

VACUUM DRYING OVEN

DZF SERIE

OPERATION MANUAL

1. Scope of application

This device is manufactured for the purpose of drying and heat treatment of items in vacuum in the labs in industries, colleges & universities and research institutes. Heat drying under vacuum conditions has the following advantages:

- (1) It may reduce the drying temperature (lower pressure and lower temperature);
- (2) Avoid the risk of oxidation of some items in heating;
- (3) Avoid killing cells that may happen due to the increased air temperature;
- (4) No any damage of particles.

2. Technical data

Model No.	6020	6021	6050	6051	6090	6210
Supply voltage	220V 50Hz					
Power	≥500W		≥1000W		≥1200W	≥2160W
Temperature range	50～200℃	50～150℃	50～250℃	50～200℃	50～250℃	
Temperature fluctuation	±1℃					
Vacuum degree	≤133pa（2mmHg）					
Dimensions of operating chamber	300×300×275mm		415×345×370 mm		450×450×450mm	560×640×600mm
Material of operating chamber	1Gr18Ni9Ti	08F	1Gr18Ni9Ti	08F	1Gr18Ni9Ti	1Gr18Ni9Ti

3. Structure

The vacuum drying oven is in the horizontal or vertical style. The rectangular-shape operating chamber is made of stainless steel plate or quality steel plate so that the effective capacity is maximized. The cabinet body is made of quality steel plate, which is plastic coated; super-fine glass fiber is used for filling the space in between the walls to serve as the heat-insulating layer. The toughened glass door makes it possible to observe all the articles in the chamber clearly. The door close mechanism can be regulated for its tightness. The silicon rubber sealing ring ensures a high degree of vacuum in the chamber.

The shelves in the chamber are made of galvanized mesh plates or stainless steel mesh plates; and 6050, 6051, 6090 and 6210 are made of two pieces of alloyed plates, which are marked

with excellent heat-conducting performances.

The plate-type heaters are adopted for the oven, and are distributed evenly on the outer wall surface of the operating chamber. The control & regulating components are all fitted on the panel to make it easy for operation. The high-precision temperature controller is used for temperature control. 6090 and 6210 are fitted with electromagnetic valves.

4. Installation and commissioning

(1) Installation

The vacuum drying oven should be placed indoor, where it is well ventilated and free of any strong vibration. In the area around the oven, no any inflammable or explosive article is allowed.

(2) Commissioning

a. Close the door and turn the handle to lock the door. Close the air-discharge valve and open the vacuum valve.

b. Get the air pipe behind the oven connected with the vacuum rubber hose and vacuum pump, and get the vacuum pump connected with the power supply for evacuation. When the vacuum meter shows the degree of vacuum required, close the vacuum valve and switch off the vacuum pump power supply. At this moment, the inner space of the oven is in the state of vacuum. If the oven has no heating function, the commissioning is finished. (Note: 6090 and 6210 already have connection with vacuum pump.)

c. 6090 and 6210 are fitted with electromagnetic valves for control, which makes operation more convenient in that it only needs to switch on the vacuum pump power supply for evacuation.

5. Method of use

(1) Place into the vacuum drying oven the articles that need to be dried. Close the door, close the air-discharge valve and open the vacuum valve. And then, switch on the vacuum pump power supply for evacuation so that the desired vacuum degree is achieved in the oven. Close the vacuum valve and switch off the vacuum pump power supply.

(2) Turn the power switch of vacuum drying oven to “I” position, and set the temperature value required so that the temperature in the oven will rise. When the temperature approaches the value required, the heating indicator will flash for several times. Normally, the thermostatic state is achieved on each shelf in 120 minutes.

(3) When the required operating temperature is relatively low, the two-time setting mode can be adopted. For example, if the operating temperature is required to be 60°C, the first-time setting can be 50°C; and after the temperature has exceeded this level and then fallen back a bit, the second-time setting should be 60°C. By doing so, temperature overshoot may be reduced or avoided, and the thermostatic state will be achieved more quickly. (Note: Please refer to the operating method for the intelligent instruments.)

(4) Select appropriate drying time subject to different articles and different humidity. If the drying time is relatively long and the vacuum degree is reduced, evacuation should be required again for restoring the vacuum degree. In this case, turn on the vacuum pump motor and then start the vacuum valve. (For 6090 and 6210, switch on the vacuum pump power supply directly.)

(5) After drying process finished, it's necessary to first switch off the power supply, turn the air-discharge valve to eliminate the vacuum state, and then, open the door to take the articles out of the oven. (After vacuum state eliminated, the door cannot be quickly opened easily as the sealing ring and the glass door are attached to each other tightly.)

6. Precautions

(1) The case of the oven should be effectively grounded to ensure safety in operation.

(2) When no continuous evacuation is required for the oven, close the vacuum valve first, and then, switch off the vacuum pump motor. Otherwise, the oil of vacuum pump may flow back into the oven.

(3) When the articles are taken out of the oven and the articles are inflammables, it is necessary to wait till the articles are cooled to the temperature lower than its burning temperature before they are taken out into the air, in order to avoid oxidation, which may lead to burning.

(4) As the vacuum oven does not have explosion-proof device, no explosive articles should be placed into the oven for drying.

(5) Preferably, there is a filter fitted in-between the vacuum oven and the vacuum pump to prevent moisture from entering the vacuum pump.

(6) Don't dismantle the door unless it is definitely necessary, in order to avoid damage to the electrical system.

7. Maintenance and servicing

(1) The vacuum oven should be cleaned often. The glass door should be cleaned with soft

cotton cloth. NO any chemical liquid that may lead to chemical reaction is allowed in cleaning, as it may cause chemical reaction and damage the glass.

(2) If the oven is to be kept idle for a long time, neutral grease or Vaseline should be applied on the glass door to prevent corrosion; and cover the oven with plastic film and then place it at a dry place indoor to protect the electrical components from moistures.

8. Troubleshooting

Problems	Possible causes	Solutions
11. No power supply	1. No power supply from the power socket.	1. Change the socket
	2. Not plugged properly or broken cord	2. Plug properly or change the cord.
	3. Fuse broken	3. Change the fuse.
	4. Power supply not switched on.	4. Switch on the power supply
2. No temperature rise	1. Temperature setting too low	1. Change the temperature setting
	2. Electric heater damaged	2. Change the electric heater
	3. Temperature control instrument damaged	3. Change the temperature controller
	4. Loose connection of temperature sensor	4. Tighten the nut for better connection.
3. Too much difference between the temperature setting and the actual temperature in the oven	1. Temperature sensor damaged	1. Change the sensor
4. Temperature out of control	1. Sensor falling off	1. Fixed temperature sensor
	2. Temperature controller damaged, controllable silicon damaged.	Change the controller and controllable silicon

Packing List

No.	Types	Names	Units	Q'ty	Remarks
1	Document	Operating instructions	Copy	1	
2	Document	Q.C. Pass	Copy	1	
3	Document	Warranty card	Copy	1	
4	Spare part	Shelf	Pcs.	2	
5	Spare part	Fuse	Pcs.	2	

All the items listed on the table are identical to those packed in the carton.

Packaging operator 2