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Freeze Dryer • Spray Dryer

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Freeze Dryer FDS-1000

Compact, tabletop type freeze dryer for -80°C and 150mL dehumidification.



FDS-1000

Features

- Compact dryer for small samples at -80°C .
Vacuum level, trap temperature and operation time are simultaneously displayed on control panel and operation condition can be confirmed at a glance.
- During auto mode operation, trap cooling temperature and vacuum level are measured and indicates sample vessel mounting possibility.
- Simple operation procedure requires only start, flask mounting and stop after drying finish.
- Timer function is provided. Oil exchange time can be confirmed by the display of integrated operation time of vacuum pump.
- Time setting for continued operation or stop is possible depending on the time required from power failure to return.
- $0.2\mu\text{m}$ filter is equipped at air inlet to prevent contamination by leak.

Option



With manifold



With dry chamber

Specifications

Product Name	Freeze dryer
Model	FDS-1000
Cat. No.	261980/261988
Cold trap temperature	-80°C
Ice holding capacity	150mL/one batch
Temp. setting & display	Sheet key input & digital display
Safety functions	Leak/over current braker, Vacuum pump automatic operation, Vacuum monitoring function, Trap temp. monitoring, Refrigerator overload relay
Vacuum leak function	Auto-leak at power OFF or at power failure
Trap deicing	by heater
Cooling & refrigerant	Refrigerator, 80W Helium gas
Vacuum pump	Option (over 50L/min)
Trap dimension (mm) & volume	$\Phi 90 \times 145\text{L } 0.85\text{L}$
Overall dimensions (mm)	455W x 220D x 497H
Weight	18kg
Power source	200VA AC100V/460VA AC230V

System Example

SYS10032

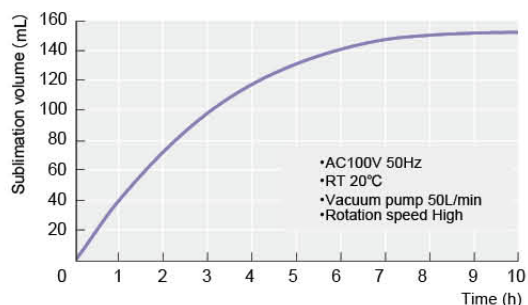


Product name	Model	Cat. No.
Freeze dryer	FDS-1000	261980
Manifold	PMS-4S	261990
Flask C adapter	Φ29x4	191120
Sample flask	Φ29 100mLx4	116150
Oil filtration vacuum pump	GCD-051XF	191080
Oil mist trap	OMC-050	118680
Vacuum hose	ID12xOD30mm 5m	119210

Data

■ Sublimation speed

100mL flask with water 38mLx4



FDS-1000 Combination guide

Pre-freezer



PFR-1000+PFM-1000

Preliminary freezing bath
PFR-1000
197410
Pre-freezing temp.: -45°C
Pre-freezer (Sample vessel rotation device)
PFM-1000
197420
Power source: AC100V 8/9A

Vessels

Freeze drying bottle

40mL	119940
80mL	119950

Sample flask (φ29)

50mL φ29	116140
100mL φ29	116150

Test tube

Ample bottle (OD8mm)

Vial bottle

Petri dish

Micro tube

1.5mL

Adapter

Freeze bottle C adapter

191130

Flask C adapter

191120

Test tube adapter

120510

Ample bottle adapter

120520

Micro plate

Micro tube holder

1.5mLx12	191110
1.5mLx24	191150

Freeze drying bottle

150mL	119970
300mL	119980

Freezing bottle C adapter

OD70mm 191130

Manifold

Manifold

PMS-4S

PMS-4S (SUS304)	Cat.No. 261990
PMS-4A (Acryl)	Cat.No. 262100

Dry chamber

Dry chamber

DRS-1 (1 stage)	Cat.No. 262000
DRS-2 (2 stage)	Cat.No. 262010

Vacuum pump

GCD-051XF
Cat. No. 191080

Oil mist trap OMC-050
Cat. No. 118680
Vacuum hose
ID12xOD30mm 5m
Cat. No. 119210

Freeze dryer

FDS-1000

Rotary Evaporator 1

Heum Pump Aspirator 2

Organic Synthesizer 3

Freeze Dryer - Spray Dryer 4

Shaker 5

Stirrer 6

Tube Pump 7

Low Temperature Cooler 8

Cold Trap 9

Control Temperature Bath 10

Incubator 11

Oven 12

Fermentor 13

Freeze Dryer FD-1000•1000REC

Freeze Dryer FD-1000•1000REC



FD-1000

Features

- Compact dryer for small samples at -45°C . Vacuum level, trap temperature and operation time are simultaneously displayed on control panel and operation condition can be confirmed at a glance.
- Trap temperature and vacuum level signal outlet realizes dry freezing data management (FD-1000REC).
- During auto mode operation, trap cooling temperature and vacuum level are measured and indicates sample vessel mounting possibility.
- For drying data management, recorder output signals on vacuum ratio and trap temperature are available (FD-1000REC).
- Service outlet prevents vacuum pump auto restart after recovery from power failure. It prevents melted samples from bumping and dispersing.

Specifications

Product Name	Freeze dryer	
	FD-1000	FD-1000REC
Model	188800/188808	191160/191168
Cat. No.		
Cold trap temperature	-45°C	
Ice holding capacity	500mL/one batch	
Temp. setting & display	Sheet key input & digital display	
Refrigerator & refrigerant	Air cooling, 350W HFC (R507A)	
Manifold	8 vials port	
Trap dimension (mm) & volume	$\Phi 83.1 \times 227\text{H}$ 1.5L	
Cooling coil material	SUS 304	
Vacuum display	Digital display, 0.0 ~ 533.0Pa, Min. scale	
Recorder outlet	NA	Equipped $1^{\circ}\text{C}/\text{mV}$ $1\text{Pa}/\text{mV}$
Overall dimensions (mm) & Weight	195W x 440D x 810H 36kg	
Power source	450VA AC100V/990VA AC220V	

Freeze Dryer FDU-1200

Unit type dryer for multiple uses at -45°C with dehumidification capacity 1L.



FDU-1200

Features

- Desk top type compact dryer for small samples at -45°C . It is possible to build up optimum freeze drying system by desired combination of manifold, dry chamber and vacuum pump.
- During auto mode operation, trap cooling temperature and vacuum level are measured and indicates sample vessel mounting possibility.
- Simple operation procedure requires only start, flask mounting and stop after drying finish.

Specifications

Product Name	Freeze dryer
Model	FDU-1200
Cat. No.	208889/208888
Cold trap temperature	-45°C
Ice holding capacity	1L/one batch
Refrigerator & refrigerant	Air cooling, 400W, HFC (R404A)
Overall dimensions (mm)	450W x 420D x 440H
Power source	805VA AC115V/1.65kVA AC220V

FDU-1200 Combination guide

Pre-freezer



PFR-1000+PFM-1000

Preliminary freezing bath
PFR-1000
197410
Pre-freezing temp.: -45°C
Power source: AC100V 8/9A
Pre-freezer (Sample vessel rotation device)
PFM-1000
197420
Applicable vessel: Sample flask ¥29/38
Freeze drying bottle

Pre-freezer

Vessels

Freeze drying bottle 40mL 119940 80mL 119950	Sample flask (¥29) 50mL ¥29 116140 100mL ¥29 116150	Test tube (As to details, refer to "Parts for freeze dryers")	Ample bottle (OD8mm) 	Vial bottle 	Petri dish 	Micro tube 1.5mL
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Adapter

Bottle adapter for freezing ① 120450 ② 120460	Test tube adapter - Sealing 120500	Test tube adapter 145610	Ample bottle 120510	Ample bottle 120520	Micro tube holder 1.5mL×12 191110 1.5mL×24 191150	Freeze drying bottle 150mL 119970 300mL 119980	Freezing bottle C adapter OD70mm 191130
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Manifold & Chamber

Manifold RMH-4A 209560 RMH-4 119820	Manifold for test tube & ample bottle PMH-12 119840 PMH-24 119860	Sealed dry chamber BSC-2L 119790 BSC-3L 119810	Dry chamber DRC-1N 119730 DRC-2L 119750 DRC-3L 119770
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Vacuum pump

Water trap

Freeze dryer

Recorder

 GCD-051XF	 CMW-1	 FDU-1200	 μR-10000
Vacuum pump with oil filtration GCD-051XF 191080	Water trap CMW-1 119900	Oil mist trap OMC-050 118680 Vacuum hose adapter A 119240 Vacuum hose 5m 119210 Molecular sieve 500g 178330	Recorder μR-10000 219280

- 1 Rotary Evaporator
- 2 Vacuum Pump & Aspirator
- 3 Organic Synthesizer
- 4 Freeze Dryer - Spray Dryer
- 5 Shaker
- 6 Stirrer
- 7 Tube Pump
- 8 Low Temperature Cooler
- 9 Cold Trap
- 10 Constant Temperature Bath
- 11 Incubator
- 12 Oven
- 13 Fermentor

Freeze Dryer FDU-2200

Unit type freeze dryer for small volume samples at -80°C.



FDU-2200

Features

- Unit type dryer for small samples at -80°C with dehumidification capacity of 1L.
It is possible to build up optimum freeze drying system by desired combination of manifold, dry chamber and vacuum pump.
- During auto mode operation, trap cooling temperature and vacuum level are measured and indicates sample vessel mounting possibility.
- Simple operation procedure requires only start, flask mounting and stop after drying finish.
- Timer function is provided. Oil exchange time can be confirmed by the display of integrated operation time of vacuum pump.
- 0.2μm filter is equipped at air inlet to prevent contamination during leak process.

Specifications

Product Name	Freeze dryer
Model	FDU-2200
Cat. No.	209550
Cold trap temperature	-80°C
Ice holding capacity	1L/one batch
Temp. setting & display	Sheet key input & digital display
Refrigerator & refrigerant	Air cooling, 400W x 2, HFC (R404A•R23)
Overall dimensions (mm) & weight	450W x 550D x 935H 67kg
Power source	1200VA AC100V

Freeze Dryer FDU-1110•2110

Unit type freeze dryer; -45°C 4L (FDU-1110), -80°C 3L (FDU-2110).



FDU-2110

Features

- 4L unit type dryer for small samples at -45°C(FDU-1110) or -80°C(FDU-2110).
Vacuum rate, trap temperature and operation time are simultaneously displayed on control panel and operation condition can be confirmed at a glance.
- During auto mode operation, trap cooling temperature and vacuum rate are measured and indicates sample vessel mounting possibility.
- Simple operation procedure requires only start, flask mounting and stop after drying finish.
- Timer function is provided. Oil exchange time can be confirmed by the display of integrated operation time of vacuum pump.

Specifications

Product Name	Freeze dryer	
	FDU-1110	FDU-2110
Model	FDU-1110	FDU-2110
Cat. No.	251920/251928	251930/251938
Cold trap temperature	-45°C	-80°C
Ice holding capacity	4L/one batch	3L/one batch
Temp. setting & display	Sheet key input & digital display	
Vacuum leak function	Auto-leak at power OFF or at power failure	
Refrigerator & refrigerant	Air cooling, 600W R404A	Air cooling, 500W x 2 R404A•R23
Vacuum pump	Option (over 100/120L/min) (50/60Hz)	
Trap dimension (mm) & material	Φ200 x 300H SUS 304	
Overall dimensions (mm) & Weight	700W x 550D x 935H 100kg	700W x 550D x 935H 140kg
Power source	1.7kVA AC100V/3.74kVA AC220V	2.4kVA AC200V/2.6kVA 220V

Drying Chamber DRC-1000•1000REC•1100•1100REC

Square drying chamber for automatically controlling pre-freezing, first and second stage drying.



DRC-1000

DRC-1100

Features

- A square drying chamber with shelves used in combination with freeze dryers FDU-1110•2110.
- 30L chamber capacity, equipped with three 24x24cm shelves.
- Three shelves can be sealed simultaneously (DRC-1100•1100REC).
- Nitrogen purge is possible by using optional connection pipe to FDU.
It is effective to preserve samples vulnerable to oxidation.
- Shelf cooling and heating method is liquid circulation from -40°C to 30°C with uniform temperature control.

System example

DRC-1100 + FDU-2110



By placing manifold for flask and manifold for ample bottle on top of trap part of the freeze dryer, the system can be used also as square dry chamber.

Specifications

Product name	Squqre Drying Chamber			
Model	DRC-1000	DRC-1000REC	DRC-1100	DRC-1100REC
Cat. No.	197450	204820	197460	204830
Pre-freezing temp.	-40°C (sample temp. -35to -30°C)			
Shelf temperature	-40 ~ 30°C			
Temp. control	Micro-processor P.I.D control			
Temp. setting & input	Ten-key input & digital setting			
Temp. display	Digital display			
Safety functions	Leak/covercurrent braker, High pressure switch, Refrigerator overload relay Independent overheat protector, Self diagnosis function			
Heater	500W			
Refrigerator & coolant	Air cooling 400W•HFC (R507A)			
Temp sensor	Pt100Ω			
Chamber dimensions	300W x 300D x 350H 30L			
Shelf dimensions	240W x 240D x 3			
Shelf material	SUS304			
Overall dimensions (mm)	420W x 550D x 1300H		420W x 550D x 1500H	
Weight	120kg		130kg	
Power source	1.3kVA AC100V			

Freeze Dryer FD-550•550R•550P

Large capacity drying chamber type freeze dryer with dehumidification capacity of 10L.



FD-550R

Features

- Both freezing and heating are possible with installed shelves. Prefreezing and freeze drying are possible by just sample vessels on shelf.
- Uniform temperature distribution is realized by coolant circulation method.
- Programmed operation is possible by FD-550P.
Drying with high reproducibility is realized by programmed operation.

Specifications

Product name	Large capacity Freeze Dryer		
Model	FD-550	FD-550R	FD-550P
Cat. No.	120540	144130	181580
Trap freezing temp.	-45°C		
Dehumidification capacity	10L/ one batch		
Ultimate vacuum	6.67Pa		
Refrigerator & coolant	Air cooling 1.1kW + 0.3kW R404A		
Chamber dimensions (mm)	ID500 x 500H 120L		
Chamber material	SUS304		
Weight	350kg		
Power source	6.5kVA AC200V 3Φ		

Parts for freeze dryers

Chamber • Manifold



Round port for flask



Manifold for flask



Cock

Cock D



Cat. No.: 209570

Air filter



Cat. No.: 187450

Adapter

Flask adapter (¥24)



Cat. No.: 144500

Flask adapter (¥29)
(Standard)



Cat. No.: 120470

Manifold adapter



Cat. No.: 120490

Freezing bottle adapter



① Cat. No.: 120450
② Cat. No.: 120460

Test tube adapter



Cat. No.: 120500

Sample flask (¥24)



50mL	116220
100mL	116230
200mL	116240
300mL	116250
500mL	116260
1000mL	116270

Sample flask (¥29)



50mL	116140
100mL	116150
200mL	116160
300mL	116170
500mL	116180
1000mL	116190

Freeze drying bottle (set)



40mL	119940
80mL	119950
120mL	119960
150mL	119970
300mL	119980
600mL	119990
900mL	120000
1200mL	120010

Freeze drying bottle



40mL ID 43mm	120050
80mL ID 43mm	120060
120mL ID 71mm	120120
150mL ID 71mm	120130
300mL ID 71mm	120140
600mL ID 102mm	120070
900mL ID 102mm	120080
1200mL ID 102mm	120090

Cap for freeze drying bottle



ID45mm 40 80mL	120020
ID70mm 120 150 300mL	120030
ID102mm 60 90 1200mL	120040

Filter holder



Cat. No.: 120100

Filter (100pcs)



Cat. No.: 120110

Sealing



Cat. No.: 145610

Flask holder



Cat. No.: 256160

Filter (100pcs)



Cat. No.: 120110

1 Rotary Evaporator

2 Vacuum Pump/Aspirator

3 Organic Synthesizer

4 Freeze Dryer • Spray Dryer

5 Shaker

6 Stirrer

7 Tube Pump

8 Low Temperature Chiller

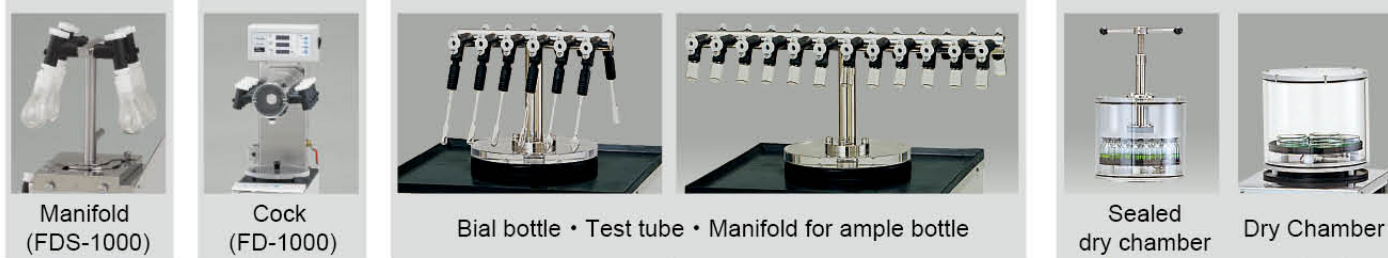
9 Cold Trap

10 Constant Temperature Bath

11 Incubator

12 Oven

13 Fermentor



※ 1

Rotary Evaporator 1

Vacuum Pump Aspirator 2

Organic Synthesizer 3

Freeze Dryer • Spray Dryer 4

Shaker 5

Stirrer 6

Tube Pump 7

Low Temperature Controller 8

Cold Trap 9

Constant Temperature Bath 10

Incubator 11

Oven 12

Fermentor 13

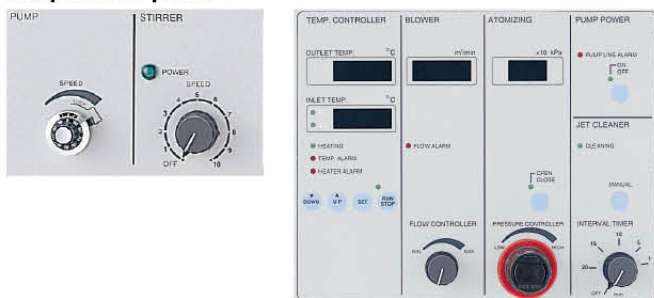
Spray Dryer SD-1000

Two way nozzle type spray dryer.
Large drying capacity of 1500mL/h.
Wide temperature range of 40~200°C.

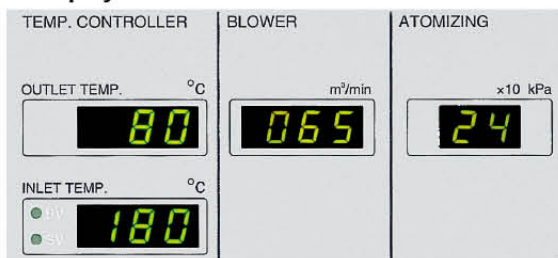


SD-1000

Operation panel



Display



Features

- Short drying time prevents influence on sample from high temperature.
- Sample solvents can be collected in the form of uniform dried powder. Pre-processing filtration, condensation or post processing grinding are not required.
- Drying by gram order is possible.
- Digital display of inlet and outlet drying air temperature, spray air pressure together with recorder outlet enable experiment data setting, confirmation and recording.
- Automatic cleaning by timer for air spraying nozzle. Powders stucked inside nozzle can be removed by pushing needle. Crystals stucked to top end of nozzle can be removed by cleaning port of the evaporation tube.
- Magnetic stirrer, suction filter and outlet air filter are equipped as standard.

Specifications

Product name	Spray Dryer
Model	SD-1000
Cat. No.	174978
Type	Two way nozzle spray type
Dehumidification capacity	1500ml/h
Temp. range & accuracy	40~200°C(at inlet), ±1°C
Heated air volume	0.2~0.75m³/min
Spray air pressure	20-245 kPa (0.2-2.5kg/cm²)
Circulation pump flow volume	150~1700mL
Stirrer rotation speed & capacity	100~1000rpm 50mL~2L water
Safety features	Evaporation tube cover, Self diagnosis function (Overheat, Excessive air flow, Heater break, Leak), Leak/over current breaker
Sprary air cleaning	Automatic cleaning by interval timer
Outlet signal	0~10mV
Heater	3kW
Circulation pump	Tube pump
Spray nozzle	Two way nozzle (nozzle ID 0.71mm)
Stirrer	DC brushless motor 6W
Overall dimensions (mm)	700W x 620D x 1500H
Weight	110kg
Power source	4.2kVA AC200V



Easy maintenance work



- Simple process of disassembly, cleaning and mounting.
- Cyclon can be disassembled.
- Positioning mark for setting evaporation tube.
- Maintenance door for filter change is provided.

Suction filter



Air filter

