

# Cryogenic Freezer-CFQ

## Cryo Freezer conqueror -156 °C

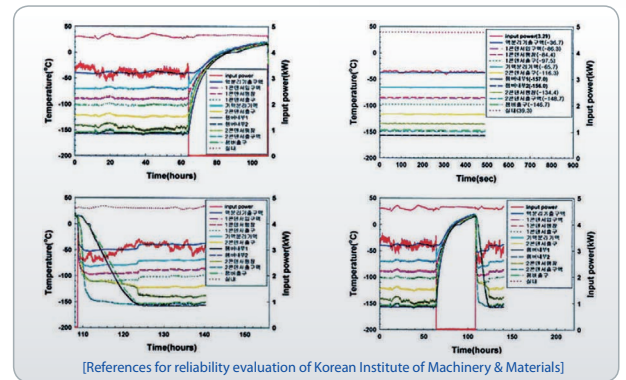
### Product features and specifications

- The world first freezer which makes maximum cryogenic -156°C without liquid nitrogen
- Application of cryogenic cooling system (Auto cascade system) registered to the international patent
- Use of CFC-free special mixed refrigerants which OPERON Co., Ltd developed
- Application of aerodynamically designed pan wings equipped with huge capacity and high performance
- Hermetic compressor for LBP with excellent performance
- CE certification product for preserving cell
- Non scaling stainless chamber and round corner design for easy cleaning
- Use of 200mm high density urethane insulating materials to minimize cold air loss
- Chamber mold and double door with elegant design
- Strong structure frame and impact resistant powder coating finishing
- Filter cover for easy cleaning
- Chest type cabinet structure
- Temperature for hard condition resistant test +32°C
- Temperature measuring sensor: platinum PT-100Ω(Class A 0.15 grade)
- Prevention of frost with Rim Heating system
- RS-232 Data port and Interface which is available for store, control and monitor temperature data via user's PC



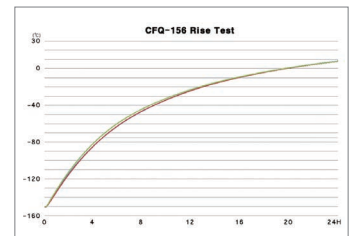
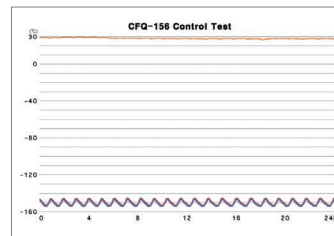
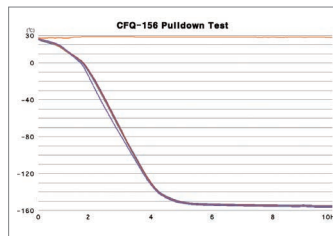
### Comparison

Items	OPERON ELECTRIC FREEZER	LIQUID NITROGEN FREEZER
Economic efficiency	It is available only with the lower cost electronic connection.	Expensive liquid nitrogen tank and the liquid nitrogen should be supplemented consistently.
Safety	It is safer from pollutants. When blackout, it secures safety with BACK UP SYSTEM if the temperature goes up.	It has a risk to be contaminated by bacteria or fungi inside the tank
Accuracy	Temperature difference between the upper part and the lower part inside is ±3°C, so the temperature is more even.	The temperature of the lower part inside the tank is -196°C, and the upper part is -70°C. The temperature difference is huge. This has a significant impact on viability of stem cell.
Convenience	Internal space can be used efficiently for keeping samples, and it is simple to perform work.	Rack for keeping samples is very inconvenient for sample work because of the liquid nitrogen tank's structure, and it is difficult to use the space inside the tank efficiently.



### Stem cell needs long-term preservation for 10~20 years.

It's been stated on various papers that cell preservation using liquid nitrogen has lots of problems. OPERON products resolved the above problems perfectly.



[References for reliability evaluation of cryogenic technology research center affiliated to OPERON]

### Control system

- Micro processor control system /Digital temperature indicator which adjust the temperature by 0.1°C
- Functions for setting double passwords to prevent access or control except administrators
- Data locking function

### Alarm system and safety devices

- Alarm for filter cleaning period (Warm Condenser alarm)
- Alarm for high/low temperature of sight and auditory
- Equipped with pressure switch
- Equipped with overheating prevention switch
- Auto return system after blackout

### Cryogenic Freezer (Mechanical Cryo)

Model	CFQ-150	CFQ-152	CFQ-156	CFQ-232	CFQ-300
External size(mm)	W1614 x D890 x H1105	W1614 x D890 x H1105	W1614 x D890 x H1105	W1676 x D890 x H1105	W2170 x D900 x H1065
Internal size(mm)	W600 x D400 x H600	W600 x D400 x H600	W600 x D400 x H600	W770 x D460 x H665	W1050 x D470 x H610
Range for usage	-90°C ~ -150°C	-95°C ~ -152°C	-100°C ~ -156°C	-90°C ~ -156°C	-80°C ~ -140°C
Inside measurement	144L			235L	300L
Electric capacity	Capacity necessary for installment AC220V 380V 3ph (50/60Hz)				
Weight	380Kg				450Kg

### Options

Rack / Box / LN2 Backup system / LCD touch screen with SD card(or USB) - Basic -1channel (sensor 3channel, 6channel options) / U-system (remote alarm system and wireless control system – telecommunication subscription needed / Automatic voltage regulator / Cryogenic gloves / Battery backup (Control panel and alarm) / Recorder / VIP