Partnering
Life Sciences
Development

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.
### 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 Refrigerators</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, -150°C</td>
<td>-20°C to -30°C/-40°C</td>
<td>+4°C</td>
<td>VIP PLUS vacuum insulation maximises storage capacity.</td>
</tr>
</tbody>
</table>

#### Dual Cooling System
- Dual Cooling System offers ultimate sample protection.

#### EZlatch Easy Access Door Handle
- EZlatch makes access to stored samples even easier.

#### Inverter Compressors
- Inverter Compressors maximise cooling performance and reduce energy consumption.

#### EZlatch Easy Access Door Handle
- EZlatch makes access to stored samples even easier.

#### Integrated Tray Catches
- Significantly minimize cleaning time and improves productivity.

#### Dual IR CO2 Sensor
- The single beam, dual detector IR CO2 Sensor offers continuous calibration for excellent control, accuracy and stability.

#### IR CO2 Sensor
- The IR CO2 Sensor offers accurate and reliable CO2 measurement.

### Incubation

<table>
<thead>
<tr>
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<th>Pages</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Universities, private companies, hospitals</td>
<td>17 — 20</td>
</tr>
<tr>
<td></td>
<td>Universities, private companies, hospitals, waterworks (water quality inspection)</td>
<td>11 — 12</td>
</tr>
<tr>
<td></td>
<td>Universities, private companies, hospitals, agricultural experiment stations</td>
<td>13 — 16</td>
</tr>
</tbody>
</table>

#### CO2 Incubators
- Animal cell incubation (temperature, humidity, gas density)

#### Cooled Incubators
- Incubation of microbes (temperature)

#### Climate Chambers
- Incubation of plants (temperature, illuminance, humidity)

#### Integrating Tray Catches
- Significantly minimize cleaning time and improves productivity.

#### Zirconia O2 Sensor
- The unique, solid state Zirconia O2 sensor delivers precise oxygen control.

#### H2O2 Decontamination
- The unique H2O2 decontamination system delivers fast and validatable decontamination.

#### SafeCell UV Lamp
- The SafeCell UV lamp prevents contamination.

### Sterilization

<table>
<thead>
<tr>
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<tr>
<td></td>
<td>Universities, private companies, experiment/research institutions, hospitals</td>
<td>22</td>
</tr>
</tbody>
</table>

#### Laboratory Autoclaves
- Guaranteed sterilization process

#### Dual Heat Sterilisation
- Two independent heaters enable cell culturing to continue uninterrupted during sterilization.

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*Blood must be preserved in Blood Bank Refrigerator.*
The most secure ultra-low temperature freezers for the storage of high value samples

**TwinGuard**

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.

**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 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.

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### TwinGuard Models

<table>
<thead>
<tr>
<th>Model No.</th>
<th>MDF-DU502VX</th>
<th>MDF-DU502VXC</th>
<th>MDF-DU702VX</th>
<th>MDF-DU702VXC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature Control Range</td>
<td>-86°C to -80°C</td>
<td>-86°C to -80°C</td>
<td>-86°C to -80°C</td>
<td>-86°C to -80°C</td>
</tr>
<tr>
<td>Effective Capacity</td>
<td>575 liters</td>
<td>715 liters</td>
<td>729 liters</td>
<td>729 liters</td>
</tr>
<tr>
<td>External Dimensions (W x D x H)</td>
<td>2010 x 845 x 1070 mm</td>
<td>2300 x 845 x 1070 mm</td>
<td>1030 x 882 x 1993 mm</td>
<td>870 x 600 x 1400 mm</td>
</tr>
<tr>
<td>Internal Dimensions (W x D x H)</td>
<td>1190 x 640 x 756 mm</td>
<td>1480 x 640 x 756 mm</td>
<td>870 x 600 x 1400 mm</td>
<td>870 x 600 x 1400 mm</td>
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<tr>
<td>Net Weight (Approx.)</td>
<td>329 kg</td>
<td>358 kg</td>
<td>328 kg</td>
<td>338 kg</td>
</tr>
</tbody>
</table>

---

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

---

**Competitor**

-86°C

**TwinGuard**

-70°C

---

<table>
<thead>
<tr>
<th>Model No.</th>
<th>MDF-DC500VX</th>
<th>MDF-DC700VX</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature Control Range</td>
<td>-50°C to -86°C</td>
<td>-50°C to -86°C</td>
</tr>
<tr>
<td>Effective Capacity</td>
<td>528 liters</td>
<td>784 liters</td>
</tr>
<tr>
<td>External Dimensions (W x D x H)</td>
<td>820 x 882 x 1993 mm</td>
<td>1080 x 882 x 1993 mm</td>
</tr>
<tr>
<td>Internal Dimensions (W x D x H)</td>
<td>630 x 600 x 1400 mm</td>
<td>900 x 600 x 1400 mm</td>
</tr>
<tr>
<td>Net Weight (Approx.)</td>
<td>285 kg</td>
<td>358 kg</td>
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[Data on power consumption and chamber temperatures is provided in the table.]

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When sample security and peace of mind are of paramount importance, put your trust in TwinGuard ultra low freezers.

- An optimal Dual Cooling System provides an unparalleled level of safety and added peace of mind through the use of two independent refrigeration systems.
- ECO mode overlaps refrigeration cycles to reduce energy consumption.
- Advanced space-saving VIP PLUS technology (compared to our conventional models).
- Graphical LCD display with data monitoring and data log exported by USB.
- Available in Upright and Chest models.
**VIP ECO**

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

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**VIP Plus**

Excellent reliability and uniformity within an optimal footprint

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**VIP**

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.

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**VIP ECO ULT Freezer**

Cost-saving and environmentally friendly sample storage

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**Cost-saving and environmentally friendly sample storage**

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**Temperature Control Range**

-86°C

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**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.

---

**Effective Capacity**

333 liters

---

**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.**

---

**PERFORMANCE**

Energy saving

---

**Innovative V.I.P.* Technology**

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**VIP ECO ULT Freezer**

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

---

**Temperature Control Range**

-86°C

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**Energy saving**

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**Cryogenic Freezers**

The most uniform storage temperatures for cryopreservation solutions

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

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**Optional Accessories**

<table>
<thead>
<tr>
<th>Model No.</th>
<th>MDF-1156</th>
<th>MDF-1156ATN</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Temperature Control Range</strong></td>
<td>–150°C to –152°C</td>
<td>–130°C to –150°C</td>
</tr>
<tr>
<td><strong>Effective Capacity</strong></td>
<td>128 liters</td>
<td>265 liters</td>
</tr>
<tr>
<td><strong>Internal Dimensions</strong></td>
<td>2010 x 770 x 1070 mm</td>
<td>1400 x 800 x 945 mm</td>
</tr>
<tr>
<td><strong>External Dimensions</strong></td>
<td>2570 x 770 x 1070 mm</td>
<td>2010 x 770 x 1070 mm</td>
</tr>
<tr>
<td><strong>Net Weight (Approx.)</strong></td>
<td>70 kg</td>
<td>291 kg</td>
</tr>
</tbody>
</table>

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**Small Inner Door Kits**

- **MDF-1156ATNMDF-1156**
- **MDF-594ATMDF-594**
- **MDF-794ATMDF-794**
- **MDF-7ID-PW**
- **MDF-11ID-PW**
- **MDF-5ID-PW**
- **MDF-9ID-PW**

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**Temperature Recorders**

- **MTR-155H-PW**
- **MTR-155H-PW**
- **MTR-85H-PW**
- **MTR-155H-PW**
- **MTR-155H-PW**
- **MTR-155H-PW**

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**Liquid N₂ Backup Kits**

- **MDF-594ATMDF-594**
- **MDF-794ATMDF-794**
- **MDF-1156ATNMDF-1156**

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**Preservation**

- **Cryogenic Freezers**
- **UTL Freezers**
- **Incubation Sterilization**
MDF Biomedical Freezers

Stable -30°C environment with extensive storage possibilities

<table>
<thead>
<tr>
<th>Model No.</th>
<th>MDF-U231M</th>
<th>MDF-U334</th>
<th>MDF-U443</th>
<th>MDF-U5312H</th>
<th>MDF-U5412H</th>
</tr>
</thead>
<tbody>
<tr>
<td>Effective Capacity</td>
<td>274 liters</td>
<td>369 liters</td>
<td>504 liters</td>
<td>479 liters</td>
<td>690 liters</td>
</tr>
<tr>
<td>External Dimensions (W x D x H)</td>
<td>616 x 772 x 1802 mm</td>
<td>616 x 772 x 1802 mm</td>
<td>706 x 787 x 1935 mm</td>
<td>640 x 651 x 1595 mm</td>
<td>856 x 856 x 2102 mm</td>
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<tr>
<td>Baskets</td>
<td>(2 chambers)</td>
<td>658 x 607 x 1272 mm</td>
<td>614 x 709 x 1620 mm</td>
<td>490 x 486 x 1290 mm</td>
<td>610 x 598 x 1620 mm</td>
</tr>
<tr>
<td>Net Weight (Approx.)</td>
<td>793 kg</td>
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</tr>
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</table>

MDF Biomedical ECO Freezers

Cost-saving and environmentally friendly

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<th>MDF-U334</th>
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MDF Biomedical Freezers

Cost-saving and environmentally friendly fresh frozen plasma storage

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MDF Biomedical Freezers

The ideal freezing environment for preservation

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Optional Accessories (for MDF series)

Temperature Recorders

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

Baskets

- No Mounting
- Brackets Required

MTR-4015LH-PA/MTR-4015LH-PE

Recording range:
- 40°C to +60°C

MTR-085A-PA/MTR-085C-PE

Recording range:
- -100°C to +60°C

MDF-Biomedical Freezers

Able to provide a stable -30°C environment

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MDF Biomedical Freezers

Power to counteract frequent door openings

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# MPR/MBR

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
  - Cooling Fan
  - Ice chest
  - Temperature Control
  - Automatic Defrost System

### 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.

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## MPR Pharmaceutical Refrigerators

### 2°C to 14°C

<table>
<thead>
<tr>
<th>Model No.</th>
<th>MPR-514</th>
<th>MPR-514R</th>
<th>MPR-1014</th>
<th>MPR-1014R</th>
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</thead>
<tbody>
<tr>
<td>Temperature Control Range</td>
<td>2°C to 14°C</td>
<td>2°C to 14°C</td>
<td>2°C to 14°C</td>
<td>2°C to 14°C</td>
</tr>
<tr>
<td>Effective Capacity</td>
<td>68 liters</td>
<td>66 liters</td>
<td>1021 liters</td>
<td>1021 liters</td>
</tr>
<tr>
<td>External Dimensions (W x D x H)</td>
<td>190 x 600 x 1950 mm</td>
<td>190 x 600 x 1950 mm</td>
<td>1790 x 600 x 1300 mm</td>
<td>1790 x 600 x 1300 mm</td>
</tr>
<tr>
<td>Internal Dimensions (W x D x H)</td>
<td>800 x 465 x 1300 mm</td>
<td>800 x 465 x 1300 mm</td>
<td>1700 x 465 x 1300 mm</td>
<td>1700 x 465 x 1300 mm</td>
</tr>
<tr>
<td>Net Weight (Approx.)</td>
<td>141 kg</td>
<td>147 kg</td>
<td>246 kg</td>
<td>258 kg</td>
</tr>
<tr>
<td>Wire shelves type</td>
<td>Lenovo type</td>
<td>Lenovo type</td>
<td>Lenovo type</td>
<td>Lenovo type</td>
</tr>
<tr>
<td>Drawer type</td>
<td></td>
<td></td>
<td>Lenovo type</td>
<td>Lenovo type</td>
</tr>
</tbody>
</table>

---

## MPR Pharmaceutical Refrigerators

### 2°C to 23°C

<table>
<thead>
<tr>
<th>Model No.</th>
<th>MPR-722</th>
<th>MPR-722R</th>
<th>MPR-1412</th>
<th>MPR-1412R</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature Control Range</td>
<td>2°C to 23°C</td>
<td>2°C to 23°C</td>
<td>2°C to 23°C</td>
<td>2°C to 23°C</td>
</tr>
<tr>
<td>Effective Capacity</td>
<td>486 liters</td>
<td>486 liters</td>
<td>1334 liters</td>
<td>1334 liters</td>
</tr>
<tr>
<td>External Dimensions (W x D x H)</td>
<td>1900 x 710 x 1500 mm</td>
<td>1900 x 710 x 1500 mm</td>
<td>1790 x 710 x 1500 mm</td>
<td>1790 x 710 x 1500 mm</td>
</tr>
<tr>
<td>Internal Dimensions (W x D x H)</td>
<td>1800 x 600 x 1790 mm</td>
<td>1800 x 600 x 1790 mm</td>
<td>1700 x 600 x 1790 mm</td>
<td>1700 x 600 x 1790 mm</td>
</tr>
<tr>
<td>Net Weight (Approx.)</td>
<td>174 kg</td>
<td>193 kg</td>
<td>216 kg</td>
<td>207 kg</td>
</tr>
<tr>
<td>Wire shelves type</td>
<td>Lenovo type</td>
<td>Lenovo type</td>
<td>Lenovo type</td>
<td>Lenovo type</td>
</tr>
<tr>
<td>Drawer type</td>
<td></td>
<td></td>
<td>Lenovo type</td>
<td>Lenovo type</td>
</tr>
</tbody>
</table>

---

## Inside Temperature of Household Refrigerator

- **Typical Cooling System of Household Refrigerator**
  - Refrigerator
  - Cooling Fan
  - Ice chest
  - Temperature Control
  - Automatic Defrost System

### 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 with Freezer

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

**Temperature Control Range**

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

**Effective Capacity**

- **Freezer:** 176 L
- **Refrigerator:** 39 L

**Net Weight**

- **Freezer:** 129 kg
- **Refrigerator:** 70 kg

**Internal Dimensions**

- **Freezer:** 540 x 557 x 1794 mm
- **Refrigerator:** 420 x 342 x 267 mm

**External Dimensions**

- **Freezer:** 720 x 516 x 913 mm
- **Refrigerator:** 680 x 470 x 415 mm

**Temperature Recorders**

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

**Optional Accessories**

- BRackets Required
- No Mounting
- Recorder Mounting Brackets
- No Mounting
- Brackets

- MTR-0621LH-PA
- MTR-0350LH-PA
- MTR-0350LH-PE
- MTR-4015LH-PA
- MTR-4015LH-PE
- MTR-G3504A-PA
- MTR-G3504C-PA
- MTR-G3504C-PE

- MTR-4015LH-P
- MTR-4015LH-PE
- MTR-G04A-PA
- MTR-G04C-PA
- MTR-G04C-PE
- MTR-G04C-PE

**External mounting power failure alarm**

- MPR-48B1-PW
- MPR-48B2-PW

**Battery box**

- MPR-305GR
- MPR-715GR

**Recording**

- +14°C
- +20°C
- -2°C
- -6°C
- -10°C
- -20°C
- -30°C
- -40°C

**Battery box**

- MPR-N450FH
- MPR-N450FSH

**Dimensions**

<table>
<thead>
<tr>
<th>Model No.</th>
<th>MTR-0621LH-PA</th>
<th>MTR-0350LH-PA</th>
<th>MTR-0350LH-PE</th>
<th>MTR-4015LH-P</th>
<th>MTR-4015LH-PE</th>
<th>MTR-G04A-PA</th>
<th>MTR-G04C-PA</th>
<th>MTR-G04C-PE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>External Dimensions</strong> (W x D x H)</td>
<td>540 x 557 x 1794 mm</td>
<td>420 x 342 x 267 mm</td>
<td>720 x 516 x 913 mm</td>
<td>680 x 470 x 415 mm</td>
<td>770 x 192 x 422 mm</td>
<td>800 x 640 x 1810 mm</td>
<td>900 x 715 x 1910 mm</td>
<td>810 x 615 x 894 mm</td>
</tr>
</tbody>
</table>

**Temperature Control Ranges**

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

**Limited countries and regions**

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

---

### MBR Blood Bank Refrigerators

Robust design for safest storage of whole blood

**Temperature Control Range**

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

**Effective Capacity**

- **Freezer:** 1301 L
- **Refrigerator:** 39 L

**Net Weight**

- **Freezer:** 119 kg
- **Refrigerator:** 75 kg

**Internal Dimensions**

- **Freezer:** 540 x 557 x 1794 mm
- **Refrigerator:** 420 x 342 x 267 mm

**External Dimensions**

- **Freezer:** 720 x 516 x 913 mm
- **Refrigerator:** 680 x 470 x 415 mm

**Temperature Recorders**

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

**Optional Accessories**

- BRackets Required
- No Mounting
- Recorder Mounting Brackets
- No Mounting
- Brackets

- MTR-107DH
- MTR-305GR
- MTR-506GR

**External mounting power failure alarm**

- MPR-48B1-PW
- MPR-48B2-PW

**Battery box**

- MPR-305GR
- MPR-715GR

**Recording**

- +14°C
- +20°C
- -2°C
- -6°C
- -10°C
- -20°C
- -30°C
- -40°C

**Battery box**

- MTR-4015LH-P
- MTR-4015LH-PE
- MTR-G04A-PA
- MTR-G04C-PA
- MTR-G04C-PE

**Dimensions**

<table>
<thead>
<tr>
<th>Model No.</th>
<th>MTR-107DH</th>
<th>MTR-305GR</th>
<th>MTR-506GR</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>External Dimensions</strong> (W x D x H)</td>
<td>1320 x 710 x 1500 mm</td>
<td>1301 x 710 x 1500 mm</td>
<td>1301 x 710 x 1500 mm</td>
</tr>
</tbody>
</table>

**Battery box**

- MPR-N450FH
- MPR-N450FSH

**Dimensions**

<table>
<thead>
<tr>
<th>Model No.</th>
<th>MTR-107DH</th>
<th>MTR-305GR</th>
<th>MTR-506GR</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>External Dimensions</strong> (W x D x H)</td>
<td>1320 x 710 x 1500 mm</td>
<td>1301 x 710 x 1500 mm</td>
<td>1301 x 710 x 1500 mm</td>
</tr>
</tbody>
</table>

---

### Preservation

- Robust design for safest storage of whole blood
- Robust design for safest storage of whole blood

---

### Incubation

- Robust design for safest storage of whole blood
- Robust design for safest storage of whole blood

---

### Sterilization
## MCO CO₂ Incubators

### Optimising cell culture outcomes and reproducibility

**Ambient temp. +5°C to 50°C**

**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.

### Integrated Tray Catches

- **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 than when using conventional models.
- The high-speed decontamination system using H₂O₂ that is also used for in regenerative 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.

### Integrated Tray Structures

- **Tray has increased by approximately 25%**
- **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** than when using conventional models.
- The high-speed decontamination system using H₂O₂ that is also used for in regenerative 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.

### Model Specifications

<table>
<thead>
<tr>
<th>Model No.</th>
<th>MCO-170AIC/MCO-170ACL</th>
<th>MCO-170AICUVH/MCO-170ACL</th>
<th>MCO-170AICUVH/MCO-170ACL</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ambient Temperature</strong></td>
<td>+5°C to 50°C (AT 5°C to 35°C)</td>
<td>+5°C to 50°C (AT 5°C to 35°C)</td>
<td>+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>
<td>0% to 20%</td>
<td>0% to 20%</td>
</tr>
<tr>
<td><strong>Chamber Humidity</strong></td>
<td>95 ±5% R.H.</td>
<td>95 ±5% R.H.</td>
<td>95 ±5% R.H.</td>
</tr>
<tr>
<td><strong>Interior Volume</strong></td>
<td>49 litres</td>
<td>49 litres</td>
<td>49 litres</td>
</tr>
<tr>
<td><strong>External Dimensions</strong></td>
<td>620 x 730 x 905 mm</td>
<td>620 x 730 x 905 mm</td>
<td>620 x 730 x 905 mm</td>
</tr>
<tr>
<td><strong>Net Weight (Approx.)</strong></td>
<td>79 kg (AICD), 80 kg (AICUVD)</td>
<td>79 kg (AICD), 80 kg (AICUVD)</td>
<td>79 kg (AICD), 80 kg (AICUVD)</td>
</tr>
</tbody>
</table>

### Comparison to Current Products

**Compared to current products, the required cleaning time and task are approximately 1/5**

---

*Standard for Model No. Including UV
*2 Standard for Model No. Including UVH

---

* External dimensions of each cabinet. — See dimension drawings of unit showing handles and other external projections.

---

**In 2 hours and half (approx.)**

**H₂O₂ Decontamination**

The high-speed decontamination system using H₂O₂ that is also used for in regenerative 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.

**Solving issues in dry heat sterilisation**

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.

---

*Compared to MCO-19AIC
**PHCbi measurement. Decontamination time differs depending on time required for cabinet cleaning and interior parts installation.

---

**11 hrs**

**180°C**
MCO Multi-Gas Incubators

Ambient temp. +5°C to 50°C

Optional Accessories

Stacking Kits

MCO-170F5-PW
Upper unit: MCO-170AC series/MCO-170ACD series/MCO-170ML
Lower unit: MCO-170AC series/MCO-170ACD series/MCO-170ML

MCO-170SB-PW
Upper unit: MCO-170AC series/MCO-170ACD series/MCO-170ML
Lower unit: MCO-19AC series/MCO-19ACD series

MCO-230SB-PW
Upper unit: MCO-170AC series/MCO-170ACD series/MCO-170ML
Lower unit: MCO-230AC series/MCO-230ACD series

MCO-230RT-PW
Upper unit: MCO-230AC series/MCO-230ACD series
Lower unit: MCO-230AC series/MCO-230ACD series

Roller Bases

MCO-230RB-PW
[for MCO-230AC series]

MCO-170RB-PW
[for MCO-170AC series/MCO-170ACD series/MCO-170ML]

MCO-SRB-PW
[for MCO-5AC series/MCO-5M series]

MCO-80RB5-PW
[for MCO-80IC]

Other Options (for MCO series)

CO₂ gas tank switcher
MCO-210C-PW
[for MCO-170AC series/MCO-170ACD series/MCO-170ML]

MCO-56C-PW
[for MCO-170AC series/MCO-170ML]

MCO-800C-PW
[for MCO-80IC]

Gas regulator
MCO-500R-PW
[except for MCO-80IC]

MCO-500SR-PW
[except for MCO-80IC]

STD gas auto calibration kit

MCO-230ST-PW
[for MCO-230AC series/MCO-230ACD series/MCO-230ACML]

MCO-230ST-PW
[for MCO-230AC series/MCO-230ACD series/MCO-230ACML]

Tray (same as standard accessory)

MCO-170ST-PW
[for MCO-170AC series/MCO-170ACD series/MCO-170ML]

MCO-230ST-PW
[for MCO-230AC series/MCO-230ACD series/MCO-230ACML]

Half tray

MCO-25ST-PW
[for MCO-5AC series/MCO-5M series]

MCO-35ST-PW
[for MCO-230AC series/MCO-230ACD series/MCO-230ACML]

UV system set

MCO-170UVS-PE*2/PA*3
[for MCO-170AIC series/MCO-170AC series/MCO-170AICD series]

MCO-230UVS-PE*2/PA*3
[for MCO-170AC series/MCO-170ACD series/MCO-170ML]

MCO-230RT-PW
[for MCO-230AC series/MCO-230ACD series/MCO-230ACML]

MCO-230RT-PW
[for MCO-230AC series/MCO-230ACD series/MCO-230ACML]

MCO-230RT-PW
[for MCO-230AC series/MCO-230ACD series/MCO-230ACML]

H₂O₂ decon board

MCO-170HB-PW*2/PA*3
[for MCO-170AC series/MCO-170ACD series/MCO-170ML]

MCO-170ID-PW
[for MCO series]

H₂O₂ generator

MCO-170EL-PW
[for MCO series]

Electric Lock

MCO-170IC-PW
[for MCO series]

Small door

MCO-170OS-PW
[for MCO-80IC]

Auto water supply system

MCO-170IC-PW
[for MCO series]

Interface board*4

MCO-170IC-PW
[for MCO series]

MTR-L03-PW or MTR-480-PW

MTR-L03-PW or MTR-480-PW

MCO-170ID-PW
[for MCO series]

MCO-170OS-PW
[for MCO-80IC]

Interface board (4-20 mA Transmitter)

MCO-170IC-PW
[for MCO series]

MCO-170OS-PW
[for MCO-80IC]

MTR-L03-PW or MTR-480-PW

MCO-170ID-PW
[for MCO series]

MCO-170OS-PW
[for MCO-80IC]

Interface board (4-20 mA Transmitter)

MCO-170IC-PW
[for MCO series]

MCO-170OS-PW
[for MCO-80IC]

Interface board (4-20 mA Transmitter)

MCO-170IC-PW
[for MCO series]

MCO-170OS-PW
[for MCO-80IC]

Interface board (4-20 mA Transmitter)

MCO-170IC-PW
[for MCO series]

MCO-170OS-PW
[for MCO-80IC]

Interface board (4-20 mA Transmitter)

MCO-170IC-PW
[for MCO series]

MCO-170OS-PW
[for MCO-80IC]

Interface board (4-20 mA Transmitter)

MCO-170IC-PW
[for MCO series]

MCO-170OS-PW
[for MCO-80IC]

Interface board (4-20 mA Transmitter)

MCO-170IC-PW
[for MCO series]

MCO-170OS-PW
[for MCO-80IC]

Interface board (4-20 mA Transmitter)

MCO-170IC-PW
[for MCO series]

MCO-170OS-PW
[for MCO-80IC]

Interface board (4-20 mA Transmitter)

MCO-170IC-PW
[for MCO series]

MCO-170OS-PW
[for MCO-80IC]

Interface board (4-20 mA Transmitter)

MCO-170IC-PW
[for MCO series]

MCO-170OS-PW
[for MCO-80IC]

Interface board (4-20 mA Transmitter)

MCO-170IC-PW
[for MCO series]

MCO-170OS-PW
[for MCO-80IC]
**Incubation**

**MIR Cooled Incubators**

*All-round performance*

**-10°C to 60°C**

(Model No.)

- MIR-154
- MIR-554
- MIR-254

**Ambient temp. +5°C to 60°C**
- MIR-154

**Ambient temp. +5°C to 80°C**
- MIR-554

**MLR Climate Chambers**

*Versatile Climate Chambers*

**-10°C to 60°C**

(Model No.)

- MIR-H163
- MIR-H263

**-45°C to 135°C**

(Model No.)

- MLS-3751L
- MLS-3781L

**MLR-352**

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

*suited for raising plants*

**Sterilization**

**MLS Portable Laboratory Autoclaves**

*Convenient sterilisation on demand offers great flexibility*

**45°C to 135°C**

(Model No.)

- MLS-3751L
- MLS-3781L

**MLR-352**

**Humidity control function**

*suited for raising plants*

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Temperature Control Range</th>
<th>Capacity (L)</th>
<th>External Dimensions (W x D x H)</th>
<th>Internal Dimensions (W x D x H)</th>
<th>Net Weight (Approx.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>MIR-154</td>
<td>-10°C to 60°C</td>
<td>93 L</td>
<td>700 x 580 x 1018 mm</td>
<td>628 x 368 x 555 mm</td>
<td>79 kg</td>
</tr>
<tr>
<td>MIR-554</td>
<td>-5°C to 60°C</td>
<td>75 L</td>
<td>700 x 580 x 1018 mm</td>
<td>628 x 368 x 555 mm</td>
<td>79 kg</td>
</tr>
<tr>
<td>MIR-254</td>
<td>-10°C to 60°C</td>
<td>153 L</td>
<td>730 x 645 x 870 mm</td>
<td>718 x 595 x 1025 mm</td>
<td>87 kg</td>
</tr>
<tr>
<td>MIR-H163</td>
<td>-10°C to 60°C</td>
<td>93 L</td>
<td>700 x 580 x 1018 mm</td>
<td>628 x 368 x 555 mm</td>
<td>79 kg</td>
</tr>
<tr>
<td>MIR-H263</td>
<td>-10°C to 60°C</td>
<td>153 L</td>
<td>730 x 645 x 870 mm</td>
<td>718 x 595 x 1025 mm</td>
<td>87 kg</td>
</tr>
<tr>
<td>MIR-H554</td>
<td>-10°C to 60°C</td>
<td>294 L</td>
<td>760 x 700 x 1835 mm</td>
<td>520 x 490 x 1135 mm</td>
<td>226 kg</td>
</tr>
<tr>
<td>MLS-3751L</td>
<td>45°C to 135°C</td>
<td>50 L</td>
<td>470 x 410 x 764 mm</td>
<td>470 x 410 x 764 mm</td>
<td>61 kg</td>
</tr>
<tr>
<td>MLS-3781L</td>
<td>45°C to 135°C</td>
<td>75 L</td>
<td>470 x 410 x 764 mm</td>
<td>470 x 410 x 764 mm</td>
<td>71 kg</td>
</tr>
</tbody>
</table>

*Model No. MLS-3751L/MLS-3781L are for laboratory use.*

---

**Incubation**

**MIR Heated Incubators**

*Intuitive and easy operable Heated Incubators*

**-10°C to 60°C**

(Model No.)

- MIR-154
- MIR-254
- MIR-554

**Ambient temp. +5°C to 60°C**
- MIR-154

**Ambient temp. +5°C to 80°C**
- MIR-554

**-40°C to 60°C**

(Model No.)

- MIR-254
- MIR-554

**-40°C to 80°C**

(Model No.)

- MIR-254
- MIR-554

**-40°C to 100°C**

(Model No.)

- MIR-254
- MIR-554

**-40°C to 125°C**

(Model No.)

- MIR-254
- MIR-554

**-40°C to 150°C**

(Model No.)

- MIR-254
- MIR-554

**MLS Portable Laboratory Autoclaves**

*Convenient sterilisation on demand offers great flexibility*

**45°C to 135°C**

(Model No.)

- MLS-3751L
- MLS-3781L

**MLR-352**

**Humidity control function**

*suited for raising plants*

**Sterilization**

**MLS Portable Laboratory Autoclaves**

*Convenient sterilisation on demand offers great flexibility*

**45°C to 135°C**

(Model No.)

- MLS-3751L
- MLS-3781L

**MLR-352**

**Humidity control function**

*suited for raising plants*