

# CAPPLUS TECHNOLOGIES

## TP 60 Tablet Press

### Installation, Operation and Maintenance Manual



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### **Introduction**

TP-60 Tablet Press is researched by taking advantages of advanced technical of foreign countries, popular in pharmaceutical, chemical, electronics, and food industries and laboratories, specially designed for compressing the powder and granular materials to tablets continually and automatically.

It take good advantages of materials, and is very easy to operate, space-economic, in strict accordance with norms of National Pharmaceutical Health, with reasonable structure , big pressure , low noise level, slight variation in tablets weight, adjustable filling depth and thickness of tablets . The entire function index has reached the level of imported machines. It is the first choice of Scientific Research Institute, Process Office of pharmaceutical manufactures, and reagent manufacturing laboratory of hospitals. It also adopts several novelty designs to ensure the safer and more normal producing.

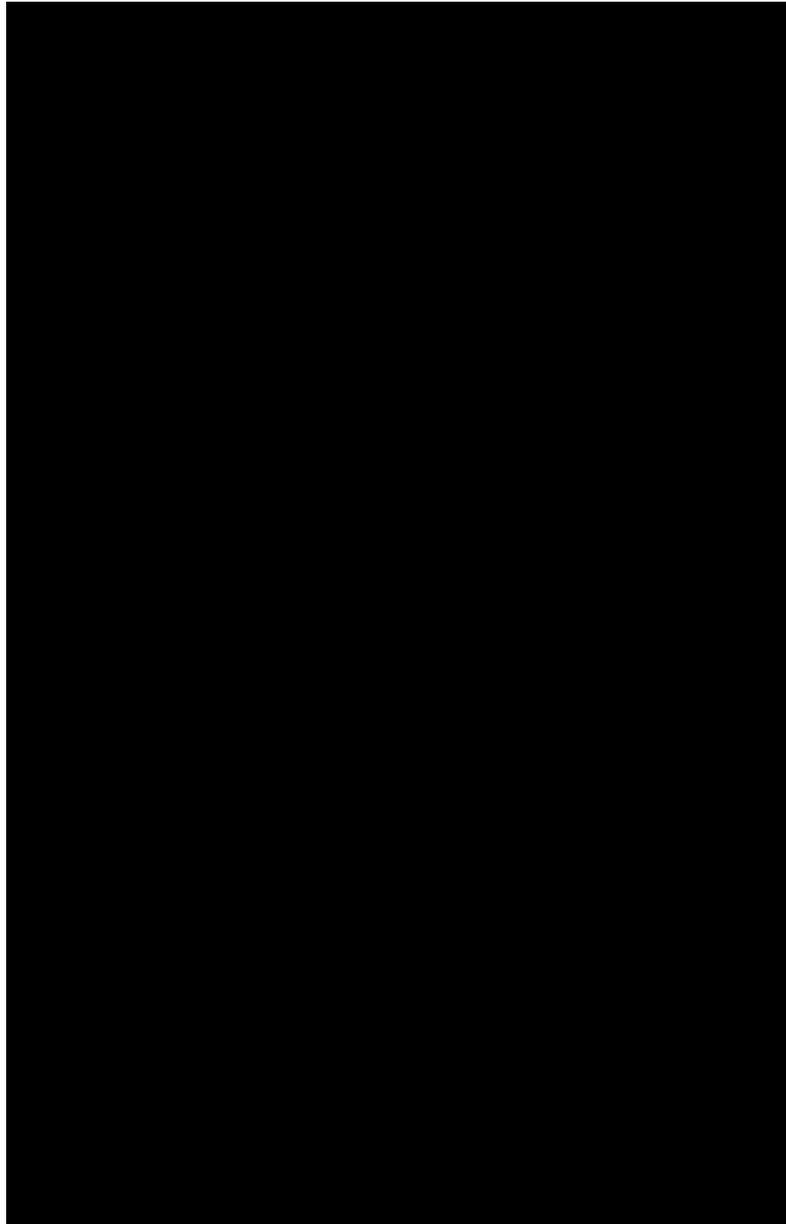
- The machine is completely closed, preventing dust from cross pollution, in strict accordance with norms of GMP.
- It is a safe guard, adopting more reasonable human-oriented designs.
- The four-column structure enables this machine to have more operational space.
- Out-standing bearable ability, applicable for more ranges of manufacture of tablets.
- Integrated driving device makes the operation more steady and low noise.

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### Product Photo



**TP60 Tablet Press**

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### **Machine Identification and Specifications**

Description: TP60 Tablet Press

Serial No.:

Customer:

Power Requirements: Three-phase 220V/60Hz, 1.5KW

Dimensions: 550mm x 600mm x 900mm

Estimated Weight: 200Kg

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### **Principle Specification**

This machine can make alternate movies by using upper jumper bar and lower jumper bar. It can adjust the filler hand wheel to confirm the lowest position of lower jumper bar and filling volume. It also can adjust the gear axle to confirm the depth of die after the lower jumper bar entering the door. Meanwhile, it has successfully adjusted the thickness and hardness of tablets.

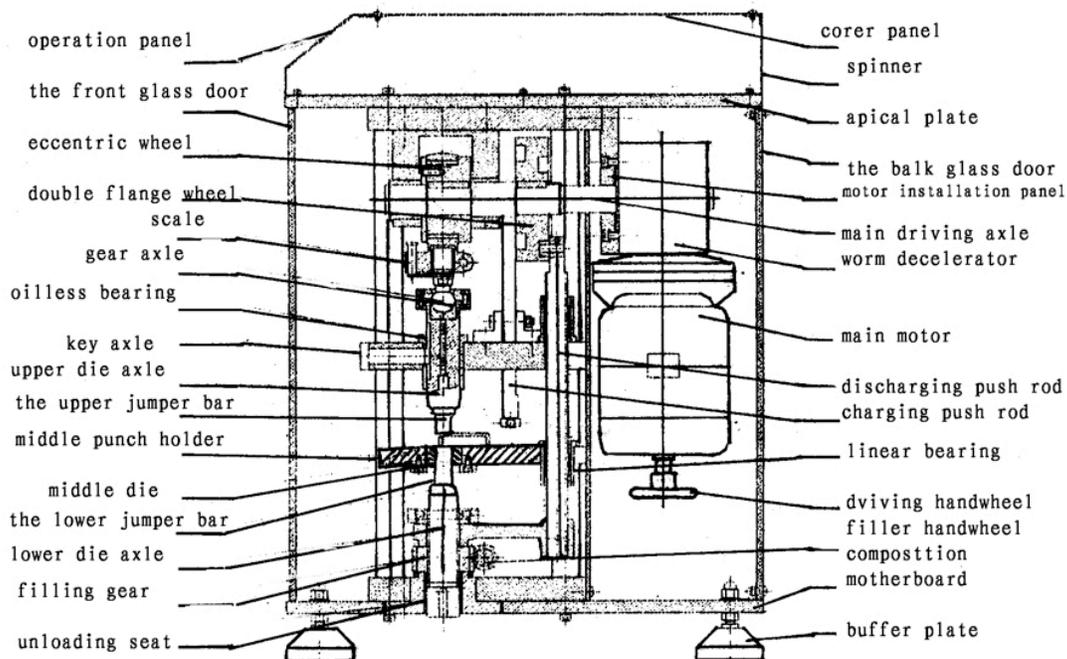
The main motor of this machine rotates by adopting the worm decelerator to drive the main axle and eccentric wheel, and the eccentric wheel drives the upper jumper bar and makes up-and –down movies. The main motor drives the double flange wheel, with the connecting rod driving device driving the charging device, the discharging bearing frame and the lower jumper bar make alternate movies. The upper jumper bar, the lower jumper bar, the charging device and the discharging bearing frame move coordinately, and finish the charging , tables compressing , discharging processes.

The process of compressing and shaping is that: the lower jumper bar moves to the lowest position and the charging device fills the middle die with materials. Once upon the charging device leaves, the upper jumper bar moves downwards and compressing and shaping materials in the middle die. The upper jumper bar moves upwards after it reaches the deepest position in the die. Meanwhile, the lower jumper bar begins to move upwards, and get the tablets which has been compressed and shaped out of the middle die, and push it and discharge it by rotating the charging device and taking advantages of the outside edge of the charging chassis. At the same time the lower jumper bar moves to the lowest position quickly, ready for the next process of compressing tablets.

## Body Structure

### 1. Introduction

The machine is comprised of the main driving device, tablets compressing device, and the electric controller. Please refer to Picture1.



*Picture1: The diagrammatic sketch of the general structure*

During compressing tablets, the main driving device starts firstly, with the worm decelerator driving the flange wheel, which feeding materials to the charging device by the connecting rod driving the charging device and then leaves, make the eccentric center moves downwards, and the upper die axle, which is connected with the eccentric bearer, drives the upper jumper bar to enter the middle die and compress and shape tablets with the lower jumper bar, which is just in the middle die. After shaping, the flange wheel rotates with the connecting rod driving the lower die axle to move upwards and the lower jumper bar gets the tablets out from the middle die, Meanwhile the flange

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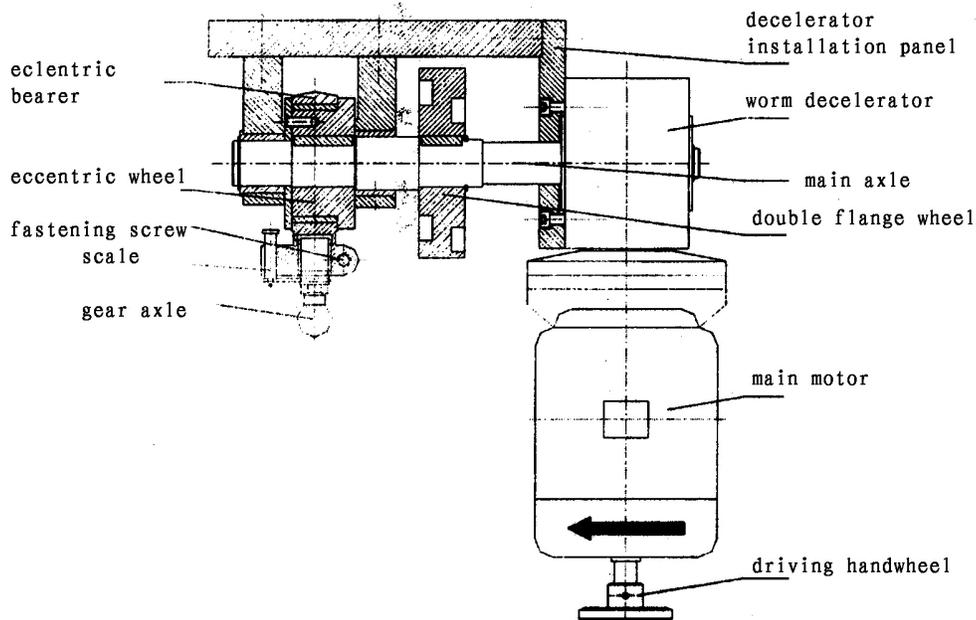
wheel rotates with the connecting rod driving the charging device and push the tablets out by taking advantage of the outside edge of the charging mother pan.. Latter, the back die axle drives the lower jumper bar and moves to the lowest position quickly. The middle die becomes empty. The charging chassis rotates above the middle die and begins to feed materials to it. The process of tablets compressing is just finished by these repeated actions.

The weight of tablets can be adjusted continually by the composition of the filling gear and the filler hand wheel.

The hardness of tablets can be adjusted continually by the gear axle under the eccentric bearer.

## 2. The main driving device

The main driving device is comprised of the main motor, worm decelerator, the main axle connected to the eccentric wheel. Please refer to Picture 2.

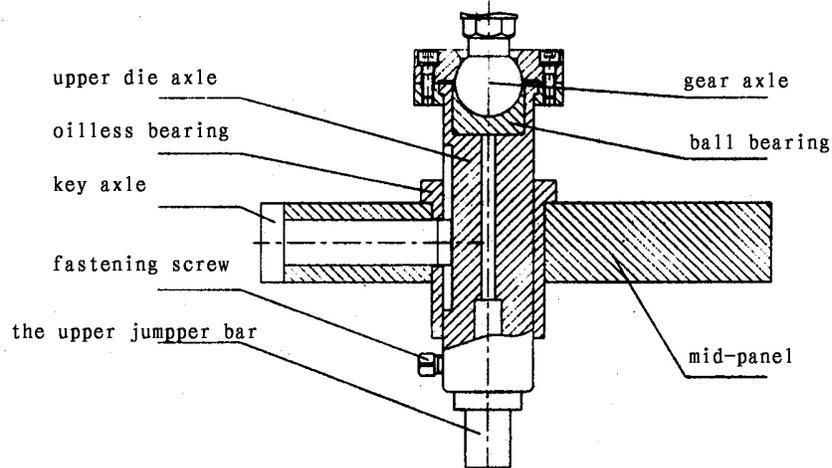


*Picture 2: The diagrammatic sketch of the main driving device*

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### 3. The upper die axle composition

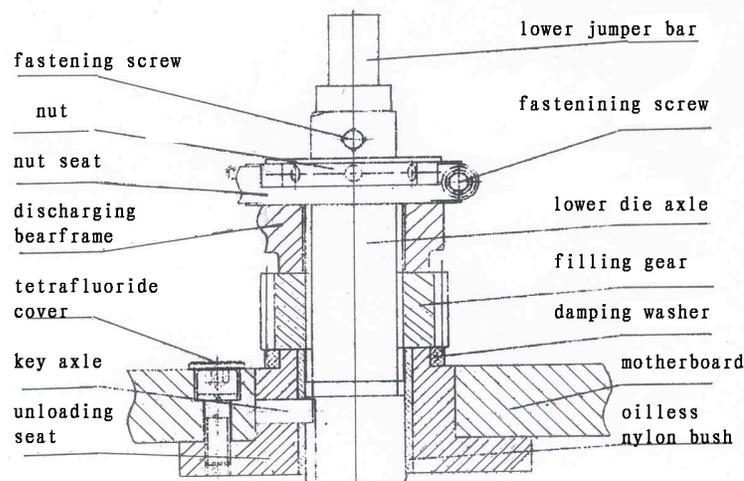
The upper die axle composition is comprised of the upper die axle, ball bearing, key axle, fastening screw, the upper jumper bar. Refer to Picture3.



*Picture 3: The diagrammatic sketch of the upper die axle composition*

### 4. The lower die axle composition

The lower die axle composition is comprised of the lower die axle, the unloading seat, the damping washer, the filling gear, the nut seat, nut, fastening screw. Refer to Picture4.

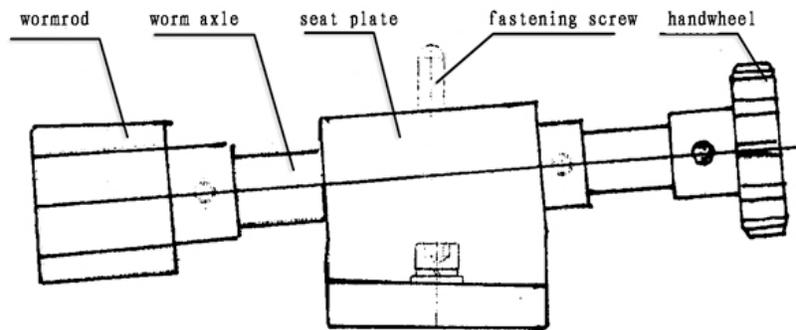


*Picture 4: The diagrammatic sketch of the lower die axle composition*

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## 5. The filler hand wheel composition

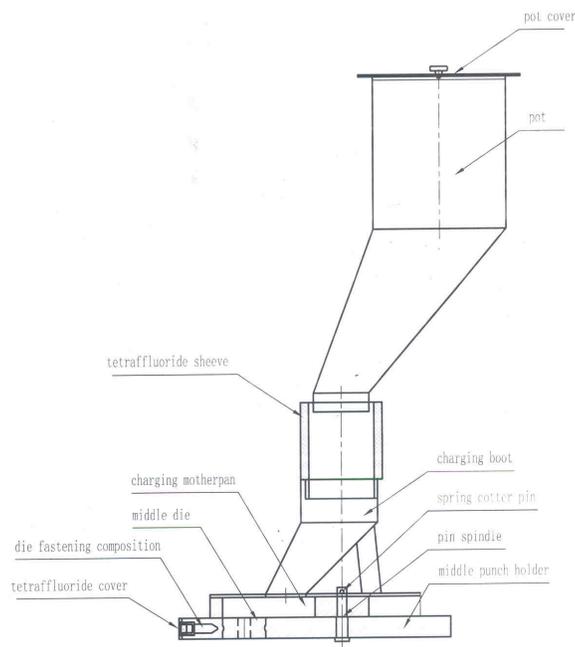
The filler hand wheel composition is comprised of the worm rod, worm axle, seat plate, fastening screw, and hand wheel. Refer to Picture 5.



*Picture 5: The diagrammatic sketch of the filler hand wheel composition*

## 6. The charging device

The charging device is comprised of the pot, the tetrafluoride sheave, charging boot, charging chassis, and pin spindle. Refer to Picture 6.



*Picture 6: The diagrammatic sketch of the charging device*

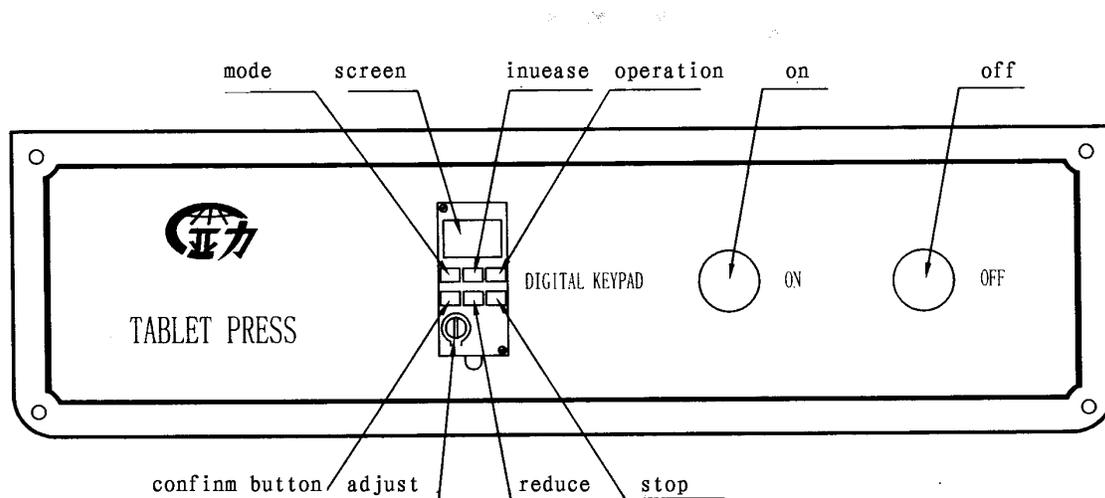
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## Electric-controller

The electric-controller is equipped in the spinner. It is comprised of the power switch, operation panel composition, inverter and control circuit.

Switch on the Power Switch, the main engine get energized.

The operation panel composition is comprised of the operation panel, ON button, OFF button. Refer to Picture 7.



*Picture7: The diagrammatic sketch of the operation panel composition*

The main motor adopts the variation of convey speed. The speed of tablets compressing can be adjusted according to the quality of those compressed. The inverter parameters are set as followings.

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Order	ON	Functions	Desired value
1	P00	Setting of main frequency input resources	04
2	P03	Choice of the highest operational frequency	60
3	P04	Choice of the highest voltage frequency	50
4	P05	Choice of the highest output voltage	220
5	P24	Forbidden setting of reversal functions	01
6	P36	Setting of upper output frequency	60
7	P37	Setting of lower output frequency	1.5
8	P54	Automatic torque compensating gain	10
9	P55	Slip compensating gain	7
10	P40	Function choice	3
11	P41	Function choice	4

Any other parameters can adopt the ex-factory value. All the set parameters should be protected from arbitrary changing by irrelative person.

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### Technical Parameters

- The main technical parameters

Die no.	1 pair
Max tablets diameter	25 mm
Capacity	3600 pc/h
Max pressure	50 KN
Filling depth	13-20 mm
Tablets thickness	8 mm
Voltage	Three-phase 220V/60Hz, 1.5KW
Dimensions	550×600×900mm
Weight	200Kg

- Electric-supply standard:

Voltage: 220V±5V

Frequency: 50±1 Hz

Power: 1.5KW

- Environmental standards:

Temperature: 18 24 °C

Comparative humidity: 40% 50%

Environment: corrosion-proof and dust-proof

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### **Installation**

#### Opening the package

Receiving the machine, you should firstly see if the package is damaged. If it is, you should open it at once to see if the machine is damaged and the parts are complete. If everything is OK, you should confirm it with the transport company by signature.

Otherwise, you should contact with us at once.

#### Installation

1. Make sure of the completeness of the machine, replacement parts, and tools according to the packing list.
2. Equip the work table with feet to ensure firm and steady position.
3. Equip the machine with feet and position it on the work table, then adjust it.
4. Clear away the preservative oil on the surface of the machine.
5. Keep the manual turning for one week, and the clamping yokes is tight or the motion work is not interfered.
6. After energizing it, you should check that the operation is normal.

### **Operational routine**

#### 1. The installation and adjustment of die

Before installing the die, you should check the hackly fracture of the head of the upper jumper bar and the lower jumper bar, cavity face and the surface of middle die, and inner hole to see if there are any damages or corrosion. If it is slightly damaged or corroded, you should repair it with oilstone. If seriously, you need to change it.

The installation is as followings: (suitable for circular die, special die, graphic die)

The random exclusive tool: sleeve spanner

Loosen the fastening screw in the lower die axle and insert the lower jumper bar into the hole of the lower die axle. (Refer to Picture4)

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Take down the tetrafluoride cover on the left of working platform, loosen the die fastening composition, and clean the middle die installation hole on the middle punch holder. (Refer to Picture6)

Position the middle die on the middle die installation hole vertically, put the head of the lower jumper bar into the middle die hole with your hand and vertically force the middle die into the middle die installation hole, keep the upper surface of middle die at the same level of or slightly below that of temple with the error between 0-0.5mm.

Insert the lower jumper bar into the bottom of the lower die axle hole. Do not fasten the fastening screw.

Loosen the fastening screw in the upper die axle. Insert the upper jumper bar into the bottom of the upper die axle hole. Make sure that the notch of the jumper bar just opposite the fastening screw, and fasten the screw to fix the upper jumper bar firmly.

Rotate the driving hand wheel by your hand (according to red arrow pointing direction) to enable the upper jumper bar move downwards slowly. When its head gets into the middle die hole, fasten the die fastening composition to fix the middle die firmly. Put on the tetrafluoride cover and fasten the fastening screw above the lower die axle.

Rotate the driving hand wheel, if there is no crash or friction when insert the head of the upper jumper bar into the middle die hole repeatedly, it proves that it is qualified. Otherwise you should install it once again as the above method.

## 2. Adjustment of discharging

The random exclusion tools: sleeve spanner, driving lever

Rotate the driving hand wheel with your hand to make the lower jumper bar rise to the

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highest position, and then loosen the fastening screw in screw seat. Rotate the nut with the driving lever to make the hackly fracture of the heat at the same lever or slightly below the upper surface of the middle die hole, enabling the lower jumper bar successfully push the tablets out of the middle die hole. Fasten the fastening screw in nut seat. (Refer to Picture 4)

Rotate the driving hand wheel for 2 or 3 circles; if the hackly fracture of the head of the lower jumper is at the same lever of or below the upper surface of the middle die, it proves that it can be energized.

Energize it and make it operate for more than ten circles. If the machine works normally, it proves the adjustment of discharging is qualified.

### 3. The adjustment of filling

Loosen the fastening screw with your hand; the filling volume and the weight of tablets are both increased when you rotate the hand wheel clock-wise (“+” direction). When you rotate the hand wheel antic lock-wise (“-” direction), the filling volume and weight of tablets will decreased. After adjusting, fasten the fastening screw. (Refer to Picture 5)

### 4. The adjustment of the hardness of the tablets.

The random exclusive tools: sleeve spanner, 21 spanners.

Loosen the fastening screw in eccentric seat, when you rotate the gear axle clock-wise with the 21 spanner, the number on scale , the depth of the head of the upper jumper bar into the middle die hole, the compressing pressure, and the hardness of tablets are all increasing , but the thickness of the tablets is decreasing , when you rotate the gear axle antic lock-wise, the number on scale , the depth of the head of the upper jumper bar into the middle die hole, the compressing pressure, and the

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hardness of tablets are all decreasing , but the thickness of the tablets is increasing. After adjusting, fasten the fastening screw in eccentric seat. (Refer to Picture 2). The number on scale is the depth of the head of the upper jumper bar into the middle die hole.

### 5. Compressing for a trial

The steps of compressing for a trial as followings:

- Install and adjust the die correctly
- Conform the weight of tablets
- Confirm the hardness of tablets.

Rotate the driving hand wheel with your hand (you can also adopt the clicking mode) to compressing several tablets for a trial, and check the weight, the hardness, the quality of the surface. If they are qualified, you can feed materials to produce.

### 6. Energizing and operation

There are inverter operation panel, ON, OFF on the operation panel.

Inverter operation panel—Press the green RUN to start the main engine, and press the red stop to stop the main engine or come back to the situation when there is a problem.

The rotating button can control the productivity, which can be displayed on the screen.

Emergency stop switch (on the upper right side of the equipment)—Press the Emergency stop bottom to stop the machine when there is any abnormality.

#### Operation

Before energizing, rotate the driving hand wheel with your hand to make the upper jumper bar rising.

Adjust the initial manufacturing speed.

When the diameter of tablets is less than 9mm, the initial manufacturing speed should be more than 25 tablets/min

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When the diameter of tablets is more than 9mm, the initial manufacturing speed should be more than 35 tablets/min.

Press the green RUN and observe the operation

Notice: If the machine is stopped for a long time, the machine should be in the no-load status.

### **Cleanness**

#### 1. The cleanness of the parts:

Wash the stainless steel metal parts with water and wipe them, then dry them in an evaporator.

Wash the nonmetal parts and let them get air dry.

#### 2. Daily cleanness

You just need to clean the dust and the granular materials, no need to take down the charging device and die.

If the materials are of absorption of moisture, oxidation, or corrosion, or with heightened viscosity, just take down the charging device and clean it. There should be no residual materials.

#### 3. Clean by batch

After the manufacturing or the experiment of one batch of materials, clean the main engine seriously, ready for the next batch.

Take down the charging device, including the pot, the charging boot composition, and the tetrafluoride sheave, take down the charging boot and the charging mother pan, and wash them one by one.

Take down the upper jumper bar, the lower jumper bar, and the middle die, wash them one by one.

Clean the main engine, including the frame, the motion work, and the glass door.

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### Notices

Before operation, new operators should read the operation manual beforehand.

Whenever manual compressing or electric compressing start it when the upper jumper bar is rising. If it is moving downwards, the machine will stop as the rotating speed is too slow and the driving ability is too weak when the upper jumper bar gets into the middle die. (Because of the resistance of the tablets, and the load is too heavy to bear, the parts and the motors will be burned out.)

Often check the quality (including the weight, the hardness, the smoothness of the surfaces) when compressing tablets, and adjust it in time.

The process of materials can affect tablets, like the formula of materials and lubricant, packing agent, adhesion agent situations such as conditions of powder, the solidity of the granular materials, proportion, water content, and so on can affect the tablets quality to a certain extent. It is usually the unsuitable formula that the tablets cannot be shaped, what is worse, it may break the machine. So this machine is not suitable for semisolid, damp or fine powder. If the pressure is very large but the tablets cannot be shaped or there are looseness, wrinkle, fragment, corning, or depowering during operation just find the reasons from formula. When it has a certain ductility and the shock resistance is not too bad (Generally speaking, It is good that it is not fragile when dropped from a height of 1—1.2m) even if there are collapse, brittleness, it is OK. So do not only take the hardness into consideration, or the pressure is too big to break the machine.

When producing, presses the WORKING STATUS, it will close the glass door and begin manufacturing.

It is in a no-load status when the machine is stopped for a long time.

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### **Maintenance**

Check the clamping yokes that they are tight during or before the operation, if it is not, fasten them.

After every adjusting, compress several tablets by your hands before electric compressing.

Check the quality of the die, if there is edge fault, crack, deformation or serious abrasion, change it in time, as these problems will destroy the machine and affect the quality of tablets.

Every day you should keep the machine clean, especially the compressing parts, eccentric parts, upper die axle composition, lower die axle composition.

Change the die in time if it has abrasion. Check carefully if there are notches on the edge of the die. Repair or change the upper or lower jumper bars if there are crash on them.

Take down the die and clean it, coat it with a film of rust-proof oil or store it in the tank of oil

The friction face often adopts oiliness parts. There are no needs of lubricant when operating normally, but you should often check the cam groove of the double cam. If the antifriction grease is in lack or polluted, or there are block formation, you should clean the cam groove in time and coat it with a film of concentrated compressing lithium antifriction grease.

Clean the organic glass with water, not with alcohol or organic solvent.

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### Common problems

Operators should read the operation manual carefully, learn and master the structure and performance of the machine before operating. When encountering the following problems, you can check and deal with them according to the solutions. If you cannot, please contact with us as soon as possible.

#### 1. Dead the machine

The upper jumper bar gets into the middle die and stops the machine at once.

#### ※ Reasons

- The pressure is too large and the tablets are too hard
- Charging repeatedly
- The starting position is not proper.

#### ※ Precautions

When adjusting the pressure, it needs progressive adjusting, not too much at a time, and the tablets cannot be compressed too hard.

- Avoid charging repeatedly
- Whenever manual compressing or electric compressing, start it when the upper jumper bar is rising.

#### ※ Solutions

- When it occurs, stop the machine quickly to avoid the burning out of the motor;
- If it is not serious, rotate the driving hand wheel to let the upper jumper bar pass the dead point. Do not rotate reversely, or it will charge repeatedly, and it will be serious

Dead the machine seriously

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Backwards rotate the hand wheel carefully and slowly, make the head of the upper jumper bar get into the hole of middle die, (You cannot rotate continually to eliminate charging repeatedly or it will be more serious), Loose the fastening screw in eccentric seat, rotate the gear axle antic lock-wise, the number of scale is decreasing, which makes the depth of the head of the upper jumper bar into the middle die hole decrease, and the pressure also decrease. Then rotate the hand wheel clock-wise, enable the upper jumper bar pass the dead point to push tablets out of the middle die hole. Adjust the hardness of tablets again; (Refer to Picture 2) Take down the three tetrafluoride covers on the motherboard, loosen their screw uniformly, and rotate the driving hand wheel at forward direction to enable the lower jumper to push out tablets. Fasten the three screws uniformly, put on the tetrafluoride covers. Adjust the hardness of tablets once again; (Refer to Picture 4) Often check the quality (including the weight, the hardness, the smoothness of the surfaces) when compressing tablets, and adjust it in time. During sapling, you can open the glass door and operate when it is set at the REPAIR status.

## 2. Vibrating

The machine vibrates abnormally

### ※ Reasons

- Parts or clamping yokes are loose
- Parts are seriously dry
- The friction face is too dry

### ※ Precautions and solutions

- Check that the clamping yokes are loose
- Often check and repair or change the parts badly dry
- Keep the friction face clean and slippery. Especially keep the double cam groove

slippery

### 3. The charging chassis gets damaged

The charging chassis crashes into the head of the lower jumper bar, the middle die and the head of the upper jumper bar and get damaged.

#### ※ Reasons

- The height of charging is not suitable, and the head of the lower jumper bar is upper than the upper surface of the middle die
- The fastening screw of lower jumper bar is loosening, and the head of the lower jumper bar is above the upper surface of the middle die
- The middle die is not equipped correctly and is upper than the upper surface of the middle die
- The adjustment of charging connecting pole is not correctly, making the upper jumper bar crash into the charging chassis.

#### ※ Precautions and solutions

- The middle die hole is not clean when installing and adjusting. Push the middle die to the bottom, fasten the die fastening composition
- Install and adjust the upper jumper bar and the lower jumper bar correctly, then fasten the fastening screw
- The length of the charging connecting rod is adjusted before ex-factory, so do not change it arbitrarily

### 4. Taking down problems of die.

The upper jumper bar, the lower bar or the middle die cannot be taken down.

#### ※ Reasons

- The die size and the equipping hole size are defective, they are fitted tightly

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- The tablets are shaped, the pressure is too large, and the die is deformed
- When equipping die, the mating surface should be cleaned and cover it with an oil film

### 5. The mating surface gets rusted.

#### ※ Precautions and solutions

- Repair or change it in time when finding the die is too tight
- Increase the pressure step by step during the compressing, or it will damage the die
- When not being used for a long time, the die should be taken down and the mating surface should be cleaned and coated with a film of rust-proof oil and stored correctly. Overlapping tablets charged for the second time and they are compressed together.

#### ※ Reasons

When adjusting compressing and tablets is not pushed out, rotate the driving hand wheel backwards the charging device charge repeatedly and lead to overlapping tablets.

#### ※ Precautions and solutions

- Don not rotate the driving hand wheel backwards when adjusting compressing
- Deal with it according to the Dead the machine.

### 6. Bouncing and getting fragile

The tablets will bounce and get fragile when being pushed out.

#### ※ Reasons

- When the discharging height is not proper, the hackly fracture of the head of lower jumper bar is lower than the surface of middle die; the tablets will bounce and get fragile when being pushed out.

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7. Die fastening composition gets loose, and prevents the middle die from discharging.

※ Precautions and solutions

Adjust the outlet height of the lower jumper bar correctly.

- Adjust and fasten the die fastening composition
- The tablet is not steady

8. The tablet weight varies a lot.

※ Reasons

- The lower jumper bar fastening screw is loose, and the lower jumper bar is rising the filling volume is decreased
- The filler hand wheel composition fastening screw is loose and the filler worm bar is rotated, the filling volume is changed
- The granular material varies a lot

9. Materials cannot flow freely.

※ Precautions and solutions

- Equip the lower jumper bar correctly ,and fasten the screw if it is loose
- Adjust the filler hand wheel once again, and fasten the screw
- Adjust materials to ensure the uniform of granular materials
- Adjust the process to improve the flow of granular materials

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## Common problems and solutions

Problem	Reason	Solution
No display when energizing	The connection of the plug is not so good. The switch terminal is loose The inverter input terminal is loose	Check the plug Check the switch terminal and the inverter terminal
Display EF, but the motor does not work	Inverter detects the outer problem	Reset the Emergency-stop switch
There are Hums and buzzes from the motor , but it does not work	The power lacks in cords or lines, or the screw is loose.	Check the motor and see if the output connection of inverter is loose.
Strong burrs	The gap size of abraded die is too large.	Change the die.
The surfaces of tablets are damaged.	The hackly fracture of the head of the upper jumper bar is deformed.	Repair or change the upper jumper bar.
Fragment	The inner hole of middle die is damaged. The formation and shaping of materials is not so good.	Change the middle die. Adjust the process
Scrape	The hardness of granular materials is not uniform.	Adjust the process.
Looseness	The pressure is not enough The formation and shaping of materials is not so good. The density is low, so the weight of tablets is beyond the limit.	Increase the pressure properly Adjust the process Improve the density of materials.
Insufficient gloss	The pressure is not enough The die cavity is abraded.	Increase the pressure properly. Polish the die cavity or change the die.

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