

Manual of Sawdust briquette machine

一、 Use and characteristics of the sawdust briquette machine:

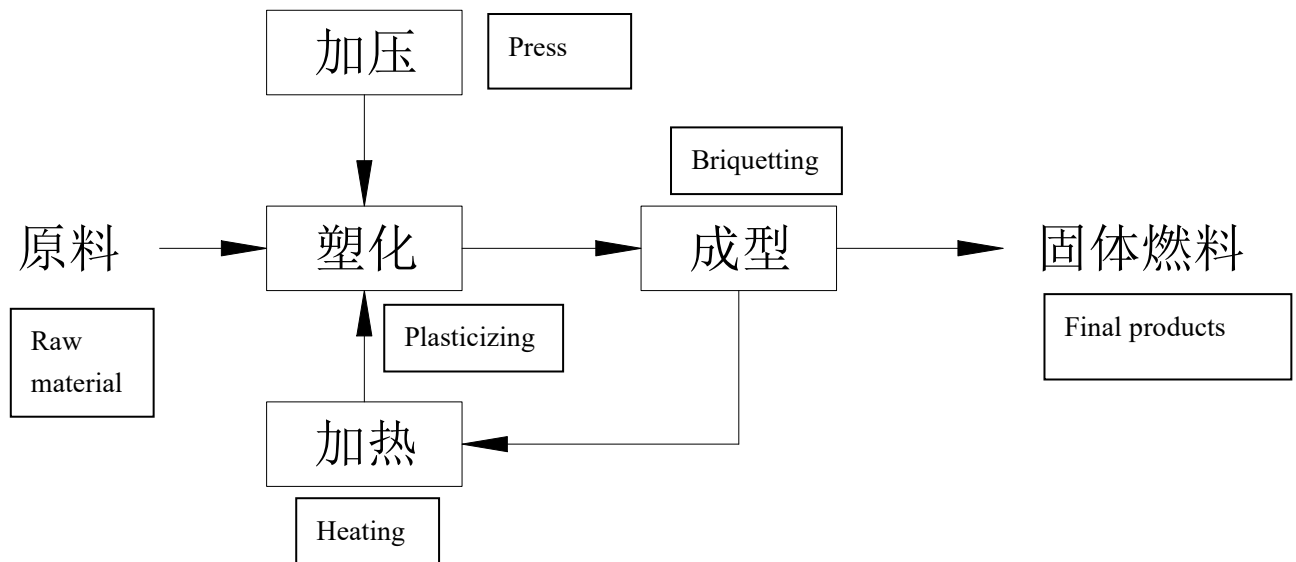
This machine uses bamboo (wood) chips, rice husks, peanut shells, shavings, bagasse and other wood materials (without any binder) to make hollow rod-shaped solid fuel (machine-made charcoal) under high pressure. .

This machine adopts a temperature adjustment indicator, which can operate stably at the set temperature, and has the advantages of reasonable structure, simple operation and maintenance, etc. The solid fuel (machine-made charcoal) produced by this machine is easy to catch fire, has a high calorific value (more than 20% higher than that of ordinary wood), has less pollutants when burned, and has a large specific gravity, which is convenient for storage and transportation. It can make full use of agricultural and forestry surpluses, and alleviate the tension of my country's agricultural and forestry energy.

二、 Working principle:

This machine utilizes the inherent characteristics of wood raw materials, through screw extrusion, under high temperature and high pressure, the lignin in the wood raw materials is plasticized to combine the fine fibers to form a rod-shaped solid fuel.

Working principle drawing:



三、 Specifications:

- 1、 Power: 18.5-22kw 380v 50Hz
- 2、 Heating power: 6kw

- 3、 Heating temperature: 260——380℃
- 4、 Dimension: Length X width X Height
2270X600X1580MM
2390X680X1780MM
2390X680X2150MM
- 5、 Weight: 630kg (V型)、680kg (VI型)、780kg (VII型高架)
- 6、 Raw materials' requirement:
 - (1) Moisture: 8--12%
 - (2) Size: \leq 3-6mm
- 7、 Performance:
 - (1) Final products: diameter: 46-50mm inner diameter: 10-20mm length: adjustable
 - (2) Density: 900—1300kg/m³
 - (3) Calorific value: 4000—5000kcal/kg

四、 Machine picture:





五、 Daily operation:

Before starting:

1. Check or add the oil level of the machine, generally add about 750ml of oil;
2. Tighten all screws, especially the screws at the flange of the forming cylinder, to ensure that the forming cylinder is fastened and parallel;
3. According to the above circuit diagram, connect the power line, heating line, thermocouple, etc. of the rod making machine; start the machine and run without load and check the corresponding operation buttons of the equipment, green (forward rotation), red button (stop), yellow button (reverse) ; No-load start-up operation for 10 minutes, no jams, bumps and other abnormal phenomena, when an abnormality is found in the test machine, you must stop immediately, find the cause, and perform no-load operation after troubleshooting.
4. Adjust the preset temperature, the boot temperature of the rod making machine is generally between 260-380°C. According to different materials, the preset temperature of rice husk is generally about 260-290°C, and other materials are adjusted according to the hardness of the material. The harder the material, the higher the temperature is about 10°C; under normal circumstances, the set temperature of rice husk can be preset Set it to about 260°C, and the general hardwood sawdust can be set to about 350°C, and then adjust it appropriately after starting the machine.
5. Check the machine forward and reverse rotation; method: press the green start button, wait for the machine to run normally, grab a little sawdust and throw it into the hopper, if the material goes back, the rod machine is reversed; if the material is forwarded, it will rotate forward; if it is

reversed, Turn off the power supply air switch in the cabinet, and switch any two of its output ends (the red button on the cabinet door is the stop button).

6. Check the dry humidity of the material. The dry humidity of the material is maintained at 8%-12%, which must meet the requirements of rod making.

Power on:

The factors affecting the operation of the rod making machine are: raw materials, the setting temperature of the temperature control meter, the welding angle of the propeller shaft, the degree of wear of the forming cylinder, the clearance fit between the propeller shaft and the forming cylinder, the degree of wear of the thermocouple, the bracket sleeve, etc. ; The most important setting temperature, the welding angle of the propulsion shaft and the clearance fit between the propulsion shaft and the forming cylinder.

When the thermostat of the rod making machine reaches the preset temperature, press the green start button to turn on the machine. After idling for about 5 seconds, put a small amount of dry wood chips into the hopper evenly. At this time, the feeding speed should not be too high, and the material will always cover the spiral Prevail, uninterrupted. Observing the great situation, there will be the following 3 situations:

1). If the rod is ejected too quickly or the color of the rod is black, it means that the preset temperature is too high. At this time, shut down first (press the red button) → press reverse after the equipment stops (press the yellow button, run for 5 seconds) → press Shut down (press the red button), adjust the temperature and propel axis according to the following (temperature control 1) method.

2). If the speed of the stick or the stick is too slow (the stick is too light and the device runs hard), it means the temperature is too low; at this time, turn off the machine (press the red button) → press reverse after the device stops (press the yellow Press the button, run for 5 seconds) → press shutdown (press the red button), and adjust the temperature and propulsion axis according to the following (temperature control 2) method.

3). When the color of the output rod is brown and the density of the rod meets the requirements, it means that the temperature and the angle of the propelling shaft are both OK. At this time, you can continue to feed the hopper, you can fill the hopper, don't stop the equipment, let the equipment continue to run . Workers are required to monitor next to the equipment. If a jam occurs, shut it down first (press the red button) → press reverse after the equipment stops (press the yellow button and run for 5 seconds) → press shutdown (press the red button, and check if there is something in the hopper after the equipment stops. No lumpy materials, sometimes need to be removed in time)→Adjust the temperature control meter to 5°C→Press the forward rotation after heating up (green button)→After ten rods are drawn, the temperature will be lowered by 5 degrees and the rods will be produced normally.

temperature control

The temperature control should be adjusted according to the different materials. Generally, the harder the material, the higher the temperature requirement; when a material is operated three times, the heating temperature of this material can be grasped; generally, the heating temperature of this material should be adjusted each time the machine is turned on. Corresponding to the heating temperature of the material is 5°C, because the resistance of the rod will be larger when the machine is turned on, which is convenient for the rod. After the rod is released normally (usually about 3 minutes), lower the temperature by 5°C.

1. If the discharge speed of the rod making machine is fast, the rod is not strong, and the color of the rod is black again, it indicates that the heating temperature is too high; at this time, the temperature control meter should be adjusted to lower the temperature control meter by 3°C. Observe the situation after 3 minutes after the stick is out. If the color of the stick is still black, continue to cool down according to the above cooling method until the color of the stick is brown. However, the temperature of the rod making machine should not be too low.

2. If the rod making machine does not discharge the rod or the discharge speed is slow (the color of the rod is light or the equipment is running hard), it means that the heating temperature is low. At this time, the equipment should be stopped according to the method above (starting 2) After that, adjust the temperature control table to increase the temperature control by 5°C. After the temperature rises, press the forward rotation (green button) and observe the rod for 5 minutes. If the temperature is still low, continue to raise the temperature according to the above method. Exceed 5°C until the rod is normal.

Downtime

When the machine is stopped, the remaining material in the hopper should be basically discharged, and then press the red stop button. After the equipment stops, press the yellow button to reverse for 5 seconds to exit the material contained in the propulsion shaft. After stopping, the heating ring needs to continue to work for 10 minutes. (Make the remaining rods in the sleeve charcoal for the next startup) and then turn off the power.

六、Screw repair:

The repair of the propulsion shaft is the most critical factor in the production of the rod making machine; the angle of the propulsion shaft affects the quality of the rod. Due to the high pressure in the production of the rod making machine and the high temperature of the heating ring, the tip of the propulsion shaft The wear of 3 turns will be very serious. Therefore, it is necessary to repair the worn part of the thruster in time; to repair the thrust shaft, master the repair skills of the thrust shaft.

When the following conditions occur in the rod making machine in production, the propulsion shaft should be repaired or adjusted:

1. When the stick production speed is obviously too fast, too slow or not sticking;
2. When the dryness and wetness of the raw materials and the temperature control meet the technical requirements, the rod making machine often gets stuck and cannot produce normally;
3. It can be formed when the rod is drawn, but it can be separated from each other and cannot be connected together;
4. The rod is produced quickly, but the structure is loose and the density is too low;
5. The wear of the front section of the thruster is less than 4mm;
6. The inner hole of the finished rod is less than 10mm;
7. The screw part of the propeller is worn out due to falling stones, metals, etc. or other reasons.

Repair method:

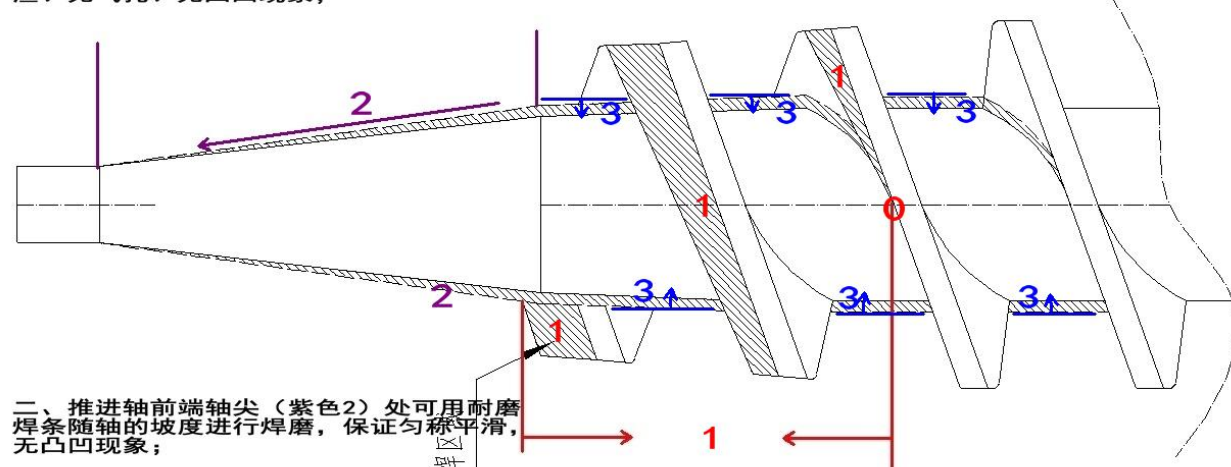
1. Preheat the front end of the thruster that needs to be welded to a temperature of about 200°C.
2. Tungsten carbide wear-resistant electrodes are generally used, and layered surfacing is carried out according to the wear of the front corner of the propeller. For each layer of surfacing, the welding slag must be removed before welding the second layer. The overall thickness of the surfacing welding should exceed the required thickness by 1-2mm, and the welded propeller should not have defects such as slag inclusions and pores.
3. After welding, insert the welded part into dry quicklime or plant ash, and the insertion depth is more than three leads for cooling.
4. Take it out after cooling to below 50°C, and grind it on a green silicon carbide grinding wheel. Do not use excessive force or local overheating during grinding. Cooling with water or other liquids is strictly prohibited.
5. When grinding, the rake angle at the 360° circumference of the spiral end increases gradually and uniformly from 2° to 22° ± 1.5° at the end. During this period of rising of the rake angle, there must be no Phenomena such as unevenness or unevenness.

If the long cylindrical part of the shaft head wears more than 6mm, repair it according to the following process:

- (1) Preheat to about 200°C according to the previous welding process, and use J422 carbon junction electrode to surfacing uniformly on the outer surface of the cylindrical part of the shaft head, which exceeds the original size of the outer circle by 1mm-2mm.
 - (2) Insert dry quicklime or plant ash and cool to below 50°C for grinding. After grinding to the original size, the concentricity should not exceed 1mm, and the surface should be smooth and without obvious unevenness.
6. The polished propeller should not be knocked or collided to avoid damage to the surfacing surface and other parts. It should be stored carefully for use.

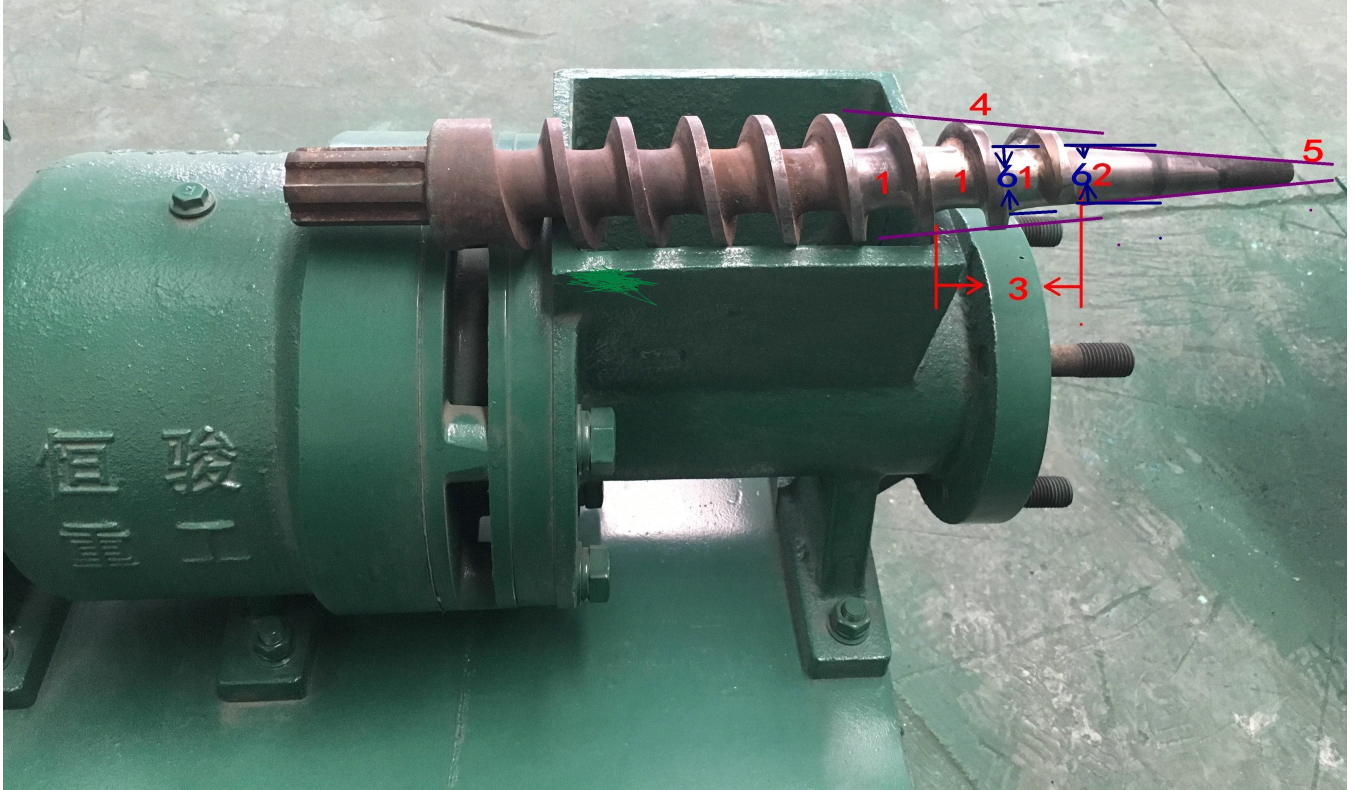
推进轴的修复要点

一、推进轴旋的前端红色1区域（从轴的最前端向后360°一圈0处起）开始用JD公司指定耐磨焊条进行焊磨；仰角由0处的2°起逐渐均匀增加到最前端的22° ± 1.5°，保证焊磨的平滑匀称，无焊渣、无气孔、无凸凹现象；



JD推进轴的修复要领一

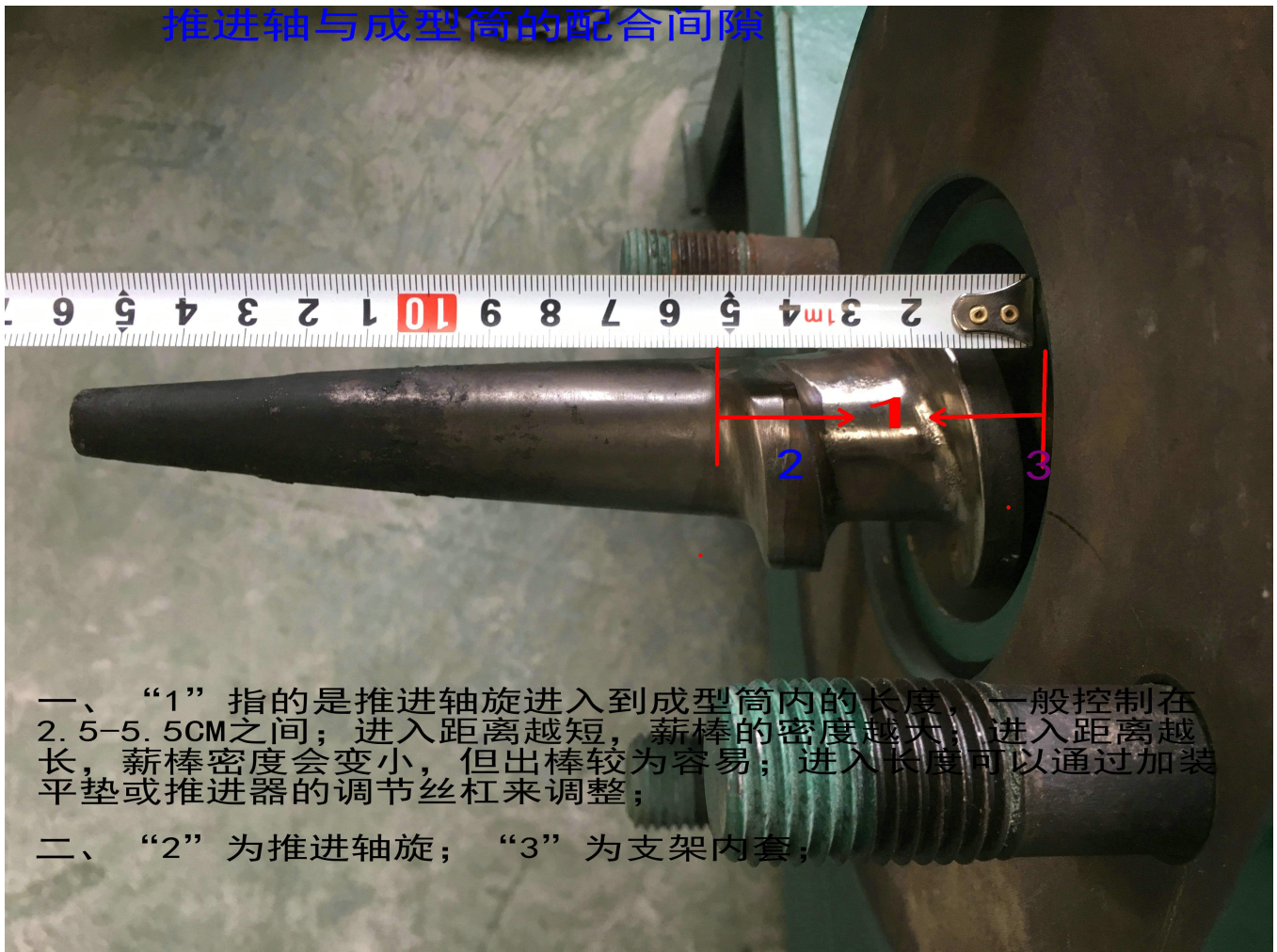
- 一、焊接区域：“1、2”处（轴心）可用焊条适当复焊，提高耐磨度，要保障打磨平整光滑；“3”处（前端旋）约前端一圈半最受力部分由后向尖逐渐加厚；
- 二、保证两锥度一致：“4”处前3旋和“5”处尖部的360度锥度必须保证平滑一致；
- 三、轴心直径一致：保证“6”的轴心直径和尖根直径必须平滑一致。



七、Space between screw and forming cylinder

The matching space between the screw and the forming cylinder is a key factor affecting the production of rods. With the wear of the propulsion shaft and the forming cylinder, the propulsion shaft and the forming cylinder must be adjusted appropriately according to the situation of the rod. When the rod-out conditions are reached, the length of the propelling shaft extending into the forming cylinder will affect the speed of the rod making machine and the density of the rod; the longer the length of the propelling shaft extending into the forming cylinder, the faster the rod-out speed will be. The rod density will be lower; the shorter the length of the propulsion shaft extending into the forming cylinder, the greater the thrust, that is, the greater the density of the fuel rod. The gap between the propulsion shaft and the forming cylinder V-type rod making machine can lengthen and shorten the gap by loading and unloading flat pads, and the VI type rod making machine can adjust the gap by pushing the adjustment screw of the shaft.

推进轴与成型筒的配合间隙



八、Electrical principle and troubleshooting method (with circuit diagram):

Power failure: Because the main motor is large, it is far away from the transformer or the transformer capacity is too small in the countryside, and the incoming and outgoing wires are too thin. The voltage is too low, the contactor cannot be closed, and the motor element method works normally. The obvious feature is that idling is possible, and the contactor is disconnected after load. Solution: Increase the transformer and thicken the wire diameter. The above problem does not exist. After starting, the motor just buzzes and does not rotate. The phase is missing and the machine is stuck. Just check the three-phase voltage and mechanical parts.

Secondary circuit failure:

① This system adopts 220V control. If the voltmeter has no display after power is supplied, the red light is off. Check whether the neutral wire is connected to N, and check whether there is electricity on the upper and lower sides of insurance L1.

② Forward, reverse all or always jog work

This is a failure to lose the self-locking function. If all is lost, check whether the lock wire (red) passes, if only one of them, check whether the corresponding contactor's normally open energy point is normal.

③ When the main motor is running normally, it will stop automatically from time to time

Check whether the secondary insurance L1 is loose, whether the normal open points of the positive

and negative contactors are not well combined, or replace the main stop button to check whether the self-locking line is loose.

④ After pressing the button, only forward (reverse) rotation will not work reverse (forward) rotation

Check the positive (reverse) button. After power off, press the button and the normally open contact should be closed. Otherwise, it should be replaced. If the solution still cannot be solved after replacement, use a multimeter to check whether the normally closed points of the forward and reverse contactors are open. The self-locking wire corresponding to the forward (reverse) turn button is disconnected.

Heating failure:

① Turn the heating switch when the power is turned on, the indicator light of the temperature controller has no display, or the digital rises directly, or a negative number. Check whether the neutral line and phase line L1 are loose. Replace the temperature controller. Straight-up means the thermocouple is disconnected, and a negative number means the thermocouple is connected reversely.

② The green light of the temperature controller is on, and the heating contactor is not closed. Increase the set temperature, check whether the low and the total are connected by a multimeter, and directly send it to the heating contactor coil A2 and power supply L1. If not, replace it.

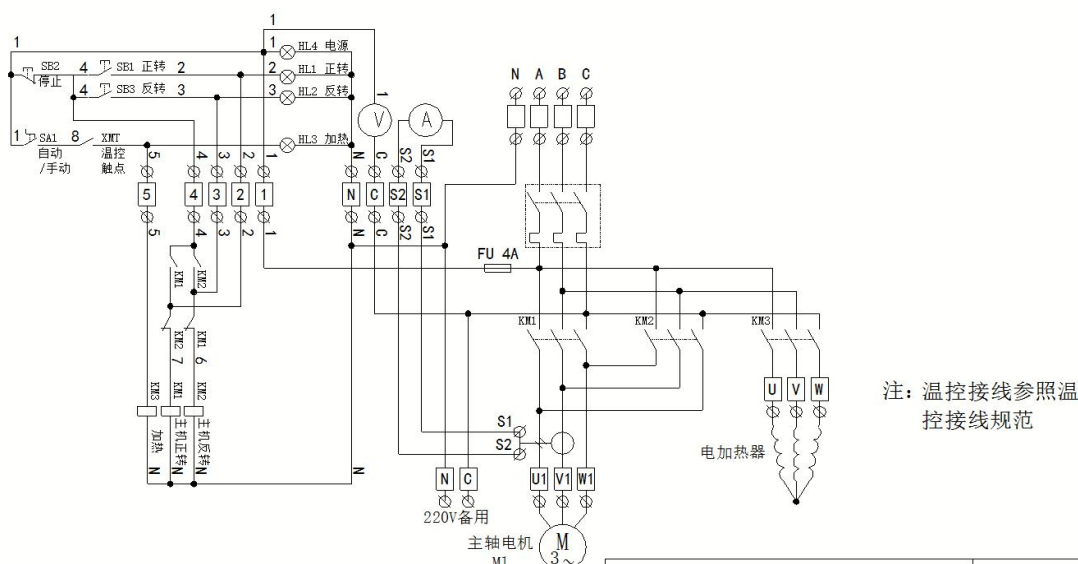
③ The heating contactor is closed, but the heating is slow. Check that the voltage is too low at this time? Is the heating loop broken? Is the contactor normally open point disconnected?

Through the above analysis, many faults are mostly caused by looseness and poor contact, so it is particularly important to tighten the screws regularly.

For your production safety, please note:

1. Turn off the power after get off work to avoid accidents caused by automatic heating.
2. The temperature controller is a precision instrument, which is easily attacked by lightning.
3. The maintenance should be carried out by professionals and be grounded reliably to avoid human and machine injury!

Circuit diagram



九、Causes of solid obstacles and troubleshooting methods:

No.	Malfunction	Cause	Methods
1	The power indicator does not light up	1、Don' t connect the power	1、Connect power well
		2、Fuse blown	2、Change fuse
		3、Indicator light broken	3、Change indicator
2	Motor won't start	1、Control button broken	1、Change button
		2、Two-phase operation	2、Connect power wire well
		3、Voltage and frequency do not match	3、Check voltage
3	The heating temperature is slow to upgrade or cannot reach the preset temperature	1、Low power supply voltage	1、Check voltage
		2、Bad heating ring	2、Change heating coil
		3、Temperature control meter and thermocouple are damaged	3、Change control panel
4	Motor heating	1、Overloaded	-
		2、Two-phase operation	2、Check fuses, switches, contacts and troubleshoot
		3、Bearing damage	3、Replace bearing
		4、Voltage is too low or too high	4、Adjust voltage
		5、Stator winding or short circuit between phases	5、Check and troubleshoot
5	Can' t make briquettes	1、High raw material humidity	1、Dry raw materials
		2、Low heating temperature	2、Increase heating temperature
		3、Low voltage	3、Check voltage
		4、Bracket inner sleeve wear	4、Replace the inner sleeve
		5、Screw damage	5、Repair thruster
		6、The gap between the propulsion shaft and the forming cylinder is too large	6、Reduce the gap by installing flat pads or adjusting the push shaft screw
6	Briquettes is bad	1、Raw materials are too wet or too dry	1、Dispose of raw materials in time according to the situation
		2、Temperature is too high	2、Gradually lower the temperature
		3、Propeller screw repair angle reason	3、Repair the propulsion axis

		4、 The gap between the propulsion shaft and the forming cylinder is too small	4、 Reduce the gap by adjusting the propeller shaft or adjusting the propeller shaft screw
		5、 Forming cylinder is severely worn	5、 Replace the forming cylinder
7	The steam is poured from the hopper and fired	1、 High raw materials humidity	1、 Dry raw materials
		2、 The rotation of the propulsion shaft, the shaft center and the taper of the tip are inconsistent, and there are uneven	2、 Repair the propulsion axis
		3、 The heating barrel is severely worn	3、 Replace the forming cylinder

十、 Safety precautions for operating the rod making machine:

1. Pay attention to whether the motor current and voltage are normal during production to prevent damage to the motor.
2. It is strictly forbidden to stand in front of the discharge port when starting work.
3. The electrical wiring should be kept dry and clean, and the power supply should be cut off when the machine is stopped.
4. Stones and iron filings are strictly forbidden to enter the hopper. If abnormalities are found, stop immediately.
5. For all lubrication parts, add grease once every 2 months.
6. The machine is not properly grounded, so it is strictly forbidden to turn on!
7. The body must be well grounded! ! !

The following are several cases of repairing the propeller screw from users, for reference:

Sample:

