

# **SG-90B**

## **Central Granulator**

Date: Dec. 2020

Version: Ver.D



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# 1. General Description



Read this manual carefully before installation and using this machine to avoid personal injuries or damage of the machine.



Note!

Be careful during operation, the knives of the granulator are very sharp and can cause personal injury.



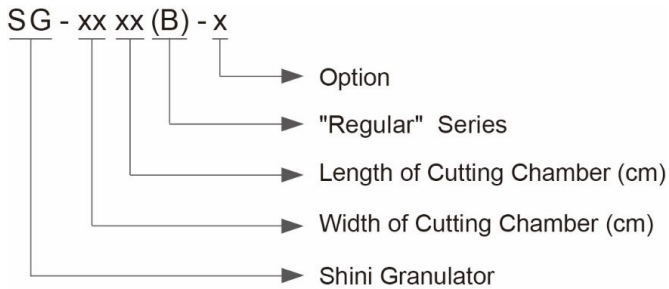
It's forbidden to process any toxic or flammable materials.

SG-90B series granulators are applicable to granulate various kinds of plastic wastes from PET bottle preforms, injection moulding, blowing moulding or extrusion moulding. This series feature compact design, easy operation and quick blade replacement. It is great in motor power, cutting chamber size, and output capacity. Gradually inclined cutting and integrated power design offer a better cutting effect and a lower noise level.



Picture 1-1: SG-90160B

## 1.1 Coding Principle



## 1.2 Features

- 1) Rotating cutters adopt newly developed 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.
- 2) Two rows of fixed blades model has big inlet space and initially low cutting point. Material can be easily grabbed and cut thus making this rotor/housing combination ideal for the granulation of hollow objects such as bottles, crates and drums as well as large bulky materials.
- 3) The cutters are made of imported high quality steel featuring wearability, high rigidity, long service life and reusable after re-sharpening.
- 4) Equipped with presetting knife jig, rotating and fixed blades can be adjusted in the fixture outside the machine inside of machine instead of machine inside. It made blades adjustment must easier.
- 5) 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.
- 6) Sound-proof feeding box reduces the noise level in operation, also equips a safety material checking curtain which ensures no material sprinkling during granulating.
- 7) V-type transmission belts help maintain a balanced operation mode, close contact, and also easy to disassemble and repair.
- 8) Both feeding hopper and screen cradle can be opened and closed by the hydraulic system which ensures safe operation.
- 9) The equipped conveying device (optional in SG-90) for auto loading has improved efficiency.
- 10) Equipped with flywheel (option in SG-9) to improve cutting ability.

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 meet any problem during using the machine, please contact the company or the local vendor.

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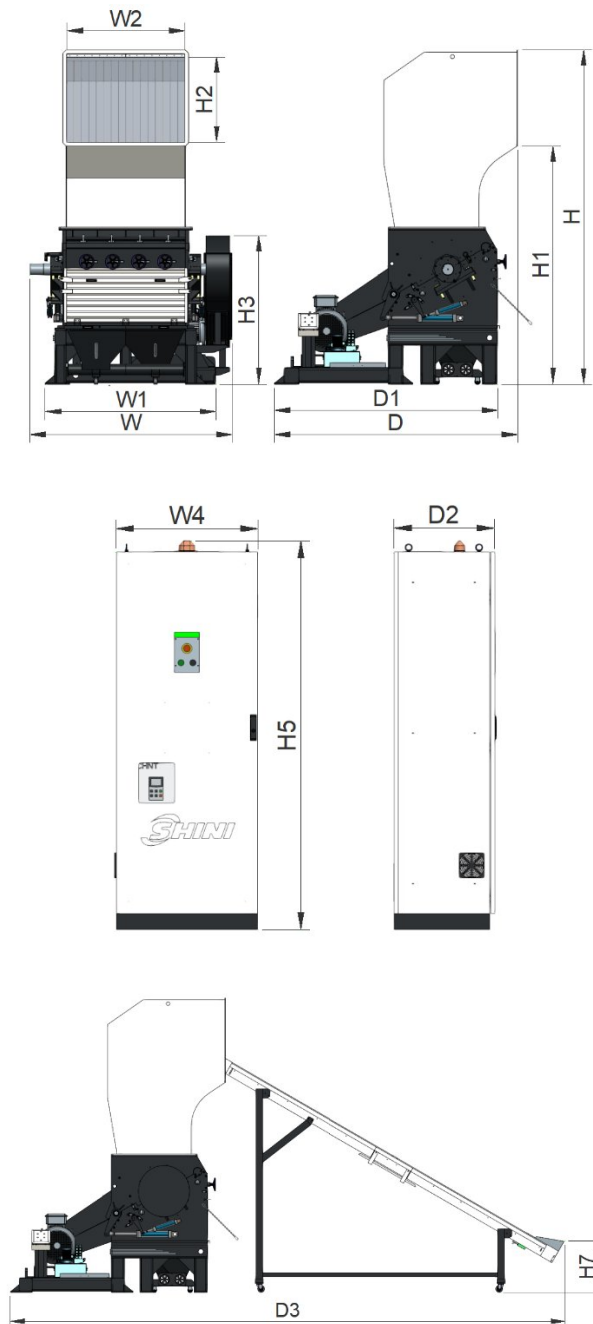
Shinden Precision Machinery (Chongqing), Inc.:

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## 1.3 Technical specifications

### 1.3.1 Outline Drawing (SG-90B)



Optional Conveyor

Picture 1-2: Outline Drawing ( SG-90 )

### 1.3.2 Specifications (SG-90B)

Table 1-1: Specifications (SG-90B)

| Model                           | SG-90160B(HB) | SG-90200B(HB) |
|---------------------------------|---------------|---------------|
| Ver.:                           | A             | A             |
| Motor Power (kW)                | 160(200)      | 200(250)      |
| Rotating Speed (r.p.m)          | 413           | 413           |
| Hydraulic Motor Power (kW)      | 1.5           | 1.5           |
| Material of Blades              | SKD11         | SKD11         |
| Number of Fixed Blades          | 2×2(3×2)      | 2×4(3×4)      |
| Number of Rotating Blades       | 5×2(7×2)      | 5×4(7×4)      |
| Cutting chamber (mm)            | 900 x 1600    | 900 x 2000    |
| Screen size (mm)                | Φ14           | Φ14           |
| Max. Throughput Capacity(kg/hr) | 3500          | 4000          |
| Noise Level (dB max)            | 120           | 120           |
| H (mm)                          | 4500          | 4500          |
| H1 (mm)                         | 3245          | 3245          |
| H2 (mm)                         | 1135          | 1135          |
| H3 (mm)                         | 1995          | 1995          |
| H5 (mm)                         | 1935          | 1935          |
| H7 (mm)                         | 777           | 777           |
| D (mm)                          | 3270          | 3270          |
| D1 (mm)                         | 2995          | 2995          |
| D2 (mm)                         | 505           | 505           |
| D3 (mm)                         | 8432          | 8432          |
| W (mm)                          | 2750          | 3150          |
| W1 (mm)                         | 2165          | 2565          |
| W2 (mm)                         | 1588          | 1988          |
| W4 (mm)                         | 701           | 701           |
| Weight (kg)                     | 13100         | 16500         |

Note:

We reserve the right to change specifications without prior notice.

- 1) SKD11 is material code number of Japanese JIS standard.
- 2) Maximum output is subject to the diameter and material of screen mesh. For granulating frame and shell material, maximum output will be reduced about 50%.
- 3) Noise level will vary with different materials and motor types.
- 4) Noise level is tested under conditions of 1m around the machine and 1.6m from the ground.
- 5) To avoid plastics from sticking to the blades, all materials should be crushed at normal temperature.
- 6) Power supply: 3Φ, 400VAC, 50Hz.

## 1.4 Safety Guide

Operation of the machine should be done according to safety guide so as to avoid personal injuries and damage of the machine.

### 1.4.1 Safety Signs and Labels



Electrical components should be installed by professionals.



Main switch and control switch should be shut off during maintenance.



Don't let any part of your body get into the granulator before you disconnect the main switch and control switch.



Warning! High Voltage

This sign is attached to the surface of the control box!



Sharp rotating blades may cause injuries!



Rotor should not be rotated by hands. Pay more attention to it!



You should not start the granulator before the feeding box and screen housing are tightly shut.



Warning!

When it is granulating, the operator should wear earplugs!



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. Make sure the waste materials are in the center of conveyor belt.



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.



Regularly clean the dust in the inlet air.



Attention!

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

## 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:

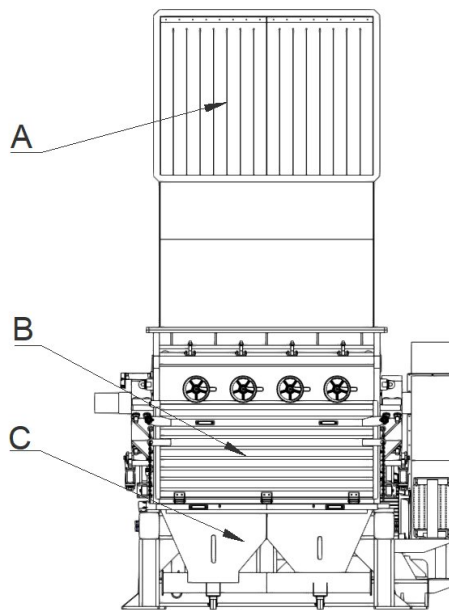
- 1) Any careless or man-made installations, operation and maintenance upon machines without referring to the Manual prior to machine using.
- 2) Any incidents beyond human reasonable controls, which include man-made vicious or deliberate damages or abnormal power, and machine faults caused by irresistible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

SG-90B series granulators are applicable to granulate various kinds of plastic wastes from PET bottle preforms, injection moulding, blowing moulding or extrusion moulding. Before granulating, it need to clean metal scraps and contamination.

#### 2.1.1 Working Principle

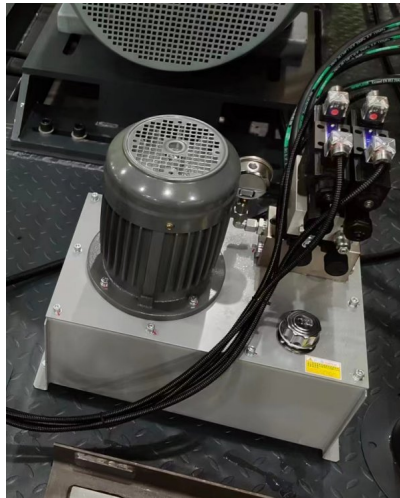


A Feeding box B Cutting chamber C Storage box

Picture 2-1: Working Principle

Feed the material into the cutting chamber from the feeding box(A), the rotating blades(B) and fixed blades work together to granulate the materials. The size of granules is based on the diameter of screen. The screen is fixed under the cutting chamber, and is easy to replace screen of different diameters. The regrinds will fall into storage box (C) through the screen, then conveying via conveying blower, the outfit blower will convey regrinds info cyclone dust separator to separate dust and air.

## 2.1.2 Hydraulic system



Picture 2-2: Hydraulic Station



Picture 2-3: Hydraulic Cylinder

This machine equips the hydraulic system. When it needs to open the upper case or screen frame, switch on the start button on the hydraulic station control box after the main shaft stops completely. Control the open/close of upper case or screen bracket via the hydraulic cylinder button on the control box.

## 2.2 Safety System

The machine has multiple protective systems to prevent personal injuries during operation. Safety system is used to prevent personal injuries caused by high rotating blades. Safety system could not be altered or accidents may happen.

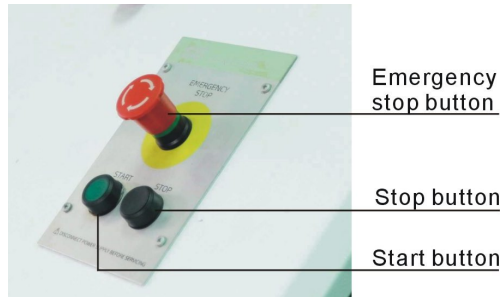
Under no circumstance, the safety system could be altered otherwise the machine would be in dangerous condition and easy to have accident, so any repairing and

maintenance of the safety system should be done by qualified technicians.

If there has any alteration to the safety system, our company will not fulfill our promise and all the spare parts should be purchased from Shini.

### 2.2.1 Emergency Stop Button

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 2-4: Emergency Stop Button

### 2.2.2 Safety Switch

The granulator has a safety switch that locates next to the storage box (as shown in the picture).



Picture 2-5: Safety Switch

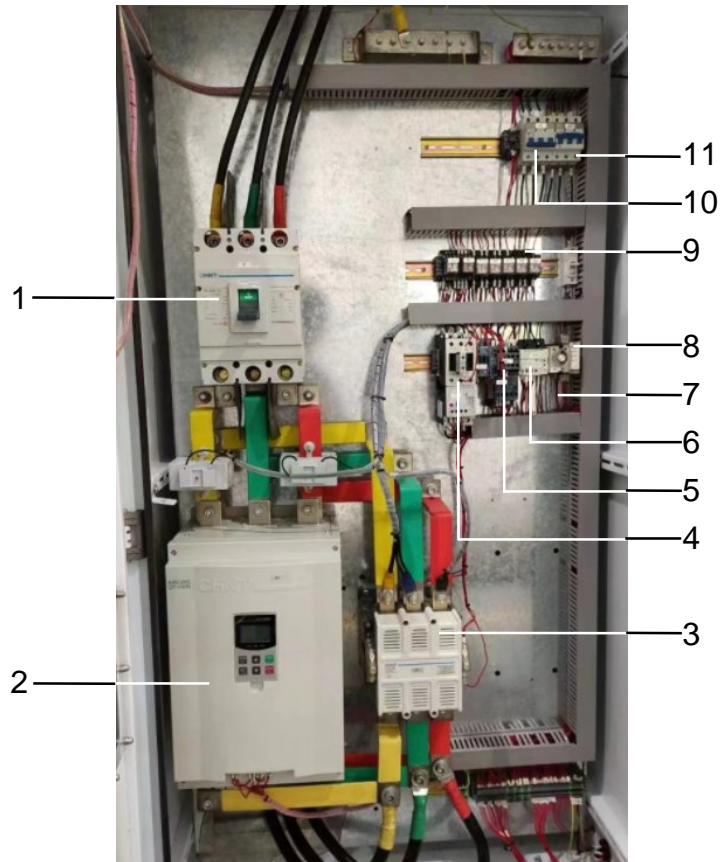
When taking out the storage box, the running machine will break the circuit to ensure operator's safety.

Pay attention to following items when start the machine:

- 1) Check if the feeding box has been locked up.

- 2) Check if the screen bracket storage box has been installed.
- 3) Check if the hydraulic station is closed.

## 2.3 Main Electrical Components Illustration



Picture 2-6: Control Cabinet

- 1) Main circuit breaker - Machine main power on/off
- 2) Soft starter - control motor step-down start to reduce the starting current on the power distribution system.
- 3) Contactor - switch to the bypass contactor after the soft start operates normally.
- 4) Conveying blower contactor (optional) - start/stop conveying blower
- 5) Contactor - bypass contactor relay
- 6) Current relay - protect the motor, and disconnect when the motor is over-current
- 7) Conveying blower timer (option) - conveying blower power off delay stop



- 8) Phase dislocation relay - check the phase sequence of the three-phase inlet wire
- 9) Middle relay-control the return circuit relay
- 10) Conveying blower circuit breaker (option) - turn on/off the power of conveying blower
- 11) Hydraulic station circuit breaker - turn on/off the power of hydraulic station power

## 2.4 Optional Accessories

### 2.4.1 Flywheel



Picture 2-7: Flywheel

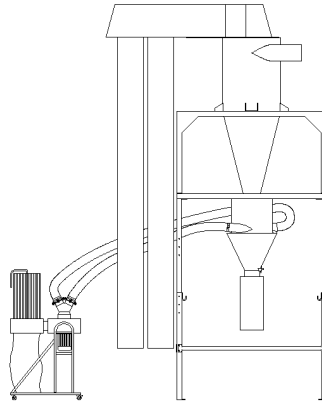
### 2.4.2 Separating Blower Conveying Device



Picture 2-8: Separating Blower Conveying Device

### 2.4.3 Dust Separating System

#### DS-70 Dust Separating System



Picture 2-9: Dust Separating System

Dust Separator can separate the dust in the regrind for immediate recycle use. The dust will be kept in filter bag, thus working environment will remain clean. This device ensures full use of regrind to avoid material wasting and enhance the economy returns. Add "DS" at the end of the model code.

### 2.4.4 Screen



Picture 2-10: Screen

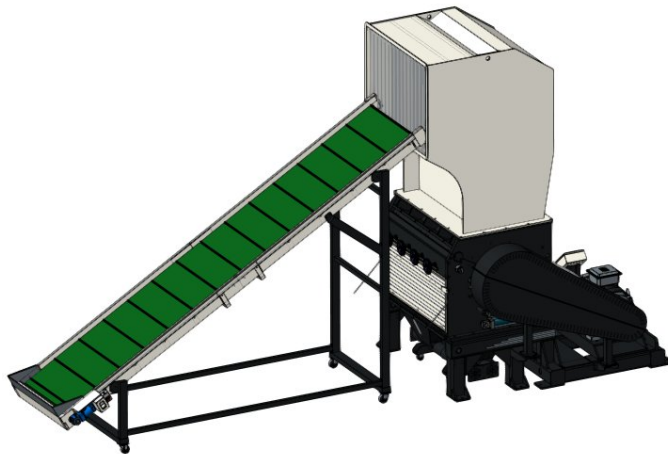
Special screen mesh sizes:  $\Phi 10$ ,  $\Phi 12$ ,  $\Phi 16$  (mm).

Add "SS + screen diameter" at the end of the model code, e.g.:  $\Phi 10\text{mm}$  , add "SS10".

### 2.4.5 Cutter

| Material | Relating standard steel code |     |       |
|----------|------------------------------|-----|-------|
|          | China                        | USA | Japan |
| SKD11    | Cr12MoV                      | D2  | SKD11 |

## 2.4.6 Belt Conveyor



Picture 2-11: Belt 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. For this, Shini designed a conveyor specially to work with SG-90B, which makes it easy to feed the materials into the cutting chamber for granulating. Add “BCF” at the model behind.

### 3. Installation and Debugging

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



Install as following orders to avoid any accident!



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!

#### 3.1 Installation Place

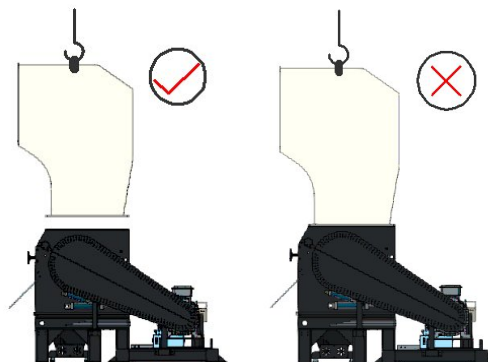


Please use the right hoisting way.

The feeding box is packaged separately from the main body and base of the granulator before leaving the factory. Use a forklift to transport the base to a proper place, hoist the main body of the granulator on the base, and lock the mounting screws. Then, hoist the feeding box on the main body of the granulator, and lock the mounting screws.



It is not allowed to install the feeding box onto the main body then hoist them together, because this could damage the machine!

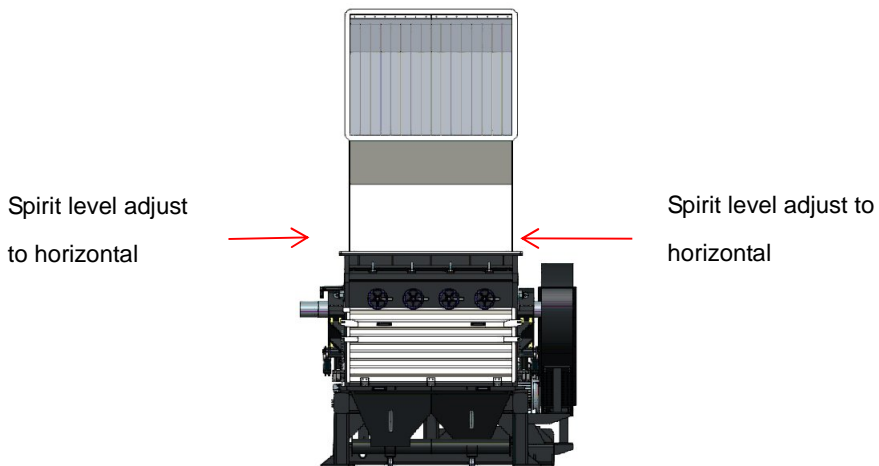


Picture 3-1: Hoisting Diagram



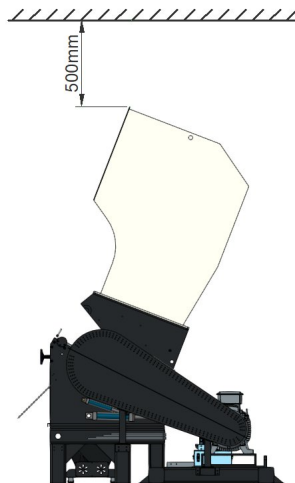
Please make sure there is enough installation space for easier maintenance and repairing.

Examine and make sure the installation floor is level and enough intensity when operating. Use spirit level to adjust the cutting chamber into a level position.



Picture 3-2: Cutting Chamber Installation Adjusting Drawing

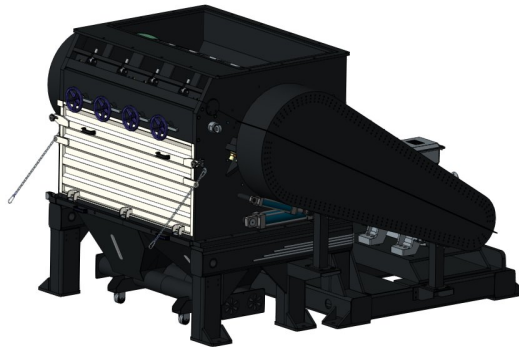
**Note: When open the feeding box, there should remain at least 500mm safety space.**



Picture 3-3: Notice of Opening Feeding Box

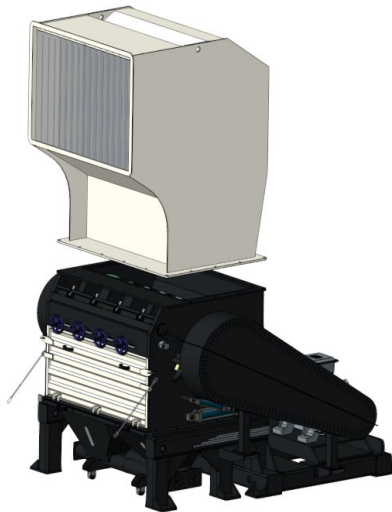
## 3.2 Install the Granulator's Main Body and Feeding Box

- 1) Place the main body of the granulator in a proper position by lifting.



Picture 3-4: Granulator's Main Body and Feeding Box Installation 1

Lift the feeding box and carefully place it above to match the cutting chamber, align it with the screw hole, and lock the screws of feeding box.



Picture 3-5: Granulator's Main Body and Feeding Box Installation 2

## 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) Power supply requirements:  
Main power voltage: +/- 5%  
Main power frequency: +/- 2%
- 6) Power connection refers to the circuit diagram of each model.  
**Note: Power connection must be done by the professional electrician !**

### 3.3.1 Check the running direction of the motor

- 1) Open the door to check whether the feeding box, screen, or storage box has been installed.
- 2) Ensure the main power switch is in ON position.
- 3) Check the emergency stop.
- 4) Start the granulator via pressing the START button and stop the granulator via pressing the STOP button.
- 5) The granulator needs some time to fully come to a halt. After full stop, check whether the running direction is anti-clockwise.

### 3.3.2 Check the Running Direction of the Blower ( If equipped )

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



CAUTION!

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.



When equipped with transmission belt: please check the running direction of the transmission belt.

## 3.4 Installation of Dust-separating System



Read chapter 3 carefully before operating on dust-separating system.

**Note: The circuit connection of the granulator must be done by**



***professional electrician!***

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.

- 1) Place a separator under cyclone device, the diameter is  $\Phi 203\text{mm}$ .
- 2) Connect to conveying pipe, the diameter is 4"×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 dust removing.



**Notes!**

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

### 3.5 Installation of Separating Conveying Device ( If equipped )

- 1) First, install shock-absorbing foot on the base of conveying blower and fix them.
- 2) Lock the main body of cyclone separator and upper bracket.
- 3) Lock the upper and lower bracket.
- 4) Lay the cyclone separator on the ground horizontally.
- 5) Fix the filter bag tightly on the outlet pipe of the cyclone separator.
- 6) Bind 8" steel wired plastic pipe on the inlet of cyclone separator and outlet of conveying blower, then tight them up with pipe clamp.
- 7) Bind 8" steel wired plastic pipe on the inlet of conveying blower and outlet of storage box, then tight them up with pipe clamp.
- 8) Connect the power source of conveying blower to the socket of control box.

### 3.6 Installation of Conveyor Feeding Device ( If equipped )

- 1) Connect the conveyor main frame with the hexagon head and floor stand.
- 2) Put the belt top end to the 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



Please wear earplugs when operating machine so to avoid personal injuries!



Please wear gloves when operating machine so to avoid personal injuries!



Please wear goggles when operating machine so to avoid personal injuries!



Because blades or rotors may be loose, before operating the machine, please check the following items:

- 1) Is there any damage to the knives?
- 2) Is there any loose within the surface of the rotors?

If any above situation has been found, please contact local dealer or SHINI company.

### 4.1 Startup Pretest

Unpainted part of the machine has been covered with anti-rusted oil. Before use, the anti-rusted 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 (0.2~0.3mm) between fixing and rotating blades, confirm if the lockup screws of the blades are tightened (torque is 600 Nm).

#### 4.1.2 After First Startup for 2 Hours

- 1) Check the space between fixing 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 tension after a 20~30-hour under full-load operation.

## 4.2 Machine Start/Stop

The granulator is controlled by main power switch, safety switch, “start/stop” button and “emergency stop button”.

Main power switch:

The main power switch of granulator is on the control box, and the power supply is controlled by turning on/off the switch.



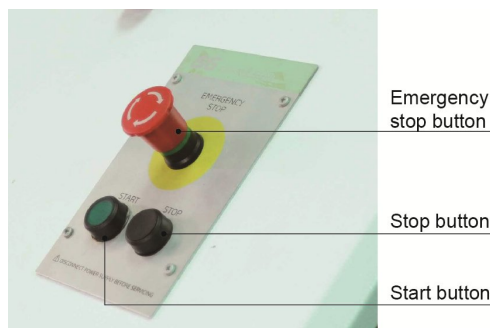
Picture 4-1: Main Power Switch

Start/Stop Button:

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

Emergency Stop Switch:

Besides, the machine has design of emergency stop button. When accident or emergency happens, press down the emergency stop button to stop the machine.



Picture 4-2: Start/Stop and Emergency Stop Button

**Note: Never stop the granulator before any material in the hopper or cutter chamber is completely granulated.**

**Residual material will clog the rotor in the granulator when restart it.**

### 4.3 Open the Feeding Box, Screen Bracket and the Storage Box



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

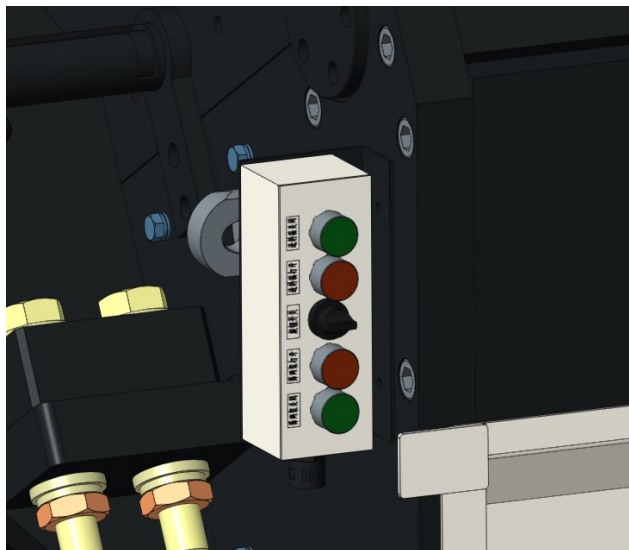


Be careful!

The blade is very sharp, please take care!

#### 4.3.1 Open the Feeding Box

- 1) At first, loose the locking screw on feeding box's set bolt.
- 2) Check if the feeding box and cutting chamber is empty.
- 3) Operate the hydraulic button to forwardly open the feeding box, and then cut off the main power source.



Picture 4-3: Hydraulic Station Start Button and Hydraulic Cylinder Button



Attention !

The feeding box is supported by hydraulic cylinder, which won't be dropped when

opening.

After feeding box contacts the limit switch when dropping, it will stop and won't damage the hydraulic cylinder.



When using the hydraulic cylinder to open the feeding box, please unlock the locking bolt.

#### 4.3.2 Open the Storage Box and Screen

- 1) Wait for the main shaft stops completely;
- 2) Unscrew the star handle and pull out the storage box.



Picture 4-4: Draw Out the Storage Box

- 3) Unscrew the screen bracket and lock the screw.

***Note: First loosen the locking handle, then use a wrench to clamp and loosen the screw, and finally rotate the handwheel by hand and screw out the screen bracket completely.***

***(Don't use tools to rotate the handwheel when loosening and tightening the screw.)***



Picture 4-5: Screen Bracket Locking Screw

- 4) Open the front door of the cutting chamber, control the hydraulic cylinder to slowly lower the screen bracket and take out the screen.

***Note: The screen bracket is supported by pneumatic stick to avoid its dropping when opening it.***

#### 4.4 Timer (Optional with feeding blower)

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

## 5. Trouble-shooting

### 5.1 The Granulator Can Not Work

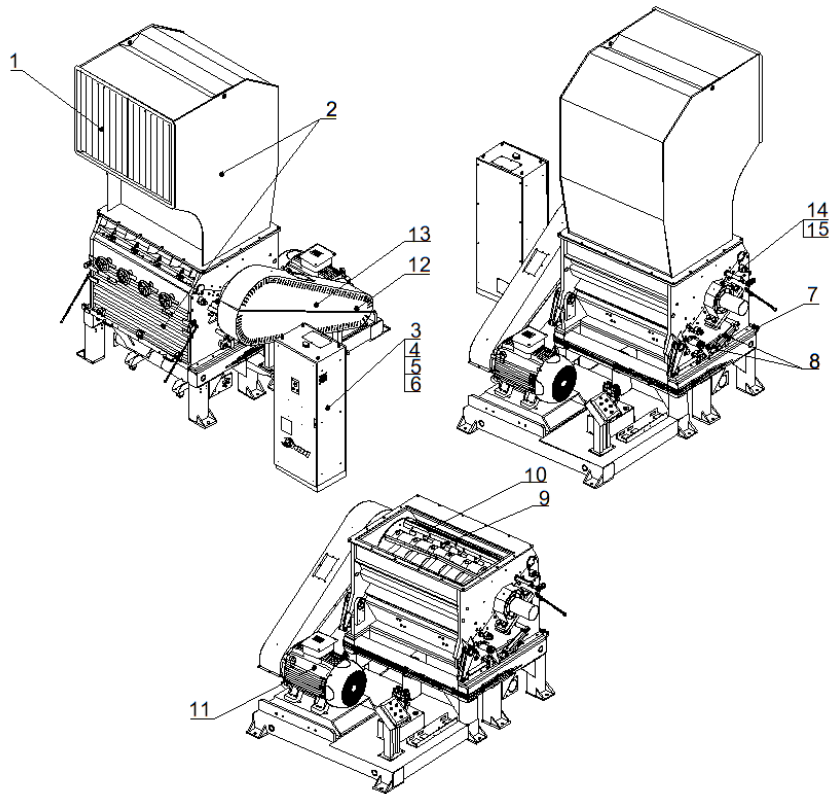
- 1) Check if the emergency stop has been reset. If not, rotate the button anti-clockwise to reset it.
- 2) Check whether the storage box is pushed in place. If it is not pushed in place, the machine can't start and check whether the star screw is tightened up.
- 3) Check the motor overload protector. The motor is equipped with overload protector. In the control box, if it detects the motor overload, the main circuit breaker will trip. Check whether there's any material left in the granulator before restart;
- 4) Check the space between blades. If the granulator blade is blunt or the blade clearance is incorrect, it will cause shutdown and the motor overload protector will trip. Check and replace the blade or re-adjust the blade space.
- 5) Check the phase sequence protector, and the phase sequence protector is inside the control box. If the power is short of phase, the phase sequence protector will cut off the power of granulator control wire, which results in the granulator failure.
- 6) Check whether the hydraulic station button is turned off.

### 5.2 Stop Due to Other Reasons

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

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

## 6. Repair and Maintenance



- 1) Check the material defender. Period: Daily.
- 2) Clean the screen and feeding box. Period: Daily.
- 3) Check the start/stop button and the main power switch. Period: Daily.
- 4) Check whether the emergency stop button/safety switch work normally.
- 5) Check all the cables.
- 6) Check the electrical components joints. Period: Weekly.
- 7) Check the safety switch. Period: Weekly.
- 8) Check the hydraulic cylinder start/stop function. Period: Weekly.
- 9) Check the screws between the fixed blades and the rotating blades.  
Period: Weekly.
- 10) Check the service condition of the blades. Period: Weekly.
- 11) Check whether the gear motor has abnormal sound, vibration and burning.  
Period: weekly.
- 12) Check the locking ring of the pulley. Period: Monthly.
- 13) Check the belt tension. Period: three months or every 500 working hours.



- 14) Check the bearing, and motor lubrication. Period: 15 days or every 360 working hours.
- 15) Check the bearing holders. Period: Semiyearly or every 1000 working hour.

## 6.1 Repair

All the repair work should be done by professionals in order to prevent personal injuries and damage of the machine.

### 6.1.1 Replace the Blades



**CAUTION!**

The blade rest shaft of the granulator has been balanced dynamically. It will rotate still due to unbalanced force during installation and also rotate when its center of gravity is unstable.



Press emergency stop button and turn off main power switch before blades changing.



Wear gloves to avoid being cut and be careful of the sharp blades. Please install the blade as correct steps during blade maintenance and replacement. Before tightening each fixed screw, inject fixing glue (blue LOCTITE 243 recommended) on all tighten screws at the joint to protect these screws from losing.



**CAUTION!**

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



**CAUTION!**

To avoid self rotation, insert the brake rod into the blade rest to prevent blade rotation during replacement.



Check whether the screen is broken after blade replacement. If the screen hole becomes larger, it needs to replace the screen.

The screw and gasket must be replaced during each blade replacement.

Open the feeding box before blade replacement.

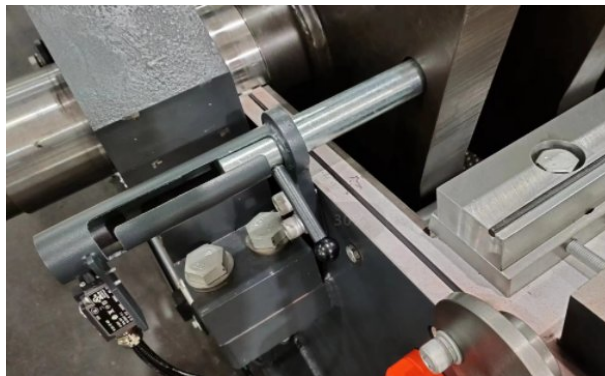
#### 6.1.1.1 Removing the rotating blades



**CAUTION!**

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

- 1) Remove the screws and washers.
- 2) Remove the blades.
- 3) Clean the installation surface of the blades.



Picture 6-1: Brake Rod Clasps the Blade Rest

#### 6.1.1.2 Remove the Fixed Blades

- 1) Front and rear fixing blades are inside the cutting chamber, loosen the fixed blade's screw.
- 2) Loosen and remove the inner hexagon screws on the front pressing block.
- 3) Remove the pressing block and blade, and finally clean the blade rest.
- 4) Loosen and remove the rear blade's screw.
- 5) Loosen and remove the hexagon socket cap screw from the pressing block again, remove the pressing block and blade. Clean the supporter box.



**CAUTION!**

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

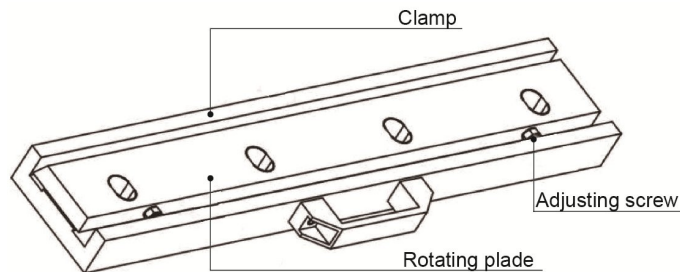
### 6.1.1.3 Install the blades

Clean the fixed blade and rotating blade carefully before installation.



Please wear gloves before installation as the blade is very sharp. Be careful during installation to avoid the cut!

- 1) 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 (rotating blades and fixed blades) 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: Fixed Blade and Rotating Blade Installation

- 2) 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  $125 \pm 0.07\text{mm}$ . 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!

During each blade replacement, the screws and gaskets must be replaced. First install the rear fixed blade, and then install the front fixed blade; Then, install the rotating blade.



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) |            |            |
|----------------|-------------------------|-------------------------|------------|------------|----------------------------|------------|------------|
|                |                         | 8.8 Grade               | 10.9 Grade | 12.9 Grade | 8.8 Grade                  | 10.9 Grade | 12.9 Grade |
| 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                         | 15         | 18         |
|                | M8                      | 16500                   | 24300      | 28400      | 25                         | 36         | 43         |
|                | M10                     | 26300                   | 38700      | 45200      | 49                         | 72         | 84         |
|                | M12                     | 38400                   | 56500      | 66000      | 85                         | 125        | 145        |
|                | M14                     | 52500                   | 77500      | 90500      | 135                        | 200        | 235        |
|                | M16                     | 72500                   | 107000     | 125000     | 210                        | 310        | 365        |
|                | M18                     | 91000                   | 129000     | 152000     | 300                        | 430        | 500        |
|                | 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 Transmission



CAUTION!

Press emergency stop button and turn off the main power switch before repairing and maintenance of the transmission belt.

### 6.2.1 Daily Maintenance of Transmission Belts

It equips 10 narrow V-belts according to the granulator's motor power.

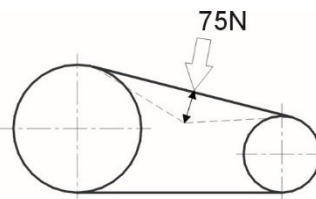
- 1) Check the V transmission belt.

Check the transmission belt's tensility and working condition after a full-load operation for 20-30 hours. Then, check its abrasion condition every month.

- 2) Check transmission belts' tensility every 3 months. See the attached table for the offset change. Remove the right sideboard and transmission belt cover. Rotate the transmission belts for several circles to see if there is any damage or abrasion.

**Note: Do not place your hands between wheels and the belts. to avoid being pinched.**

If it is necessary, check the belt's tension via extra force. Inflict extra force (75N) in the middle of the belt and measure its offset (The offset distance is determined by the motor's power and frequency. Refer to the table for specific specifications):



Picture 6-4: Belt Tension Measurement Drawing

Table 6-2: Belt Tension Measurement Specification

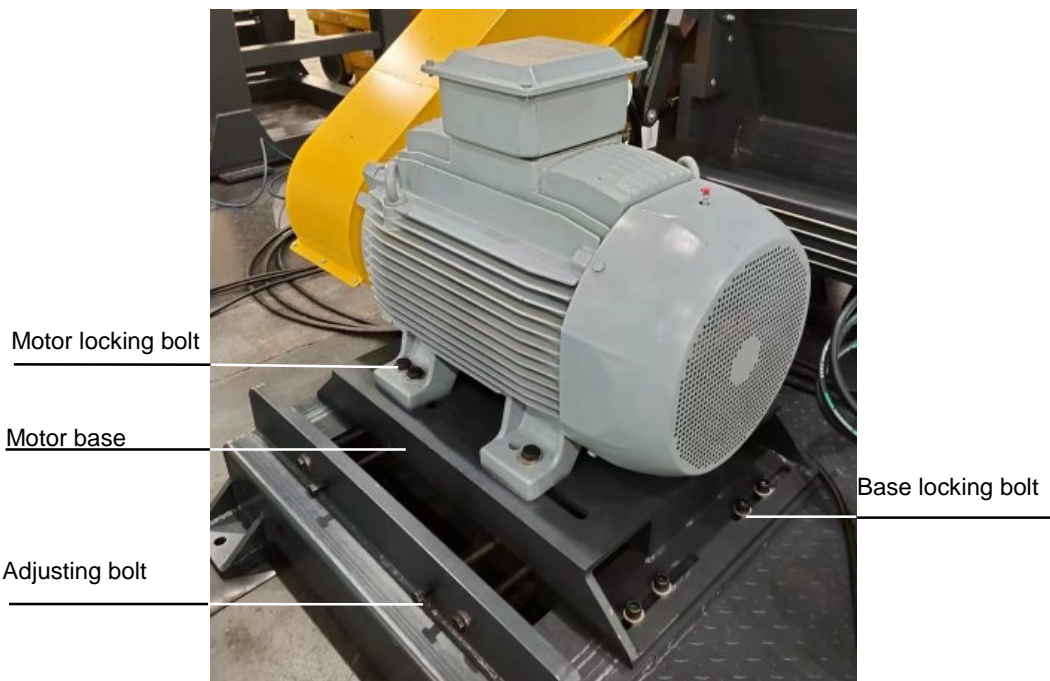
|                              |           |         |         |
|------------------------------|-----------|---------|---------|
| Motor 50Hz                   | 18.5/22kW | 30/37kW | 45-55kW |
| New belt                     | 15mm      | 14mm    | 15mm    |
| Old belt (Six - month later) | 19mm   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

|                              |      |      |      |
|------------------------------|------|------|------|
| New belt                     | 18mm | 17mm | 16mm |
| Old belt (Six - month later) | 22mm | 23mm | 20mm |

### 6.2.2 Adjustment of V Transmission Belts

- 1) Loose the 4 fixing screws on mounting base of the motor.
- 2) Adjust the V belt tension by pulling and pushing up the motor mounting base via the adjustment of the 4 screws.
- 3) Lock up the moving bolts.
- 4) Lock up the moving bolts.

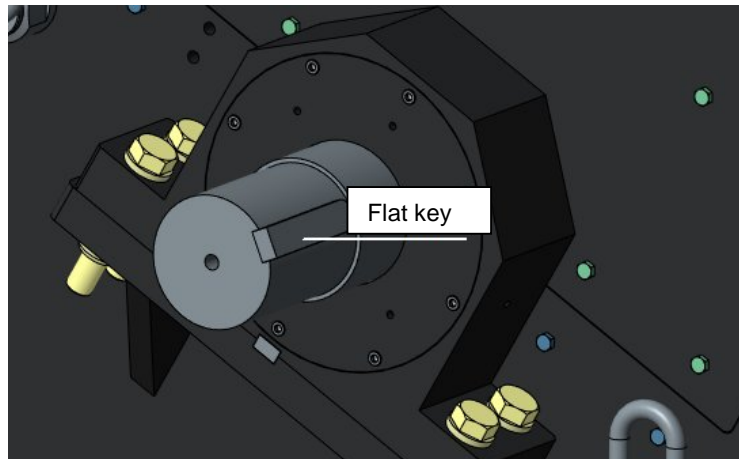
Recheck the belt tension after a full-load operation of 20-30 hours.



Picture 6-5: V-belt Adjustment Drawing

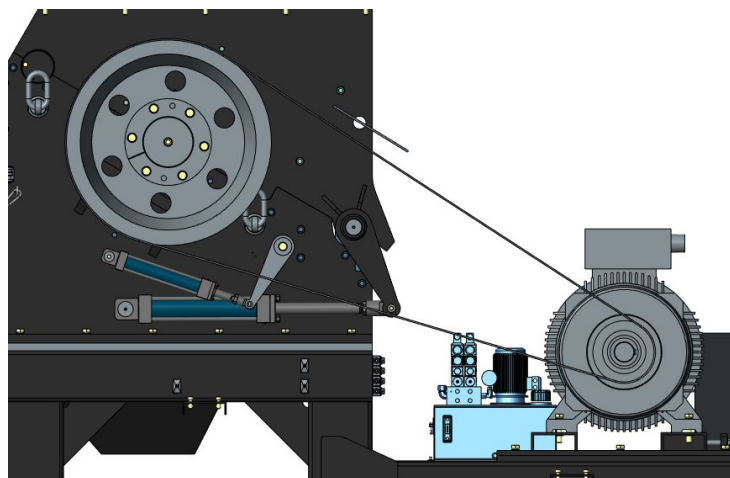
### 6.3 Installation of Belt Pulley and Motor

- 1) Put the flat key on the key groove of the shaft.



Picture 6-6: Installation of Belt Pulley and Motor 1

- 2) Put the taper sleeve inside of the hole of large pulley and aim the hole to the big pulley. Then, lock up the inner hexagon screw.
- 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: 880 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 (Torque:170Nm).



Picture 6-7: 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 ten belts be stressed by equal forces. Tighten the belts and lock up the position adjusting screw.
- 10) Finally mount the upper and lower protective cover for the pulley.



Picture 6-8: Installation of Belt Pulley and Motor 3

## 6.4 Installation of Screen, Screen Bracket and Storage box

- 1) Install the screen bracket under the cutting chamber, and align the square holes on both sides of the rotary shaft with the mounting holes on left and right case blocks.

Motor locking bolts

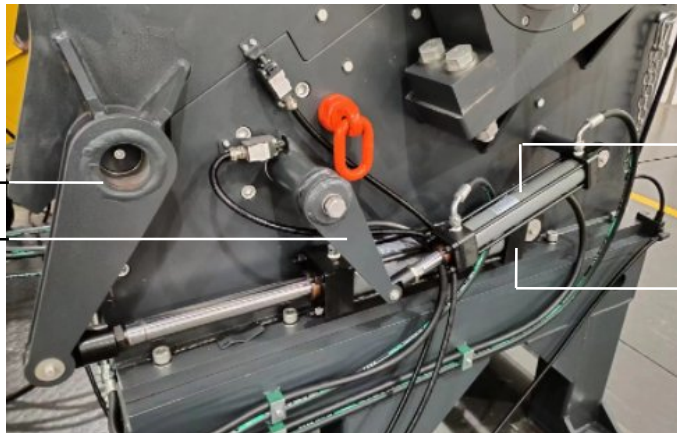


Picture 6-9: Installation of Screen, Screen Bracket and Storage Box 1

- 2) Insert the rotary arm of the screen bracket through the left and right case blocks into the rotary shaft of the screen bracket, and lock the bolts.

Upper case rotary shaft

Screen bracket rotary arm



Screen bracket hydraulic cylinder

Upper case hydraulic cylinder

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

- 3) Put the screen into the screen bracket. Lift up the screen bracket and use four locking screws to fix it.

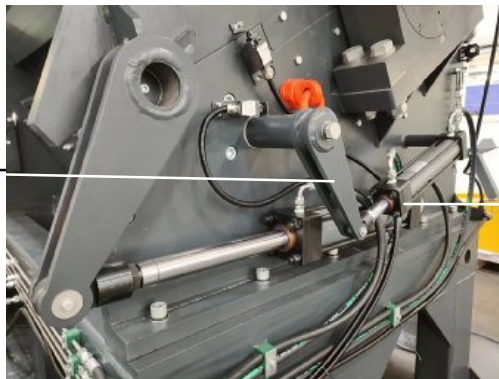
Screen locking screw



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

- 4) Mount the hydraulic cylinder and adjust the angle of screen bracket's rotary arm and hydraulic cylinder position, and then fasten the hydraulic cylinder.

Screen bracket rotary arm



Screen bracket hydraulic cylinder

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

- 5) Close the front door, lift up the storage box, insert the storage box on the support plate and lock the two star bolts in front of the screen bracket tightly.



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

## 6.5 Lubrication

### 6.5.1 Lubricating oils

The applicable lubricating oils :

Xin Chang Long: FX-00

FX-000

Bp: BP Grease LGEP 2

ESSO: Beacon Ep2, Beacon EP2

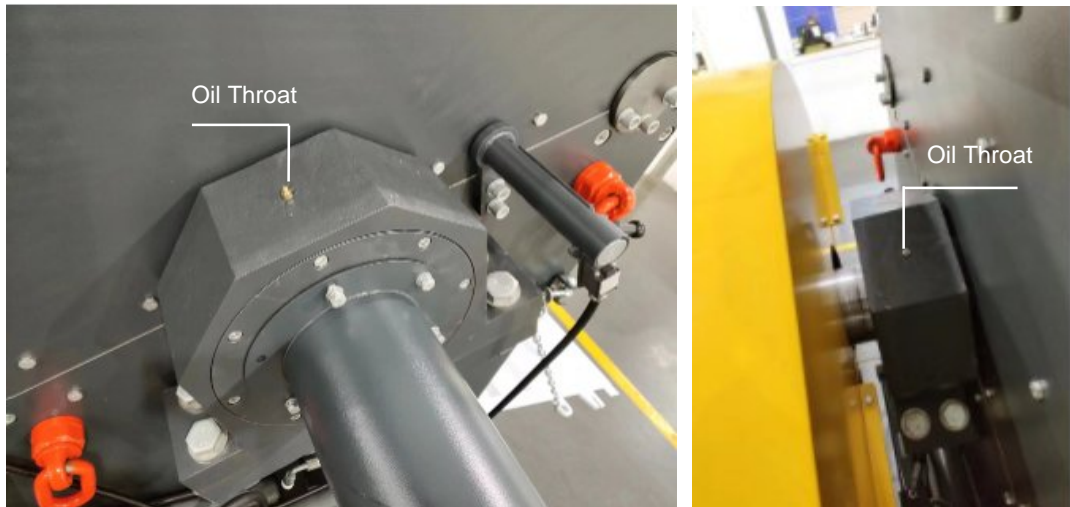
Mobil: Mobilux EP2

Shell: Shell Alvania EP2

Texaco: Multifak Ep2, Novotex Grease EP2

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

Align the lubricating oil gun with the bearing's oil port and inject the lubricating oil.



Picture 6-14: Oil Throat

## 6.6 Maintenance

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

***Note: All staff concerning repair must be conducted by professionals to avoid damage or harm to human body.***

### 6.6.1 Daily Check

- 1) 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.

### 6.6.2 Weekly Check

- 1) Check the power wire to see whether there is any damage. If so, replace it immediately.
- 2) Check the safety switch.
- 3) Check the function of the electrical handspike which is used to open the feeding box.

### 6.6.3 Monthly Check

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

## 6.7 Cleaning



When opening the feeding box, be careful of the blade; The blade is very sharp that may cause personal injury.



- 1) Check whether the feeding box is emptied before stopping the machine.
- 2) Clean the exterior surface of the feeding box.
- 3) Open the feed box.
- 4) Turn off the main power switch.
- 5) Clean the check board of the feeding box with dust separator.

***Note: The feeding box is held by electrical handspike, therefore it can't fall down.***

- 6) Clean the interior surface of the feeding hopper.
- 7) Loosen the fixing screw of screen bracket and open the screen bracket.
- 8) Take out the screen.
- 9) Clean screen bracket and screen.
- 10) Clean both surfaces of the cutting chamber.
- 11) Clean every loading pipe, blower, and cyclone dust separator.
- 12) Clean the wheels with bright dust-precipitator.

Re-install after cleaning

## 6.8 Repair and Maintenance Record

### 6.8.1 About the Machine

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

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

### 6.8.2 Check After Installation

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

### 6.8.3 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.

### 6.8.4 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.

### 6.8.5 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 if the cracking window.

#### 6.8.6 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.

#### 6.8.7 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.

#### 6.8.8 3 year Checking

- PC board renewal.
- No fuse breaker renewal.