SHGW120×2 & 220×2

Horizontal Dryer

Operation Manual

ZTMT
ZHONGTIAN AGRO

江苏中天农牧机械有限公司

JIANGSU ZHONGTIAN AGRO MACHINERY CO.,LTD

Important instruction:

1 This manual detailedly describes SHGW series horizontal dryer of each system structure, function and use and maintenance method. Before installation and use of the machine , customer should read the manual,and have a full understanding of the ministries and its structure and function ,then have operation and maintenance of the machine. Due to the continuous improvement of product structure, after a certain time period, the manual of narrative content and the actual situation of the products will have small changes.Users should pay attention to it.

2 Please propose your advice to us for melioration when finding quality problem or others.Thanks !

1.USES, APPLICABLE SCOPE AND PERFORMANE FEATURES

1.1 Uses, applicable scope

SHGW120*2 and 180*2 horizontal dryer is widely applicable in the drying section of extruded feed and pellet feed in feed industry, for the drying of aqua feed, poultry feed, pet food and specialized feed, especially commonly in the high quality aqua feed production process; Also for the drying of pellet and flake type product in grain, food and chemical industries.

1.2Performance features

This equipment utilizes cross-flow drying principle and adopts modular design, with the features of concise structure, reliable control, convenient operation, flexible adjustment, high heat efficiency and high product quality after drying, is a kind of high efficiency, energy saving and environmental protection drying equipment.

2. MAIN TECHNICAL PARAMETERS AND PERFORMANCE INDEX

Main technical parameters and performance index see table 1:

Table 1: Main technical parameters and performance index

Model& Spec. / Item	SHGW120×2	SHGW220×2	Remarks
Capacity（t/h）	2.5	4.5	
Steam consumption（kg/h）	550—900	950—1500	Steam pressure 0.6—0.8MPa
Moisture evaporation（kg/h）	850	1350	
Variation of drying(%)	≤2	≤2	Moisture variation of intake product≤3％
Drying area($m^{2)}$	39.6	48.4	
Power(kw)	53.25	78.25	
Dimension (L*W*H)(mm)_	12500×3900×4115	12500×4900×4115	

Note: All the above technical parameters and performance is based on below conditions: drying hot air temperature 120℃, hot air recycle ratio 80%, primary exhaust air

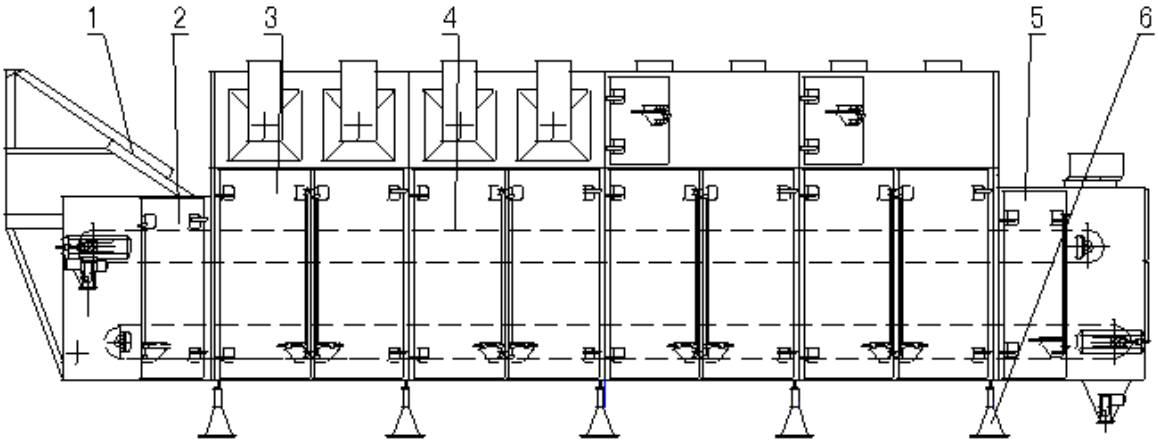
volume 14000m^3/h—16000m^3/h, product is dia. 3mm aqua feed, moisture from 20%-22% reduce to 8%-12%. Considering the difference in product variety, moisture content, environment and requirement to final product, the possible change of the above technical parameter and performance index is foreseeable.

3. MAIN STRUCTURE AND WORKING PRINCIPLE

The drying processing section of SHGW18*2 horizontal dryer is composed of dryer, steam supplying system, ventilation and air volume control system, dust-removing system, electric control system etc.

3.1 Main structure

This machine mainly composed of base frame, intake section, drying section, return section, bedplate, oscillating feeder etc. (see fig. 1)



1.摆动喂料器2.进料段3.干燥段4.履带5.回料段6.支脚

图一、烘干机的主要结构

1. Oscillating feeder 2.intake section 3.drying section 4. bedplate 5.return section 6.supporting leg

Fig. 1, main structure of dryer

3.1.1Oscillating feeder

This part adopts link mechanism driven by chain, the outlet of feeder is oscillating. The inlet of spout does not move, to realize the uniform distribution effect.

3.1.2 Intake section

Intake section is by section steel frame, with interior and exterior wall, in between is rock wool for heat insulation. Intake section includes bedplate main shaft support. Below the lower bedplate of one end has screw conveyor

for mash product collecting. The access door is for the ease of maintenance for operator.

3.1.3Drying section

Composed of upper and lower parts, section steel frame, with interior and exterior wall, in between is rock wool for heat insulation. The ventilation circuit of each drying module is an independent and complete circulation, all air ducting are integrated internally. In the upper part integrated with circulation fan and heat exchanger.

The drying time of product inside can be adjusted by VFD; optimum drying effect could be achieved for different product and requirement within the processing scope of equipment.

Both sides with interior and exterior door, facilitates the cleaning, maintenance and heat release after machine stopped.

3.1.4 Bedplate

Bedplate is composed of conveying chain, perforated plate, product holding plate and scraper etc. The scraper is for the cleaning of mash and broken product inside the dryer.

3.1.5 Return section

Made by section steel frame, with interior and exterior wall, in between is rock wool for heat insulation. Return section also includes bedplate main shaft support. Product is returned here and falls to the lower bedplate.

Meanwhile, there’s a small diameter screw conveyor for discharging of mash and broken product.

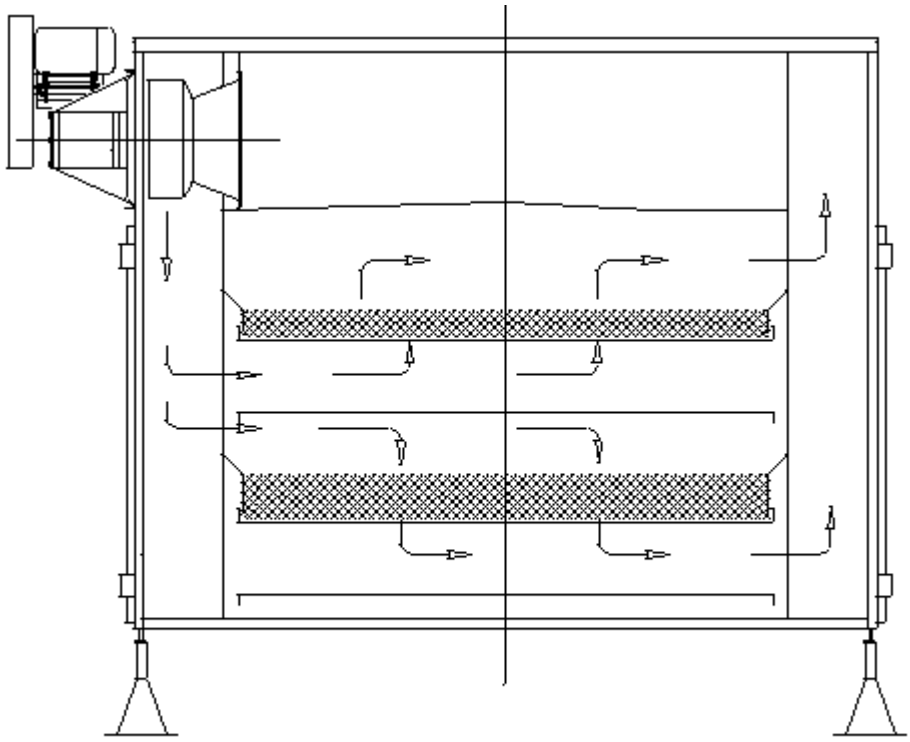
3.1.6Base frame

Base frame is made up of several supporting legs, whose height can be adjusted independently, could be installed on different levels, features with stable support and high strength etc.

3.2Working principle

This machine is a kind of bedplate dryer, the hot air heated by steam as drying media, adopts cross-flow drying principle (see fig. 2), hot air exchanges heat with product and take away moisture inside product to achieve the required moisture content of product. After the exchange of heat and moisture between drying media and product on bedplate, part of the air is discharged out of the dryer via duct; other part of the air will be re-heated via

heat exchanger, mixed with fresh air and enter the dryer again. The product is distributed evenly on the bedplate via oscillating feeder, enter the dryer with bedplate. Returned in the return section after first drying and drop on the lower bedplate to be dried for the second time, and then discharged. The mash and broken product will be discharged by cleaning system.



图二、气流穿流方式

Fig. 2, Flow route of air

4、INSTALLATION

4.1Installation of equipment

4.1.1 Drying is a processing section with relatively high temperature; enough space should be reserved for operation and maintenance personnel during installation. Need to ensure that all access doors could be opened smoothly during maintenance.

4.1.2 In order to ensure the smooth air intake and easy maintenance on top of the dryer, there should be at least 1 meter space on top of the dryer. Meanwhile, need to pay attention to the ventilation condition of the dryer room.

4.1.3 During hoisting, the hook should be in the specialized lifting ring, to

avoid damaging the important working parts of dryer and influence the performance.

4.1.4 The dryer is quite big in volume, in order to ensure the stable installation of dryer, should reserve anchor bolts. It is required that the floor contacting with dryer support should be flat and sturdy. During installation, the height of supports need be adjusted from time to time, to ensure the dryer is in the status of horizontal and same level installation.

4.1.5 The installation dimension of various major part connection surfaces on dryer is completely same, and make sure the parts are replaceable.

4.1.6. The overall dimension of dryer is quite large, and the distance between bedplate shafts is big, so the center distance of sprocket is not easy to adjust. In order to get smooth running bedplate, the proper steps as below:

a. Adjust the bedplate shaft in advance; try the best to keep at parallel position;
b. Installation of chain: all chain to be connected at site, run the driving motor. Fine adjust the screw rod according to the running condition of both sides, to avoid chain loose and chain run off;
c. Adjust the support bearing synchronically, let the chain hang on the rail naturally, and ensure the chain and its accessories do not touch or friction with other parts of dryer during running.
d. Run the dryer bedplate, and keep running for at least one week, further check the stableness of chain running;
e. Fasten all the bolts for chain connection;
F. Run the bedplate again and repeat item “c” and “e” when available.

4.1.7 One surge hopper should be installed on top of the oscillating feeder at the dryer intake section to ensure the stable and continuous feeding.

4.1.8 There should be enough space or collecting measure at the outlet of screw conveyor for mash and broken product out of the dryer.

4.1.9 There should be no leakage etc. defects at the steam piping for dryer.

4.1.10. The pressure display and adjustment of the steam system for dryer should be easy to read and adjust.

5. ADJUSTING AND COMMISSIONING

5.1. Adjusting

5.1.1 Adjusting of bedplate chain tension

The tension of chain is adjusted by sliding support, should neither be too loose nor too tight.

5.1.2Adjusting of bedplate running speed

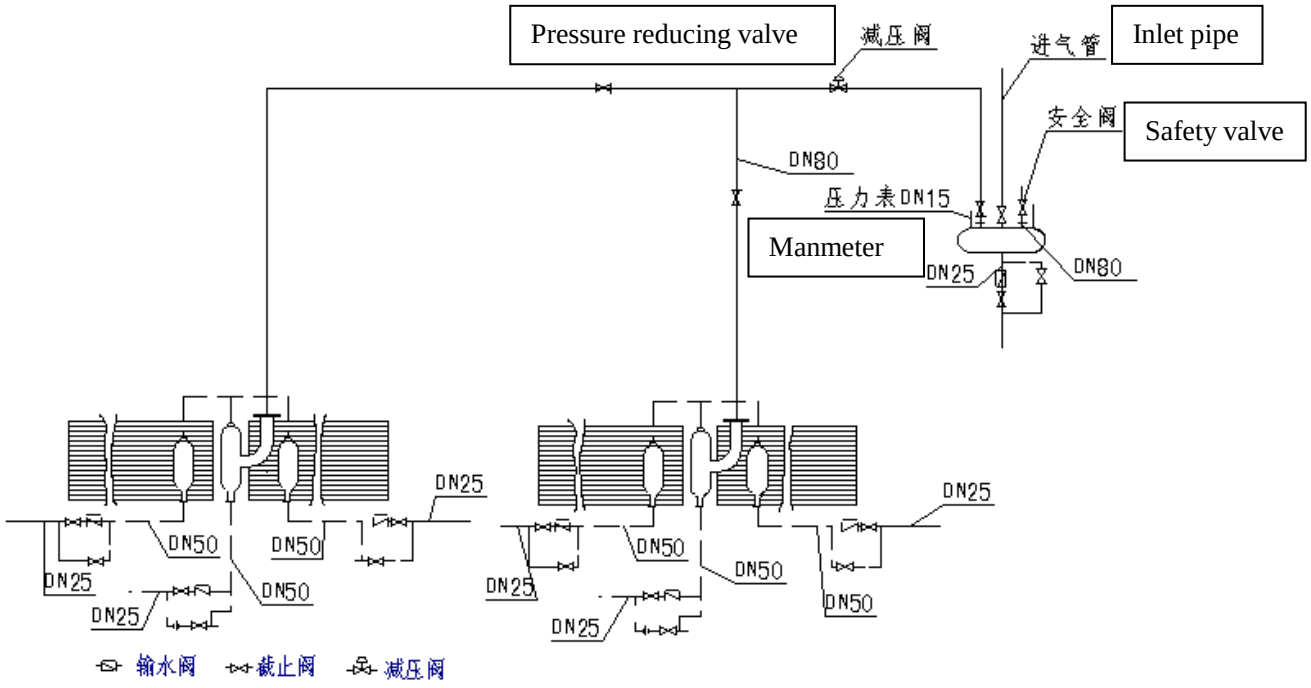
According to the running situation of equipment and requirement to finished product moisture, the product discharging speed and product thickness on the bedplate could be adjusted by changing the bedplate running speed.

5.1.3Adjusting of ventilation air damper

There is one mechanical (manual) air damper at the middle of each drying module. The ultimate ventilation air volume out of dryer could be controlled by adjusting the air damper open degree, which is the major factor influences the recycle ratio of dryer.

5.1.4Adjusting of steam system (see Fig. 3 Steam system diagram)

Proper steam temperature is decisive to the drying effect of dryer. The steam system parameter of this dryer is manually adjusted.



Steam trap Cut-off valve Pressure reducing valve

5.2. Commissioning

5.2.1 Below items need to be checked before first running of dryer:

5.2.1.1 Check if various spare parts of dryer are complete or any damage.
5.2.1.2 Check if there are enough lubricants in all gear motors and bearings.
5.2.1.3 Check if the tension degree of conveying device and fixing condition of chain accessories are as required.
5.2.1.4 Check if the rotation direction of conveying device is correct.
5.2.1.5 Check if steam system is installed per “steam system diagram”.
5.2.1.6 Check if the rotation direction of fan is correct.
5.2.1.7 Check if the steam pipe has been flushed, if has problem of leakage etc.
5.2.1.8 The trial-run can only be started after the above checking and all problems solved.
5.2.2 Start-up sequence
5.2.2.1 Start the lower stream equipment or conveying elements of dryer.
5.2.2.2 Start the cleaning screw conveyor.
5.2.2.3 Start the lower bedplate.
5.2.2.4 Start the upper bedplate.
5.2.2.5 Start the main fan.
5.2.2.6 Start the circulation fan.
5.2.2.7 Start the steam system, pre-heating for 15-20 minutes.
5.2.2.8 Start the oscillating feeder.
5.2.2.9 Feed-in product for drying.
5.2.3 Stop production sequence
5.2.3.1 Stop oscillating feeder.
5.2.3.2 Cut-off the steam supply after product completely discharged out of dryer.
5.2.3.3 Stop fan after 15-20 minutes of cooling.
5.2.3.4 Stop bedplate in sequence.
5.2.4 Cleaning and checking
5.2.4.1 Clean dryer.
5.2.4.2 Check various moving parts to see if any loose, prepare for next production.

6. ELECTRIC CONTROL

Refer to electric diagram of project central control system.

7. USING CONDITION AND SAFETY REGULATION

7.1 Using condition

7.1.1 Dryer should be installed indoor or under canopy, ambient temperature 5℃-40℃.

7.1.2 The equipment capacity upper stream and lower stream in flow diagram should match with the dryer.

7.1.3 The working power voltage should be stable, variation ≤ ±5%.

7.1.4 The steam pressure and temperature should comply with regulation in operation manual.

7.1.5 Electric control panel should be convenient for site operation, observation and dealing when in emergency.

7.2 Safety regulation

7.2.1 Before start machine, should turn on the heat supply and get the dryer pre-heated for 15 minutes, then run the bedplate, and finally the oscillating feeder.

7.2.2 All motors and heat source can only be turned off after the product completely discharged.

7.2.3 Open the dryer door to emit heat timely after stopped the dryer.

7.2.4 Strictly follow the operation steps, avoid machine failure caused by misoperation.

7.2.5 It's forbidden to open the dryer exterior door during equipment running, to avoid operator from injuring.

7.2.6 It's forbidden that human body touches any moving parts during equipment running to avoid injury.

7.1.7 Stop the equipment in sequence immediately after find any abnormal situation or machine failure. Check after machine stopped, and start machine in sequence after problem removed.

8. GENERAL TROUBLE-SHOOTING

General trouble-shooting see table 3

Troubles	Cause	Trouble-shooting
Perforated bedplate, product holding plate loose or missing	Fastening bolt loose or missing	Fasten the bolts

Chain moving direction wrong	Main motor direction wrong	Re-wiring for main motor
Product moisture content after drying too high	1. Initial product moisture too high 2. Throughput too high 3.Hot air temperature too low 3. Not enough air volume 4. Product has too much ingredient hinder drying 5. Not enough drying time	1. Reduce moisture in raw material 2. Reduce intake product volume or increase drying module 3. Increase steam pressure 4. Increase air damper degree 5. Change product ingredient 6. Reduce bedplate speed, increase drying time
Product moisture uniformity exceed standard after drying	1. Air volume through bedplate is not even 2. Difference of hot air temperature at both sides is too much 3. Product distribution in dryer not even 4. Product lump too much 5. Perforated plate damaged 6. Moisture content not even in raw material	1. Improve the air intake condition of both sides, to balance the volume. 2. Improve the air intake condition of both sides, to balance the temperature. 3. Improve the product intake condition, to evenly distribute the product on bedplate. 4. Adjust the air shielding device to suitable height. 5. Replace or repair the perforated plate 6. Keep the moisture content of raw material stable

9. MAINTENANCE

9.1 After every shift, check the fastening situation of chain accessories; deal with it timely if loose or missing.

9.2 After every shift, timely clean the residue product and mash inside dryer.

9.3 After every shift, delay 15-20 minutes then stop the fan, make the dryer cooled down and discharge the steam, to avoid internal spare parts of dryer from rusty.

9.4 After every shift, should open the drainage pipe to discharge the condensated water, to avoid non-smooth steam in next shift and poor heat exchanging effect.

9.5 Check the lubrication of gear motor and bearing periodically, timely add lubricants.

9.6 Check the tension of conveying chain periodically.

9.7 For long period stop maintenance, must take measures for anti-rusting, moisture proof, and rain proof etc.

10. TRANSPORTATION AND STORAGE

10.1 Transportation

10.1.1 Dryer should be suitable for ocean and land transportation. During loading and unloading of transportation, should pay attention to the marking on package, “THIS SIDE UP”, “FRAGILE” etc.

10.1.2 During transportation of dryer, should take measure for rain-proof.

10.2 Storage

10.2.1 For long period outdoor storage, should take measures for rain-proof, anti-sunburn etc.

10.2.2 For long period indoor storage, should be with good ventilation condition and moisture proof measure.

11. Vulnerable PARTS

The vulnerable parts list see table 4

Table 4

No.	Name	Qty.	Remarks
1	Perforated plate	300	SS
2	Product holding plate	600	SS
3	Chain	600	
4	Sweeper	14	SS

ZTMT
ZHONGTIAN AGRO

江苏中天农牧机械有限公司

JIANGSU ZHONGTIAN AGRO MACHINERY CO.,LTD

ADD: No.7 ZhongDaLi Road,New industrial Park,
DaiBu Town,LiYang,JiangSu,China.
P C：　213300
Tel：　13814760009
Fax:：　0086-519-87256670
Http://www.jsztmt.com
E-mail:info@jsztmt.com