



# Model Hammer Type Whirlwind Mill Operation Manual

## A. General Description

The Whirlwind Mill is suitable to be used in the grain processing industry for pulverizing of intermediate and small size grains, such as wheat and rice with water content that meet national standards.

### Features

1. It can pulverize various grains with high efficiency and high speed, The sample grains are pulverized by means of high speed mill hammers (16800 rpm) into fine and uniform powder which enter into a stainless steel collector through a screening plate and then fabricated into a sample powder.
2. The inner wall of the tank is stacked with a layer of advanced sound absorbing material which makes noise to be lower compared to other similar products.
3. There is an embedded temperature protector within the motor. Once the temperature of the motor exceeds a set temperature limit, it should automatically stop running and start again when the temperature decreases to the normal value below the limit.
4. The high speed air flow produced during pulverizing sample grains has a self cleaning effect. Therefore, no manual cleaning of the mill cylinder is required generally during the interval between sample pulverizing operations.
5. After going through sieves with different screening hole sizes, the pulverized sample powder is suitable for samples' preparation, measurement, and analysis of their various indexes, such as wheat gluten quantity and quality, falling number, near infrared compositions, grain viscosity and other fineness requirements.
6. For large grain samples of irregular form (such as maize grains), a preliminary pulverizing by means of laboratory pulverizing mill or direct feeding pulverizing is required.
7. The high speed air flow produced during hammer pulverizing could result in loss of water content in sample grains. Normally, a sample grain that contains 10% to 20% water would lose 5% to 10% water content during the pulverizing process.

## B. Technical Specifications

Power Supply Voltage	AC 220V +/- 10V, 50 Hz
Motor Output Power	750 W
Working Chamber Diameter	110 mm

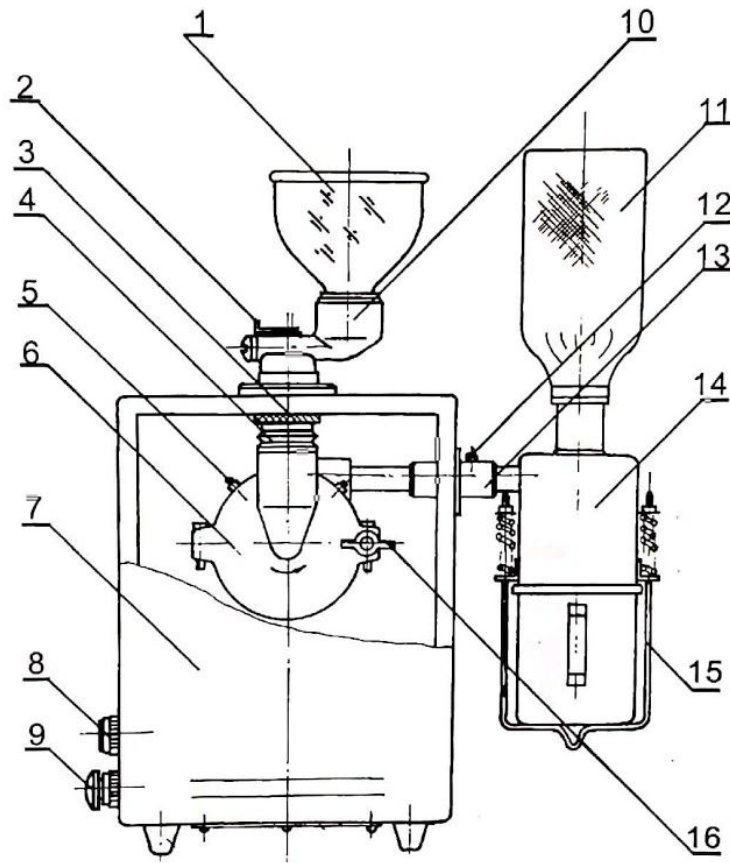
Mill Hammer Rotational Speed	16800 rpm
Screening Plate Hole Diameter	0.5 mm, 0.8 mm, 1.5 mm
External Sizes	530 mm x 530 mm x 650 mm
Weight	51 kg

## C. Packing List

Description	Quantity	Description
Whirlwind Mill	1	
Stainless Steel Collector	1 set	Accessory
Transparent Sample Feed Hopper	1	Accessory
Filter Bag	1	Accessory
2 m Power Supply Cord	1	Accessory
Automatic Feeding Device	1 set	Optional spare
Driving Belt	1	Spare
Stainless steel Screening Plate with 0.5 and 1.5 holes	1 each	Spare
Sealing O-ring of 19 x 2.65 mm	1	Spare
M6 Socket Head Cap Screws	2	Spare
M6 Socket Head Spanner	1	Spare
25 mm Sweeping Brush	1	Spare
Quality Certificate of Product	1	Spare
Operation Manual	1	Spare
Voltage Transformer	1	

## D. Installation Guide

1. Place the Whirlwind Mill on a flat and sound work stand surface.
2. Carefully read the operation manual and the operation precautions printed on both sides of the Whirlwind Mill.
3. Take the stainless steel collector (14) and unscrew the fixing screw (12) on the upper side of the discharge pipe on the right side of the machine. Insert the feed pipe on the upper part of the collector into the discharge pipe (13), fasten the screws after adjustment of collector angle. Put the air filter bag (11) around the big pipe on the upper part of the collector.
4. Open the front door (7), loosen the circular connecting nut (3) on the upper of the rubber sealing sleeve which is located on the upper part of the mill cylinder and butterfly nuts at the right side (16). Open the front cover (6) of the mill cylinder and check if the mill hammer is loose. Then pull and hold the outer side of blades of the mill hammer with your left hand and fasten the M6 stainless steel nut on the center of the shaft clockwise by means of a spanner with your right hand. Check the size of the screening plate (a screening plate with hole size 0.8 mm is mounted when delivered). Close the front cap (6) of mill cylinder and fasten butterfly nut (16) and circular nuts (3), then close the front door (7).
5. Check if the voltage power supply meets requirements and then connect the plug with the power supply socket. **This machine is a 220 V machine, please use the included transformer for standard North American outlets 110-120V.**
6. Check if the rotational direction of the mill hammer is in coincidence with that pointed out by the arrow on the front cover of the mill cylinder (counter clockwise).
7. Pull down the spring clamp (15) of the collector with your left hand and take out the sample cup on the lower part of the stainless steel collector with your right hand. Then pour out the foreign object in the cup and lightly rotate it several times leftwards and rightwards after replacing it back to prevent leakage.
8. Install the transparent feed hopper into the feeding head (10) and press it soundly. Totally open the adjustment plate (2) of the stainless steel throttle valve.
9. Press the green start button (8) on the lower left side. For the first time application, let the motor run idly for 2 to 3 minutes.
10. Press the red stop button (9) to stop the machine.



1. Feed Hopper;
3. Connecting Nut;
5. Fixing Screw of Screening Plate;
7. Front Door;
9. Stop Button;
11. Filter bag;
13. Connecting Sleeve of Discharge Pipe;
15. String Clamp;

2. Throttle Adjustment Plate;
4. Connecting Sealing O-ring;
6. Front cover of Mill Cylinder;
8. Start Button;
10. Feeding head;
12. Fix screw;
14. Collector;
16. Butterfly Nut;

## E. Operational Guide

1. Before putting sample grains into the feed hopper, make sure that there are no small metal pieces or other hard objects within the sample grains.
2. The Whirlwind Mill should be placed on a clean, dry, well ventilated, level and sound stand to ensure normal running of the equipment.
3. After connecting to the power supply, the start button should be pressed only after having adjusted the throttle valve to let the sample grain gradually enter into the mill cylinder. The entering speed of the grain should not be too fast to avoid the blocking operation.
4. After having pulverized the sample grain, let the mill operate for an extra 40 to 60 seconds to clean the mill cylinder automatically, and then press the red stop button to stop the mill.
5. The quantity of the pulverized sample grain for each time is 200 to 300 grams.
6. The feed speed could be adjusted by the adjustment plate of the throttle valve on the feeding head. The feed speed depends on water content within the sample grain. The greater the water content in the sample grain, the slower the feed speed should be. For 300 grams of wheat grain with standard water content, the normal pulverizing time is about 90 seconds. If there is abnormal sound from the motor, it means the feed speed is too high.
7. For sample grain with high water content, the feed speed should be very low. Otherwise, the dough would be burnt due to high temperature within the mill cylinder. If this phenomenon has happened, the mill cylinder and whole powder discharge duct should be cleaned immediately.
8. If an automatic feeding device is used, the feed quantity of sample grain could be adjusted by the speed regulator, so that the necessity of controlling the feed quantity of sample grain by means of manual adjustment of the throttle valve could be totally excluded.
9. After finishing pulverizing the sample grain, the upper part of the collector must be beaten several times with a small wooden stick. Then take out the sample grain cup and screening and weighing as required.
10. If falling number or index in relation to water content is measured, the weight measured by means of scale must be corrected to that at the standard water content.

## F. Caution

1. The Whirlwind Mill is not suitable to be applied to pulverize sample grains with high water content, high viscosity, high oil content, and high cellulose. Otherwise, not only the pulverizing effect would be not satisfactory, but also the machine would possibly be damaged and the motor could burn out.
2. A single phase capacitor is used on the Whirlwind Mill and its output power is 750 Watts. It cannot be used to start with load and for a long time with a full load running. Otherwise, the temperature within the mill cylinder would rise rapidly, or the motor would be damaged due to overloading.

3. The Whirlwind Mill is not applicable to pulverize the sample grains with high hardness, large size, or irregular form. If such sample grains must be pulverized with the whirlwind mill, they should be first processed by preliminary pulverizing and then pulverized by the Whirlwind Mill.

## G. Troubleshooting

### 1. Cleaning

If abnormal sound or low powder output efficiency( powder output lasts for a long time) is heard or observed during the process, it means that the machine should be stopped for cleaning. The cleaning should be done as following:

- 1.1. Disconnect the power supply and take away the sample cup. Loosen the fix screw (12) on the connecting sleeve (13) of the discharge pipe, and then turn the collector 90 degrees forward. Wipe and clean the internal chamber of the collector.
- 1.2. Remove the collector and poke and stir the discharge duct with a small stick.
- 1.3. Remove the filter bag and clean it.
- 1.4. Adjust proper tension of the driving belt as described in Section G.4.
- 1.5. If the Whirlwind Mill is continuously used for a long period, it should be cleaned everyday.

### 2. Replacement of Screening Plate

- 2.1. Disconnect the power supply and open the front cover (6) of the mill cylinder as described in Section D.4.
- 2.2. Unscrew both M4 nuts (5) on the left and right of the external side to fix pressing plates of the screening plates.
- 2.3. Loosen both M4 screws on the left and right from the inner side with a screwdriver.
- 2.4. Pull out the original screening plate and insert the new screening plate.
- 2.5. The procedure of locking up the pressing plate is just opposite the steps mentioned above for removing.

### 3. Replacement of Mill Hammer

If the mill hammer is worn out seriously or deformed under the effect of a force, it should be replaced according to the following procedure:

- 3.1. Buy a new hammer mill.
- 3.2. Disconnect the power supply and open the front cover (6) of the mill cylinder as described in section D.4.
- 3.3. Pull and hold the outer side of the blades of the mill hammer with your left hand and unscrew the M6 stainless steel hexagon nut on the center shaft counter clockwise with your right hand.
- 3.4. Remove the nut and mount a new mill hammer, then fasten as described in section D.4.

- 3.5. When mounting the new mill hammer, it is prohibited to beat on a new mill hammer. Otherwise, it could result in deformation of the mill hammer and affect the quality.

#### 4. Locking Up and Replacement of Driving Belt

After a long term operation of the Whirlwind Mill, the driving belt would definitely elongate and be worn out, resulting in slipping of the belt tension or low working efficiency. At this time, it is necessary to adjust belt tension or to replace the driving belt as follows:

- 4.1. Disconnect the power supply and unscrew the 6 M5 screws on the back of the sealing plate and remove the back sealing plate.
- 4.2. Adjust both the upper and lower nuts of bolts fixing the motor to make the driving belt tensioned lightly.
- 4.3. When replacing the driving belt, first unscrew the bolts fixing the motor and lift the motor on one side. Replace the driving belt between the pulley of the motor and spindle of the mill cylinder, and then re-tension the new belt.
- 4.4. Mount back the sealing plate.

#### 5. Start Failure

- 5.1. Disconnect the power supply.
- 5.2. Tip the whole machine 90 degrees from the front backwards.
- 5.3. Remove the 4 M5 screws on the cover of the electric box on the base surface, and remove the contactors of heat relay from the cover.
- 5.4. Press the reset switch of the heat protector.
- 5.5. Mount the cover of the electric box in procedure opposite to that steps mentioned above and start again.

#### 6. Tripping of Internal Heat Protector Within the Motor Due to Overheating of the Motor

Wait for some time and restart the motor after it is cooled down.

#### 7. Burning Out of Motor Due to Overloading

Remove the motor and send it back for repair.



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