PHCbi Biomedical products are designed to meet the demands of the life science industries by providing reliability, accuracy, and usability to facilitate cutting-edge research and preservation of precious samples.
"PHCbi" is a new brand for our Biomedical business that has globally supported cutting-edge research and healthcare for over 50 years. Since 1966, when we first launched pharmaceutical refrigerators, we aimed to support cutting-edge research in life sciences. We have provided equipment and services required for sample preservation, bacterial and cell culture as well as maintenance of cleanroom environments.

Life Science Innovator Since 1966

Commitment to Quality PHCbi MONOZUKURI* Way

The most important points that customers demand of our products are quality and reliability. At our factories, we have established the "MONOZUKURI Way" as a theme of action. We carry out various initiatives to improve quality while working to pass on the legacy of traditional Japanese manufacturing technology in a multi-faceted fashion. *MONOZUKURI is the Japanese word for [Craftsmanship]

Our Quality Management System

In our quality management and development process (Quality Management System), we establish a number of checkpoints in the value chain. Staff with various occupational abilities carry out stringent evaluation and improvement of products from the customer’s perspective. This is the system that creates our high level of quality.

Japan Factory (Gunma)

Established in 1959 as the Tokyo Manufacturing Site of Sanyo Electric Co., Ltd., this is our core factory which has the Product Technology Development/Design Department, Quality Assurance Department, and Production Department.

As of April 2018, Over 500 PHC employees engaged in the development, quality assurance, and production of products of PHCbi. Within the factory, we have many environmental testing laboratories, and these are used for stringent product screening with the aim of studying technology development and maintaining quality.

In addition, at the "MONOZUKURI-Dojo (Training)," the purpose is to pass down our legacy for traditional technology. We carry out various kinds of training to improve skills such as brazing capillary tubes of Ultra-low Temperature Freezers, etc., which require a high level of skill.
**Dual Cooling System**
Dual Cooling System offers ultimate sample protection.

**VIP PLUS vacuum insulation**
VIP PLUS vacuum insulation maximises storage capacity.

**Natural Refrigerants**
Naturally occurring hydrocarbon (HC) refrigerants improve performance and reduce running costs.

**Inverter Compressors**
Inverter Compressors maximise cooling performance and reduce energy consumption.

**EZlatch Easy Access Door Handle**
The EZlatch makes access to stored samples even easier.

**inCu-saFe germicidal interior**
inCu-saFe germicidal interior prevents contamination.

**Integrated Tray Catches**
Significantly minimize cleaning time and improves productivity.

**H2O2 Decontamination**
The unique H2O2 decontamination system delivers fast and validatable decontamination.

**SafeCell UV Lamp**
The SafeCell UV lamp prevents contamination.

**IR CO2 Sensor**
The IR CO2 Sensor offers accurate and reliable CO2 measurement.

---

## Preservation

<table>
<thead>
<tr>
<th>Client</th>
<th>Typical needs</th>
<th>Storage temperature</th>
<th>Ultra-low temperature freezers</th>
<th>Biomedical Freezers</th>
<th>Pharmaceutical Freezers</th>
<th>Blood Bank Refrigerators</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Universities, private companies, laboratories/research institutions</td>
<td>Preservation of cells, microbes, specimens</td>
<td>-80°C to -150°C</td>
<td>5 — 10</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Hospitals, universities, private companies, blood centers</td>
<td>Preservation of reagents, frozen plasma</td>
<td>-20°C to -30°C/-40°C</td>
<td>11 — 12</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Drugs, blood*, reagents</td>
<td>+4°C</td>
<td>13 — 16</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Blood must be preserved in Blood Bank Refrigerator.

## Incubation

<table>
<thead>
<tr>
<th>Client</th>
<th>Typical needs</th>
<th>CO2 Incubators</th>
<th>Cooled Incubators</th>
<th>Climate Chambers</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Universities, private companies, hospitals</td>
<td>Animal cell incubation [temperature, humidity, gas density]</td>
<td>Incubation of microbes [temperature]</td>
<td>Incubation of plants [temperature, illuminance, humidity]</td>
</tr>
<tr>
<td></td>
<td>Universities, private companies, hospitals, waterworks [water quality inspection]</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Universities, private companies, agricultural experiment stations</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## Sterilization

<table>
<thead>
<tr>
<th>Client</th>
<th>Typical needs</th>
<th>Laboratory Autoclaves</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Guaranteed sterilization process</td>
<td></td>
</tr>
</tbody>
</table>

---

*Blood must be preserved in Blood Bank Refrigerator.
TwinGuard

The most secure ultra-low temperature freezers for the storage of high value samples

**TwinGuard**

Ultimate Sample Protection

Unlike conventional ultra-low freezers, TwinGuard ULT freezers have two independent refrigeration systems to provide the highest levels of sample security. Should one system unexpectedly fail, the other will maintain a temperature in the -70°C range ensuring that the integrity of irreplaceable and potentially life-saving samples are not put at risk.

Safe and Secure Extra-Large Capacity Ultra-Low Freezer with Dual Cooling System

Secure storage with new dual cooling system

The Dual Cooling system is newly designated to securely store valuable biological samples. It consists of two individual compressors to provide a reliable -86°C ultra-low temperature environment. Should unexpected failure occur in one cooling circuit, the other will maintain at least -70°C.

**EZlatch**

EZlatch door handle newly developed based on human engineering

EZlatch is designed for secure door opening/closing with minimum strength as the name suggests and makes access to stored samples easier.

---

**Model No.**

- **MDF-DU302VX**
- **MDF-DU502VX**
- **MDF-DU702VX**

**Temperature Control Range**

-50°C to -86°C

**Effective Capacity**

- 575 liters
- 715 liters
- 729 liters

**External Dimensions (W x D x H)**

- 2010 x 845 x 1070 mm
- 2300 x 845 x 1070 mm
- 1030 x 882 x 1993 mm

**Internal Dimensions (W x D x H)**

- 1190 x 640 x 756 mm
- 1480 x 640 x 756 mm
- 870 x 600 x 1400 mm

**Net Weight (Approx.)**

- 328 kg
- 358 kg
- 328 kg

*External dimensions of main cabinet only - see dimension drawings on flyers showing handles and other external projections.*
**Preservation**

**ECO ULT Freezer**
Cost-saving and environmentally friendly sample storage

**VIP ECO**
Cost-saving and environmentally friendly sample storage within an optimal footprint

---

**Eco operation and Energy saving**

Unlike conventional ultra low freezers, TwinGuard ULT freezers ECO ULT freezers use natural hydrocarbon (HC) refrigerants to provide minimal energy consumption, reduced environmental impact and substantially lower running costs. HC refrigerants have a high latent heat of evaporation making them more efficient at removing heat from the freezer chamber than conventional refrigerants, resulting in up to a 55% reduction in energy consumption and costs. These refrigerants also have an extremely low Global Warming Potential, helping organizations to meet environmental objectives.

When low electrical running costs and environmental considerations are of paramount importance, put your trust in VIP ECO and PRO ECO ULT freezers.

- New heat exchanger design for greater surface area contact and overall efficiency.
- Advanced space-saving VIP PLUS Insulation (compared to our conventional models).
- Graphical LCD display with data monitoring and data log exported by USB (for MDF-DU702VH/MDF-DU702VHNL).
- Class IIa Medical Device certified quality (Certification itself for Europe area only to comply with European regulations).

Energy Efficient, Balanced Power Smart compressors, natural refrigerants and integrated electronics combine to lower your facility's operating costs. Freezer operation is managed by the practical balance of temperature performance and energy management.

---

**VIP**
Excellent reliability and uniformity within an optimal footprint

---

**VIP Plus**
Innovative V.I.P.* Technology

VIP is the innovative insulation technology developed by PHC. VIP series contain densely packed, open cell foam insulation under the vacuum panel. This configuration dramatically enhanced the insulation capability of the freezer while reducing the wall thickness from 140mm to 70mm, and achieved nearly 30% more storage capacity than conventional insulated freezers. The VIP Plus achieved 4 times stronger thermal resistance with more rigid foam polyurethane while keeping the same thickness of 70mm.

---

**Model No.**
MDF-DU300H
MDF-DU502VH
MDF-DU702VH
MDF-DU900V
MDF-DU300H
MDF-DU502VH
MDF-DU702VH
MDF-DU900V

**Temperature Control Range**
-86°C

**Effective Capacity**
333 liters

**External Dimensions (W x D x H)**
490 x 600 x 1140 mm

**Net Weight (Approx.)**
246 kg

---

**Performance**

- **Power consumption [W]**
  - AT 30°C, SV= -80°C
  - 23°C 230V, 50Hz

- **Rotation speed [rpm]**
  - AT 25°C 35°C 55°C

- **Model No.**
  - MDF-DU702VH
  - MDF-DU900V

---

**VIP Plus**

*Vacuum Insulation Panel

---

**VIP**

- **Class IIa Medical Device**
- **Graphical LCD touch panel**
- **Advanced V.I.P. Technology**
- **Energy Efficient, Balanced Power Smart compressor**
- **Environmentally friendly refrigerants**
- **Graphical LCD touch panel**
- **Advanced V.I.P. Technology**
- **Energy Efficient, Balanced Power Smart compressor**
- **Environmentally friendly refrigerants**

---

**VIP Plus**

*V.I.P. * Technology

VIP is the innovative insulation technology developed by PHC. VIP series contain densely packed, open cell foam insulation under the vacuum panel. This configuration dramatically enhanced the insulation capability of the freezer while reducing the wall thickness from 140mm to 70mm, and achieved nearly 30% more storage capacity than conventional insulated freezers. The VIP Plus achieved 4 times stronger thermal resistance with more rigid foam polyurethane while keeping the same thickness of 70mm.
**Cryogenic Freezers**

The most uniform storage temperatures for cryopreservation solutions.

**VIP MDF ULT Freezers**

Excellent reliability and uniformity within an optimal footprint.

---

### Effective Capacity

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Effective Capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>MDF-1156/1156ATN</td>
<td>487 liters</td>
</tr>
<tr>
<td>MDF-594</td>
<td>128 liters</td>
</tr>
<tr>
<td>MDF-794</td>
<td>231 liters</td>
</tr>
<tr>
<td>MDF-1156AT/NMDF-1156</td>
<td>701 liters</td>
</tr>
</tbody>
</table>

### Temperature Control Range

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Temperature Control Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>MDF-1156/1156ATN</td>
<td>-150°C to -152°C</td>
</tr>
<tr>
<td>MDF-594/594AT/NMDF-594</td>
<td>-80°C to -86°C</td>
</tr>
<tr>
<td>MDF-794/794AT/NMDF-794</td>
<td>-150°C to -152°C</td>
</tr>
</tbody>
</table>

### Internal Dimensions

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Internal Dimensions</th>
</tr>
</thead>
<tbody>
<tr>
<td>MDF-1156/1156ATN</td>
<td>500 x 350 x 625 mm</td>
</tr>
<tr>
<td>MDF-594/594AT/NMDF-594</td>
<td>500 x 200 x 572 mm</td>
</tr>
<tr>
<td>MDF-794/794AT/NMDF-794</td>
<td>760 x 450 x 572 mm</td>
</tr>
</tbody>
</table>

### External Dimensions

<table>
<thead>
<tr>
<th>Model No.</th>
<th>External Dimensions</th>
</tr>
</thead>
<tbody>
<tr>
<td>MDF-1156/1156ATN</td>
<td>550 x 685 x 945 mm</td>
</tr>
<tr>
<td>MDF-594/594AT/NMDF-594</td>
<td>1280 x 500 x 762 mm</td>
</tr>
<tr>
<td>MDF-794/794AT/NMDF-794</td>
<td>2010 x 770 x 1070 mm</td>
</tr>
</tbody>
</table>

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### Optional Accessories

- **Sensor Cover**
  - MTR-UB6-PW
  - MTR-UB7-PW
- **Brackets**
  - CVK-UB1-PW
  - CVK-UB2-PW
  - CVK-UBN2-PW
  - CVK-UB4-PW
- **Mounting Kit**
  - MDF-DU502VX, MDF-DU502VHL, MDF-DU702VX, MDF-DU702VHL
- **Recording range:**
  - +50°C to +30°C
  - -100°C to -170°C

---

### Liquid CO2 Backup Kits

- MDF-DC500V X, MDF-DC700V X
- MDF-DU300V, MDF-DU502V
- MDF-DU702V, MDF-DU702VH

---

### Temperature Recorders

- **2-month Strip Chart Recorders**
  - MTR-155H-PW
  - MTR-85H-PW
  - MTR-G85A-PA/MTR-G85C-PE
  - MDF-DC700V, MDF-U33V, MDF-U54V, MDF-U55V, MDF-U74V
  - MDF-DU502VX, MDF-DU502VHC, MDF-DU702VH, MDF-DU702VHL
  - MDF-DU900V C, MDF-DU900V X, MDF-DU900V H, MDF-DU900V CL, MDF-DU900V PX

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### Small Inner Door Kits*

- MDF-1156AT/NMDF-1156
- MDF-594/594AT/NMDF-594
- MDF-794/794AT/NMDF-794

---

*Please be aware cooling capacity will be less than specified if small inner doors are installed. Installation of the kit may affect usable storage capacity.
**MDF Biomedical Freezers**

Stable -30°C environment with extensive storage possibilities

**MDF Biomedical ECO Freezers**

Cost-saving and environmentally friendly fresh frozen plasma storage

**MDF Biomedical Freezers**

The ideal freezing environment for preservation

---

### External Dimensions

* External dimensions of main cabinet only – see dimension drawings on flyers showing handles and other external projections.

### Temperature Control Range

-20°C to -30°C

### Effective Capacity

- 274 liters (MDF-U334)
- 482 liters (MDF-U443)
- 504 liters (MDF-U5412H)
- 690 liters (MDF-U5612)

### Basket Options

- Small (dew pan)
- Large

### Net Weight

- 135 kg (MDF-U334)
- 185 kg (MDF-U443)
- 132 kg (MDF-U5412H)
- 152 kg (MDF-U5612)

### Internal Dimensions

- (W x D x H) (MDF-U334): 280 x 552 x 157 mm
- (W x D x H) (MDF-U443): 290 x 536 x 136 mm
- (W x D x H) (MDF-U5412H): 290 x 536 x 238 mm

### Options

- Temperature Recorders
- Baskets

---

**Optional Accessories**

- Chart Recorder
- Brackets
- Recorder Mounting
- No Mounting

---

**Preservation**

**Incubation**

**Sterilization**

---

**Cost-saving and environmentally friendly**

- Biomedical Freezers
- Biomedical ECO Freezers

---

**Preservation Incubation Sterilization**
A stable temperature environment is important for the storage of your precious drugs and samples. However, household refrigerators do not offer a stable temperature environment due to relatively simple construction. PHCbi pharmaceutical refrigerators employ a forced air circulation and sophisticated plenum systems to realize a uniformed temperature throughout the chamber even under a changing ambient temperature environment.

### Inside Temperature of Household Refrigerator

- **Typical Cooling System of Household Refrigerator**

  - **Refrigerator**
    - **Temperatures**:
      - **Freezer**: -18°C
      - **Temperature Fan**: -4°C — 6°C
      - **Temperature — 4°C**: -4°C — 6°C
      - **Temperature — 1°C**: -1°C — 6°C
      - **Temperature — 0°C**: 0°C — 6°C

- **Only one FAN to cool down refrigerator and freezer**
- **The difference in the temperature between the upper and lower areas of the refrigerator section can be 10°C**

In regular refrigerators it is possible for the chamber temperature to fall below 0°C depending on the ambient temperature which may cause the freezing of medicines and mediums. The auto defrost system turns on every 7 – 8 hours. During this time, the chamber air temperature rises.

### Temperature Stability — temperature Uniformity

- **Multi air-flow plenum cooling system**
- **Uniform cold air flow distribution throughout the chamber**
- **Ensure temperature uniformity of big capacity chamber**

The cycle defrost system turns on the defrost heater during each off period of the compressor only when needed. This control method prevents large temperature rises.

### MPR Pharmaceutical Refrigerators

#### 2°C to 14°C

**Sliding Door Type**

**Temperature Control Range**
- 2°C to 14°C

**Effective Capacity**
- MPR-514: 386 liters
- MPR-1014: 758 liters
- MPR-1412R: 1038 liters

**External Dimensions**
- MPR-514: 800 x 465 x 1300 mm
- MPR-1014: 1700 x 465 x 1300 mm
- MPR-1412R: 1900 x 465 x 1300 mm

**Net Weight**
- MPR-514: 147 kg
- MPR-1014: 246 kg
- MPR-1412R: 287 kg

### Inside Temperature of Household Refrigerator

- **Typical Cooling System of Household Refrigerator**

  - **Refrigerator**
    - **Temperature Fan**: -4°C — 0°C
    - **Temperature — 3°C**: -2°C — 1°C
    - **Temperature — 6°C**: 0°C — 5°C

- **Uniformal cold air flow distribution throughout the chamber**
- **Ensure temperature uniformity of big capacity chamber**

#### Cooling Fan

<table>
<thead>
<tr>
<th>Temperature (°C)</th>
<th>-4°C — 0°C</th>
<th>-2°C — 1°C</th>
<th>0°C — 5°C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ambient Temp.</td>
<td>0°C — 3°C</td>
<td>0°C — 3°C</td>
<td>0°C — 3°C</td>
</tr>
</tbody>
</table>

### Temperature Stability — temperature Uniformity

- **Multi air-flow plenum cooling system**
- **Uniform cold air flow distribution throughout the chamber**
- **Ensure temperature uniformity of big capacity chamber**

The cycle defrost system turns on the defrost heater during each off period of the compressor only when needed. This control method prevents large temperature rises.
**Preservation**

**MPR Pharmaceutical Refrigerators with Freezer**

Providing a complete storage solution; Refrigerator and freezer in one unit

**Temperatures**

- Refrigerator: 2°C to 14°C
- Freezer: -20°C to -30°C

**Effective Capacity**

- Refrigerator: 1301 L
- Freezer: 136 L

**Net Weight**

- Refrigerator: 170 kg
- Freezer: 302 kg

**Optional Accessories**

- 32-day Strip Chart Recorders
- 2-month Strip Chart Recorder
- 1-day/7-day/32-day Circular Chart Recorders

**External Mounting Power Failure Alarm**

**Preservation**

**MBR Blood Bank Refrigerators**

Robust design for safest storage of whole blood

**Temperatures**

- Refrigerator: 2°C to 14°C
- Freezer: -20°C to -30°C

**Effective Capacity**

- Refrigerator: 1301 L
- Freezer: 136 L

**Net Weight**

- Refrigerator: 170 kg
- Freezer: 302 kg
## MCO CO₂ Incubators

### Ambient temp. +5°C to 50°C

Optimising cell culture outcomes and reproducibility

<table>
<thead>
<tr>
<th>Model No.</th>
<th>MCO-170ACL</th>
<th>MCO-170AC</th>
<th>MCO-19ACL</th>
<th>MCO-19AC</th>
<th>MCO-80IC</th>
<th>MCO-230ACL</th>
<th>MCO-230AC</th>
<th>MCO-851IC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature Control Range</td>
<td>Ambient temperature +5°C to 50°C</td>
<td>Ambient temperature +5°C to 50°C</td>
<td>Ambient temperature +5°C to 50°C</td>
<td>Ambient temperature +5°C to 50°C</td>
<td>Ambient temperature +5°C to 50°C</td>
<td>Ambient temperature +5°C to 50°C</td>
<td>Ambient temperature +5°C to 50°C</td>
<td>Ambient temperature +5°C to 50°C</td>
</tr>
<tr>
<td>CO₂ Setting Range</td>
<td>0% to 20%</td>
<td>0% to 20%</td>
<td>0% to 20%</td>
<td>0% to 20%</td>
<td>0% to 20%</td>
<td>0% to 20%</td>
<td>0% to 20%</td>
<td>0% to 20%</td>
</tr>
<tr>
<td>Chamber Humidity</td>
<td>95 ±5% R.H.</td>
<td>95 ±5% R.H.</td>
<td>95 ±5% R.H.</td>
<td>95 ±5% R.H.</td>
<td>95 ±5% R.H.</td>
<td>95 ±5% R.H.</td>
<td>95 ±5% R.H.</td>
<td>95 ±5% R.H.</td>
</tr>
<tr>
<td>Interior Dimensions</td>
<td>490 x 523 x 665 mm</td>
<td>490 x 523 x 665 mm</td>
<td>620 x 730 x 905 mm</td>
<td>620 x 730 x 905 mm</td>
<td>806 x 693 x 1524 mm</td>
<td>806 x 693 x 1524 mm</td>
<td>851 litres</td>
<td>230 litres</td>
</tr>
<tr>
<td>Interior Volume</td>
<td>49 litres</td>
<td>49 litres</td>
<td>80 kg</td>
<td>90 kg</td>
<td>275 kg</td>
<td>275 kg</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Internal dimensions only. 

** Compared to current products, the required cleaning time and task are reduced by approximately 80% while using virtually the same installation space used in conventional models. Four more 100ø dishes can be set up when using conventional models.

### H₂O₂ Decontamination

The high-speed decontamination system using H₂O₂ that is also used for regeneration medicine equipment can complete the entire decontamination process in approximately 135 minutes (about 2 hours including preparation time), enhancing work efficiency for researchers and enabling complete decontamination within the unit.

** Approx. 2.5hrs

### Dual Heat Sterilisation

No more problems during dry heat sterilisation: such as interior components removal during sterilisation; temperature/CO₂ density composition before restart; impacts to temperature when stacking two boxes; and current consumption.

** Approx. 11hrs @ 180°C

In 2 hours and half (approx.)

** Preserving Incubation Sterilization

Increase in cleaning and storage efficiency with Integrated Tray Catches

The unit employs an integrated tray structure without shelf supports thereby reducing the number of interior components by approximately 80% and significantly saving cleaning time needed when changing cells for incubation.

Compared to current products, the required cleaning time and task are reduced by approximately 80% while using virtually the same installation space used in conventional models. Four more 100ø dishes can be set up when using conventional models.

### Interior Components

** Approx. 25% more storage

Tray space has increased by approximately 25% while using virtually the same installation space used in conventional models. Four more 100ø dishes can be set up.

** Approx. 80% fewer interior components

Interior components have decreased by approximately 80% while using virtually the same installation space used in conventional models.

### In Regenerative Medicine Equipment

** Preserving Incubation Sterilization
## Incubation

### MCO Multi-Gas Incubators

**Ambient temp. +5°C to 50°C**

### Optional Accessories (for MCO series)

#### Stacking Kits

- **MCO-170FS-PW**
  - Upper unit: MCO-170AC series/MCO-170ACL series/MCO-170AIC series/MCO-170ACL series/MCO-170AIC series
  - Lower unit: MCO-170AC series/MCO-170ACL series/MCO-170AIC series/MCO-170ACL series/MCO-170AIC series
- **MCO-170SB-PW**
  - Upper unit: MCO-170AC series/MCO-170ACL series/MCO-170AIC series/MCO-170ACL series/MCO-170AIC series
  - Lower unit: MCO-170AC series/MCO-170ACL series/MCO-170AIC series/MCO-170ACL series/MCO-170AIC series
- **MCO-230FS-PW**

#### Roller Bases

- **MCO-230RB-PW**
  - [for MCO-230AC series]
- **MCO-170RB-PW**
  - [for MCO-170AC series/MCO-170ACL series/MCO-170AIC series/MCO-170ACL series/MCO-170AIC series]
- **MCO-SRB-PW**
  - [for MCO-170AC series/MCO-170ACL series/MCO-170AIC series/MCO-170ACL series/MCO-170AIC series]
- **MCO-80RB-PW**
  - [for MCO-80AC series/MCO-80ACL series/MCO-80AIC series/MCO-80ACL series/MCO-80AIC series]

#### Roller bottle rack mount

### Incubation Details

- **Model No.**
  - MCO-170/MCO-170AC/MCO-SM
- **Temperature Control Range**
  - Ambient temperature +5°C to 50°C (AT 5°C to 35°C)
- **CO₂ Setting Range**
  - 0 to 20%
- **O₂ Setting Range**
  - 1 to 18%, 22 to 80%
- **Chamber Humidity**
  - 95 ±5% R.H.
- **CO₂ Gas tank switcher**
  - for MCO-170AC series/MCO-170ACL series/MCO-170AIC series/MCO-170ACL series/MCO-170AIC series
- **Tray (same as standard accessory)**
  - [for MCO series]
- **Tray (reinforced tray)**
  - [for MCO series]
- **Half tray**
  - [for MCO series]
- **UV system set**
  - [for MCO series]
- **H₂O₂ generator**
  - [for MCO series]
- **Electric lock**
  - [for MCO series]
- **Small door**
  - [for MCO series]
- **Auto water supply system**
  - [for MCO series]
- **H₂O₂ reagent**
  - [for MCO series]
- **Interface board**

### Other Options (for MCO series)

- **CO₂ gas tank switcher**
  - for MCO-170AC series/MCO-170ACL series/MCO-170AIC series/MCO-170ACL series/MCO-170AIC series
- **Gas regulator**
  - for MCO series
- **STD gas auto calibration kit**
  - for MCO series

<table>
<thead>
<tr>
<th><strong>Model No.</strong></th>
<th><strong>MCO-170/MCO-170AC/MCO-SM</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Temperature Control Range</strong></td>
<td>Ambient temperature +5°C to 50°C (AT 5°C to 35°C)</td>
</tr>
<tr>
<td><strong>CO₂ Setting Range</strong></td>
<td>0 to 20%</td>
</tr>
<tr>
<td><strong>O₂ Setting Range</strong></td>
<td>1 to 18%, 22 to 80%</td>
</tr>
<tr>
<td><strong>Chamber Humidity</strong></td>
<td>95 ±5% R.H.</td>
</tr>
<tr>
<td><strong>CO₂ Gas tank switcher</strong></td>
<td>for MCO-170AC series/MCO-170ACL series/MCO-170AIC series/MCO-170ACL series/MCO-170AIC series</td>
</tr>
<tr>
<td><strong>Tray (same as standard accessory)</strong></td>
<td>[for MCO series]</td>
</tr>
<tr>
<td><strong>Tray (reinforced tray)</strong></td>
<td>[for MCO series]</td>
</tr>
<tr>
<td><strong>Half tray</strong></td>
<td>[for MCO series]</td>
</tr>
<tr>
<td><strong>UV system set</strong></td>
<td>[for MCO series]</td>
</tr>
<tr>
<td><strong>H₂O₂ generator</strong></td>
<td>[for MCO series]</td>
</tr>
<tr>
<td><strong>Electric lock</strong></td>
<td>[for MCO series]</td>
</tr>
<tr>
<td><strong>Small door</strong></td>
<td>[for MCO series]</td>
</tr>
<tr>
<td><strong>Auto water supply system</strong></td>
<td>[for MCO series]</td>
</tr>
<tr>
<td><strong>H₂O₂ reagent</strong></td>
<td>[for MCO series]</td>
</tr>
</tbody>
</table>

### Notes

- MCO-170AIC UV is equipped with MCO-170AICUV/MCO-170AICUVL/MCO-170AICUVH/MCO-170AICUVHL and MCO-170AICUV/MCO-170AICUVL/MCO-170AICUVH/MCO-170AICUVHL, as standard.
- For 220 V—240 V 50 Hz—60 Hz  *2 For 220 V—240 V 50 Hz—60 Hz  *3 For 110 V—120 V 60 Hz  *4 Only for MTR-5000 (data acquistion system) users.
### Incubation

**MIR Cooled Incubators**

**All-round performance**

<table>
<thead>
<tr>
<th>Model No.</th>
<th>MIR-154</th>
<th>MIR-254</th>
<th>MIR-554</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ambient temp.</td>
<td>-10°C to 60°C</td>
<td>-5°C to 60°C</td>
<td>-5°C to 60°C</td>
</tr>
<tr>
<td>Interior Volume</td>
<td>93 litres</td>
<td>50 litres</td>
<td>153 litres</td>
</tr>
<tr>
<td>External Dimensions (W x D x H)</td>
<td>580 x 580 x 820 mm</td>
<td>450 x 460 x 450 mm</td>
<td>730 x 645 x 870 mm</td>
</tr>
<tr>
<td>Internal Dimensions (W x D x H)</td>
<td>428 x 368 x 1088 mm</td>
<td>405 x 330 x 1140 mm</td>
<td>560 x 400 x 1378 mm</td>
</tr>
</tbody>
</table>

**MIR Heated Incubators**

**Intuitive and easy operable Heated Incubators**

<table>
<thead>
<tr>
<th>Model No.</th>
<th>MIR-154</th>
<th>MIR-254</th>
<th>MIR-554</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ambient temp.</td>
<td>-10°C to 60°C (AT 0°C to 35°C)</td>
<td>-5°C to 60°C (AT 0°C to 35°C)</td>
<td>-5°C to 60°C (AT 0°C to 35°C)</td>
</tr>
<tr>
<td>Interior Volume</td>
<td>123 litres</td>
<td>79 litres</td>
<td>238 litres</td>
</tr>
<tr>
<td>External Dimensions (W x D x H)</td>
<td>630 x 368 x 1088 mm</td>
<td>508 x 330 x 1140 mm</td>
<td>620 x 368 x 1700 mm</td>
</tr>
<tr>
<td>Internal Dimensions (W x D x H)</td>
<td>450 x 330 x 1140 mm</td>
<td>405 x 330 x 1140 mm</td>
<td>560 x 330 x 1140 mm</td>
</tr>
<tr>
<td>Net Weight (Approx.)</td>
<td>79 kg</td>
<td>50 kg</td>
<td>115 kg</td>
</tr>
</tbody>
</table>

### Sterilization

**MLR Climate Chambers**

**Versatile Climate Chambers**

<table>
<thead>
<tr>
<th>Model No.</th>
<th>MLR-352</th>
<th>MLR-352H</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internal Volume</td>
<td>294 litres</td>
<td>294 litres</td>
</tr>
<tr>
<td>External Dimensions (W x D x H)</td>
<td>760 x 700 x 1835 mm</td>
<td>760 x 700 x 1835 mm</td>
</tr>
<tr>
<td>Internal Dimensions (W x D x H)</td>
<td>520 x 490 x 1135 mm</td>
<td>520 x 490 x 1135 mm</td>
</tr>
<tr>
<td>Net Weight (Approx.)</td>
<td>226 kg</td>
<td>235 kg</td>
</tr>
</tbody>
</table>

**Humidity control function (only for H type)**

- Suited for raising plants
- This holds an ultrasound humidifier controlled by a PID controller, making it able to control the humidity of an area of 60 — 90 % RH (fluorescent light off).
- Furthermore, it is able to humidify the chamber with the L-shaped humidifying pipe installed at the bottom of the chamber.
- The humidifying duct is L-shaped.

- **Circulation fan**
- **Ultrasonic humidifier**
- **Humidifying duct**
- **Ultrasonic element**

### MLS Portable Laboratory Autoclaves

**Convenient sterilisation on demand offers great flexibility**

<table>
<thead>
<tr>
<th>Model No.</th>
<th>MLS-3751L</th>
<th>MLS-3781L</th>
</tr>
</thead>
<tbody>
<tr>
<td>Effective Internal Capacity</td>
<td>50 litres</td>
<td>50 litres</td>
</tr>
<tr>
<td>External Dimensions (W x D x H)</td>
<td>470 x 420 x 740 mm</td>
<td>470 x 420 x 740 mm</td>
</tr>
<tr>
<td>Chamber Dimensions (dia. x depth)</td>
<td>270 x 410 mm</td>
<td>270 x 410 mm</td>
</tr>
<tr>
<td>Net Weight (Approx.)</td>
<td>41 kg</td>
<td>71 kg</td>
</tr>
</tbody>
</table>

* Models MLS-3751L, MLS-3781L are for laboratory use.

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MLR-352

MLR-352H

MLS-3751L

MLS-3781L

Sterilization