SGS-S

Single-shaft Shredders

Date: Jan., 2022

Version: Ver.D(English)

Contents

Table Index

Picture Index

1. General Description

Please read carefully the operation instructions before install and use this machine in order to prevent from any human injury or damage to the machine.

Caution!

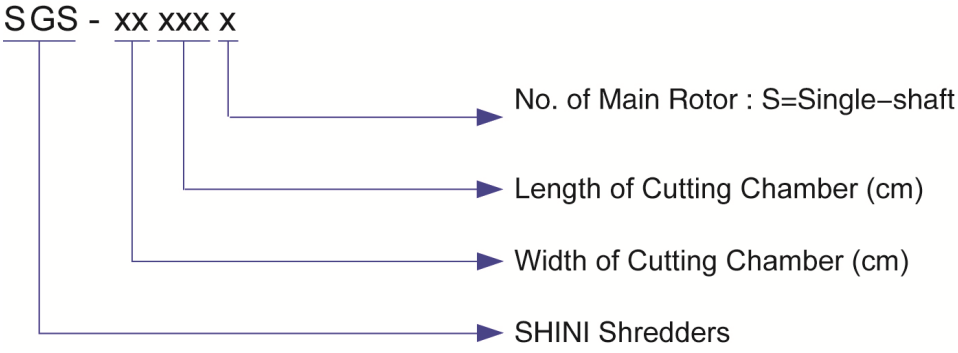
Granulator's blades are sharp and users are vulnerable from being cut, which requires users to pay attention to them.

No treating with poisonous and inflammable materials!

SGS-S series of single-shaft shredders can shred extremely thick, tough and large solid materials. They can be applied in a wide range, for example, recycling all kinds of materials such as plastics, rubber and wood. Wastes that are produced by the injection molding, blow molding or extrusion molding are also included.

Picture 1-1：Model: SGS-6080S

1.1 Coding Principle



1.2 Features

- Milling smashing design, low noise, low energy consumption, smashing in the uniform size. Screen mesh is optional in accordance with customer's demands.
- Rotor uses the square knife block of indentation on the surface to reduce the friction heat. When one of the angles of cutter is broken, it can simply inter-change the cutter to improve cutting efficiency.
- Automatically hydraulic device can be adjusted to achieve optimal production.
- Equipped with independent control panel, there are automatic and manual operational modes to choose, quite flexible and safe.
- The machine connects the transmission shaft and pulley through the V-belt, which makes it run smoothly and easy to disassemble;
- The gear box is installed on the cutter shaft, which directly drives the cutter shaft to rotate for shredding;
- It install the anti-vibration pad under the machine to reduce the vibration when the machine is shredding;

All service work should be carried out by a person with technical training or corresponding professional experience. The manual contains instructions for both handling and servicing. Chapter 6, which contains service instructions intended for service engineers. Other chapters contain instructions for the daily operator.

Any modifications of the machine must be approved by SHINI in order to avoid personal injury and damage to machine. We shall not be liable for any damage caused by unauthorized change of the machine.

Our company provides excellent after-sales service. Should you have any problem during using the machine, please contact the company or the local vendor.

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1.3 Safety Regulations

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

1.3.1 Safety Signs and Labels

Electrical installation must only be done by a competent electrician!

Disconnect main switch and control switch before the granulator servicing and maintenance.

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.

Rotating blades of granulator are extremely sharp, which are liable to cause injuries.

Be particularly careful when blade rest is rotating manually.

No starting up granulator before close screen bracket.

No privately turning up hydraulic pump output volume and hydraulic system pressure.

Operating personnel shall put on ear shield while granulator is crushing materials.

Be sure open feed hopper before open screen bracket.

When conveying belts is used to convey regrinds and powders, the

temperature of material should be higher than 60℃.

When replace and inspect conveying belts, make sure disconnect main power and avoid objects or clothes to be nipped into belts. Also make sure motor shield and baffle are well installed when startup.

Please scrutinize whether the conveyer belt nips clothes, arms and feet of operating personnel while using it in cooperation with conveyor belt.

Please scrutinize when conveying plastic wastes with high temperature in order to ensure that the materials are conveyed in the center of conveyor belt.

Note!

All screws of electric components in cabinet have been tightened and no need for periodical checking.

When operate the shredder, please notice the following signs

	Motor rotation direction.

1.3.2 Machine Transportation and Storage

Transportation

1) SGS-S series of granulator is packaged with slatted crate or wood case with wood plate as its cushion, which is suitable for forklift to change positions in a quick way.
2) There is space on the bottom of machine for forklift to easily move the machine after unpacking.
3) Please do not make it collide with other objects during the transportation in order to avoid any machine damage.
4) Machine structure is well-balanced with transfer hoisting rings and please be careful while lifting the machine in order to avoid machine's falling

down.

5) Temperature requirement for the preservation of this machine and its auxiliaries for long-distance transportation shall be within the range from -25℃to +55℃.

Storage

1) SGS-S series of granulator shall be stored indoors with the environmental temperature between 5℃ to 40℃ and humidity lower than 80%.
2) Please turn off all power supplies and shut down main power switch and control switch.
3) Please separate the entire machine especially its electric parts from water resource in order to avoid any potential faults caused by water vapor.
4) Drain out hydraulic oil of hydraulic system and gear oil of gear box to avoid impurity sedimentation.
5) Please wrap tightly the machine with plastic film in order to keep from the invasion of dust and rain.

Working Environment

Indoor temperature shall never exceed +45℃ and humidity shall never exceed 80%.

The machine works normally with the environment at an elevation below 3000m.

The machine requires peripheral space of 1m at least during its operation. Please keep it a distance of 2m at least from inflammable materials.

Please avoid vibration and influence by magnetic force within the work area.

No using this machine in following situations:

1) Damaged cables.
2) No running the machine on wet floors or after the machine is caught in the rain in order to avoid electric shock.
3) Before the inspection, repair and installation by professional maintenance personnel if the machine is damaged or dismantled.

1.3.3 Treatment with Discarded Parts

Please cut off power supply when the equipment's service life expires and it is unavailable for continual service. Please treat it well according to local regulations.

Fire alarm. Please equip it with CO^2 dry powder fire extinguisher to avoid fire disaster.

No using the granulator to deal with inflammable and explosive materials, or materials polluted by inflammable and explosive materials and liquids, which is liable to cause explosion or fire disaster.

Danger of intertwining especially during manual feeding! Please contact with SHINI or with your local agents.

Screw tightly the screws according to the regulation requirements.

Pay attention to feeding method if material length is bigger than feed hopper port.

1.4 Exemption Clause

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

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

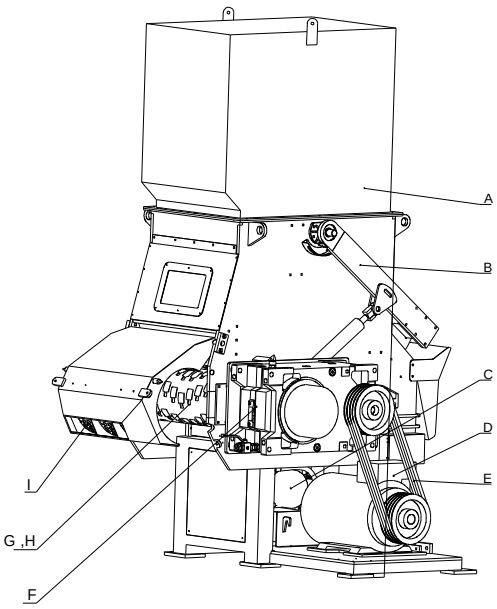
1) Any careless or man-made installations, operation and maintenances upon machines without referring to the Manual prior to machine using.
2) Any incidents beyond human reasonable controls, which include man-made vicious or deliberate damages or abnormal power, and machine faults caused by irresistible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

2. Structural Features and Working Principle

2.1 General Description

SGS-S series are suitable for crushing plastics including wastes of injection molding, blow molding or extrusion molding; it is a must to clear away metal dust and dirt before crushing.

2.1.1 Working Principle



Parts name:

A. Feed box	B. Material pushing block	C. Hydraulic pump station
D. Motor	E. V belt	F. Gear box
G. Cutter shaft	H. Fixed blade	I. Screen

Picture 2-1：Working Principle

Wastes fall into crushing chamber through feed box (A). Activated by hydraulic system(C), the oil cylinder drives pushing block (B) to move wastes close to cutter shaft (G). The cutter shaft is driven by the main motor (D) through the V-belt (E) and then driven by the gear box (F).The wastes are shredded by the rotating blades and fixed blades (H) that close on the blade shaft, and the granule size is controlled by screen (I), which is mounted at the crushing chamber bottom for easy replacement of different screens. Regrinds falls into storage hopper though

screen and are transformed by the conveyor belt to the material container or granulator for further crushing. This model adopts feeding methods include conveyor belt or forklift, etc.

After the wastes are shredded, the particles can be directly sent to the granulator through the conveyor belt for granulating, or sent to a place for storage. The shredder is equipped with a detachable feed box, which can be customized according to customer requirements.

Single-shaft shredder is controlled by control cabinet and control station. There’re power switch in the cabinet and control panel in control station, which are used to operate or debug machine.

2.2 Security System

In order to prevent from accidental human injury during the operation, the granulator is equipped with highly secured protection system.

Nobody is allowed to make any changes of security system in any condition.

Otherwise, the machine might be in dangerous state and liable to cause accidents. Maintenance and repair for security system must be accomplished by profession personnel.

The company will not continue to perform any commitment if anyone makes any change of granulator's security system and the replacement of all components must be provided by Shini Company.

Picture 2-2：Main Power Switch

2.2.1 Emergency Switch

There is a red button on the machine's control panel and the machine will stop running after presses this button. Rotate this button along the arrow direction, which will reset the button (counterclockwise direction).

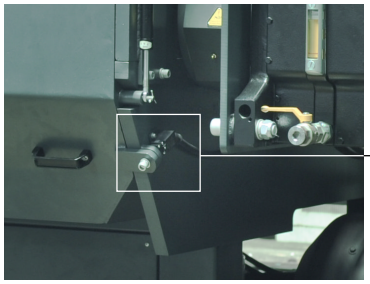
Picture 2-3：Emergency Switch

2.2.2 Safety Switch

It mounted a safety position switch on the shredder. If the screen position changed the place, it will cut off the power supply and shut down.

The granulator has a safety switch, which is located between the screen bracket and the right side plate of the cutting chamber.

When the screen bracket opens, the running machine will stop immediately to ensure the human safety.



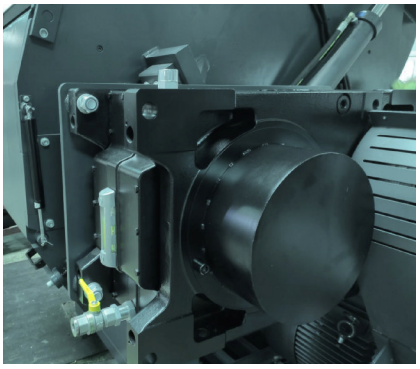
Picture 2-4：Screen Bracket Safety Switch

Notice before start-up:

1) Check if screen bracket and hopper are locked tightly.
2) Check if motor baffle is well installed.
3) Ensure no one working inside crushing chamber.

Picture 2-5：Bolts

2.2.3 Gear Box



Picture 2-6：Gear Box

1. Installation and Use

For connection of high speed shaft and other parts, hammering is not allowed. Users can rotate bolts into shaft-end holes and press fastenings.

After install gear box, rotate it manually to ensure smooth rotation.

Without loading condition, operate device for 2 hours. If you find uneven sounds, overheat and oil leakage, please shut it down and contact Shini Company.

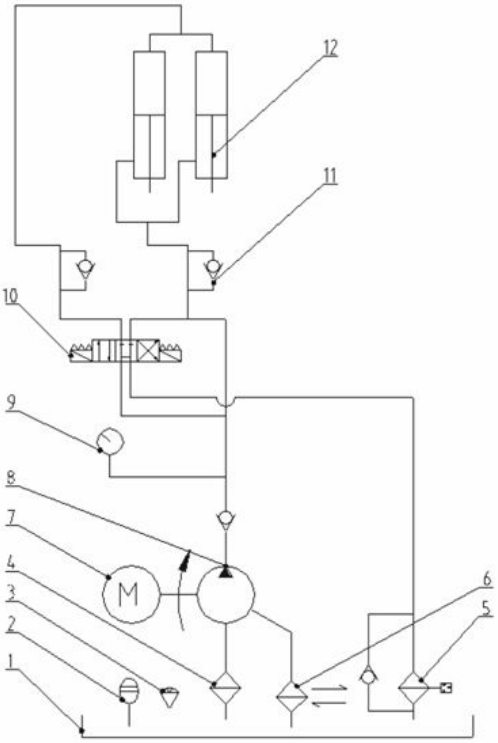
During installing torque arm, make point of connection being vertical with output shaft axis, deviation is $\pm 5^{o}$.

2. Lubrication

Use VG46 gear oil to lubricate gear box, and do not use additives containing graphite or molybdenum disulfide. After first oil filling, run the machine for 200 hours then replace oil. For the following operation, replace the oil after 6 months or 2500 hours running.

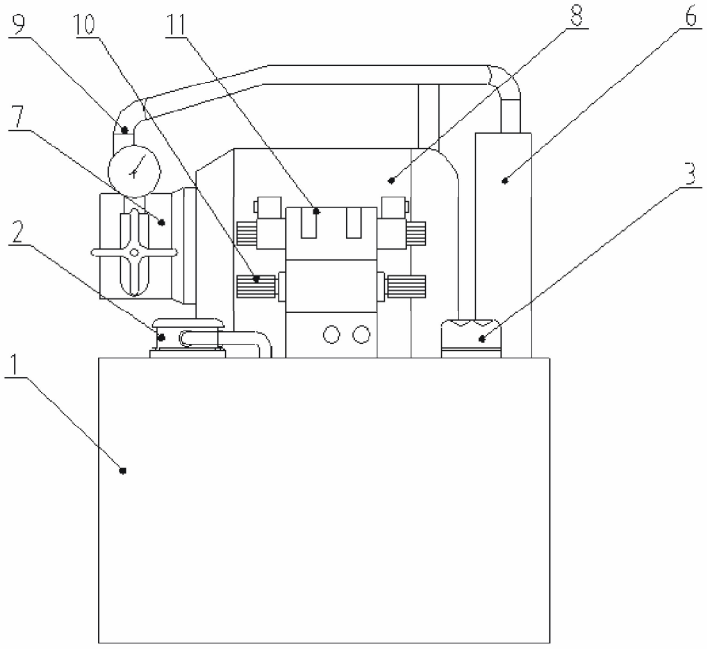
2.2.4 Hydraulic System

2.2.4.1 Principle of Hydraulic System



Picture 2-7：Principle of Hydraulic System

2.2.4.2 Hydraulic Pump Station



Picture 2-8：Hydraulic Pump Station

2.2.4.3 Hydraulic System Parts List

Table 2-1: Hydraulic System Parts List

No.	Name	No.	Name
1	Oil tank 60L	7	Oil pump VPF-30
2	Dipstick 3“	8	Motor 5HP
3	Oil filler 63	9	Oil meter 250kg
4	Precise filter screen 08	10	Shuttle valve DSG-03-3C6-A5
5	Return oil filter 40L	11	Throttle valve MTC-03W
6	Air cooler 407	12	Hydro-cylinder MOB63x420-CA-I

2.2.4.4 Overview of Hydraulic System

Hydraulic system of SGS-S includes many hydraulic elements and auxiliaries. Hydraulic circuit adopts integral oil circuit structure. Overall, the system is easy to maintain with a reasonable and reliable design.

2.2.4.5 Performance and Technical Parameters

1) Rated operating pressure: 7MPa
2) Flow rate: 25/min
3) Motor technical parameters:
   Model: 5HP-4P
   Power: 3.7kW
   Rotation speed: 1450r.p.m.
4) Power parameters of components:
   Solenoid directional valve (electro-hydraulic): DC24V
   Motor: AC400, 50Hz
5) Recommended transmission medium:
   N46, N32 antiwear hydraulic oil
   Cleanliness requirements for oil tank normal work: NAS10 Grade (NAS1638 standard)
   Temperature range of system oil: 5℃ ≤ t ≤ 50℃
   Oil tank effective volume: 60L

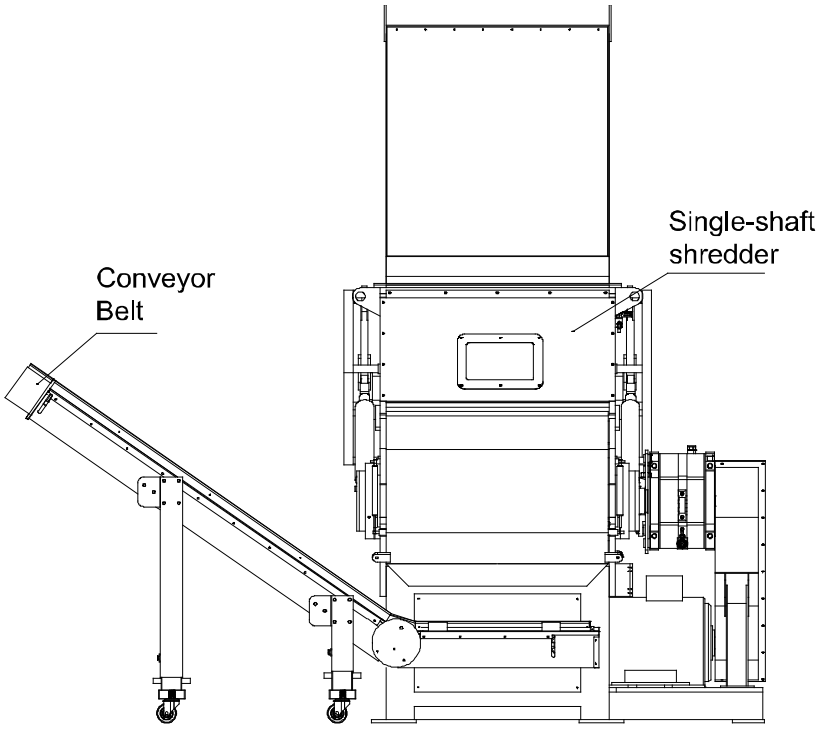
2.2.4.6 Operation and Use of Hydraulic System

1) Inspection before using
   Inspect if adjusting handle of elements and auxiliaries is in correct position, if oil level in liquid indicator range, if pipe joint and fastening screw are lose, if valve and pipeline leaks.
2) Inspection after startup
   Start oil pump and check if system pressure is not higher than 6.5Mpa, if pushing device speed is suitable. Check at all times motor and oil pump temperature rising and observe system operating pressure.
3) Maintenance
   Replace oil after debugging hydraulic system. Replace hydraulic oil once after initial using then replace once every year to ensure normal operation. During operation, inspect if oil filter is blocked and clean or replace filter core. Spares parts and auxiliaries should be stored for dealing with faults.

2.3 Options

2.3.1 Conveyor Belt Feeding System

2.3.1.1 Conveyor Belt Feeding System Installation



Picture 2-9：Conveyor Belt

2.3.1.2 Conveyor Belts Feeding Installation

Note: Refer to manual carefully before operate conveyor belt feeding system.All electrical connection should be conducted by professional electricians.

2.3.1.3 Control Circuit Connection and Operation

Conveyor belt can be solely controlled or can be controlled with single-shaft shredder by a control station. In solely controlling, connect power and start/stop machine via start/stop switch in the conveyor belt. Note: It is controlled together with the single-shaft shredder by default when leaving the factory. The conveyor belt power connector has the metal connector. When it is controlled independently, it should disassemble the metal connector. In connecting with shredder, conveyor belt is separate from host machine and belt does not connect shredder. Therefore,

before shredder servicing, connect power of conveyor belt to the plug in right door of control cabinet.

Note: Turn start switch of conveyor belt on if adopting this type of controlling.

Start-up and shutdown.

It is controlled by the start and stop switches on the conveyor in sole control.

When it is in centralized control, the conveyor belt is automatically controlled by the machine.

2.3.1.4 Checkup of Conveyor Belt

Refer to CB Manual for Details.

3. Installation and Debugging

 This series of models can only be worked in a well ventilated environment.

 Please read carefully this part before installation.

 Please install the machine according to the following orders in order to avoid human injury and machine damage!

 Please be very careful and avoid cut by the extremely sharp blades!

 Power connection of granulator must be accomplished by professional electricians!

3.1 Installation Notices

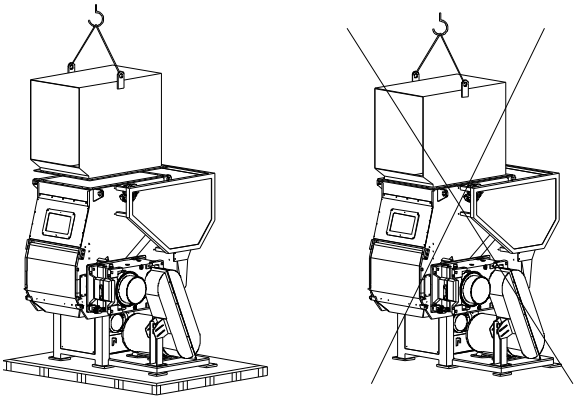
1) Please ensure that the voltage and frequency match with those marked on name plate provided by the plant.
2) Connection of cables and ground wires shall accord with local regulations.
3) Please use independent cables and power switches and the diameter of cables shall not be less than that of cables applied in electric cabinet.
4) Cable terminals shall be safe and fixed.
5) This series of machine requires three-phase four-wire power supply. Power supply (L1, L2, L3) connects with live conductor and ground wire (PE).
6) Power distribution requirement:
   Main power supply pressure: ± 10%
   Main power supply frequency: ± 2%

3.2 Installation Positions

Note: Please use the correct lifting method!

The feed box and the single shaft shredder's main body shall be packed separately when the machine leaves the factory. Use a forklift to move the shredder feed box to a proper position, then hoist the feed box on the shredder by the lifting ear on the feed box, and lock all the screws.

Note: No lifting the machine while installing the feed box on granulator body and overweight will damage the machine!



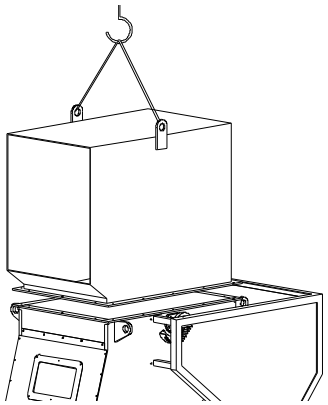
Picture 3-1：Installation Positions

Note: Please assure of enough installation space in peripheral area of the machine for the convenience of machine maintenance and repair.

Note: Please inspect and confirm the level installation ground and its full strength for machine's operation.

3.3 Installation of Feed Hopper

1) Use the rope to fix the two lifting ears on the feed box.
2) Lift up feed hopper and lay it on top of crushing chamber carefully to make it match well with crushing chamber and justify with its fixing holes.
3) Lock tightly the external hex bolts of feed hopper. (Torque: 220Nm).



Picture 3-2：Installation of Feed Hopper

3.4 Power Connection

1) Make sure the voltage and frequency of the power source comply with those indicated on the manufacturer nameplate that attached to the machine.
6) Power cable and earth connection should conform to your local regulations.
7) Use independent electrical wires and power switch. Diameter of electrical wire should not be less than those used in the control box.
8) The power cable connection terminals should be tightened securely.
9) The machine requires 3-phase 4-wire power source, connect the power lead (L1, L2, L3) to the live wires, and the earth (PE) to the ground.
10) Power supply requirements:
    Main power voltage: +/- 5%
    Main power frequency: +/- 2%
11) Please refer to electrical drawing of each model to get the detailed power supply specifications

3.4.1 Check the motor running direction

1) Check whether the screen bracket and feed por are installed properly.
1) Make sure that the main power switch is at the "ON" position.
2) Check whether the emergency stop switch works.
3) Start the granulator and press the "start" button. Then close it immediately and press the "stop" button.
4) During the period that the shredder is about to stop, check whether the motor running direction is clockwise.

Note: If the motor runs in the wrong direction, it will easily damage the cutter and greatly reduce the crushing capacity! Please cut off the power supply and replace any two of the three wires of the main power supply.

Note: When checking the motor rotating direction, be careful of the hand injury crushed by the belt!

3.4.2 Check the running direction of the hydraulic pump station motor

1) Check whether the running direction of the pump station motor is consistent with the arrow direction on the motor.
2) Start the hydraulic system manually and stop it again to check the motor running direction.

Note: When the hydraulic system's motor rotates in the wrong direction, it will not work and greatly affect the servicing life of the hydraulic system. Please cut off the power supply and replace any two of the three wires of motor in the control box.

Note: When it is equipped with a conveyor belt, please check the rotation direction of the conveyor belt.

4. Operation Guide

Please put on ear shield while operating the machine in order to avoid human injury!

Please put on gloves while operating the machine in order to avoid human injury!

Please put on protective glass while operating the machine in order to avoid human injury!

Please inspect whether the blades or rotators are loosened before operate the machine:

1) If any damage exists in blades.
2) If fixed welding block of rotated blade is loosened.
3) Pull or push rotators and blades to examine if they are loosened.

Please contact local sale company or Shini Company if users find out any of the above-mentioned situations.

4.1 Starting-up Pre-inspection

Rust preventing oil has been painted on parts without any painting upon delivery, clear away rust preventing oil before using this machine.

1) Clean it with cleaning rag first.
2) Then clean it with cleaning rag by amyl alcohol.

4.1.1 Before First Starting-up

1) Inspect if the shredder is in the level position.
2) Inspect blade gap (0.5~1.5mm) and if lock screws of blades are tightened.
3) Inspect if gear box is adequately lubricated, if hydraulic oil is adequately filling.

4.1.2 2 Hours Later after First Starting-up

1) Recheck blade gap, including fixed and rotate ones, then check blade screws are loosened.

2) Check motor positioning screw and check if positioning screw is tightened.

4.1.3 20~30 Hours Later after First Starting-up

Check belt tension after full-load 20~30 running, then adjust belt tension if it goes wrong.

4.2 Circuit Connection

Circuit installation of shredder shall be accomplished by professional electricians.

1) Connects shredder power.
2) Shredder motor and oil pump motor rotate clockwise

4.2.1 Inspect the Operation Direction of Motor

1) Confirm main power switch is "ON".
2) Check up if emergency switch acts.
3) Start shredder by pressing the button of "Start"; then shut it down immediately by pressing the button of "Stop".
4) Shredder needs some time for full stop and examine if the operation direction of the motor is clockwise direction.

Note:Be careful not being crushed by belt when manually checking motor operation direction.

4.2.2 Inspect the Operation Direction of Hydraulic Motor

Start pump and shut it down to check if motor vanes rotate in accord with the arrow mark in nameplate.

4.3 Open Screen Bracket

Turn off control power switch and shredder power before opening screen bracket.

Note: Sharp blades may cause personal injuries.

4.3.1 Open Screen bracket

1) Turn off shredder power.
2) Unscrew fixed bolt at two sides of bracket then pull it out.
3) For replacing screen, user needs to dismantle the whole bracket firstly.

Note: Screen bracket is supported by pneumatic spring bar so it would not drop down when opening. Use an object to support

bracket if manually working under screen to prevent injuries caused by spring bar failure.

4.4 Close Screen Bracket

Note: Hold the handles on bracket tightly and push them toward crushing chamber to close bracket , then lock fixed screws at two ends of screen.

Note: Avoid crushing injuries when close bracket !

4.4.1 Install Screen Bracket

1) Put screen into bracket , match hole sites and fix them via lockup bolts.
2) Refer to installation instruction for details.

Picture 4-1：Installation of Screen Bracket and Storage Hopper

4.5 Turn On and Off the Machine

1) Shredder is controlled by main power switch, safety switch, console and emergency stop.
2) There are two modes of Manual and Auto available.
3) Normal operation adopts Auto mode.
4) Once start-up, check instruction on panel and check if switches are in OFF position. Then turn on main switch on left side of control cabinet and switch motor into “Running” on control panel.
5) Manual mode is to maintain, debug, cleanup and other operations of separately controlling pushing block and cutter shaft. Under Manual mode, motor switch controls shaft running and reversely running, turn on oil pump to control pushing block movements.

Note: Under Auto mode, oil pump switch, pushing switch and motor reverse are unavailable. During operation, keep oil pump

and pushing switch in OFF position to avoid misoperation when switching for Manual mode and cause personal injury and device damage.

Main power switch:

Main power switch of shredder is installed on control cabinet and turning on/off the machine is controlled by main power switch. Door interlock switch id adopted for convenience.

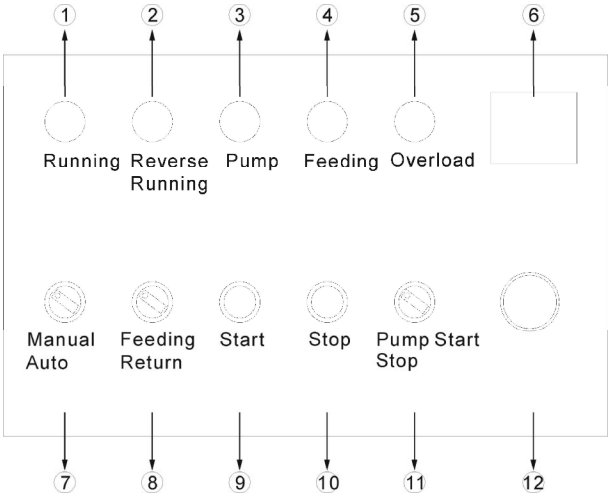
Picture 4-2：Main Power Switch

Shutdown and Turn Power Off

Under Auto mode, switch off motor to shut down shredder; under manual mode, just switch off oil pump, motor and pushing block; for cutting ff power, switch power to “O” position in the left side of control cabinet.

Emergency Button:

Furthermore, an emergency button is also equipped with machine. Press this button if any accident or other situations happen.



Picture 4-3：Emergency stop

1. Running
2. Reverse running
3. Pump running
4. Feeding
5. Motor overload
6. Ampere meter
7. Manual/Auto
8. Feeding /return
9. Start
10. Stop
11. Pump start/stop
12. Emergency stop

Note: Under Auto mode, oil pump switch, pushing switch and motor reverse are unavailable. During operation, keep oil pump and pushing switch in OFF position to avoid misoperation when switching for Manual mode and cause personal injury and device damage.

4.6 Parameter Setting

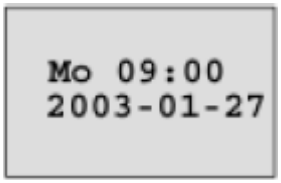
Parameters are set via SIEMENS LOGO! Controller. Firstly, confirm parameters based on demands then input parameters to controller manually. Turn on control panel and enter LOGO! Setting.

4.7 Parameters List

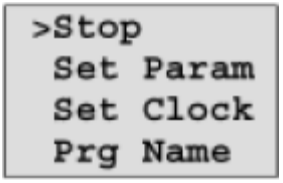
Param. No.	Function	Remark
B1	Startup reversely running	Cleanup of residual material, default is 5S.
B2	Star start time	Star starting time, default is 8S.
B9	Shutdown time after start and reverse running	Shutdown time after reverse running, default is 10S.
B14	Feeding time interval	The swing arm rests at the highest position, so that we know the feeding time interval, and the factory setting is 3S
B16	Residence time when materials are pushed to the max. position	The residence time of swing arm when it is pushed into the max. position each time (not include the time after the 1st startup), and the factory setting is 3S.
B17	Feed crushing time	Judging time when the swing arm is pushed for n secs, that it hasn't reached the max. feeding position. The factory setting is 30s.

4.8 Parameter Input

Initial screen of SIMENS LOGO！Is the clock and date.



1) Press “ESC” key to switch LOGO！controller from Operation mode to Parameter assign mode and a menu comes out:



Below are the functions of 4 menu keys:

STOP

Press this key to turn off controller.

Note: Do not select this menu functions, for it will forces running system to stop.

Set Param

Parameters setting of B1, B2, B3, B4, and B5 are completed via this key.

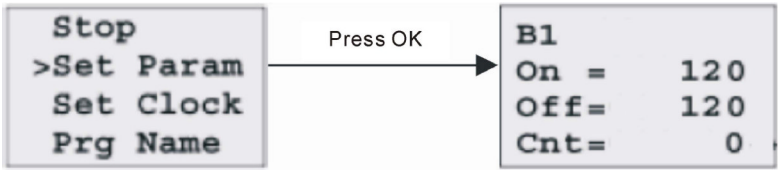
Set Clock

Set controller time via this key.

Prg Name

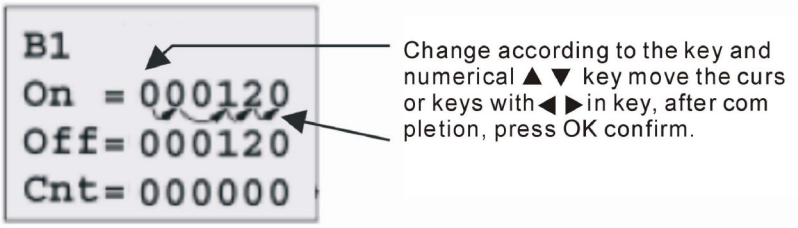
This menu command only allows you to read the name control program.

1) Press ▲ or ▼ keys to move cursor “>” to “Set Param”.



12) Press OK key to confirm, LOGO！ It will display first parameter B1.

13) Press OK again to confirm parameters edited.



14) After setting B1 parameters, press ▲ key and LOGO！ Displays second parameter B2. Press OK key to modify parameters then press ▲ key, LOGO！ Displays third parameters B5. Repeatedly, complete settings of B2, B5 and...B11, press ESC key to exit parameters setting menu to parameter assign screen. Press ESC key to return initial screen with clock and date.

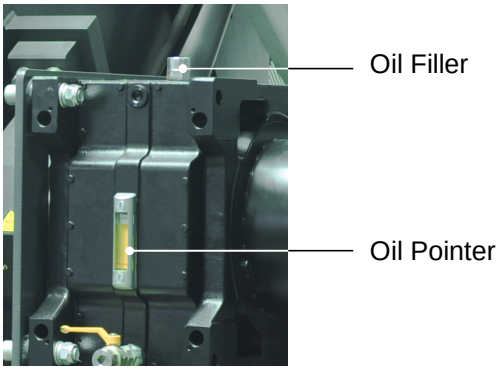
5. Trouble-shooting

5.1 Shredder Fails to Operate

1) Check whether the emergency stop switch has not been reset. Rotate the knob in the direction of the arrow (counterclockwise) to reset it.
2) Check whether the safety switch between the feed box and the storage box is fully closed. If the safety switch between the feed box and the storage box is not fully closed, the machine will not start.
3) Check the motor overload protector. The motor has an overload protector. In the control box, if the motor is overloaded, it will trip. Test the white key (A) that shifts to the left, and press "Reset" button (B) to reset it. Before reboot, check whether there is residual material inside the shredder.
4) Check the conveying blower motor protector. If the conveying blower is not started, the shredder can’t work either. Check the motor protector in the control box; If the protector is closed, the switch will be in the "0" position. Reset the switch to the "1" position, check whether there is any residue material, and then restart the machine. Test the white key (A) that shifts to the left, and press "Reset" button (B) to reset it.
5) Check the clearance between the blades. If the shredder’s cutter is blunt or the blade clearance is incorrect, it will cause machine shutdown and the motor overload protector will trip. Check the blade, replace the blade or readjust the blade clearance.
6) The contactor is burnt out or the control circuit is disconnected.

5.2 Excessive Noise of Gear Box

1) Check if lubrication oil is filled to the desired level (as oil pointer indicates).
2) Incorrect installation position of gear box. This situation should detected during first start-up and adjust it to the right position.
3) Too high ambient temperature, take off pump shield to ensure enough space for pump cooling.



Picture 5-1：Oil Filler, Oil Pointer

5.3 Hydraulic System Faults

Too high oil temperature

1) Inspect if oil used is recommended brands, if oil has been polluted with too much impurities, if oil level exceeds specified point (above the top of liquid indicator).
2) Inspect if hydraulic oil cooler works normally; if hydraulic pressure too high (not more than 7MPa).

No pressure indicated in pressure gauge, oil cylinder stays idle

1) Inspect if oil pressure gauge is turned on.
2) Inspect setting pressure of relief valve is too low, if flow rate of one-way throttle valve is too small or in shutdown.
3) Inspect if oil circuit is suspended and if pump still works.

5.4 Others Causes for Shutdown

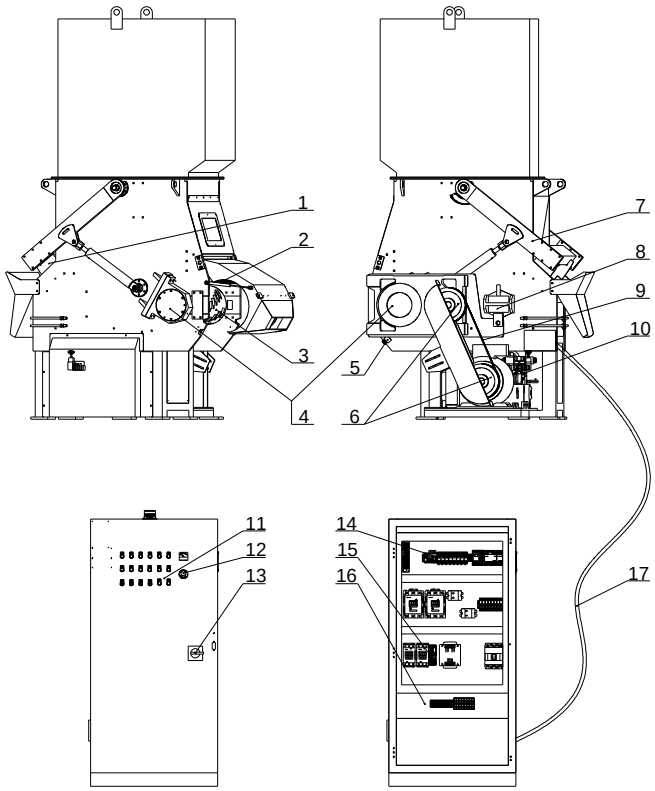
1) Too much material remained in crushing chamber once start-up.
2) Solution: Start the machine manually, manually control pushing block to move backwards, and then start the main motor manually. The main motor will reverse for a few seconds, stop for a few seconds, and then run forward. The machine will operate normally, and then shift the machine to automatic mode.Then run motor reversely and non-reversely until it runs normally. At last, shift motor into Auto running mode.
3) Connection damage or loose in safety and limit switch also cause shutdown.

Note: Do not break off safety switch or control switch.

5.5 Inaction of Pushing Block under Auto Mode

1) Shutdown then re-startup machine.
2) If it still fails to run, manually start machine and start oil pump motor. Manually control pushing block to move backward and forward, if machine starts then shift it to the Auto mode and running.
3) If solutions above do not work, inspect position switch of pushing block, if they are well adjusted, if nylon bars are under serious wear for renewal. If connection screws in pushing mechanism are loose.

6. Maintenance and Repair



1. Check the condition of the guide and pusher nylon strips (monthly check);
2. Check the screen condition (monthly check);
3. Check the cutters' wear and locking condition (monthly check);
4. Check the lubrication of bearings, motors and gear boxs (half a year check);
5. Check all safety switch functions (weekly check);
6. Check the belt pulley (half a year check);
7. Check whether the pusher is loose (weekly check);
8. Check whether the shock absorber is loose. If it is loose, tighten the upper nut (weekly check);
9. Check the condition of the machine belt (monthly check); Check the belt tension (half a year check);
10. Check the hydraulic oil and system pressure (daily check); Check whether the hydraulic system is leaked (half a year check); Check hydraulic system components and hydraulic oil (half a year check);

11. Check the start / stop button (daily check);
12. Check the emergency stop switch (daily check);
13. Check the main power switch (daily check);
14. Check the over-current protective function of the crushing motor (monthly check);
15. Inspect the oil pump overload protective function (monthly check);
16. Check whether the electrical component connectors and terminal board connectors are loose (weekly check).
17. Check all the cables if there are broken (weekly check);

6.1 Maintenance

All maintenance work must be finished by professional personnel in order to avoid human injury and machine damage.

Table 6-1: Torque Forces of Blades and Other Fixing Screws

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

6.1.1 Replacement of Blades

Warning!

After replacing rotate blades, make sure fix new blades tightly to avoid the constant contact between rotate blade and fixed blade.

Users must press emergency switch and turn off main power switch while replacing the blades!

Blades are extremely sharp. Please put on gloves before operation and please be very careful during operation to avoid cut injury! During the tool maintenance or replacement, inject the screw fixative (it is recommended in blue, LOCTITE 243) into the screw thread joint to fix the screw and prevent the screw from slipping.

Attention!

During assembly and disassembly of blades, dismantle motor baffle and pull belt to rotate cutter shaft. Don't rotate shaft manually to avoid personal injury.

Attention!

To avoid accidents caused by shaft autorotation, use a wood block to fasten fixed blades and rotate blades.

Check if screen is damaged after replace blades, replace screen if serious wear or deformation is caused.

Replace screws and washers along with blades

Before replace rotate and upper fixed blades, open storage hopper and dismantle screen bracket; dismantle pressing block before replace lower fixed blades.

1. Demount rotate blades

Note: Use wood block to plug into blades to avoid shaft autorotation.

15) Take off screws.
16) Take out rotate blades.
17) Clean fitting surface of blades.

Note: Single-shaft model adopts sunken diamond-shape blades, which can switch degrees for using even if one of angels wears.

2. Demount fixed blades

1) Unscrew bolts of upper fixed blades in chamber before demount them.
2) Unscrew adjusting bolts of upper fixed blades.
3) Take off bolts and fixed blades.

Note: When unscrew the lasting bolt, make sure press pushing block and blades to avoid injuries!

4) Unscrew six inner hex sunk bolts of pushing block before demount fixed blades.
5) Take off pushing block.
6) Unscrew fixed bolts and take off lower fixed blades.
7) Clean fixing plate of lower fixed blades.

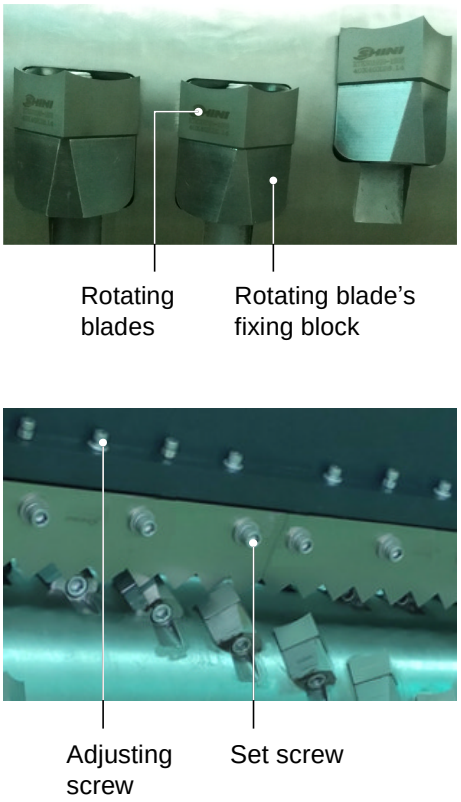
6.2 Installation of Fixed and Rotating Blades

Installation Steps:

1) Put the rotating blade into the cutter shaft groove, match the hole with its fixing block, and tighten the screws to make the blade close to both sides of the cutter shaft groove and front end of the rotating blade's fixing block.

2) Fix the upper fixed blade on its blade rest, lock the blade fixing screws and adjusting screws to prevent blade from shaking; Lock the adjusting screws of the lower fixing blade and fix them on the fixing block of the lower fixing blade.

3) Use a feeler gauge to check the clearance between the fixed blade and the rotating blade, and the normal clearance is 0.5~1.5mm; If it is not within this range, the fixed blade can be adjusted to reach this range, and then lock the fixed blade's set screws.



Picture 6-1：Installation of Fixed and Rotating Blades

Note: To avoid personal injury and machine damage, make sure to tighten the blade set screws.

Note: When adjusting the blade clearance, don't set the clearance too small at the beginning, so as to avoid cutter damage due to rotating blades and fixed blades' collision!

After several adjustments, gradually adjust the clearance of the fixed blade to appropriate position!

6.3 Mount the Shield

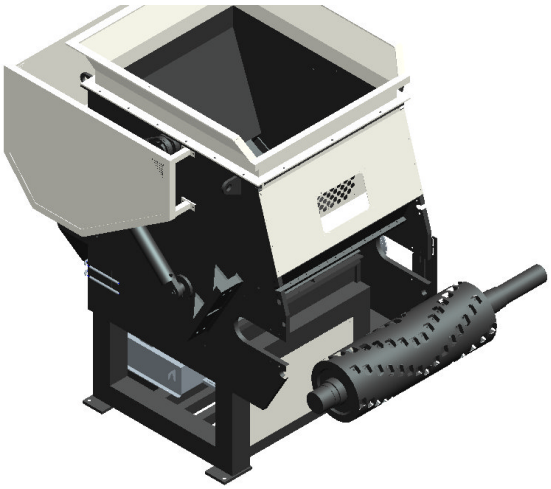
Install the shield after installing the feed box.

1) Place the shield plate on the side plate and align the holes.
2) Lock the front and rear screws.

Picture 6-2：Installation of the Shield

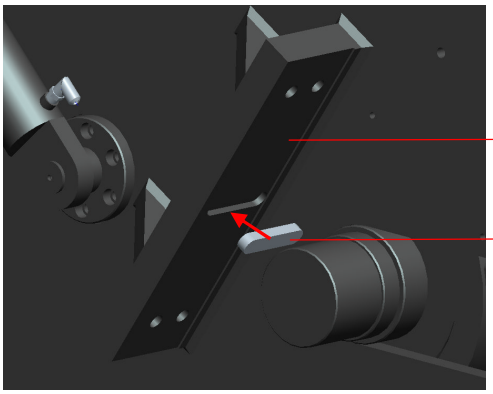
6.4 Installation of the Main Cutter Shaft and Bearing

1) Lift the cutter shaft up to its mount opening in the cutting chamber, align the two ends and push it to the innermost end of the cutter shaft's mount opening in the cutting chamber.



Picture 6-3：Installation of the Cutter Shaft

2) Press the bearing into the bearing seat, and press the flat key into the key groove of the bearing seat fixed plate.

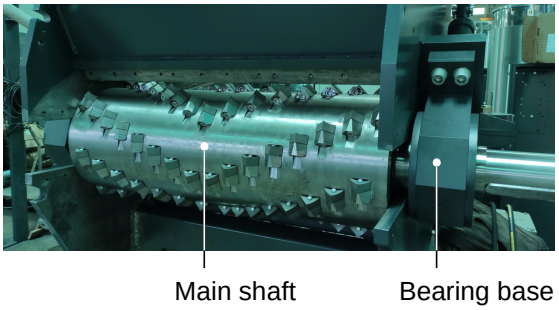


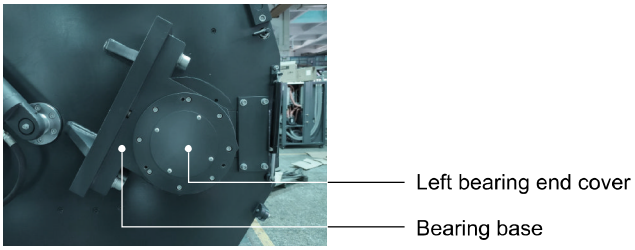
Picture 6-4：Installation of the Bearing

3) Press the bearing seat and bearing into the main shaft, align the mounting hole of the bearing seat fixing plate, and lock the screw bolt.

Note: Apply lubricating oil on the bearing and bearing seat.

4) Install the bearing end cap and lock it with screws.

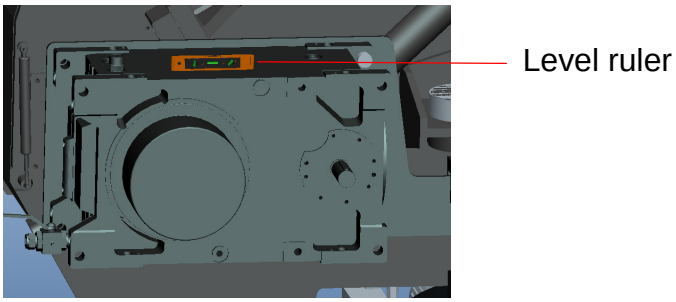




Picture 6-5：Installation of Main Cutter Shaft and Bearing

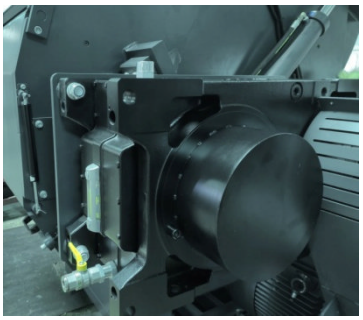
6.5 Installation of Belt Pulley, Motor and Gear box

1) Put the key into the key groove of the cutter shaft, lift the gear box with a hoist (there is a lifting ear on the gear box), insert the output hole into the cutter shaft, and mount the screw on the shaft end screw hole to pull the gear box in place. After installing the gear box, it must rotate flexibly without jamming.
2) When installing the torque arm, try to make the connection point perpendicular to the output axis, with deviation ± 5 ° (Place the level ruler on the gear box, and keep the bubble of the level ruler in the middle of the glass tube).



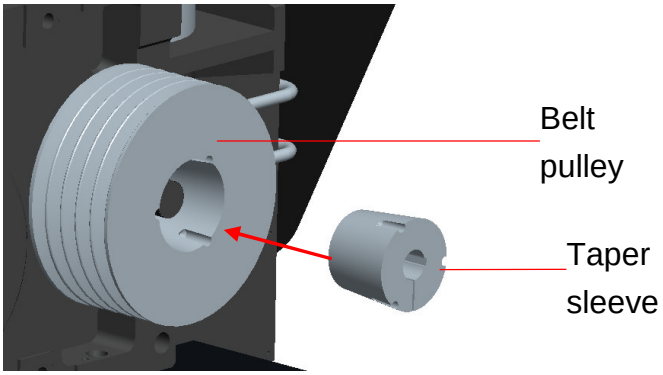
Picture 6-6：Installation of the Torque Arm

3) After installing the gear box, install the belt pulley on the input shaft of the gear box.



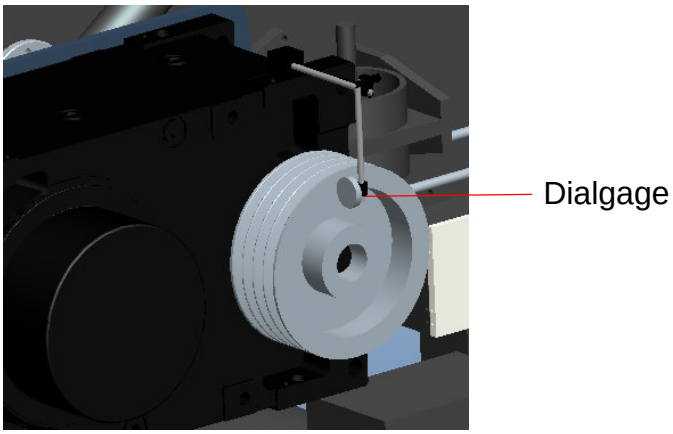
Picture 6-7：Installation of the Belt Pulley I

4) Put the taper sleeve into the round hole of the belt pulley, align its hole with the belt pulley, and then lock the inner hexagon socket screw.



Picture 6-8：Installation of the Belt Pulley 2

5) Use the dialgage to correct the balance of the belt pulley, attach the dialgage to the belt pulley and then rotate the belt pulley to check whether the pointer of the dialgage is within 0~0.1mm.

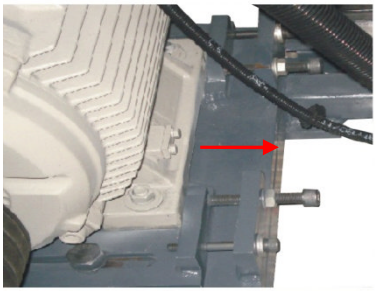


Picture 6-9：Installation of the Belt Pulley 3

6) After balancing, tighten three inner hexagon screws of the taper sleeve (Torque: 150 Nm).
7) Install the belt pulley on the motor shaft.
8) Place the taper sleeve into the round hole of the motor belt pulley, align the hole with the pulley, and then screw on the inner hexagon screw (The torque of M10mm×25 is 45 Nm).
9) Place the motor on the motor fixing plate and push it forward to shorten the distance between the belt pulleys.
10) Calibration of the belt pulley balance: Place a level ruler between the belt pulleys to check whether the mercury column is in the middle. If it is not in the middle, adjust the pulleys to make them balance.

Picture 6-10：Adjustment of the Belt Pulley

11) Install the belt, and rotate the adjusting screw to pull the motor in the direction shown in the Picture to make the four belts bear the force evenly, and tighten the belt and lock the adjusting bolts.



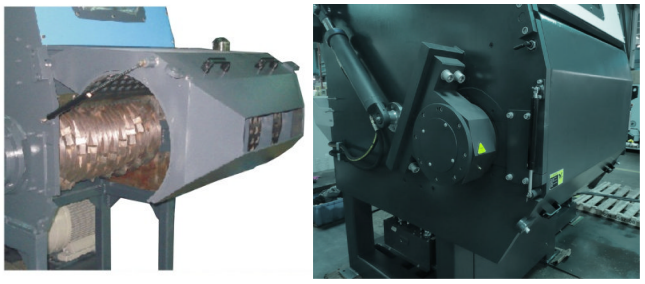
Picture 6-11：Adjustment of the Belt Pulley

12) Finally, install the belt shield.

6.6 Installation of the Screen and Screen Bracket

1) Put the screen into the bracket, align the two fixing holes and fasten them with screws, and place the screen bracket under the cutting chamber.
2) Put the two support rods stretching from the screen bracket into the fixing holes of the cutting chamber's two side plates, and screw on the fixing block of the screen bracket for fixation.
3) Install the gas spring between the left side plate and the screen bracket, and insert the split pin.
4) Pull down and close the screen bracket, screw on the bolts on both sides. First loosen the fixing screws of the screen and the screen bracket, tighten the fixing bolts of the screen on both sides, and then tighten the screws to fix the screen and bracket.

Note: During screen replacement, before locking the screws at both ends of the screen bracket, and make sure to loosen the screws fastening the bracket, and then tighten the screws. Otherwise, it may lead to both loose ends of the screen, and damage the screws fastening the screen due to excessive stress.



Picture 6-12：Installation of the Screen and Screen Bracket

Note: While overhauling and adjusting the hydraulic system, open the shield of the hydraulic pump station first.

6.7 Transmission

6.7.1 Maintenance for V-belt

Note: Press emergency stop and turn off power switch before maintenance or repair!

Shredder is equipped with four conveyor belts based on motor power.

1. Inspect cog belt

Inspect cog belt tension and running state after 20~30 full load operation. Also check cog belt wear condition once in a month.

2. Inspect cog belt tension every six month

Open side plate of control cabinet, rotate cog belt for several circles and inspect if there is wear or damage.

Note: Never put your hands between belt and pulley, otherwise it will cause crushing injuries!

Inspect belt tension and adjust it if necessary. Check tension by applying force (75N) at the middle of pulley then measure offset (Distance of offset depends on motor power and frequency, below is specifications):

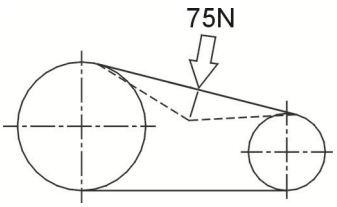


Table 6-2：Belt Tension Specification

Offset Distance (mm)	18.5/22kW	30/37kW	45-55kW
New belt	15mm	14mm	15mm
Old Belt (after 6 month)	19mm	19mm	19mm
Motor 60Hz	18.5/22kW	30/37kW	45-55kW
New belt	18mm	17mm	16mm
Old belt (after 6 month)	23mm	23mm	20mm

6.7.2 Adjustment of V-belt

1) Unscrew four fixed bolts (C) in motor plate (A).
2) Use four flexible bolts (B), and then adjust belt tension by changing gap between pulleys.
3) Tighten flexible bolts (B).
4) Tighten fixed bolts (C).

Recheck belt tension after 20~30 hours machine full load running.

Picture 6-13：Adjustment of V-belt

6.8 Lubrication

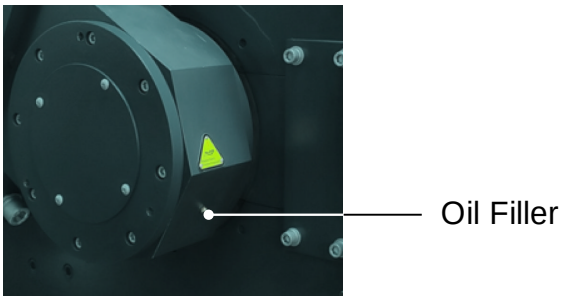
6.8.1 Bearing lubrication oil (Recommended brand)

Table 6-3： Bearing Lubricating Oil (Recommended)

Brand	Model
Xinchanglong	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

6.8.2 Periodically lubricate bearings

1) Open motor shield.
2) Use lubricate oil gun to fill oil in the bearing.

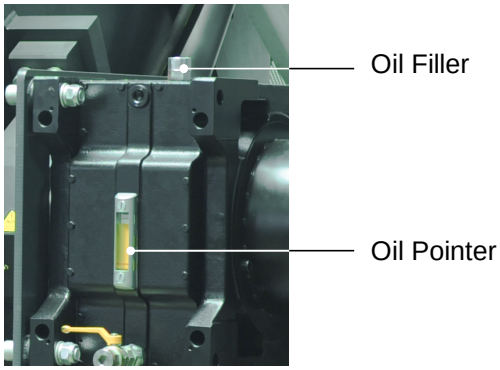


Picture 6-14：Bearing Oil Filler

6.8.3 Periodical Check or Renew Lubrication oil

1) Open oil discharge valve to drain old oil then close the valve.
2) Open oil filler and place a funnel, fill in with 10L gear lubricate oil VG460.

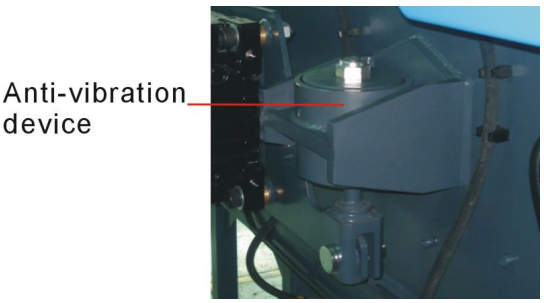
If shredder not used for a long time, apply oil to tool rest, fixed blade, rotate blade, crushing chamber and screws.



Picture 6-15：Oil Filling and Drain of Gear box

6.8.4 Regularlly Check the Anti-vibration Device

The anti-vibration pad narrows due to the pinching during operatin, thus leading to the looseness. Check whether the anti-vibration device is loose after 20~30 hours operation.If it is, please tighten the screw nut on the device.



Picture 6-16：Anti-vibration Device

6.9 Hydraulic System Repair and Maintenance

6.9.1 Hydraulic system overview

The hydraulic system of single-shaft shredder SGS-S adopts multiple hydraulic components and auxiliary parts, and the hydraulic circuit uses the integrated oil circuit block. The hydraulic system features advanced overall structure, which is reasonable, reliable and easy to maintain.

6.9.2 Main performance and technical parameters

1) Rated working pressure of the hydraulic system：7MPa
2) Working flow of the hydraulic system：25/min
3) Technical parameters of hydraulic pump motor：
   Model：5HP-4P
   Power：3.7kW
   Rotational speed: 1450rpm
4) Power parameters of each electrical component:
   Solenoid directional valve (electro-hydraulic)：DC24V
   Motor：AC400，50Hz
5) Recommended transmission medium：
   Anti-wear hydraulic oil N46，N32
   Cleanliness requirements for oil tank normal operation: NAS10 Grade (NAS1638 standard)
   Normal working temp. of the system oil: 5 ℃ ≤ t ≤ 50 ℃
   Effective volume of the oil tank：60L

6.9.3 Hydraulic System Operation and Maintenance

1) Pre-inspection before operation

Before operation, check whether the adjusting handwheels of all components and accessories are in the correct position, whether the oil is within the measuring range of the liquid level sensor, whether the pipe interfaces and set screws are loose, and whether the valve bodies, components and pipes have leakage.

2) Startup Inspection

Start the oil pump after startup, and check whether the system pressure is≤6.5MPa and whether the speed of the pusher is appropriate.Check the temperature rise of the motor and oil pump, working pressure of the system, and each high-pressure connection is loose at any time to avoid abnormal accidents.

3) Repair and Maintenance

Replace the hydraulic oil after the hydraulic system commissioning. After the initial use for half a year, replace the hydraulic oil once. After it, replace the oil once a year to ensure the system normal operation. During the hydraulic system operation, check whether the oil filter is blocked at any time, and clean or replace the filter core in time. The hydraulic system shall always keep the easily-worn parts, components and auxiliary parts for timely troubleshooting.ujjuj

6.10 Maintenance

Please make sure that there is no raw material in the granulator while executing maintenance.

Note: All maintenance work must be finished by professional personnel in order to avoid human injury and machine damage.

6.10.1 Daily Inspection

1) Once startup, check if hydraulic pressure is normal and oil is enough is oil tank (amounts to 70%).
2) Inspect if emergency switch is normal and stop the machine immediately after turn on the machine. Rotate the button along the arrow direction, namely, counterclockwise direction, to reset it.

6.10.2 Weekly Inspection

1) Inspect if power wire is wear or damaged. Replace with new one if any damage.

2) Inspect safety switch.
3) Inspect if baffle nylon bar of pushing block and baffle iron are lose. Fix screws if they are loosened.

6.10.3 Monthly Inspection

1) Inspect if belt is wear and inspect belt tension every 6 month.
2) Inspect if blades and their fixing screws are loosened.
3) Inspect wear condition of baffle nylon bar, adjust it to make it fit with bottom plate; inspect scrapping nylon bar and adjust it to make it fit with top face of pushing block; inspect wear condition at two sides of pushing block, replace it if serious damage.

6.11 Cleaning Up

Attention: Please be careful of not touching blades while opening the feed box, which is extremely sharp and liable to cause human injury.

1) Check if crushing chamber empties material before shutdown.
2) Turn off main power switch.
3) Clean feed port then clear side walls and pushing block.
4) Open storage hopper then pull out screen bracket .

   Note: Screen bracket is supported by air spring and it would not drop down.

   Watch out during working to avoid air spring sudden failure, causing personal injuries.

5) Clean interior of crushing chamber and residuals on blades.
6) 6) Unscrew bolts in screen fixed block and take it off.
7) Unscrew fixed bolts in screen.
8) Hold the screen and pull it out outwards.
9) Clean the screen bracket, and screen.
10) Clean interior and exterior of crushing chamber.
11) Clean the conveyor belt.
12) Dismantle the belt cover, and clean the belt pulley with bright dust remover.

Reinstall after cleaning up

Note: Be careful of crushing injury when close screen bracket!

1) Fix screen into bracket and place the screen bracket below the discharge port of the cutting chamber.
2) Lift the screen bracket and fix it with fixed block.
3) Pull up bracket and install air spring to bracket and left side plate, then insert cotter.
4) Close the screen bracket and lock screws on both sides.
5) Place the conveyor belt under the screen bracket.
6) Close motor baffle.
7) Open the main power switch.
8) Start-up.

6.12 Maintenance Schedule

6.12.1 About the Machine

Model _____ SN _____ Manufacture date _____

Voltage _____Φ_____ V Frequency _____ Hz Power _____ kW

6.12.2 Check After Installation

☐ Check if pipe connections are firmed locked by clips.

☐ Check the gap between fixed blade and rotating blade. (0.5~1.5mm).

☐ 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.

☐ Operation direction of oil pump motor and conveyor belt.

6.12.3 Daily Check

☐ Inspect main power switch.

☐ Inspect emergency stop switch.

☐ Inspect start / stop button.

☐ Inspect the hydraulic oil volume and system pressure.

☐ Check whether emergency stop switch and safety switch work normally.

☐ Clean the screen and feed hopper.

☐ Check whether start, stop and power switches are normal.

6.12.4 Weekly Check

☐ Inspect if there is damage to all cables of the machine.

☐ Inspect if junctions of electric components are loosened.

☐ Check whether the pushing mechanism is loosen.

☐ Check the function of all safety switches.

☐ Check if the hydraulic system has leakage.

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

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

☐ Check the cracking window

6.12.5 3- Year Checking

☐ PC board replacement.

☐ No fuse breaker renewal.