

# **SG-43/43B**

## **Central Granulator**

Date: Nov., 2020

Version: Ver.D(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-43(B) series are suitable for centralized recycling of waste and rejected parts from injection, blowing molding and extrusion lines. This series feature compact design, easy operation and quick blade replacement. Gradually inclined cutting and integrated power design offer a better cutting effect and a lower noise level, ensures low energy consumption.

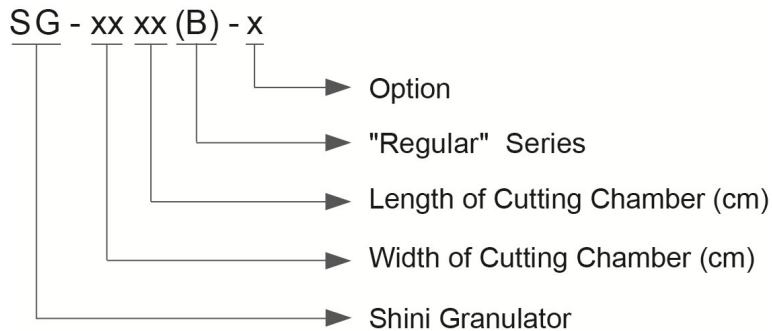


Model:SG-4390



Model: SG-4390B

## 1.1 Coding Principle



## 1.2 Feature

- I Optimized structure and full-closed sound-proofing ensure low noise level.
- I Rotating cutters adopt V-type cutting technology which can send the feeding material into the center of rotating cutters so to prevent the material from adhering onto the inner side of the cutting chamber while enhancing its wearability.
- I V-type transmission belts help maintain a balanced operation mode, close contact, and also easy to disassemble and repair.
- I Cutting chamber made of high rigidity material, after processing by CNC machine, has the features like high intensity, super wearability, no contamination, long service life and easy for maintenance and repairing.
- I The initial cut-off point of machine with cutting chamber design is high, applicable to grind thick walled objects and sheet.
- I Paddle blades design allows increased efficiency.
- I The cutters are made of imported high quality steel featuring wearability, high rigidity and reuse after sharpening.
- I Equipped with presetting knife jig, rotating blades can be adjusted in the fixture outside the machine inside of machine instead of machine inside. It made blades adjustment much easier.
- I Cooling water device at the rear plate of the cutting chamber can effectively cool down the cutting chamber and prevent materials from melting-up.
- I Equipped with electrical current relay, motor overload protector and multiple safety devices, to ensure safe operation.
- I Regrind conveying system as standard. (optional in SG-43B)
- I Dust cyclone separator can effectively remove the air from regrind and

facilitates material collecting. (optional in SG-43B)

- I Adopts anti-vibration pads to absorb vibration during operation.
- I Equipped with flywheel to improve cutting ability. (optional in SG-43B)

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.

Headquarter and Taipei factory:

Tel: (886) 2 2680 9119

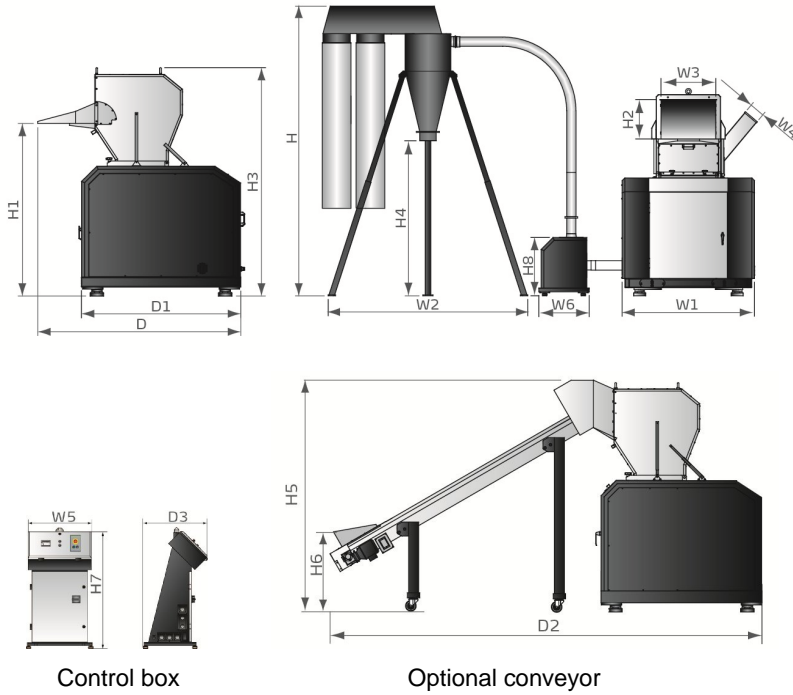
Shini Plastics Technologies (Dongguan), Inc:

Tel: (86) 769 8111 6600

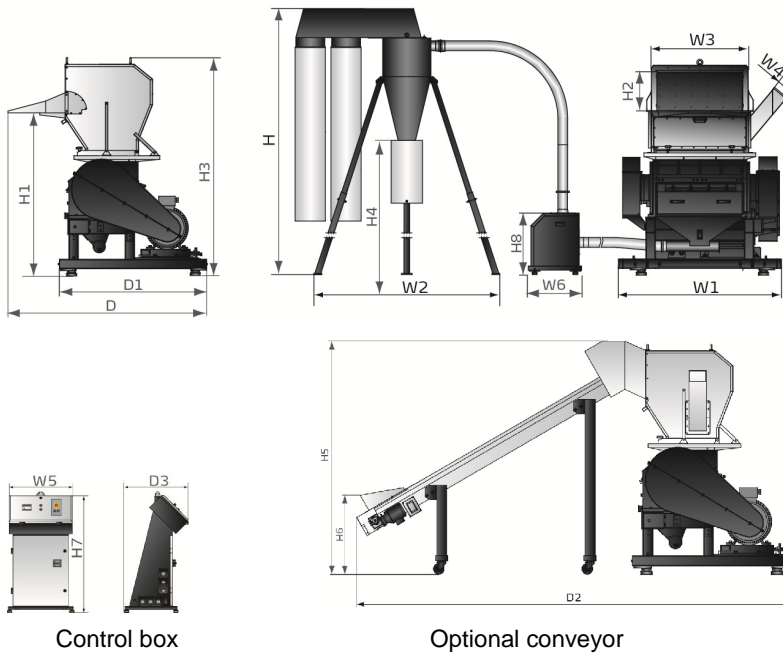
Shini Plastics Technologies India Pvt.Ltd.:

Tel: (91) 250 3021 166

### 1.3 Technical Specifications



Picture 1-1: Dimensions(SG-43)



Picture 1-2: Dimensions(SG-43B)

Table 1-1: Technical Specifications

Model		SG-4360(H)	SG-4360(H)B	SG-4390(H)	SG-4390(H)B
Ver.		D	C	D	C
Motor power (kW)		30(37)	30(37)	37(45)	37(45)
Conveying blower (kW 50 / 60Hz)		2.2	2.2	2.2	2.2
Quantity of fixed blades		2×1	2×1	2×2	2×2
Quantity of rotating blades(Optional)		3×1 (5×1)	3×1 (5×1)	3×2 (5×2)	3×2 (5×2)
Cutting Chamber (mm)		430×600	430×600	430×900	430×900
Max. Output (kg/hr)		800	800	1000	1000
Noise Level dB(A)		105~110	110~115	105~110	110~115
Material of Blades		SKD11	SKD11	SKD11	SKD11
Screen		Φ12mm	Φ12mm	Φ12mm	Φ12mm
High-power blower(kW)		○(7.5)	○(7.5)	○(7.5)	○(7.5)
Dimensions	H (mm)	2710~3155	2710~3155	2710~3155	2710~3155
	H1 (mm)	1708	1708	1708	1708
	H2 (mm)	430	430	430	430
	H3 (mm)	2260	2260	2260	2260
	H4 (mm)	1240~1690	1240~1690	1240~1690	1240~1690
	H5 (mm)	2277	2277	2277	2277
	H6 (mm)	750	750	750	750
	H7 (mm)	1268	1268	1268	1268
	H8 (mm)	636(970)	636(970)	636(970)	636(970)
	W1(mm)	1450	1390	1750	1690
	W2 (mm)	1900~2310	1900~2310	1900~2310	1900~2310
	W3 (mm)	600	600	900	900
	W4(mm)	166x166	160x160	166x166	160x160
	W5(mm)	720	720	720	720
	W6(mm)	552(630)	552(630)	552(630)	552(630)
	D (mm)	1978	1978	1978	1978
	D1(mm)	1553	1553	1553	1553
D2(mm)	4300	4300	4300	4300	
D3(mm)	690	690	690	690	
Net Weight (kg)		2350(2430)	2300(2350)	2730(2780)	2630(3680)

Note:1) "○" stands for optional.

- 2) SKD11 is steel grade of Japanese JIS standard.
- 3) Max. capacity of the machine is subject to diameter of screen mesh and composition of the material.
- 4) Noise level will vary with different materials and motor types.
- 5) Noise level refers to the following conditions: 1 meter around and 1.6 meter above the machine.
- 6) Power supply: 3Φ, 230 / 400 / 460 / 575VAC, 50 / 60Hz.

## 1.4 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.

### 1.4.1 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!



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



The granulator should not be able to start before the hopper and screen bracket are properly closed.



Attention please!

Ear protection is used during granulating of plastic materials.



When open feed box, please make sure the front door is opened.



Loading blower is applicable to convey regrind powder and it requires the temperature less than 80°C.



Loading blower has great suction power and it is easy to have objects and clothes suctioned into and lead to personal injuries. So the blower should not be used without any protective cover.



When it is working with transmission belt, please carefully check if the operator's clothes, arm or leg has been stuck by the transmission belt.



Air inlet dust clean.



Concerning SG-43 the cutting chamber should be heat-processed and the blades must be changed before the granulators deal with fibre added material.



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

	<p>Water outlet: drainage outlet.</p>
	<p>Water inlet: inlet for replenishing water and cooling water.</p>

## 1.4.2 Transportation and Storage of the Machine

### Transportation

- 1) SG-43(B) 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  $-25^{\circ}\text{C}$  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-43(B) 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

The machine should be operated:

- 1) 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 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, CO<sub>2</sub> 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.

## 1.5 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:

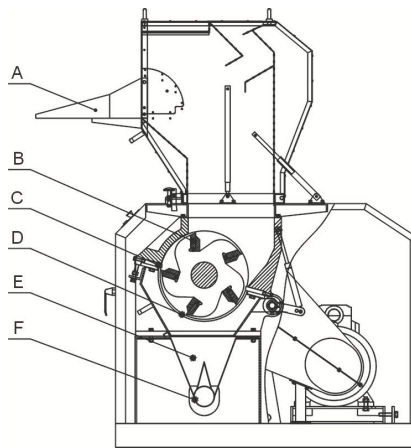
1. Any careless or man-made installations, operation and maintenances upon machines without referring to the Manual prior to machine using.
2. Any incidents beyond human reasonable controls, which include man-made vicious or deliberate damages or abnormal power, and machine faults caused by irresistible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

SG-43(B) series granulators applicable to granulate waste plastic for recycling use, mount magnet at the material inlet to clean out metal scraps and contaminations before granulating so to prevent metal scraps from getting into cutting chamber and brings damage to the blades.

#### 2.1.1 Working Principle



Parts name:

- |                   |                     |                |           |
|-------------------|---------------------|----------------|-----------|
| A. Material inlet | B. Rotating blade   | C. Fixed blade | D. Screen |
| E. Storage bin    | F. Discharging pipe |                |           |

Picture 2-1: Working Principle

The waste materials enter the cutting chamber via material inlet (A). The rotating blade (B) and fixed blade (C) grind the materials. The particle size is controlled by the size of screen (D). The screen (D) is located behind of the granulation chamber. Thus it is convenient to replace screen for other different sizes. The granulated materials are dropped into the regrind storage bin (E) via the screen and be conveyed via discharging pipe (F).

The external material-conveying blower absorbs the granulated materials into the cyclone dust separator to separate the granulated materials and air.

The obtained particles can be reused directly or sent to somewhere for storage. The foldable feed box has a good tunnel for maintenance, thus it is very convenient for cleaning.

## 2.2 Safety System

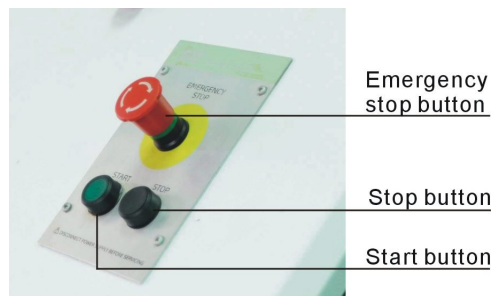
The granulator possesses a highly-secure safety system to avoid accident during the operation. The fast-rotating blade in the granulator is prone to result in an accident.

Thus, the safety system can protect human body. The safety system can be altered under no circumstances, otherwise the machine would in dangerous situation and can do harms. All repair and maintenance work should be carried out by the professionals.

If any safety system change takes place, no commitment will be fulfilled and all replaced components should be provided by SHINI.

### 2.2.1 Emergency Stop

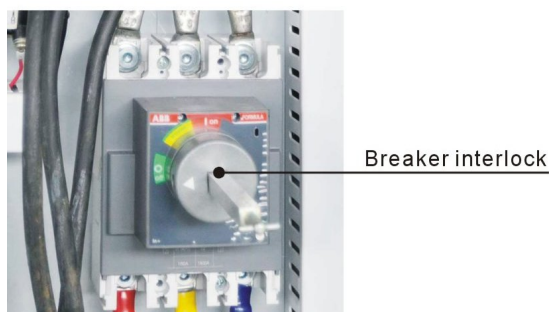
Emergency stop is a red button on the control panel. Press it then the machine will stop working. Turn the button in the arrow direction (clockwise) we can reset it.



Picture 2-2: Emergency Stop Button

### 2.2.2 Breaker Interlock

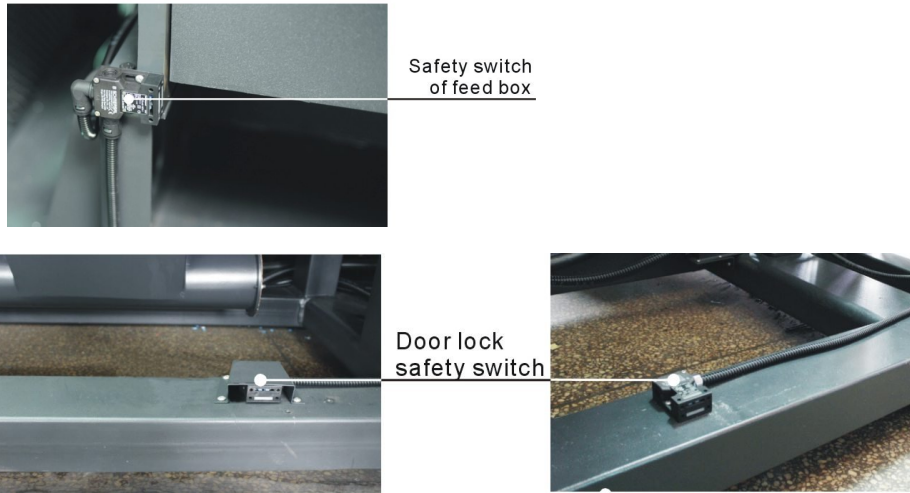
When circuit breaker closed, the control box can't be opened, while the door plank of control box could be opened normally to ensure human safety.



Picture 2-3: Breaker Interlock

### 2.2.3 Safety switch

Four safety switches may be involved. One is located between the feed box and the cutting chamber, and one is located between the storage box and the chamber. The other two ones are located at machine front door and back door. (Only 43B)



Picture 2-4: Safety Switch

### 2.2.4 Long Star Screw

When opening the door, this hexagonal screw shall be loosened. Loosening the door-lock needs a period of time avoiding personnel injury.

Keep in mind before you start the granulator:

- 1) Whether the feed box has been tightly locked or not.
- 2) Whether the screen or the regrind storage bin has been well installed or not.
- 3) Close the door.



Picture 2-5: Screw Shaft

## 2.3 Optional Accessories

### 2.3.1 Dust Separating System



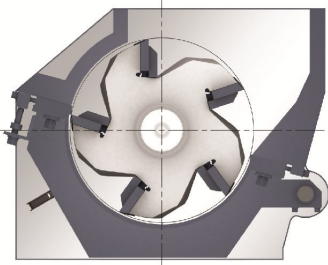
Optional dust-separating system to remove the dusts in the material. Add "DS" at the model behind.

### 2.3.1 Special Screen



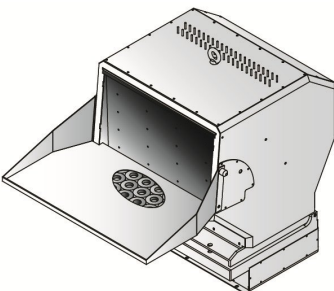
Optional screen mesh sizes includes  $\Phi 8$ ,  $\Phi 10$ ,  $\Phi 17$ ,  $\Phi 25$  (mm) which are applicable to different occasions. Add "SS" at the end of the model code.

### 2.3.2 Cutter (High Cutting Point)



Optional two fixed plus five rotating blades which is suitable for granulating block and solid, thick sheet material.

### 2.3.3 Feed Hopper with Magnet



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

### 2.3.4 Flywheel



Increase inertia, thereby increasing the cutting ability. At the same time can result in a more balanced force and longer service life. Add “FW” at the end of the model code; (Option for SG-43B)

### 2.3.5 Separate Conveying Blower



The blower stands outside the machine. Without restriction of the inner space of the machine, customer can choose different kinds of blowers. Add "SC" at the end of the model code. (Option for SG-43B)

### 2.3.6 Feeding Hopper for Conveyor



Material feeding for traditional large granulators is quite a difficult matter. They are generally installed at a lower place or a platform must be built for material feeding. Shini has particularly designed the belt conveyor to easily convey the material into the cutting chamber of SG-43 series. Add "BCF" at the end of the model code.

### 2.3.7 Material Side Feed Pipe



The design of feeding hopper of traditional granulators is not suitable for longer pipes and section bars. We have designed material side feed pipe for convenient feeding of long materials. Add "SF" at the end of the model code.

### 2.3.8 Others Optional

- I The function of fiber reinforced material granulating is optional. Adopt surface-hardening treatment on the material contacting component. And blade material is V-4E joint with S50C. Add "F" at the end of the model code;
- I Full-receive alarm device helps to realize unmanned operation and no materials will be wasted, Add " FAD " at end of the model code.
- I For stainless steel made feed hopper cover plate and storage tank, Add " R " at end of the model code.

### 3. Installation and Debugging



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 when do 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.



Notice!

The blades are very sharp, so use protective gloves to avoid being cut.



Notice!

Please use new screws and gaskets when installing cutters.



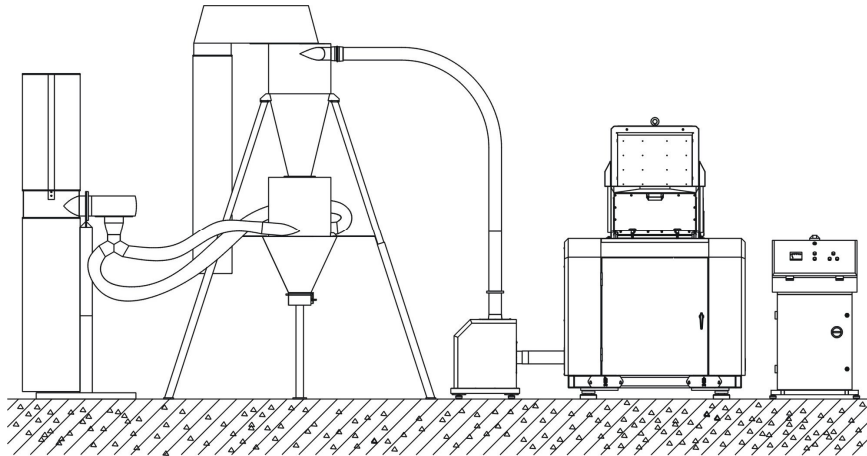
The power connection of the granulator should be carried out by professional electrician so to avoid electrical shock !

### 3.1 Machine Installation

Make enough installation space to help the repair and maintenance.

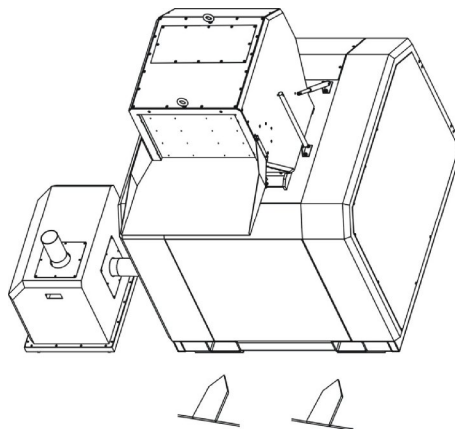
Check and make sure the installation ground is level, there is enough intensity when it is running.

Use spirit level to adjust the cutting chamber to the level position.



Picture 3-1: Installation Place 1

SG-43 rabbets for forklift to transport.

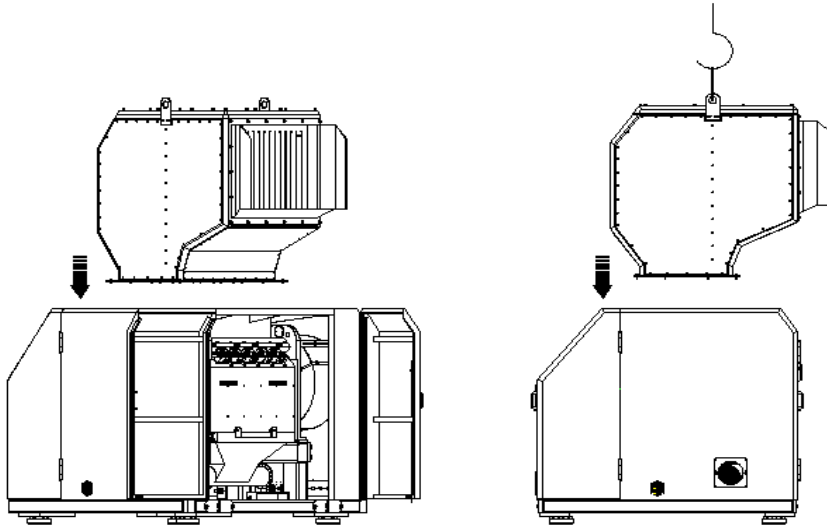


Picture 3-2: Installation Place 2

***Please do not install feed box on the mainbody of the granulator, then hoist them together, or it will cause damage to the machine.***

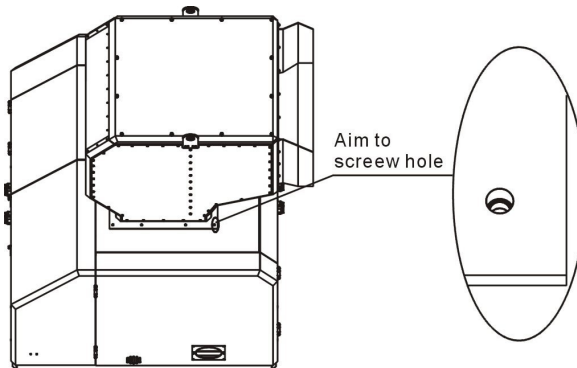
## 3.2 Install Feeding Box

- 1) Open the two front doors of the machine.



Picture 3-3: Feeding Box Installation 1

- 2) Carefully lift the feeding box onto the cutting chamber and aim to the screw holes.



Picture 3-4: Feeding Box Installation 2

- 3) Lock the screws of the feeding box.

### 3.3 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 size 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:
  - a) Main power voltage: +/- 10%
  - b) Main power frequency: +/- 2%
- 7) Power connection refers to the circuit diagram of each model.

***Make sure there's enough space (at least 1m) around the machine for convenient repair and maintenance.***

#### 3.3.1 Check the Running Direction of the Motor

- 1) Open the door to check whether the feed box is closed.
- 2) Close the door.
- 3) Ensure the main power switch is in ON position.
- 4) Check the emergency stop.
- 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.

***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.***

#### 3.3.2 Check the Running Direction of the Blower

- 1) Check whether the running direction of the blower is in accordance with the symbol on the shield.
- 2) Connect to the power and stop again to check the blower's running direction.

***If the blower's running direction is not in accordance with the symbol, the machine's working capability will be reduced by at least 25 percent. Under these circumstances, please disconnect to the main power and transpose any two wires of the three in the blower.***

### 3.4 Installation of Dust-separating System

***Read chapter 3 carefully before operating on dust separate system the circuit connection of the system should be done by professional electrician.***

Before first startup

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

Connection

- 1) Place a separator under cyclone device, the diameter is  $\Phi 250\text{mm}$ .
- 2) Connect to conveying pipe, the diameter is 4 inches $\times$ 2.
- 3) Mount dust collection device including air and dust separate bags.
- 4) Place a container under the separator to help collecting plastic material after dustremoving.

***Notes: If use cloth bag to connect the separator, please make sure a good ventilation within the cloth bag.***

### 3.5 Conveying Belt Installation

- 1) Connect belt main frame to floor stand with hexagon bolt.
- 2) Put belt top end to feeding box inlet.
- 3) Insert belt power plug into power socket.
- 4) Connect metal head of belt control wire to control box socket.

## 4. Operation Guide



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.

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

### 4.1 Startup Pretest

Unpainted part of the machine has been covered with stainless oil. Before use, the stainless 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.

***Note: Adjust the machine to make its four holders to share the weight and be in a level state.***

- 2) Check the space of the cutting tools (0.2~0.3mm) to see whether the lockup screws of the blades are tightened (fixed blade M16x75, rotating M20x66).

#### 4.1.2 After First 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 First Startup for 20~30 Hours

Check and adjust the belt's tensility after a 20~30-hour full-load operation.

### 4.2 Open the Feeding Hopper, Screen and the Regrind Storage Bin



Before opening the feeding hopper, screen and the regrind storage bin, turn off the main power switch and the power switch of the granulator.



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

#### 4.2.1 Open the Feeding Hopper

- 1) Check if the feeding hopper and pulverizing room have been emptied. After that, turn off the main power supply.
- 2) Loosen the long star screw and open the door.
- 3) Loosen the lock clip of the hopper.
- 4) Open the hopper backward.

***The feeding hopper is held by air spring to avoid its dropping when opening it.***

#### 4.2.2 Open the Regrind Storage Bin and Screen

- 1) Turn off the power switch of the granulator.
- 2) Loosen the star screw and open the door.
- 3) Loosen the quick coupling hoop in the end of the outfall pipe and transfer it to one side.
- 4) Open the spring bolt and take out the regrind storage bin.
- 5) Screw off the hexagon socket cap screws in the pothook to loosen the pothook.
- 6) Take out the screen bracket and withdraw the screen.

***Attention: The screen bracket is supported by air spring, which won't fall off when opening.***

### 4.3 Close the Screen Bracket, Regrind Storage bin and the Feeding Hopper

***Before opening, clean the interface. Take care! DO NOT be squeezed!***



Picture 4-1: Close the Screen Bracket; the Regrind Storage Bin and the Feeding Hopper

#### 4.3.1 Installation of the Screen Bracket and the Regrind Storage Bin

- 1) Put the screen into the screen bracket and put the screen bracket under the cutting chamber.
- 2) Lift up the screen bracket and lock it closely with front block.

***Note: Screw must be locked tightly, or else screen bracket will be out of shape and screen fracture.***

- 3) Put the material collecting box under the screen bracket, and make them closed by putting material collecting box along bracket.
- 4) Lock the storage box tightly with screw.

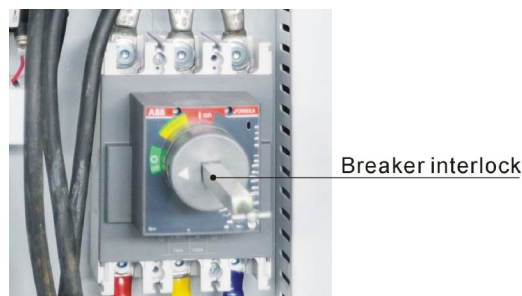
#### 4.4 Turn Off and Stop the Granulator

The granulator has start/stop button, which controls machine's start/stop.

Emergency Stop Button:

Main power switch:

The main power switch of granulator is mounted on control box. The connection of the power is controlled by rotating of the main power switch.



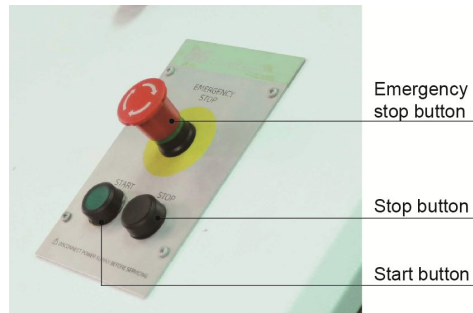
Picture 4-2: Main Power Switch

START button and STOP button:

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

Emergency stop:

When an accident happens, this button can do a favor.



Picture 4-3: Start/Stop and Emergency Stop Button

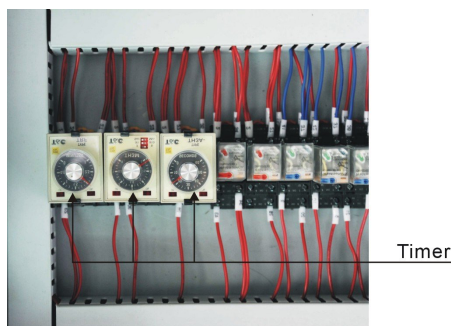
***CAUTION: If there are ungrinded crew materials in the feed box or cutting chamber, the granulator shall NOT be stopped, otherwise the crew materials will blockade the rotator and the motor will be overloaded next time you start the machine up.***

## 4.5 Feeding blower Timer

Press down the stop button to stop the machine, the feeding blower working time can be prolonged by the timer, which enables the granules in the storage box be fully conveyed. The setting of timer varies with different screen diameters and output capacities.

### Timer Setting:

After the granulator stops, via the timer it could prolong the working time of the feeding blower, the granules in the storage box can be sent out completely. The setting of timer varies with different screen diameters and output capacities.

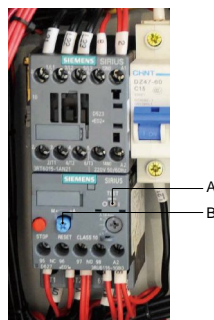


Picture 4-4: Timer

## 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.
- 7) Check the phase sequence protector, which is inside the control box. If power phase shortage occurs, the phase sequence protector will cut off the control circuit of granulator, and it leads to granulator can't be started.

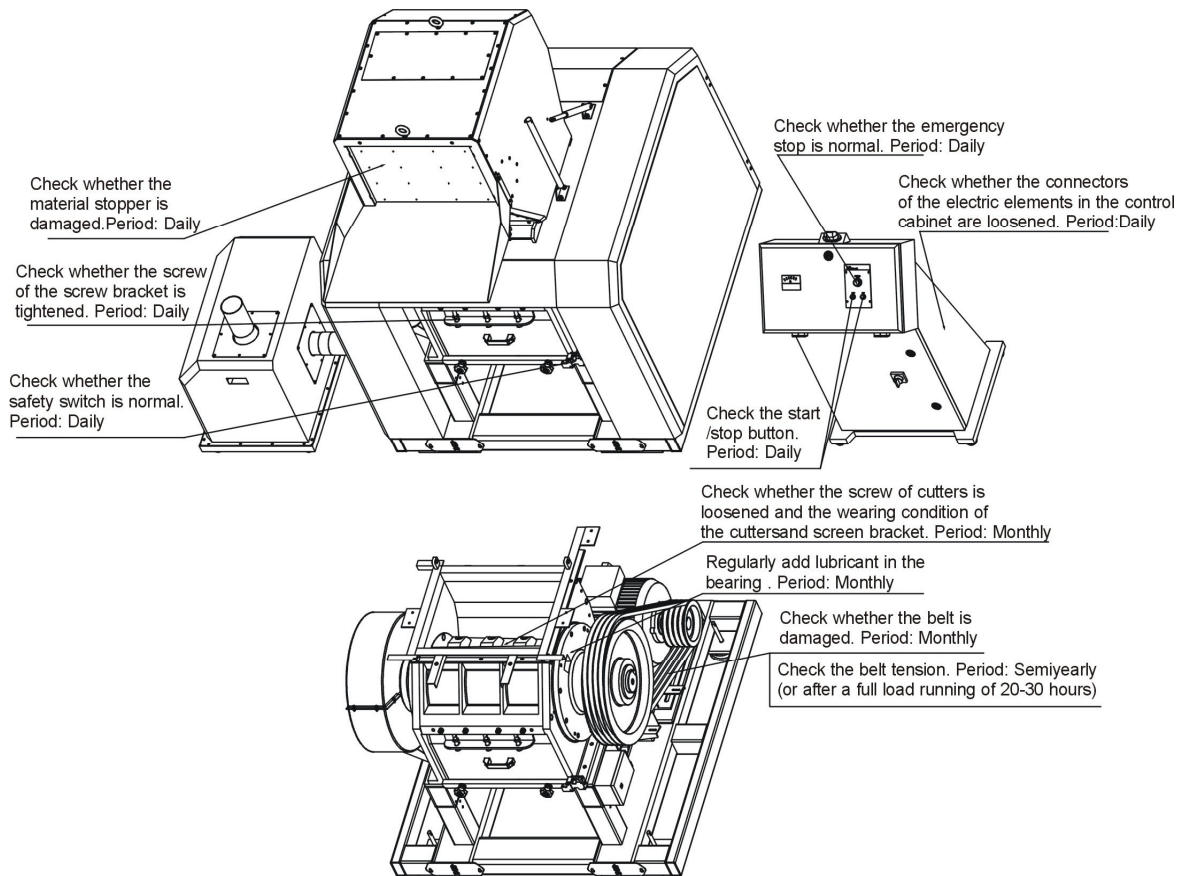


## 5.2 Stop Due to Other Reasons

Connection failure or looseness of safety switch or limit switch can also result in operation failure.

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

## 6. Maintenance and Repair



### 6.1 Repair

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

#### 6.1.1 Operation and Maintenance of Dust-separating System

Start and stop of the machine.

Start and stop of the machine is controlled by main power switch.

Daily check

Air bag and dust bag: check if these bags are damaged, if there is any damage, please replace them.

Conveying pipe: check if the conveying pipe is damaged, if it is, please replace it.

Check if the connecting joint had been fixed and sealed.

Check if the dust collection bag is full, if it is, please dump it.

Weekly check

Check to see if the wire has any damage and the condition of the wire, if it has any problem, please fix it.

### 6.1.2 Dust-separating System Cleaning



Notes!

Clean the machine when the processing material is changed or after every 300-hour running time. Before cleaning, please cut off the power.

- 1) First clean the inner side of the cleaning facilitates.
- 2) It is necessary to check and clean dust separator.
- 3) Move away separator, use high pressure air to blow away its interior granules.
- 4) Clean out the storage hopper and clean its interior.
- 5) Shake the air bag to drop the dust down.
- 6) Assembly the disassembled parts according to reversed order.

### 6.1.3 Replace the Blades



CAUTION!

Warning: Self- rotation exists due to non-balanced forces or unstable barycenter.



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



More details about replacing or maintaining the blades to see chapter 3.4. Inject screw thread fixing glue (blue LOCTITE 243 recommended) tighten all fixing screws to fix the screws.



CAUTION!

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



### CAUTION!

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



After replacement, check whether the screen is damaged. If so, replace the screen. Each time to replace the blade, the screw and insulation ring must be replaced also. Before replacing the blades, open the door and feed box, remove the regrind storage bin, screen and screen bracket.

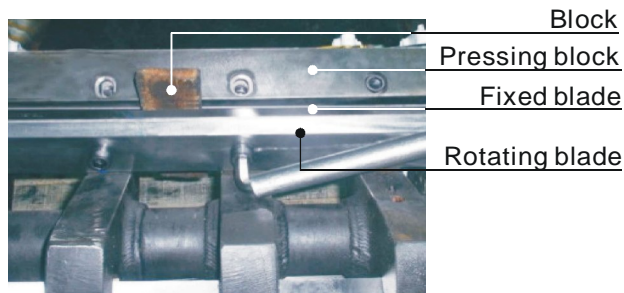
### 1) Remove the rotating blades



### CAUTION!

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

1. Remove the screws and insulation rings.
2. Remove the blades.
3. Clean the installation surface of the blades.



Picture 6-1: Remove the Rotating Blades

### 2) Remove the fixed blades

1. Revolve the screw of the front fixed blade.
2. Loosen and remove the hexagon socket cap screw.
3. Remove pressing block and blade, clean the blade rest.
4. Loosen and remove the screws of the back blades.
5. Loosen and remove the hexagon socket cap screw again, remove the pressing block and blade. Clean the supporter box.

### 3) Install the blades

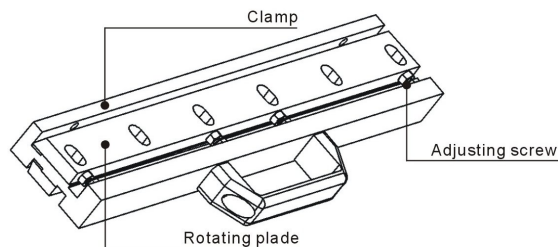
Clean carefully the fixed blades and rotating blades and then install them.



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

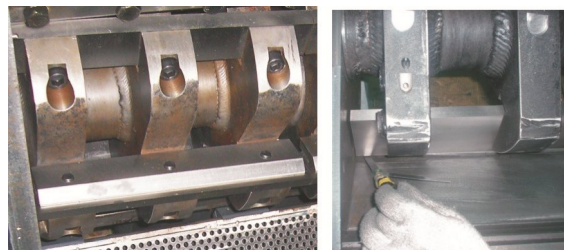
A: The installation steps with presetting knife jig:

- a. All blades, including rotating blade and fixed blade, could be adjusted inside the presetting knife jig outside the machine. Put the blade into the presetting knife jig. Regulate the adjusting screw till it touches the presetting knife jig.



Picture 6-2: Blades Installation Adjusting

- b. After the rotating and fixed blade adjusted well on the presetting knife jig, put the rotating blade inside the groove of the milled blade rest. Aim the holes on the blade rest, put down the pressing plate and fix the screws till the blade without any shaking (in order to adjust the clearance between the rotating and fixed blade).
- c. Mount front / back pressing block of the rotating and fixed blade on front /back block, fasten the screw till the blade without any shaking.
- d. Use the feeler gauge to check the clearance between rotating and fixed blade, the distance is 0.2~0.3mm; Adjust the rotating and fixed blade if it is not within this distance. At last, lock the fixing screw of rotating and fixed blade with torque spanner, for the torque please refer to Table 6-1.



Picture 6-3: Installation of Rotating and Fixed Blade

B: Without presetting knife jig:

- a. When presetting knife jig is not adopted, firstly adjust the length of one adjusting screw on rotating blade as its total width with blade to  $114 \pm 0.07\text{mm}$  (3 rotating blades width, 5 rotating blades width is  $90 \pm 0.07\text{mm}$ ); Then adjust another screw length to the same value, at last lock the nuts and screws.
- b. Same as the installation with presetting knife jig.



**CAUTION!**

In order to avoid human injury and machine damage, it must lock up the blade screw tightly.



**CAUTION!**

The blade clearance can't be too close to avoid blade damage!



**CAUTION!**

Every time to replace the cutters, the blade, pressing block, screw, blade rest and main shaft should be inspected carefully, to check if there is any damage.

Table 6-1: Attached Form, Cutters and Other Fixing Screw Torque

Threading Type	Threading Specification	Stretching Force FV (N)			Tightening Torque Ma (N.m)		
		Grade -8.8	Grade -10.9	Grade -12.9	Grade -8.8	Grade -10.9	Grade -12.9
Coarse Thread	M4	3900	5750	6700	3.0	4.4	5.1
	M5	6400	9400	11000	5.9	8.7	10
	M6	9000	1320	15500	10	16	18
	M8	16500	24300	28400	25	36	43
	M10	26300	38700	45200	49	72	84
	M12	38400	56500	66000	86	126	145
	M14	62500	77500	90500	135	200	236
	M16	72500	10700	12500	210	310	365
	M18	91000	129000	152000	300	430	600
	M20	117000	166000	195000	425	610	710
	M22	146000	208000	244000	580	820	960
	M24	168000	240000	281000	730	1050	1220
	M27	222000	316000	369000	1100	1550	1800
	M30	269000	384000	449000	1450	2100	2450
Fine Thread	M8×1	18100	26600	31200	27	39	46
	M10×1.25	28300	41600	48700	52	76	90
	M12×1.25	43300	63500	74600	93	135	160
	M12×1.5	40800	60000	70000	89	130	155
	M14×1.5	58600	86000	100000	145	215	255
	M16×1.5	79500	116000	136000	226	330	390
	M18×1.5	108000	152000	177000	340	485	570
	M20×1.5	134000	191000	224000	475	680	790
	M22×1.5	166000	236000	276000	630	900	1050
	M24×2	189000	270000	316000	800	1150	1350
	M27×2	246000	350000	409000	1150	1650	1950
	M30×2	309000	440000	515000	1650	2350	2750

## 6.2 Transferring

***Maintenance or repair the transmission belts after pressing down the emergency stop button or main power switch!***

### 6.2.1 Daily Maintenance of V Belts

There are four V belts according to motor power.

1) Check the V belts

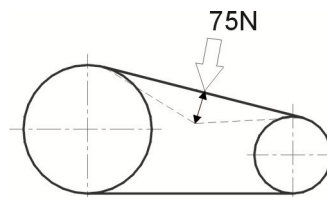
Check V belts' tensility after a full-load operation for 20-30 hours. And then check its abrasion condition.

2) Check V belts' tensility every 6 months.

Remove the upper panel in the back end of the granulator. Rotate the V belts for several circles to see if there is any damage.

***Pinch risk! Do not place your hands between wheels and the belts.***

If it is necessary, check the belt's tensility via enforce extra force (75N) and measure its excursion. This extra force is determined by power and frequency of the motor. More Details to see the following table.



Picture 6-4: Daily Maintenance of V Belts

Motor 50Hz	18.5 / 22kW	30 / 37kW	45-55kW
New belt	15mm	14mm	15mm
Old belt (Six- month later)	19mm	19mm	19mm
Motor 60Hz	18.5 / 22kW	30 / 37kW	45-55kW
New belt	18mm	17mm	16mm
Old belt (Six- month later)	23mm	23mm	20mm

### 6.2.2 Adjustments of V Belts

- 1) Remove the upper panel and feeding plate in the back end of the granulator and open the box door.
- 2) Open the quick coupling clip in the end of the outlet pipe and remove the regrind storage bin.
- 3) Adjust the belt's tensility via changing the space between the driving wheels and the driven wheels with two moving screws.
- 4) Lock up the two moving screws. Recheck the belts' tensility after a full-load operation for 20-30 hours.

### 6.3 Installation of Bearing and Blade Rest

- 1) Lock up the left, right, front and back block of cutting chamber by screw, then install right side of material feeder.
- 2) Put the blade rest inside the bearing block.
- 3) Put the material feeder and left bearing block into the bearing of blade rest, and lock them tightly on the left side of block of cutting chamber.
- 4) Install the shutter ring and bearing cap. Then, lock it up with screws.

***Note: Add some lubricating oil in both bearing and bearing block.***

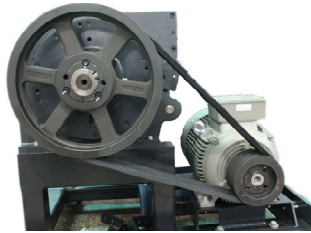
- 5) Check the gap between left and right blade rest, finally install bearing cover and lock it up, avoid axial movement of right bearing.



Picture 6-5: Installation of Bearing and Blade Rest

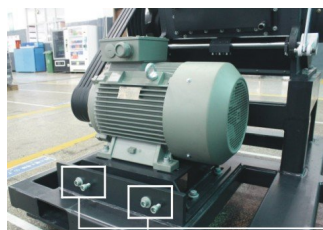
## 6.4 Installation of Belt Pulley and Motor

- 1) Put the flat key on the key groove of the shaft.
- 2) Put the taper sleeve inside the hole of large pulley and aim the hole to the big pulley. Then lock up the inner hexagon screw (M20mm×50).
- 3) Adjust the balance of the large pulley with dial gauge. Stick the dial gauge to the large pulley and rotate the large pulley to see whether the value of gauge is within 0~0.1 mm.
- 4) After balance, screw tightly the 3 inner hexagon screws (Torque: 710 Nm)
- 5) Install the small pulley on the shaft of the motor.
- 6) Put the taper sleeve into the hole of small pulley and aim the hole to large pulley, then lock it up with inner hexagon screw (M16mm×30, the torque is 90 Nm).



Picture 6-6: Installation of Belt Pulley and Motor 2

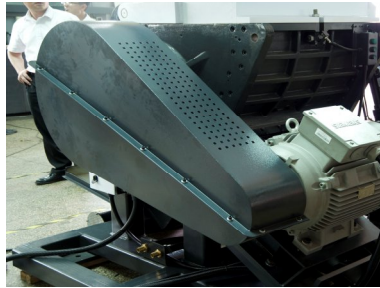
- 7) Put the motor on the motor fixed board, and move it forward to reduce the distance between small and large pulley.
- 8) Adjust the balance of the small and large pulley: put spirit level between the big pulley and the small pulley to observe whether the mercury column is in the middle. If not, adjust the small pulley (Note: NOT to adjust the big pulley) to make the two pulley in balance.
- 9) Install the belt, push the motor backward and screw tightly the position adjusting screw. Make the 6 belts be stressed by equal forces. Tighten the belts and lock up the position adjusting screw.



Adjusting screw

Picture 6-7: Installation of Belt Pulley and Motor 3

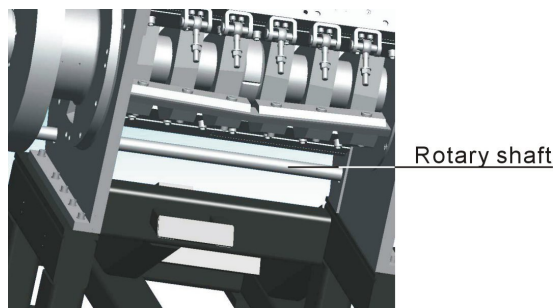
10) Finally mount the upper and lower protective cover for the pulley.



Picture 6-8: Installation of Belt Pulley and Motor 4

## 6.5 Installation of Screen, Screen Bracket and Storage Box

1) Insert the rotary shaft of screen bracket in left / right block hole. Make the right end of rotary shaft and right block outside in a line.



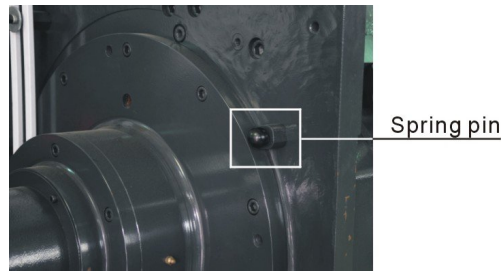
Picture 6-9: Installation of Storage Box, Screen and Screen Bracket 1

2) Mount the screen bracket on the rotary shaft under the cutting chamber, fix the pin hole cover with serew tightening.



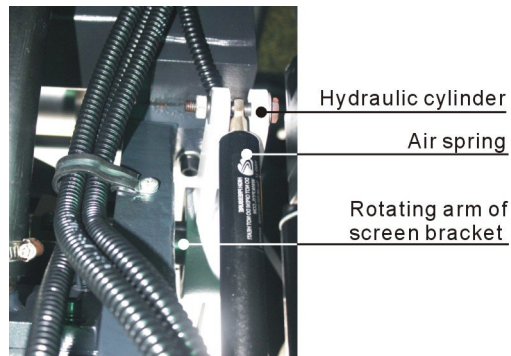
Picture 6-10: Installation of Storage Box, Screen and Screen Bracket 2

3) Put the screen into the screen bracket. Lift up the screen bracket to left spring pin and insert in the screen bracket, lock it up with 5 screws for fixing.



Picture 6-11: Installation of Storage Box, Screen and Screen Bracket 3

- 4) After flat key is mounted inside the rotating arm of screen bracket, put it through the rotating shaft end at left.
- 5) Mount the hydraulic cylinder and adjust the angle of screen bracket's rotating arm to correct angle, and then fasten the hydraulic cylinder.



Picture 6-12: Installation of Storage Box, Screen and Screen Bracket 4

***Note: Make sure the fixing screw of air spring is fastened. Otherwise, the screen bracket would be deformed with screw fracture.***

- 6) Lift up the storage box, insert the storage box on the support plate and mount the safety switch.



Picture 6-13: Installation of Storage Box, Screen and Screen Bracket 5

7) Lock the two star bolts in front of the screen bracket tightly.



Picture 6-14: Installation of Storage Box, Screen and Screen Bracket 6

## 6.6 Lubrication

### 6.6.1 Lubricating Oils

Xin Chang Long: FX-00  
FX-000

Bp: BP Grease LGEP 2

ESSO: Beacon Ep2, Beacon EP2

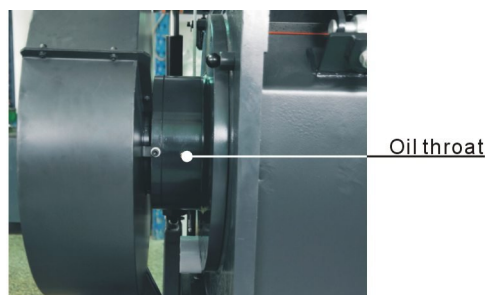
Mobil: Mobilux EP2

Shell: Shell Alvania EP2

Texaco: Multifak Ep2, Novotex Grease EP2

### 6.6.2 Please Grease the Bearing with Lubricating Oil Periodically

- 1) Open the front door of the machine.
- 2) Inject lubricating oil via throat with an oil greaser.



Picture 6-15: Oil Throat

## 6.7 Maintenance

Ensure no residual materials left inside the granlator during maintenance.

***Attention: All repair works should be completed by technicians as to avoid human injury and machine damage.***

### 6.7.1 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 star screw, safety screw is part of granulator' safety system, its length is pre-designed, when the screw is loosened, the granulator will stop working so to protect the machine. The thread length of the safety screw is 90mm, damaged screw needs to be replaced by a new one.

### 6.7.2 Weekly Check

- 1) Check the power wire to see whether there is any damage. If so, replace it immediately.
- 2) Check the safety switch.

### 6.7.3 Monthly Check

- 1) Check the belt to see whether there is some damage. Check the belt's tensility every 6 months. More details to see chapter 6.2 Transmission.
- 2) Check the blades and screws to see if they get loose.

## 6.8 Cleaning



**CAUTION:** The blade may do harm to human body when opening the feeding hopper!

- 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) Loosen star screw.
- 6) Open the feed box backwardly.

**Note:** *The feed box is held by pneumatic spring, therefore it cannot fall down.*

- 7) Clean the interior surface of the feed box.
- 8) Clean the interior surface of the feed box.
- 9) Open the door and remove fast pipe connector from one end of the pipe.

***Note: Lift the regrind storage bin in both hands so it would not fall down.***

- 10) Loosen the lock wiring in the screen bracket and remove the screen bracket.
- 11) Take out the screen.
- 12) Hold to the screen and take it out outwardly.
- 13) Clean the regrind storage bin, screen bracket and the screen.
- 14) Clean both surfaces of the cutting chamber.
- 15) Clean every transmission pipe, blower, and cyclone dust separator.
- 16) Clean the wheels with bright dust-precipitator.

***Note: Feed box is supported by air spring that won't fall off.***

Reinstall after cleaning

***Note: Take care not to be squeezed when closing the door!***

- 1) Install the screen bracket.
- 2) Lift the handle of the screen bracket and push it into front block tightly.
- 3) Put the storage box under the screen bracket, and make them closed by putting storage box along bracket.
- 4) Lock the screw on the material collecting box tightly.
- 5) Install the fast pipe connector at the end of the extraction line.
- 6) Close the door.
- 7) Close the feed box.
- 8) Lock the two long star screws on the feed box.
- 9) Install the material feeder.
- 10) Check if the feed box is emptied.
- 11) Open the main power switch.
- 12) Start the machine.

## 6.9 Maintenance Schedule

### 6.9.1 About the Machine

Model \_\_\_\_\_ SN \_\_\_\_\_ Manufacture date \_\_\_\_\_

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

### 6.9.2 Check After Installation

- Check if pipe connections are firmly locked by clips.
- Check the gap between fixed blade and rotating blade. (0.2~0.3mm).
- Check the rotating balance of the belt wheel.

#### 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.

### 6.9.3 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 screen and feeding hopper.
- Check whether start, stop and power switches are normal.

### 6.9.4 Weekly Check

- Check all the electrical cables.
- Check if there are loose connections of electrical components.
- Check the start and stop function of the electrical handspike
- Check function of all the safety switch
- Check the cooling system of the cutting chamber
- Check blade condition.
- Check whether set screws in fixed and rotate blades are under looseness.
- Check if there is abnormal noise, vibration and heat in reduction gear.
- Check the cracking window

### 6.9.5 Monthly Check

- Check the status of the belt.
- Check the overload protection function of the motor.
- Check motor reversed running function.
- Check the tightness of the blades.
- Check the pneumatic stick
- Check start/stop delay function of the conveying motor
- Check whether clamp ring of pulley is fastened.
- Check belt tension.

### 6.9.6 Check Half-yearly or Every 1000 Running Hours

- Check belt tension
- Check the bearings, motor and shaft lubrication
- Check the shaft holder
- Valuation of machine performance

### 6.9.7 3 year Checking

- PC board renewal.
- No fuse breaker renewal.