

Freeze Dryer VD-250R/550R/800R

*These Freeze dryers are designed for easy combinations.
Wide variety of options are available to correspond to various vessels.*

•Vacuum Pumps for Freeze Dryers (Lyophilizers) --> P.176



VD-550R
with Drying Chamber

VD-250R
with 2-port multiple tube

VD-800R
with 8-port multiple tube

Above combinations are examples.
Each Chamber and Multiple tube are sale separately.

Simple operation



Turn on the power. When the blue button lights up, the unit is ready for use. Pressing the yellow VAC START button will turn on the pump that is connected to the vacuum pump interlocking outlet on the back of the unit, and then vacuuming starts.

Secure cold trap for the sublimated water

Because of the direct cooling system in which water vapor is directly coagulated and collected on the surface of the cooling coil in the trap chamber, the cooling temperature becomes almost the same as the trap temperature.

Trapped water is quickly defrosted by hot gas. When the DEFROST button is pressed, hot gas will flow into the coil of the cold trap, and ice equivalent to the dehumidification capacity can be defrosted in about 30 minutes.

Features

- Ensures reliable moisture collection with direct cooling system of cooling pipes
- Simple operation and reliable drying
- Ultimate Vacuum display function [except for VD-250R]

Applications

- Drying of samples such as Proteins, etc.
- Freeze drying of samples for analytical applications

Setting and display function of Ultimate vacuum range [550R/800R]



Displays Atmospheric pressure range/ Vacuum drying range/Lyophilization range in order with the LED when decompression starts to notify the progress of decompression. The setting can be changed according to the application. It can also be used for pump maintenance.

Signal output [550R/800R], leak port



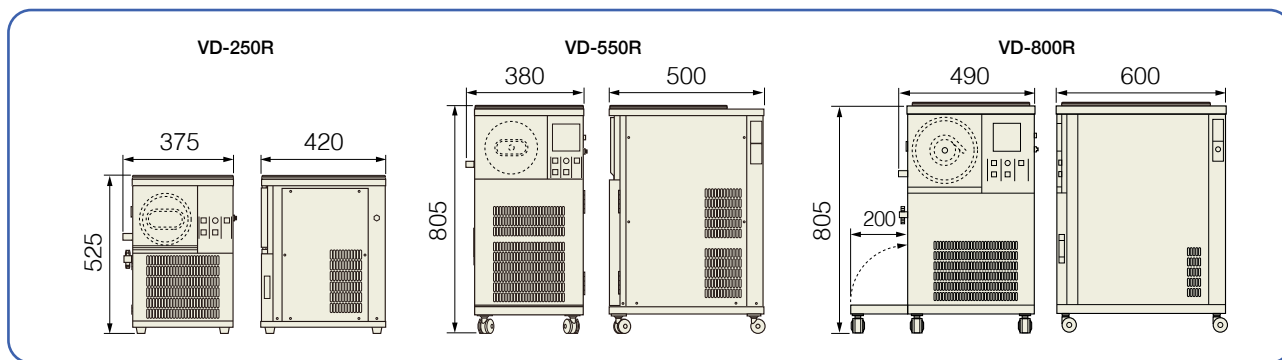
The VD-550R and 800R can record the vacuum degree. For samples that are resistant to oxidation, a nitrogen gas purge can be performed from the leak port on the back of the main body (equipped on the 250R/550R/800R) when the vacuum is released to minimize the effects of oxidation.

Model	VD-250R	VD-550R	VD-800R
Cooling temperature	-45°C (at no load) (*)	-75°C (at no load) (*)	
Trapping volume	Approx. 500 mL/time	Approx. 1000 mL/time	Approx. 2000 mL/time
Volume inside chamber	Approx. 4 L (Inner dia. 160 × 205 mm)	Approx. 4 L (Inner dia. 160 × 205 mm)	Approx. 11.7 L (Inner dia. 210 × 345 mm)
Vacuum gauge	-	Pirani vacuum gauge (Digital display)	
Compressor	250 W	250 W × 2 (Cascade refrigerating system)	400 W × 2 (Cascade refrigerating system)
Recommended vacuum pump	Oil-sealed Rotary Vacuum pump (Ultimate pressure below 50 Pa, Displacement above 100 L/min)		
Vacuum hose connection port	For outer dia. φ22 mm (Rc 3/8 Thread on inner surface, Convertible to different dia.), a hose with an inner diameter of φ18 mm is basically used.		
Vacuum release	Leakage port with filter on the side of the body (N ₂ Gas purge combined use, Hose attachment port, Pisco φ6 mm), automatically released by halting the vacuum pump.		
Other functions	Hot gas defrosting (thawing in approx. 30 minutes, outlet for the vacuum pump interlocking (Max. 3 sockets, 9 A, with operation switch), service outlet (up to 2 sockets, 3 A) Ultimate pressure display function (VD-550R/800R), Recorder output for the degree of vacuum pressure (0 to 5 V, VD-550R/800R)		
Dimensions (W×D×H)/Weight	375 × 420 × 525 mm, Approx. 34 kg	380 × 500 × 805 mm, Approx. 75 kg	490 × 600 × 805 mm, Approx. 97 kg
Power supply	AC100V/6A /Max.15A (Need a step-down transformer)	AC100V/9A /Max.19A (Need a step-down transformer)	AC100V/13A /Max.30A (Need a step-down transformer)
Standard accessories	Table mat × 1 pc	Power plug (20 A) × 1 pc, Table mat × 1 pc	Power plug (30 A) × 1 pc, Table mat × 1 pc

(*)The value under ambient temperature 5°C to 35°C.

•The Vacuum gauge and Solenoid valve are not operated unless the operation switch of service outlet for pump turned on. The power supply from the switchboard is recommended at the interlocking.
•See pages 173-174 for optional accessories such as various chambers, multiple tubes, vessel adapters, etc. See page 176 for vacuum pumps.

Dimensions



System example in the photos on the left page

Model	combined with	Features
VD-250R	2-Port multiple tube MP-020, Vacuum pump GCD-051XA, Freeze-dried Bottle FB-4015 × 2 pcs	For the connection of the Freeze-dried Bottle to Multiple tubes, it is used by placing Microtubes or other vessels inside the bottle. -45°C, approx. 500 mL/time.
VD-550R	2-Port multiple tube MP-020, Drying Chamber DC-280, Vacuum pump GCD-051, System stand C-type	It enables Vacuum/Lyophilize sample slices with multiple dishes by connecting the Drying Chamber to Multiple tubes. Eggplant-shaped flasks, etc. can be connected to Multiple tubes. -75°C, approx. 1000 mL/time.
VD-800R	8-Port multiple tube MP-080, Vacuum pump GCD-136XA	Large capacity enables Mass processing with Eggplant-shaped flasks. -75°C, approx. 2000 mL/time.

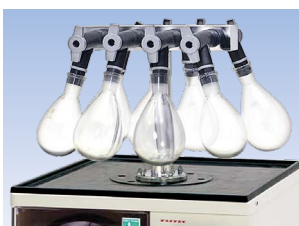
Optional accessories

Multiple tubes (for Egg-plant shaped flasks/Test tubes/Drying vials)

Enables drying processing for plural Egg-plant shaped flasks/Test tubes (Adapter is required)/Drying vials.

Model	MP-020	MP-060	MP-080
Number of ports	2	6	8
Applicable vessels (*)	Egg-plant shaped flasks (Optional AD-0181 is required in § 29 and § 24), Test tubes, Drying vials		
Mounting cock interval	-	75 mm	
Dimensions (WxDxH)	300 × 50 × 250 mm	300 × 230 × 310 mm	300 × 305 × 310 mm
Standard accessories	Adapter for Egg-plant shaped flasks (AD-0180, § 29)		

(*) Test tubes require Optional adapters (below). Ask us when using for ampule filling, etc.

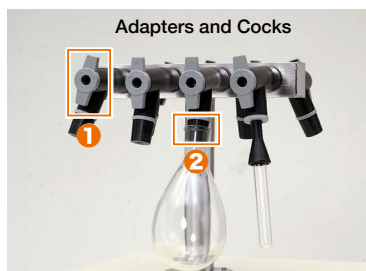


MP-080 with Egg-plant shaped flasks



With Egg-plant shaped flasks

Adapters / Cocks For Multiple tubes MP-020/060/080



1 Sample mounting Cock

AD-0550

For exchange when rubber deteriorates.



2 Adapter for Eggplant shaped flasks

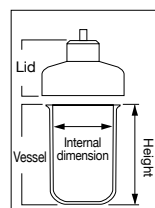
AD-0180 (§29)

AD-0181 (§24)

AD-0180 is for exchange in case of deterioration.

AD-0181 is mainly required for small diameter flasks of 300 mL or less.

Freeze-dried Bottle



Example of Freeze-dried bottle installation

• Place a Centrifuge tube or other vessel in the bottle for Lyophilization.

• If you want to use a filter, a $\phi 38$ mm filter can be attached. The sublimation speed will be reduced, so please be careful about the number of samples, etc.

Model	Dimensions		Volume
	Internal dimension	Height	
FB-4007	40 mm	80 mm	75 mL
FB-4010		100 mm	100 mL
FB-4015		140 mm	150 mL
FB-6030	60 mm	130 mm	300 mL
FB-6050		200 mm	500 mL
FB-9075		140 mm	750 mL
FB-9100	90 mm	180 mm	1000 mL
FB-9120 (*)		220 mm	1200 mL

(*) Enables 2 pcs in MP-020, 4 pcs in MP-060 and 4 pcs in MP-080 mounted.

NEW

Constant-temperature incubator/shaker
OD Monitor

For cell culture related products

Shaker

Mixer
Rotator
Stirrer

Bead beater
homogenizer
Ultrasonic

Aluminum block Bath
Mini-size Bath

Water bath
Shaking Water bath
Immersion cooler

Hybridization
Incubator
Constant temperature Chambers

Centrifugal
Concentrators
Cold Trap

Freeze dryers

Substrate Electrophoresis apparatus
Blotting device for hybridization

Constant-temperature water circulating system [Chiller]

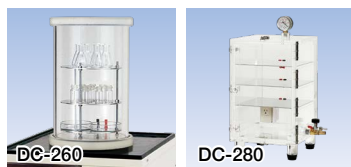
Appendix

VD series Optional accessories (continued)

•Vacuum Pumps for Freeze Dryers (Lyophilizers) --> P.176

Drying Chamber

Dries samples in various small vessels as they are. Built-in Silicone rubber heater on each shelf promotes drying samples.

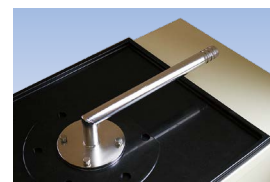


Model	DC-120	DC-260	DC-280
Applicable models	VD-250R/550R/800R		
Temperature range	30°C Only		
Number of Shelves	1 level	3 levels	
Heater	70 W × 1	100 W × 3	
Shelf size	φ180 mm	φ185 mm	258 × 250 mm
Dimensions	φ225 × 200H mm	φ225 × 380H mm	430 × 400 × 615H mm
Power supply	AC 100V/0.7 A~240V	AC 100 V/3 A~240V	

Attached to VD series



MP-010 (for DC-280)



In the DC-280, it can be used singly. It is easy to remove large vessels that can obtain sublimation areas such as petri dishes and plates. It can be done while adjusting the speed of the vacuum release by oneself. When connecting to the VD series, it enables to place it on the VD unit and use it by using the Optional MP-010 (see the right page for details on DC-280).

- When a frozen sample (beforehand) is thawed using the dry chamber, it can be considered that the sample volume (sublimation amount) might be too large to the displacement of the vacuum pump or sublimation does not progress well as resistance may occur due to the chemical filter placed before the pump. Instead of a large amount of samples at one time, put a small amount of samples that can obtain the surface area to solve the problem. If there is no improvement, review the pump displacement.

- Ask us when lyophilizing (e.g., L-drying) ampule tubes with our/TAITEC equipment.

How to do freeze drying well

●Cautions on pre-freezing samples beforehand

The time required for drying differs depending on the manner of freezing. It is ideal to freeze the sample as thin as possible considering the receding and area of sublimation surface as shown below. It is recommended to slice as thin as possible for solid samples.

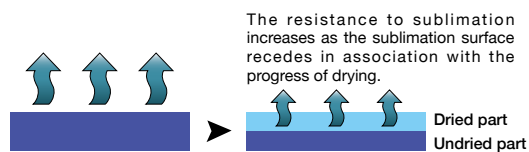
●The importance on displacement of the vacuum pump

The degree of vacuum is reduced inside vessels with the vapor of solvents when sublimation starts. If the vacuum pumps with displacement is below 50 L/min, it cannot discharge the steam efficiently, and the sample may melt along the way (dissolved easily when the salt concentration of samples is too high). Each freeze dryer has a limited "dehumidifying capacity". If the capacity of the sample dried exceeds the limitation, the degree of vacuum decreases because the aggregation and coagulation of the steam cannot catch up to it.

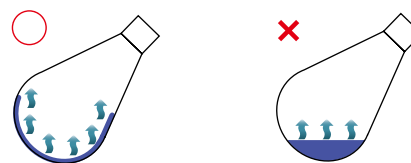
●The necessity of heating

Please use the Drying Chamber DC-280 to heat vessels such as vials, etc. (except for egg-plant shaped flask).

Receding of sublimation surface



Sublimation surface area



Reference: Use the Centrifugal Concentrator as a chamber for Lyophilization



TAITEC's VC-36R/96R Centrifugal Concentrators (page 162) are equipped with a "Freeze Dryer" mode that allows the unit to be used as a vessel drying chamber for Lyophilization. In the "Freeze Dryer" mode, after the preset time has elapsed, the vacuum pump remains running (vacuum is maintained), the centrifugation stops, and the heater turns off.

*It can be used while the rotor is removed and the rotation speed is set to zero, so it can be combined as a chamber with temperature control.