



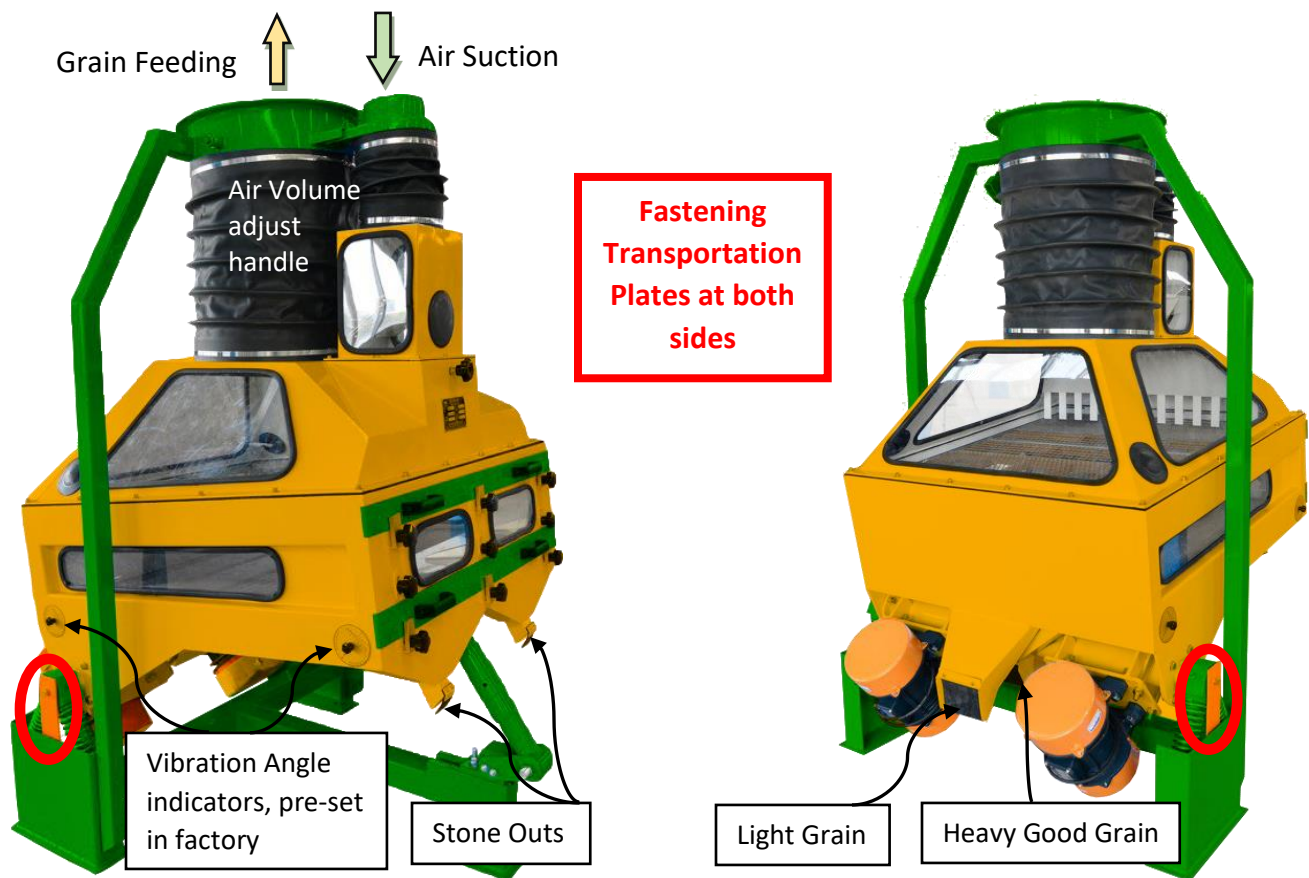
Gravity-acting Destoner
METRA GDSM
USER MANUAL



DON'T start up the machine until:

- 1) You have finished reading this Manual and understood very well;**
- 2) You have removed the yellow fastening plates for transport on the machine.**
- 3) You have checked and refastened every part that may get loose in transportation.**

Installation Reference



Materials from upper and lower outlets can be collected together if the machine works for destoning only.

Brief instruction for installation and operation:

1. Remove the transportation plates at both sides.
2. Connect the motors, make them rotate towards each other.
3. Start the suction fan first and then machine motors
4. If no stones at stone outlet, reduce air volume; if too much grains in stones, increase air volume.
5. Blow from bottom to clean the sieves regularly to ensure the performance.

1. Brief introduction

GDSM gravity destoner & grader is mainly used for grain grading and stone removing for grains and granular materials such as wheat, soybean, rice, maize, coffee beans. With the external air suction, the destoner can effectively remove the lighter impurity such as large straws, grass seeds, husks and dust impurities in grains, and can also be used for seed selection of various grains..

Advantages of GDSM destoner: good grain grading, stone removing and impurity removal performance; compact structure, no rising dust, low noise, low power consumption, convenient operation and simple maintenance.

GDSM destoner requires large and stable air volume to work together. Better to equip with the independent air suction equipment.

2. Technical parameters

Model	Capacity (wheat)	Screen Width	Amplitude	Screen Dip Angle	Air Suction	Power	Weight	Size
GDSM-400	280-360 bu/h 7-9 t/h	39.4 in 100 cm	0.1-0.2 in 4-5 mm	5-9°	4709 cfm 8000 m ³ /h	2×0.33 HP 2×0.25 kW	882 lbs 400 kg	59×49×75 in 1500×1246×1900 mm

*Air Pressure ≤ 0.14 psi (980 Pa). The above-mentioned parameters are subject to change without prior notice.

3. Structure

Both sides of the rear end of the fully-sealed vibration body (A) are supported by 2 pairs of “/”-shape rubber springs (B) and one adjustable supporting rod (C) at the middle of the front end.

Two vibrating motors (L) are bolted side by side on the round shaft at the back end of the vibration body. The two motors rotate towards each other, driving the vibrating body for reciprocating linear vibration.

The top feeding inlet (D) is supported by a bracket plate fixed on the support frame (M). The upper end is connected with the grain feeding pipe (from a conveyor or a buffering bin), the lower end is connected to the feeding box (E) through a flexible connection tube. The feeding box (E) is located below the feeding inlet and fixed on vibration body. There is feeding baffle with adjustable spring installed in the feeding box to control the material flow, and plexiglass window (F) installed at two sides of the box to observe the material situation.

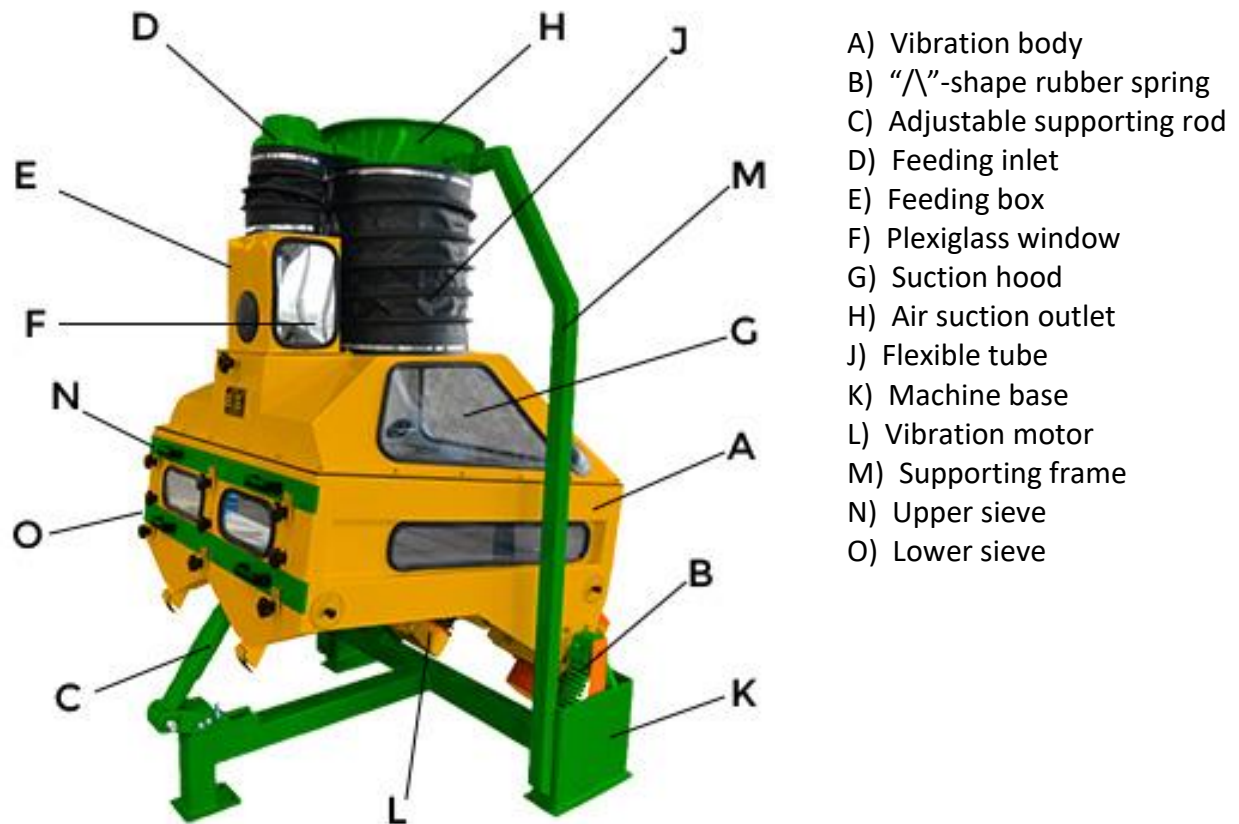


Figure 1.

The suction hood (G) with a large observation window is installed on the upper part of the vibration body. The air suction pipe (H) is connected with the suction hood by a flexible tube (J), and is equipped with an handle-held butterfly valve which can adjust the air flow.

The machine frame (K) directly supports the vibration body (A). The support frame (M) supports the air suction outlet (H) and the feeding inlet (D) and is fixed on the machine frame (K).

Two layers of sieves (N) and (O) of drawer type are installed in the vibration body. There are 3 sections of sieve surface on upper sieve (N). The first section is a spring steel wire woven mesh, the second section is an oblong hole sieve plate, and the third section is a round hole sieve plate. Upper sieve (N) is a material grading layer. The graded materials (light grain flow) are discharged from the rear end of the vibration body, and the light impurities are sucked away by the air suction pipe. The lower sieve (O) mainly removes stone and mud. Stones and mud which above the sieve will be discharged from the stone outlets at two corners of machine front end, which below the sieve will be discharged directly from the machine. The material (heavy grain flow) will be discharged through the grain outlet at the rear end of the vibrating body.

4. Working principle

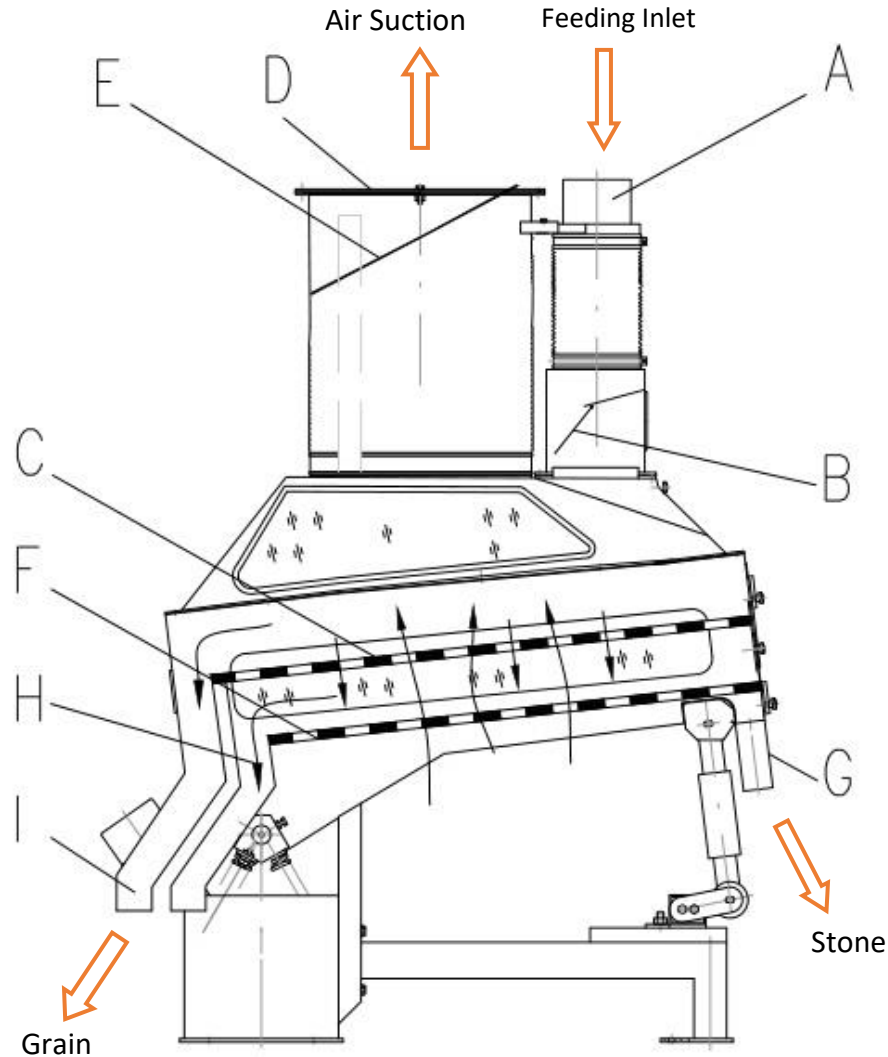


Figure 2.

Material falls into the flow baffle (B) in the feeding box (A), which evenly covers the whole screen width due to machine vibration.

The material on the upper sieve surface (C) is automatically stratified according to the gravity of the material and the particle size under the combined action of vibration and air flow. The light material flow with smaller specific gravity as the oversize material above the upper sieve surface will be discharged from the tail of the machine (I). The lighter impurities such as husks and dust are sucked out by air suction outlet (D), and suction volume is regulated by air flow adjusting butterfly valve (E).

Material with larger gravity, and sand, stone and mud fall on the lower sieve surface (F). Under the combined action of vibration airflow and sieve surface friction, heavy impurity and good materials will be stratified; good materials move to the tail end of sieve surface; Stone, sand and mud move

to the front end of the sieve surface. Undersized sand and crushed grains will be discharged from bottom directly.

Through the observation window of the suction hood, we can intuitively see the effect of grading and stones removing, as well as the discharging of separated stones (G). heavy materials (H) and light materials (I).

5. Installation and adjustment

5.1 Installation

The destoner should be installed on the solid ground without vibration. The front end of the machine should have space no less than 39 in (1000 mm) for mounting and dismounting sieves, and the rear end of the machine should have space no less than 27 in (710 mm) for convenient maintenance.

The installation dimensions of destoner are shown in the drawing in chapter 9.

Please lift the machine via the machine frame. When the machine is in place, remove the transport fastening plates (Figure 3) (usually in yellow color) at the front and rear “/\” springs, align the bottom of the machine to ground level, fix the machine on the floor with anchor bolts, then connect the feeding and discharging pipes (if any), and put the stone collecting bins in place.

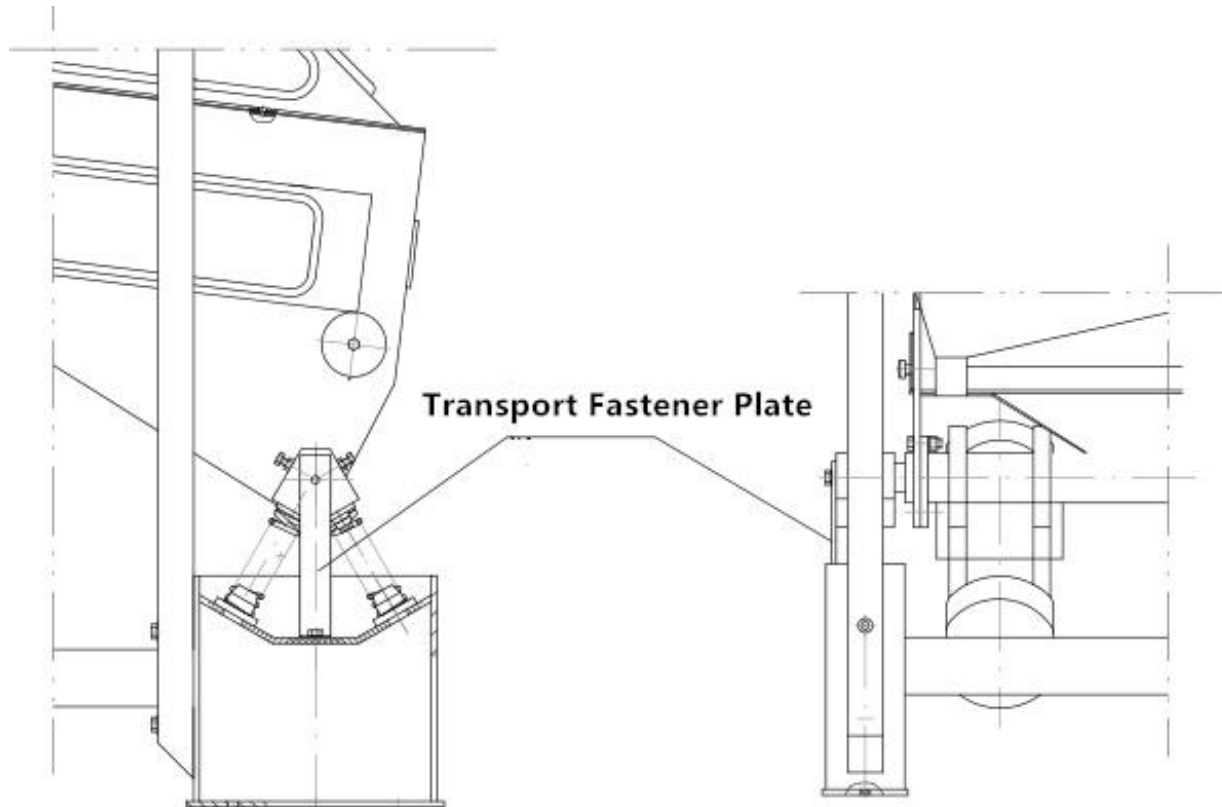


Figure 3.

The two outlets are equipped with rubber plates, so that the material can flow out smoothly, meanwhile ensure its air tightness. Rubber sealing plate shall be added to the flange connection of the air suction outlet at the top of the machine.

The two vibrating motors must rotate towards each other. When connected, they should be equipped with electrical interlocking devices to ensure that the two motors run or stop at the same time.

5.2 Adjustment

- (1) Adjusting the feeding gate to adjust the flow rate and flow uniformity;
- (2) Adjust the butterfly valve handle to change the suction air volume;
- (3) Adjust the supporting rod of vibration body to change dip angle of sieves;
- (4) Adjust the back-blowing plate to adjust the stone removal condition.

Adjustment steps:

(1) Set the butterfly valve adjusting handle to "6", set the back-blowing plate to the bottom, And adjust the supporting rod to make the dip angle of the sieves around 7°. We usually pre-set before machine leaving the factory.

(2) Start-up the air suction system to check if it works properly.

(3) Start-up the destoner, when it is running normally, feed the material and adjust the feeding door until the material flow is uniform and the material layer thickness goes up to about half of the plexiglass window height. After a few minutes, the stone will appear behind the back-blowing plate, then raise the back-blowing plate to the normal discharge position of the stones. If open the back-blowing plate largely, but no stone is discharged, please adjust the supporting rod of vibration body appropriately to make the screen dip angle smaller. If stones found in discharged good grain materials, please increase the suction volume appropriately.

(4) The proportion of light and heavy grain flow can be realized by changing the air suction volume. When the air volume is large, there will be more light grain materials. Otherwise, please change the second and third section of the upper sieve.

6. Start and stop the machine

When stopping, it should be done in the following order:

Stop feeding → shut down machine → shut down air suction system.

Start up of the system is exactly in reverse order.

7. Adjustment of vibration direction angle and amplitude

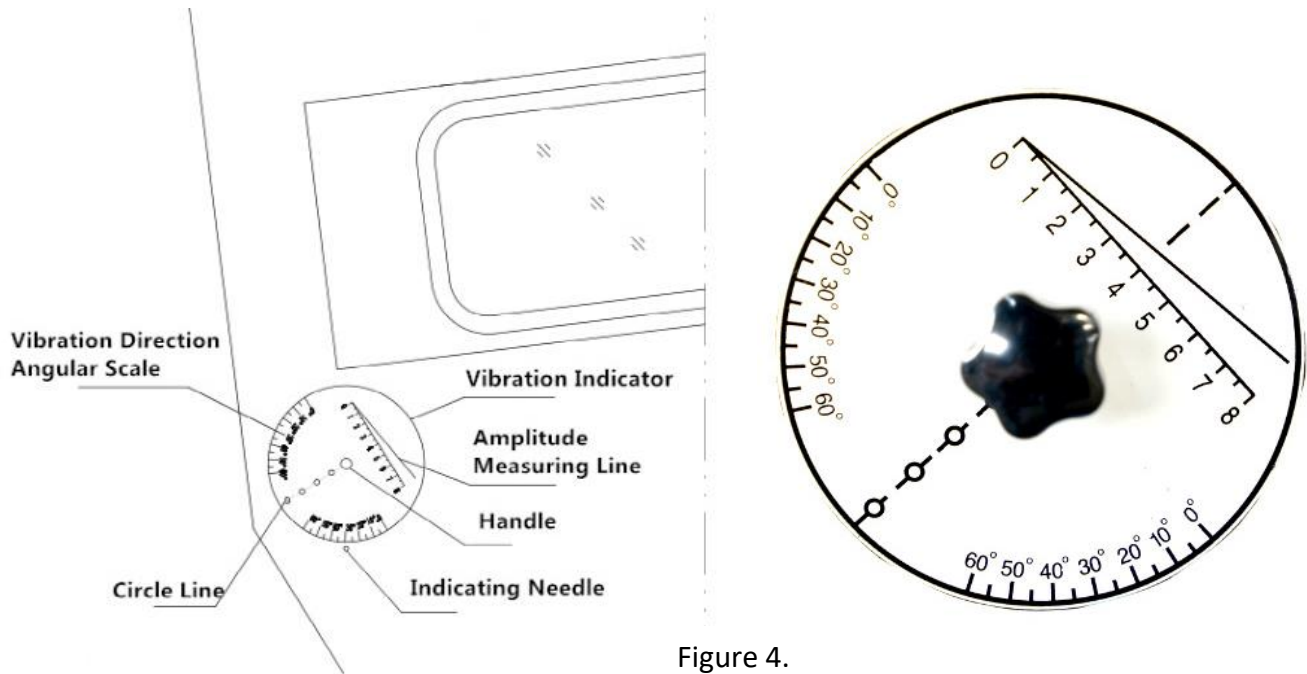


Figure 4.

7.1. Vibration direction angle: 30°

During the normal operation of the destoner, loosen the lock hand-wheel of the vibration indicator, and rotate the indicator, fasten the indicator when the circle line becomes a straight line with vibration direction. Then the degree corresponding to the indicator needle is the vibration direction angle, commonly around 30°. Usually the angle is pre-adjusted before machine leaving the factory.

7.2 Amplitude: 0.1~0.2 in

During the normal operation of the destoner, according to the principle of visual pause, when the indicator is in the correct position to observe the vibration direction angle, the corresponding degree of the intersection point of the amplitude measuring line is the actual amplitude value. Generally, the amplitude should be between 0.1 - 0.2 in (4 - 5 mm). Adjustment of the amplitude can be realized by adjusting the balance weight in the vibration motor.

Note: *The balance weight of the two motors should be adjusted consistently, and should be locked after adjustment.*

8. Maintenance and Troubleshooting

8.1 Maintenance

(1) The sieve surface should be cleaned once a week to ensure that the sieve holes are smooth. When mounting the sieves, fasten the hand-wheels with special tools. Clean the sieve surface with compressed air or wire brush. Don't beat the sieve surface to avoid the bending and deformation. Replace the sieve immediately if sieve surface is found worn-out. The woven mesh sieve should be evenly and firmly tensioned on the wooden frame and shouldn't be uneven.

(2) Motor bearings should be greased every three months. Check the handles, hand-wheels and connecting bolts frequently to avoid the looseness, especially the connecting bolts of vibration motors.

8.2 Troubleshooting

(1) During the operation of destoner, if the vibration of the vibration body is abnormal, please check whether the rotation speed of the two motors is obviously different, whether the eccentric block is loose, whether the supporting spring, the supporting rod and the rubber ring are damaged, etc.

(2) If the grain grading and stone removing effect is not good, please check the opening size of the air valve, the position of the back-blowing plate, the feeding flow rate, etc. If one supporting spring is damaged, please change one pair of new springs at the same time.

(3) If the machine will not be used for a long time, please put the destoner at a dry place, and the vibration body should be supported up and fixed by the transport fastening plates.

9. Drawing of destoner, for reference

