SG-24

Screenless Granulators

Date: Nov. 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!

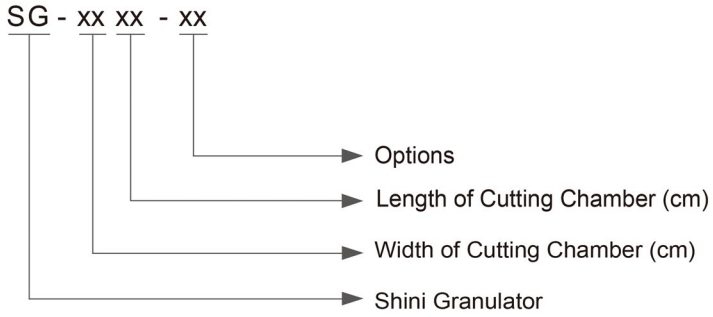
Always take great care when the knives are within reach, they are very sharp and can cause personal injury.

Forbidden to process flammable or toxic material!

SG-24T series granulator operate in super low speed to cut materials into well-proportioned granules. There are least dusts produced in the cutting process. Multiple security devices ensure high safety grade; automatic reverse running function ensures continuous operation. This series of screenless granulators are suitable for granulating hard and thick materials.

Picture 1-1: Screenless Granulators SG-2427

1.1 Coding Principle



1.2 Feature

1) Adopting gear box of global brand, SG-24 series features steady performance, long service life and large transfer torque.
2) SG-24 series teeth cutters and cutting blades are integrally fitted in one cutting chamber. Screenless design, well-proportioned size of regrinds and least amount of dusts. Regrinds could be used with virgin materials.
3) The front and rear fixed cutter and staggered blade of SG series are in double-edged design, and the cutter or blade can be capsized if one side is blunt to extend the service life of the cutter by twice.
4) SG-24 series motor shaft and rotor shaft are connected by shaft coupling
5) for convenient motor replacement.
6) When motor blockage occurs, the machine will alarm visibly and enable motor to run reversely. It resumes normal operation automatically after the trouble is clear.
7) Transparent PC feeding hopper for easy checking. With standard magnet installed at the inlet of the feeding hopper, metal impurities in the materials can be avoided to protect the cutter;
8) The machine can be set to run at intervals according to demands, which can save the energy up to 50%.
9) The blade shaft speed can range is 30Hz~70Hz. Low speed is used for brittle materials, and it can reduce noise and dust content, and save energy; High speed is used for soft materials to improve the cutting ability.
10) Compact design, small footprint for fast cleaning and maintenance.

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.

Shini Hotline Service:

Headquarter and Taipei factory:

Tel: + 886 (0)2 2680 9119

Shini Plastics Technologies (Dongguan), Inc.:

Tel: +86 (0)769 8331 3588

Shini Plastics Technologies (Pinghu), Inc.:

Tel: +86 (0)573 8522 5288

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.

1.3.1 Safety Signs and Labels

 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!

 The granulator should not be started 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 has been cut off before open the feed box.

 Please be noted to handle with care when opening or closing the feed box.

 SG-24 Granulators can not deal with fiber added material and CPVC or similar materials.

 Attention!

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

1.3.2 Transportation and Storage of the Machine

Transportation

1) SG-24 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℃ to +55℃ for long distance transportation and for a short distance, it can be transported with temperature under +70℃.

Storage

1) SG-24 series should be stored indoors with temperature kept from 5℃ to 40℃ 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

The machine should be operated:

1) Indoors in a dry environment with max. temperature +45℃ 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 3000m.

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 not 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 substances/liquid may not be processed in the granulator. Serious risk of fire or explosion may cause personnel injury.

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

 When process item is longer than feed port, please cut long items 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:

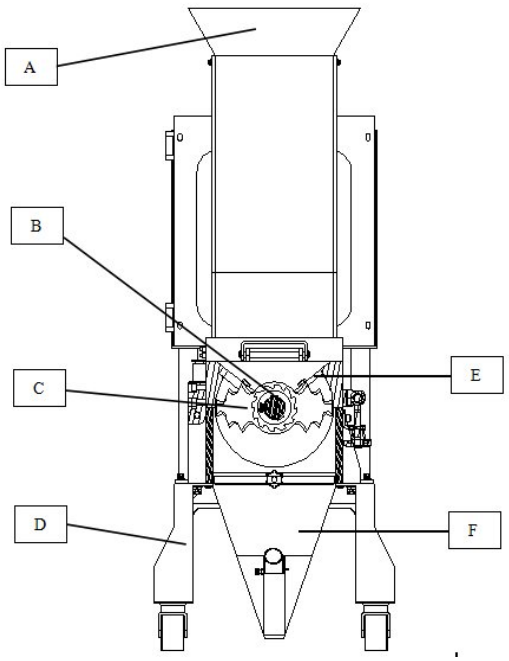
1) Any careless or man-made installations, operation and maintenances upon machines without referring to the Manual prior to machine using.
2) Any incidents beyond human reasonable controls, which include man-made vicious or deliberate damages or abnormal power, and machine faults caused by irresistible 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-24 series screenless granulators, which mainly works with the injection molding machine to crush a small amout of material. When crushing, don't input excessive materials. The granulator are controlled by main power switch, emergency stop button, start button, stop button and safety switches.

2.1.1 Working Principle



Parts name:

Feed box B. Teeth cutter C. Staggered blade D. Rack

E. Fixed blade F. Storage bin

Picture 2-1: Working Principle

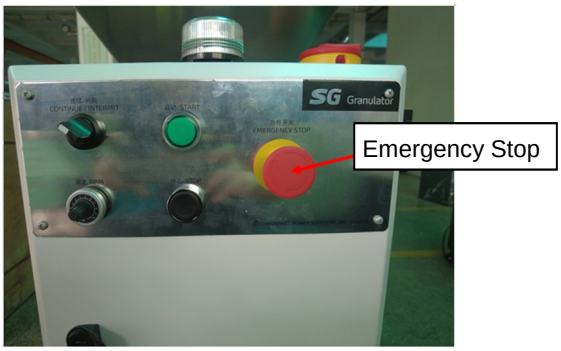
The material is fed in via a feed box (A) and drops inside the cutting chamber, the block material is cut by the staggered (C) and fixed blades (E), then the material is cutted into granule by (B) and (E). The granule directly fall into the storage bin (F), it does not need the screen. The cutting chamber is easy to open for cleaning and maintenance. After this, the granulate is 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 Emergency Stop Switch

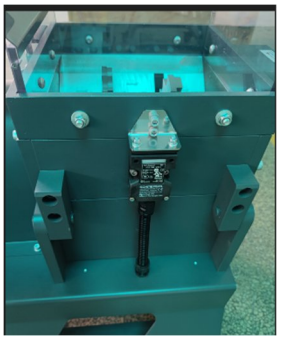
There is one red button on the control panel. Upon pushing it, the machine will stop running. Turn the button in the arrow direction as shown on the button, the button will reset (counter-clockwise).



Picture 2-2: Emergency Stop

2.2.2 Safety Switch

On the granulator is equipped the safety position switch for circuit breaker. In case the position of feed box is changed or the breaker is loosened, it will cut off the power supply. The safety switch of the granulator is installed on the outer wall of cutting chamber between the feed box and cutting chamber.



Picture 2-3: Safety Switch

2.2.3 Gate Lock

For opening feed box and cutting chamber, users need to loosen a long star screw (gate lock). It takes some time to unscrew the lock to completely stop cutter shaft and avoid personal injuries.

Notice before startup:

1) Check if feed box is tightened.
2) Check if plug of storage bin safety switch is tightened.
3) Check if there are foreign matters like metals in the cutting chamber.

2.3 Electrical Components Description

2.3.1 Thermal Overload Relay

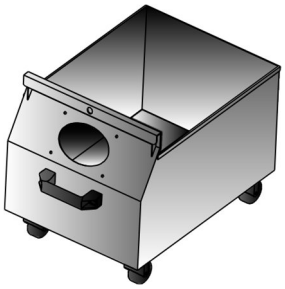
Picture 2-4: Electrical Components Description

1) Transformer, provide suitable voltage for control circuit.
2) Microcomputer control board (PCB) achieves granulator normal operation, material blockage reverse running and related alarm function.
3) Fuse, perform the function of overload and short phase protection.
4) Circuit breaker, isolate or short circuit protection.
5) Contactor, connect or disconnect circuit in a distance.
6) Overload relay, can protect the motor or default phase.

2.4 Options

2.4.1 Manual Collection Bin

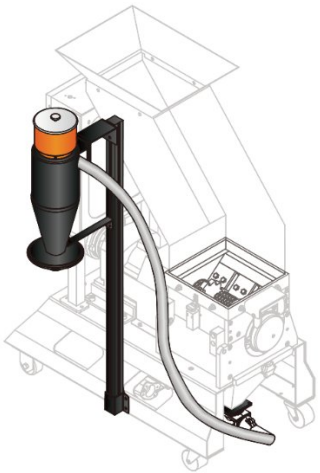
Manual collection bin helps to collect and store regrind.



Picture 2-5: Manual Collection Bin

2.4.2 Regrind Conveying Via Blower & Cyclone (PC type)

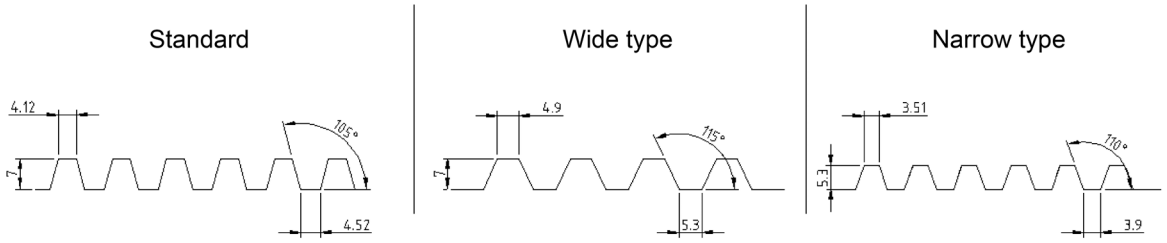
This device utilizes loading blower to convey regrind into the cyclone dust collector to separate the regrind from the air and then the regrind will fall into the material storage hopper.



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

2.4.3 Cutters

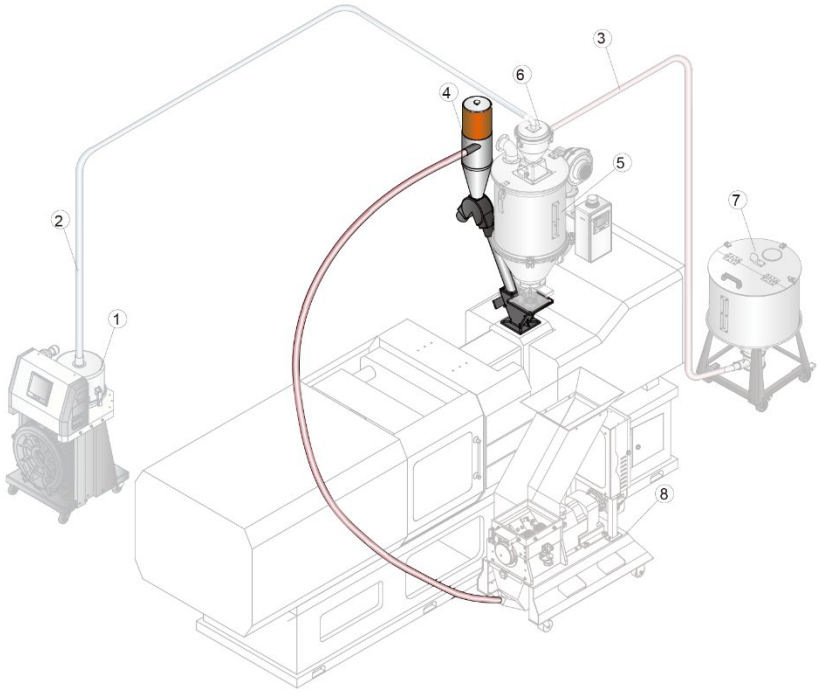
On the basis of standard cutter, additional wide cutters or narrow cutter are provided for options.



Picture 2-7: Cutter Size

2.4.4 30-second 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. Screenless Granulator

Picture 2-8: 30-Sec Instant Recycling System-VR Type

2.4.5 30-second Instant Recycling System -PR Type

The 30-sec. instant recycling system utilizes the high-pressure blower to blow the

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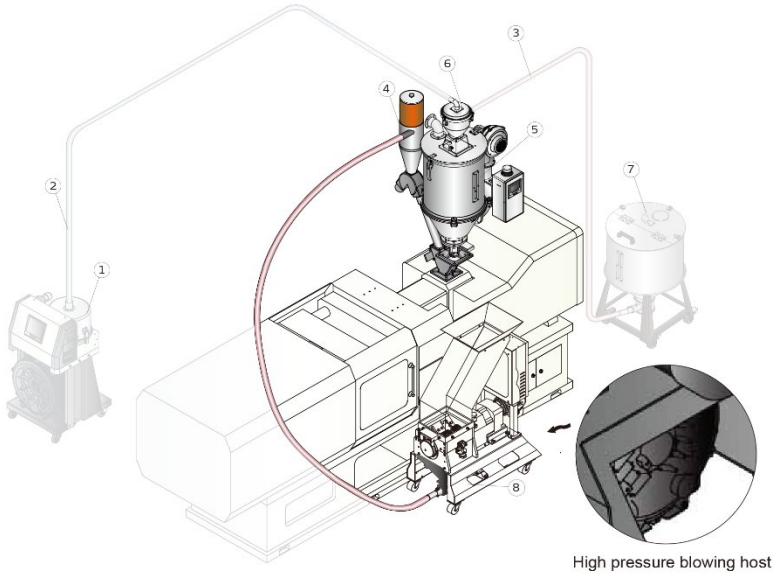


1. Vacuum Loader
2. Suction pipe
3. Material pipe
4. 30-Sec. Instant Recycling System-VR Type
5. Dryer
6. Vacuum hopper receiver
7. Material storage tank
8. Screenless Granulator

Picture 2-1: 30-Sec Instant Recycling System-PR Type

3. Installation and Debugging

 Read through this chapter before installation.

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

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

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

 Be careful!

Cutting blades must be put balanced, prevent it to rotate itself when do the installation. Keep hands from blades to avoid body injuries!

 Attention:

Don't take other person's help to finish the installation, use a wooden board to block the rotating blade to finish it.

 Notice!

Use protective gloves since the blades are very sharp.

 Caution!

Must use new screw and washer to install the blade.

3.1 Installation Notice

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) 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: +/- 5%
   Main power frequency: +/- 2%
7) Make at least 1 meter clearance around the machine to facilitate repair and maintenance.
8) Power connection refers to the circuit diagram of each model.

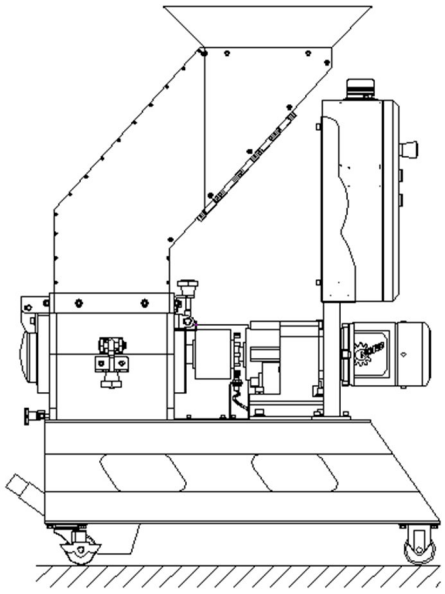
Picture 3-1: Installation Notice

Table 3-1: Cutters and other fixing screw torque

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
Fixing torque (Nm)	50	86	135	215	290	420	570	730

3.1 Installation Place

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



Picture 3-2: Installation Place

4. Operation Guide

Important: Wear gloves during operating to avoid personal injury!

Important: Wear goggles during operating to avoid personal injury!

Note: Blade or rotor may be loose, make sure check them before operation:

1) Check if blades are damaged and loose.

2) Check if rotor is damaged and loose.

Please contact Shini Company if any situation above has been found.

4.1 Startup Pretest

Unpainted part of the machine has been covered with antirust oil. Before use, the antirust oil should be cleaned.

1) Clean with a towel.
2) Wash with a towel dipping with amyl acetate.

4.1.1 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 granulation, ensure the rotation direction of main shaft is in line with that marked in nameplate.

4.1.2 After Startup for 2 Hours

1) Check the space of the cutting tools of the fixed blades and rotating blades again; check whether the lockup screws of the blades are loose.
2) Check the position-adjusting screws of the motor and check whether the position-adjusting screws are tightened.

4.1.3 After Startup for 20-30 Hours

After 20-30 hours machine running in full load, users need to check temperature on motor surface and check if there oil leaks.

4.2 Circuit Connection

Note: The installation of the granulator's circuit must be conducted by the professional electricians.

1) Check if feed box is fully closed;
2) Check if storage bin is fully closed;
3) Ensure the main power switch is in ON position.
4) Check if emergency stop is under action;
5) Start the granulator via pressing the START button and stop the granulator via pressing the STOP button.
6) The granulator needs some time to fully come to a halt; after full stop, check whether the running direction is clockwise.

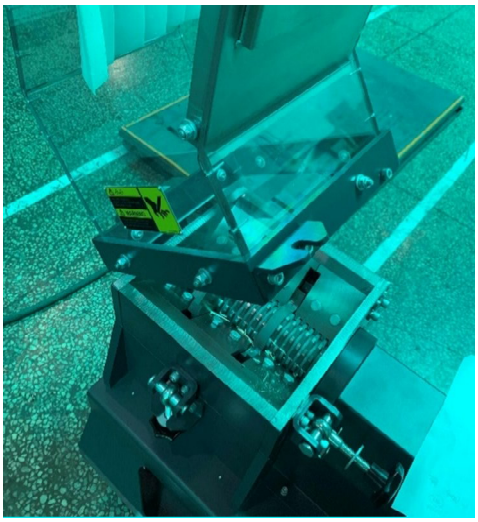
Important: The cutting tools may be damaged and the granulating capability will be reduced if there is a wrong running direction. Please disconnect the power and transpose any two wires of the three in the main power.

4.3 Open the Feed Box and Storage Bin

Note: Before opening the feed box and the storage bin, turn off the main power switch and the power switch of the granulator.
Note: Please take care when opening the feed box!
Important: Be careful! The blade is very sharp, please take care.

4.3.1 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 feed box backwards.



Picture 4-1: Open the Feed Box

4.3.2 Open the Storage Bin

1) Turn off granulator power.
2) Loosen long star screw.
3) Pull out storage bin.

4.4 Shut the Feed Box and Storage Bin

4.4.1 Shut the Feed Box

Note: Please take care when closing the feed box!

Note: Make sure feed box is fully closed, otherwise machine would not start.

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

4.4.2 Shut the Storage Bin

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 bin inwards along its slideway.
3) Lock up long star screw and fix storage bin.

4.5 Start and Stop the Granulator

The granulator is controlled by main power switch, safety switch, START/STOP button and emergency stop button.

Main power switch is located at the front control panel. And the startup and stop of the machine is controlled through rotating the main poewer switch.

Picture 4-2: Main Power Switch

START button and STOP button:

These two buttons control the startup and stop of the machine.

Emergency stop:

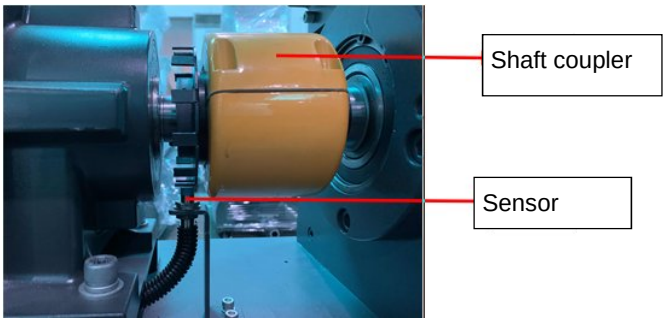
This switch can protect and stop machine when accidents happens.

Picture 4-3: Control Box Button and Panel

Note: If there are ungrinded materials in the feed box or cutting chamber, the granulator shall NOT be stopped, otherwise raw materials will block the rotor and the motor will be overloaded next time you start the machine up.

4.6 Motor Reversed Protective Function

When there are hard material appear in the feed box and cutting chamber or for other reason the cutting blades can not cut, this unit will enable blade shaft reverse rotating with alarm, it resumes normal operation automatically after 3 seconds later, so to keep granulating material. The alarm dies out after blade shaft rotates normally. If the motor reverse function be started over 3 times, the motor would be stopped. At this time you can press down the STOP button to cut off the power, and then restart it by press the START button.



Picture 4-4: Motor Reversed Protection

If the rotor has been seized during operation, its working mode is:

Rotor is seized up, auto stop for 1 sec.→reverse rotate for 3 secs→stop for 1 sec →normal rotate→

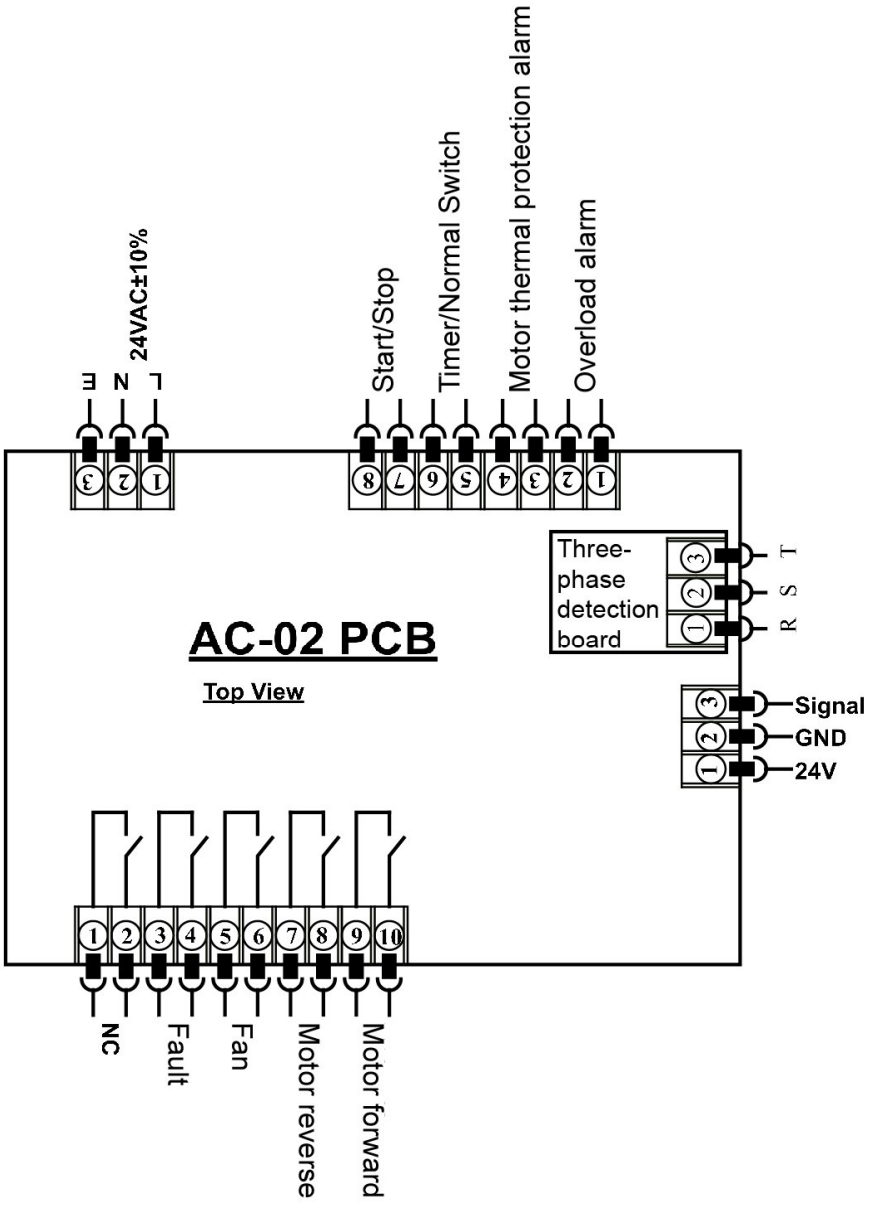
A. 1) normal→working
   2) seized up→stop for 1 sec.→reverse rotate for 3 secs→stop for 1 sec→normal rotate

B. 1) normal→working
   2) seized up→stop for 1 sec.→reverse rotate for 3 secs.→stop for 1 sec→normal rotate

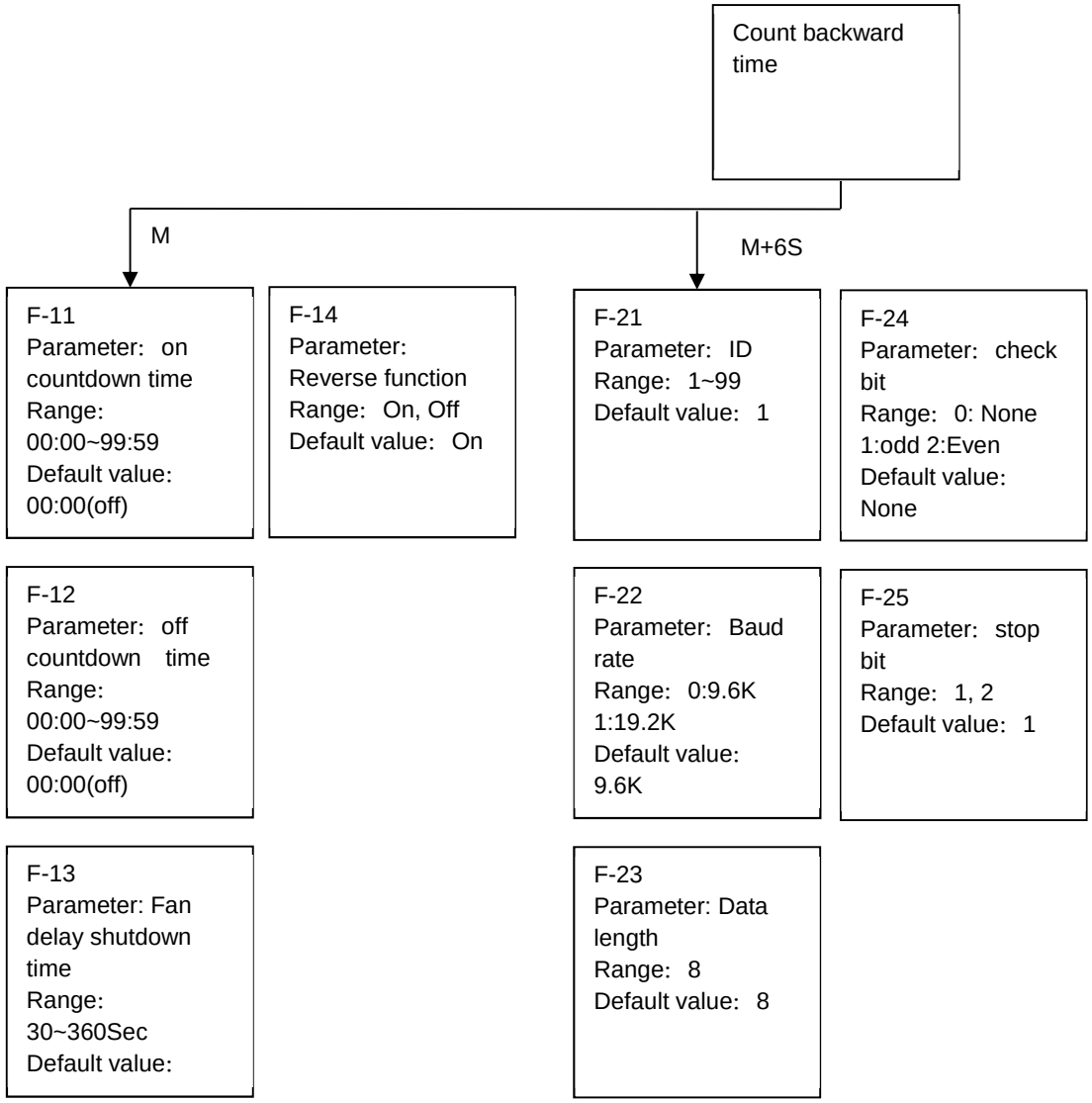
C. 1) normal→working
   2) seized up→machine stops

Note: Mount sensor and ensure its space with shaft coupler to about 2~4mm.

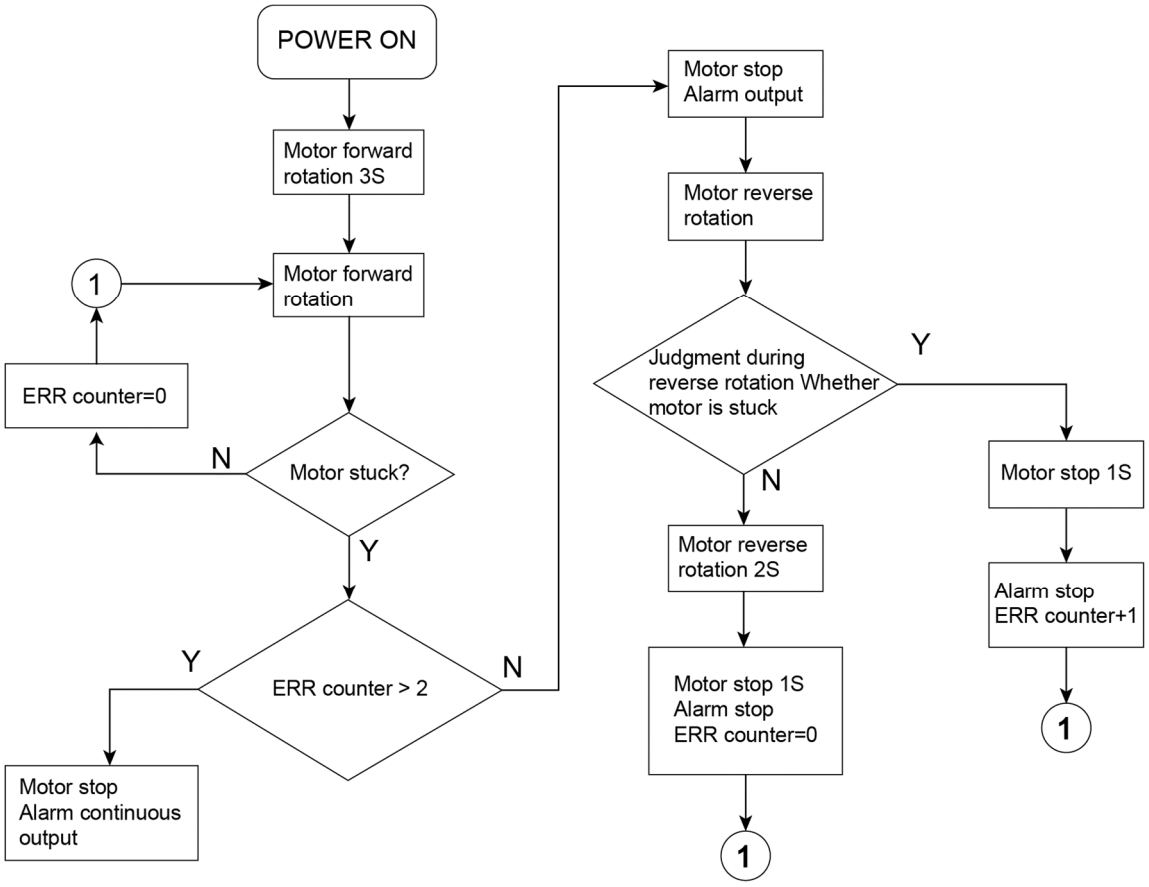
4.7 Guidance


24VAC±10%
L
N
E
Start/Stop
Timer/Normal Switch
Motor thermal protection alarm
Overload alarm
Three-phase detection board
R
S
T
AC-02 PCB
Top View
Signal
GND
24V
NC
Fault
Fan
Motor reverse
Motor forward

4.8 Operation Flow



4.9 Motor Detection Logic



Note:

There is 1S switching time between forward and reverse rotation.

When the Sensor input signal is less than 4 (including 4) pulse signals, it is judged that the motor is stuck.

When the Sensor input signal is greater than 4 (including 4) pulse signals, it is judged that the motor is not stuck.

When the Sensor input signal is greater than 14 pulse signals, it is judged that the motor rotates normally.

4.10 Action logic

4.10.1 Startup

1) After the external startup signal is input, start the motor and detecting the motor status.

2) When there is an alarm, the fault Relay outputs, while the NC Relay can't output.
3) 3) When there is no alarm, the fault Relay can't output, and the NC Relay outputs.

4.10.2 Intermittent running

1) When the timing switch signal is input and the F-11 and F12 parameters are not 00:00, the countdown timer will run intermittently.

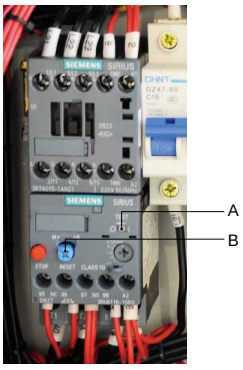
4.11 Error Type and Reasons

Error Display	Error Reasons	Alarm	Control
E-01	The motor is completely stuck	Occur	Stop
E-02	3-phase alarm	Occur	Stop
E-03	Overload	Occur	Stop
E-04	Motor overheat protection	Occur	Stop

5. Trouble-shooting

5.1 Granulator Can Not Work

1) Check if the emergency stop has been reset or not. If not, rotate the button anti-clockwise to reset it.
2) Check if the safety switch between feed box and storage box is completely closed. If not, machine can not be started.
3) Checking overload protector of the motor. The overload protector in the electrical control box will work if the motor overloads. Test white key (A) turn left, press the “Reset” button (B) to reset it. Before it starts again, check whether there is any powder left in the granulator.
4) Check the overload protector of the feeding blower's motor.If the feeding blower does not run, the granulator can run neither. Check the motor protector in the electric control box. If the protector is closed, the switch will be at “0” position, reset it to “1” position. Check if there’s no leftover, then re-start the machine. Test the white key(A) turn left, press” Reset” key (B) to reset it.
5) Check the clearance between the blades. The stop will happen or the motor overload protector will work if the blade is very blunt or the space between blades is not correct. Protector will be tripped if motor is overload. Blades should be checked, replaced or adjusted between the blades.
6) The contactor is burnt down or the control circuit is break off.

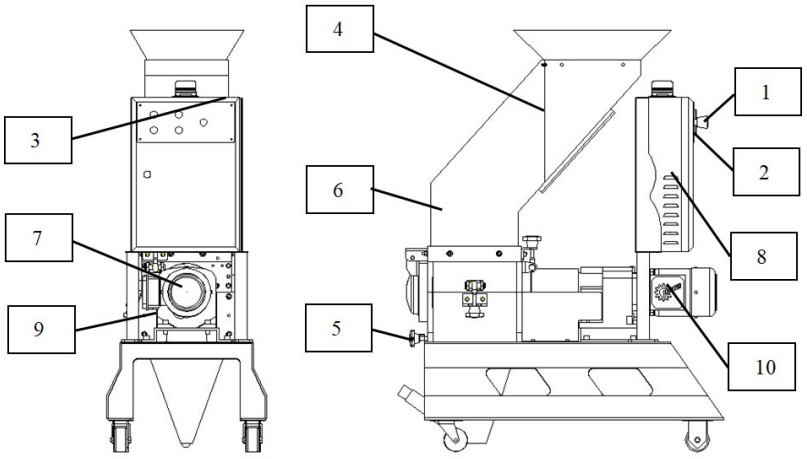


5.2 Stop Due to Other Reasons

Connection failure or looseness of safety switch can also cause shutdown.

Note: Do not disconnect to safety switch or control switch.

6. Maintenance and Repair



Picture 6-1: Maintenance and Repair

1) Check whether emergency stop works normally. Period: daily.
2) Check whether START/STOP button works normally. Period: daily.
3) Check whether main power switch works normally. Period: daily.
4) Check whether material stopper is intact before startup. Period: daily.
5) Check whether star screws in feed box and storage bin are tightened. Period: daily.
6) Check whether there is metal in cutting chamber. Period: daily.
7) Check whether cutter shaft rotates as showed in the nameplate. Period: daily.
8) Check whether electric joints are loose in control cabinet. Period: weekly.
9) Check whether fixed screwed are loose. Period: monthly.
10) Check the gear box lubrication oil. Period: Every six months.

6.1 Replace the Blades

Note: Self-rotation also happens when barycenter is unstable. Wear gloves to avoid being cut and be careful of the sharp blades!

Picture 6-2: Blades Maintenance

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

1. Remove the fixed blades

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

Note: Be careful with the sharp blades.

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

Picture 6-3: Remove the Fixed Blades

2. Remove the rotating blades

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

Picture 6-4: Dismantle Rotate Blades

Note: 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.

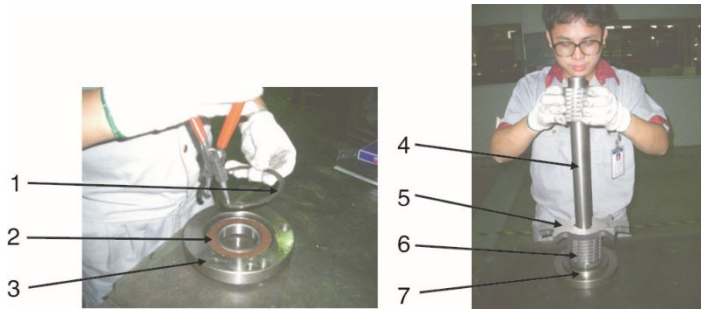
1) Install the rotating blades
2) Then the fixed blades
3) Finally the front fixed blades

Note: Each time to replace the blade, the screw and insulation ring must be replaced also.

Note: Inject screw thread fixing glue (light blue LOCTITE 243 recommended) to the fixing screw so to avoid slipping and tighten screws up.

6.2 Installation of Bearing and Cutter Shaft

1) Install the bearing 2. bearing washer 1. bearing sleeve 7 into the bearing base 3.
2) Insert the blade shaft 4 into the bearing sleeve vertically 7.Then sleeve the staggered blade 5 and the teeth blade 6 on the bearing spacing.



Picture 6-5: Installation of Bearing and Cutter Shaft 1

3) Put the Cutter Shaft 2 into the cutting chamber 1, let both terminals of the bearing tallies with the grooves.

Picture 6-6: Installation of Bearing and Cutter Shaft 2

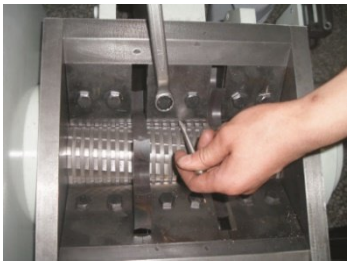
4) Fix the bearing base on the cutting chamber.

Picture 6-7: Installation of Bearing and Cutter Shaft 3

Note: Daub the lubrication on the bearing and bearing base. Use proper twisting force to lock the screw tightly.

5) Use a wrench to tight up all the screws on bearing block or cutting chamber and lock them up with right torque (M12×25).

6) After installed the rotating Cutter Shaft to the housing, mount fixed blades that correspond with teeth cutters on pressing block and align their holes. Lockup the fixing screw (LOCTITE243 thread fixing glue is recommended). (Fixing screw for front fixed blade is M10×30, while for back fixed blade is M10×35).



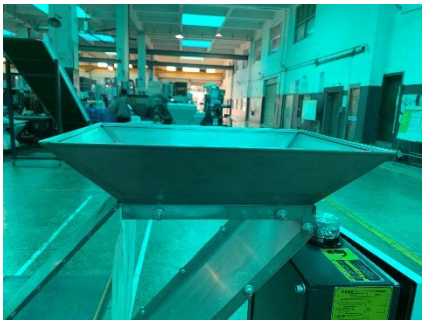
Picture 6-8: Installation of Teeth Cutter and Fixed Blade

Note: In order to avoid personal injury and machine damage, the lockup screws has to be tightened.

Note: Blades are extremely sharp; to avoid injuries, please wear gloves before and during installation.

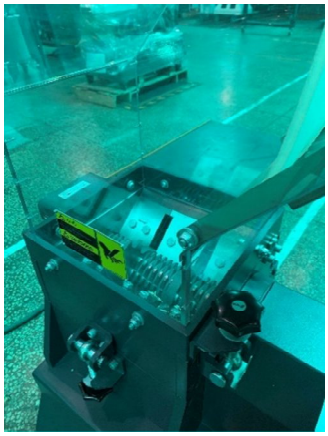
6.3 Installation of Feed Box, Feed Port and Storage Bin

1) Lift up the feed box to fix it onto the cutting chamber with screws (M8×35).



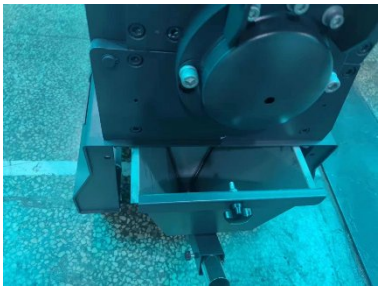
Picture 6-9: Installation of Feed Box, Feed Port and Storage Bin 1

2) Put the feed box on the cutting chamber, insert the rotation shaft of feed box (BH10184900010) into the hole, and then use the inner hexagon screw (M8 × 20) to lock up both ends.



Picture 6-10: Installation of Feed Box, Feed Port and Storage Bin 2

3) Hold the storage bin with both hands and push it into its right position along the slide way.



Picture 6-11: Installation of Feed Box, Feed Port and Storage Box 3

4) Lock up plum blossom handle.

Picture 6-12: Installation of Feed Box, Feed Port and Storage Box 4

Note: Lock nut is necessary for keeping screws falling into cutting chamber.

6.4 Cutting Chamber Disassembly

6.4.1 Gear box dismantlement

1) Dismantle the screw of gear box's fixed plate to push out the gear box directly outward to separate the coupler;

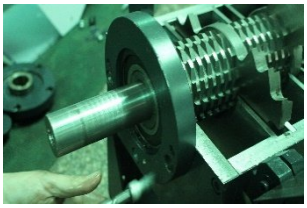
Picture 6-13: Step 1 of Gear box Dismantlement

6.4.2 Dismantlement of left / right bearing base

1) Firstly disassemble the fixing screws of right bearing base and take down the base;

Picture 6-14: Step 1 of Left /Right Bearing Base Dismantlement

2) Disassemble the fixing screws of left bearing base, take down the base and the whole blade shaft together. Then dismantle the teeth cutter, staggered blade.




Picture 6-15: Step 2 of Left / Right Bearing Base Dismantlement

3) Dismantle the left bearing base, and then the left and right bearing bases are taken out.

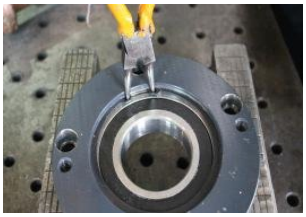
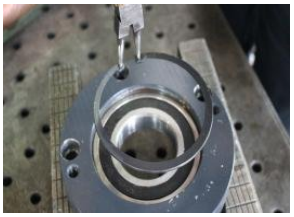

Picture 6-16: Step 3 of Left/ Right Bearing Base Dismantlement

6.4.3 Bearing Dismantlement

1) Put the fitted iron rod on the shaft sleeve, and use the copper stick to knock the top of the iron rod, then shaft sleeve is taken down.


Picture 6-17: Step 1 of Bearing Dismantlement

2) Take out the circlip with the circlip plier

Picture 6-18: Step 2 of Bearing Dismantlement

3) Put the fitted iron rod on the bearing, and use the copper stick to knock the top of the iron rod, then bearing is taken down.


Picture 6-19: Step 3 of Bearing Dismantlement

6.5 Installation of Reduction Gear

Note: To stop blade rest shaft rotating while installation, use a thick wood block to stuck rotate blades!

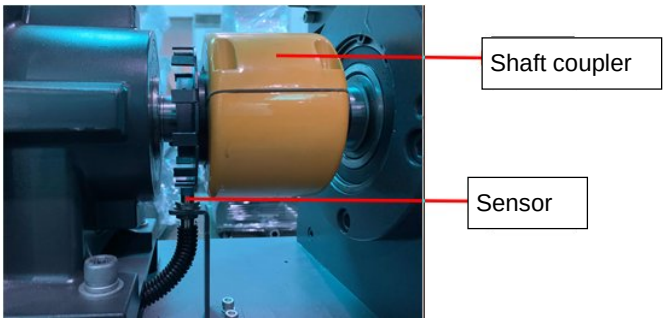
1) Firstly, fix the gear box on the fixed plate, and use the hexagonal screw to fasten.

Picture 6-20: Installation of Reduction Gear 1

2) Use hexagon screw to fix the gear box's fixed plate on the base and lock the screw to fasten the motor.

Picture 6-21: Installation of Reduction Gear 2

3) Install the sensor fixed plate M6×12.



Picture 6-22: Installation of Reduction Gear 3

Note: The cutting blade rest shall be put stably and avoid cutter self-rotation.At the time of operating, hand shall stay away from the cutting tool to avoid bodily injury.

6.6 Transmission

6.6.1 Maintenance of Reduction Gear

Replace lubricating oil after initial motor running for 400 hours, and oil change period later would be 4000 hours running. There should be enough lubricating oil inside motor tank and inspect volume regularly. If oil volume is found to be decreased or oil quality to be deteriorated, supply or renew oil immediately. Note that keep the appearance of mixing motor and gear box clean by dedusting .

6.7 Check and Maintenance of Gear box

Check lubricating oil for every six months or after 3000 hours in operation

1) Check oil level:
   a) Cut power off so to avoid electric shock and wait till the motor get cooled.
   b) Remove oil level plug to check if the oil has been filled up full.
   c) Install oil level plug.
2) Check the lubricating oil:
   a) Cut power off so to avoid electric shock and wait till the motor get cooled.
   b) Open oil drain plug to take samples.
   c) Check viscosity index of the lubricating oil.
   d) If it is evidently turbid, please replace it as soon as possible.

Check the lubricating oil level and install oil level plug.

3) Lubricating oil replacement: Increased viscosity of the lubricating oil will make it harder to discharge the oil, so better replace it when the motor is in its operational temp.
   a) Cut power off so to avoid electric shock.
   b) Lay an oil pan under the oil drainage plug.
   c) Open the oil level plug, air valve and oil drainage plug.
   d) Drain all the lubricating oil out.
   e) Install oil drainage plug.
   f) Fill in new lubricating oil in same brand.
   g) Tight up the oil level plug and air valve.
4) Brand of lubricating oils (ambient temperature : -10℃~40℃):
   Mobil: Mobilgear 630
   Shell: Shell Omala 220
   Aral: Aral Degol BG 220
   BP: BP Energol GR-XP 220
   Texaco: Meropa 220

6.8 Maintenance

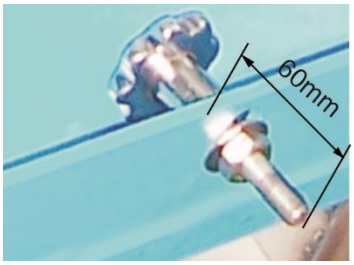
When carrying out maintenance, ensure that there is no material left in the granulator.

Note: All repairimg must be conducted by professionals!

6.8.1 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.
4) Check the reversed rotating function.
5) Check star screw, safety screw is part of granulator' safety system, its length is pre-designed, when the screw is loosen, and the granulator will

stop working so to protect the machine. The thread length of the safety screw is 60 mm, damaged screw needs to be replaced by a new one.



Picture 6-23: Star Screws

6.8.2 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 whether there is looseness in electrical connections.

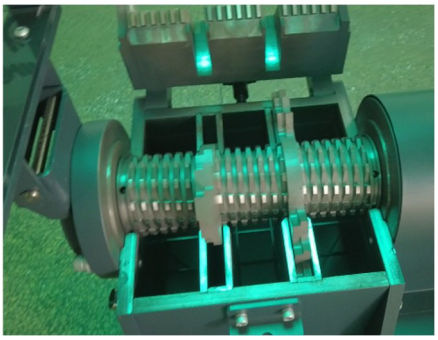
6.8.3 Monthly Check

1) Check whether blades are loose or abraded.

6.9 Cleaning

Note: 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) Clean the shutter of the feed box with a dust separator.
5) Unscrew the star knob to open the feed box backward. Please take care to prevent feed box damage.
6) Clean the interior surface of the feed box.
7) Clean both surfaces of the cutting chamber; open the upper cutting chamber and to clean the remained material by using revolving rod to turn the blade shaft.
8) Unscrew star screw and take out storage bin.
9) Clean storage bin.



Picture 6-24: Machine Cleaning

Note: Finish step 9 for every time of machine cleaning and also it at least has to be done for one time after 300 hours in operation.

6.10 Maintenance Schedule

6.10.1 About the Machine

Model _____ SN _____ Manufacture date _____

Voltage_____Φ_____V Frequency _____ Hz Power _____ kW

6.10.2 Check after Installation

☐Check if the lockup screws of the fixed blades are locked firmly.

☐Check whether star screws are tightened.

☐Check if the flange of the speed reducer has been locked firmly.

Electrical Installation

☐Voltage: _____ V _____ Hz

☐Specs of the fuse: 1 Phase _____ A 3 Phase _____ A

☐Check phase sequence of the power supply.

6.10.3 Daily Check

☐Check main power switch.

☐Check emergency stop button.

☐Check start / stop button.

- [ ] Check material check plate (strip) is perfect or not.
- [ ] Check whether emergency stop and safety switch works normally.
- [ ] Clean cutting chamber and feeding hopper.
- [ ] Check whether start, stop and power switches are normal.

6.10.4 Weekly Check

- [ ] Check all the electrical cables.
- [ ] Check if there are loose connections of electrical components.
- [ ] Check whether fixed screw loose for the blade.
- [ ] Check if there is abnormal noise, vibration and heat in reduction gear.
- [ ] Check the cracking window

6.10.5 Monthly Check

- [ ] Check the status of the belt.
- [ ] Check the overload protection function of the motor.
- [ ] Check the tightness of the blades.

6.10.6 Check Half-yearly or Every 1000 Running Hours

- [ ] Check or replace lubrication for gear box.
- [ ] Check lubrication of bearing.
- [ ] Evaluation of the machine condition.

6.10.7 3 year Checking

- [ ] PC board renewal.
- [ ] No fuse breaker renewal.