1 Safety attention points

1.1 Environment conditions

In order to operate this equipment safely, please install it according to following operating conditions.

(1) Please install this equipment indoors according to following conditions:

. Ambient temperature range (-10～+40℃)

. Relative humidity range:within 30～85%

. Altitude: less than1000.

. Guarantee indoor cleaning and ventilation

. Guarantee that the equipment is far away from the corrosive gas, inflammable and explosive gas as well as steam

(2) Power source: as for Voltage and Frequency, please refer to the nameplate; pressure ≧0.4Mpa.

(3) For easy use, operation and maintenance, please check this equipment and reserve enough space for it.

(Please refer to Fig.4-6 Scaled drawing for TPH200D Extruder)

(4) Please place the equipment horizontally.

(5) The vibration to be borne under effects of many complicated environments may not exceed 12 $mm \cdot s^{-1}$.

1.2 Description of warning marks

(1) In order to well understand this operation Manual, the safety warning marks are divided into following kinds.

(2) These warning marks have been worked out according to the operating regulations and safety attention points for this equipment. In order to avoid dangerous accidents, this Operation Manual also includes concrete preventive measures. Please operate this equipment according to the instructions based on sufficient understanding of warning marks.

Table1-1 Description of warning marks

 ATTENTION	This mark expresses that in order to avoid death and serious injury accidents, please be sure tooperate this equipment according to relevant stipulations of safety attention points.
 DANGER	This mark expresses that in order to avoid potential dangerous accidents and serious injuryaccidents, please operate this equipment according to relevant stipulations of safety attentionpoints.
 WARNING	This mark expresses that in order to avoid slight wound and potential moderate injuryaccidents, please operate this equipment according to relevant stipulations of safety attentionpoints.

1.3 Description of safety marks

(1)Relevant safety marks are pasted on different corresponding positions of this equipment, which are properly dangerous to personal safety.

(2)All the safety marks are indicated in Fig.1.1～Fig1.10,on basis of good understanding of these safety marks, install, adjust, operate, maintain and inspect this equipment according to the contents indicated by these marks.

(3) Equipment operators and maintainers are not allowed to damage or shade these marks.

(4) When these safety marks have fallen off or been damaged, please replace them with new marks.

(5) If you want to order new marks, please contact our company.

Table1-2 Safety marks on this extruder

No.	Designation	Ordering code	Contents
1	Beware of electric shock	COMM65010010	Safety mark:Do not open the junction box until the power supply is switched off.
2	Carry out repair and maintenance according to the Operation Manual.	COMM65010016	Carry out repair and maintenance according to the Operation Manual.
3	Beware of injuries from the machine	COMM65010008	Safety mark: Do not open the operating gate when the machine is running and until it has not been completely stopped.
4	Preventing any scald (high temperature)	COMM65010007	Do not touch the machine with bare hands when it is working.
5	Do not remove the guard shield	COMM65010012	Do not remove the guard shields when the machine is running.
6	To wear protective gloves	COMM65010015	Please wear gloves up according to the regulations when the machine is running.
7	No climbing	COMM65010013	Do not climb or stand on the equipment.
8	Clockwise direction	COMM65010005	Instruction mark: Clockwise direction
9	Counterclockwise direction	COMM65010004	Counterclockwise direction mark
10	Check the lubricant level	COMM65010023	Check lubricant level before operating

Fig.1-1 Beware of electric shock

Fig.1-2　Maintaining according to the operating manual

Fig.1-3　Beware of injuries from the machine

Fig.1-4 Beware of scald(high temperature)

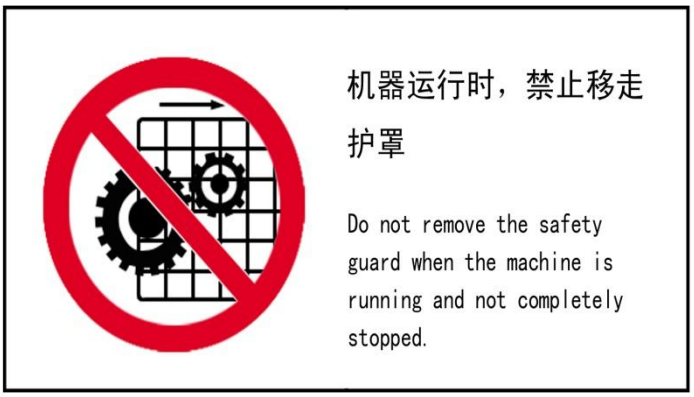


Fig.1-5　Do not remove the guard shied

Fig.1-6 To wear protective gloves

Fig.1-7　No climbing

Fig.1-8 Clockwise direction

Fig.1-9　Counterclockwise direction

Fig.1-10 Check lubricant level

The wholeTPH200Dextruder can be divided into 4 parts: a feeder, a conditioner and a principal machine and a cutting device. Corresponding safety marks are pasted on the required surface positions of these four parts.

1.4Attention points

(1) The here said equipment operators refer to all personnel who participate in operation, inspection and maintenance etc.

(2)The equipment operator must carry out the operation on the basis of sufficient understanding the Operation manual.

(3) For safety attention points, the owner has the duty and obligation to deliver the contents of the Operation Manual for the equipment to all working personnel.

(4) At the same time when obeying all the safety attention points, the users also must obeythe safety regulation and stipulations to prevent accidents.

(5) All related employees should receive safety education. The enterprise management should be in charge of it and respect the national, local and the other enterprise's safety regulations of the users.

ATTENTION

(6)All the responsibilities for any accidents or damage to the equipment shall not be borne by manufacture and commission agent if the equipment is not operated according to the stipulations.

DANGER

(7) Please install, use and operate the equipment correctly. Whoever takes off guard or makes it dysfunctional should be responsible for the safety result.

(8)In normal production, high pressure generated in the extruding chamber.Therefore the installation manner of the extruding chamber must meet all the requirements of firmly connecting the extruding chamber in theoretical way and practical application. However, accidents such as the"jetting out" of the extruding chamber or discharging device during production have ever happened, as the result of improper installation and screw fatigue. **Therefore, no one is allowed to stand at front of the extruding chamber when it is running.**

DANGER

(9)Any reformation of the equipment may not affect the functions and safety performances of the equipment.

(10) Be sure to run the extruder under strict obeying all regulations for prevention of accidents.

(11) If any accidents are caused due to not obeying the stipulations in the Operation in the Operation Manual and the control system for Muyang equipment is not used as per the conditions mentioned above, the Muyang will refuse to take any responsibility. If the Muyang is required to take responsibility, the Muyang will reserve the right to investigate and affix the responsibility of the operator.

1.5 Safety attention points in transport, storage and installation

DANGER

(1)The equipment must be placed and handled by professionals.

(2) Please use designated tools (steel cable, crane, hoisting machine etc.) for hoisting, andcarry out the hoisting according to designated sequence and method.

(3) Staff only when carrying out hoisting.

(4) In order to prevent serious injury accidents, no one is allowed to be under the equipment when carrying out hoisting.

(5) The permissible load of hoisting tools should be more than total weight of the equipment.

(6) When the equipment is stored temporarily, please place the equipment horizontally andkeep a normal temperature and clean indoors.

(7) For transportation and handing, it is not allowed to damage the equipment by binding. It should be reported to the manager immediately in case of any machine damage and missing of parts in transporting.

(8) In installation, enough space should be reserved for future maintenance and replacement of the equipment.

(9)Prior to installation, all machine parts must be kept in their original package. The machine parts and packing boxes should be properly covered and stored in places sheltered from rain, sunning and damp.

WARNING

(10)The cover plate, protecting hood or guard grating are usually installed and delivered together with the machine. They can only be disassembled with tools. And the machines with such kind of devices can never be put into work until the above-mentioned devices have been properly installed.

1.6 Safety attention points in operation, inspection and maintenance

DANGER

(1)The operation, inspection, repair and maintenance of the equipment shall be carried out only by the trained technical personnel according to different specifications provided together with the equipment. Electric installation shall be carried out only by professional persons according to relevant electric safety standards.

WARNING

(2)Whenever maintenance or repairing is to be done, the power must be cut off so as to prevent the motor from accidental staring.

(3)Operation and installation should be done after shutdown, please be sure to cut off and lock the main supply switch, and place the execution mark plates on the workshop gateway, in front of the electric control cabinet in the control room and near the extruder respectively, so as to prevent the motor from accidental staring.

ATTENTION

(4) In operation, a special attention shall be paid to the positions with attached safety marks.

(5) Do not operate when the safety protection device and operating gate are open. It is prohibited to open the operating gate until the machine has been fully stopped.

(6) If any troubles occur in the operating gate and safety protection device, please repair orreplace them at once.

WARNING

(7)The safety protection devices can never be dismounted, covered or overlapped at will. It can never be opened until the machine has completely stopped. And the machine can only be started when these safety protection devices are in good order.

DANGER

(8)The feeder door, conditioner door, guard shield, cutting cart guard shield may not be opened or detached, and it is not allowed to remove or throw them away during production! Otherwise, it will harm personnel safety. These devices shall be repaired or replaced immediately when any malfunction occurs.

(9)When the machine is under stoppage, attention must be taken to prevent the feeder, conditioner, principal machine of the extruder from starting by any accidental starting mode.

(10) Except the maintenance work for the equipment, it is not allowed to take off the guard shields of the chain wheel and the belt wheel.

WARNING

(11)When the safety guard shields or operating gates have to be opened or the safety devices have to be disassembled in order to inspect, adjust, repair and maintain the equipment or replace the parts, please well negotiate about the required safety attention measures and work out the safety countermeasures prior to the operations and then carry out the inspection work.

DANGER

(12)When the machine is running, it is strictly forbidden to put fingers near the running,components, such work as inspection, maintenance and cleaning etc cannot be done until all the rotors in the extruder have been completely stopped.

(13) In case maintenance and inspection work should be done with a welder or other tools that can generate sparks, strict safety precautions must be taken against dust explosion and combustion (see "Explosion protection").

(14) If the parts are damaged, please repair or replace them immediately.

(15) Guarantee the safety of the electric system. Before the electric circuit is cut off, it is strictly prohibited to open the terminal box for avoiding electric shock.

(16)The electric control system of the extruder must follow the following points. Otherwise, the technical safety responsibility of the supplier will be canceled.

① The electric control system of the extruder must be supplied by Jiangsu Muyang Holdings Co.,Ltd.

② The equipment must be checked up by an expert from Muyang before commissioning.

③ The electric control is a component part of the safety regulations for accident precaution.

④ Prior to commissioning the control system must be tested by an expert from Muyang in light of the testing list and a permit will be signed by him.

⑤ If the control system for Muyang machinery equipment is not used as per the conditions

mentioned above, the Muyang will refuse to take any responsibility. If the Muyang is required to take responsibility, the Muyang will reserve the right to investigate and affix the responsibility of the operator.

1.7 Personal protection

(1) All the mechanical equipments manufactured by Jiangsu Muyang Holdings Co.,Ltd are equipped with safety devices, which are consistent with modern technical level and universally effective safety rules prior to ex works, so that the customers can use the machines in accordance with the regulations.

DANGER

(2) If the operators employed cannot read or write, the owner has the duty to explain to them clearly where dangers exist and warn them that special attention should be paid.

(3) In order to guarantee the safety and health of labors during production process, it is necessary to use labor protection articles (such as gloves, breathing masks and labor shoes) during operation.

ATTENTION

(4) Please execute the special regulations on accidents prevention in the operation manualprovided by us.

(5) The enterprises are obligated to execute following regulations to guarantee operators'safety.

DANGER

①The shield cap must be mounted at any moment and keep closing. It is very dangerous when they are opened or disassembled. It may cause casualty accident. This is also applicable for the preventive device of the manipulator.

② The safety limit switches should always be kept in good order. Overlap or discard of the safety limit switches is not allowed.

③ The driving motor must be switched off completely to make the machine stop when carrying out inspection, commissioning, repair and maintenance. This can be done through a full-phase separating and lockable switch which is installed near the machine or on the operation desk, or the control panel on the site. It is not enough only to screw off the fuse wire!

④If the machine needs other energy like pneumatic, hydraulic, steam and hot water energy, it is necessary to cut off their energy supply or turn off the switch, and eliminate the pressure in the internal pipeline system of the machine.

⑤ As for handling heated or cooled parts and components of the machine, special attention should be paid to the danger of burning or scalding, frost-bitting.

⑥ If you have pressed the emergency stop switch to stop the machine and you want to reset the switch, so it is not permissible to only re-press this button to restart the machine.

⑦ If some machines are equipped with a local shutdown system, especial care should be taken. Read the instruction manuals attached with the machine carefully. In such machines with a local shutdown system, temperature will rise because pressure or vacuum will occur after they have been used for a period.

⑧ The cleaning, lubricating and oiling of the machine or its parts and components may be

carried out only when the machine is stopped. If you have to climb on or enter the machine to do such work, the mandatory provisions shall be made without exception: the power supply of motors must be cut off completely and the switch must be locked. Attention must be paid to safety measures for climbing.

⑨ Be careful, sampling from inside the machine can never be carried out unless there is not any danger. Usually, the samples can be taken from the pipe under the machine instead of inside machine.

⑩ Clear off the deposited dust, dirties and materials frequently. Keeping the machine clean can enhance production safety and the cleaning level of workshop, and is also beneficial to prevent dust explosion.

⑪ If oil (grease) leakage occurs, clean it immediately and seal well the place where leakage occurs. For oil or grease leaked on the floor will easily bring about hazards to the operators.

⑫In production operation, the machine must be equipped with safety devices, which may be neither removed and abandoned nor reduced in functions. Otherwise, we are not responsible for any accidents resulted here from, and reserve the right to ascertain where the responsibility lies.

1.8 Explosion Protection: Countermeasures against dust explosion and fire hazard

(1) Common cleaning work

① Keeping the working site with combustible dust clean is an important condition for safe production.

② Try not to pile bagged or bulk materials between machines.

③ In order to reduce dust emission to surrounding areas, all conveying devices, air pipe, filtering bag should be kept in good condition. Especially, the unsealing of pipes or top covers should be avoided.

④ In order to reduce dust explosion hazard, dust everywhere must be cleaned out frequently and effectively.

⑤ Keep all motors free of deposited dust.

(2)Regular inspection and maintenance

① Check the safety devices such as speed monitor or the like regularly, at least once a week.

② In order to avoid heat generation, it is necessary to regularly check the functions of all main shafts and bearings, at least once a week, and to regularly fill up lubricating oil.

(3)Electric apparatus

Regularly check the electric apparatus and articles, and special attention should be paid to the following points:

①It is forbidden to use any flashlights and other lamps without shielding or explosion-proof glass.

②It is forbidden to use any lengthened cable or electric furnace.

③It is necessary to immediately repair or replace the electric apparatus and equipment if any failure occurs.

④The cables without conduits are not allowed to be installed on the floor.

⑤ Cut off the power supply of the machine after work.

⑥An electrician should be assigned to check the insulation of all the lines of electric network according to relevant regulations on heavy current, at least once a year.

(4)Smoking and welding

DANGER

①Smoking is forbidden. which is applicable to all workers and staff of the enterprise as well as guests, customers, foreigners and drivers visiting the factory.

②If the tools such as welding machine or soldering lamp (flame soldering lamp) etc. are required for repair or installation, do as best as possible to arrange the work in a special workshop or on a special site.

③If it is necessary to carry out welding or the like directly in production area or storehouse once in a while, written applications must be submitted to a related supervisor in advance for written approval. The above mentioned operations can be carried out only when special safety measures have been taken, such as laying pieces of water soaked canvas or canvas special for covering on the surrounding area and preparing fire extinguishers. After completion of the operation, the welding site and the surrounding area are to be monitored at least for 10h.

④The gas cutting sparks are very dangerous, for people can't see where they will fly on earth. They can cross through the narrow clearance of walls and drop downstairs or to the next rooms, or even fly off 10 m away in distance. If the sparks drop in dusts, fire accidents may occur at any time.

⑤Welding is prohibited on a running conveyor. If the welding work is necessary, shut down the machine first, and then make a thorough cleaning and isolate both sides of the welding site tightly with materials like mineral wool to avoid connecting with other conveying devices, silos or tanks. If the work is to be done on the chutes or conveying pipes, it is necessary to disassemble them or divert their lower ends and seal them to avoid welding sparks entering the conveying pipes or silos.

(5) Effect of static electricity

DANGER

① In order to ensure the safety of electric circuits and avoid explosion resulted from spark discharge.

② The paint coat at the electric connections must be removed.

1.9 Other attention points(environmental protection measurements)

If you decide not to use the machine any longer after it is used for a certain number of years (about8-10years),the measures for environmental protection and reutilization should be taken.

ATTENTION

(1)Drain the liquids inside the machine (like motor oil, gearbox oil, brake oil and coolant etc.) into special containers and send them to the preparation workshop.

(2) The plastic parts shall be picked out for reutilization.

(3) The metal parts shall be sorted out so as to be ground or scraped.

2 General

2.1 Application and adaptability

TPH200D common type raw material extruder(“extruder” for short)is mainly applicable for production of four raw materials, such as expanded full fat soybean powder, expanded corn flour, flake piglet feed and expanded soybean meal in feed industry. This Operation Manual is mainly about the extrusion operation of above mentioned four raw materials.

The extruder can also be applied in other new fields. For example, rice meal cooking,, cereal treatment, oilseed related product pretreatment and so on. It can also be used for cooking some mixtures, such as the blend of corn flour and soybean flour in different proportion.

The applications in new fields may refer to materials of different properties and also have different requirements to the extruded products. So, it is better to contact us for evaluating the material properties and quality of extrudates before using the extruder in new fields. We will take out some tests on the new applications and provide optimal production solutions.

As for the application in new fields, please consult Muyang experts for further technology support.

2.2 Main components and working principle

2.2.1 Main components

The extruder is mainly composed of a feeder, a conditioner and a principal machine of extruder.

Functions and features

2.4.1 Functions and features

The extrusion provides great superiority for the productions of many products in comparison with other technologies. This is because it almost integrates functions of different equipment in a single process. When extrusion the processes of mixing, extruding, cutting, cooking, forming and drying in a certain degree can be carried out at the same time.

Extrusion process has the following functions and features:

(1)Multi functions

Multi-functionality of the equipment presents as suitable for processing of different materials and able to achieve different ripening degrees (or extrusion degrees) as required when processing the same material. The reasons why one extruder has multifunction include the following three aspects:

①The screw configuration applies combined-type structure, which can provide different shearing forces for materials through changing some simple rod configurations;

②There are sorts of discharge devices and the discharge area of materials can be adjusted as required.

③In production, the processing parameters of the extruder can be adjusted as required.

(2)Uniqueness of the product

Other technologies are difficult in producing some feed products or cannot produce products with certain shapes, however extrusion process can produce them easily.

(3)High-quality product

This extruding operation is extremely effective in high-temperature and short-period processing. It provides improved nutrition with reducing the influences of anti-nutritional factors in products as well as sterilizing..

(4)Effective utilization of energy

Ripening degree of products through this extrusion operation is improved greatly. Compared with the other processing technologies or modes, extrusion can ripen material in a great degree, sufficiently use steam and reduce power consumption, and thus process cost can be saved.

(5)Minimum industrial wastewater

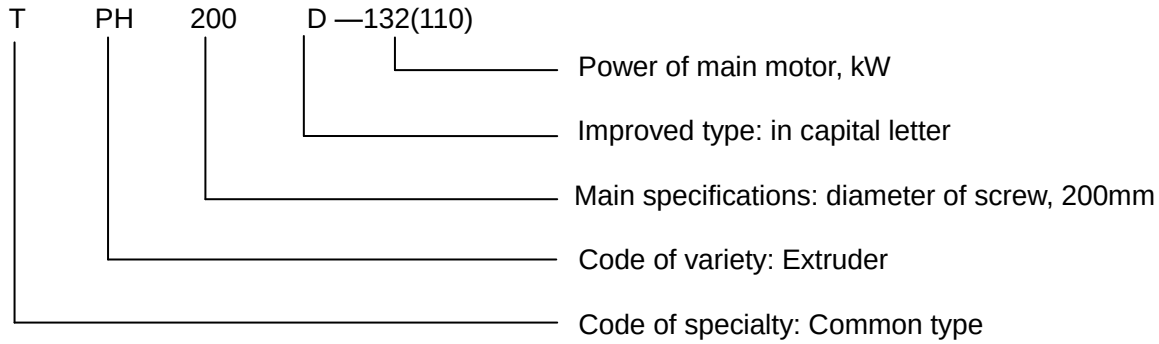
This extruding can effectively avoid industrial wastewater; this is an outstanding advantage for feed manufacturers bearing the increasing pressure for reducing influences of production activities on surrounding environment.

Specifications of the extruder

3.1 Basic Specification

3.1.1 Model description

Model of the extruder is composed of variety code, product specifications, specialty code, improvement Model (as follows).



Transport,installation and adjustment

Transport

Before ex work, whether to use a packing case or not can be determined according to actual conditions.

① If a packing case is not used, rain-proof measures shall be taken and it shall be prevented against collision and overturn of the equipments during transport.

② If a packing case is used, the complete machine and accessories shall be fixed securely in the case and a certain distance shall be reserved from the plate of the packing case, so as to avoid collision and damage in transport. If the height is in excess of the standard, the whole packing shall be separated into parts.

③ During transport, any overturn, intense pressure or collision is not allowed on the machine body.

④ The equipment can be packed in a container for transportation.

Checking

① When the machine arrives at the destination, unpack it and check careful if there is any phenomenon like collision or friction occurs during the transportation.

②Count the documents and accessories attached compared with the packing list.

Storage

① When the machine equipment is to be stored in the open air, the facilities for prevention of rain, sunshine and water accumulation should be available. When the machine equipment is to be stored indoors, the measures for ventilation and damp proof shall be taken.

② The equipment should be stored in ventilated, dry and cool place for long-time storage, and damp proof measures should be taken, the exposed surface without painting should be painted with rust-proof oil.

Maintenance and repair

Safety attention points for inspection, repair and maintenance

Besides those mentioned in Chapter 1, following attention points should be obeyed when carrying out inspection, repair and maintenance.

✓ Whenever inspection, commissioning, repair and maintenance is to be done the power must be totally cut off first.

✓ Directly open operating gates and air inlet only can be done when the power is off and the machine is completely stopped.

✓ Only trained technical personnel is allowed to do works with danger-potential such as parts replacement and repair.

✓ The replacement or maintenance of electric elements should only be done by trained personnel.

✓ The machine can only be started when all protection devices, including cover plate, protecting hood, guard grating , etc.,are installed and in good order functionally.

✓ When the safety guard shields or access doors have to be opened or the safety devices have to be disassembled in order to inspect, adjust, repair and maintain the equipment or replace the parts, please well negotiate about the required safety attention measures and work out the safety countermeasures prior to the operations and then carry out the inspection work.

✓ Be sure that the above said safety devices and guards are installed to their positions after inspection, adjustment, repair and maintenance.

✓ When operation, installation, repair and maintenance, please be sure the execution mark boards [In Process of Maintenance and Inspection] are placed on the workshop gateway, so as to let other people know about it.

✓ Attention! Improper operation and maintenance may cause accident.

✓ The equipment should be cleaned for both inside and outside after each shift of operation. Especially, there shall be no material remained in the extruding chamber, so as to avoid difficult cleaning after the materials cooling down and agglomerating;

✓ The big belt pulley of extruder main shaft should be usually cleaned for preventing dust accumulation; otherwise, unbalance of the belt pulley will cause extruder vibration;

✓ After the new equipment used for one week, the tension of belt shall be checked to prevent belt slipping;

✓ Remove screw head and pressure ring, do not knock heavily. Ensure the flatness and cleanness of the screw and both sides of the pressure ring. Only through this, the material will not be extruded from the contact face, thus to ensure the convenience for the next disassembly.

✓ The machine must be operated in the light of operating requirement, and necessary checking and cleaning should be conducted for each working shift.

Daily inspection and regular inspection

In daily and regular inspection, stop the machine rapidly and take on proper measures in case of any abnormality in machine operation. Re-use the machine after confirming that the machine is recovered to normal operation.

List of daily inspection items

Table 6-1 List of daily inspection items

No.	Position	Inspection item	Cycle	Method	Solution
1	Steam	Check whether the pressure is higher than0.6Mpa before passing through pressure-relief valve	Everyday	Inspection	Increase steam supply pressure
		Check whether the pressure is about2.5Mpa after passing through pressure reducing valve	Everyday	Inspection	Adjust the pressure-relief valve
		Check for liquid leakage	Everyday	Inspection	Exhaust steam and repair
		Check the drain valve for normal working condition	Everyday	Inspection	Exhaust steam and clean
2	Machine	Check for any abnormal noise	Everyday	Listening	Checking
3	Bearing	Check whether the temperature rising is lower than 45℃	Everyday	Thermometer	Checking
4	Motor	Check whether the temperature rising is lower than 45℃	Everyday	Thermometer	Checking
	Motor	Check for any abnormal noise	Everyday	Listening	Checking
5	Reducing motor	Electric current	Everyday	Ammeter	Cleaning
6	Temperature sensor	Check for any abnormality	Everyday	Inspection	Replacing
7	Magnetic separator	Check for any iron impurities	Everyday	Inspection	Cleaning

Note:The basis of electric current in the table above can refer to the table 6-2 check list of rated power and current of motor.

Table6-2Check list of rated power and rated current of motor

No.	Rated power/kw	Rated current/A	Remarks
1	0.75	1.57	
2	1.5	3.69	
3	3	6.8	
4	7.5	15.4	
5	110	197	
6	132	235	

6.2.2 List of regular inspection items

Table 6-3 List of regular inspection items

No.	Position	Inspection item	Cycle	Method	Solution
1	Belt	Cleaning	Once a half year	Inspection	Cleaning
2	Filter	Cleaning	Once a half year	Inspection	Cleaning
3	Circulating lubricant	First oil change	3 months	Inspection	Changing lubricant
	Circulating lubricant	Filling grease	Once 3 months	Inspection	Filling grease
	Circulating lubricant	Changing lubricant	Once a year	Inspection	Changing lubricant
4	Chains and sprockets	Cleaning and adding lubricant	Every month	Inspection	Adjusting
5	Belt and belt pulley	Check whether chain is in good tensioning condition	Every two weeks	Inspection	Adjusting
6	Sealing elements	Cleaning	Every month	Inspection	Cleaning
7	Safety device	Check the warning marks for missing or abrasion	Every month	Inspection	Cleaning
		Safety switch on access door	Every month	Inspection	Cleaning

Note:

(1)The above-mentioned cycle applies 12h a day and 25 days a month. Customers can adjust it by themselves according to actual conditions

(2)Three frequently-used greases for lubricating bearing : ①LITEAEP6-077(ASEOL)

②BEACOMPZ(ESSO)

③ARALUBHLP(ARAL)

Chain: GB492-65Zn-3

Speed reducing motor:ZL-2lithium lubricating grease or ISOV9220

Mechanical maintenance

(1) The discharge mechanism should move flexibly, and the joint parts should be brushed with proper amount of machine oil.

(2) Lubricating grease should be replaced regularly for each bearing; the lubricating grease applied should be the sodium base grease(GB492-65)Zn-3.

(3) Chain for driving shall be coated with enough 30# machine oil and be cleaned regularly to ensure the chain is in good lubricating condition.

(4)Lubricating of reducing motor. Grease type: molybdenum sulfide -2 or ZL - 2 lithium base grease. For the detail lubricating amount and maintenance of the reducer please refer to Operation Manual of Speed Reducer. Before the machine leaves the plant ZL-2 lithium base grease has been added into the geared motor, so it is not necessary to add lubricating oil any longer, otherwise, there may be oil leakage at the end cover. If using the Mitsubishi lubricating oil , adopt model ISO VG220 ; Some of the existing models installed the gear reducer should be lubricated with thin oil , model ISO VG220 .

(5) If the equipment to be out of use for a long time, it needs to make a complete cleaning and take measures for corrosion and rust prevention.

(6)The residual materials inside and on the surface of the machine shall be cleaned regularly to prevent against corrosion.

(7)Lubrication of chain: chain drive is used at one side of the discharge outlet of the conditioner; lubrication of the drive chain at this position shall be done once every month.

Malfunction and troubleshooting

Table 6-6 Malfunction and troubleshooting

Trouble	Causes	Troubleshooting
1,material cannot be discharged from the outlet of extruding chamber when processing soybean	a) Foreign matter is chocked in the die holes, causing blockage. b) Too slow feeding speed(less than8Hz) c) Too small steam flow d) Too much water addition	a) Stop and chean b) Increase the feeding speed c) Increase the steam flow d) Check the steam and water valve
2.the extruded soy flour mixed with beans when processing soybean	The raw materials have not been grained or the grinding particle size is too big	Change for the sieve with smaller diameter of grinder
3.the temperature of extruding chamber cannot meet the rated temperature	a) Too small diameter of pressure ring or low temperature of conditioning without steam b) pressure ring or screw head is worn	a) change for bigger pressure ring or increase the temperature of conditioning,the materials temperature shall reach above 90°C after conditioning . b) replace the pressure ring or screw head
4.materials cannot be discharged or materials become paste when processing powdery feeds	Too big or too small pressure of steam and water flow or steam flow	Adjust the pressure of water and steam
5.Throughput decreases	a) pressure ring or wear is worn; b) screw head is serious worn	a)Replace wear ring or pressure ring b) Replace screw head
6.Material cannot be discharged suddenly after normal operation	a) Excessive short-time feeding b) The discharge hole is blocked by foreign matter c) Material cutting-off or bridging in feeding bin	a) Reduce the feeding speed b) Stop, disassembly and clean c) Feeding or break the material bridging
7.the diameter of extruded corn pellets are too small or too big	die holes at feeding section are too small or too big	Choose the suitable size of die hole as required
8 the extruded soy flour squirted out from the feeding inlet when processing soybean.	a) Too much or too fast feeding b) Difficulty discharging or blocked feeding c) The unsuitable assembly of screw head and pressure ring d) The extruding chamber is serious worn	a) Control the feeding speed and feeding amount b) Adjust the distance between the discharging plug screw and end shaft taper screw according to trouble1. c) Reassemble after inspection d) Replace the extruding chamber
9. products are blocked before discharging from the die hole	a) The pellet size of raw material is bigger relative to the size of die hole b) The water is too little to make	a) grind the raw materials b) increase the initial flowrate and add water before the product entering the chamber c) Layout in an reasonably way

	the materials flow c) Structural architecture of extruding chamber is irrational d) The diameter of pressure ring may too big	d) Change for the pressure ring with smaller diameter
10.Poor product forming	a) Improper raw material formula b) Over-high or low processing Temperature c) Unstable feeding d) Over high or over low moisture content in product e) Blade is worn f) Too large grinding particle	a) Change formula of raw materials b) Recombine the components in machine barrel c) Adjust to even feeding d) Reduce or increase moisture or steam addition volume e) Replace blade f) Grind the raw materials further to reach the defined particle

Tools for repair and maintenance

Table 6-7 Tools for repair and maintenance

No.	Tool name	Spec.	Function
1	Spanner for plug screw adjustment	TPHE01110087	Adjust the discharge plug screw（for extruded soybean only）
2	Hexagon spanner (cross flats:97)	TPHE01111431	Rotate the main shaft
3	Screw assembly tool	TPHE01191300	Disassemble screw
4	Torque wrench		Hexagon socket head cap screw on chain wheel of taper sleeve, according to the parameter list of chain wheel of taper sleeve for the moment of force
5	Hook spanner		Tightening the round nuts of bearing pedestal.
6	A group of inner hexagon spanner	Width (mm)：4～22	Tightening bolts
7	Double-ended wrench	Opening width (mm): 8×10, 12×14,17×19	Tightening bolts and nuts
8	Monkey wrench	Maximun opening width(46mm)	Tightening bolt M24 on motor base
9	A group of socket wrench		Common bolt
10	Chain block (2T)		Hoisting or lifting heavy parts
11	Steel rope		Used for heavy parts
12	Scissors		Cutting
13	Screwdriver		Tightening bolts
14	Ammeter		Measuring the current of motor
15	Thermometer		Measuring the temperature of motor and bearing
16	Knife		Cutting
17	Vernier caliper		Length measuring
18	Flexible ruler		Length measuring
19	Long straight ruler		Length measuring
20	Oil gun		Filling oil
21	Iron hammer		Knocking
22	Rubber hammer		Knocking
23	Portable electric driller(0～13mm)		Drilling hole
24	Electrical heating device for bearing		Heating bearing
25	Retainer pliers		Retaining rind disassembling
26	Glass cement gun		Filing glass cement

27	Multimeter	Resistance, voltage	Measuring
28	Hearing needle		Checking
29	Scraper		Cleaning
30	Metal bush		Cleaning
31	Air gun		Cleaning
32	Barrel	20L/piece	Cleaning (bearing, etc.)
33	Tension force tester		Belt tension detection

6.6 Long-term stoppage

If the machine is to be halted for a long time, it must be thoroughly cleaned both inside and outside and the dustiness must be removed to avoid rusting of the machine and aging of rubber parts.