

# BICELL (BIO FREEZING VESSEL)

## Cryopreservation vessel for animal cells

- Cells can be preserved by freezing without programmable freezers.
- BICELL offers high viability and retrieval of cells.
- BICELL involves no operation expense.
- Usage of BICELL is easy. Keep BICELL at 4°C. Prepare specimen with your ordinary procedure for cryopreservation of cells. Insert sealed ampuls or serum tubes into BICELL. Place BICELL into a -80°C freezer. A freezing process is completed within approx. 3 hours.

### Specifications

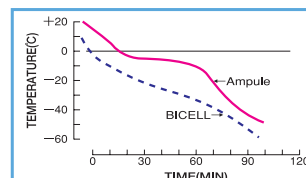
|                      |   |
|----------------------|---|
| Heat resistant range | -80°C~+40°C   |
| External dimensions  | φ88x H109 mm (Inclusive of lid)   |
| Internal dimensions  | φ50×H69mm   |
| Weight               | Approx. 200g  |
| Freezing buffer      | Approx. 100 ml  |
| Capacity             | Serum tube (1.8~2ml): Approx. 7 to 8<br>Glass ampuls (1ml): Approx. 9 to 10 |



BICELL

## TEST DATA

Medium : EMEM + FCS10% + DSO5%  
Specimen Tube : Glass ampule (1ml)  
(Equivalent to 0.5cc plastic tube)  
Specimen : VERO (African green Monkey)  
Cell Density : /5 × 10<sup>6</sup>ml  
(Sealed Glass Ampules placed into BICELL were stored in -80°C freezer.)



## DATA OF BICELL

### ASCITES TUMOR CELLS

| Name of cells   | Kind of animal | Years of preservation | Name of viable cells (%) |               |               |
|-----------------|----------------|-----------------------|--------------------------|---------------|---------------|
|                 |                |                       | Before freezing          | After thawing | Survival rate |
| M-1498          | Mouse C57BL    | 0.5                   | 99                       | 95            | 96            |
| MM-102          | Mouse C3H/He   | 1.5                   | 90                       | 83            | 92            |
|                 |                | 2.5                   | 90                       | 72            | 80            |
| FM3A            | Mouse C3H/He   | 2.0                   | 94                       | 90            | 96            |
|                 |                | 5.0                   | 97                       | 93            | 96            |
| S-37            | Mouse JCR/JCL  | 3.0                   | 91                       | 71            | 78            |
|                 |                | 5.0                   | 88                       | 79            | 90            |
| Yoshida-Sarcoma | Rat Donryu     | 3.0                   | 91                       | 31            | 34            |
|                 |                | 4.0                   | 91                       | 54            | 59            |

### INCUBATION CELLS

| Name of cells                          | Years of preservation | Survival rate (%) |
|--|-----------------------|-------------------|
| HeLa-S <sub>3</sub>                    | 3                     | 95.5              |
| Vero                                   | 10                    | 90                |
| BHK21-C1 <sub>13</sub>                 | 12                    | 65                |
| *Primary culture of Human fibroblast   | 12                    | 75                |
| MDCK                                   | 7                     | 85                |
| FM <sub>3</sub> A                      | 12                    | 93                |
| *Primary culture of chick embryo cells | 13                    | 55                |

# NIHON FREEZER

# GENERAL CATALOGUE



**NIHON FREEZER CO., LTD.**

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**NIHON FREEZER CO., LTD.**

URL : <http://www.nihon-freezer.co.jp>



# ULTRA-LOW TEMPERATURE FREEZER

—85/-95°C

Cooling performance and environmental adaptability have been improved totally with Nihon Freezer's new technology. Easy maintenance is ensured.

- Single compressor cooling system.
- No filters and no need of condenser cleaning.
- High temperature alarm, power failure alarm, and voltage free contact for remote alarm are standard.
- Double cooling system with high reliability.

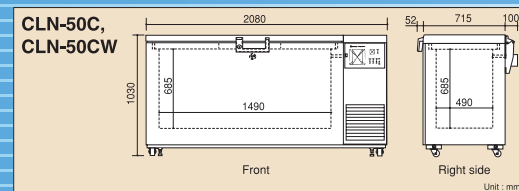
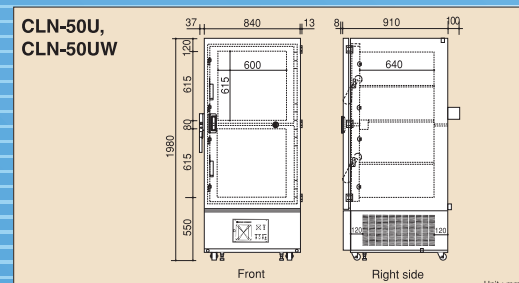


## Specifications (Upright)

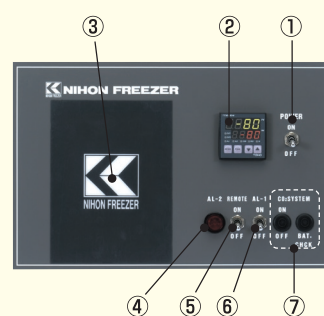
| Model               | CLN-30U  | CLN-30UW            | CLN-50U                          | CLN-50UW            | CLN-70UW                          |
|---------------------|--|---------------------|----------------------------------|---------------------|-----------------------------------|
| Cooling system      | Single   | Double              | Single                           | Double              | Double                            |
| Temperature range   | −70℃~−80℃ (MAX−85℃)  | −75℃~−85℃ (MAX−90℃) | −70℃~−80℃ (MAX−85℃)              | −75℃~−85℃ (MAX−90℃) | −70℃~−80℃ (MAX−85℃)               |
| Capacity            | Approx.308 ℓ   |                     | Approx.503 ℓ                     |                     | Approx.705 ℓ                      |
| External dimensions | W (710+50) ×D (770+108) ×H1980mm   |                     | W (840+50) ×D (910+108) ×H1980mm |                     | W (1055+50) ×D (930+108) ×H1980mm |
| Internal dimensions | W470×D500×H1310mm  |                     | W600×D640×H1310mm                |                     | W815×D660×H1310mm                 |
| Material            | Exterior: Electro-galvanized steel / Interior: Stainless steel   |                     |                                  |                     |                                   |
| Weight              | Approx.170Kg   | Approx.210Kg        | Approx.210Kg                     | Approx.280Kg        | Approx.290Kg                      |
| Refrigerant         | Specially mixed refrigerant  |                     |                                  |                     |                                   |
| Alarm               | High temperature alarm and power failure alarm   |                     |                                  |                     |                                   |
| Accessories         | Stainless steel shelf: 3, Key: 2 types (2 each), Caster: 4, Adjustable bolt: 2, Access port: 1 (φ20mm) |                     |                                  |                     |                                   |

## Specifications (Chest)

| Model               | CLN-35C  | CLN-35CW            | CLN-50C                    | CLN-50CW            | CLN-70C                    |
|---------------------|--|---------------------|----------------------------|---------------------|----------------------------|
| Cooling system      | Single   | Double              | Single                     | Double              | Single                     |
| Temperature range   | −70℃~−80℃ (MAX−85℃)  | −75℃~−85℃ (MAX−90℃) | −70℃~−80℃ (MAX−85℃)        | −75℃~−85℃ (MAX−90℃) | −70℃~−80℃ (MAX−85℃)        |
| Capacity            | Approx.349 ℓ   |                     | Approx.500 ℓ               |                     | Approx.701 ℓ               |
| External dimensions | W1630×D (715+152) ×H1030mm   |                     | W2080×D (715+152) ×H1030mm |                     | W2080×D (865+152) ×H1075mm |
| Internal dimensions | W1040×D490×H685mm  |                     | W1490×D490×H685mm          |                     | W1490×D640×H735mm          |
| Material            | Exterior: Electro-galvanized steel / Interior: Stainless steel               |                     |                            |                     |                            |
| Weight              | Approx.180Kg   | Approx.230Kg        | Approx.200Kg               | Approx.260Kg        | Approx.220Kg               |
| Refrigerant         | Specially mixed refrigerant  |                     |                            |                     |                            |
| Alarm               | High temperature alarm and power failure alarm                               |                     |                            |                     |                            |
| Accessories         | Key: 2 types (2 each), Caster: 4, Adjustable bolt: 2, Access port: 1 (φ20mm) |                     |                            |                     |                            |



## Control Panel (Upright and Chest)



- ① Main switch
- ② Temperature controller (Upper : Chamber temperature / Lower : Set temperature)
- ③ Temperature recorder space (Option)
- ④ Alarm lamp for Double cooling system (Only for appliance with Double cooling system)
- ⑤ Remote alarm switch
- ⑥ Alarm buzzer switch
- ⑦ CO<sub>2</sub> back-up system (Option)

# ULTRA-LOW TEMPERATURE FREEZER

Single compressor cooling system provides excellent cooling performance.

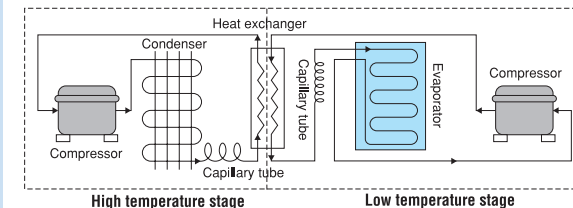
Single compressor cooling system

A traditional cascade cooling system\*1, which requires 2 compressors and 2 cooling cycles, has been used for ultra-low temperature freezers. Nihon Freezer, however, has succeed in developing its own cooling system\*2, which achieves lower temperature than —80°C only with one compressor and the specially mixed refrigerant. CLN series

has adopted this new technology. Since Single compressor cooling system is simple, it is possible to simplify the electric circuit, which leads to a low trouble rate. It also contributes to conservation of energy. About 10% lower power consumption is accomplished, compared with conventional ultra-low temperature freezers.

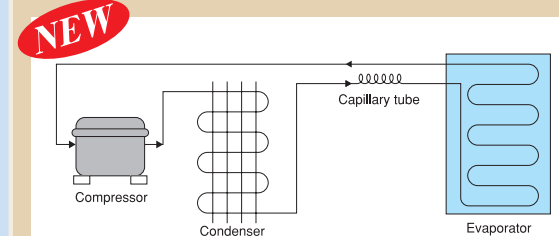
## \*1 Cascade cooling system (Traditional system)

A cascade cooling system consists of a low temperature stage and a high temperature stage. The combination of the 2 stages is only able to produce such low temperature as —80°C. If there is trouble with one of the stages, low temperature can not be maintained. Moreover, the structure of cascade cooling system is rather complicated and the system requires a number of components, which leads to a high trouble rate.



## \*2 Single compressor cooling system (New cooling system)

Lower temperature than —80°C is reached only with one cooling cycle with one compressor. Basically, the cooling system is the same as one of a household refrigerator. The merit of Single compressor cooling system is the simplicity.



## Improvement of safety and security with double cooling system

Double cooling system

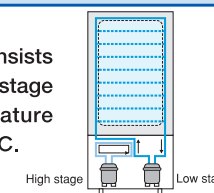
In case one of the high or low temperature stages has trouble, an ultra-low temperature freezer with a conventional cascade cooling system loses the whole cooling function. For the first time in the industry, Nihon freezer has adopted Double cooling system, which has 2 independent

Single compressor cooling systems, in an ultra-low temperature freezer. Since each Single compressor cooling system is able to achieve ultra-low temperature, even in case one of the systems has a problem, a Double cooling system freezer can maintain —70°C or lower in the chamber.

## Traditional cascade cooling system (Other manufacturers)

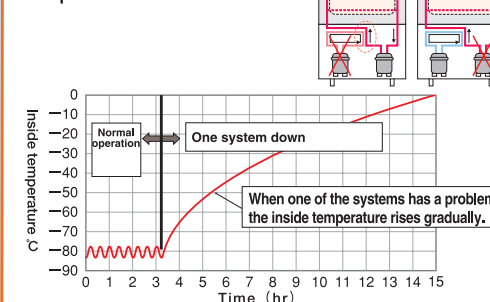
Normal Operation

The cooling system consists of a high temperature stage and a low temperature stage. It maintains —80°C.



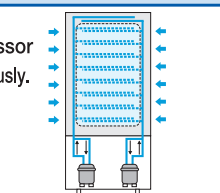
In case of trouble (One system down)

The whole system can not function properly. The inside temperature will rise.

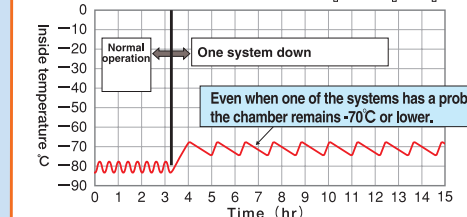
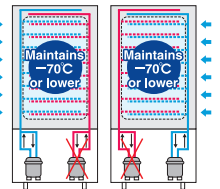


## NEW Double cooling system (Nihon Freezer)

2 independent Single compressor cooling systems work simultaneously. Each system is able to reach ultra-low temperature.

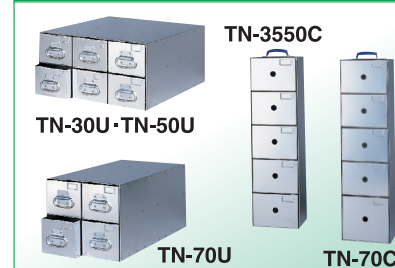


One of the systems can maintain —70°C or lower.

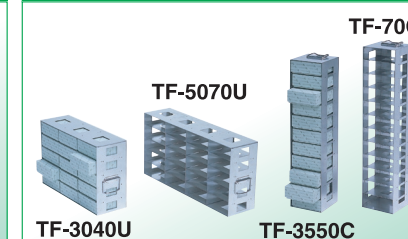


## OPTION

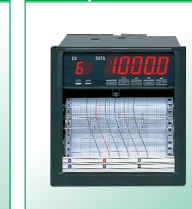
### Standard Rack



### Freeze Box Rack



### Temperature recorder



- ① Large and vivid LED display
  - ② Easy and interactive configuration
  - ③ Dust and splash-proof front door (Confirming to IP54)
  - ④ The recorder has variety functions such as printing functions (Message and periodic printout), zone recording, and partial expanded recording.
- 《Specifications》
- Measurement points: 6 dots
  - Sensor: Pt100

- Effective recording width: 100mm
- Recording period: 6 ch/10 sec (The shortest recording period)
- Dimensions : W144 x H144 x D220mm
- Weight : 2.5Kg
- Rated voltage : 100 ~ 240VAC (Automatically selected)
- Rated frequency: 50/60Hz

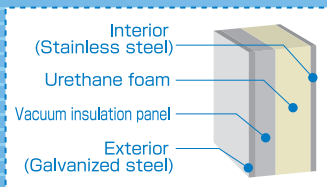


## MYBIO CUBE (DESKTOP FREEZER)

−85°C

**Ideal personal freezer for every researcher**  
Compact design / Dead space can be used effectively.

- Excellent cooling performance makes long term storage possible.
- No filter cleaning is required. (Easy maintenance)
- Up to 20 freeze boxes (2ml x 100 tubes) can be stored.
- Nihon Freezer's original new technology, Single compressor cooling system is used. Vacuum insulation panels allow high-density storage. (30% more space-saving, compared with conventional insulation.)



MYBIO  
CUBE  
ULTRA-LOW  
TEMPERATURE



DTF-35

※Freezer stand and freeze box racks are options. (Not included)

### Specifications

| Model               | DTF-35  |
|---------------------|---|
| Temperature range   | −70°C~−80°C (MAX−85°C)  |
| Capacity            | Approx.35 ℓ   |
| External dimensions | W (460+35) × D (620+40) × H680mm  |
| Internal dimensions | W336×D356×H295mm  |
| Material            | Exterior: Electro-galvanized steel / Interior: Stainless steel            |
| Weight              | Approx.65Kg   |
| Refrigerant         | Specially mixed refrigerant   |
| Alarm               | High temperature alarm and power failure alarm                            |
| Accessories         | Stainless steel shelf: 1, Key, Adjustable bolt: 2, Access port: 1 (φ20mm) |

### 《Option》



Standard Rack

Freeze Box Rack

Freezer Stand (Stainless steel)

## MY BIO (ULTRA-LOW TEMPERATURE FREEZER)

−80°C

**One ultra-low temperature freezer for one researcher for his personal use**  
Compact design

- Low price, low energy consumption, and low noise have been realized with Single compressor cooling system, Nihon Freezer's original new technology.
- Space saving compact design.
- No filter cleaning is required. (Easy maintenance)



VT-78



VT-208

### Specifications

| Model               | VT-78  | VT-208              |
|---------------------|--|---------------------|
| Temperature range   | −70°C~−80°C  |                     |
| Capacity            | Approx.70 ℓ  | Approx.189 ℓ        |
| External dimensions | W555×D555+78×H885mm                                      | W925×D605+95×H855mm |
| Internal dimensions | W385×D385×H470mm   | W755×D435×H650mm    |
| Material            | Exterior / interior: Baked-on acrylic resin finish steel |                     |
| Weight              | Approx.45Kg  | Approx.64Kg         |
| Refrigerant         | Specially mixed refrigerant                              |                     |
| Alarm               | High temperature alarm and power failure alarm           |                     |

### 《Option》



Rack for VT-78  
Dimensions: W180×D177 ×H385+30mm  
Full set: 4

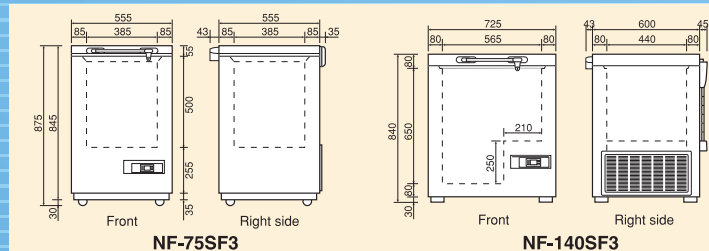
Rack for VT-208  
Dimensions: W160×D200 ×H570+30mm  
Full set: 6

## FREEZE (CHEST FREEZER)

−60°C

**Multipurpose freezers with excellent cooling performance**

- Little loss of cool air during lid opening.
- Line-up of small to large, 4 models available.
- No filter cleaning is required. (Easy maintenance)
- Useful in various fields.



NF-75SF3

NF-140SF3

NF-75SF3

NF-140SF3

NF-400SF3



### Specifications

| Model               | NF-75SF3   | NF-140SF3           | NF-300SF3            | NF-400SF3            |
|---------------------|--|---------------------|----------------------|----------------------|
| Temperature range   | −45°C~−60°C  |                     |                      |                      |
| Capacity            | Approx.70 ℓ  | Approx.140 ℓ        | Approx.300 ℓ         | Approx.400 ℓ         |
| External dimensions | W555×D555+78×H875mm                                    | W725×D600+88×H840mm | W1260×D600+88×H840mm | W1565×D600+88×H840mm |
| Internal dimensions | W385×D385×H470mm                                       | W565×D440×H648mm    | W1100×D440×H648mm    | W1400×D440×H648mm    |
| Material            | Exterior/interior: Baked-on acrylic resin finish steel |                     |                      |                      |
| Weight              | Approx.43Kg  | Approx.50Kg         | Approx.66Kg          | Approx.78Kg          |
| Refrigerant         | Specially mixed refrigerant                            |                     |                      |                      |
| Alarm               | High temperature alarm                                 |                     |                      |                      |

### 《Option》



Rack for NF-75SF3

Rack for NF-140/300/400SF3

## BIO MEDICAL SHOWCASE

+2°C~+14°C

**Ideal cold storage environment for medicine, vaccine, and reagent**

- No filter cleaning is required. (Easy maintenance)
- Microprocessor controller enables accurate and appropriate temperature control.
- Forced air circulation provides good uniformity.
- Cycle automatic defrost with heater.
- Adjustable shelves.
- Various alarms protect your cold storage.

### Specifications

| Model               | BMS-350F3   | BMS-5000F3                   |
|---------------------|---|------------------------------|
| Temperature range   | +2°C~+14°C  |                              |
| Capacity            | Approx.350 ℓ  | Approx.500 ℓ                 |
| External dimensions | W830×D511+25×H1830mm  | W920×D601+25×H1830mm         |
| Internal dimensions | W730×D310×H1435mm   | W820×D400×H1435mm            |
| Material            | Exterior/Interior: Painted steel  |                              |
| Door                | Double-paned sliding glass door   |                              |
| Shelf               | Polyethylene coated shelf: 5  | Polyethylene coated shelf: 6 |
| Weight              | Approx.110 Kg   | Approx.135 Kg                |
| Refrigerant         | R-134a  |                              |
| Alarm               | High temperature alarm, low temperature alarm, door alarm, and sensor alarm |                              |

### Control panel



### Temperature recorder (Option)



Model: AKM-0620

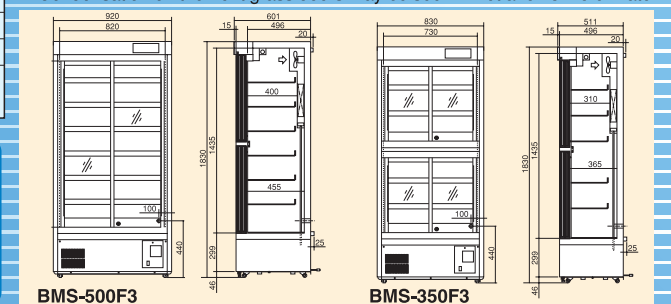


BMS-350F3



BMS-5000F3

※Condensation on the front glass doors may be seen in hot and humid climate.



BMS-5000F3

BMS-350F3



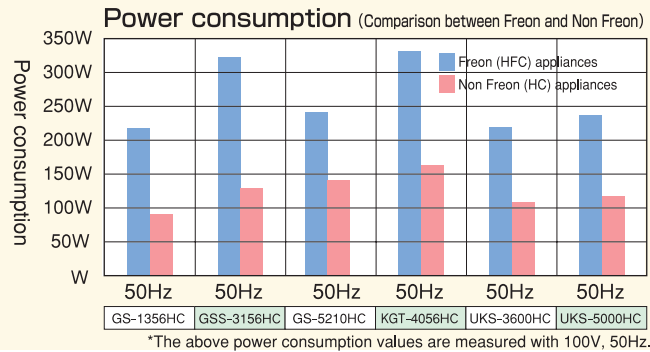
## Advantage of NON FREON refrigerant

Non Freon refrigerant, R-600a, gives no harm to ozone layers and has little effect on Global warming. Thanks to higher cooling efficiency, power consumption has been decreased remarkably, compared with common Freon appliances.

| Type of refrigerant | Name   | Ozone destruction coefficient | Global warming coefficient |
|---------------------|--------|-------------------------------|----------------------------|
| CFC                 | R-12   | 1.0                           | 8500                       |
| HCFC                | R-22   | 0.055                         | 1700                       |
| HFC                 | R-134a | 0                             | 1300                       |
| HC                  | R-600a | 0                             | 3                          |

• Ozone destruction coefficient : Relative value when R-11 is made 1.0

• Global warming coefficient: Relative value when CO<sub>2</sub> is made 1



## BIO FREEZER (NON FREON)

### Storage in order with drawers and easy putting in and out

■ Static cooling provides better preservation condition than forced-air cooling, without heater defrost and a fan. No automatic defrost and no regular temperature rise.

■ Drawers keep storage in order and provide easy putting in and out. Leakage of cooled air can be also minimized with drawers during door-opening.

#### ●Specifications

| Model               | GS-1356HC                          | GSS-3156HC           | GS-5210HC            |
|---------------------|------------------------------------|----------------------|----------------------|
| Temperature range   |                                    | -14℃~-28℃            |                      |
| Capacity            | Approx.104 ℓ                       | Approx.307 ℓ         | Approx.513 ℓ         |
| External dimensions | W555×D625+26×H850mm                | W660×D683+32×H1644mm | W750×D750+42×H1725mm |
| Drawers             | 4                                  | 7                    | 14                   |
| Weight              | Approx.42Kg                        | Approx.77Kg          | Approx.99Kg          |
| Insulation          | Foamed polyurethane (Cyclopentane) |                      |                      |
| Refrigerant         | R-600a                             |                      |                      |

GSS-3156HC

GS-5210HC

GS-1356HC

## BIO MULTIPLE COOLER (NON FREON)

### Cooler and freezer, suitable for storage of medicine and reagent

■ Cooler and freezer have 2 independent cooling and control systems with 2 compressors. Designed for not affecting each other.

■ Drawers in the freezer compartment keep storage in order and provide easy putting in and out. Leakage of cooled air can be also minimized with drawers during door-opening.

#### ●Specifications

| Model               | KGT-4056HC                                   |
|---------------------|--|
| Temperature range   | Cooler / +2℃ ~ +11℃ Freezer / -14℃ ~ -28℃    |
| Capacity            | Cooler / Approx.274 ℓ Freezer / Approx.109 ℓ |
| External dimensions | W 600 × D 631+35 × H1975mm                   |
| Drawers             | 3 (Freezer)                                  |
| Weight              | Approx.91Kg                                  |
| Insulation          | Foamed polyurethane (Cyclopentane)           |
| Refrigerant         | R-600a                                       |

KGT-4056HC

## BIO MEDICAL COOLER (NON FREON)

### Multi-purpose cooler Make the best of its storage space effectively.

■ Compact design with thin walls allows installation in a little space.

■ Shelf position is adjustable. (Pitch: 30mm) Store from large things to small things effectually.

#### ●Specifications

| Model               | UKS-3600HC           | UKS-5000HC           |
|---------------------|----------------------|----------------------|
| Temperature range   | +2℃~+15℃             |                      |
| Capacity            | Approx.331 ℓ         | Approx.429 ℓ         |
| External dimensions | W602×D580+43×H1589mm | W755×D695+43×H1515mm |
| Weight              | Approx.62Kg          | Approx.78Kg          |
| Refrigerant         | R-600a               |                      |

UKS-3600HC

UKS-5000HC

## REFRIGERATOR·FREEZER with spark-free interior

### For storage of flammable gas and/or liquid in laboratories

■ The interior of the appliances is spark-free in compliance with ATEX Directive 94/9/EC zone II.

■ There are no parts, producing any electric sparks, inside. Thus, flammable materials can be stored. (Explosion-proof interior)

■ Environmental-friendly Non Freon refrigerant is used. (No ozone destruction and little effect on Global warming)

■ Small-size articles can be stored on flat glass shelves.

※ The appliances are spark-free only inside. Do not use them in hazardous areas.

#### ●Specifications

| Model No.           | FKEX-1800           | FKEX-5000            | CT-3213                                     |
|---------------------|---------------------|----------------------|---|
| Temperature range   | +2℃~+10℃            | +2℃~+10℃             | F: -15℃ or lower / R: +1℃~+9℃               |
| Capacity            | Approx.174 ℓ        | Approx.433 ℓ         | F: Approx.71 ℓ / R: Approx.236 ℓ            |
| External dimensions | W600×D600+43×H885mm | W755×D691+43×H1515mm | W597×D629+25×H1690mm                        |
| Internal dimensions | W513×D441×H734mm    | W646×D516×H1338mm    | F: W437×D442×H379mm<br>R: W519×D451×H1056mm |
| Weight              | Approx.34Kg         | Approx.78Kg          | Approx.70Kg                                 |
| Refrigerant         | R-600a              |                      |   |

+2℃~+10℃/-15℃/+1℃~+9℃

FKEX-5000

FKEX-1800

CT-3213

## EXPLOSION-PROOF REFRIGERATOR·FREEZER

-20℃~+10℃

### For refrigerated storage of flammable materials such as organic solvents

■ The appliances are explosion-proof in compliance with the explosion-proof guideline of the Technology Institution of Industrial Safety (Japan).

■ The refrigeration cycle is "Pressurized Apparatus" (f) and the control circuit has "Flame-proof Enclosure" (d).

■ There are no parts, producing any electric sparks, inside and also in the compressor compartment. Thus, flammable materials can be stored.

■ Stainless steel interior and exterior

■ Temperature alarm and voltage free contact for remote alarm are standard.

#### ●Specifications

| Model No.           | EP-180               | EP-400               | EP-522               | EP-351FR                               |
|---------------------|----------------------|----------------------|----------------------|--|
| Temperature range   | 0℃~+10℃              | 0℃~+10℃              | -20℃~+5℃             | F: -20℃ R: 0℃~+10℃                     |
| Capacity            | Approx.185 ℓ         | Approx.403 ℓ         | Approx.520 ℓ         | F: Approx.80 ℓ R: Approx.280 ℓ         |
| External dimensions | W610×D615+50×H1320mm | W750×D665+50×H1750mm | W850×D860+40×H1780mm | W750×D665+50×H1750mm                   |
| Internal dimensions | W510×D455×H800mm     | W650×D505×H1230mm    | W700×D625×H1190mm    | F: W600×D465×H280<br>R: W650×D490×H875 |
| Weight              | Approx.110Kg         | Approx.150Kg         | Approx.210Kg         | Approx.140Kg                           |
| Refrigerant         | R-134a               | R-134a               | R-134a+R-404A        | R-134a                                 |
| Type of protection  | fd2G4                | fd2G4                | fdi2G4               | fd2G4                                  |
| Power supply        | 100V 50/60Hz         |                      |                      |  |

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\* The flammable gas and/or liquid below, in the light blue area, can be stored in the above explosion-proof appliances.

<Classification of electrical instrument for explosive fumes>

| Ex-<br>plosion<br>class | T 1<br>(G1)   | T 2<br>(G2)   | T 3<br>(G3)        | T 4<br>(G4)                 | T 5<br>(G5)       | T 6<br>(G6) |
|-------------------------|---|---|--------------------|-----------------------------|-------------------|-------------|
| IIA<br>(1)              | Acetone<br>Ammonia<br>Carbon monoxide<br>Ethane<br>Acetic acid<br>Ethyl acetate<br>Toluene<br>Propane<br>Benzene<br>Methanol<br>Methane | Ethanol<br>Isopentyl acetate<br>I-butanol<br>Butane<br>Acetic anhydride | Gasoline<br>Hexane | Acetaldehyde<br>Ethyl ether |                   |             |
| IIB<br>(2)              | Coal gas  | Ethylene<br>Ethylene oxide  |                    |                             |                   |             |
| IIC<br>(3)              | Water gas<br>Hydrogen   | Acetylene   |                    |                             | Carbon disulphide |             |

Custom made models, based on the explosion-proof guideline of the Technology Institution of Industrial Safety (Japan), are also available. Please feel free to contact us.

OSF-1500EP

OS-1700UEP

Note: Do not store materials, which have any possibilities to produce water gas, hydrogen, acetylene, and carbon disulphide. Also do not store self-reactive substances. Do not use the appliances under the atmosphere that contains the above mentioned substances.