LORDERAN

TECHNICAL DATASHEET
DS-BK-FD18-EN · REV. B · NOV 2026

LABORATORY FREEZE DRYER

28 Litre **Laboratory Freeze Dryer**

Pre-freeze in the machine, then pull the chamber to **≤ 5 Pa** so ice turns straight to vapour — onto a **28 L** cold trap at **≤ −60 °C**.

MODELS

BK-FD18S · BK-FD18P · BK-FD18T · BK-FD18PT





BK-FD18S



BK-FD18PT

≤ −60 °C COLD TRAP, NO LOAD	**≤ 5** Pa VACUUM DEGREE	**28** L COLD TRAP CAPACITY	**6** L/24 h WATER CAPTURE
3.6 L LIQUID LOAD, S / P	**615** Φ12 VIALS, T / PT	**36** h FREEZE-DRYING TIME	**2** years WARRANTY

01 **Pre-freezing built in**
No separate low-temperature freezer.

02 **Four chamber types**
Trays, flasks or vials stoppered under vacuum.

03 **Watch it dry**
Aviation-acrylic drying chamber.

APPLICATIONS

Biology & biochemistry · Pharma R&D · Food science · Materials

2-year warranty
Major defects: full refund or replacement.

Free DDP shipping
Duties paid, no surprise import charges.

30-day returns
Most new, unopened items.

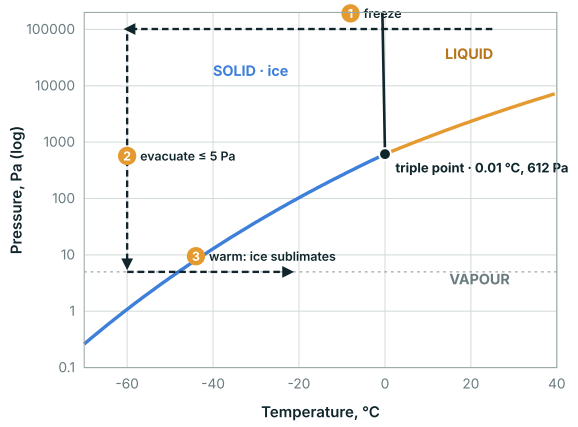
PRODUCT OVERVIEW

Freeze, then turn ice straight to vapour

A 28 L laboratory freeze dryer that **pre-freezes samples in its own cold trap**, so you do not need a separate low-temperature freezer. The cold trap reaches −60 °C or lower (−80 °C or −110 °C optional) and the vacuum pump pulls the chamber to 5 Pa.

Vacuum freeze-drying freezes the sample first, then lowers the pressure below the **triple point of water**. Gently warmed, the ice sublimates without ever melting, so the moisture leaves and the sample's structure stays intact.

Phase diagram of water. Below the triple point (612 Pa) ice turns directly to vapour. Calculated curves (IAPWS, Murphy & Koop).



HOW IT WORKS

01 Pre-freeze
Freeze samples in the large cold trap opening.

02 Evacuate
4 L/s vacuum pump to ≤ 5 Pa.

03 Sublimate
Ice turns to vapour in the transparent drying chamber.

04 Capture
Vapour freezes on the ≤ −60 °C trap, 6 L / 24 h.

05 Stopper or remove
T / PT stopper vials under vacuum; then defrost.

COLD TRAP
≤ −60 °C
−80 °C or −110 °C optional

VACUUM
≤ 5 Pa
4 L/s pump

CAPTURE
6 L / 24 h
28 L trap

DRYING AREA
0.18 · 0.09 m²
S / P · T / PT

SUBLIMATION DRIVING FORCE

$$\Delta p = p_{ice}(T_{product}) - p_{ice}(T_{trap})$$

Vapour flows from product ice to the colder trap. At −30 °C product and −60 °C trap: about 38 Pa against 1.1 Pa (calculated).

Freeze completely
Pre-freeze below the product's collapse or eutectic temperature before vacuum.

Thin, even layers
Spread liquid thinly in trays or shell-freeze flasks: drying time grows with layer thickness.

Defrost between runs
A loaded trap loses capacity; defrost and drain before the next batch.

FEATURES

Engineered for reliable drying

01 Freezing & trap

- **Pre-freezing function** in the cold trap opening
- **Stainless steel** cold trap, Φ300 × 410 mm
- **Defrost function** between runs
- Gas diversion for even airflow and ice capture

02 Refrigeration

- Efficient, low-noise, long-life **compressor**
- Refrigerant R600a + R23 (−60 °C) · R404a + R23 (−80 °C)
- **ODP = 0** refrigerants
- Air cooling standard; water cooling optional

03 Vacuum & chamber

- Compact **4 L/s** vacuum pump
- **Aviation acrylic** drying chamber, transparent
- Freeze-drying area 0.18 · 0.09 m²

04 Options

- Moving frame; other vacuum pumps
- Vacuum regulation, oil mist filter
- Automatic air intake and water discharge
- 600 / 1200 ml wide-mouth flasks (P / PT)

CHOOSE YOUR CHAMBER TYPE · EVERY SIZE COMES IN FOUR VERSIONS



S · Standard
Stainless trays for bulk liquid, paste and solids.



P · With manifold
Trays plus an 8-port manifold for flasks.



T · Stoppering
3 adjustable trays; stopper vials under vacuum.



PT · Stoppering + manifold
Stoppering chamber with the 8-port manifold.

TECHNICAL SPECIFICATIONS

Technical specifications

Parameter	BK-FD18S	BK-FD18P	BK-FD18T	BK-FD18PT
MODEL AND CHAMBER				
Type	Standard chamber	Standard chamber with 8 port manifold	Stoppering chamber	Stoppering chamber with 8 port manifold
Freeze Drying Area	0.18m²	0.18m²	0.09m²	0.09m²
Tray	4 pcs	4 pcs	3 pcs	3 pcs
Height Between Trays	80mm	80mm	/	/
Tray Size (D*H)	Φ240*20mm			
Drying Chamber Size (Diameter*H)	Φ300*445mm	Φ300*465mm	Φ300*465mm	Φ300*465mm
COLD TRAP AND VACUUM				
Cold Trap Temperature	≤-60°C(No load)(-80°C -110°Coptional)			
Cold Trap Capacity	28L			
Cold Trap Size (Diameter*H)	Φ300*410mm			
Vacuum Degree	≤5 Pa			
Water Capture Capacity	6L/24h			
Freeze Drying Time	36h			
LOADING				
Loading Capacity/Shelf (Liquid)	1.8L	1.8L	0.9L	0.9L
Total Loading Capacity (Liquid)	3.6L	3.6L	1.8L	1.8L
Total Qty. Of Vial Φ22	/	/	183	183
Total Qty. Of Vial Φ16	/	/	345	345
Total Qty. Of Vial Φ12	/	/	615	615
REFRIGERATION AND POWER				
Refrigerant	-60°C: R600a, R23 -80°C: R404a、R23			
Cooling System	Standard: Air cooling Optional: Water cooling			
Power Supply	Standard: 220V 50Hz Optional: 220V 60Hz			
Power Consumption	1800W			
ACCESSORIES				
Standard Accessory	Vacuum pump 4L/S, Material tray*4(Material tray*3 for T/PT), Drying rack*1, Cover*1, Acrylic bucket*1(all models) Conical-mouth flask 100ml*2pcs, 200ml*2pcs, 250ml*2pcs, 500ml*2pcs, Switch valve*8 pcs (only for model BK-FD18P/PT)			
Optional Function & Accessory	Equipment moving frame, vacuum pump of other specifications, vacuum regulation, oil mist filter, automatic air intake, automatic water discharge and other customization(for all models) 600ml/1200ml Wide-mouth flask (for BK-FD18P/PT)			
SIZE AND WEIGHT				

Parameter	BK-FD18S	BK-FD18P	BK-FD18T	BK-FD18PT
External Size (W*D*H), mm	545*686*938			
Package Size (W*D*H), mm: Main Body	804*672*1170			
Package Size (W*D*H), mm: Accessory	650*710*650			
Gross Weight(kg)	144	145	151	152

Specifications from the LORDERAN product documentation. Subject to change without notice for product improvement.

AT A GLANCE

MODEL
BK-FD18S
Type
Standard chamber
Drying area
0.18 m²
Trays
4 × Φ240 mm
Drying chamber
Φ300 × 445 mm
Liquid load
3.6 L
Vials Φ22/16/12
—
Gross weight
144 kg

MODEL
BK-FD18P
Type
Standard + 8-port manifold
Drying area
0.18 m²
Trays
4 × Φ240 mm
Drying chamber
Φ300 × 445 mm
Liquid load
3.6 L
Vials Φ22/16/12
—
Gross weight
145 kg

MODEL
BK-FD18T
Type
Stoppering chamber
Drying area
0.09 m²
Trays
3 × Φ240 mm
Drying chamber
Φ300 × 465 mm
Liquid load
1.8 L
Vials Φ22/16/12
183 / 345 / 615
Gross weight
151 kg

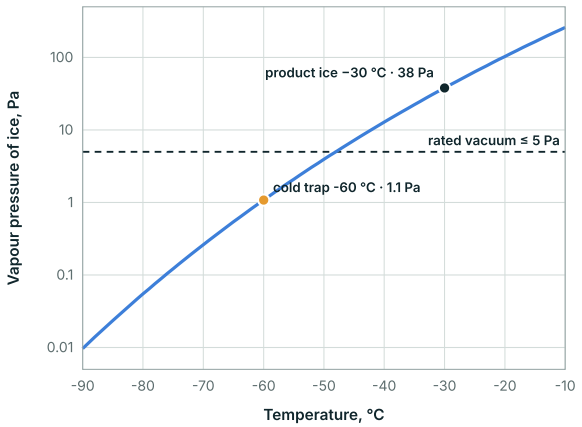
MODEL
BK-FD18PT
Type
Stoppering + 8-port manifold
Drying area
0.09 m²
Trays
3 × Φ240 mm
Drying chamber
Φ300 × 465 mm
Liquid load
1.8 L
Vials Φ22/16/12
183 / 345 / 615
Gross weight
152 kg

COMPARE SIZES · THREE COLD TRAPS, THE SAME FOUR CHAMBER TYPES

Size	Models	Cold trap	Water capture	Loading S/P · T/PT	Φ12 vials	Footprint W×D×H
6 L benchtop	BK-FD10S/P/T/PT	Φ219×140 mm, ≤ −60 °C	3–4 L / 24 h	2.4 L · 1.6 L	492	640×610×550 mm
9 L vertical	BK-FD12S/P/T/PT	Φ219×240 mm, ≤ −60 °C	3–4 L / 24 h	2.4 L · 1.6 L	492	520×625×865 mm
28 L	**BK-FD18S/P/T/PT**	**Φ300×410 mm, ≤ −60 °C**	**6 L / 24 h**	**3.6 L · 1.8 L**	**615**	**545×686×938 mm**

THE PHYSICS OF SUBLIMATION

Driving force. Ice at −30 °C has about 35× the vapour pressure of ice at −60 °C, so water vapour flows to the cold trap and freezes there.



VAPOUR PRESSURE OF ICE

Ice temperature	Vapour pressure	Typical role
-10 °C	260 Pa	warm product ice
-20 °C	103 Pa	product ice
-30 °C	38 Pa	product ice
-40 °C	12.8 Pa	product ice
-60 °C	1.08 Pa	cold trap, standard
-80 °C	0.0548 Pa	cold trap, −80 °C option
-110 °C	0.162 mPa	cold trap, −110 °C option

Calculated reference values (Murphy & Koop, 2005). Vapour moves from the warmer product ice to the colder trap; the pressure difference drives drying.

APPLICATIONS & SERVICE

Where it works, and what comes with it

Biology & biochemistry
Proteins, enzymes, bacteria and cultures.

Pharma R&D
Formulations dried and stoppered in vials.

Food science
Fruit, vegetables and samples with structure intact.

Materials & chemistry
Porous materials and solvent-free samples.

INSTALLATION

Supply
220 V 50 Hz standard; 220 V 60 Hz optional. 1800 W.

Space
545 × 686 × 938 mm; allow airflow around the unit.

In the box
Vacuum pump 4 L/s, trays, drying rack, cover, acrylic bucket, flasks; 8 valves on P / PT.

WARRANTY & SERVICE

2-year warranty
Major defects under warranty: full refund or replacement.

30-day returns
Return most new, unopened items within 30 days.

Free DDP shipping
Delivered duty paid, no surprise import charges.

Formal quotation
PDF quote on request, with a confirmed ship date.

Request a quotation

Send your application, model and quantity through www.lorderan.com and we will reply with a formal PDF quotation.

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LORDERAN
www.lorderan.com
Laboratory and environmental test equipment