choose based on whether to install anti-blocking rotation sensors
	*Conveying blower output	enabled	Disable; enable	Whether the conveying blower relay is outputting in close.
	*Reverse running retry times	3	0~10 times	During the blocked fault cycle, if the number of motor reversals exceeds the "reversal retry times", it gives the motor blocked fault and the machine stops.
	*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.
	Rotation blocked detection cycle	3 mins.	1~255 mins.	Cycle time for detecting the rotation blocked times
	Rotation blocked detection	3 secs.	1~8 secs.	Judge the motor blocked delay time

	delay			
	Motor reverse time	1 secs.	1~5 secs.	Motor reverse rotation time after the motor is blocked
	Vibration fault stabilization	2 secs.	0~255 secs.	Motor overload, stabilization time of safety input signal
	Reverse waiting time	3 secs.	1~100 secs.	Waiting time between forward and reverse switching
	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	
	*Anti-blocking rotation 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	

5. Trouble-shooting

5.1 Granulator Can Not Work

- 1) Check if the emergency stop has been reset. If not, rotate the button anti-clockwise to reset it.
- 2) Check if the feed box is completely closed. If not, the machine could not be started.
- 3) Check the clearance between the blades.

If the granulator's blades are blunt or the blade clearance is incorrect, it will lead to shutdown and the motor circuit breaker will trip. More details about checking, and replacing the blades to see chapter of Repair and Maintenance.

Fault	Possible Reason	Trouble Shooting
After the main power switch is on, the system can't start up.	Disconnect with power. Emergency stop button hasn't been reset. The circuit breaker of motor is damaged. The safety switch is not off.	Check the power wire. Reset the emergency stop button. Replace the motor circuit breaker. Check the safety switch.
After the main power switch is on, the motor is buzzing.	Overflow voltage. Default phase. Motor blocked or failed.	Check the power. Check the cutting chamber. Check the motor.
The machine suddenly stops during operation.	The granulating motor overloads. Voltage fluctuation range is too large.	Check the granulating motor and its relevant components. Improve the power quantity.

5.2 Stop Due to Other Reasons

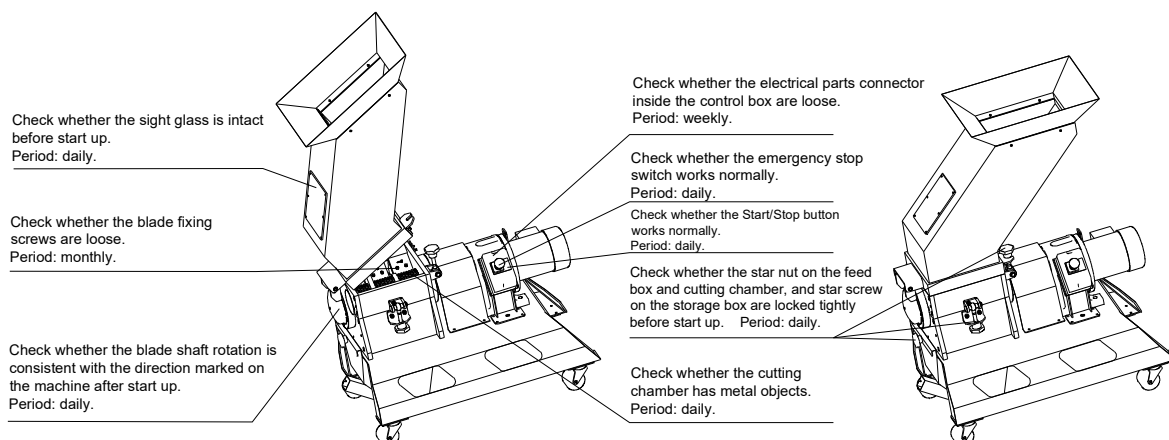
The connection of safety or limit switch is damaged or loosen, which may also result in machine stop.



Caution!

Do not turn off safety switch or control switch.

6. Maintenance and Repair



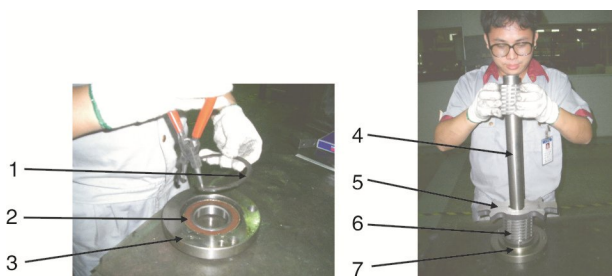
Picture 6-1: Maintenance and Repair Diagram

Table 6-1: Blade and Other Fixing Screws' Torque Table

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

6.1 Installation of Bearing and Blade Rest

- 1) Install the bearing 2, bearing retaining ring 1 and bearing sleeve 7 into the bearing seat 3 in order.
- 2) Insert the cutter shaft 4 vertically in the bearing sleeve 7, and then cover the staggered blade 5 and teeth blade 6 on the cutter shaft in spaced order.



Picture 6-2: Installation of Bearing and Blade Rest 1

- 1) Install the right bearing seat, bearing sleeve and bearing retaining ring.
- 2) Put the blade rest 2 into the cutting chamber 1 to make the bearings at

both ends match with the lower groove of the bearing seat.

- 3) Fix the left and right bearing seats 3 with screws on the left and right end plates.



Picture 6-3: Installation of Bearing and Blade Rest 3



Caution!

The blades must be placed steady, and prevent the blades from self-rotating during installation.

The blades must be placed steady, and keep your hands away from the blades to prevent human injury.

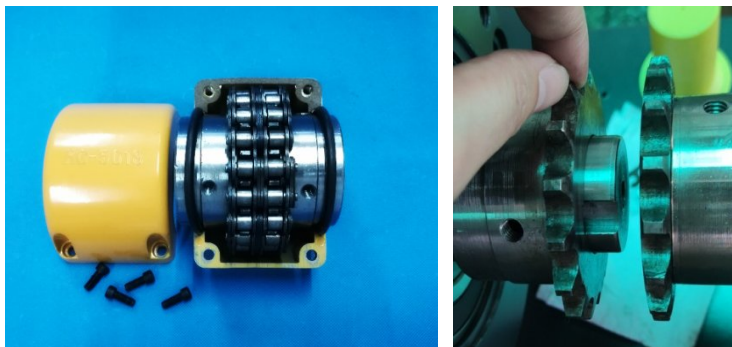
6.2 Installation of Motor



Warning!

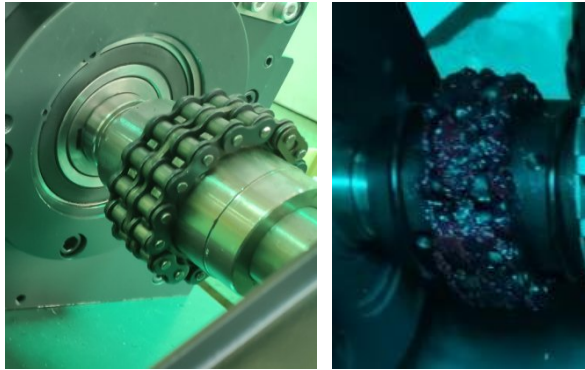
As to avoid cutter shaft auto-rotating, it should use a thick wood to fasten the rotating blade when installing the gear motor.

- 1) Disassemble the chain coupling KC-5016 apart, and remove the chain. Then, install both coupling ends on the gear motor and main shaft end.



Picture 6-4: Installation of Gear Motor 1

- 2) Place the gear motor on machine frame and move it to proper position, and install the chain of the chain coupling. Then, use set screws to lock up the shaft coupling, apply lubricating oil on the chain completely and then install the yellow casing of the coupling.



Picture 6-5: Installation of Gear Motor 2

- 3) Use the inner hex. screws (M12x30) and nuts to fix the gear motor on machine frame, and fasten the screws to prevent the motor from swing freely.



Picture 6-6: Installation of Gear Motor 3



Be careful!

The blades must be placed steady, and prevent the blades from self-rotating during installation. When operating, keep your hands away from the cutters to prevent personnel injury.

6.3 Installation of Feed Box and Storage Box

- 1) Install the feed box hinge on the left bearing seat of the cutting chamber, and fix it with M8 screws.
- 2) Lift up the feed box onto the cutting chamber, and use the feed box rotating shaft and retaining ring to connect the feed box and hinge.



Picture 6-7: Installation of Feed Box, Feed Port and Storage Box 1

- 3) After installing the upper parts, hold up the storage box with both hands, and push it gently along the feed box's fixing plate.



Picture 6-8: Installation of Feed Box, Feed Port and Storage Box 2

Note: Each set screw must be locked with the correct torque.

6.4 Repair

All the repair must be done by professionals to avoid damage to machine and harm to human body.

6.4.1 Replace the Blades



Warning!

When installing the cutters, the rotating blades of the granulator will rotate on its own due to unbalanced force!



Be careful!

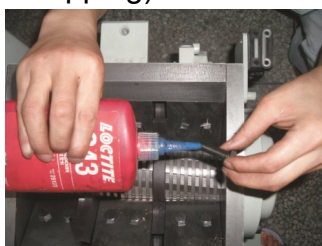
It will also rotate on its own when the center of gravity is unstable.

Wear protective gloves before operation because the blades are very sharp.

Take care when operating to avoid being cutting!



More details about replacing or maintaining the blades to see chapter 6.3. Inject screw thread fixing glue (light blue LOCTITE 243 recommended) to the fixing screw so to avoid slipping and tighten screws up(The fixation can prevent the screw from slipping).



Picture 6-9: Replace the Blades



Caution!

To decrease the possibility of harm to other people, the replacement action must be conducted by oneself.



Attention!

As to avoid auto-rotation, it should use a thick wood to fasten the rotating blade. Be carefully during the process, the cutter is very sharp!

1. Remove the fixed blades



Caution!

To avoid self rotation, block the rotating blade with a thick wood block.

- 1) Remove the set screws.
- 2) Remove the fixed blades.
- 3) Clean the installation surface of the blade.



Picture 6-10: Dismantle Fixed Blades

2. Remove the rotating blades

- 1) Open the cutting chamber and loosen inner hex screw on bearing block.
- 2) Take out blade rest.
- 3) Clean the whole rotating blades and cutting chamber.



Picture 6-11: Dismantle Rotating Blades



Caution!

Press the pressing block and blade when you remove the last screw so to avoid personal injuries.

3. Install the Blades

Clean carefully the fixed blades and rotating blades and then install them.



Attention!

The screws and washers must be all replaced during each blade replacement. Install the rear fixed blade at first, and the front fixed blade. Then, install the rotating blades. Specific installation steps please refer to the Installation of the Fixed Blades and Rotating Blades.



Caution!

Wear protective gloves before operation because the blades are very sharp.

Take care during installation to avoid being cutting!

Installation Steps:

- 1) Put the rotating blade rest onto the lower cutting chamber box, and align its hole position with the holes on the cutting chamber.



Picture 6-12: Installation of Fixed Blades and Rotating Blades 1

- 2) Tighten the corresponding screws on the bearing base and cutting chamber with a wrench and tighten them with the correct torque.



Picture 6-13: Installation of Fixed Blades and Rotating Blades 2

- 3) After the rotating blade rest has been installed on machine frame, install the teeth blades corresponding fixed blades on the front and rear case block to keep the gap of 0.3-0.5mm between the teeth blades and corresponding fixed blades. Then, lock up the fixing blades' screws (Use the screw thread agent LOCTITE243).



Picture 6-14: Installation of Fixed Blades and Rotating Blades 3

Note: In order to avoid personal injury and machine damage, make sure to tighten the fixed blade's set screw.

6.5 Maintenance

When carrying out maintenance, ensure that there is no material left in the granulator.



Caution!

All stuff concerning repair must be conducted by professionals to avoid damage or harm to human body.

6.5.1 Daily maintenance of the gear motor

The manufacturer has added the lubricating oil (BT-860-0) before the shipment of the gear motor, and oil change cycle thereafter is about 10000 hrs. It must reserve enough lubricating oil in the case of the gear motor, and check it periodically. When it detects the oil amount is decreased or quality went bad, replenish or replace the lubricating oil in time. Please be noted to keep the mixing motor and gear motor surface clean, and clean the dust and impurities in time for good heat dissipation.

The models of lubricating oil that can be replaceable for gear motor maintenance are as follows:

Table 6-2: Lubricating Oil Model

Brand	SHELL	COSMID	MOBIL	SHOWASHELL	Made in Taiwan
Model	OMALA OIL 320	EP-320	MOBIL GEAR 632	ISO VG EP320	Guoguang Brand HD-320

Lubricating oil amounts for corresponding models are shown as the Table below:

Table 6-3: Models and Gear Motor Lubricating Oils

Model	Gear Motor Original Oil Amount (Unit: litre)
SG-L17(1.1kw)	1.45
SG-L27(1.5kw)	1.47
SG-L32(1.5kw)	1.47
SG-L43(2.2kw)	1.49

6.5.2 Daily maintenance of the chain coupling

The chain coupling of the machine has been coated with the lubricating grease before shipping, which should be checked regularly every one~two months. When it detects the lubricating oil between the chain and pulley is insufficient or

dry out, replenish or replace the lubricating grease or oil in time. The preferred lubricating oil is lithium based lubricating oil (such as 0, 1, 2 viscosity) or polymer thickened lubricating oil. Due to the vibration or frequent start and stop of the granulator, it's recommended to add molybdenum disulfide (MoS₂) to the lubricating oil to improve its compressive strength and wear resistance.



6.5.3 Daily Check

- 1) There is rubber shutter in the feed box. If the rubber shutter is damaged, replace it immediately. Otherwise the fragment of the shutter will damage the blades in the cutting chamber.
- 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 main power switch, start/stop button.

6.5.4 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 if the electrical parts' connector is loose.

6.5.5 Monthly Check

- 1) It must reserve enough lubricating oil in the case of the gear motor, and when it detects the oil amount is decreased or quality went bad, replenish or replace the lubricating oil in time. Please be noted to keep the mixing motor and gear motor surface clean, and clean the dust and impurities in

time for good heat dissipation.

- 2) Check that the chain coupling inside should have enough lubricating oil. When it detects the chain grease is dry out, use relevant lubricating grease to fill the gap between the chains in time, ensuring the chain meshing parts is fully covered to reduce wear and noise.
- 3) Check whether the cutters are loose and worn-out.
- 4) If the granulator is idle for a long time, please apply the anti-rust oil on the blade rest, fixing blade, rotating blade, cutting chamber, and screw to prevent rust.

6.6 Cleaning



Caution!

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

- 1) Check whether the feed box is emptied before stopping the machine.
- 2) Clean the exterior surface of the feed box.
- 3) Turn off the main power switch.
- 4) After loosening the long star screw, open the feed box backwards and be noted to handle with care to prevent feed box damage.
- 5) Clean the interior surface of the feed box.
- 6) Loosen the star screw to take out the storage box.
- 7) Clean the storage box.
- 8) Clean the inside and outside of the cutting chamber.

6.7 Maintenance Schedule

6.7.1 About the Machine

Model: _____ No.: _____ Manufacturing date : _____

Voltage: ____ Φ _____ V Frequency: ____ Hz Total power: _____ kW

6.7.2 Check after Installation

☐ Check whether the locking screw of the fixed blade is locked up.

☐ Check whether the gear motor flange is locked up.

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.

6.7.3 Daily Check

☐ Check the main power switch.

☐ Check emergency stop button.

☐ Check start/stop button.

☐ Check material plate (strip) is perfect or not.

☐ Check whether emergency stop and safety switch works normally.

☐ Check the feed box.

☐ Check whether the 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 whether set screws in fixed and rotating blades are under looseness.

☐ Check if there is abnormal noise, vibration and heat in the gear motor.

☐ Check the cracking window.

6.7.5 Monthly Check

☐ Check the lubricating oil condition of the gear motor.

☐ Check the lubricating oil condition of the chain coupling.

☐ Check motor overload protective function.

☐ Check the tightness of the blades.

6.7.6 Check Half-yearly of Every 1000 Running Hours

- ☐ Check the cutter abrasion degree.
- ☐ Check lubrication of bearing.
- ☐ Check the coupling.
- ☐ Evaluation of the machine condition.

6.7.7 3 Year Checking

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