

# Freeze dryer-FDCF

## Chemical-free Upright type

**Product Introduction : Only Operon,  
-120°C Chemical free freeze dryer for organic solvents**

### Product features and specifications

-156°C cryogenic cooling system registered to the international patent and Operon Auto Cascade System, the original technology for -203°C cryogenic cooling system are combined to realize quick freezing and quick defrosting functions.

### Technical Data sheet

#### Features and advantages

- Chemical free freeze dryer is -120°C ~ -135°C cold trap with powerful freezing power, and it can capture organic solvents whose freezing point is -115°C ~ -95°C like ethanol, methanol, acetone, hexane or Iso-Octane.
- In case of samples whose freezing point is below -100°C, an expensive cryogenic freezer or liquid nitrogen is needed for pre-freezing. That is expensive and inconvenient way, and especially, liquid nitrogen is risky to use and has a possibility to contaminate samples. Also, samples are not frozen well in the general -86°C freezer, or while moving frozen samples to the drying chamber, samples are melted, so the examination is likely to fail. Chemical free freeze dryer of OPERON uses stainless five stage mini tray for self-freezing (pre-freezer embedded) below -120°C, and it is appropriate for the quick, convenient and efficient experiment.



#### Freezing Section

- Freezing system: Duality cooling system applied with Auto Cascade Systems of OPERON registered to the international patent
- Concentrator capacity: 1.5HP x 2 Set
- Refrigerant: CFC-free eco-friendly mixed refrigerant
- Refrigerant oil: Polyester oil
- Cold trap size: Ø345 x L380mm
- Cold trap capacity: 12L
- Cold trap material: Stainless steel SUS-304(Teflon coating)
- Material for Cold trap lid: Transparent acryl
- Defrosting: Automatic defrosting

#### Control Section

- Presentation Section: STN-2Tone(Blue/White) LCD Display(128x64 Dot, 60x32mm) / 6Point LED Presentation of state)
- Entering Section: 6Point Touch Key.
- Entering the temperature sensor: 1ch (Extension to 6ch for monitoring – option)
- Entering the vacuum sensor: 1ch
- Range of degree of vacuum (degradability): 2000~0mTorr / 1mTorr
- Sending monitoring data: Send temperature or monitoring data to PC or Konics data recorder, thermal printer.
- SMS sending function: Send SMS to the registered phone number when alarming

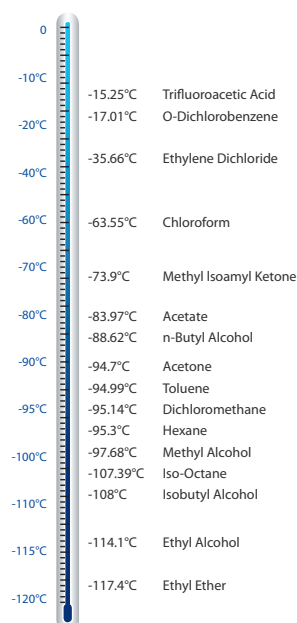
#### Vacuum Section

- Vacuum sensor (Varian)
- Valve for auto vacuum release

#### Drying section options and other options

- Vacuum pump: 100LPM ~ 1600LPM
- Manifold (T-type : 24P ~ 8P) / D-type : 12P ~ 8P)
- Five stage mini tray
- Flask (150ml ~ 1000ml)
- Vacuum valve + Cap + Adaptor
- Option for additional shelves
- Device for heating the heat plate (For FDCF, FDU, FDB, FDS)
- Chemical trap
- Oil mist trap
- Activated Carbon
- Torch
- Stoppering device
- Used as vacuum concentration
- Used as Shell freezer
- Drying chamber (transparent acryl, stainless square chamber)
- Three stage shelf

#### Freezing Points



### Application

Chemical free freeze dryer is used to dry directly diluted solvents without other preprocessing in the samples such as ethanol, methanol, acetone, hexane or Iso-Octane whose freezing point is -115°C ~ -95°C. Especially, chemical free freeze dryer of OPERON is the world first below -120°C dryer for chemicals. This product is used by users who experiences frequent breakdown of the vacuum pump and experiment failures while using -85°C ~ -50°C freeze dryer from other companies.

### Freeze dryer(Chemical free type) - Lab scale

Model	Chemical Free		
	FDCF-12012	FDCF-12006	FDCF-12003
Cold Trap Temp	-120°C	-120°C	-120°C
Capacity(total)	12L ~ 15L	6L ~ 8L	3L ~ 4.5L
Dimension	W850 x D796 x H987		
Trap Size	Φ 345 x L380	Φ 315 x L300	Φ 315 x L180
Controller	Auto/Manual start-up controller, Display cold trap, Temperature & vacuum pressure(2000mTorr ~ 0mTorr), printer set		
Pump Protection System	(Automatic vacuum pump start & Stop controller system)		
Defrost	Auto		Manual
Electric	220V/1Ph(50/60Hz)		
Weight	210kg	190kg	180kg