

Husk Furnace + Grain Dryer

User's Manual

NCD-62SAX + HF-100(Dual)







Foreword

1. Thank you very much for purchasing our SH Dryer.
2. After the installation of dryer and husk furnaces, check the assembly and operation status with our engineers.
3. The life of product depends on the correct use. If you are well aware of this handling manual, it could be helpful in using the dryer. Using correctly is the only way to use this product for a long period of time.
4. With this handling manual, you can use the dryer safely for a long time with variety of functions.

About Safety


1. It is important to handle this dryer in correct way. If not, the durability and performance of the machine are decreased and unexpected accident may be arisen. Moreover, it may cause severe injury to the human body or loss of property.
2. This handling manual let you know about the expectable dangerous situation in advance. For precautions, symbol marks with description (danger, warning, attention and important) are attached to indicate the dangerous situation by the cautious contents.


 Danger	Imminent crisis to death or serious injury provided that one does not follow the instructions.
 Warning	Crisis possibly to death or serious injury provided that one does not follow the instructions.
 Attention	Dangerous situation to slight injury or material damage provided that one does not follow the instructions.


 Remark	Items to be kept for the efficient use of the dryer
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3. Be aware of the safety indication described in the Handling Manual and observe them for safe use.

Safety precaution is classified into three safety alert symbols, Danger, Caution, and Warning. The meanings are as follows

 **Danger** Not following this instruction may result in serious injury or even sudden death

 **Warning** Not following this instruction may result in serious injury or even death

 **Attention** Not following this instruction may result in light injury or product damage

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1. Products Outline

1.1 Major Features

1) New concept 4-way decompression drying system

It is a high capacity grain drying system of new concept that implemented high-quality and low-price drying without decreasing drying speed by maximizing the drying efficiency with 4-way decompression drying method.

2) Artificial Intelligence drying control

It controls automatically the hot wind temperature according to the grain type, loading amount, grain moisture and air temperature, so it reduces the occurrence of cracked grain and increases the germinating rate and implements the drying in good quality.

3) Equipped with automatic moisture control system

With the equipped single kernel automatic moisture control system, the drying is implemented automatically to the desired target moisture and there is no need to measure moisture often during the drying.

4) Dust outlet equipment

The dust outlet fan designed for excellent selective inhaling power removes soot, immature ear of grain and dust during the drying operation so the grain can be dried neatly.

5) Husk Furnace

Furnace will burn rice husk economically.
Automatic fuel feeding, Ash conveying system and Primary, secondary air control system.

6) Various safety and alarm devices

Various safety and alarm functions such as overheat protecting, motor overload cutoff function, malfunction detecting function and over drying protecting function are equipped, and the power is automatically cutoff and alarm is generated to prevent failure in drying and accident during operation in advance.

1.2 Specifications

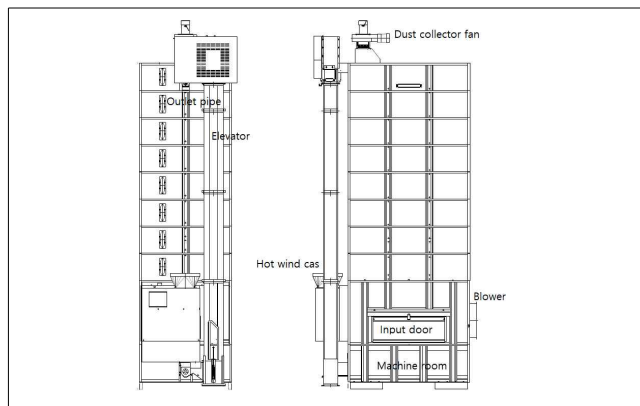
Model		Unit	NCD-62SAX
Capacity		kg	1,500~6200
Dimension	Length	mm	3,463
	Width	mm	1,563
	Height	mm	6,250
Drying	zone	row	2+4
Heat		-	Husk furnace / Indirect, Gun type burner, Kerosene
Blower	Form	-	Diagonal flow type
Required Power	Rated Voltage		V 1phase 220V
	Rated Power	Blower	kW 1.5
		Lower Screw	kW 0.75
		Elevator	kW 0.75
		Exhauster	kW 0.5
		Shutter drum	kW 0.06
		Air duct	kW 0.02
		Moisture meter	kW 0.02
	Control panel		kW 0.05
	Power Consumption		kW 3.7
Recommended power		kW 5.0	
Performance	Loading time	min	20
	Unloading time	min	29
	Drying rate	%/h	0.9~1.1
Control device	Safety devices	-	Protect relay, overheat protector, load abnormal (overload, unloading) detector, thermal sensor abnormal detection, alarm
	Operation control	-	microprocessor and program
	Moisture control	-	Program type automatic moisture control
	Time control	-	Program type digital timer

* Specification are subject to change without notice.

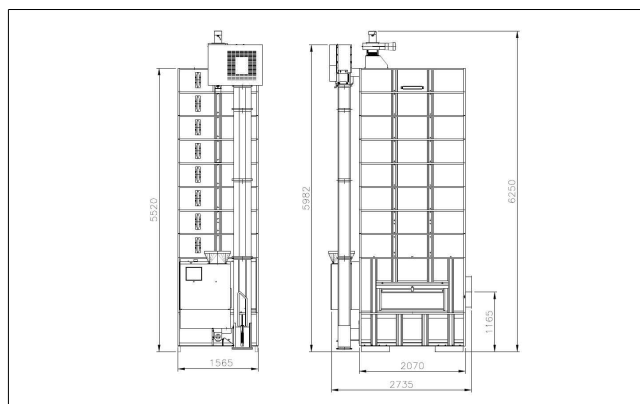
* Drying rate is for reference only. (Actually drying rate will differ by ambient temperature, relative humidity, hot air temperature, grain variety, moisture before and after drying)

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1.3 Parts of Main Body

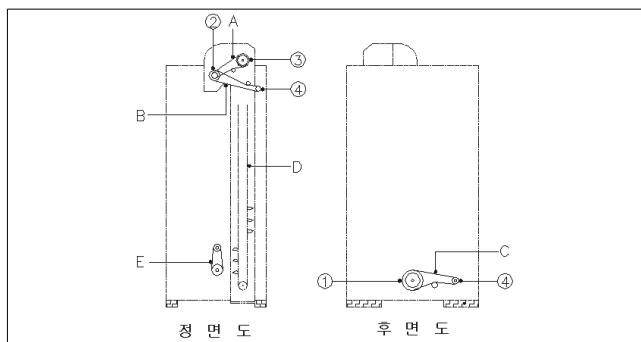


1.4 External Specifications



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1.5 Diagram of Driving Parts



1) Specification of Belts & chain

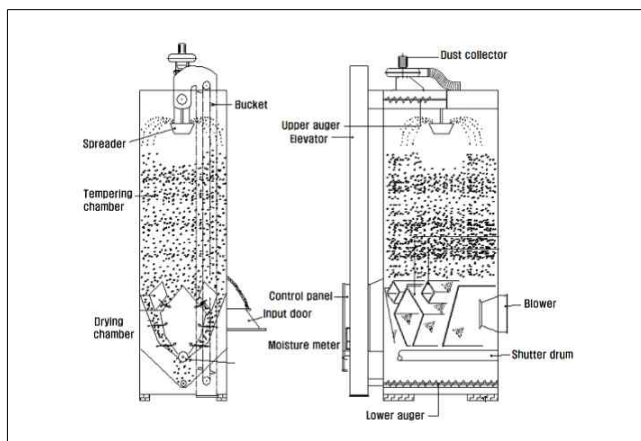
No.	Name	Standard	Quantity
A	Elevator V-Belt	B - 67"	1
B	Upper screw V-Belt	B - 74"	1
C	Lower screw V-Belt	B - 48"	1
D	Elevator bucket belt	215(wide), 3.2(thick)	1
E	Shutter drum chain	#40	1

2) Specification of Belt Pulley and Bearing

No.	Name	pulley spec.	Quantity	Bearing spec.	Quantity
1	Lower screw pulley	B - $\Phi 260$	1	UCF 205	2
2	Lower screw motor pulley	B - $\Phi 65$	1	-	-
3	Upper screw pulley	B - $\Phi 177 / 97$	1	UCF 205	1
4	Elevator motor pulley	B - $\Phi 65$	1	-	-
5	Elevator pulley	B - $\Phi 220$	1	UCF 205	2
6	Shutter drum motor sprocket	#40 x 9T	1	-	-
7	shutter drum sprocket	#40 x 27T	1	-	-

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1.6 Internal Structures and Operational Principle

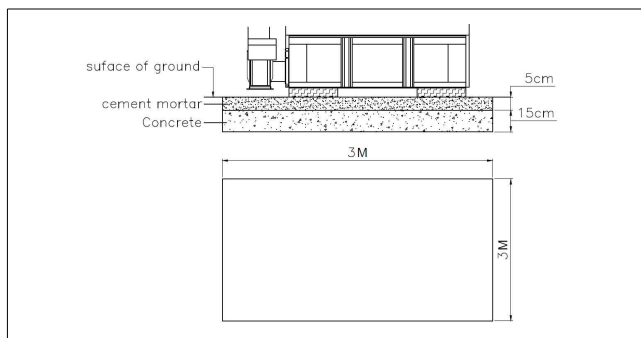
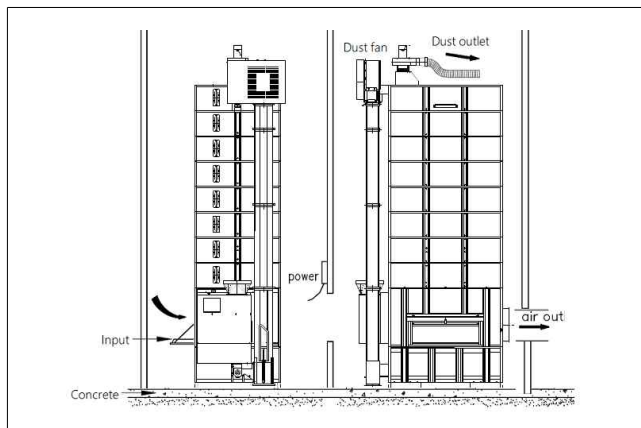


1. The grain is input through the loading door is delivered to the lower part of the elevator by the lower screw.
2. The grain is delivered to the upper part of dryer by the bucket elevator and delivered to the central part of tempering chamber and then falls to the grain spreader.
3. The grain spreader makes the grain piled up evenly in the tempering chamber.
4. On dry mode of the control panel, the motors of each driving part are operating and grain drying starts.
5. The dry hot wind generated by a husk furnace is flown into the drying chamber and passes the grain layer dry hot wind through the perforated sheets by the blower takes away moisture from the grain.
6. The dried grain falls to the lower part of dryer through the shutter drum and is delivered lower screw, elevator and upper screw into the drying chamber.

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2. Installation and Checkpoints before Operation

2.1 Dryer Installation Method



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■ Selecting Installation Place

⚠ Attention

- The installation of dryer is very important in every working conditions, performance, safety and post-managerial aspects, so please select installation place in accordance with the following conditions

1) A place where inhalation and ventilation are smooth.

When the dryer is installed inside of the building, the front of the dryer shall face the south or west and the building shall have a window for the dry air to be inhaled and the front of the dryer shall be located more than 1.5m away from the wall.

2) A place where exhaust and air discharge duct can be easily installed.

The backside of the dryer shall be located in which the air discharge duct can be straightly installed and where exhaust condition is good.

3) A place where dust outlet can be easily installed.

The dust outlet hose shall be installed easily and in a direction letting dust not to be scattered to the neighbors.

4) A place where foundation is firm.

The floor shall be made of concrete and shall be level horizontally. The foundation of concrete shall be firm considering the weight and vibration of the dryer and if needed, support the floor with wood.

5) A place which has good working conditions.

Select a place in which the access to the dryer is convenient and where the loading and unloading operations can be easily made.

6) Safety condition.

Do not place any combustibles or ignitable materials around the dryer and keep clean and install a circuit breaker at the nearest place around the power source before use.

7) A place that can be easily managed.

Select a place where has little humidity and away from any chemical, sanitation facility or barn.

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2.2 Preparation and Checkpoint before Operation

1. Safety Check

- 1) Check the safety around the machine so that there would be no difficulty in doing operation, and do not let children play around the machine.
- 2) Please install safety covers and check if all the check windows, cleaning holes and brush operation levers of each part are closed.
- 3) Clean and check around the machine.
- 4) Check the connecting and accessing status of each connector part of control panel.

⚠ Attention

- In any case that the dryer is not in operation, please cutoff the power supplied to the dryer. (Cut off the power by operating the circuit breaker)

⚠ Attention

- Do not dry any object other than the designated grain and do not use the dryer for the purpose other than grain drying (e.g. grain storing).

2. Power

- 1) Please install the circuit breaker and fuse to the power. In addition, use the power service wire that can stand the required power(load) and do not use the wire too long.
- 2) Please install the ground for the safety.

⚠ Warning

- The ground should be installed for the safe use and protecting the machine.

- 3) Provide power and check if the lamp of power switch is lighted.

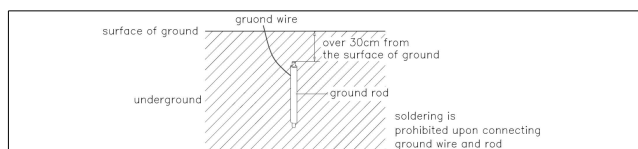
⚠ Attention

- In case the lamp of power switch is not lighted, please check the power service wire, circuit breaker and fuse.

At this moment, check if 5→4→3→2→1 are progressed at the figure indicating part of the control panel and all the lamps are lighted.

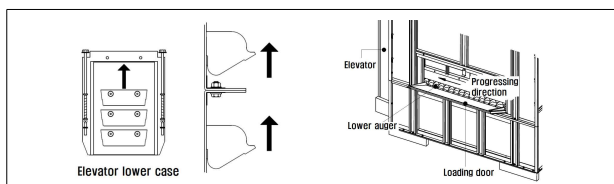
- 4) Press loading among operation selections and check if alarming sound is generated.
- 5) Check if the machine stops upon pressing stop button.

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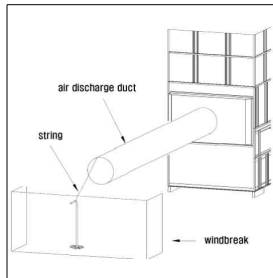
3. Driving Parts

- 1) Check the connector binding of control panel, motor and other parts.
- 2) If loading is selected among operation selections, the elevator and lower screw operate in order. At this moment, the blower operate upon pressing blow among the operation selections.
- 3) Check the rotating direction and status of elevator bucket belt through the check window of elevator when the dryer starts operation.
- 4) Open the loading door and check the rotating direction of lower screw. Moving toward the elevator is the normal rotating direction.
- 5) Close the loading door and check the rotating direction and air discharge status of the blower.
- 6) Check the operational status upper screw and spreader.
- 7) Check the operational status and dust discharging status of the dust collector.



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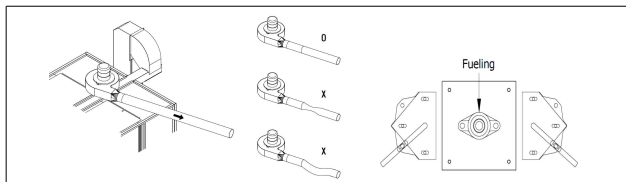
4. Installing Air Discharge Duct of Blower



- 1) Install the air discharge duct straight so that no resistance might be generated and pull the end of the duct tightly.
- 2) Do not place any obstacles within 1.0m from the output.
- 3) Install windbreak when wind blows in the direction of the end of the air discharge duct.
- 4) If discharge duct is severely bent or overlapped each other, the combustion state goes wrong and the drying will take much time.

5. Installing Dust Outlet Hose

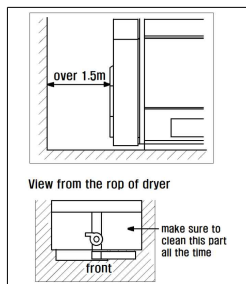
- 1) Install the air discharge hose straight and pull the end of the hose tightly.
- 2) If the middle of the hose is loosened, bent or used overlapped, the dust ejecting efficiency may decrease.



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2.3 Precautions upon Installation & Use

1. Precautions upon Installation



- 1) Place the front of furnace away from the wall or obstacles more than 1.5m.
- 2) Install the air discharge duct straight and do not let it be bent or pressed.
- 3) Do not put any obstacle disturbing air discharge on the outlet of air discharge duct.

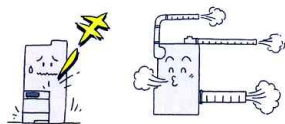
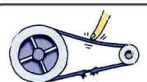
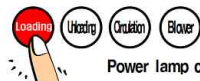
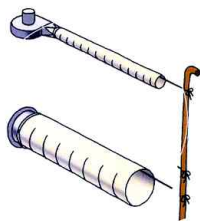
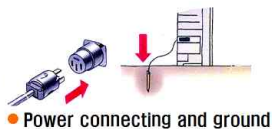
2. Precautions upon Use

- 1) Check if the duct of heat exchanger is installed in right position.
- 2) Clean the front and floor side of the furnace and around the dryer and remove any flammables.
- 3) Do not use without any safety gear (over heat protector, air flow switch).
- 4) Don't open the loading doors and roof doors, it may cause the fire.

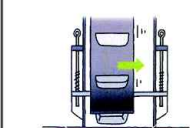
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Checkpoint before operation

1. Safety
2. Power
3. Cleaning around the dryer
4. Driving



● Blower & Dust fan check



If you find any abnormalities, please contact our service center

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3. Operation Method

3.1 Names and Functions of Control Panel

Abnormal warning indication

- Indicates major abnormality.
- Buzzer stop button stops the operation of alarm.

Heated air temperature indication

- Indicates the hot wind temperature.
- You can select grain temperature and ambient air temperature to check them.
- The indicated items are changed upon pressing display selection button.

Power switch

- Used to turn the power on/off.
- If it is not lighted upon power on, please check the power fuse.



Grain moisture content indication

- Indicates the grain moisture.
- Grain moisture is measured at regular time interval during the operation.
- Error may be generated according to the grain status so use it carefully.

Drying time indication

- Indicates the progressed operation time.
- Decimal point means the 10 minutes unit. For example, 12.3 = 12 hours and 30 minutes.

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Hot wind temperature setting

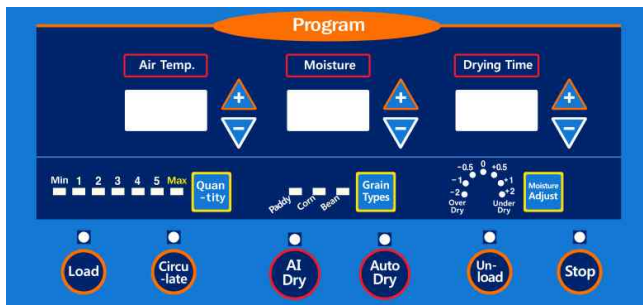
- Sets up the desired hot wind temperature.
- The hot wind temperature is automatically setup upon selecting drying operation.
- Modify it if necessary.

Grain moisture setting

- Sets up the objective moisture.
- Please check after selecting operation and then modify it.
- Error may be generated according to the grain status so use it carefully.

Operation time setting

- Sets up the time limit of the operation to be implemented.
- The setup time automatically setup upon selecting operation; however, please adjust it after check the power fuse.



Grain selection

Grain quantity setting

- Sets up the grain quantity loading into the dryer.
- Set up correctly according to the grain quantity indicating graduation of the dryer.
- It is related to the circulating speed

Working selection

- Sets up the desired operation.
- Selects loading, unloading, circulation, blow.
- Power switch off for the immediately stop.

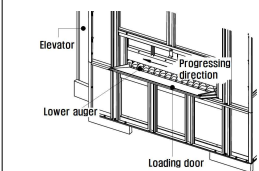
Drying mode selection

- selects the desired operation.
- Selects Ai or Auto.
- Power switch off for the immediately stop.

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3.2 Loading Operation

1. Open loading door and prepare the loading operation.



- Convert into the loading status by pulling down white string attached to the elevator.

2. Turn the power switch ON.



- Power lamp is lighted and countdown for checking figure-indicating part is progressed.
- Check if the figure indicating part is in normal status.

3. Select desired type of grain to be loading. (Grain selecting part)

- Select paddy or corn according to the grain type.



- Select sub item according to moisture correction.

4. Press loading button (Selecting operation)



- loading lamp is lighted and internal alarming sound is generated for 3 seconds.
- Dryer begins to operate.
- Elevator and lower screw are operated in order.

5. Check the time setting and adjust it.




- Upon selecting loading operation, time setting is basically set up for 20 hours.
- Time setting can be changed with + - buttons.

6. Press Cooling button



- The blower is not operated upon loading.
- Blow function is effective for the loading operation accompanying lots of dust.
- To stop the blower in action, press Cooling button once more.

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7. Loading grain <ul style="list-style-type: none"> Remove alien substances such as rice straw, waste and grass as much as possible since they disturb the flow of grain. If 002 is indicated on the hot wind temperature indicating part and stops automatically, that means the dryer is full. <ul style="list-style-type: none"> Stop loading. Re-operate the dryer and deliver the remained grain left in the lower screw into the dryer. 	8. Press stop button for the forcible stop. <div style="text-align: center;">  </div> <ul style="list-style-type: none"> Stop lamp is lighted and the dryer stops. When stop the dryer after completing grain loading, press stop button after loading all the remained grain of loading door. (idle for 30 seconds)
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9. Close the loading door and clean around the dryer.
<ul style="list-style-type: none"> If drying is progressed with the loading door open, the sucking force of the blower is decreased and the combustion status of gets bad and the drying is not performed smoothly. Please remove flammable grain or sack littered around during the operation.

Attention

- Before loading, make sure to pull down white string attached to the elevator to set loading state.
- Please remove alien substances (paddy straw, twigs, waste and grass) before loading if possible.
- Turn off the power switch upon emergency

1. Loading Operation Method

The number of standard combined sack (paddy-based) in case full loading

Grain	Paddy(560kg/m ³)	Corn(700kg/m ³)
NCD-62SAX	6,200kg	7,700Kg
Remarks		

※ Corn drying is less airy than paddy because they have no husk, and the density is high, so the amount loading the dryer should be 20 ~ 30% less.

- Loading quantity of paddy can be changed according to its moisture or conditions (including remains of other materials paddy straws, blasted ears).
Comply with standard quantity so as not to cause a malfunction or overload.
- Remove, if possible, other substances such as rice straw, twig, waste, weed etc., from an loading entry that cause a problem in circulating of grain.
- If a warning lamp of elevator is on and indicator of hot-wind temperature displays "004" and alarm gets to work and dryer gets to stop, it means that elevator have a problem due to overloading. Execute the following instructions:
 - Stop alarm by pushing the buzzer stop button
 - Place a power switch to OFF position.
 - Remove grains within a rotating disk of equal distributor through roof door of dryer.
 - Remove grains in the lower part of elevator
 - Check dryer by performing re-operation according to loading operational order.
- Please close the door of loading door after completing loading operation.

Attention

- Do not remove or open roof door of dryer, side cover of elevator and auto moisture meter while operating.
- Overloading grains is the main cause of dryers malfunction. Be careful with this.
- Be sure to close the loading door after finishing loading.
- In case of open position of the loading door, it causes an imperfect reducing suction ability of blowers and so drying is not performed well

2. Spreader

It piles up loading grains like mortar-type, which is that exterior of storage is high and its center is low. It helps to collect straws or waste of grains into one place not to disturb circulating grains. The form of piling grains can be differed from its moisture and crop and so on.

3. Automatic Moisture Measurement

It measures moisture of grain automatically with an electric-resistance method attached in the lower part of elevator.

- 1) It measures the initial moisture of grain as an loading operating and automatically sets a drying time according to target moisture as dry operating.
- 2) Dryer automatically stops as moisture value is under the setting moisture value upon a drying operation.
- 3) In case of circulating operation, it performs moisture measuring but don't automatically stop by moisture content.
- 4) In case of unloading operation, it does not perform moisture measuring.

■ Important

- Error of moisture value may be caused in case that grain is not supplied enough into auto-moisture meter and grain is mixed with other substances such as paddy straws, weed and dust, etc.
- Keeping cleaning work after finishing unloading operation. Then it allows you to measure grain moisture precisely.

■ Important

- Large deviation in the initial moisture of grain occurs in case that harvested grain is fallen or damaged by frost.
Example) Grain moisture can be distributed from 19.5% to 24% even if auto-moisture meter indicates 21%.

Moisture	19.5	20.0	20.5	21.0	21.5	22.0	22.5	23.0	23.5	24.0
Distribution (%)	6	12	12	11	18	12	9	8	6	6

- In case of a large deviation of moisture of the initial grain before drying, perform the circulation and blow operations together more than 3 hours before drying.

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⚠ Attention

- You do not need to adjust auto-moisture meter. It already set before its release.
- Contact nearest Service Center or vendor when huge error of indicating value of moisture is generated.

4. Manual Moisture Measurement

Please take note of the following when measuring with a manual moisture meter.

- 1) After drying, allow the grain sample to stand for 10 minutes or more, and measure after the temperature of the sample and the measuring machine are the same.
- 2) Put the sample into a sample dish with a spoon, Select and load evenly.
- 3) Put the sample dish into the machine and turn the handle until it touches the stop bar

■ Important

- After 5 samples of moisture were collected, they were allowed to cool for 10 minutes or more, measured 5 times per one place Calculate the average value and the average value for the total of 5 places.
- In case of manual moisture measurement, the water content of grains is very large, If you have a lot of premature rips, make a lot of measurements.
- green paddy and immature lip are high in water content of paddy. Repeat measurement, low value of manual moisture meter Finish drying and check the change of moisture over time.
- Remove batteries when not in use for a long time.

■ Important

- If there is a lot of premature ripening or storage for a long time after drying, the moisture value and actual moisture value at the end of drying may be different.

5. Characteristics of paddy moisture

- Describe the moisture change of paddy. Please make sure to understand the content and make note of harvest timing, drying setting and correction.
- 1) If the paddy harvest season is early or late each year, the percentage of paddy is decreased.

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2) when the harvest is delayed, the paddy germ layer becomes thicker, and the shape of

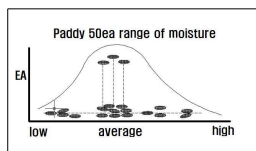
the paddy seedlings becomes worse due to the increase of the defects such as damage, coloring defects etc.,

- Moisture of paddy at harvest

Early-season paddy, fallen paddy, and watery

paddy are

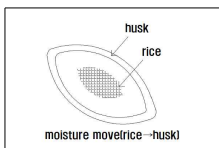
distributed in the early part of the moisture, and may be distributed in the range of about 20%~30%.



- Moisture of paddy during drying

(1) When the tempering and circulation are occurred during drying, the moisture distribution of paddy gradually decreases as time passes, but it varies depending on drying time, set temperature, set moisture, grain quantity, and ambient temperature.

(2) The moisture content of paddy is uneven in surface velocity and when the moisture passes through the drying part, the moisture of the deep part of the paddy moves to the paddy surface and mutual moisture is equal.



6. Caution about Grain Moisture

- 1) At the first drying every year, set up 1% higher than the target moisture content and checks moisture error at the end of drying operation. Then, refer it into moisture set up the next drying.
- 2) Auto moisture meter of dryer can make an error according to harvest timing, weather condition, condition of crops (including lodged grain, unripe grain) and moisture ununiform of grain during drying.
- 3) An auto moisture meter of dryer uses as a convenience device only and it recommends you to use a manual moisture meter for the final grain moisture.
- 4) Owing to higher moisture of dead and unripe grain, it is required to finish drying with a low value of manual moisture meter by measuring it repeatedly and check the change of moisture as taking a time.

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5) Do not be overconfident of auto-moisture meter of dryer. It recommends you to confirm grain moisture with manual.

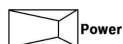
Items	Problems	Solutions
<ul style="list-style-type: none"> ■ High moisture paddy ■ Ununiformity of ripening ■ Wet paddy ■ Time difference of harvest. ■ Moisture change of Brown rice 	<ul style="list-style-type: none"> ■ Cause a moisture ununiformity. ■ Quality degrading, lower rice taste and germination rate by high moisture and high speed drying. ■ Ununiform circulation. ■ Changed moisture of brown rice after finishing drying 	<ul style="list-style-type: none"> ■ Perform circulation and blow at first to reduce a moisture deviation. ■ Lower hot wind temperature by 5~10℃ in case of a high moisture grain. ■ Resolve problems of moisture deviation with 2 steps drying. ■ Set the stop moisture of auto moisture meter higher and finish with manual moisture meter
<ul style="list-style-type: none"> ■ Many of damaged and cracked kernel 	<ul style="list-style-type: none"> ■ The more an unripe grain, the more a damaged grain. ■ Degrading quality and taste of rice 	<ul style="list-style-type: none"> ■ Lower hot air temperature by 5~10℃ and perform 2 steps drying ■ Set up stop moisture of dryer higher and finish drying confirming moisture with a manual moisture meter
<ul style="list-style-type: none"> ■ Insufficient loading quantity 	<ul style="list-style-type: none"> ■ Acceleration of circulating speed ■ Increase cracked and damaged kernels. 	<ul style="list-style-type: none"> ■ Be precise on loading quantity setting ■ Reset hot wind temperature according to loading quantity

3.3 Drying Operation

1. Prepare for drying operation

- Check air discharge duct of blower, dust discharging hose of dust outlet and condition of dryer.
- Rearrange and clean the surroundings of dryer to prevent from fire.
- Check the surroundings for other safety.

2. Turn the power switch ON.



- A power lamp turns on and it starts to countdown for checking a number indicator.
- Check there is no abnormal condition on a number indicator

3. Select type of grain.



- Paddy are selected in order, whenever you push selection button.
- The standard both of paddy.

4. Set up grain quantity



- Set up grain quantity according to indicator of sticker attached on dryer.
- Be precise on set up grain quantity otherwise dry condition can be changed.

5. Select the mode of drying (Auto, Ai drying)



- Select Auto or Ai drying at user's need.
- drying starts after the selected lamp turns on and an alarm is generated for 3 seconds.

6. Confirm and set up target moisture (option)



- Target moisture of grain is automatically set according to its drying mode. But it is required to confirm and modify it, if necessary, with (-) and (+) buttons.
- Set up target moisture considering moisture correction.

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7. Confirm and set up drying time



- Setting time is automatically set followed by difference between target moisture and initial moisture.
- If necessary, modify it with (-) and (+) buttons after confirmed.

8. Confirm and adjust set temperature



- Setting temperature is automatically set. But it is required to confirm it.
- If necessary, modify with (-) and (+) buttons,
- It is not required to modify set temperature in case of intelligent drying mode.

9. Press stop button for the forcible stop.



- The stop lamp turns on and dryer gets to stop.
- If completing drying by the established moisture or time reaches to the extent of target one, 000 is displayed and dryer automatically stop.

10. Turn off power switch



⚠ Attention

- Turn off power switch in case of an emergency

⚠ Attention

- This dryer performs unmanned auto-control after starting operation. Do not, if possible, run in unmanned operation mode. Check its operational status around once in a 2 or 3 hours while unintended away from dryer. It might cause a fire or fatal accidents in case of operating continuously dryer in abnormal condition.

⚠ Attention

- Be precise on set up grain quantity and select on types of grain that highly effect on drying control methods.
- It happens to degrade quality or make large moisture error resulting from over-drying or rush drying in case of set up grain quantity and select grain wrong.

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⚠ Attention

- Confirm grain moisture with a standard manual moisture meter after finishing drying.
- It is required to use a standard manual moisture meter that is manufactured no later than one year after elevating grains.
- In case of measuring grain moisture with a manual moisture meter, cooling off a grain sample for more than 10 minutes and select and measure the only refined grain that is removed from unripened grain or other substances.
- In case of measuring paddy, it is more precise on measuring moisture of a brown rice condition that is pilled off the husk.
- The measurement of moisture is to be confirmed by calculating a mean value of the measurement more than 5 times.
- It might cause an error of moisture value between actual grain moisture value and moisture value obtaining from auto moisture meter equipped with this dryer.
- It might make a difference in moisture value because auto moisture meter is measured not by separating a grain but by including unripened grain or other substances remained inside a dryer.
- Therefore, if possible, remove other substances as an loading process. Perform drying operation after correct moisture of grain by modifying a grain selection number.
(Refer to how to correct moisture of grain selection)

1. How to Select Grain



This is to set up the desired grain types for drying.

The type of grains is largely divided into paddy, corn, bean

■ Important

- Set up precisely grain quantity and select on types of grain that affect highly drying control methods.
- It happens to degrade quality or make large moisture error resulting from over-drying or rush drying in case of set up grain quantity and select grain wrong.



Grain selection and moisture correction of paddy drying

Grain selection and moisture correction of Corn, Bean drying

(Corn and bean drying need extra automatic moisture meter)

How to operate not using auto-moisture meter

How to operate the switch attached on the right side of control system as drying not using an auto moisture meter is as follows:

An indicator of grain moisture displays  (set moisture )

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⚠ Attention

- Be precise on set up drying time as not using auto moisture meter because the only setting time can finishes drying.
- Check grain moisture all the time in order not to cause an over-drying.

2. How to Set Up Grain Quantity



- 1) The grain quantity set up is required to comply with a grade indicator of grain quantity displayed on dryer.
- 2) Setting grain quantity precisely that automatically fixes hot wind temperature and circulating speed.
- 3) It is required to set up grain quantity by 1~2 grade lower for maintaining grain quality after drying in case of the followings:

- ① In case of generating a cracked rice while drying.
- ② In case of many paddy pilled off husk before drying.
- ③ In case of grain types of cracking easily.
- ④ In case of low humidity(below 60%) condition of inhaled air

3. Check Grain Temperature and Ambient Temperature



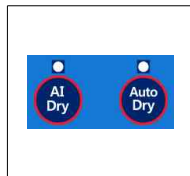
- 1) The current indicator of the hot wind temperature displays a normal interior temperature of the hot wind room.
- 2) Push selection button as checking grain temperature and ambient temperature.
- 3) It shows changes in hot wind temperature, grain temperature and ambient temperature each one time push button selection.

⚠ Attention

- Indicator of heated air temperature displays not temperature but abnormal sign when an abnormal condition of the temperature sensor occurs.
 - ① In case of open of temperature sensor: It displays - - -.
 - ② In case of short-circuit of temperature sensor: It displays F F F .
- When ambient temperature or grain temperature are not detected normally, large error of moisture measurement value may take place and perform drying inefficiently .

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4. Drying Operation(Mode) Selection



- 1) Drying mode is classified into Auto and Ai drying.
- 2) Perform drying operation after selecting grain types and set up loaded grain quantity.
- 3) Built-in artificial intelligent program automatically calculates and establishes drying conditions such as a setting temperature, moisture, time, etc. But be sure to use this function after checking the drying conditions.

■ Important

- The large deviation between moisture value right after drying and moisture value during storage might be generated when many of unripe paddy is included or long period time of drying.

■ Auto drying mode

- This mode is proceeded from beginning to end by user's selected certain conditions.
- The drying conditions such as setting temperature, moisture and time is automatically set as selected. But be sure to check the drying conditions and if necessary, modify the setting values.
- Modify hot wind temperature according to changes of environmental condition even in drying due to the possibility of degrading grain quality in case of large changes in ambient temperature or humidity. Be sure to check a reference table as modifying hot wind temperature.
- The auto-calculated target moisture value is 15%.

■ Important

- As the hot wind temperature goes higher, The more grain quality degrades, cracked kernels are generated and over-fuel combustion occurs. Therefore, be sure to refer to hot wind temperature reference table.

■ Ai drying mode

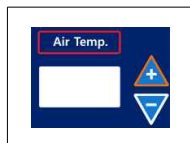
- This mode dries by applying artificial intelligent control program until user's established target moisture and auto-adjusting properly at changes of ambient conditions.
- The drying condition such as a setting temperature, moisture and time is automatically set as selected. But be sure to check the drying condition and if necessary, modify the setting values.
- An auto-established target moisture value is 16%.

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■ Important

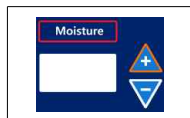
- Auto drying mode is programmed for drying processing with a constant speed by grain types, grain quantity, established target moisture, exterior-environment conditions, drying rate, etc. Therefore, there might be changed in the hot air temperature set up value. But it does not mean that have a malfunction.
- Ai drying mode also perform tempering drying function during drying.

5. How to Set Up Heated Air Temperature



- 1) The built-in program automatically set up hot wind temperature according to grain types, grain quantity, established target moisture, ambient conditions and drying rate, etc. But set temperature can be changed by user's purposes.
- 2) The hot wind temperature cannot set up over 80℃
(It can be changed to make better quality.)

6. How to Set Up Target Moisture



- 1) Moisture measurement of grain is automatically performed at every 15 minutes in the course of drying.
- 2) Dryer automatically stop if a measuring moisture value is equal to set up moisture value or below.
- 3) On this case, "000" displays on the indicator of hot wind temperature.

■ Important

- Be sure to check if set up moisture value complies with that of manual moisture meter by comparing with it many times at the end of drying or after drying completion

7. Hot Wind Temperature Reference Table

corresponding to ambient temperature and grain quantity (paddy-based)

1) NCD-62SAX(Indica)

Indicator grade	L	1	2	3	4
Loading quantity	2,200kg	3,200kg	4,200kg	5,200kg	6,200kg
Ambient Temperature(℃)					
20	46℃	49℃	52℃	55℃	58℃
25	49℃	52℃	55℃	58℃	61℃
30	52℃	55℃	58℃	61℃	64℃
35	55℃	58℃	61℃	64℃	67℃

8. How to Set Up Drying Time



- 1) Drying time is automatically set by measured initial moisture of grain and established target moisture as an loading operation. But it can be changed at user's purpose.
- 2) Dryer automatically stop regardless of grain moisture after proceeding drying until the established time and "009" display on indicator of heated air temperature.
- 3) Also dryer automatically stop by target moisture first, then setting time.

⚠ Attention

- Perform drying by setting up one hour less at the first drying after harvesting or purchasing. And refer to target moisture set up or operating time set up by checking grain moisture after drying completion.

⚠ Attention

- It is originally the same as rice drying. But perform adequate a glutinous rice drying at its own region due to chlorosis and easy to crack by its type.
- It is required to hull glutinous rice after passed at least 15 days in drying. Otherwise it causes to degrade quality as hulling.

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3.4 unloading Operation

1. Prepare for unloading operation

- Rearrange and clean the surroundings of dryer for safe and efficient unloading operation.
- Check fuel condition of lubricant and tension of belt
- Check the surroundings for other safety.

2. Turn on power switch



- A power lamp gets turn on and it starts to countdown for checking a number indicator.
- Check if there is no abnormal condition on a number indicator.

3. Push unloading button



- unloading lamp turns on and dryer start to operate after an internal sound generates for 3 seconds.
- Elevator and lower screw operate in order and shutter drum operate at highest speeds.

4. Adjust after checking set up time



- Set up time is basically established by 20 hours as selecting unloading operation.
- Modify setting time with (-) and (+) buttons.

5. Push blow button as intended to operate blow.



- It is efficient to use Cooling function for unloading operation of dust involved.
- Push Cooling button once more as intended to stop blower.

6. Unloading grain

- unload grain by pulling down the unloading string(blue-colored) attached on elevator

7. Push stop button as intended to stop operation.



- A stop lamp turns on and a dryer stop.
- Close a grain outlet gate by pulling down loading string (white-colored) attached on elevator.

8. Turn off power switch and rearranging the surroundings of dryer.

- Turn off power switch after unloading completion and also cut off the breaker of a distributing board.
- Rearranging and cleaning the surroundings of dryer for later efficient usage. And checking the condition of dryer.

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⚠ Attention

- Check grain moisture with manual moisture meter after a natural cooling obtained grain sample over 10 minutes before performing unloading operation.
- Never store grains within a dryer after drying completion.
- Store the dried grain with a low humidity, a well ventilation and a cool storage.

3.5 Circulation Operation

1. Check the condition of dryer and prepare its operation.

- Check condition of dryer such as air discharge duct, dust discharge hose, belt tension, etc.
- Check the surroundings for other safety.

2. Turn on power switch



Power

- A power lamp turns on and it starts to countdown for checking a number indicator.
- Check if there is no abnormal condition on a number indicator.

3. Select types of grain



- Paddy is selected in order whenever push selection button.
- The standard of paddy.

4. Set up grain quantity



- Set up quantity according to grade indicator(sticker) attached on dryer.
- Set up grain quantity precisely otherwise dry condition may get different.

⚠ Attention

- Turn off power switch in emergency and rush to stop operation.

■ Important

- Grain is dried partially even at slower speed by circulation and blowing when circulating operation.
- Dryer is not controlled by grain moisture when circulating operation. Be precise on set up a desired circulating time.

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5. Push circulation button



- A circulation lamp turns on and dryer start to operate after internal sound generates for 3 seconds.
- A circulation operation performs not a furnace operation but a circulating and blowing only.

6. Set up desired operating time



- Modify setting time with (-) and (+) buttons.

7. Push stop button on compulsory stop.



- A stop lamp gets turn on and a dryer stop.
- If drying is completed by the setting moisture 000 or time, 009 is displayed and dryer automatically stop.

8. Turn power switch off.



Power

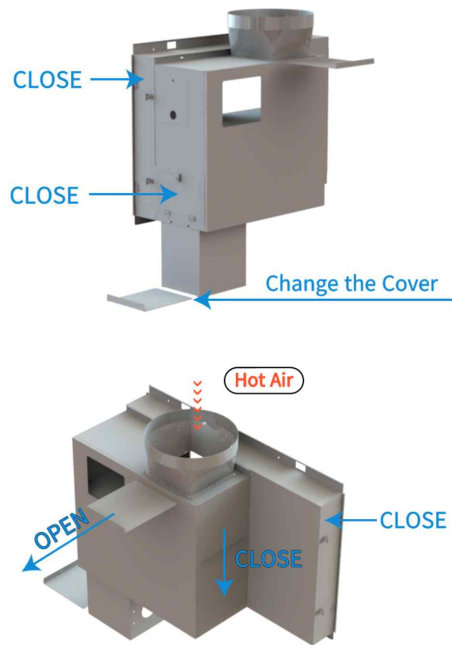
The necessity of circulating operation is as follows

- When you loading grains many times or with different moisture, spot or circulating stagnation might occur due to grains congestion.
- When you can not operate drying due to furnace malfunction, preform the circulation.

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3.6 Switching Burner & Husk Furnace

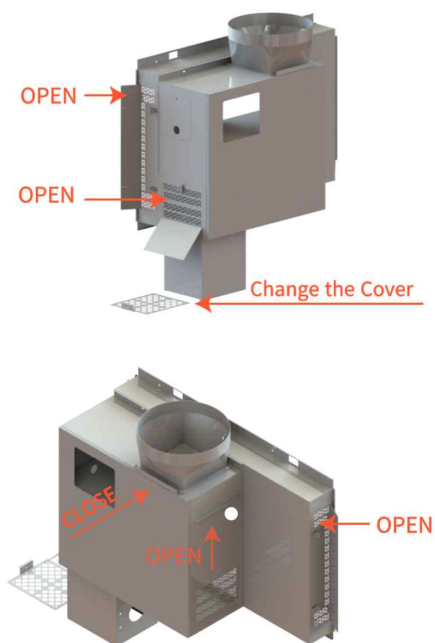
1) Husk Furnace



- (1) In case of using husk furnace, drying with hot wind from husk furnace..
 - (2) Close the air inlet cover on the how wind case and bottom of burner.
 - (3) Open the furnace hot air inet cover.
- Caution : Hot wind temperature will not rise, if the covers were in wrong position.

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2) Burner







- (1) In case of using burner, drying with hot wind combined burner heat with cool outside air in the hot wind box.
 - (2) Open the air inlet cover on the how wind case and bottom of burner.
 - (3) Close the furnace hot air inet cover.
- Caution : Hot wind temperature will not rise, if the covers were in wrong position.

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3) C-Box Setting

Turn off the power → C-Box setting → Turn on the power

Sort		Setting	Display	Note
Heat Source Choice	Burner			Switch the button on the C-Box
	Husk			

4. Abnormal Diagnosis and Counter Measures

4.1 Inspection and Counter Measures upon Abnormality

- Inspect referring to the followings before you report an error upon alarm or sudden-stop of dryer resulting from its abnormality.
- 1) Check what error occurs in an abnormal warning indicator of operating panel and an indicator of hot wind temperature.
 - 2) Refer to Counter measures on abnormal particulars for other abnormalities.
 - 3) Push the buzzer stop button on abnormal indicator to stop an alarming.
 - 4) Perform reoperating dryer at its operational methods upon recovery done by counter measures.
 - 5) Contact the nearest Service Center or vendor after disconnecting power supply if is impossible to take counter measures upon errors.

⚠ Danger
















- Be sure to disconnect power supply and turn off power switch as inspecting, controlling and repairing dryer. Injuries or fatal accidents might be caused by electric shock upon short-circuit or other electricity-related accidents.

⚠ Attention

- Disconnect power supply after stop alarming by pushing a buzzer stop button first while alarming.

1. Self Diagnostic Code Indication



When any abnormality is occurred, the following abnormality codes (letter) appear on the heated air temperature indication LED as well as the abnormal warning lamp.

 drying completion (target moisture completion)	 power abnormal (program abnormal)	 grain overloading
 Hot wind damper abnormal	 elevator abnormal (elevator overload or bad operation)	 lower screw abnormal (lower screw overload or bad operation)
 blower abnormal (blower overload or bad operation)	 shutter drum abnormal (shutter drum or limit switch)	 tempering drying is running (not abnormal phenomenon)
 time completion (set time arrival)	 dust collector motor abnormal (exhauster overload or bad operation)	 thermal sensor abnormal (cut off or short)
 moisture abnormal (connection)	 moisture abnormal (grain sampling)	 moisture abnormal (sensor)




- 36 -

2. Counter Measures by Abnormal Phenomenon





If any abnormality is occurred on the dryer, please check the following items considering safety.

Before reporting failure, please check the following items in advance. Please cutoff the power during checking, adjusting and repairing dryer.		
Abnormality	Cause	Solution
Power Lamp is not lighted up	Power breaker is shut down.	Turn on the power breaker.
	The fuse of cover knife switch (fuse box) is blown.	Replace the fuse.
	Power plug of the control panel is out of receptacle.	Insert the plug in a receptacle.
No indication is appeared on the control panel even though power lamp is lighted.	The round fuse of control panel is blown.	Turn off the power switch and replace it with spare fuse (250V, 2A)
Figures appear on the control panel, but the dryer is not running upon working selection	The connector between control panel and motor is pulled out.	Insert the connector firmly. Check if the alarm sound is generated upon working selection
 Hot wind damper abnormal	connecting line is plugged out.	Check the connecting line.
	motor is damaged slightly.	Check the heat level of the motors and contact the Service Center. (ID FAN, Air FAN or Fuel feeding motor)
 Elevator (elevator abnormal lamp is on with alarm)	Elevator connecting line is plugged out.	Check the connecting line.
	Grain is overloaded.	Remove the grain.
	Elevator bucket belt is loosened or inclined	Check and adjust the bucket belt.
	Tension of the elevator motor belt is wrongly adjusted.	Adjust the belt tension.

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Abnormality	Cause	Solution
 Lower screw (lower screw abnormal lamp is on with alarm)	Lower screw motor connecting line is plugged out	Check the connecting line.
	Too much grain over lower screw due to overload from loading door.	Remove the grain
	Tension of the lower screw motor belt is wrongly adjusted.	Adjust the belt tension.
	Trouble in lower screw motor.	Contact the Service Center.
	Grain overload due to the elevator trouble.	Check the elevator and remove the grain.
Grain is coming out of dust collector	Airflow dust collector of is too strong.	Open airflow adjusting plate a little bit.
Dust collection is not sufficient	Airflow dust collector of is too weak	Close airflow adjusting plate a little bit.
 Blower (blower abnormal lamp is on with alarm)	Blower connecting line is plugged out.	Check the connecting line.
	Alien substance is stained on the wing of blower.	Check the rotating status of blower and remove the alien substance.
	Blower motor is damaged slightly.	Check the motor heat level and contact the Service Center.
 Shutter drum (alarm only with no abnormal lamp)	Shutter drum connecting line is plugged out.	Check the connecting line.
	Too much grain in the lower screw hopper up to shutter drum.	Check the elevator and lower screw status and remove the grain.
	Shutter drum limit switch connecting line is plugged out.	Check the connecting line.
	Shutter drum coupling is come out of the place.	Check the coupling.
	Shutter drum motor is slightly damaged or motor condenser is out of order.	Check the motor heat level and connecting status of condenser.

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Abnormality	Cause	Solution
 dust collector (alarm only with no abnormal lamp)	dust collector connecting line is plugged out.	Check the connecting line.
	motor is damaged slightly.	Check the heat level of the motors and contact the Service Center.
 Moisture meter connection	main PCB and moisture meter PCB problems.	Check the Communication IC main PCB and moisture meter PCB replace Communication IC Check the PCB and replace PCBs.
	connecting cable cutoff between main PCB and moisture meter PCB	Check the connecting cable.
 Moisture meter sampling	in sufficient grain is collected by moisture meter	Check the grain collector on the elevator and clean.
 Moisture meter roller	Roller in moisture meter are stained or choked	Clean the rollers in moisture meter

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4.2 Safety Equipment

Do not operate the dryer with the following safety gear removed. If not, it may cause important results such as accident, fire and failure in drying.

Classification	Function	Trouble generated upon removing	Check items upon abnormality
Alarm	Generate alarming sound when dryer is in abnormal condition.	User hardly can recognize the trouble occurrence in dryer.	Check the connector of alarm and adjusting status of alarm generating panel.
Overheat protector	Power of furnace is automatically blocked when the hot wind room is overheated and returns to the normal status when overheat is released.	It may cause fire, over dry and fast dry.	Block the power and check the connecting status and installation status of the overheat protector.
Shutter drum limit switch	Detect the rotating status of shutter drum and alarm is generated and dryer is blocked from operation upon abnormality.	Grain drying is impossible since the operation of shutter drum cannot be detected.	Check the connector status of motor or limit switch.

4.3 Safety Protection Equipment

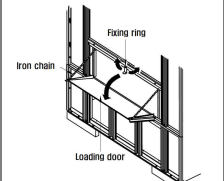
Classification	Functions	Trouble generated upon removing	Check items upon abnormality
Belt cover	Prevent accidents due to various belts or driving parts.	Injury or accident may happen due to the driving parts.	Check the installation status before the operation.
loading door protection net	Prevent alien substances from flowing in and person from falling down upon loading operation.	Damage in machine parts due to the alien substance such as wooden log, and accidental fall of a person cannot be prevented.	Check the installation status before the operation.

- 40 -

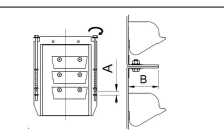
5. Maintenance and Safekeeping Method

5.1 Inspection and Adjustment on Each Part

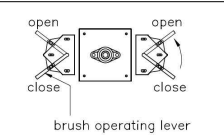
1. Opening / Closing and Adjustment of loading Door

	<ol style="list-style-type: none"> 1) Release the fixing screw at the both ends of loading door and pull the fixing ring following the arrow direction and then open the door. 2) Upon adjusting loading door, remove the iron chain from fixing peg and hang on again after adjusting it. 3) Be sure to close the loading door after loading. 4) Do not stand on the loading door. It is very dangerous.
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2. Adjusting Tension of Elevator Belt

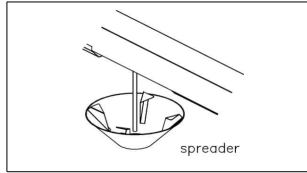
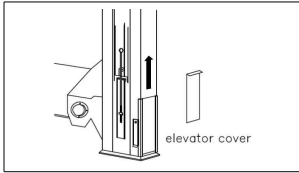
	<ol style="list-style-type: none"> 1) Check the elevator belt after removing automatic moisture meter. 2) If elevator belt is loosened or leaned toward a direction, adjust it with belt tension with adjusting bolt.
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3. Cleaning Grain Residual

	<ol style="list-style-type: none"> 1) Run the machine as unloading operation till all the grain get out of the dryer and then stop the machine. 2) Fix the brush operating lever at the rear of the machine room at open and fix the screw. 3) Open the grain drain cover of the impeller case and remove the grain residual completely.
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- 4) Open the side and the lower cover of the elevator and remove the grain residual.
- 5) Open the cover fixing ring under the equal distributor case and perform cleaning.
- 6) Clean the drying room inside.
- 7) Check each part after cleaning and fix the operation lever at "close" and then close the cover of each part.

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⚠ Attention

- Attach all the cover to the original place after inspection, adjustment and maintenance of this dryer. If not, it may cause injury.

4. Cleaning automatic moisture



- 1) Place a power switch to OFF position.
- 2) Remove, if possible, other substances such as rice straw, twig, waste, weed etc., from an input entry that cause a problem in circulating of grain.

■ Important

- Error of moisture value may be caused in case that grain is not supplied enough into auto-moisture meter and grain is mixed with other substances such as paddy straws, weed and dust, etc.

5.2 Dryer Safekeeping Method

1. Cleaning Ventilator



- 1) Detach the inhalation hole cover and check inside the hot wind room. If dust or soot is piled up, remove them.
- 2) Detach the circulation hole cover on the blower at the rear side of the dryer and check inside the supplementary hot wind room and clean the piled up dust with rod.

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⚠ Warning

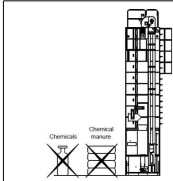
- If any lighting is needed inside this dryer, please use a flashlight. The edge of iron sheet may damage the electric wire and injury or accidental death may happen by electric shock.

2. Cleaning Blower

- Detach the air discharge duct and clean the dust inside blower and then block the outlet of blower to prevent rats or birds from entering.

3. Safekeeping Electric Parts

- 1) Moisture or rain soaked into the control panel, automatic moisture measurer may cause a trouble, so store them in the dry warehouse separate from the dryer while not in use after the drying period if possible. Take care of wire not to be damaged by rat.
- 2) If separate safekeeping is impossible, wrap them to prevent from moisture soaking or rain and please disconnect the power cable.



- 3) Since the electronic parts cause chemical reaction near the chemicals and it causes trouble, so do not place ammonia, chlorine, acid, chemical manure or disinfectant near the electronic parts.
- 4) Safekeeping the driving motors of each part by wrapping not to be wet, and adjust the tension pulley of various driving belts loosened upon storing.

4. Safekeeping Main Body

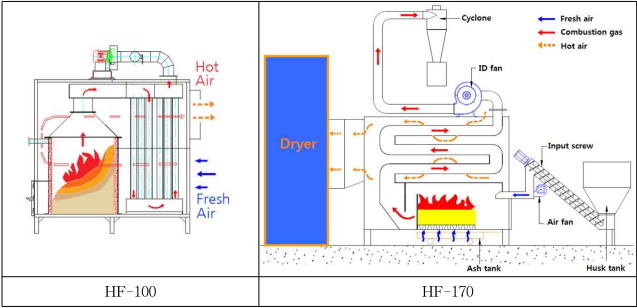
- 1) Remove dirt such as dust piled up during drying from each part of the dryer, and make the parts waterproof not to be soaked by moisture or rain from outside upon storing.
- 2) The external parts of the dryer are painted to protect them from rust, however, take measure for the part on which the paint has been removed while using to proof them from rust upon storing.
- 3) Please remove the remained grain inside the main body after drying. If not, rat and other animals may enter inside the dryer and cause trouble.
- 4) Clean bearing, chain and driving part.

⚠ Attention

- Upon using ladder, please make sure to hang the end of ladder on the ladder peg.
- If it is felt down during the use, severe injury may be occurred.

6. Husk furnace

6.1 Flow chart



Item	unit	HF-100	HF-170
Heat capacity	kcal/h	75,000	170,000
Max fuel(Husk)	kg/h	24	50~60
Fuel Feeding	kW	0.015	0.4
Air Fan	kW	0.15	0.04
ID Fan	kW	0.75	0.75
Total Power	kW	0.915	1.23

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6.2 C-BOX

1. Control System Specifications

1) HF-100

Item		Specification
Input Voltage		3phase AC220V/AC380V
Load factor	Fuel Feeding Screw	15W
	ID FAN	0.75kW
	Air FAN	150W
	Temp. Controller	TZ4W (PT-100 Sensor)

EFX-III (HF-100)	Connecting	HF-75 Control Panel
	dryer & furnace Connecting jack ↔ power wire (1Φ, 3Φ)	

2) HF-170

Item		Specification
Input Voltage		3phase AC220V/AC380V
Load factor	Fuel Feeding Screw	400W
	ID FAN	0.75kW
	Air FAN	40W
	Ash Discharge FAN	0.75kW
	Temp. Controller	TZ4W (PT-100 Sensor)
Show	Temp. Controller	Current/Setting Temperature Value of Heated Air
	Switch Light	Motor On/Off state

Control Panel	Parts Description
	1. Temperature Controller 2. ID Fan On/Off Switch 3. Fuel Feed Screw On/Off Switch (MN : Manual, On : Auto) 4. Air Fan On/Off Switch 5. Ash Discharge Fan On/Off Switch







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2. Operation(HF-170)

1) Preparation Procedure

- (1) After the assembly of unit
- Checked all the following motors if in good condition and proper direction of rotation.
- Air Fan, - Fuel Feeding Screw
 - ID Fan, - Ash Discharge Device, - Ash Fan
- (2) Fill the rice husk tank, removed all solid or alien substances inside the tank to avoid.
- (3) Clean area before operation assure that no flammable such as straw, papers, gasoline, paint etc should be near the machine.
- (4) Check the connecting and accessing status of each connector part of control panel.

2) Operation

	<ul style="list-style-type: none">Switch main breaker [On]Turn on the main breaker, the light is on
	<p>1) Set the Selector switch of ID FAN to [ON]</p> <ul style="list-style-type: none">By doing so, the ID Fan run and turn on the light,Set the selector switch of ID FAN to [OFF] then stop the ID Fan and turn off the light.
	<p>1) Set the Selector switch of AIR FAN to [ON]</p> <ul style="list-style-type: none">By doing so, the AIR Fan run and turn on the light,Set the selector switch of AIR FAN to [OFF] then stop the AIR Fan and turn off the light.
	<p>1) Set the Selector switch of FUEL FEED to [ON]</p> <ul style="list-style-type: none">By doing so, the FUEL FEED screw run and turn on the light,Set the selector switch of FUEL FEED to [OFF] then stop the FUEL FEED screw and turn off the light.But If the following conditions are satisfied, the screw motor operates. <p>(1) ID FAN [ON]</p> <p>(2) when the current temperature of the temperature controller is lower than the set temperature</p>
	<ul style="list-style-type: none">Setting of desire temperature of temperature controller Please refer on the temperature controller setting manual.
	<p>1) Setting the overload relays</p> <ul style="list-style-type: none">Adjustment dial (Setting Value ID FAN : 4.8A, Fuel Feed : 3.0A) Before adjusting the dial open the protection cover.Current setting can be done easily by using (+) or (-) driver.Do not rotate the dial out of the setting range.

2. Wiring Diagram & Setting the overload relays

1) HF-100

Motors	HF-100						ETC
	3Φ 380V 50Hz			3Φ 220V 60Hz			
	Power	Rated current	TP SET	Power	Rated current	TP SET	
Fuel Feed	0.015kW	0.2A	Fuse 0.5A	0.4kW	2.3A	2.5A	TP110%
ID Fan	0.75kW	2.5A	2.8A	0.75kW	3.5A	3.9A	
Air Fan	0.15kW	0.5A	0.6A	0.15kW	1.16A	1.3A	

2) HF-170















Motors	HF-170N										ETC
	3φ 380V 50Hz					3φ 220V 60Hz					TP:110%
	Power	Rated current	EOCR SET	EOCR TR	M/C	Power	Rated current	EOCR SET	EOCR	M/C	
Fuel Feed	0.4kW	1.2A	1.3A	ME2 (116A)	MC9	0.4kW	2.3A	2.5A	ME2 (1625A)	MC9	
ID Fan	0.75kW	2.5A	2.8A	ME2 (254A)	MC9	0.75kW	3.5A	3.9A	ME2 (254A)	MC9	
Air Fan	0.15kW	0.95A				0.15kW	0.95A				
Ash Fan	0.75kW	2.5A	2.8A	ME2 (254A)	MC9	0.75kW	3.46A	3.8A	ME2 (254A)	MC9	Option

6.3 Checkpoints in Operation

1. Checkpoints before Operation

Checkpoints	Measures
• Power check	• Check the switch is 'ON', disconnection, a short circuit.
• Husk quality	• High moisture causes the husk clinker and makes the screw blocked. • Keep the husk moisture less than 12%.

2. Operation method matching dryer

1. Power, Signal, ID Fan etc. connecting	 HF-100	 HF-170
2. Turn the power switch Dryer "ON" Dryer C-BOX Press button "Auto Dry"	 POWER	 Power
3. Ignition A. check rice husk inside the combustion chamber B. Ignite rice husk C. It may be dangerous "SAFETY FIRST"		
4. Adjust Air FAN blower and ID FAN blower		
5. Setting of desire temperature HF-100 : Dryer temperature HF-170 : Furnace & Dryer temperature		
6. If any abnormality is occurred on the furnace, Please check the motor, screw & c-box items considering safety		
7. Sometimes pull out the ashes with tools		

3. Checkpoints when Feeding Fuel

		
Beware of clogged rope	Beware of putting alien substance	Do not use wet husk

4. Checkpoints and Measures in Operation

1) Heat temperature falls.

- The husk is not transferred freely. → Remove the bridge in the husk tank
- Drying efficiency is low, heat exchange pipe is blocked with ashes or soot.
→ Clean up the heat exchanger after stop the dry and husk furnace.
- Cyclone is blocked with ashes. → Clean up the cyclone.



6.4 Maintenance and Safekeeping Method

1. Reminder

- Turn off the main power before conducting any cleaning or inspections of machine components. Post a sign "UNDER INSPECTION" at the point of power shut.

2. Caution

- If the machine is not in used for a long time, insects, rats may rest at the varies corners. When restarting operation, check the machine for any nest or insects, or rats and removed them.
- If any parts were worn or broken, or when the time has come to replace any consumable parts, please contact the sales office.
- Conduct the inspection and maintenance work on a regular basis.
The inspections and maintenance are also required when keeping the machine without being operated for a long time or when restarting operation after along time.

3. Fuel feeding Screw

- Check also the wire of motors if any damaged from the bites of rats.

4. Air FAN, ID FAN

- Check also the wire of motors if any damaged from the bites of rats.
- Inspect the fan from any damaged.

5. Heat Exchanger

- Check heat exchanger fro any clogging of ash that stuck on every tubes.
- If any, use a round steel brush accordingly to the inside diameter of tubes.
- If at any time you need to clean after checking if it is clogged.

6. Safe cleaning and inspection


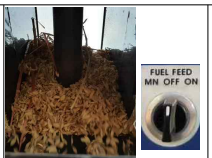




- Shut down power before cleaning and inspecting.
- Do not operate the control with bare foot or wet hands to avoid electric shock.
- Avoid opening the furnace door to avert backfire accident.
- Stand in a safe distance when inspecting or igniting the combustion chamber.
- Wear gear such as thermal gloves, nose mask, glasses and safety shoes etc.
- Check faulty wiring.
- Clean surrounding area before and after operation.

7. Location of fire extinguishers




- Fire extinguisher should be display near the machine.
- Carefully read the instruction of how to use the fire extinguisher.
- Before the machine being operated, please checked if the fire extinguisher exceeds the expiry date.
if yes, change the inside chemicals to refill.
- In case of fire, stay calm, use the fire extinguisher to stop the fire.

8. Cleaning Manual

1) Ash Discharge①

		
Prepare Water and Tools	Fuel Feeding off	Check the Inside of Furnace
		
Discharge the ash	Put out Embers	Clean the ash

2) Cleaning Period

		
Upper Heat Exchange④ (2 times/Year)	lower Heat Exchange③ (1 time/Week)	Dust Box of Cyclone② (Each Time of Finishing drying)

☞ Please use the furnace in clean condition. The more you clean, the more you can use.

