

# Safety

## Personnel Protection: countermeasures against accident

- All the mechanical equipments manufactured by Jiangsu Muyang Holdings Co., Ltd are equipped with safety devices, which are consistent with National and European safety standards prior to ex works, so that the customers can use the machines in accordance with the regulations. The enterprises are obligated to execute following regulations to guarantee operators' safety.
- The guard hoods of the machine must be mounted and kept in good working condition. It is very dangerous when they are opened or disassembled. It may cause personnel injury accident.
- The safety limit switches, interlocking electromagnetic switches, revolution monitors and others should always be kept in good order. Overlap or discard of the safety limit switches is not allowed.
- The cover plate grating, access door, guard shields and others 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.
- **The driving motor must be switched off completely to make the machine stop when carrying out inspection, commissioning, repair and maintenance.** This can be realized through a full-phase separating and lockable switch installed near the machine or on control panel of the pellet mill on job site. It is not enough only to screw off the fuse wire!
- If 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.
- 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. And the machine can only be started by re-closing the main switch first.
- If some machines are equipped with a local shutdown system, especial care should be taken. Read the instruction manuals attached with the machine carefully.
- 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.
- The cleaning, maintenance work 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!**
- 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.
- 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.
- In 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.

- Please execute the special regulations on accidents prevention in the operation manual provided by us. Only the trained professionals are allowed to operate the machine and equipment manufactured by our Company.

- Environmental protection measures

Any machine has a certain service life. If you decide not to use the machine any longer because its service life is over or for other reasons, the machine should be disposed according to local relevant laws, and at the same time, the measures for environmental protection and reutilization should be taken: Drain the liquids inside the machine (like motor oil, gearbox oil, brake oil and coolant etc.) into special containers. The plastic parts and metal parts shall be classified and sent to a special plant for disposal.

## **Explosion Protection: Countermeasures against dust explosion and fire hazard**

### **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, cyclone separators and dust collectors should be kept in good condition to minimize the density of dust in air on site.
- 4) In order to reduce dust explosion hazard, dust everywhere must be cleaned out frequently and effectively.
- 5) Keep motors and safety switches free of deposited dust.

### **Frequency inspection and maintenance**

- 1) Regularly check the safety devices such as safety limit switch, interlocking electromagnetic switch, speed monitor or the like at least once a week.
- 2) Clean the wet material deposit inside the pellet mill access door timely, thus to prevent it from entering the finished product, avoiding any loss caused due to mildew.
- 3) Regularly check the cleaning magnet plate, at least once a day.
- 4) In order to guarantee the safety operation of the machine and prolong its service life, it is necessary to check the clearance of all bearings at least once a week, especially the bearing of the press roller, and fill lubricating oil (grease) according to the regulations.

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

- 1) It is forbidden to use any flashlights and other lamps without shielding or explosion-proof glass.
- 2) It is necessary to immediately repair or replace the electric apparatus and equipment if any failure occurs.
- 3) The cables without conduits are not allowed to be installed on the floor.
- 4) Cut off the power supply of the machine when going off work
- 5) An 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.
- 6) Rat proofing

## **Smoking and welding**

- 1) Smoking is forbidden on working site, which is applicable to all workers and staff of the enterprise as well as guests, customers, foreigners and drivers visiting the factory.
- 2) If 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.
- 3) If 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. The 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.
- 4) Welding 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, so as to prevent it from connecting to the other conveying equipment, storage bin 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 bins.

### **Effect of static electricity**

In order to ensure the safety of electric circuits and avoid explosion resulted from spark discharge, the paint coat at the electric connections must be removed, so as to make them earthed reliably.

## **Safety specification for operation of pellet mill**

- 1) This pellet mill shall be operated by trained and designated workers.
- 2) The main power supply must be cut off when making repairs and maintenance work, and it is forbidden to open the access door till the equipment is stopped completely.
- 3) 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 pellet mill have been completely stopped.
- 4) Wear protective gloves (max. temperature of ring die, press roller and other parts can be high up to 100°C), safety shoes with steel plate and safety helmets when making repairs and maintenance work.
- 5) Do not remove the guard shields of the machine when it is running.
- 6) 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
- 7) The electric control device provided by Jiangsu Muyang Holdings Co., Ltd is an integral part of the Accident Prevention Safety Plan, The control device must be checked by the expert of Muyang before starting up and the approval (operation) certificate should be signed by him. If any control system used

for the equipment produced by Jiangsu Muyang Holdings Co., Ltd is provided by a third party, it shall be manufactured according to the specifications of Muyang Holdings Co., Ltd and shall be checked carefully and approved in writing by an expert from Muyang Holdings Co., Ltd before startup. If the control system for Muyang machinery is not provided as per the quality standard, the Muyang Holdings Co., Ltd will refuse to take any responsibility and the Muyang Holdings Co., Ltd will reserve the right to investigate and affix the responsibility of the operator.

8) The interlocking limit switch is installed for the access door of Pellet Mill, the strict wiring must be ensured for cutting off the switch when opening the door and the equipment cannot be started up when the door is opened. Owing to the fact that this safety mechanism is related to life safety, it can never be removed or discarded! Whenever there is anything wrong with this mechanism, it should be repaired or renewed promptly.

9) Electric installation and the treatment of conducting parts can only be done by specialized persons in accordance with the related electric safety standards.

**10) Keep the safety devices of Pellet Mill in good condition and regularly check their function, for instance once a month.**

11) When the machine is under stoppage, attention must be taken to prevent the machine from being started by any accidental starting mode.

12) Before the electric circuit is cut off, it is strictly prohibited to open the junction box for avoiding electric shock.

### Description of safety marks

1. Beware of electric shock: Do not open the junction box until the power supply is cut off.

	<p>未断电时, 禁止打开接线盒</p> <p>Do not open the junction box until it is switched off to avoid electrical injury.</p>
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2. Carry out repair and maintenance according to the Operation Manual.

	<p>按照说明书维修</p> <p>Maintaining according to the operating manual.</p>
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3. Beware of Mechanical injuries: Do not open the operating gate when the machine is running and it has not been completely stopped.

	<p>机器运行及未完全停止前 禁止打开操作门 Do not contact running parts with hands when the machine is running. The inspection, repair, disassembly or replacement etc. can be carried out only after the machine is stopped.</p>
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4. Beware of scalding: Do not touch the machine with bare hands when it is normally working.

	<p>机器正常工作时, 请勿 徒手触摸 Do not touch the machine with bare hands when the machine is running.</p>
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5. Do not remove the guard shield when the machine is running

	<p>机器运行时, 禁止移走护罩 Do not remove the safety guard when the machine is running and not completely stopped.</p>
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6. Do wear protective gloves according to regulations when inspecting and repairing the equipment.

	<p>维修机器时, 请按规定戴手套 Wearing gloves during maintenance.</p>
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7. Do not climb or stand on the equipment.

	<p>不要攀爬或站在机器上 Do not climb or stand on the machine.</p>
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## Noise

- 1) The noise level of this machine (sound pressure level)  $\leq 110$  Db (A);
- 2) The foundation for installing the equipment should have a sufficient strength and rigidity, and also proper vibration dampers shall be installed for reducing the noise caused by vibration.
- 3) Also the noise will be caused due to installation precision of the rotary parts of the machine, such as installation precision of the ring die, the clearance between the press rollers and ring die, etc. It will be described below.
- 4) Wear an ear protector when working near the pellet mill for long time.

## Brief

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### General

- Muyang MUZL2010A Pellet Mill is an advanced machine for producing pellet feed. The entire manufacturing process is fully in line with international technical standards.
- A double-motor, V-belt driving system is adopted for this machine type, which is characterized by its ideal drive ratio, great driving moment, smooth rotation, high throughput, low noise, easy operation and maintenance.
- A patented technique of automatic roller adjustment system characterized by easy operation and precise adjustment is adopted for this machine. So that the clearance between the press rollers and ring die can be adjusted just by the auto-control system according to the characteristics of raw materials, thus effectively controlling the pellet quality and greatly prolonging the service lives of the ring die and press rollers.
- A hydraulic system for rapid die assembly and/or disassembly is used for this machine, which can realize quick replacement of the ring die, benefiting shorter replacing time as well as lower labor intensity, and ensuring the precision of die installation.
- This type of machine can be fitted with many kinds of ring dies with  $\phi 1.5\sim\phi 12$  die holes and different thickness, and the user can select based on self demand for achieving the optimum technical and economic efficiency.
- This machine, characterized by its stable running performance, high throughput and high pellet forming ratio, is applicable for producing pellet feeds for livestock, poultry as well as aqua animals.
- The adjustable speed control motor is adopted for feeding of this machine, and the machine is equipped with an overload protection device and an outside discharging mechanism, and the bypass gate can be opened automatically in case of overload of the main motor.
- Different type of conditioners are optional as required, such as single-, double- and triple-pass conditioners as well as a different diameter cylinder conditioner.

### Application and adaptability

Application: This pellet mill is specially used for animal feed processing, generally for processing powdery, flowable and easily pelletized materials into feed pellets for poultry, livestock and fish.

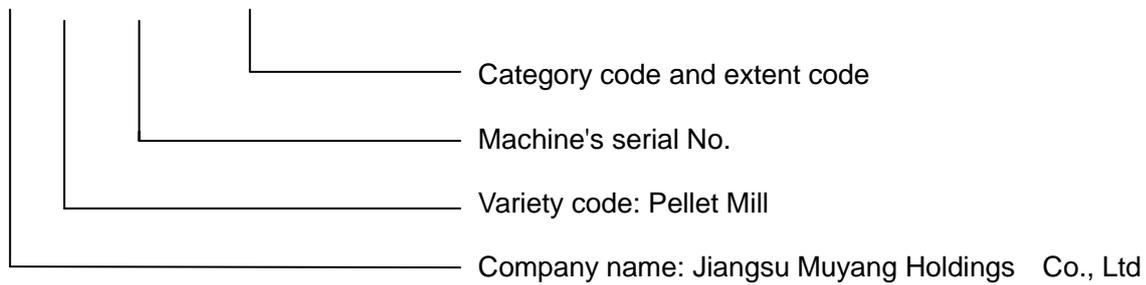
Do not use it for food processing.

To ensure safety and efficiency, this machine shall be used in the areas with an altitude lower than 1000 m, a temperature from  $-5^{\circ}\text{C}$  to  $40^{\circ}\text{C}$  and an air relative humidity from 30% to 95%.

If the environment of the region to be served does not accord with the above conditions, please specify when ordering.

## Meanings of the model

MU ZL 2010 A □



## Transport

### Transport regulations

A crane shall be used for unloading and transporting of the pellet mill.

Please use the hoisting machine rope for unloading and transport of pellet mill.



The pellet mill can only be transported flatly!

### Requirement of storage

If the machine or components can not be immediately installed after arriving job site, they should be stored carefully in a place of no-vibration and safety, and should be covered correctly to prevent dust and moisture from entering into the machine. If the machine is stored in open air, they should be shelved on the wood.

Do not place them directly on the ground.

## Malfunction and troubleshooting

**Table 5.1 Malfunction and troubleshooting**

No.	Trouble	Cause	Solutions
1	Feed cannot enter ring die.	<ol style="list-style-type: none"> <li>1. Bridging at the inlet of the feeder</li> <li>2. The conditioner is clogged</li> <li>3. Failure of the feeder driving device</li> </ol>	<ol style="list-style-type: none"> <li>1. Vibrate or clean the inlet</li> <li>2. Clean the conditioner</li> <li>3. Check the driving device for feeder</li> </ol>
2	Material can enter the ring die, but cannot be pelletized.	<ol style="list-style-type: none"> <li>1. The press rollers and ring die are worn</li> <li>2. Too many die holes are clogged</li> <li>3. The feed formula is changed</li> <li>4. The clearance between the press rollers and ring die is too large</li> <li>5. Improper water content in feed</li> </ol>	<ol style="list-style-type: none"> <li>1. Replace the press rollers and ring die</li> <li>2. Remove the feed and impurity from the die holes</li> <li>3. Install the ring die properly for the feed formula</li> <li>4. Readjust the clearance between the press rollers and ring die</li> <li>5. Adjust steam amount correctly</li> </ol>
3	The pellet mill can't be started up.	<ol style="list-style-type: none"> <li>1. The press rollers and ring die in pelletizing chamber are clogged.</li> <li>2. The limit switch cannot contact with brake disc or operating arm on gate.</li> <li>3. Circuit failure</li> </ol>	<ol style="list-style-type: none"> <li>1. Remove the feed from the pelletizing chamber.</li> <li>2. Check the limit switch for mounting status.</li> <li>3. Check the electric circuit</li> </ol>
4	Load on pellet mill fluctuates unreasonably or the pellets quality is nonuniform.	<ol style="list-style-type: none"> <li>1. Steam supply is not enough or the pressure is changed</li> <li>2. Unstable conveying of material</li> <li>3. Deflecting plate scraper is worn which causes uneven feeding.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check the steam pipelines</li> <li>2. Adjust the feeding speed</li> <li>3. Replace the deflecting plate scraper</li> </ol>
5	Pellet mill is stopped during working.	<ol style="list-style-type: none"> <li>1. Tension of V-belt is not enough which makes the speed controller act.</li> <li>2. The parameter setting of speed control instrument is unreasonable.</li> <li>3. V-belt is worn partially or completely or broken.</li> <li>4. The main shaft is rotated due to overload or impurity blocked between press roller and ring die, the limit switch is released.</li> <li>5. Circuit failure</li> </ol>	<ol style="list-style-type: none"> <li>1. Readjust the tension of V-belt or check the pressure value on the pressure gauge of hydraulic system, reset the pressure value if necessary (Take care when adjusting).</li> <li>2. Reset the parameter.</li> <li>3. Replace the V-belt completely instead of partially.</li> <li>4. Reset the main shaft and limit switch.</li> <li>5. Check the electric circuit</li> </ol>
6	The pellet mill is clogged frequently.	<ol style="list-style-type: none"> <li>1. Deflecting plate scraper is worn and material is distributed unevenly.</li> <li>2. Press roller is worn.</li> <li>3. A press roller gets stuck.</li> </ol>	<ol style="list-style-type: none"> <li>1. Replace with a new deflecting plate scraper.</li> <li>2. Replace with a new press roller.</li> <li>3. Check the press rollers.</li> </ol>

		<ol style="list-style-type: none"> <li>4. The installation location of deflecting plate scraper is incorrect.</li> <li>5. The moisture content in feed is too high.</li> </ol>	<ol style="list-style-type: none"> <li>4. Reassemble the deflecting scraper.</li> <li>5. Decrease the moisture content if feed mash.</li> </ol>
7	Pellet mill is smoking.	<ol style="list-style-type: none"> <li>1. The scraper is worn and there is a layer of hard material formed between the supporting plates of the press rollers and rotors.</li> <li>2. Tension of V-belt is not enough.</li> <li>3. Hard material deposited behind the back supporting plate, which makes the main shaft lack of lubrication.</li> </ol>	<ol style="list-style-type: none"> <li>1. Install a new scraper.</li> <li>2. Tighten the V-belt.</li> <li>3. Clear away hard material and lubricate the main shaft till lubricating grease overflows from the back supporting plate.</li> </ol>
8	Ticks are heard when the pellet mill rotates every circle.	Metal impurity in the ring die	Check the inner surface of ring die and clear away metal impurity.
9	V-belt is slipping when under full loading or slightly overload a bit	<ol style="list-style-type: none"> <li>1. Tension of V-belt is not enough.</li> <li>2. The length of V-belt in a group is different.</li> <li>3. V-belt is contaminated by grease.</li> <li>4. Wrong location of V-belt</li> <li>5. The external form of V-belt is incorrect</li> </ol>	<ol style="list-style-type: none"> <li>1. Readjust the tension of V-belt</li> <li>2. Replace with a group of belt in the same size.</li> <li>3. Clean the V-belt and belt pulley.</li> <li>4. Correct the motor and middle belt pulley.</li> <li>5. Use qualified V-belts.</li> </ol>
10	Output of the pellet mill is not enough, but the main motors have already worked in full load.	<ol style="list-style-type: none"> <li>1. Too much steam (only for materials sensitive to temperature and humidity)</li> <li>2. The ring die is too thick</li> <li>3. Bad steam quality and too much water content</li> <li>4. Material is not sufficiently conditioned</li> <li>5. The clearance between the press roller and ring die is too big</li> <li>6. The press roller and ring die are over worn</li> <li>7. Bad formula or too big grinding pellet</li> </ol>	<ol style="list-style-type: none"> <li>1. Reduce the steam amount</li> <li>2. Use the ring die with a depth proper for material</li> <li>3. Readjust the steam supply system</li> <li>4. Increase the steam amount or the delay conditioning time</li> <li>5. Readjust the clearance</li> <li>6. Replace the press roller and ring die</li> <li>7. Adjust the formula or replace with a sieve with small aperture</li> </ol>
11	The ring die is broken when worn to a certain degree.	<ol style="list-style-type: none"> <li>1. Foreign material in press die</li> <li>2. Ring die is too thin.</li> <li>3. The Driving flange of ring die is worn.</li> </ol>	<ol style="list-style-type: none"> <li>1. Perfect the cleaning of material.</li> <li>2. Use a thicker ring die with shoulder holes.</li> <li>3. Check the abrasion of driving flange of ring die and the fastening blot is locked or not, replace the driving flange of ring die if necessary.</li> </ol>
12	The bearing of the press roller is vulnerable.	<ol style="list-style-type: none"> <li>1. There are hard foreign materials in the feed.</li> <li>2. The clearance between the press</li> </ol>	<ol style="list-style-type: none"> <li>1. Perfect the cleaning of material.</li> <li>2. Adjust the clearance between the press roller and ring die.</li> </ol>

	roller and ring die is too small. 3. Improper lubricating grease is used. 4. Lubricating grease applied for press roller is insufficient. 5. Bad bearing end cover and seal ring are used. 6. Unqualified press roller bearings provided by other manufacturers are used.	3. Apply lubricating grease as designated. 4. Apply enough lubricating grease as designated 5. Replace the end cover of bearing and seal ring. 6. Use bearings provided by regular manufacturer
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## Maintenance and repair

Proper maintenance is essential for normal operation of the pellet mill and failure reducing.

### Cleaning

To keep all rotating components clean is very important, so it necessary to thoroughly clean following components regularly:

**Table 6-1 Cleaning positions and methods**

Cleaning position	Cleaning method
Press roller, front plate, deflecting plate, main shaft disc, cutting knife, ring die, driving rim of ring die and pelletizing chamber.	Cut off the power whenever check or replace the components or assemblies in the pelletizing chamber or make maintenance, and then clean these components, especially the ring die, die clamp, press rollers and matched surface of main shaft disc, press roller and main shaft disc.
Feeding chute and by-pass gate	Use proper tools to clean away hard material deposited here weekly.
Hydraulic device	Thoroughly clean the hydraulic system with jet airflow every week.
Pellet mill body (fasteners for ring die, rotor etc.)	Clean away dirt, material or fat possibly dropping into the chamber monthly.
Inner chambers of conditioner and feeder	Open the access doors of conditioner and the repair gate of feeder to carry out checking and maintenance works once a month.
V-belt hood	Clean away dirt or material on the hood monthly.

### Lubricating

#### Selection of lubricating grease

Lubricating grease selected shall be fit for the working conditions of pellet mill since it is working with great load, severe vibration, high temperature and in corrosive environment.