The patented TwinGuard® series delivers an unsurpassed level of temperature performance and sample protection, critical in the preservation of biological samples.
**TwinGuard® -86°C ULTRA-LOW TEMPERATURE FREEZERS**

**TwinGuard® Upright Freezers**
- MDF-U700VXC-PA
  - 25.7 cu.ft. [728 L] Freezer
  - Capacity (qty) = 576 2"Boxes
- MDF-U500VXC-PA
  - 18.3 cu.ft. [519 L] Freezer
  - Capacity (qty) = 352 2"Boxes

**TwinGuard® Chest Freezer**
- MDF-DC700VXC-PA
  - 25.3 cu.ft. [715 L] Freezer
  - Capacity (qty) = 520 2"boxes
The Dual Cool primary freezer circuit operates at -86°C while the back-up circuit maintains an operating temperature of minimum -65°C in the case of a service event.

Reliable -86°C Ultra-low Temperature Freezers for Long-Term Storage of Critical Samples

The Panasonic patented TwinGuard® series satisfies the industry demand for safe, long-term storage of sensitive, high-value samples. Two independent refrigeration systems, combined with optional liquid CO₂ back-up systems, offer a layer of protection unmatched in the marketplace.

Scientific Applications

- Temperature-sensitive samples such as therapeutics and biospecimens.
- Samples that need to retain viability such as stem cells, engineered tissue, organs, vaccines, hybromas, cancer cells or fibroblasts.
- Longitudinal study samples.
- Important medical research samples.
- Valuable pharmaceutical products.
- Clinical trial samples.
- Pathogenic samples within high security laboratories.
The Dual Cooling System offers the highest level of sample protection through the use of two independent refrigeration systems. The patented VIP® insulation panel ensures superior temperature uniformity for sample integrity and viability.

Freezers are managed and monitored by an integrated microprocessor controller with a comprehensive alarm system and diagnostic functions. Status and control of parameters are accessible via an LCD information center. Both upright and chest models are available with LCD touch panel that allows full user control, even with gloved hands, and a USB port for convenient transfer of logged data to a PC.

This energy transfer technology maintains optimum condenser airflow, eliminating the need for an air filter.

Panasonic TwinGuard® ULT series offers rapid pulldown (the time needed for your freezer to return to set point after door openings). See back page for pulldown information.

Panasonic’s space-saving VIP® PLUS insulation offers outstanding energy efficiency, while delivering exceptional cooling performance and durability for storage of valuable research and clinical samples.

- Advanced cabinet insulation technology for increased energy efficiency and cooling performance.
- Components are compliant with the RoHS directive on the use of hazardous substances in electrical and electronic equipment.
Patented TwinGuard® Series Technology

The Dual Cooling System offers the highest level of security through the use of two independent refrigeration systems. If one system has an unexpected service request the other will maintain the freezer at a minimum of -65°C.

Innovative Design

Panasonic was the first manufacturer in the life science industry to introduce vacuum insulation panels (VIP®) for ultra-low temperature freezers. The Panasonic patented VIP® Plus insulation typically provides 30% more storage capacity for a given floor area, saving valuable laboratory space. This thin-wall composite is a high-efficiency design that yields more interior storage volume than can be found in a conventional freezer footprint.

Which freezer would you choose?

- A: Conventional Freezer
- B: Panasonic MDF-U500VXC With VIP® Insulation

- 240 ca. 2" boxes
- 352 ca. 2" boxes

TEMPERATURE UNIFORMITY

Uneven internal temperatures can lead to a loss in sample integrity. Panasonic freezers with uniform, stable temperatures and quick recovery times provide the best protection for your samples, ensuring reliable preservation while guarding against degradation.
SAMPLE PROTECTION
Models: MDF-U500VXC-PA | MDF-U700VXC-PA | MDF-DC700VXC-PA

RELIABLE -86°C ULTRA-LOW TEMPERATURE FREEZERS FOR LONG-TERM STORAGE OF CRITICAL BIOLOGICALS

The Panasonic TwinGuard® series was developed to offer ultimate protection for valuable samples such as those in the pharmaceutical and biotechnology sectors, research institutes, blood and tissue banks or clinical applications.

TwinGuard® Upright -86°C Freezers
Performance Data TwinGuard® Freezers in Case of Compressor Failure

TwinGuard® Chest -86°C Freezers
Dual Cooling System in the TwinGuard® Chest Freezers

Patented TwinGuard® Technology

- Each refrigeration circuit includes a closed-loop cold-wall evaporator configured in parallel to the other.
- If a component, such as a compressor, fails in a conventional ULT freezer with single or cascade refrigeration circuits with mutually dependent high and low stage systems, the whole system will fail and the freezer will eventually rise to room temperature, putting samples at serious risk of degradation.
- Independent compressors, evaporators and cooling fans in TwinGuard freezers ensure back-up status at all times, eliminating system failure due to failure of a compressor.
- A unique ECO mode deploys both systems in overlapping cycles to maintain -86°C and to reduce energy consumption.
- Evaporator coils embedded in the patented, high-tech, Panasonic VIP® PLUS vacuum-insulated thin-wall cabinet are strategically oriented to provide temperature uniformity throughout the freezer at all times, even if only one system is active.
- Panasonic-designed Dual Cool compressors feature innovative refrigerant feedback processes to reduce compressor temperature, thereby extending compressor life and minimizing heat output.
INDUSTRY FIRST INTELLIGENT ECO MODE OPERATION

The Panasonic TwinGuard® series freezers can be set to NORMAL or ECO mode operation, depending on the requirements of the user. Although both refrigeration systems are completely independent, ECO mode establishes an overlapping cycle to significantly reduce energy consumption while maintaining optimal interior uniformity for protection of high-value materials. NORMAL mode maintains the most repeatable, cycling wave form for the strictest of GMP applications.

<table>
<thead>
<tr>
<th>Status</th>
<th>System A and B ON</th>
<th>System A and B ON, Cycling On/Off</th>
<th>System A and B ON, Cycling On/Off</th>
<th>System A ON</th>
<th>System B ON</th>
</tr>
</thead>
<tbody>
<tr>
<td>Function</td>
<td>Maximum Pull-Down and Recovery Performance</td>
<td>ECO mode</td>
<td>Normal Mode</td>
<td>Back-Up for System B</td>
<td>Back-Up for System A</td>
</tr>
<tr>
<td>Performance</td>
<td>Establishes highly uniform -86°C storage temperature; maximizes recovery following door or lid openings and heat load additions in ECO and Normal Mode.</td>
<td>Maintains better energy management at high or low ambient temperatures as well as excellent top-to-bottom uniformity.</td>
<td>Maintains excellent top-to-bottom uniformity. Maintains most repeatable, cycling wave form for the strictest of GMP applications.</td>
<td>Maintains minimum -65°C reserve temperature.</td>
<td>Maintains minimum -65°C reserve temperature.</td>
</tr>
</tbody>
</table>
**CABINET CONSTRUCTION**

**Models:** MDF-U500VXC-PA | MDF-U700VXC-PA

<table>
<thead>
<tr>
<th>What it is</th>
<th>What It Does</th>
<th>Why It Is Important</th>
</tr>
</thead>
<tbody>
<tr>
<td>-86°C <strong>TwinGuard®</strong> Technology</td>
<td>Two independent refrigeration systems operate together or individually, depending on loading and operating conditions.</td>
<td>One refrigeration system is available to back-up the other in the case of a service event maintaining the freezer at a minimum of -65°C.</td>
</tr>
<tr>
<td>ECO mode performance</td>
<td>Two independent refrigeration systems running in overlapping cycles.</td>
<td>ECO mode optimizes run time, minimizes energy costs while maintaining optimal performance.</td>
</tr>
<tr>
<td>Filterless condenser design</td>
<td>Transfers energy from the refrigeration system with minimal heat output.</td>
<td>Eliminates the need for an air filter and the associated maintenance and cleaning, optimizes heat exchange and minimizes compressor heat build-up over time.</td>
</tr>
<tr>
<td>Patented VIP® Plus vacuum insulation panels</td>
<td>Combines high-efficiency vacuum panels with conventional polyurethane structural foam and barrier film into a high-tech wall assembly.</td>
<td>Increases interior volume within conventional dimensions offering more storage capacity per sq.ft. of occupied floor space.</td>
</tr>
<tr>
<td>Integrated graphical LCD control center</td>
<td>Combines all control, alarm, monitoring and data management functions into a single door-mounted system controller.</td>
<td>High visibility LCD display provides a convenient user interface to setpoints, current and previous temperature status, alarm parameters, internal diagnostics, communications and security.</td>
</tr>
<tr>
<td>Enhanced cabinet construction</td>
<td>Robust cabinet design with high strength lockable doors. Optimized storage using inventory management systems.</td>
<td>Simplifies installation and operation. Exceptional durability under demanding conditions in busy laboratories.</td>
</tr>
<tr>
<td>Compliant to international standards</td>
<td>Assures quality standards, safety and performance criteria are met or exceeded.</td>
<td>Essential for compliance with ISO9001 and 4001, RoHS and other third-party standards and recommended practices.</td>
</tr>
</tbody>
</table>

Various alarms including high/low temperatures, door ajar, power failure alarm and part replacement notification keep samples safe even in an emergency.
MICROPROCESSOR CONTROL WITH TOUCH SCREEN DISPLAY

The TwinGuard® series is managed by an integrated microprocessor controller with LCD information center to simplify all freezer functions. Uniform ultra-low temperature is achieved through a combination of performance systems supervised by the controller complete with alarm, programming and diagnostic protocols.

The TwinGuard® upright and chest freezers feature a touchscreen display and a USB port which allows logged data to be easily transferred to a PC.

MEETING YOUR FREEZER STORAGE NEEDS

An organized freezer will provide you with:
• Time savings - locate, retrieve and replace your samples easily and quickly.
• Cost savings - organized samples and cell lines can help to reduce the number of freezers.
• Added sample security and energy savings - samples are better protected and are less exposed to ambient temperatures as door opening times can be reduced when placing and retrieving samples, which also reduces energy use.

Panasonic’s racks are made of stainless steel. These racks are very light, yet sturdy and corrosion free. Meeting your freezer storage needs
• High quality racks – designed for safe working and easy access to samples.
• Affordable solutions – making freezer storage cost-effective as well as space-efficient.
• Large selection of products – additional rack types and boxes are available on request.

For an overview of the racks designed for the TwinGuard® series see backpage.
## SPECIFICATIONS

<table>
<thead>
<tr>
<th>Model Number</th>
<th>Twistline® Upright Freezers</th>
<th>Twistline® Chest Freezers</th>
</tr>
</thead>
<tbody>
<tr>
<td>MDF-U500VIC-PA</td>
<td>mdf-u510VIC-PA</td>
<td>mdf-DCT070VIC-PA</td>
</tr>
</tbody>
</table>

### Temperature

- Externally Dimensions (WxHxD) inches | mm
  - 40.3 x 34.6 x 18.4 | 1020 x 879 x 468
- Internally Dimensions (WxHxD) inches | mm
  - 36.2 x 29.5 x 15.7 | 925 x 750 x 400
- Volume cu ft | liters
  - 26.7 | 757
- Weight lbs | kg
  - 723 | 328

### Performance

- Capacity 2 Boxes/3 Boxes
  - 352 | 224
  - 576 | 352

### Refrigeration

- Compressor
  - Pt-100 Platinum RTD
- Refrigerant
  - R252
- Controller
  - Microprocessor non-volatile memory

### Optional Features

- Chart Paper
- Optional Temperature Recorders
- Small Inner Door Kit
- Liquid CO2 back-up
- Chart Paper
- Stand Alone Recorder
- Optional Communication Systems

### Rack Configurations

<table>
<thead>
<tr>
<th>Stainless steel rack</th>
<th>Box type / quantity</th>
<th>Total boxes</th>
</tr>
</thead>
<tbody>
<tr>
<td>MDF-U500VIC-PA</td>
<td>with trays</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>with trays</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>with trays</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>with trays</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>with trays</td>
<td>1</td>
</tr>
</tbody>
</table>

### Performance Data

<table>
<thead>
<tr>
<th>Time (hour)</th>
<th>Temperature (˚C)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>-86</td>
</tr>
</tbody>
</table>

### Rack Configuration

![Upright Freezer Rack Diagram](image1)

### Dimensions

- Internal Dimensions (WxDxH)
  - 30.3 x 34.3 x 78.3
- Net Weight lbs | kg
  - 723 | 328
- Capacity 2 Boxes/3 Boxes
  - 352 | 224
- Total boxes
  - 576 | 352

### Accessory Dimensions

- Guards
  - Upright Freezers
  - Side opening: 40 x SCR-093-N, 24 x SUR-434-N, 24 x SDR-434-N, 24 x SCR-093-N
  - Stainless Steel Rack
  - 1.9
- Control
  - Microprocessor non-volatile memory

### Notes

1. Exterior dimensions of main cabinet only, excluding handle and other external projections
2. Air temperature measured at freezer centre, ambient temperature +30°C, no load
3. Nominal value: Background noise 20dB
4. Installation of small inner door kit may affect usable storage capacity.