

# Medium Speed Granulator

## SG-M

Date: Sep.2023

Version: Ver. A (English)



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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.



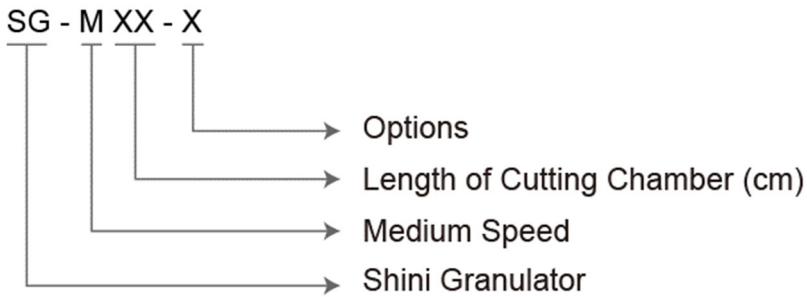
Forbidden to process flammable or toxic material!

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 GranulatorSG-M29

## 1.1 Coding Principle



## 1.2 Feature

- 1) 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.
- 2) 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 of wear, which can significantly reduce the down-time for cutter disassembly and assembly.
- 3) 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.
- 4) Optimal cutting angle makes resistance small and avoid blockage to improve cutting efficiency.
- 5) The soundproof feed box is made of double-layer stainless steel and with visual window.
- 6) Adopt self-aligning bearing with seat that can mount on the external side plate of the cutting for easy bearing mount and maintenance.
- 7) Reasonable design that can reduce the vibration during granulating.
- 8) Equipped with motor overload relay and multiple safety devices to ensure machine safe operation.
- 9) Small in size with castor for easy moving.
- 10) Economic structure design can reduce the cost of replacement parts.

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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## 1.4 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.

### 1.4.1 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!

### 1.4.1 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  $-25^{\circ}\text{C}$  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  $5^{\circ}\text{C}$  to  $40^{\circ}\text{C}$  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, CO<sub>2</sub> 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.

## 1.5 Exemption Clause

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

Shini is exempted from liability for any costs, fees, claims and losses caused by reasons below:

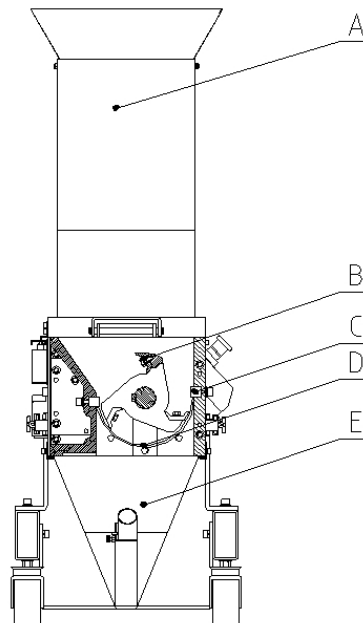
1. Any careless or man-made installations, operation and maintenances upon machines without referring to the Manual prior to machine using.
2. Any incidents beyond human reasonable controls, which include man-made vicious or deliberate damages or abnormal power, and machine faults caused by irresistible natural disasters including fire, flood, storm and earthquake.
3. Any operational actions that are not authorized by Shini upon machine, including adding or replacing accessories, dismantling, delivering or repairing.
4. Employing consumables or oil media that are not appointed by Shini.

## 2. 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 by the start and emergency stop switches.

#### 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.

### 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 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: +/- 5%

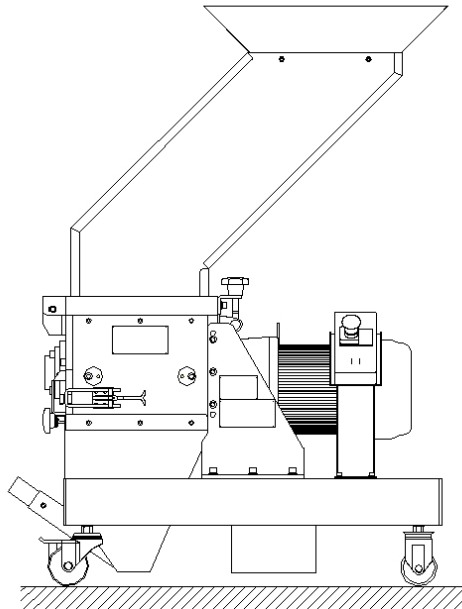
Main power frequency: +/- 2%

7) ***Power connection refers to the circuit diagram of each model.***

### 3.2 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.***



Picture 3-2: Installation Space

### 3.3 Installation Notice

- 1) Check that whether the emergency stop is not activated;
- 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.
  - c) Change the phase of power line, and any two of the three power lines.
  - d) Restart and recheck.

### 3.4 Safety System

The high-speed rotating cutters in the granulator are easy to cause accidents, so it installed a safety system to protect personal safety. The safety system can't be changed randomly. Otherwise, the machine may be in dangerous situation and cause accident. All maintenance and repair of the safety system must be carried out by professionals.

### 3.4.1 Main power plug (only for machine optional with CE standards)

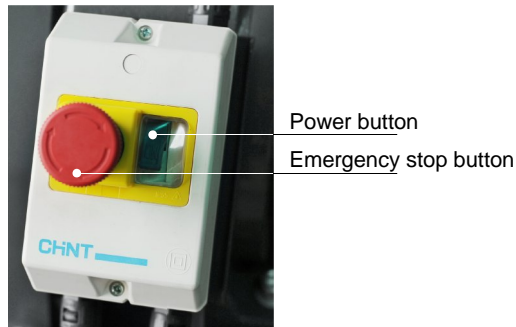
When the granulator is optional with CE standards, its main power supply has a 5P industrial plug, and machine ON and OFF can be controlled by plugged in or out.



Picture 3-3: Main power plug for machine optional with CE standards

### 3.4.2 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 3-4:Emergency Stop Switch

### 3.4.3 Safety Switch

There's a safety position switch of openable circuit on the granulator. If the safety position is changed or the safety switch is released, it will cut off the control power to stop the machine.





Picture 3-5: Safety Switch

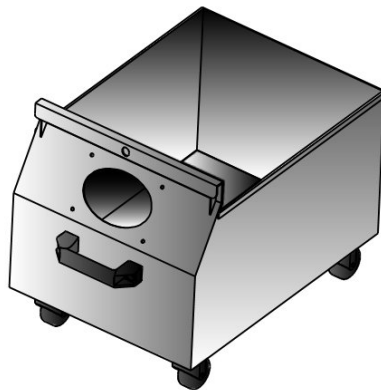
## 3.5 Options

### 3.5.1 CE Standards

CE standard machines are equipped with 5P industrial plugs and electrical components such as safety switches for storage boxes, which has greater safety during operations compared to GB standards.

### 3.5.2 Manual collection bin

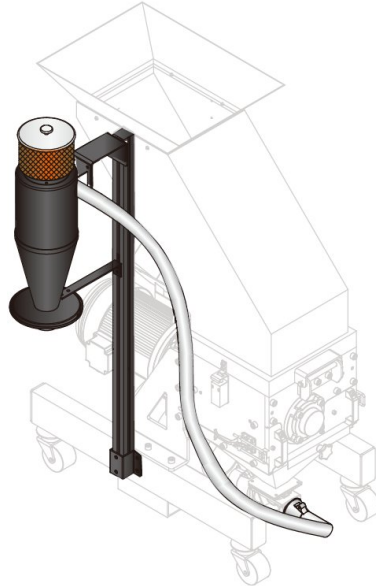
The manual collection bin is convenient for regrind recycling and storing.



Picture 3-6: Manual collection bin

### 3.5.3 Regrind Conveying via Blower& Cyclone (PC type)

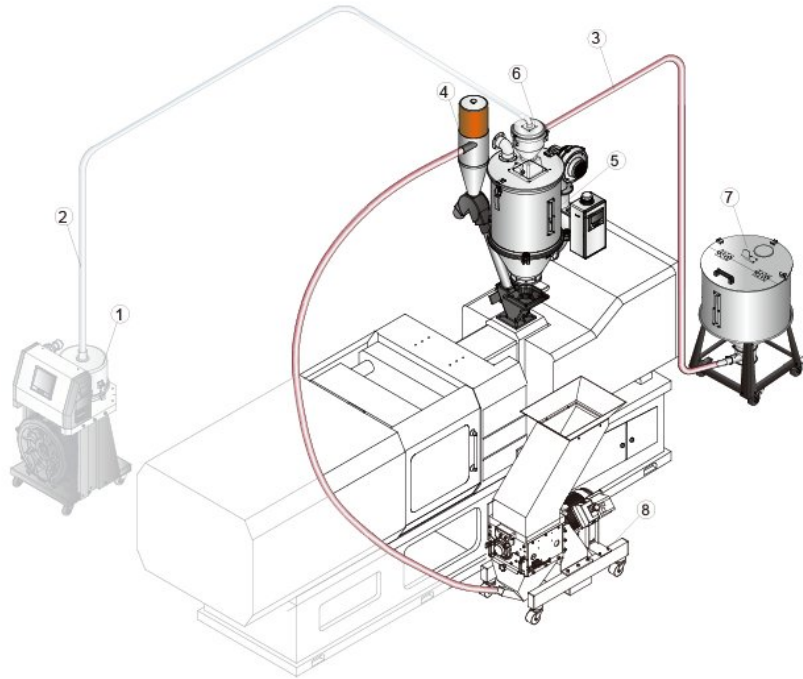
This machine utilizes high pressure blower to convey the regrinds into the cyclone dust collector and separate there grinds from the air and then the materials will fall into the material storage tank.



Picture 3-7:Regrind Conveying Via Blower& Cyclone (PC type)

### 3.5.4 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.

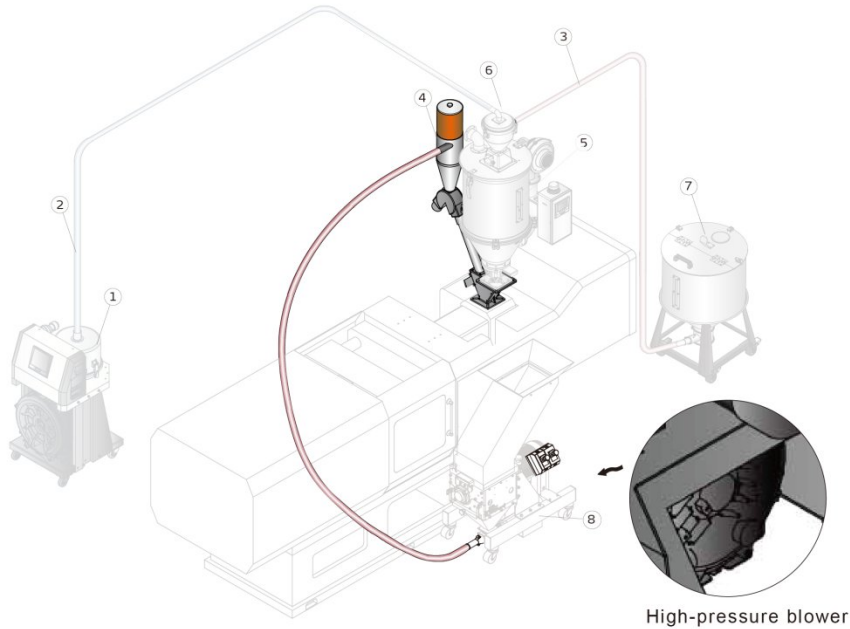


1. Vacuum Loader
2. Suction pipe
3. Material pipe
4. 30-Sec Instant Recycling System- VR Type
5. Dryer
6. Vacuum hopper receiver
7. Material storage tank
8. Medium speed granulator SG-M

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

### 3.5.5 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.

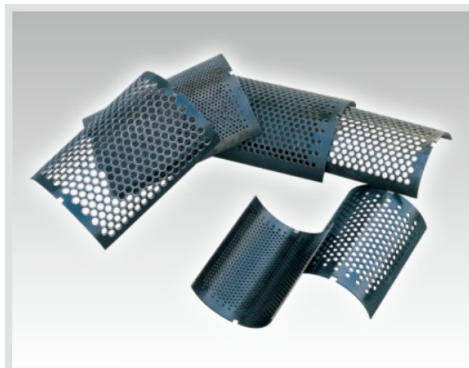


1. Vacuum Loader
- 2.Suction pipe
- 3.Material pipe
- 4.30-Sec Instant Recycling System- PR Type
- 5.Dryer
- 6.Vacuum hopper receiver
7. Material storage tank
- 8.Medium speed granulator SG-M

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

## 3.6 Options

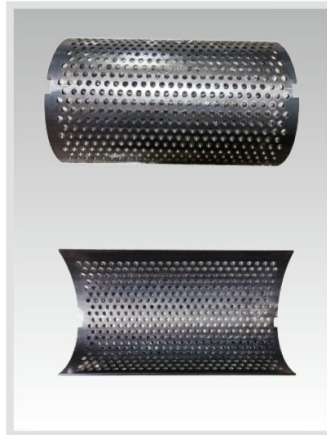
### 3.6.1 Special screen



Picture 3-10:Special Screen

Other special screen mesh size:  $\Phi$  5,  $\Phi$  8,  $\Phi$  10,  $\Phi$  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  $\Phi$ 5.

### 3.6.2 Slant hole screen



Picture 3-11:Slant hole screen

Especially for the filtering long strips, the slant hole screen  $\Phi$ 5mm and  $\Phi$ 6mm 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.
- 2) Check the cutter clearance and whether the blade screw is tightened (torque 43Nm).

#### 4.1.2 Two Hours after First Start

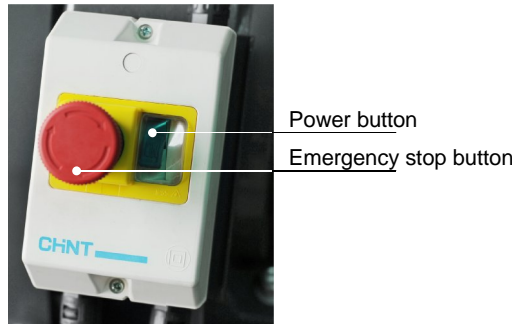
- 1) Check the cutter clearance again, including rotating blades and fixed blades, and check whether the blade screw is loosen again.
- 2) Check the motor set screw and whether the set bolt is tighten.

#### 4.1.3 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 Start and Stop the Granulator

The startup and stop of the SG-M series granulators are controlled by the start button and emergency stop switch on the switch box.



Picture 4-1: Start and Stop the Granulator

**CAUTION: If there are un-grinded materials in the feed box or cutting chamber, the granulator shall NOT be stopped. Otherwise, the screw materials will block the rotator and the motor will be overloaded at the next startup.**

## 4.3 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.

- 1) Check that the feed-in case is empty, and then stop the machine.
- 2) Loosen the star knobs on the feed box.
- 3) Open the feed box backwardly.

## 5. Trouble-Shooting

### 5.1 Granulator Can Not Work

- 1) Check if the emergency stop button is reset or not.



Picture 5-1:Emergency Stop Button

- 2) Check if the feed box is closed fully, if not, or the star knob has not been locked fully, the machine can't be started.



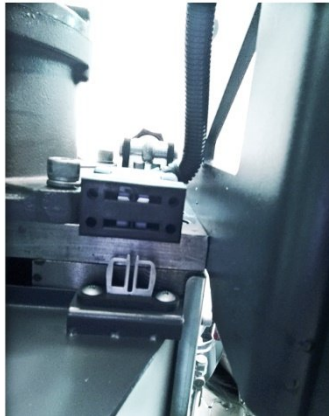
Picture 5-2:Star Knob

- 3) Check whether the storage box is properly installed. If it is not fully closed or the safety switch pin is disconnected, the machine can't be started.  
Check whether the feed box and storage box are properly installed. If they are not completely closed or the safety switch pin is not inserted, the machine can't start.





Picture 5-1: Feed box safety switch pin



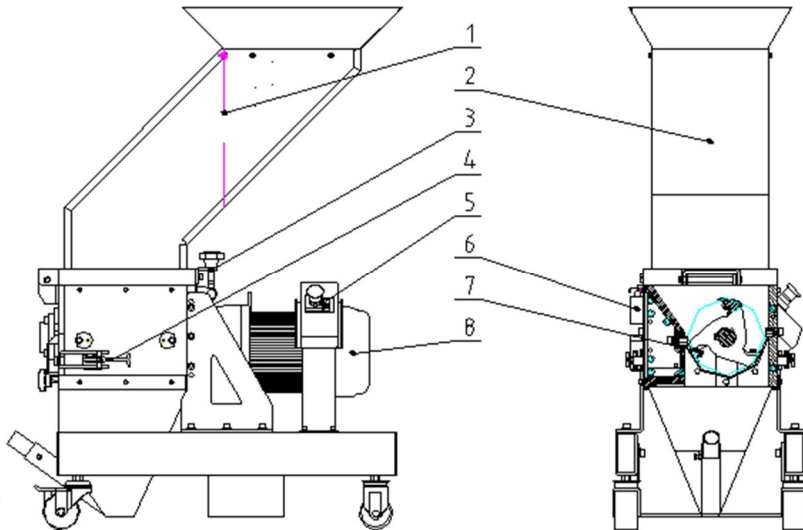
Picture 5-2: Storage box safety switch pin ( only for machine optional with CE standards )

- 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 5-3:Cutting Chamber Cutter

## 6. Maintenance and Repair



- 1) Check whether the material fender is complete before startup. Cycle: daily.
- 2) Check there's metal in the cutting chamber before machine start. Period: daily.
- 3) Before startup, check whether the star screw of the feed box is tightly locked. Cycle: Daily.
- 4) Check whether the screen bracket buckle locking with the cutting chamber is tightened up before machine startup. Cycle: Daily.
- 5) Check start button/emergency stop button works normally or not. Period: daily.
- 6) Check safety switch works normally or not. Period: daily
- 7) Power off and check whether the fixing screws of the fixed and rotating blades are loose. Cycle: Weekly.
- 8) 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

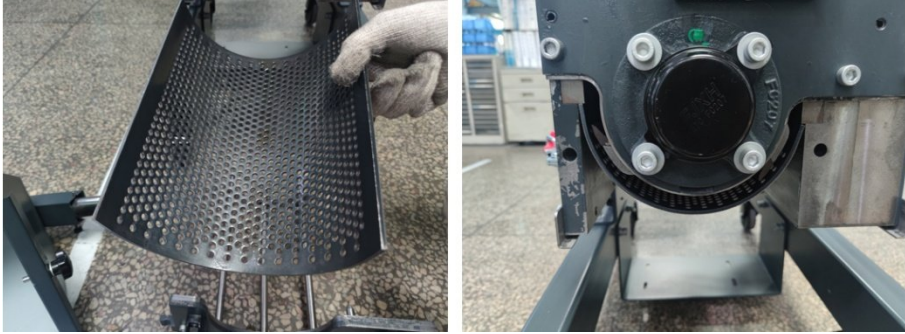
The blade rest is directly installed on the motor shaft. Clean the blade rest and shaft first thoroughly to remove the dust and debris before installation. Otherwise, the blade rest and shaft may not move forward or cause. After cleaning, place the blade rest sleeve on the motor shaft, keep the blade 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

- 1) 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

- 2) 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

- 3) 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

- 4) 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!



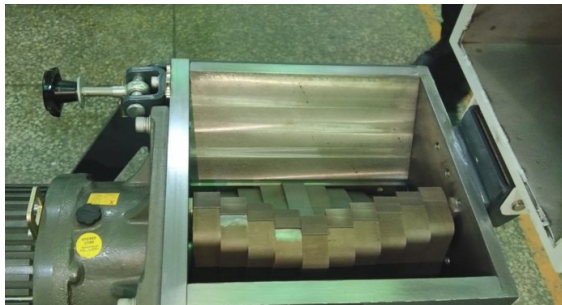
The blade fixing screws must be changed during each blade replacement.



**Notice!**

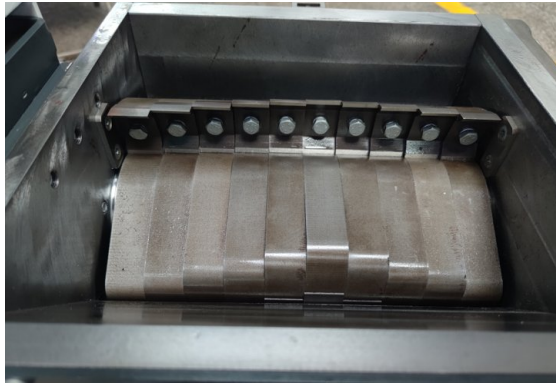
Don't install the cutters with the help of others to prevent personal injury. Lock the rotating shaft with a thick wooden block on the cutting chamber.

- 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

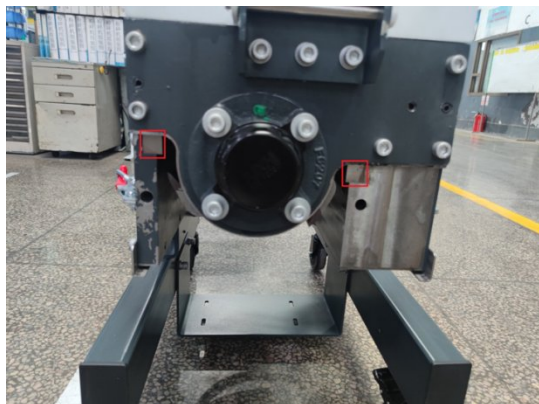
- 3) After removing the blade, clean the installation point of the blade.
- 4) Replace the prepared new blade. Check whether the screen mesh hole has deformed during the replacement, and replace it at once if it finds the elliptic mesh hole. Check the blades and rotate the rotating blade rest till all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

Table6-1: 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 6-1: 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 6-12: 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 \_\_\_\_  $\Phi$  \_\_\_\_ 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.