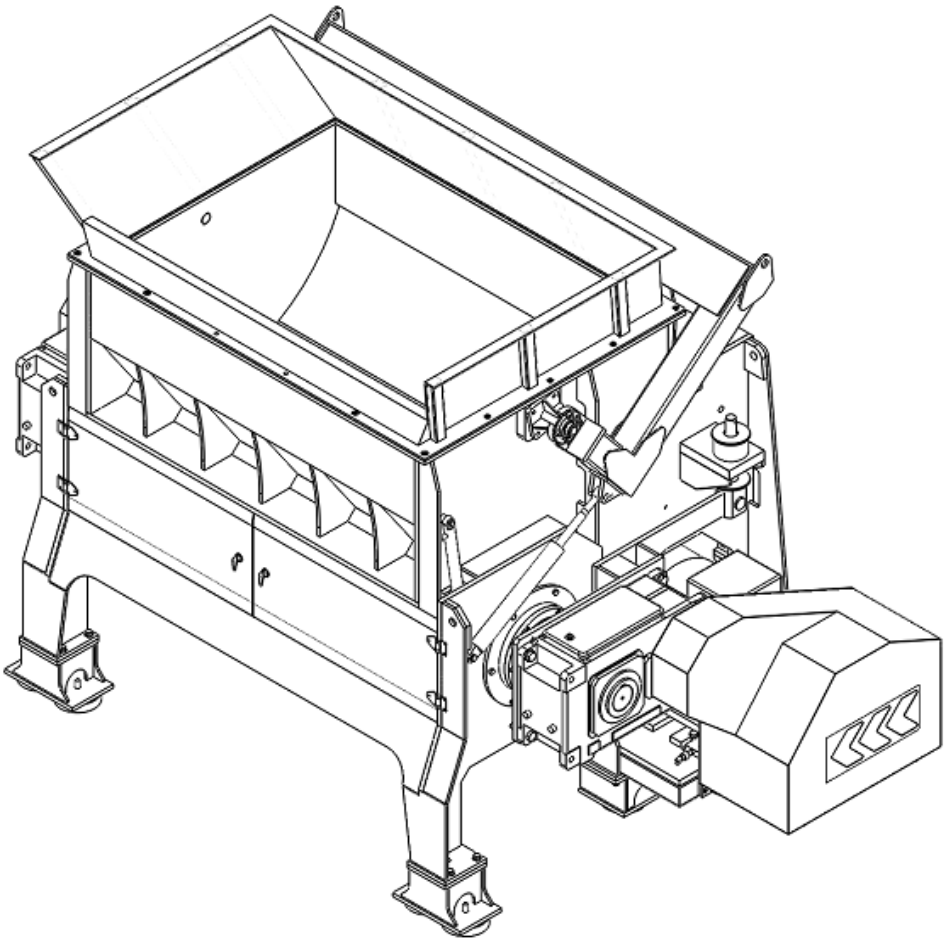
Panther 2000
Single Shaft Shredder
Instruction manual



EUROPE RECYCLING EQUIPMENT

Contents

Chapter 1 Safety

1-1 How to Use This Manual

Use this manual as a guide and reference for installing, operating, and maintaining your equipment. The purpose is to assist you in applying efficient, proven techniques that enhance equipment productivity.
This manual covers only light corrective maintenance. No other maintenance should be undertaken without first contacting a service engineer.
The Functional Description section outlines models covered standard features and safety features. Additional sections within the manual provide instructions for installation, pre-operational procedures, operation, preventive maintenance, and corrective maintenance.
The Installation chapter includes required data for receiving, unpacking, inspecting, and setup of the equipment. We can also provide the assistance of a factory-trained technician to help train your operator(s) for a nominal charge. This section includes instructions, checks, and adjustments that should be followed before commencing with operation of the equipment.
These instructions are intended to supplement standard shop procedures performed at shift, daily, and weekly intervals.
The Operation chapter includes a description of electrical and mechanical controls, in addition to information for operating the equipment safely and efficiently.
The Maintenance chapter is intended to serve as a source of detailed assembly and disassembly instructions for those areas of the equipment requiring service. Preventive maintenance instructions are included to ensure that your equipment provides excellent, long service.
The Troubleshooting chapter serves as a guide for identification of most common problems. Potential problems are listed, along with possible causes and related solutions.
The Appendix contains wearing and spare parts lists, and electric setting information.
Refer to this section for a listing of spare parts for purchase. Have your serial number and model number ready when ordering.

1-2 General Safety Regulations

This machine uses knives for the performance of its intended use. Consequently, it can be a dangerous machine to operate and maintain unless these safety regulations are followed.

These regulations should be read, understood and periodically reviewed by all personnel involved in any way with this machine.

Never operate or remove any machine components that are secured by wrench-type fasteners unless the motor is electrically locked out and the rotor is motionless.

Never operate the machine components the rotor unless the cutting chamber covers, discharge chute, or any guards or covers are in place and secure. Do not circumvent the safety interlocks.

Prior to clearing a jam or performing any maintenance, the motor should be turned off and

electrically locked out. Be sure that the rotor has come to a stop. Hands must not be inserted into the machine to clear the jam.

Do not extend any part of the body into feed roll openings or discharge area unless the motors are electrically locked out and the rotor and feed rolls are motionless.

Never extend fingers through holes in screen.

Be sure that the v-belts are properly aligned and that tension is at its maximum.

Extreme care should be taken to see that all bolts are properly tightened at all times. During the operation of the machine, rotor knife bolts may come loose. Although fine threads are used on the rotor knife bolts because vibration does not easily loosen them, you should inspect the tightness of the bolts frequently.

This machine is designed for the granulation of plastic materials. Do not feed any other materials into the machine.

1-3 Responsibility

These machines are constructed for maximum operator safety when used under standard operating conditions and when recommended instructions are followed in the maintenance and operation of the machine.

All personnel engaged in danger signs use of the machine should become familiar with its operation as described in this manual.

Proper operation of the machine promotes safety for the operator and all workers in its vicinity.

Becoming familiar with materials, inspection, speed limitations, screens, and guard maintenance and total user responsibility will assist you in learning potential areas in need of observation for danger.

Each individual must take responsibility for observing the prescribed safety rules as outlined.

All caution warning and danger signs must be observed and obeyed. All actual or potential danger areas must be reported to your immediate supervisor.

1-4 Warnings and Precautions

Our granulators are designed to provide safe and reliable operation when installed and operated within design specifications, following national and local safety codes.

To avoid possible personal injury or equipment damage when installing, operating, or maintaining this granulator, use good judgment and follow these safe practices:

- **LEARN AND OBEY** your company's safety policy regarding granulating equipment.
- **MOVING OR LIFTING THD GRANULATOR:** Although our equipment is built and engineered for great ruggedness in operation, care must be taken when moving the machine

along the floor or lifting it. Damage may occur to sheet metal covers, electrical cabinets, or small brackets if pressure is applied to them when moving the granulator. When lifting the granulator, be certain of total machine weight and the capability of the lifting equipment. (See the Granulator Specification Sheets for machine weights and dimensions.)

- **SHREDDER LOCATION:** Adequate area for routine maintenance should be provided in order to open the machine for knife, screen, or cleanout service. Proper service area clearances also should allow people who are working on the machine to be clearly visible to others, thereby reducing the potential safety hazard
- **SAFE HOUSEKEEPING:** The work area must be kept clean and uncluttered during periods of operation or maintenance. No hand tool6 or other metal objects should be left on or around the machine. Any tools or other metal objects that mistakenly fall into the hopper feed opening can cause severe damage to internal cutting chamber, rotor and screen components.
- **SAFETY GLASSES OR A FACE SHIELD MUST ALWAYS BE WORN** When servicing or operating the machine. Although our machines are designed for the maximum in fly back control, caution must be used when operating near the hopper feed opening in order to guard against unexpected material fly back.
- **EAR PROTECTION** may be required when operating the machine during granulation of very hard or noisy materials. The Occupational Safety and Health Act of 1970 has established guidelines for Permissible Noise Exposures (OSHA 1910.95) that should be followed.
- **NEVER** attempt to operate the machine unless it is fully assembled with all guards and interlocks in place and functional.
- **OBSERVE** all danger, warning caution and safety labels on the equipment.
- Upon completion of any machine maintenance, be certain **ALL SAFETY GUARDS AND COVERS** are securely and properly fastened prior to resuming machine operation. All fasteners must be in place and properly tightened. **ANY SEORTCUTS MAY RESULT IN INJURY TO PERSONNEL OR DAMAGE TO EQUIPMENT.**
- **NEVER** wear any loose fitting clothes, neckties, or dangling items such as earrings, belts, or shoestrings. Jewelry, such as wristwatches, bracelets, or rings should **NEVER** be worn. Long hair must be tied back or placed in a tight fitting hairnet. **NEVER** lean against or rest hands or feet on the granulator when it is in operation or open for maintenance. **NEVER** stand on the granulator when it is in operation.
- **ROTATION OF MOTORS:** The correct rotating direction for the machine motor is clearly marked on the machine. Always check for proper rotation of motors. Incorrect rotation direction can cause severe damage.
- **ELECTRICAL GROUNDING:** All electrical equipment on the granulator must be

grounded in accordance to all local codes and Article 250 of the National Electric Code

- **ALWAYS DISCONNECT AND LOCKOUT** the main electrical power to the granulator before performing any service.
- **SAFETY INTERLOCKS MUST NOT BE BYPASSED.** The mechanical and electrical safety interlocks ensure the safety of personnel. They should never be tampered with or removed for ANY reason. They should be checked frequently by a qualified mechanic for proper operation.
- **NEVER** modify the machine configuration or any individual component without written notice from the factory.

REMAINING RISKS

The machine is constructed so that you are able to operate it safely. Structurally non-avoidable dangers are prevented as well as possible by the protective devices. Certain risks still remain. It is imperative to be aware of these risks in order to avoid accidents. To avoid danger, please observe all safety advice provided.

TYPE OF DANGER	ACTIVITY	POSSIBLE CONSEQUENCES	PREVENTATIVE MEASURES
Danger of crushing by heavy parts falling down/over	Unloading and transporting the machine and/or components	Serious injury	● Wear personal protective gear. ● Follow safety instructions in manual
Cutting caused by sharp knives –even when rotor is stationary	Knife replacement, knife setting, knife sharpening and other maintenance work	Serious injury particularly to hands and fingers	● Wear personal protective gear. ● Follow safety instructions in manual
Crushing when opening/closing maintenance doors on front side of machine	Maintenance work	Serious injury	● Make sure no persons are in the danger area while closing
Tripping over cables and other objects	All activities	Serious injury	● Lay cables in accordance with regulations. ● Keep work station clean and tidy.
Crushing, cutting, amputation caused by rundown of the rotor	Maintenance work	Serious injury	● Maintenance doors must always be tightly locked during operation. ● DO NOT make the run down safety devices ineffective by using technical aids or other

			manipulations. ● NEVER use hands to check if the rotor has stopped.
Pulling in caused by running V-belts	All activities	Serious injury can result from hair, jewelry, etc. Being pulled into the machine.	● Never dismount V-belt protection and window.
TYPE OF DANGER	**ACTIVITY**	**POSSIBLE CONSEQUENCES**	**PREVENTATIVE MEASURES**
Failure of Emergency Stop function	All activities	Serious injury or death	● It must be guaranteed that failure of an Emergency Stop button is displayed and leads to an immediate stop.
Direct/indirect contact with live parts in terminal box.	Maintenance work, start up	Serious injury or death	● Only trained electricians may carry out all work on the electrical equipment. If work is necessary on parts that conduct dangerous voltage, a second person should be present to break the power supply in case of emergency. ● The yellow-marked lines conduct voltage at all times –even when the machine is switched off. ● Only use original safety fuses with stipulated intensity of current. ● Faulty electrical components must be replaced immediately. ● If faults occur in the electrical energy supply, switch machine off immediately. ● The terminal box must be locked during operation. Before opening the terminal box switch too off.
Failure of Emergency Stop function	All activities	Serious injury or death	It must be guaranteed that failure of an Emergency Stop button is displayed and leads to an immediate stop.

Fire/explosion caused by throwing dangerous objects into the shredder	Grinding	Serious injury or death	Only grind material which corresponds to the agreed customer-specific specifications in all points
TYPE OF DANGER	**ACTIVITY**	**POSSIBLE CONSEQUENCES**	**PREVENTATIVE MEASURES**
Damage to hearing	All activities	Diminished hearing, headaches, impaired balance, deterioration of concentration.	Reduced noise emissions by taking suitable measures. Wear ear protection.
Instability of machine cause by vibration	All activities	Serious injury	Install the machine according to the instructions in the manual.
Loosening of the cutting knife mountings caused by vibration	All activities	Serious injury	Check the cutting knife mountings regularly according to the instructions in the manual.
Inhalation of grinding dust	All activities	Diseases of the respiratory tract, etc.	Mount a suitable air suction device and wear breathing equipment if necessary. When cleaning the machine, use suction; do not blow out grinding dust.
Crushing, cutting, amputation caused by manipulation of protective devices	All activities	Serious injury or death	Never make the protective ineffective. Check the protective devices regularly for proper function according to the manual's specifications.

1-5 Safety Symbols and Signs

Safety Symbols Used in this Manual

DANGER!

DANGER indicates an imminently hazardous situating that, if not avoided, will result in death or serious injury.

WARNING! **WARNING indicates a potentially hazardous situating that, if not avoided, will result in death or serious injury.**

CAUTION! **CAUTION indicates a potentially hazardous situation or practice that, if not avoided, may result in minor or moderate injury or in property damage.**

HINTS **HINTS indicate an easy and correct method for machine operation.**

Safety Signs on the Machine

DANGER! Risk of electric shock! Operate with care!

WARNING! Rotating belts. Do not operate without guards in place!

WARNING! Rotating blades. Do not operate without guards in place!

CAUTION! Tighten the belts after the first 5 hours of operation.

CAUTION! Never put metal into cutting chamber.

1-6 Personal Protective Gear

Wear close-fitting clothing. Hair must be pulled back, and loose fitting jewelry is prohibited. (See table below for more details).

The following protective gear must be worn when performing the outlined tasks:

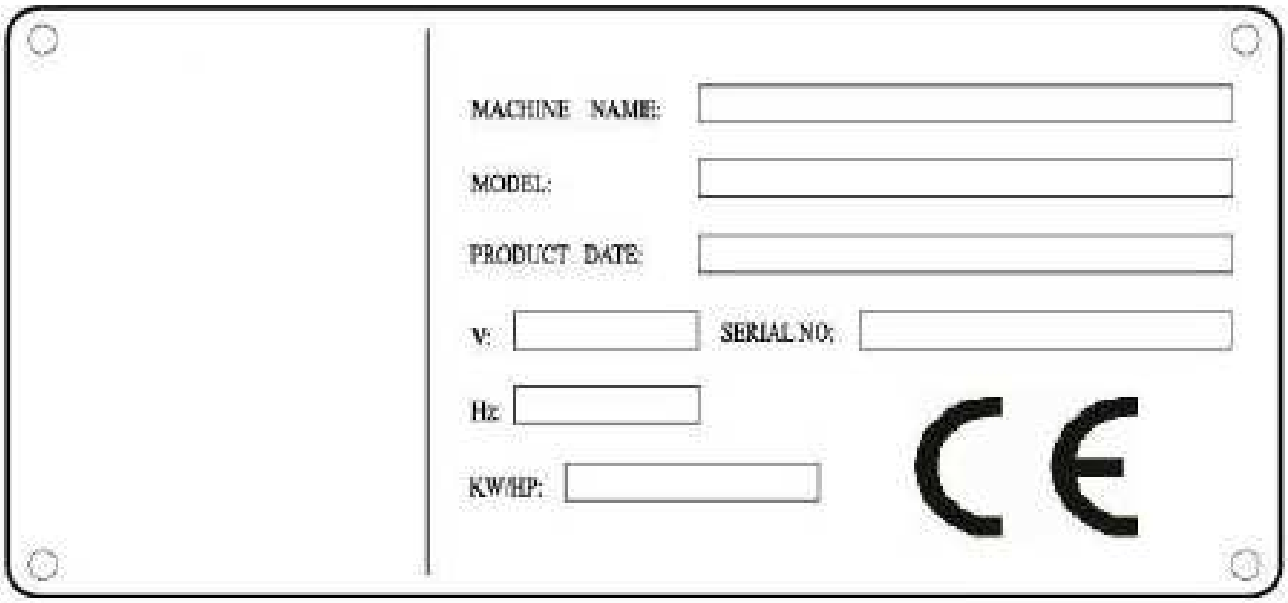
	Safety Helmet	Safety Boots	Safety Gloves	Safety Goggles	Safety Muffs
Unloading machine.	X	X	X		
Connecting machine.		X			
Operation.		X	X	X	X
Cleaning.		X	X	X	
Maintenance of bearings.		X			

Chapter 2 Functional Description

2-1 Models Covered in This Manual

2000 Extreme Duty Shredders are designed for processing large and rigid plastic or rubber wastes, such as PP, PE, PET, and PVC etc. It is not allow to put the metal in it.

NAMEPLATE:

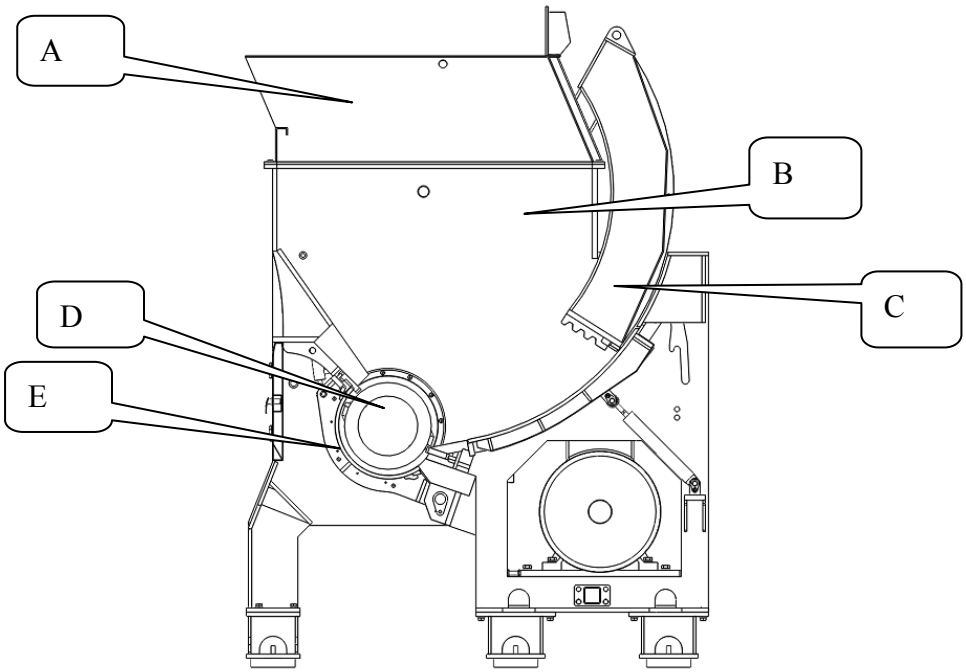


2-2 Structure

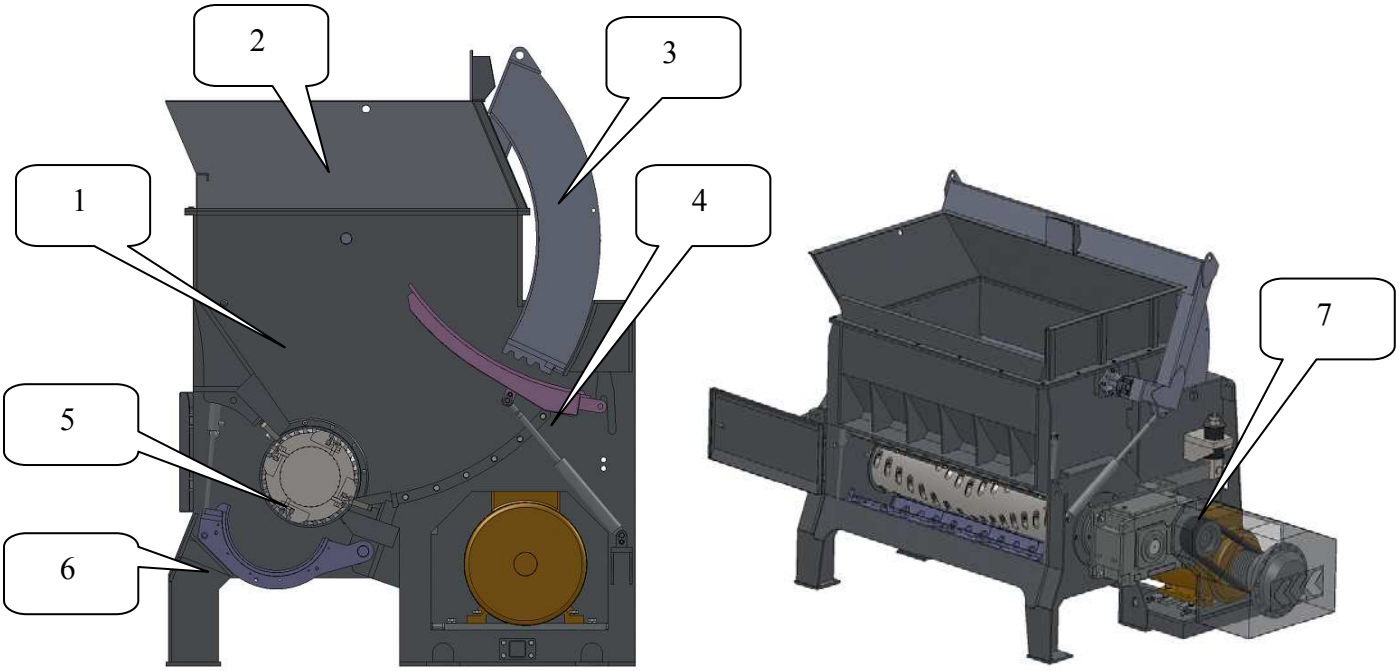
2000 Single Shaft Shredder is designed for shredding material into pieces. It has swing arm for force feeding materials, Driven by the motor, the rotor rotates and tears the in-feed material apart with the fixed knife set in the cutting chamber. Made from AISID-2 high alloy, the cutters and blades are of high intensity and good ductility. The special blade structure can enhance rotational speed, lower noise and bring efficiency. With reasonable design, they can be mounted and dismounted easily. The machine is also equipped with hydraulic ram and the overload protection system, which can not only improve the shredding ability, but also prolong the durability. it is suitable for shredding the solid materials, hard process materials, plastic container, plastic barrel, fiber, paper and etc. it is now allow to put the metal into it.

2-3 Working Principle

Materials should be put in from the Hopper (A). The Ram (C) inside the machine Casing (B) will push the material towards the cutting Rotor (D). Qualified material will drop out from the Screen (E) for further procession.



1. Machine structure: (figure 2)



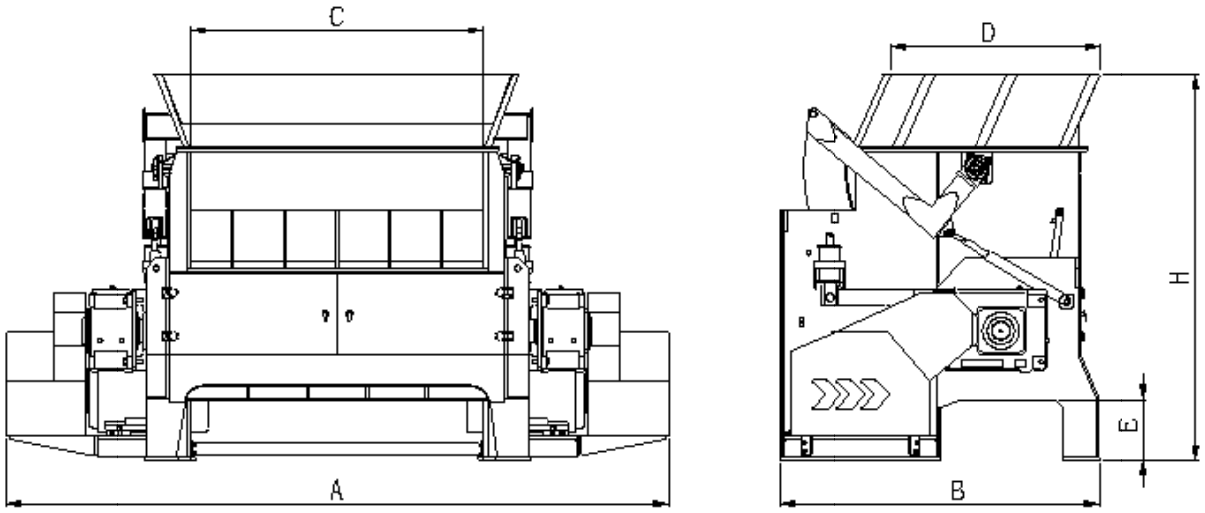
1. Casing components
2. Feeding device
3. Hydraulic push device
4. Bottom board device

5. Rotor components

6. Screen support

7. Driving & Cutting Device

2. Machine Dimension



Item / Model	A (mm)	B(mm)	C (mm)	D (mm)	E (mm)	H (mm)
2000	4580	2200	2000	1450	410	2660

3. Specifications

Item / Model	Rotor Diameter (mm)	Rotor Speed (r/min)	Rotating Knife (pec)	Fixed Knife (pec)	Motor Power (Kw)	Hydraulic Power (Kw)	Weight (Kg)
2000	Φ480	81	95	4	75+75	5.5	16000

4. Safety system

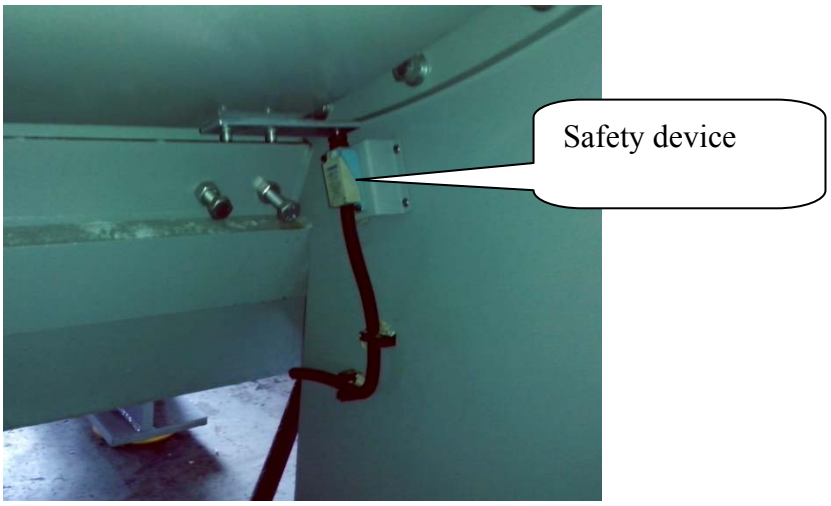
DANGER!

The machine may under no circumstances be operated without these protective devices. The use of faulty or manipulated protective device is strongly prohibited.

Emergency Stop

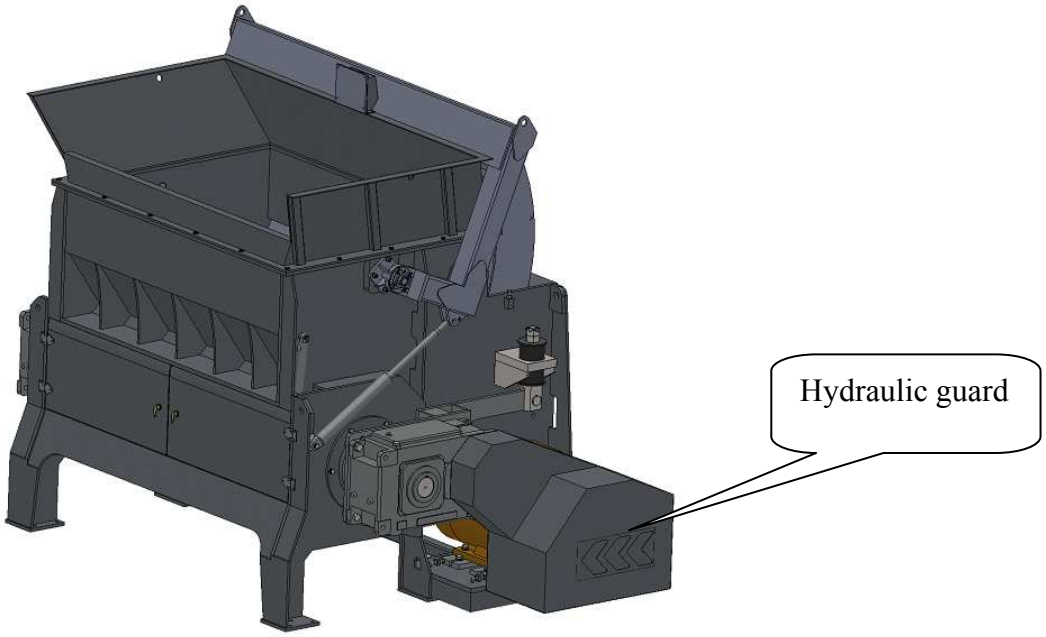
SAFETY DEVICE

Safety device is set on the screen support door. The shredder can only be operated if the door is closed. The safety contact is broken when the machine or hopper door is open, thus the machine switches off automatically.



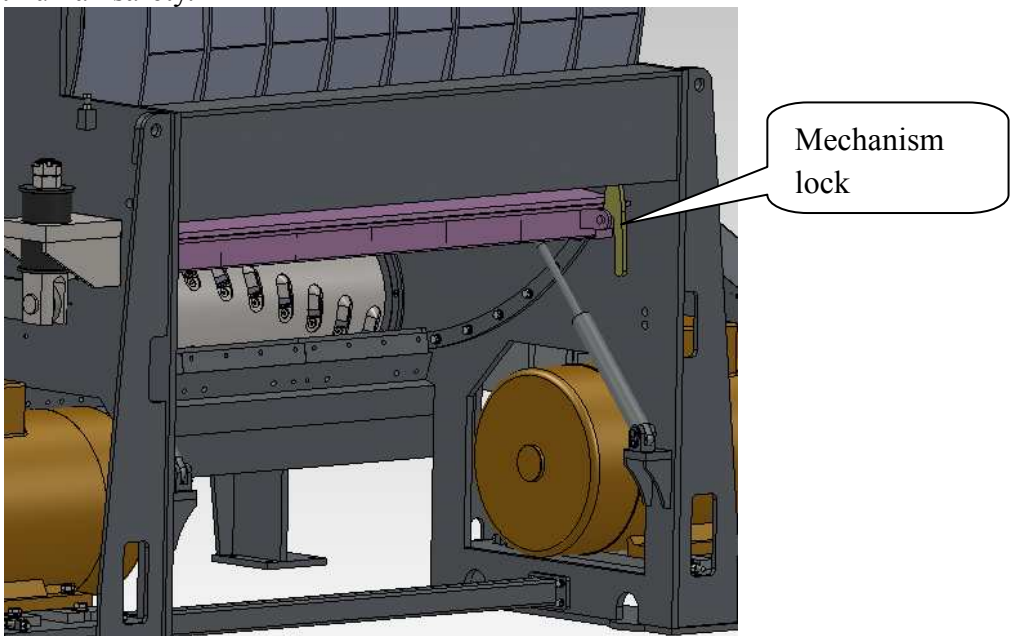
COVERING GUARD

Belt guard and hydraulic guard are installed to protect important components of the machine and ensure the safety of the operators.



MECHANISM LOCK

When come into the casing to change the knives,the mechanism lock can limit the bottom board fix,it can protect human safety.



OVERLOAD PROTECTIVE SYSTEM

Overload protective system is adopted to protect the machine from harms caused by crushing hard material. If the machine is overloaded, it will automatically shut down and restart.

HINTS

Operators can manually shut down the machine by pressing the Emergency button, if the machine is overloaded.

Chapter 3 Installation

3-1 Storage and Transport

3-1-1Storage

The machine is packed for transport to the place where it is to be used. On delivery it is protected with Castrol DWX22 anti-rust oil.

LONG-TERM STORAGE/CONSERVATION

- Store the machine in a room with a stable, dry temperature.
- Treat the unpainted surfaces of the machine with rust preventer, such as Castrol DWX 22. DWX 22 will protect the machine up to 12months. Alternatively, DWX 160 will provide protection for 24-26 month.

3-1-2 Transport

For the machine is very big, it will dismount the feeding hopper, hydraulic unit and control panel when transportation.

DANGER!

Never step underneath or close to the machine during lifting.

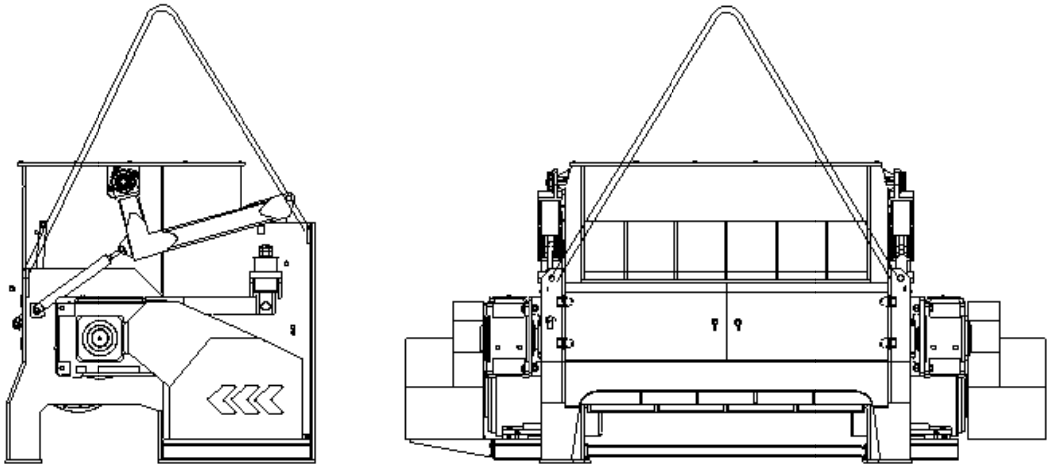
- Check that the machine has not been damaged during transport.
- Never unpack the machine before it has been transported to where it is going to be used.
- Check with the delivery note that that the delivery is complete.

Please refer to Chapter 2 Dimension for space requirements. The machine can be lifted and handled by means of fork-lift or crane.

LIFTING WITH A CRANE

DANGER!

The crane and lifting strops should be strong enough to endure 15tons.



LIFTING WITH A FORKLIFT

The forklift should be strong enough to endure 15 tons.

DANGER!

- Remove the hopper from the machine.
- Lift the machine from the bottom. Both lifting forks must be positioned inside of the feet of the machine (refer to the diagram).

3-2 Requirement for the Application Site

Check the application site to make sure it conforms to the qualifications listed below.

- The site has enclosed space.
- The ground has sufficient load-bearing capacity (refer to Chapter 2 for dimension and weight of the machine). The unevenness of the ground surface may not exceed 5 mm.
- The machine must be freely accessible from all sides.
- There must be sufficient room for operating and service personnel.
- The site is a vibration-free environment.
- The site has sufficient lighting.
- The machine may not be exposed to direct radiation caused by radiators or the sun.
- Room temperature: +5℃ to 40℃ (+41℉ to 104 ℉).
- Relative atmospheric humidity according to DIN40040: 15% to 70% (indoor)
- The machine may not be operated within range of static discharges or strong magnetic fields as this could lead to faults in the machine control system.
-

If the humidity levels higher than 70%, apply anticorrosive agent to the metallic-finished machine parts. Insulation for the tropics is also

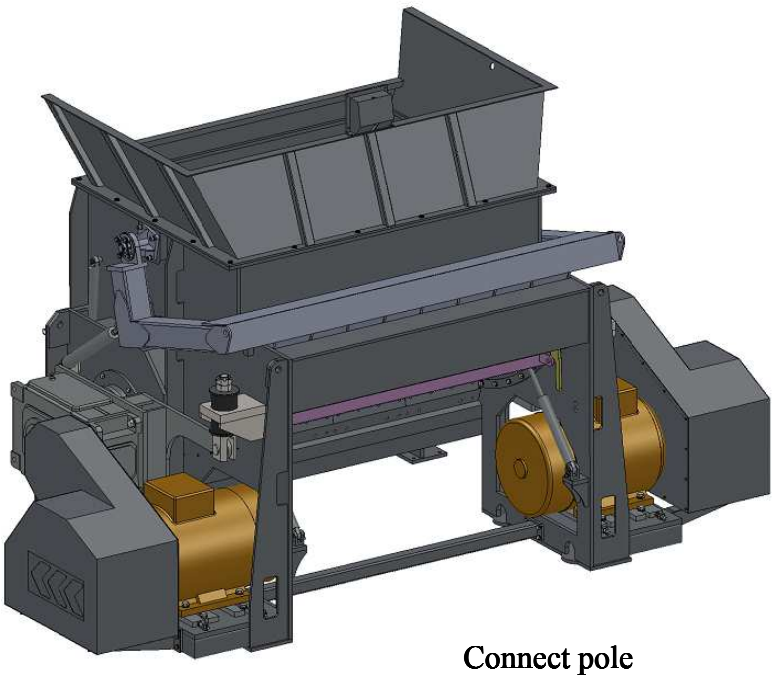
necessary.

CAUTION!

3-3 Installation

The machine and components are packed so that they can arrive safely. After unloading the machine, you should:

- Remove the packaging material and all transportation safety devices after unloading the machine.
- Mount all the components at the site of application, in the case that the shredder and its accessory components have been delivered as individual items. (This is the only way to guarantee there are sufficient piping parts, tubing, and cable connections, and that the linking places match.)
- Align the machine horizontally using a suitable spirit level.
- Put the machine in the floor stably, install the rubber absorbers in each foot to auti-shock, make sure each foot is stable, the machine do not need to install the foot in the floor, the machine can be operated put in the floor stably. The connect pole is use for fix when transportation, it can dismount after the machine is installed.



Connect pole

3-3-1 How to Mount Hopper

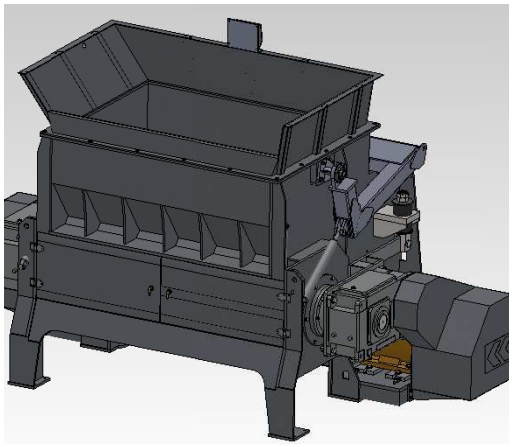
Put the machine in the operation place stably; adjust the height of the bottom.

Normally, the hopper and machine is separate when transportation.

The steps to mount the hopper:

A B

1) Install two eyebolts (A) on both sides of the hopper edge.
2) Lift up the hopper and place flatly on the machine.
3) Tighten M12 screws on the hopper flange and the casing junction (B).



3-3-2 Electrical Connection

Electrical connection should only be completed by competent electrician.

DANGER!

- Install the distribution box and connect cables in accordance with the markings in the wiring diagram. Refer the appendix.
- Connect the machine to the mains. The wiring diagram indicates the fuse sizes.
- The machine is delivered with electrical equipment connected for clockwise phase rotation. Check with a phase sequence indicator and connect the machine with clockwise phase rotation.

Check the direction of rotation of the shredder motor:

- Make sure that the main switch is "ON".
- Check that the emergency stop is not activated.
- Check that the knobs for the screen box lock are fully tightened.
- Check that the machine knobs for locking the hopper are fully tightened.
- Press "Start".
- Check that the shredder motor rotates in the direction indicated by the arrow on the housing.

If the motor rotate incorrectly:

- Press the "Stop" button.
- Switch off the main switch.
- Switch two incoming phases.

3-3-3 How to Mount Hydraulic unit

1) Connect hydraulic pipes to the machine.
2) Connect the wires for the motor and magnetic valves.
3) Fill the oil tank with hydraulic oil No. 46 or No.32 until the maximum is reached and mark the level indicated by the gauge.
4) Run motor to see whether the running direction is correct (facing the motor knife, the motor should run clockwise); if the direction is not correct, change the electrical wiring.
5) Run motor, operate the magnetic valve to check the function and wiring connections.

Chapter 4 Operation

4-1 Requirements for Operator

All operators should be trained before machine operation. They should fulfill the following requirements.

- Operators should acquire certain knowledge about the working principle, structure and function of the machine.
- Operators should read and understand the instruction manual completely.
- Operators should have an alert mind and careful enough to observe the working condition of the machine.

4-2 Requirements for Machine Operation

PRE-RUNNING CHECK

- The machine is evenly placed.
- There is enough room for operation.
- Screws are tightened enough.
- There are no residual materials in the cutting chamber.
- There are no metal materials in the cutting chamber.
- Control buttons are sensitive enough.
- Oil level of hydraulic station is under requirement.

OPERATION REQUIREMENTS

- Operators should stand before the control cabinet in case of any emergent situations. When the machine is crushing hard and tough material, operators should never leave their working position.
- Operators should keep observing the material discharging condition. If the machine jams and reveres frequently, stop the machine.
- As soon as the machine works normally, operators can turn it into automatic mode so that it can be easily operated by pressing ON/OFF button.

- When maintenance is needed, operators can turn the machine into manual mode so that the hydraulic ram and rotation direction of the rotor can be controlled.
- Operators should never touch the surface of motor, bearing cover plate and machine housing, in case of any burning injuries.
- The machine is usually working with feeding conveyor. If manual feeding is needed, please inform manufacturer. An additional protection device should be equipped in this circumstance.

4-3 Daily Operation

4-3-1 Start-up & Shut-down Procedure

START-UP

1) Switch ON the material discharge device.
2) Switch On the Shredder. Wait until the rotor has reached its full speed and switched from star to delta.
3) Switch ON the hydraulic unit.
4) Switch On the material in-feed device.

SHUT-DOWN

1) Switch OFF the material in-feed device
2) Wait until the remaining material has been shredded, and then switch OFF the shredder
3) Switch OFF the material discharge device.

4-3-2 How to Mount and Dismount Casing and Screen

DANGER! **Shut down the machine and cut off the main power before mounting and dismounting machine casing, screen and pusher.**

HOW TO DISMOUNTING CASING

1) Switch off the machine and press safety switch
2) Turn the manual/AUTO button in the control panel to manual;
3) Start the hydraulic unit;
4) Turn the open/close in the rear casing to open;(as figure 1)
5) Rise up the pusher, and then open the bottom board;
6) When the bottom board open to the Max. position, turn the open/close button to close, lock the mechanism lock to fix the bottom board.(as figure 2)

Figure 1

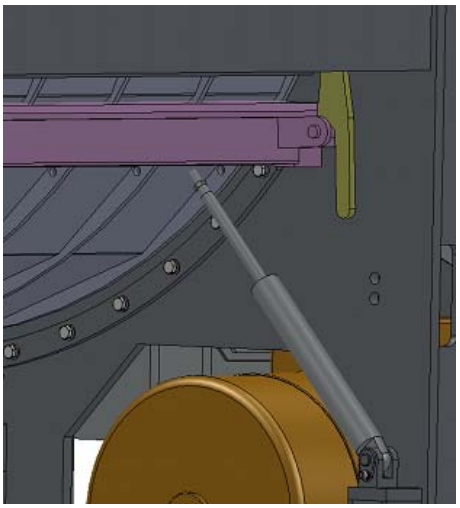


figure 2

HOW TO MOUNTING CASING

- Clean the machine chamber, the bottom cannot close completely if there are some materials in it;
- Switch the control mode into Manual Mode.
- Start the hydraulic unit;
- Turn the switch on the rear part of machine open/close into open;
- Open the bottom plate completely, loosen the turn switch, pull back the mechanism lock;
- Turn the switch to close, loosen the switch after the bottom plate closed;
- Check if the bottom plates close completely.

How to Dismount Screen

- Stop the machine, press Emergency Stop button and lock the control panel.
- Open the front door of the machine, loose 16xM16 lock screws that hold the screen support;(figure 1)
- Switch the control mode into Manual Mode.
- Start the hydraulic unit;
- Turn the switch on the machine screen open/close into open;
- Loosen the turn switch after the screen support open completely.

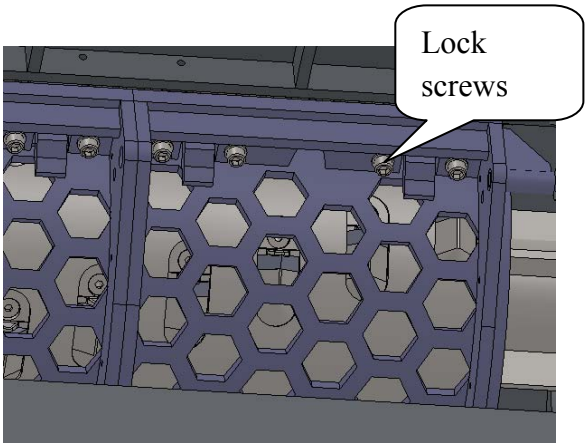


figure 1

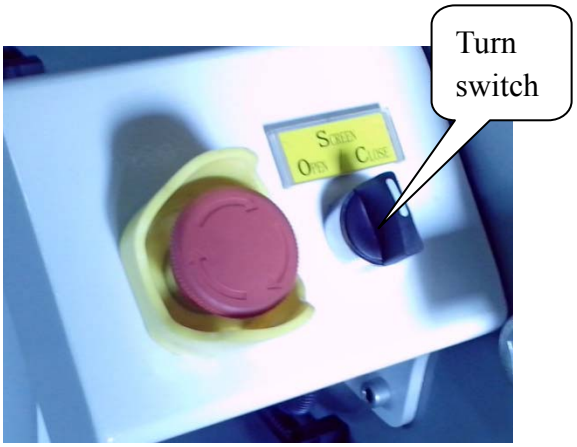


figure 2

CAUTION!

Loosen the turn switch immediately after the screen support open completely, in order to avoid damage of cylinder.

HOW TO MOUNTING SCREEN

- Clean the screen support and machine, if there are materials in it, the screen support cannot close completely.
- Switch the control mode into Manual Mode.
- Start the hydraulic unit;
- Turn the switch on the machine screen open/close into open;
- Loosen the turn switch after the screen support closed completely;
- Check if the screen support closed completely;
- Tight the fix screw of the screen support;
- Close the front door.

4-3-3 Cleaning

WARNING!

Before cleaning, shut down the main power and place the warning sign.

Clean monthly or at least once every 300 hours.

Proceed as follows:

1) Switch OFF the shredder at the main switch.
2) Open screen support.
3) Empty the screen.

WARNING!

Danger of cutting caused by sharp cutting knives – even when the rotor is not operating! Serious injury, especially to the hands and fingers, can result. Wear protective gloves.

5) Pre-clean the cutting chamber using a hand brush.
6) Vacuum the remaining shredded material residue using a suitable suction device.
7) Remove clinging shredded material residue using a suitable wooden scraper.
8) Place the screen back in to its working position and fasten with the mounting screws.
9) Machine can be started again.

4-4 Daily Inspection

WARNING!

Inspection should be finished by qualified personnel.
Danger caused by electrical during maintenance work. Death can result.

The tasks for inspection work are described below.

PERFORM THE FOLLOWING AFTER EVER 8 OPERATION HOURS:

- Check protective devices.

WARNING! **Danger due to non-functioning protective devices can cause serious injury or death.**

- Check cutting knife mountings.
- Check condition of cutting knives.

PERFORM THE FOLLOWING AFTER EVERY 40 OPERATION HOURS:

- Check V-belt tension force and V-belt condition.
- Check all screws of the machine for a tight fit.
- Check wearing parts.
- Check hydraulic oil level and consistence.

PER FORM THE FOLLOWING AFTER EVERY 2000 OPERATION HOURS:

- Change hydraulic oil
- Check gearbox oil level

YEARLY MAINTENANCE:

The purpose of yearly maintenance is primarily to check the general condition of the machine and to arrange for the supply of any necessary replacement parts. A service engineer can carry out this request.

Chapter 5 Maintenance

5-1 Gear Box Maintenance and Replacement

The gearbox is designed so a replacement is only necessary in exceptional cases.

Dismounting and mounting of the gear box requires specialist knowledge and a careful working method. Please observe the instructions given in the installation manual of the gear box manufacturer or ask the service department for help.

5-1-1 Maintenance

CAUTION! **After running for the first 240 hours, gear box lubricant needs to be changed completely. Drain the oil tank and refill with new lubricant.**

- Use recommended lubricant for the safety of the machine.
- Change lubricant every 5000 hours,
- Check the gauge at regular intervals and fill the tank promptly.
- Working environment temperature of the gear box should not exceed 40℃.
- If the working environment temperature is below 0℃, the lubricant for the gearbox should be heated above 0℃, or low-freezing lubricant can be adopted. Idle-running the machine for a few minutes.
- Gearbox is suitable for continuous running, and allows position and opposition running.
- Do not allow to hit any parts of gearbox when mount and dismount;
- Make sure the tank is filling enough lubricant, check if the rotary valve is working.

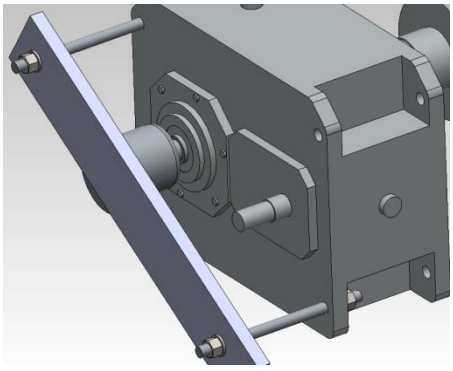
The list for lubricant:

Name	Model	Volume（L）	Chinese code /Mobil code	Machine model
Gearbox	H2HH8	30	VG320/600XP320	2000

Change lubricant every 5000 hours.

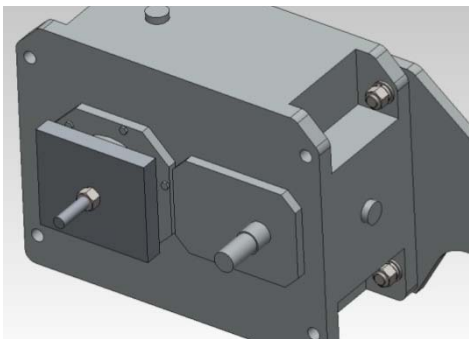
5-1-2 Replacement

1) Dismount the belt cover
2) Take off the belt and gear pulley.
3) Loose the cross pin that hold the damper. (Ensure that the damper is braced steadily)
4) Set the lifting jack on the mounting hole, and take off the gear box.
5) Loose the screws between the damper and gear box.



MOUNTING THE GEAR BOX

1) Clean the mounting hole and the main shaft.
2) Tighten the screws between the damper and the gear box.



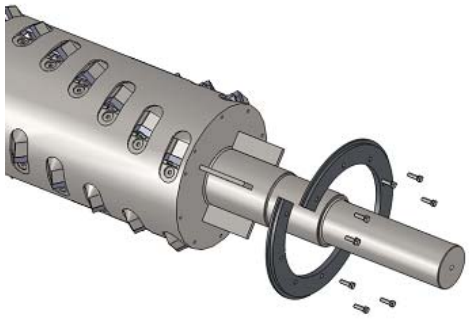
3) Set the gear box on the shaft, use pressure plate to jack the gear box in the correct position.
4) Tighten the damper and insert the cross pin.
5) Mount the pulley and the belt.
6) Mount the belt cover

5-2 Rotor Replacement

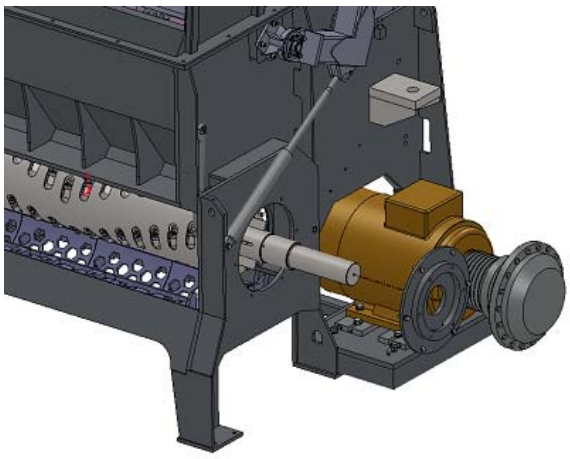
The rotor's design is heavy duty design, so a replacement is necessary only after a crash, (i.e. a hammer fall inside). Dismounting and mounting of the rotor requires specialist knowledge and a careful working method. Contact the Service Department for assistance.

DISMOUNTING THE ROTOR

1) Dismount the V-belt cover.
2) Dismount the V-belts and pulley.
3) Dismount the gearbox.
4) Remove the screen support.
5) Dismount the casing (reference to how the dismount the casing).
6) Remove upper fixed knife rotor knife holder and rotor knife.
7) Remove the baffle on both side of rotor. (figure 1)
8) Remove the bearing cover plate.
9) Hook both sides of the rotor.
10) Remove the rotor mounting slot plates.(figure 2)
11) Carefully lift out the complete rotor.
12) Lay the rotor down in a safe location using appropriately sized timber beams.



(figure 1)



(figure 2)

MOUNTING THE ROTOR

1) Lift the rotor on the top of the casing.

2) Mount the rotator mounting slot plates.
3) Mount the bearing cover plate.
4) Mount the rotor knives, rotor knives holder and lower fixed knives ;(Ensure that the clearance between fixed and rotor knife has been properly set).
5) Mount the gear box.
6) Mount the belt and set the tightness.
7) Carry out a test run to check whether there are any collisions between the fixed knives and the rotor.
8) Mount the belt cover.
9) Lock the screen support;
10) Start the machine to trial running.

HINTS

Mount the bearing on the rotor before setting on the bearing housing.

5-3 Main Bearing Maintenance and Replacement

The main bearing of the machine are designed so a bearing replacement is necessary only in exceptional cases. Dismounting and mounting of the bearings requires specialist knowledge and a careful working method. In addition to the following advice, please observe the instructions given in the installation manual of the bearing manufacturer or ask the service department for help.

The bearings mounted in this machine are indicated in the spare parts list. A suitable pulling-off device is required for dismounting and mounting the bearings.

5-3-1 Maintenance

An important requirement for high operational safety and long service life of the arrangement of bearings is the correct lubricant supply. Every machine is greased and checked before test runs and operations.

CAUTION!

Unsuitable lubricant, lubricant deficiency, excessive lubricant, or impurities in the lubricant lead to overheating and extreme wear of the bearings.

CHECK LUBRICANT QUALITY

You can judge whether the lubricant needs to be replaced by checking for the following features:

- Change in consistency.
- Discoloration.
- Degree of soiling.

REPLACING OR REFILLING LUBRICANT

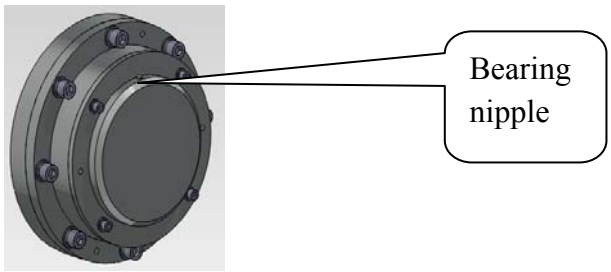
- Only one type of grease may be used, mixing different types of grease is prohibited. The bearings have been filled at the factory with lithium base saponification roller bearing grease F3.
- For rotor bearings, a lubricant quantity of one third to a maximum of half of the bearing volume per bearing is required. If too much grease is used, the lubricant will become unusable due to excessive temperature.
- Refill the bearings every 3000 hours.
- Refer to the following "list of lubricants" for recommend bearing grease.

Producer/Country	Model
ARAL	ARL Grease HL3
BP	BP ENERGREASE LS 3
CASTROL	CASTROL SPHEEROL AP3
ESSO	Beacon3
FUCHS	FUCHS Grease1200 FUCHS Grease FWA 220
SHELL	SHELL Alvania Grease3
MOBIL-OIL	MOBILUX3
WISURA	WISURA Liba L 3
Zeller$Gmelin	ZET GE Grease M 50
FAG	FAG L 71
ANTAR	ROLEXA
ARAL	ARL Grease HL3
BP	BP ENERGREASE LS 3
CASTROL	CASTROL SPHEEROL AP3

REFILLING LUBRICANT

The grease reaches through the circulating grooves and bores via lubrication nipples into the interior of the bearing.

The grease quantity is .13 to .22 lbs (60 to 100g) roller bearing grease F3 per bearing.



REPLACE LUBRICANT

Renewing the lubricant between intervals is only necessary when there are unusual noises or overheating. Mounting and dismounting of the bearings must be carried out in accordance with

the instruction in this manual.

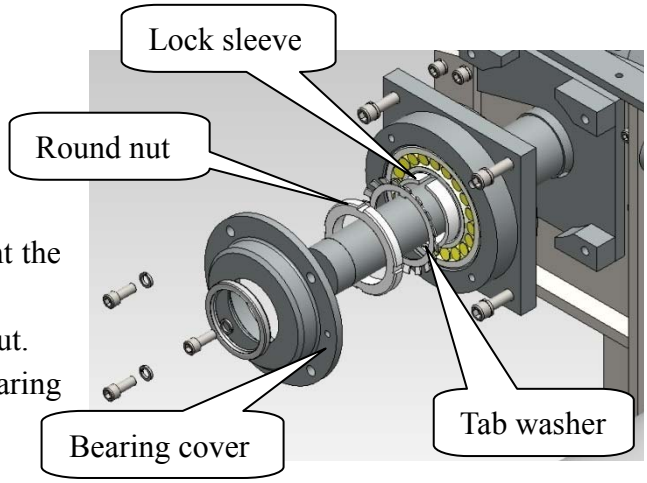
1) Open the bearing cover plate.
2) Remove the bearing.
3) Clean the bearing carefully using petroleum ether.
4) Fill bearing with approved lubricant.

HINTS

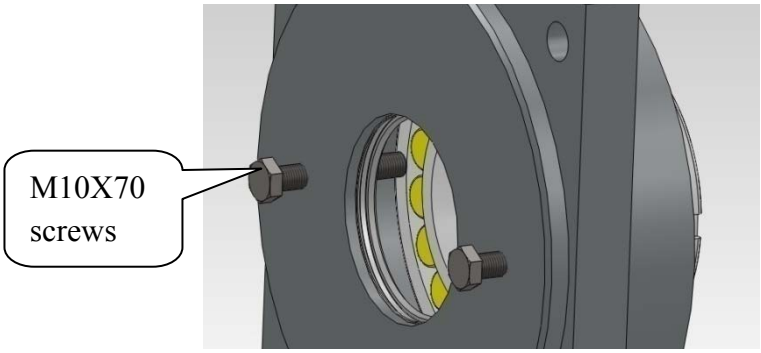
After washing out, the bearing must immediately be preserved using lubricant, in order to avoid corrosion.

5-3-2 Replacement

DISMOUNTING MAIN BEARING



1) Dismount the V-belt cover.
2) Dismount the V-belt.
3) Dismount the gear box.
4) Loosen the bearing cover screws, and dismount the bearing cover.
5) Loosen the tab washer and remove the round nut.
6) Take out the lock sleeve by knocking the bearing cover plate appropriately.
7) Loosen the bearing cover plate screws.
8) Dismount the bearing cover plate and the bearing.
9) Pull out the bearing from the cover plate by screwing two M10X70 screws into the dismounting position on the cover plate.



MOUNTING MAIN BEARING

1) Clean and lubricate the bearing and cover plate before installation.
2) Set the bearing and lock sleeve in the cover plate. (Ensure that sealing ring has been mounted.)
3) Insert the bearing cover plate into the rotor, and match with the cover plate mounting plate.
4) Tighten the cover plate screws.
5) Mount the tab washer and round nut,(Ensure that the clearance between fixed and rotor knife has been properly set.)
6) Install the bearing cover. (Ensure that sealing ring has been mounted.)

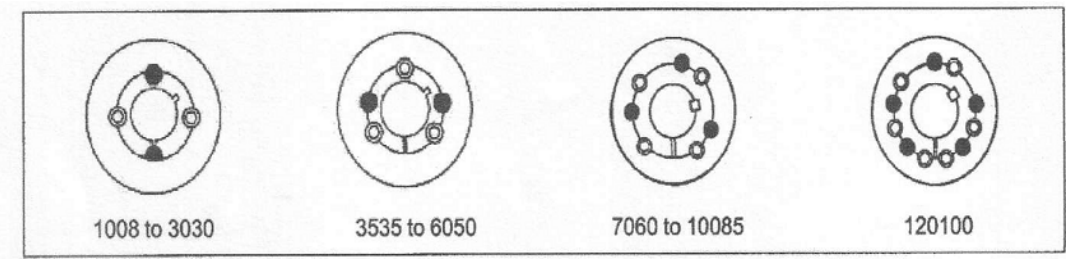
7) Mount the gear box.
8) Mount the V-belt and set the tightness.
9) Mount the V-belt cover.
10) Check whether there are any collisions between fixed and rotor knife before performing a running test.

HINTS **The hardened bearing rings are sensitive to impact stress; never hit the rings with the hammer.**

HINTS **Use bearing dismounting device.**

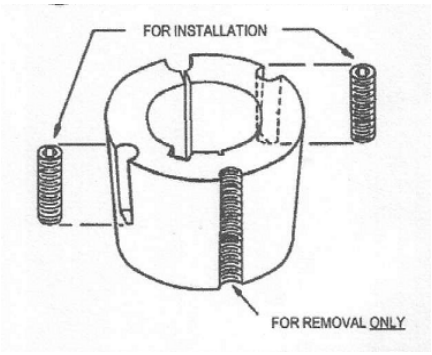
5-4 Mounting and dismounting Pulley Taper-lock

The motor and the gear V-belt are attached to the shaft using a taper-lock tensioning element. The disks must be dismounted for certain maintenance processes.



MOUNTING TAPER-LOCK

1) Clean shaft, bore and outside of bushing, and bore of hub (taking bushing from hub if already assembled). Remove any oil lacquer, or dirt. Place bushing in hub and match half holes to make complete holes (each complete hole will be threaded on one side only).
2) Oil thread and pint of set screws or thread and under head of cap screws. Place screws loosely in holes that are threaded on hub side (shown thus ◎in diagram).
3) Make sure bushing is free in hub. Slip assembly onto shaft and locate in position desired.
4) Tighten screws alternately and evenly until all are pulled up very tightly. Use a piece of pipe on wrench to increase leverage. (Refer to "Tightening Torque of the Screws"
5) Hammer against large end of bushing using hammer and block or sleeve to avoid damage. Screws can now be turned a little more using the specified wrench torque. Repeat this alternate hammering and screw re-tightening until the specified wrench torque no longer turns the screws after hammering.



6) After drive has been running under load for a short time stop and check tightness of screws.

Fill other holes with grease to exclude dirt.

DISMOUNTING TAPER-LOCK

Remove all screws. Oil thread and pint of set screws or thread and under head of cap screws.

1) Insert screws in holds that are threaded on bushing side (shown thus● in diagram). In sizes where washers are found under screw heads, be sure to use these washers. Note that one screw in each hub is left over and is not used in this loosening operation.
2) Tighten screws alternately until bushing is loosened in hub. If bushing does not loosen immediately, tap on hub.

Tightening Torque of the Screws

Tensioning element (Type)	Screws-Tightening torque (Nm)	Screw details	
		Number	Size (BSW)
1008	5.6	2	1/4”
11108	5.6	2	1/4”
1310	20	2	3/8”
1315	20	2	3/8”
1210	20	2	3/8”
1215	20	2	3/8”
1610	20	2	3/8”
2012	31	2	7/16”
2017	31	2	7/16”
2517	48	2	1/16”
2525	48	2	1/16”
3020	90	2	5/8”
3030	90	2	5/8”
3535	60	3	1/2”
4040	102	3	5/8”
4545	155	3	3/4”
5050	185	3	7/8”

5-5 Screen Replacement

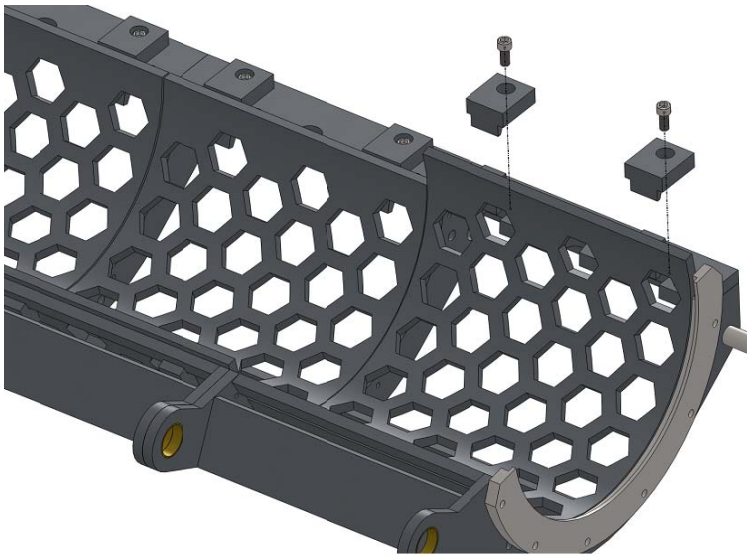
The condition of the screen must be checked regularly in order to keep the throughput of shredder and the quality of the shredded material constant.

The screen may be damaged, dirty, or not suitable for the shredding material when:

- Screen holes too fine- overheating of the material can occur.
- Screen holes too course – shredded material can have larger pieces that are unacceptable.

SCREEN REPLACEMENT

1) Switch OFF the shredder at the main switch.
2) Safeguard main switch using a padlock.
3) Open the screen support.
4) Loosen the screen fixing screws, take off the fixing block;
5) Remove the screen.
6) Put a new screen into the screen support.
7) Put into the fixing block and fasten using mounting screws.
8) Close the screen support.
9) Shredder can be started again.



5-6 V-belts Adjustment and Replacement

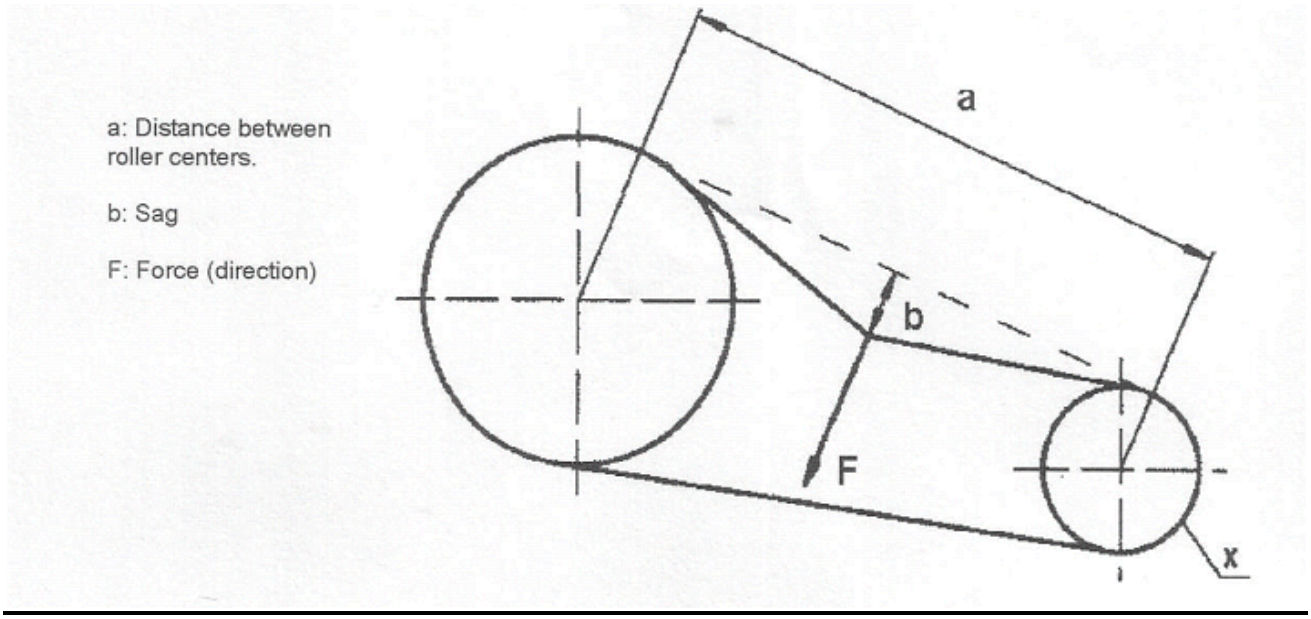
V-belts are wearing parts that stretch and must be re-tensioned. Regular checks on the tension force of the V-belts and the condition of the V-belts are necessary in order to guarantee a long service life of the V-belts.

DANGER!

Danger of pulling into machine caused by running V-belts. Hair, jewelry etc. can be pulled into machine without proper precaution, resulting in serious injury. Never dismount the V-belt cover during operation.

CHECKING THE TENSION FORCE OF THE V-BELT

- Remove the V-belt cover.
- Measure the distance between the roller centers.
- Determine the belt sag force F for each belt at 16mm sag if sag "b" is equal to 1 m distance between roller centers. Do this by measuring the distance between roller centers at a right angle to the V-belt.
- Compare determined value with the value in the above table. If the value lies below the lowest tolerance limit, the V-belt must be retensioned. If the value lies above the highest tolerance limit, the V-belt must be relaxed.

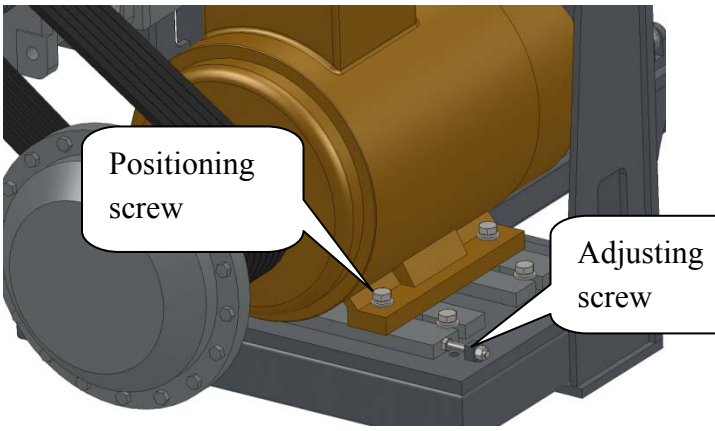


Profile section	Force required for 1m distance between roller centers and 16mm sag		
	Efficiency of x in mm		Efficiency of x in mm
SPA	100-132	20-27	4.4-5.9
SPA	140-200	27-35	5.9-7.7
SPB	160-224	35-50	7.7-11
SPB	236-315	50-65	11-14.3
SPC	224-355	60-90	13.2-19.8
SPC	375-560	90-120	19.8-26.4
XPB	224-250	25-35	5.5-7.7

RE-TENSIONING AND RELAXING THE V-BELT

Enlarging or decreasing the centre distance "A" tensions or relaxes the V-belt.

1) Loosen the motor positioning screws.
2) Shift the drive motor by controlling the adjusting screws.
3) Lock the drive motor into new position.
4) Check the tension force of the V-belt
5) Mount the V-belt cover.



V-BELT REPLACEMENT

1) Remove the V-belt cover.
2) Loosen the screws.
3) Relax the V-belt by shifting the drive motor.
4) Put new V-belt in.

5) Tension the V-belt.
6) Mount the V-belt cover.

5-7 Cutting Knives Replacement

Correctly setting and mounting the cutting knives is important when working with shredders to ensure efficient and economic function.

DANGER! **Danger of cutting caused by sharp knives at all times – even when rotor is at standstill. Serious injury especially to the hands and fingers can occur. Wear protective gloves!**

5-7-1 Checking Cutting Knife Condition

REPLACING AND CHECKING THE CUTTING KNIFE MOUNTINGS

Certain machine parts are subject to stress during operation as a result of vibrations that can lead to loosening of the screw connections. It is absolutely necessary to check the knife and bed knife mounting screws in accordance with the maintenance plan.
Tighten the mounting screws on the knifes and bed knives using a torque wrench (check required torque for the screw size).

HINTS **You can find out the required torque from the following table. Tightening capacity decreases for screws when loosened and tightened again several times.**

Toque						
Bolt type	**Bolt type**		**Bolt type**		**Bolt type**	
	Nm	Lbf ft	Mn	Ibf ft	Nm	Ibf ft
M8	25	18.4	35	25.8	41	30.2
M10	49	36.1	69	50.9	83	61.2
M12	86	63.4	120	88.5	145	106
M14	135	99.6	200	147.6	235	173.4
M16	210	154	295	217	355	261
M20	410	302	580	428	690	508
M24	710	523	1000	737	1200	885

CHECKING THE CONDITION OF THE CUTTERS

The cutting knives become blunt after a certain number of operation hours; they should be checked regularly. Using blunt knives can affect the efficiency and performance of the machine in the following ways:

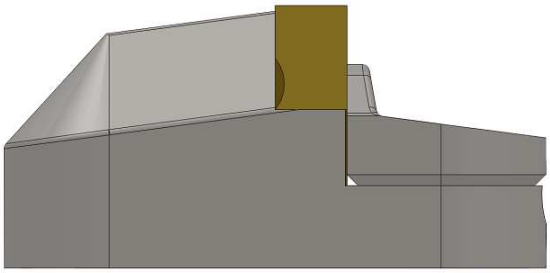
- Decreased shredding capacity.
- Increased current consumption of the drive motor.

- Inexact cut.
- Overheating of the shredded material.

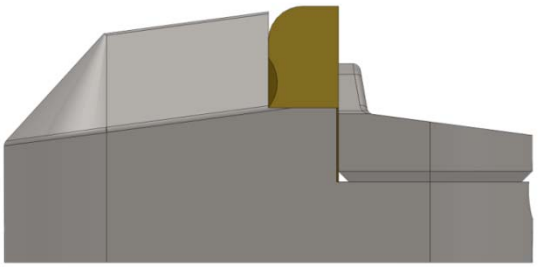
5-7-2 Dismounting Cutting Knives

Rotor knife

The rotor knife is design with square shape, two cutting edges with concave; when shredding the big volume, hollow and frangible material, using the concave edge is better; when shredding hard material, using another cutting edges, the cutting edges are changeable after worn, also it can shred by both sides, but the edges of rotor knife have to touch with knife holder.



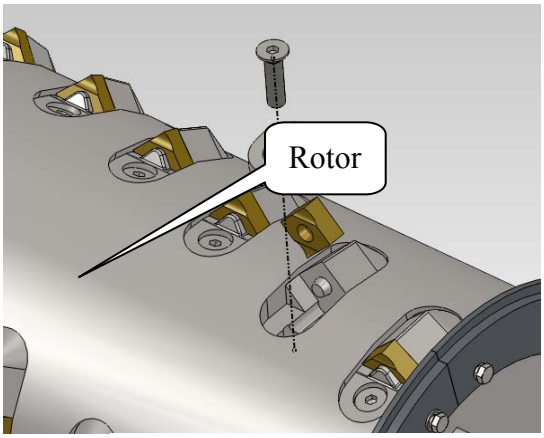
right



wrong

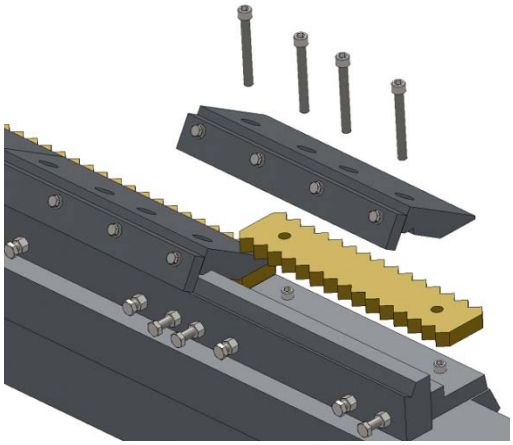
DISMOUNTING THE ROTOR KNIFE

1) Switch OFF the shredder at the main switch.
2) Open the casing;
3) Clean the hexagon head socket of the knife mounting screw.
4) Loosen the bolt using a high quality spanner.
5) Take out the knife mounting screw and the cover plate.
6) Take off the rotor knife



DISMOUNTING THE FIXED KNIVES

1) Switch OFF the shredder at the main switch.
2) Dismounting the casing;
3) Clean the hexagon head socket of the knife mounting bolts and the cover plates mounting bolts.
4) Loosen the lower fixed knives cover plates mounting bolts using a high quality spanner.
5) Take out the bolts and lower fixed knives cover plate



6) Take off the fixed knives.

5-7-3 Mounting Cutting Knives

DANGER! **Danger of cutting caused by sharp knives at all times – even when rotor is at standstill. Serious injury especially to the hands and fingers can occur. Wear protective gloves!**

MOUNTING THE ROTOR KNIFE

1) Clean the knife supporting surface and the rotor knife holder.
2) Insert sharp rotor knife or turn old one and push against the rotor knife holder surface.
3) Put in the knife mounting bolt
4) Screw in the mounting screws and tighten lightly first.
5) Check the clearance between rotor knives and fixed knives.(the clearance is 1-1.5mm)
6) Check if the cutting gap is correct and if the cutting knives do not collide as the rotor turns.
7) Remove tools and other objects from the cutting chamber.
8) Switch on the shredder for a short time without grinding material, and listen for noises. If there are unusual noises, determine the cause and eliminate it.

CAUTION! **The cutting knives, in particular the rotor knives, should only be sharpened or replaced in sets. There is a danger of balance error if a combination of rotor knives from different knife sets is used.**

MOUNTING THE FIXED KNIVES

1) Clean the knife supporting surface and the fixed knives cover plate;
2) Insert sharp knife or turn old knife.
3) Put in the lower fixed knives cover plates and mounting bolts and tighten lightly first.
4) Adjust the gap between rotor knives and counter knives to 1-1.5mm.
5) Tighten the knife mounting bolts using a torque wrench.

CAUTION! **The required torque for the knife mounting bolts is 235 Nm (also see the table under "Replacing and checking the cutting knife mountings").**

6) Turn the rotor by hand.
7) Check whether the cutting gap is correct and make sure the fixed knives do not collide as the rotor turns.
8) Put back the cover plates and mount them with the bolts.
9) Remove tools and other objects from the cutting chamber.
10) Put screen back and mount it.
11) Switch ON the shredder for a short time without material and listen for noises. If there are unusual noises, determine the cause and eliminate it.

5-8 Sharpening Rotor and Fixed Knives

Shredder rotor knife has 4 cutting edges. This means they can be turned 3 times. The rotor knife should be replaced after the third use. Fixed knives can be re-sharpened as long as you can fix them with the long hole.

Fixed knives sharpening

1) Dismount the rotor and fixed knives (see "dismounting the cutters").
2) Sharpen the fixed knives.

HINTS

A specialist in accordance with the sharpening plan using particular care should uniformly sharpen the cutting knives mechanically. It is important to make sure that sharpening takes place with small grinding allowance and sufficient coolant supply. The sharpening process is finished when the cutting edge is sharply cut. Not all indentations must be ground out; otherwise the number of possibilities for sharpening is unnecessarily reduced. For the sharpening process, use soft grinding wheels (Quality 40H or 46K). Knives, which have grinding cracks, are not to be reused due to danger of breakage during operation.

1) Whet the cutting edges of the fixed knives using a whetstone.

HINTS

The service life of the fixed knives can be increased by taking this measure.

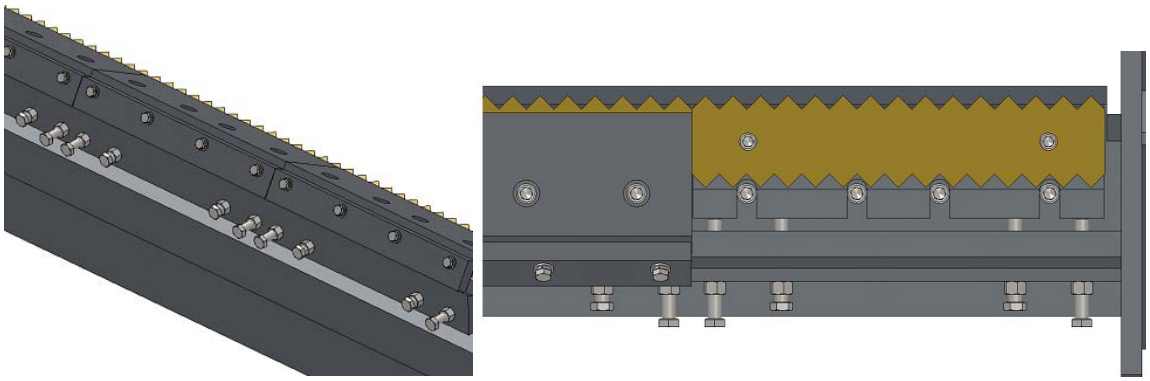
4) Set the rotor knives and fixed knives (Refer to Setting the Knives Clearance").
5) Mount the rotor knives and fixed knives (Refer to Knives Replacement").

CAUTION!

The fixed knives should only be sharpened or replaced in sets. There is a danger of balance error if a combination of knives from different knife sets is used.

5-9 Setting the Knives Clearance

Correct and careful setting of the gap between the rotor knives and fixed knives (cutting gap) is important for productive capacity of the shredder. Rotor knives for the shredder do not have to be adjusted. All adjustments have to be done with the fixed knives. To simplify knife setting and shorten standstill periods when replacing knives, fixed knives cover plate have 4 adjusting screws. (As show below figure)



Setting the clearance:

1) Remove fixed knives cover plate mounting screws;
2) Adjust fixed knives adjusting screws;
3) Adjust the gap between rotor knives and fixed knives to 1-1.5mm using a caliber gauge.
4) Tighten the knives mounting screws using a torque wrench.
6) Turn the rotor by hand.
7) Check whether the cutting gap is correct and make sure the rotor knives and fixed knives do not collide as the rotor turns.

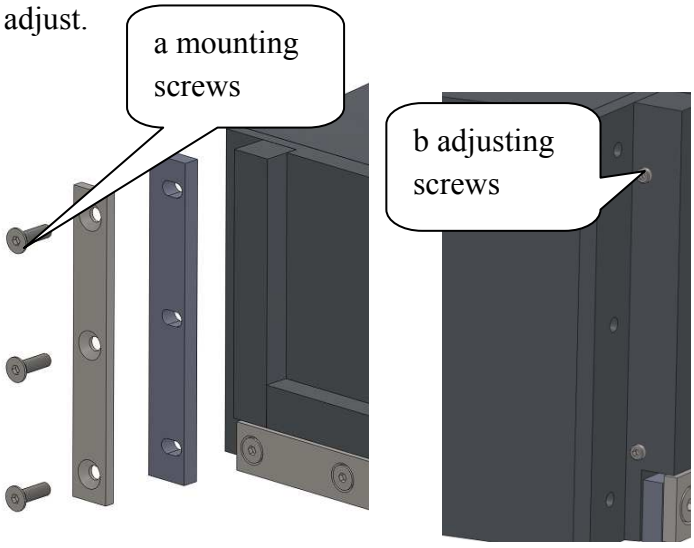
5-10 The scraper in the pusher adjustment and replacement

The guide bar mount on the pusher to ensure the pusher working flatly and prevent the material follow into the rear of pusher, they can be adjusted, when the guide bars wear seriously, they should be replaced.

Scraper adjustment

As show in below figure, each guide bar has mounting screws and adjusting screws, when the guide bar wear the gap is too big, it should adjust.

Adjusting steps:
1. Loosen the “a” mounting screws in the guide bar.
2. Adjusting the position of “b” adjusting screws;
3. Tight the “a” mounting screws after the position are proper.



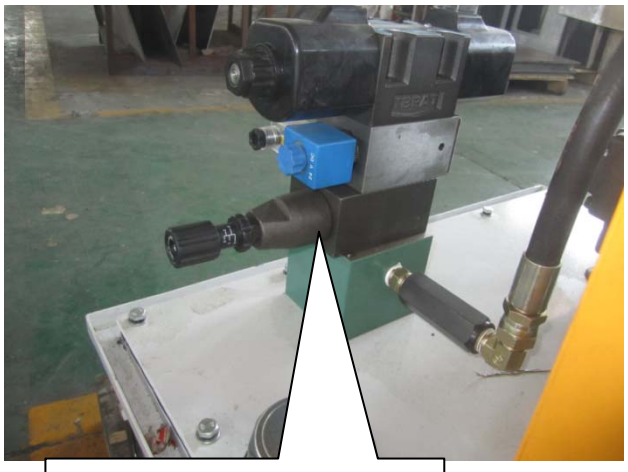
Guide bar replacement

Replacement steps:

1. Loosen the “a” mounting screws in the guide bar;
2. Loosen the “b” adjusting screws in the guide bar;
3. Put the new guide bar into the “b” adjusting screw;
4. Tight the mounting screws after the position are proper.

5-11 Hydraulic Unit Maintenance

There are fast and slow speed in this machine, the movement speed of the ram can be controlled by electricity setting. If the working current is above 80% of the rated current, the moving speed will increase. On the contrary, if the working current is below 80% of the rated current, the speed will drop down. (the current value can setting refer to electrical system), the pusher speed can be adjusted through flow valve when the pusher is forward slow, Working pressure of the ram can be adjusted by setting the pressure control valve on the hydraulic unit.。Max. pressure of the unit is 15Mpa. (Default setting value is 10Mpa)



Pressure adjusting valve

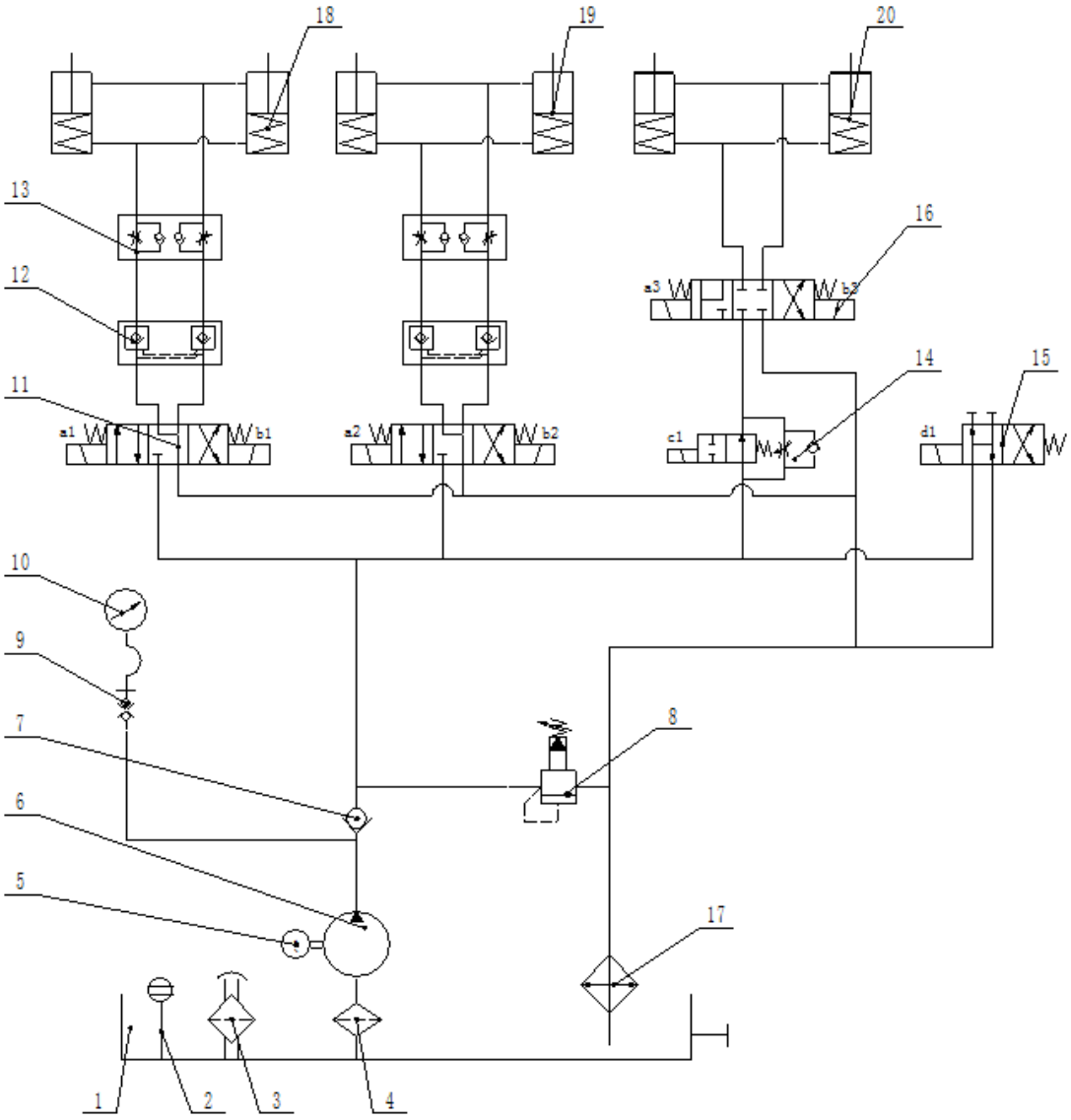
Flow adjusting valve

One-way throttle valve

Specification:

Item / Model	Oil Volume	Motor Power	Flow	Rated Pressure	Mobil oil
2000	80L	5.5KW	19.8L/min	10Mpa	VG32-46 /DTE32-46

Schematic Diagram:



Pos.	Description/Standard	Component Code	Qty.
1	Oil tank	2-1-01	1
2	Oil gauge	2-1-02	1

3	Oil nipple	2-1-03	1
4	Oil filter	2-1-04	1
5	Motor	2-1-05	1
6	Oil pump	2-1-06	1
7	Non-return valve	2-1-07	1
8	Flow valve	2-1-08	1
9	Pressure gauge switch	2-1-09	1
10	Pressure gauge	2-1-10	1
11	Solenoid valve	2-1-11	2
12	Hydraulic control one-way valve	2-1-12	2
13	One-way throttle valve	2-1-13	2
14	Solenoid throttle valve	2-1-14	1
15	Solenoid valve	2-1-15	1
16	Solenoid valve	2-1-16	1
17	Cooler	2-1-17	1
18	Φ50X275 cylinder	2-1-18	2
19	Φ40X425 cylinder	2-1-19	2
20	Φ63X420 cylinder	2-1-20	2

Timescale:

		a1	b1	a2	b2	a3	b3	c1	d1
Φ63cylinder forward	Fast						+	+	+
	Slow						+		+
Φ63cylinder backward						+			+
Φ50 cylinder forward			+						+
Φ50 cylinder backward		+							+
Φ50 cylinder forward					+				+
Φ50 cylinder backward				+					+

Hydraulic Unit Attention

- Check the oil level of the gauge.
- Use ISO VG32-46 type hydraulic oil. (mobil DTE32-46)
- Start motor, paid attention to rotation direction and electromagnetic valve voltage is correct for the motor and oil pump
- Check the temperature of the hydraulic unit. The temperature of the working environment is 10℃-35℃. The temperature of the hydraulic oil is 10℃ -60℃.
- Check working condition of the cooler and oil return line. In the operation, if the temperature is extremely high and change, stop the machine immediately and check the machine.

- The hydraulic unit with air cooler, put the cooler in the ventilated place, do not put it in the closed place and near to heat.

Hydraulic Unit Maintenance

1) During use, keep clean to the tank surface and the surround of the hydraulic unit, clean the dust on the tank surface and hydraulic valves regularly, prevent the impurities or dust entering into the hydraulic unit;
2) Do take out filter when refilling oil, make sure the oil purity
3) Clean or change the filter element regularly, normally 2 months it should be changed.
4) Oil tank should be cleaned regularly, generally after working 12-18 months, it should be cleaned.
5) Hydraulic components disassemble; put them on a clean place to prevent dirt immersed
6) Choice the correct viscosity oil, hydraulic oil should be inspected regularly replacement, generally after working 1000 hours, it should be changed.
7) Inspection cycle can be shortened for the "tank level" inspection, make sure there is sufficient hydraulic oil for the oil cooling cycle of the hydraulic unit.
8) Check the joint points of the different pipes, avoid the air going into the hydraulic unit
9) On the terms that the system is in normal working conditions, decrease the pressure of the relief valve, to reduce the energy loss and reduce heat.

CAUTION

Dirty oil may cause machine heat, and damage of the hydraulic unit, change the hydraulic oil in time.

HYDRAULIC LIQUID RECOMMENDATION

Designation to DIN51524	HLP 32
Ambient temperature:	-7 to+70 ℃
Supplier	**Name of the oil**
ARAL	Aral vitam Gf 32 Aral vitam Hf 32
BP	Bp Energol HLP-D 32 Bp Energol HLP 32 Bp Energol SHF 32
ELF	Elfolna Hydrelf
ESSO	Nuto H 32 HLPD-oel
FINA	Fina hydran 32
FUCHS	Renolin MR 10 Renolin B 10
MOBIL	Mobil DTE 24 Mobil DTE 17 Druckol HLRD 32 Hydraulikol HLPD 32
TEXACO	Rando oil HD A -32 Rando oil HD AZ-32 Alcor oil DD 32

Chapter 6 Troubleshooting

6-1 Introduction

The utmost in safety precautions should be observed at all times when working on or around the machine and the electrical components. All normal troubleshooting must be accomplished with the power off, line fuses removed, and with the machine tagged as out of service.

The use of good quality test equipment cannot be over-emphasized when troubleshooting is indicated. Use a good ammeter that can measure at least twice the AC and DC current that can be encountered for the machine. Be sure that the voltmeter has at least minimum impedance of 5,000 OHMS-per-volt on AC and 20,000 OHMS-per volt on DC scales. Popular combination meters, VOM and VTVM can be selected to provide the necessary functions.

Before making haphazard substitutions and repairs when defective electrical components are malfunctioning, we recommend that you check the associated circuitry and assemblies for other defective devices. It is common to replace the obviously damaged component without actually locating the real cause of the trouble. Such hasty substitutions will only destroy the new component. Refer to wiring diagrams and schematics.

Locating mechanical problems, should they occur, is relatively straightforward. When necessary, refer to the parts catalog section.

6-2 Troubleshooting

Problem	Possible Cause	Possible Solution
Machine blocks or switches itself off.	Too much feed material.	Reduce grinding material infeed.
	Screen blocked.	Clean screen, check condition, select larger screen perforation if necessary.
	V-belts slip.	Check V-belt tension and condition. Re-tighten or replace if necessary.
	Knife condition.	Check knives and resharpen or replace if necessary.
	Cutting gap.	Check cutting gap and set following the instructions in this manual.
	Discharge blocked.	Check if discharge conveyor belt is running.
	Current failure.	● Check limit switch for defective contact. ● Check electrical connection. ● Tighten limit switch if necessary.
	Fuse too small.	Fit larger fuse only after consulting the service department.
	Rotational direction of rotor	Check motor and reverse polarity if necessary.
	Rotor speed.	Change rotor speed only after consulting the service department.
Rotor does not grip bulky material.	Knife condition.	Check and sharpen if needed following the instructions provided in this manual.
	Protruding fixed knife.	Consult the service department.
	Knives not aggressive enough.	Fit underlay plates below knife holders.

Problem	Possible Cause	Possible Solution
Overheating of the shredded material.	View fist 5 possible causes for “Machine blocks or switches itself off”	View fist 5 possible Solutions for “Machine blocks or switches itself off”
	Screen perforation too small.	Insert a screen with larger perforation.
	Knives wrongly sharpened.	Modify knife finish only after consulting the service department.
	Material rubs against the housing wall.	Fit anti winding device.
	Insufficient cooling.	Fit rotor cooling.
Unusual vibrations	Rotor out of balance.	Weight knives, balance rotor.
	Bearing damage.	Check bearings and replace if necessary.
	Anti-vibration pads defective.	Check mounting pads and replace if necessary.
Extreme knife wear.	Bearing damage.	Check bearings and replace if necessary.
	Knife finish.	Check knife and sharpen or replace if necessary.
	Wrong cutting gap.	Check cutting gap and set following the instructions in this manual.
	Foreign matter.	Fit feed device with metal detector.
Bearings too hot.	Too much grease in bearing.	Reduce amount of grease.
	V-belts too tight.	Reduce tension.
	Rubbing on cover plate sealing ring.	Check sealing ring and oil or replace.
	Bearing damage.	Check bearings and replace if necessary.
	No grease in bearing.	Lubricate bearing.
Too many fines in shredded material.	Screen worn.	Renew screen (possibly using manganese steel).
	Unsuitable screen perforation.	Replace screen after consulting the service department.

Problem	Possible Cause	Possible Solution
Cutting gap alters during operation.	Knife mounting screws not tight.	Re-tighten using torque wrench following the instructions in this manual.
	Screw fatigue.	Fit new screws.
	Washers deformed.	Insert new washers.
	Knife holder surface deformed.	Insert new knife holders
	Supporting surfaces not clean.	Clean and re-dust supporting surfaces.
	Threads in housing worn.	Fit new bushes in housing.
Screen damage.	Screen wrongly inserted.	Fit screen correctly.
	Screen support buckled.	Replace screen support.
	Wrong screen radius.	Correct it.
Shredder does not start	Limit switches not activated.	Check position of limit switch and correct.
	Main and control fuses.	Replace fuse.
	Feed device not connected.	Switch on in sequence.
	Material jam.	Empty shredder before switching ON.
	Star delta connection.	Correct wiring on motor.
	Motor protection switches off.	Check motor relay for correct setting and increase if necessary.
	Star delta time relay.	Correct time.
Shredder blocks when under load.	Feed starts too early.	Start feed only after switch over from star to delta.
	Limit switch loose or wrongly set.	Re-position and tighten limit switch.
	Fuse defective.	● Replace fuse. ● Fit larger fuse only after consulting the service department.
	Motor fuse switches off –red indicator.	● Reduce feed quantity of the grinding material. ● Correct setting ● Replace fuse.
Frequent switching off of in-feed device.	Current relay switches off.	Correct setting.

6-3 Hydraulic Troubleshooting

Problem	Possible Cause	Possible Solution
Motor doesn't work.	Electric source.	Correct wire connection.
	Motor damage.	Replace motor.
Oil pump doesn't work.	Motor not functioning.	Correct wire connection.
	Pump damage.	Replace pump.
Oil pump noise	Filter jam.	Clean the filter.
	Hydraulic oil is too thick	Change hydraulic oil.
	Hydraulic oil has bad quality.	Change hydraulic oil.
	Pipe is leaking.	Tighten pipe connectors.
	Pump damage.	Change pump.
	Motor and pump misalignment.	
Working pressure is abnormal.	Spillover valve and sequence valve jam.	Clean spillover and sequence valves.
	Pump damage.	Replace pump.
Pressure maintain is abnormal.	Sealing is broken.	Change sealing.
	Pipe is leaking.	Check and solve leak.
	Single direction valve jam.	Clean the valve.
	Pressure is abnormal.	Clean spillover valve and sequence valve.
	Magnetic valve is abnormal.	If the valve jams, clean it; if it is broken, replace it.
	Electrical problem	Check and change the broken electrical parts.
High oil temperature.	Sequence valve pressure is too high.	Correctly set it to 30 bar.

Chapter 7 Parts instruction

The shredder is consisting of followings parts:

1. Casing components

2. Rotor

3. Bearing holder components

4. Gearbox components

5. Motor components

6. Ram components

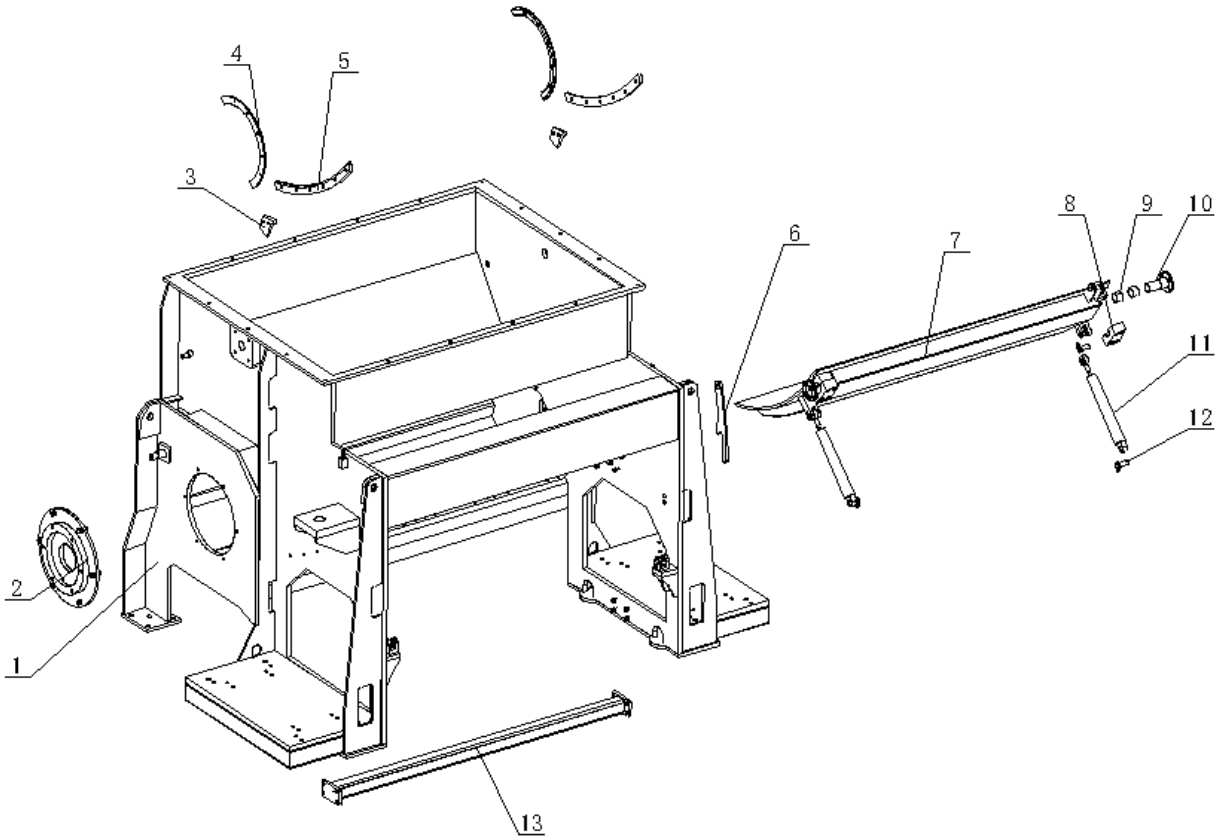
7.screen support components

When maintenance or repair the machine, it can only use the parts are produced by Europe Recycling Equipment

When purchase the parts, please provide the following information: Model, serial No. You can see them on the nameplate.

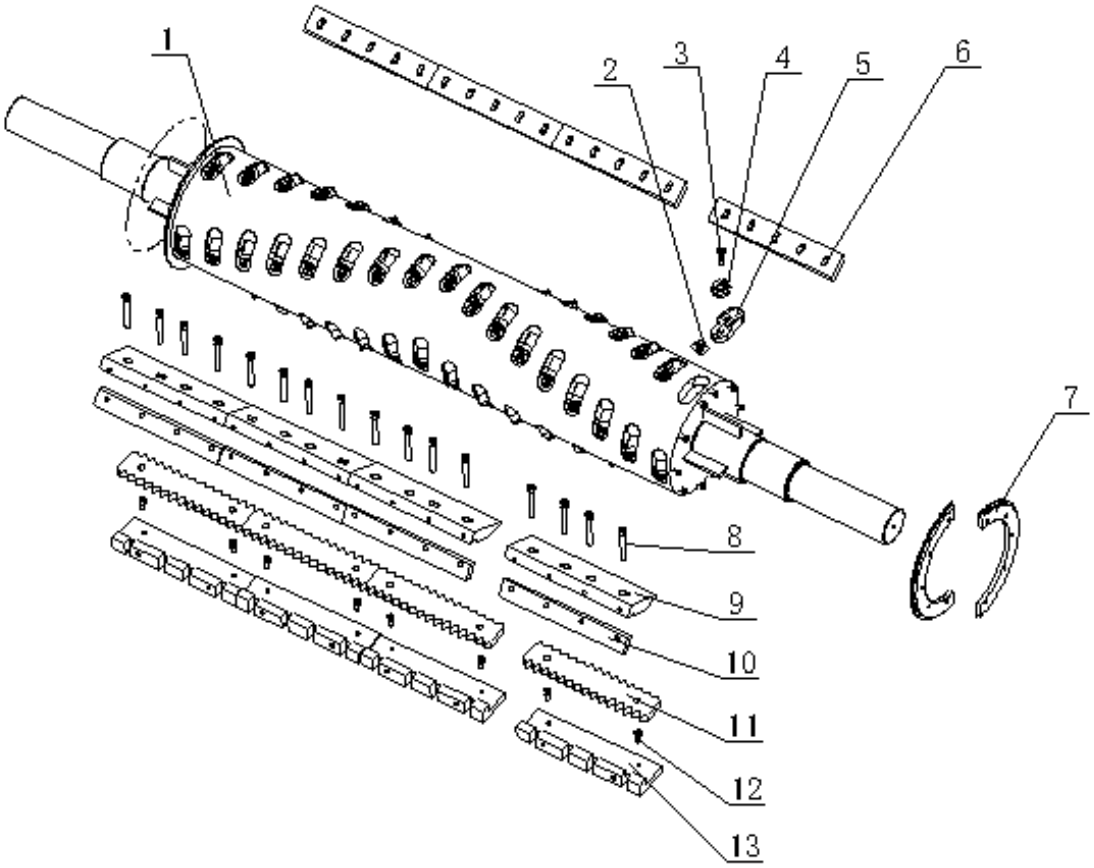
- Parts code, showing on the manual.
- Quantity of parts, showing on the manual.

7.1 Casing components:



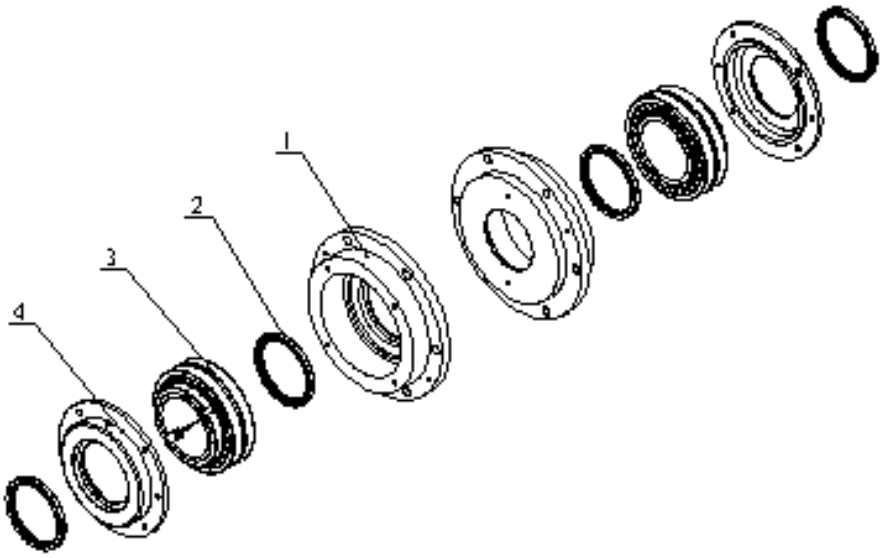
Pos.	Part	Component Code	Qty.
1	Casing	K2000-01010	1
2	Cover plate	K2000-01020	1
3	Baffle block	K2000-01030	2
4	Baffle ring	K2000-01031	2
5	Bottom plate support	K2000-01032	2
6	Fixed plate	K2000-01040	1
7	Bottom plate	K2000-01051	1
8	Pin fixed holder	K2000-01052	1
9	Copper sleeves	K2000-01060	4
10	Pin	K2000-01070	2
11	Oil cylinder	K2000-01080	2
12	Oil cylinder pin	K2000-01090	4
13	Rail support	K2000-01100	1

7.2 Rotor components:



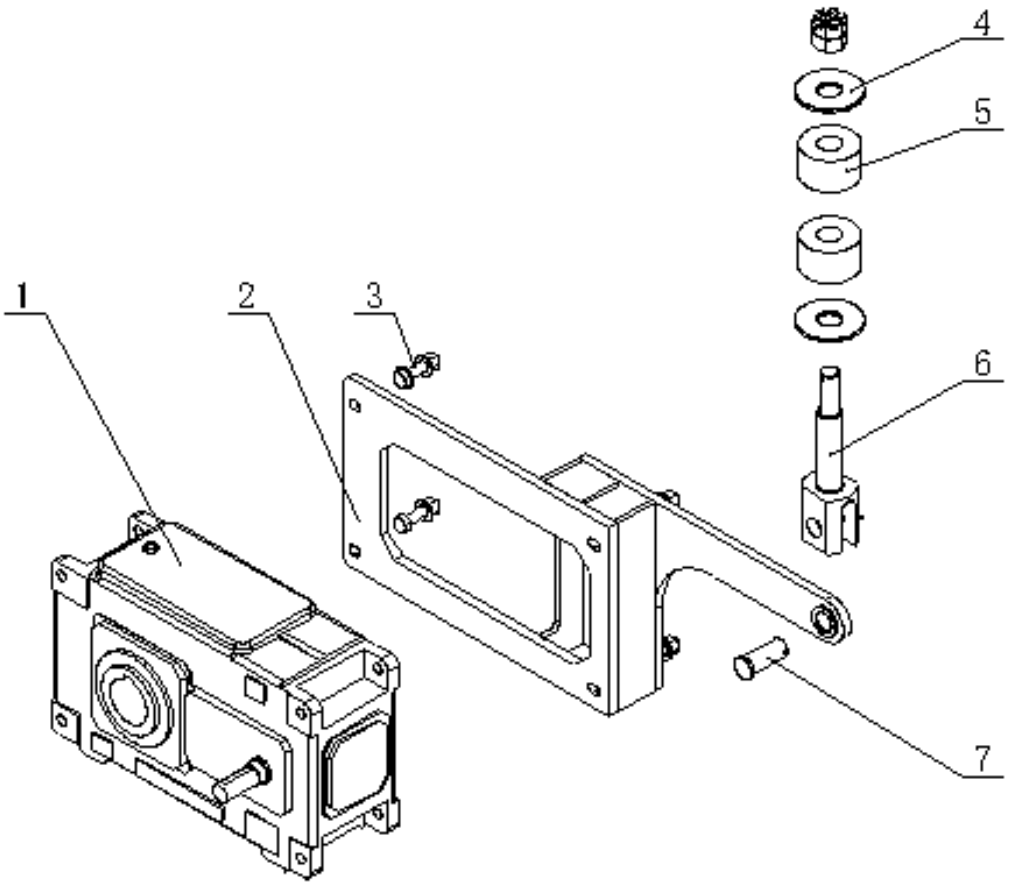
Pos.	Part	Component Code	Qty.
1	Rotor	K2000-02010	1
2	Rotor knife	K2000-02020	95
3	Rotor knife bolt	K2000-02030	95
4	Rotor knife cover block	K2000-02040	95
5	Rotor holder	K2000-02050	95
6	Upper fixed instead plate	K2000-02060	4
7	Baffle ring	K2000-02070	4
8	Lower fixed knife bolt	K2000-02080	16
9	Lower fixed knife cover plate	K2000-02090	4
10	Bottom support	K2000-02100	4
11	Lower fixed knife	K2000-02110	4
12	Fixed bolts	K2000-02120	8
13	Lower fixed knife support	K2000-02130	4

7.3 Bearing components:



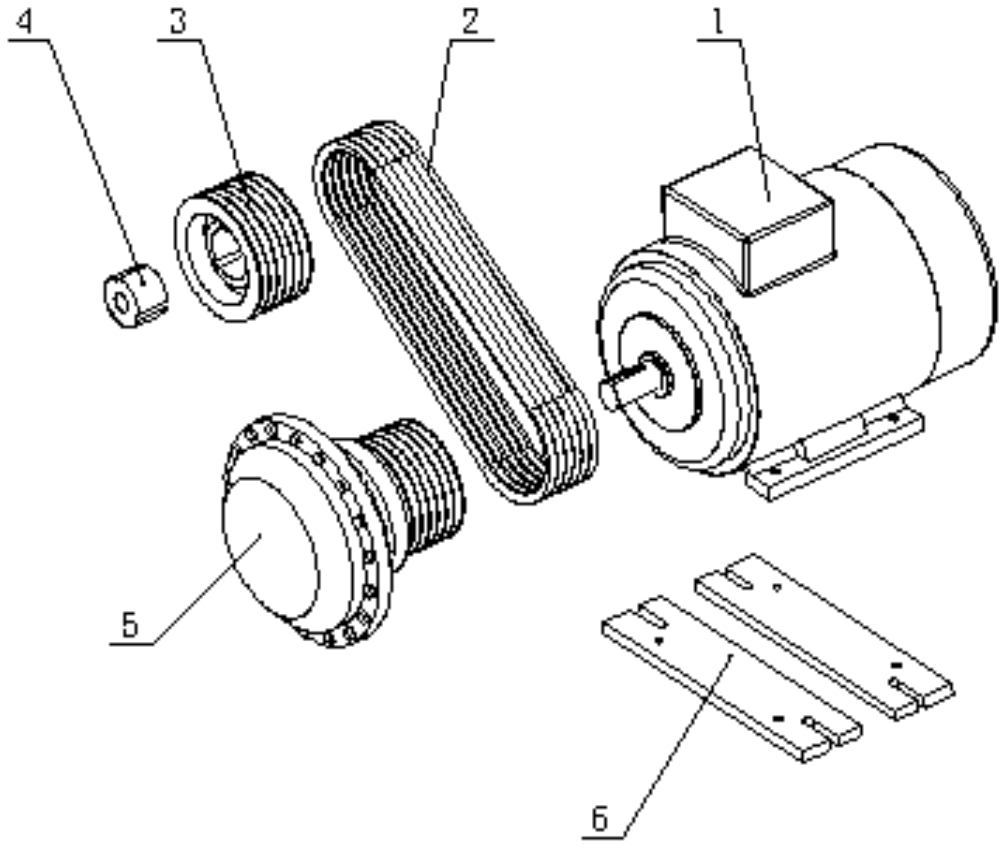
Pos.	Part	Component Code	Qty.
1	Bearing holder	K2000-03010	2
2	Oil seal	K2000-03020	4
3	Bearing	K2000-03030	2
4	Bearing cover plate	K2000-03040	2

7.4 Gearbox components (two sets for one machine)



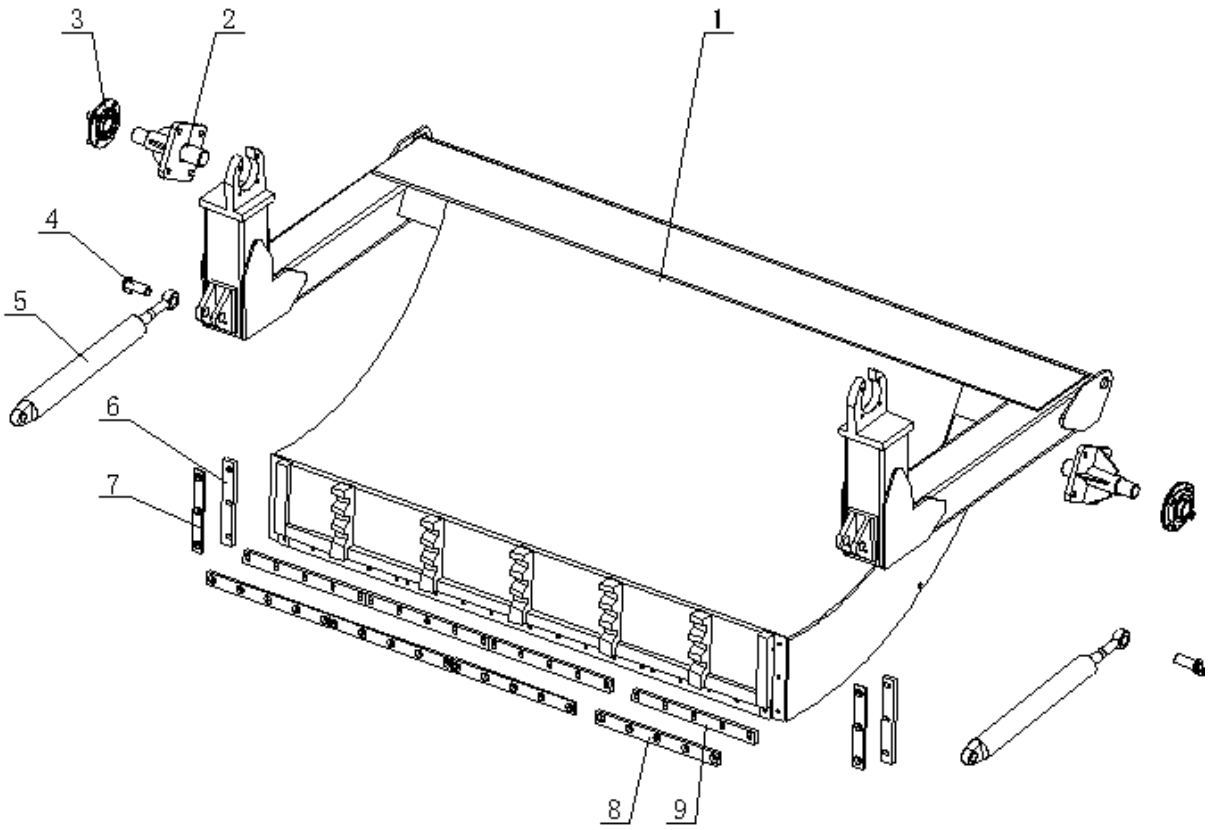
Pos.	Part	Component Code	Qty.
1	Gearbox	K2000-04010	1
2	Gearbox mounting plate	K2000-04020	1
3	Fixed bolt	K2000-04030	4
4	Washer	K2000-04040	2
5	Rubber absorber	K2000-04050	2
6	Anti-shock pole	K2000-04060	1
7	Pin	K2000-04070	1

7.5 Motor components (two sets for one machine)



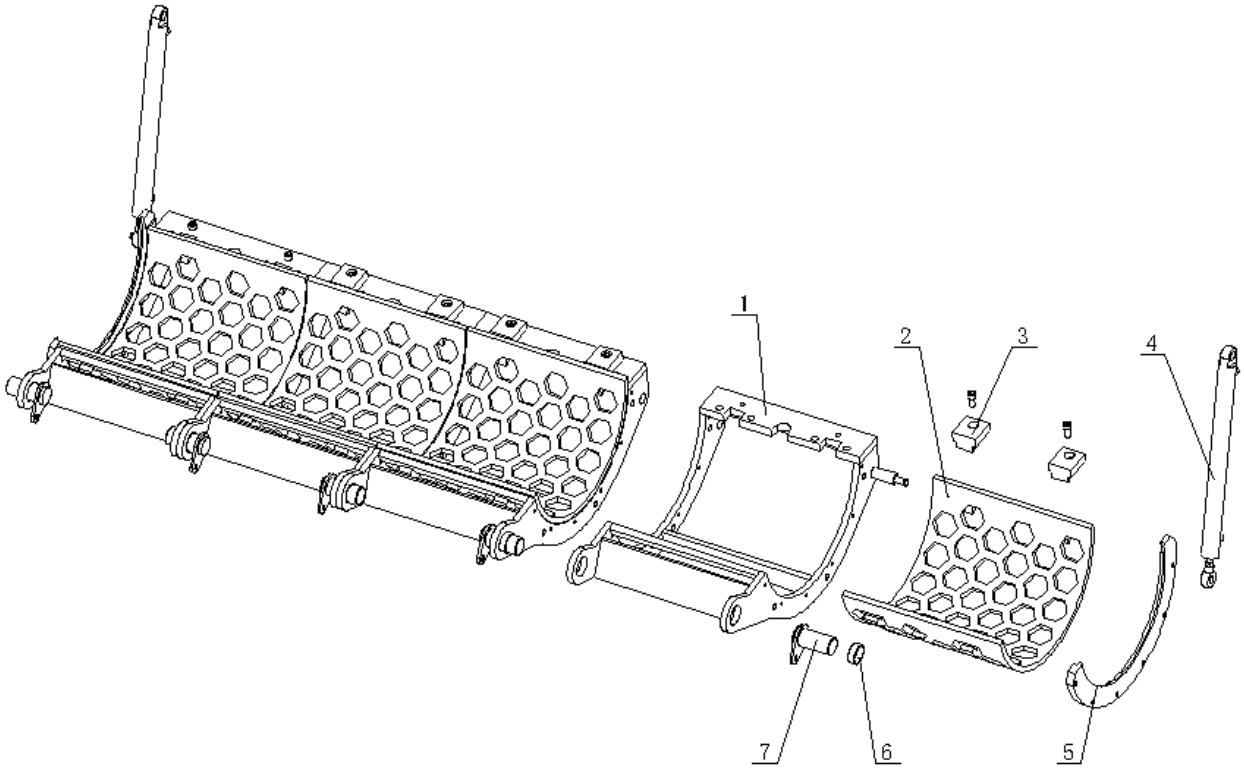
Pos.	Part	Component Code	Qty.
1	Motor	K2000-05010	1
2	Belt	K2000-05020	6
3	Pulley	K2000-05030	1
4	Taper sleeves	K2000-05040	1
5	Hydraulic coupling	K2000-05050	1
6	Motor adjusting plate	K2000-05060	2

7.6 Pusher components:



Pos.	Part	Component Code	Qty.
1	pusher	K2000-06010	1
2	Fixed shaft	K2000-06020	95
3	bearing	K2000-06030	95
4	Oil cylinder pin	K2000-06040	95
5	oil cylinder	K2000-06050	95
6	Scraper A,B	K2000-06060	4
7	Cover plate A.B	K2000-06070	4
8	Front cover plate	K2000-06080	16
9	Front scraper	K2000-06090	4

7.7 Screen support components:



Pos.	Part	Component Code	Qty.
1	Screen support	K2000-07010	4
2	Screen	K2000-07020	4
3	Screen fixed block	K2000-07030	8
4	Oil cylinder	K2000-07040	2
5	Baffle ring	K2000-07050	2
6	Copper sleeves	K2000-07060	8
7	Support shaft	K2000-07070	4

(Remark: the standard hole is 40mm,it can change as requirement)

Chapter 8 Electrical System

Never change or modify the basic electrical settings of the shredder, without first obtaining permission from the technical department of the manufacturer.

If the settings are changed, the machine can be seriously damaged.

All warranties will be void, if the basic settings of the machine are changed.

High voltage. Death can result.

DANGER!

All maintenance and service work must be done by trained and competent personnel!

Electrical installation must only be done by a competent electrician.

8-1 Power Requirement

3 PHASE 380V/400V, 50/60Hz

8-2 Operation

1. Emergency stop

Emergency stop buttons are set on the control panel. Every machine has its corresponding Emergency stop button, except for the "oil pump" motor and "granulator 1". These two buttons are set together.

- Emergency situation: Adjunction of water pine, oil pine and air pine; abnormal function; peculiar smell from the machine; abnormal noise; and other accidents.
- Operation: Press the "Emergent stop" button immediately. Cut off the power and call for the technician to check. Press the button again to restart the machine after maintenance.

HINTS

The control panel is still in electric charged condition when the "Emergency stop" button has been pressed.

2. Preparation

- Check whether the machine is safe. Make sure that the machine is not undergoing any repairing missions. No sundries left inside the machine.
- Check whether the values of ammeter and voltammeter are in the specified range.
- Switch on the power in the driving control cabinet. Check whether the air switch has been closed.

- Press the “power” button and the light will flash.

3. Operation

AUTO MODE

Select “Auto Mode” by shifting the “Manual/Auto” button. Press “Power” button to connect main power. Press “ON” button to start the main motor, hydraulic pump and conveyor belt. Shredder will run in automatic electrical program as follow:

- In normal loaded condition, shredder runs normally.
- **When the working current is detected more than 60% of the rated current,** the machine will turn into slow pushing mode, controlling the hydraulic ram to press slowly.
- If gently overload condition is detected and exceed the setting time in the program, hydraulic ram will draw back automatically.
- If heave overload condition is detected and exceed the setting time in the program, shredder will stop running and then motor will start reversing.

MANUAL MODE

Select “Manual Mode” by shifting the “Manual/Auto” button. When “Manual Mode” is selected, user can operate the movement of the hydraulic ram through the control panel. User can also reset the machine after emergency stop in this mode.

HINTS

Electric interlock is set both in “Auto” and “Manual” mode. In “Auto Mode”, manual operation is in valid, while in “Manual Mode”, auto operation is in valid.

STOP MODE

Select “Stop Mode” by shifting to the middle of the “Manual/Auto” button. User can turn machine in this mode after the manufacturing process.

4. Maintenance

- Prevent water, fire, dust and other foreign matter which may damage the electronic component.
- Cut off the power, lock the electric cabinet and hand the warning sign before maintenance.
- Check the machine at any time. Make sure that the value of ammeter and voltammeter is in the specified range.
- Check the electric components in the control cabinet.
- Clean the electric cabinet termly.

5. Warning System

- When the machine is in gently-load or unload condition and exceed the time setting (**Material** parameter in the following table), warning system will be activated. Once the machine is loaded or stopped, warning will be deactivated.
- When the machine is still in overloaded condition after the motor reverse for the third time, warning system will be activated and the machine will be stopped automatically.
- When the machine is in thermal overloading condition, warning system will be activated.

6. Parameter Setting

DEFAULT SETTING (3 PHASE 380V/400V, 50/60HZ)

Power(KW) / Parameter	15	18.5	30	37	45	55	75	90	110+110
current	30A	36A	57A	70A	84A	102A	138A	164A	199A
Y-A	2.5s	2.5s	3s	3s	5s	5s	6s	6s	6s
Motor4 1	24A	29A	46A	56A	67A	81A	110A	131A	160A+160A
Count 1	6times	6times	6times	6times	6times	6times	6times	6times	6times
Overtime	30s	30s	30s	40s	40s	40s	50s	50s	50s
Backward	1.5s	1.5s	1.5s	1.5s	1.5s	1.5s	1.5s	1.5s	1.5s
Drang 2	0.8s	0.8s	0.8s	0.8s	0.8s	0.8s	0.8s	0.8s	0.8s
Material	2.0m	2.0m	2.0m	2.0m	2.0m	2.0m	2.0m	2.0m	2.0m
Motor 1	15A	18A	29A	35A	42A	51A	69A	82A	100A+100A
Stop2	5s	5s	5s	5s	5s	10s	10s	10s	10s
Reverse	5s	5s	5s	5s	5s	5s	5s	5s	5s
Stop1	5s	5s	5s	5s	5s	10s	10s	10s	10s
Overload	1.5s	1.5s	1.5s	1.5s	1.5s	1.5s	1.5s	1.5s	1.5s
Motor 3 1	36A	44A	69A	84A	100A	122A	165A	197A	239A+239A
Gently	1s	1s	1s	1s	1s	1s	1s	1s	1s
Motor 2 1	27A	33A	52A	63A	76A	92A	124A	148A	180A+180A

SETTING REFERENCE

Y—A: Star delta switch time (ref. value 02:00s～10：00s)

Set small model with small value and larger model with bigger value.

Motor2 -3 1：Single shaft shredder motor 2 overload setting (ref. value 100%～120% In, default setting 120% In)

If the motor 2 working current is higher than the parameter (100%-120% of the rated current), the pusher will stop working. at the meantime, after the main motor stop(stop 1:reverse stop time),start reversing again, after reversing(Reverse: reverse running time),the machine stop(stop 2:stop time after reversed),it starts to running.

Crushing hard and ductile material set a big value.

Crushing soft material set a small value.

Motor2- 2 1：Motor 2 full overloaded setting (ref. value 85%～95% In, default setting 90% In)

If the motor 2 working current is higher than the parameter (85%-95% of the rated current) and the lasting time exceeds the setting time (Gently parameter), pusher will stop and backward for deloading time.

Crushing hard and ductile material set a big value.

Crushing soft material set a small value.

Motor2- 4 1：Motor 2 gently overloaded setting (ref. value 75%～85% In, default setting 80% In)

If the motor 2 working current is higher than the parameter (75%～85% of the rated current) and the pusher will push slowly. When it is lower than this parameter, the pusher backward and the parameter is not effect.

Motor 2-1 1：Motor 2 unloaded setting (ref. value 40%～50% In, default setting 50% In)

If the machine working current is lower than the parameter (40%-50% of the rated current) and the lasting time exceeds the setting time (Material parameter), warning system will be activated.

Motor1- 4 1：Motor 1 gently overloaded setting (ref. value 75%～85% In, default setting 80% In)

If the motor 1 working current is higher than the parameter (75%～85% of the rated current) and the pusher will push slowly. When it is lower than this parameter, the

pusher backward and the parameter is not effect.

Count 1 count time setting value of the pusher backward when motor 1.2 full loading(Ref. value 3-10times, default setting 6times)

Overtime：pusher forward overtime（ref. value 05:00s～60：00s）

After starting of motor 1.2.,the pusher will backward to the limit, the time for pusher single forward is over than this parameter, the pusher automatic backward to the end and repeat it.

Backward：the deloading time of the pusher backward when the motor1.2 full overloaded.

(ref. value 00:40s～03：00s，default setting 1.5 s)

Drang 2：the pusher forward to limit duration （ref. value 00:20s～01：00s，default setting 0.8 s）

This parameter is stop time of the pusher forward to limit, when the cylinder is push to the end of journey switch, the pusher stop a moment, and then backward.

Material ; count time of no material (ref. setting 02:00m～10：00m，default setting 2 m)

Crushing hard and ductile material set a small value.

Crushing soft material set a big value.

Motor 1-1 1：Motor 1 unloaded setting (ref. value 40%～50% In, default setting 50% In)

If the motor 1 working current is lower than the parameter (40%-50% of the rated current) and the lasting time exceeds the setting time (Material parameter), warning system will be activated.

Stop2：Machine stopping time after reverse (ref. value 03:00s～30：00s)

Crushing hard and ductile material set a big value.

Crushing soft material set a small value.

Reverse: Motor reverse time (ref. value 03:00s～10：00s)

Crushing hard and ductile material set a big value.

Crushing soft material set a small value.

Stop1：Machine stopping time after reverse (ref. value 03:00s～10：00s)

Crushing hard and ductile material set a big value.

Crushing soft material set a small value.

Overload: Motor overload time (ref. value 00:10s～02：00s, default setting 01：50s)

Crushing hard and ductile material set a smaller value.

Crushing soft material set a bigger value.

Motor1 -3 1：Single shaft shredder motor 1 overload setting (ref. value 100%～120% In, default setting 120% In)

If the motor 1 working current is higher than the parameter (100%-120% of the rated current), the pusher will stop working. at the meantime, after the main motor stop(stop 1:reverse stop time),start reversing again, after reversing(Reverse: reverse running time),the machine stop(stop 2:stop time after reversed),it starts to running.

Crushing hard and ductile material set a big value.

Crushing soft material set a small value.

Gently: Motor 1.2 gently overload time (ref. value 00:20s～10：00s, default setting01：00s)

Crushing hard and ductile material set a small value.

Crushing soft material set a big value.

Motor2- 2 1：Motor 2 full overloaded setting (ref. value 85%～95% In, default setting 90% In)

If the motor 2 working current is higher than the parameter (85%-95% of the rated current) and the lasting time exceeds the setting time (Gently parameter), pusher will stop and backward for deloading time.

Crushing hard and ductile material set a big value.

Crushing soft material set a small value.

More information instruction and operation,please download in below website:

http://www.siemens.com/logo

l. 7 Selecting the parameters

To select a parameter:

1. On the parameter assignment menu, select 'Set Param': Press ▼ or ▲

```
 Stop
>Set Param
 Set..
 Prg Name
```

2. Confirm with OK.
   LOGO! shows the first parameter. If no parameter can be set, you can press ESC to return to the parameter assignment menu.

```
B9          1
T  =60:00s

Ta =06:00s
```

Block number

Display number for functions with several displays

The value set at parameter T (Time)

The current time in the LOGO!

```
No Param
Press ESC
```

No parameters for editing:
Press ESC to return to the parameter assignment menu

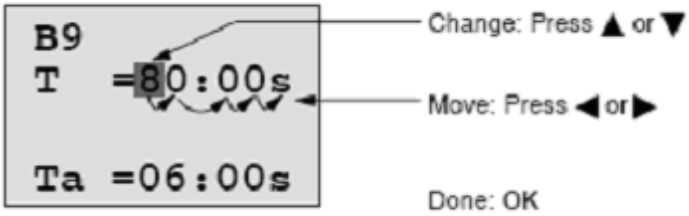
3. Now, select the desired parameter: Press ▲ or ▼.
4. Select the parameter you want to edit, and press OK.

1.8 Modifying parameters

You first select the parameter you want to edit (see Chapter 1.7).

You change the value of the parameter in the same way as you did in programming mode:

1. Move the cursor to the point at which you want to make the change: Press ◀ or ▶
2. To change this value: Press ▲ or ▼
3. To apply the value: OK

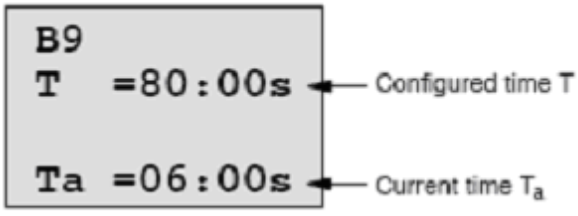


Note

Alongside with a change of the time parameters when the system is in RUN, you can also change the timebase (s = seconds, m = minutes, h = hours). This does not apply if the time parameter represents the result of another function (for an example, see Chapter 4.4.1). In this case you can neither change the value nor the timebase.
The current time is reset to zero when you change the timebase.

Current value of a time T

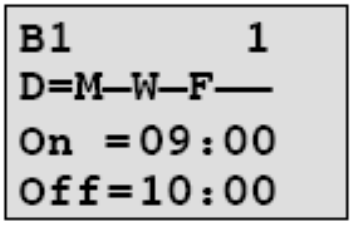
View of a time T in parameter assignment mode:



You can change the configured time T.

Current timer value

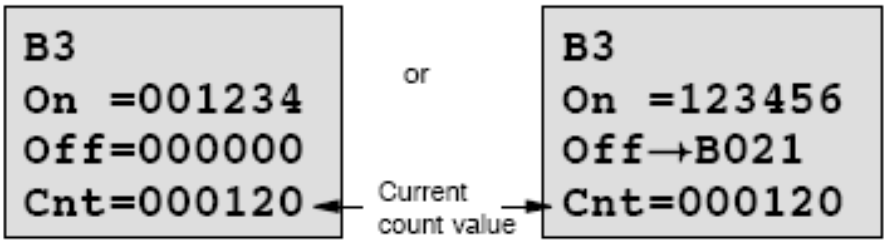
View of a timer cam in parameter assignment mode:



You can change the on/off times and the day.

Current value of a counter

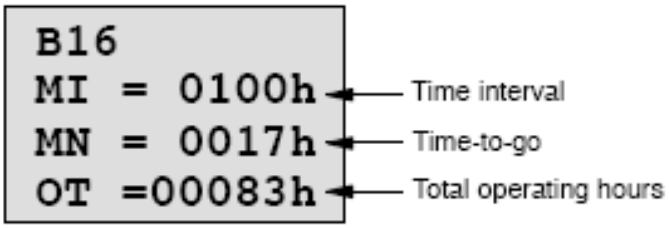
View of a counter parameter in parameter assignment mode:



You can change the on/off threshold. This does not apply if the on or off threshold represents the result of another function (in the example, this is B21, see Chapter 4.4.13).

Current value of an hour counter

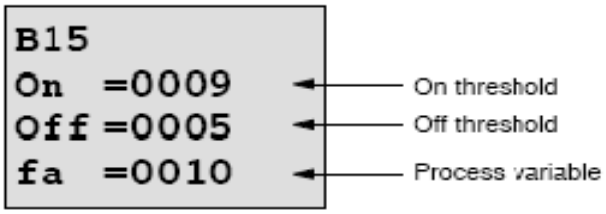
View of an hour counter parameter in parameter assignment mode:



You can edit the configured time interval MI.

Current value of a threshold trigger

View of the parameter of a threshold trigger in parameter assignment mode:



You can change the on/off threshold.