Providing a complete storage solution — refrigerator and freezer in one unit. The MPR-N450FH/MPR-N450FSH combine high-performance refrigeration with a -30°C freezing environment within a small footprint for flexible, reliable and convenient sample storage. Natural refrigerants minimise environmental impact for a sustainable storage solution.

**Natural Refrigerants and Inverter Technology**

Naturally occurring hydrocarbon (HC) refrigerants have minimal effect on the environment and are compliant with environmental legislation for climate control. Combined with inverter technology, these refrigerants also provide more efficient cooling without compromising performance and ambient tolerance and recovery speeds following door openings.

**Superior Uniformity**

The refrigerator provides superior uniformity throughout. Temperatures remain stable wherever products are stored, even in a fully loaded chamber. The refrigerator is engineered to prevent inadvertent freezing of temperature sensitive vaccines.

**Security Control and Monitoring**

The microprocessor controller and OLED display are door mounted at eye level. Control buttons allow convenient but secure user control. Refrigerator and freezer temperatures can be displayed in 0.1°C increments simultaneously or individually. Minimum/maximum temperatures are automatically displayed every 12/24 hours. All alarm conditions are displayed and recorded. Data transfer is through a USB port.

**Energy-efficient performance**

Natural refrigerants, compressors and integrated electronics combine to achieve facility sustainability objectives by minimising any environmental impact without compromising cooling performance, ambient tolerance and recovery speeds following door openings.

**Temperature Distribution**

The refrigerator includes a high performance refrigeration system with a forced air, back wall plenum. This provides even, horizontal airflow across the solid, adjustable glass shelves at each shelf level. A uniform freezer temperature is maintained through a cold wall refrigeration system with natural circulation.

**Safe & Secure storage**

Adjustable audible and visual alarms are standard, along with integrated system diagnostics and predictive performance supervision. The password-protected control panel provides security and minimises risk of accidental changes.
Pharmaceutical Refrigerators with Freezer

With the new platform, the volume of the freezer (-30°C) has increased to 136 L, which is about 60%* larger than the conventional model. By implementing a new platform with improved duct and mechanical layout, storage efficiency increased by 10% per area of storage.

* comparison with MPR-414F.

Ease of Use

Removable glass shelves inside the refrigerator compartment enable easy cleaning. Clear visibility inside the refrigerator compartment is provided by an LED light. Optional containers for the freezer compartment are available for flexible storage solutions.

Defrost Methods

The MPR-N450FH/MPR-N450FSH include manual defrost for the freezer compartment. The refrigerator compartment includes automatic defrost which activates electronically when needed. The refrigerator evaporator operates above freezing at all times. This prevents vaccines and lab supplies from freezing.

Performance Data

AT30°C Pull-down & Pull-up Temperature (No load)

<table>
<thead>
<tr>
<th>Refrigerator side</th>
<th>Freezer side</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internal temperature (°C)</td>
<td>Internal temperature (°C)</td>
</tr>
<tr>
<td>20</td>
<td>-30</td>
</tr>
<tr>
<td>10</td>
<td>-40</td>
</tr>
<tr>
<td>0</td>
<td>-50</td>
</tr>
<tr>
<td>10</td>
<td>-60</td>
</tr>
<tr>
<td>20</td>
<td>-70</td>
</tr>
</tbody>
</table>

Options

- Temperature recorders
- Temperature chart recorders
- Chart paper
- Recorder housing
- Continuous strip type chart recorder
- Chart paper
- Recorder housing
- Battery kit for power failure alarm
- Containers inside freezer
- Blackout panel

Optional Communication Systems

- Digital interface (RS232C/RS485) [1]
- Ethernet interface (LAN) [2]

Electrical and Noise Level

<table>
<thead>
<tr>
<th>Power supply</th>
<th>Noise level</th>
<th>(dB [A])</th>
</tr>
</thead>
<tbody>
<tr>
<td>V: 115V, 60Hz / PE: 220/230/240 V, 50Hz</td>
<td>61</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Power failure</th>
<th>High temperature</th>
<th>Low temperature</th>
<th>Door open</th>
</tr>
</thead>
<tbody>
<tr>
<td>R</td>
<td>V-B-M-R</td>
<td>V-B-M</td>
<td>V-B-M</td>
</tr>
</tbody>
</table>

Alarms

(V = Visual Alarm, B = Buzzer Alarm, R = Remote Alarm, M = Message)

- Power failure
- High temperature
- Low temperature
- Door open

Dimensions

<table>
<thead>
<tr>
<th>Refrigerator side</th>
<th>Freezer side</th>
</tr>
</thead>
<tbody>
<tr>
<td>W x D x H mm</td>
<td>W x D x H mm</td>
</tr>
<tr>
<td>800 x 640 x 1810</td>
<td>136</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Model Number</th>
<th>MPR-N450FH-PE / MPR-N450FSSH-PE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimensions</td>
<td>Refrigerator</td>
</tr>
<tr>
<td>External dimensions [W x D x H] mm</td>
<td>800 x 640 x 1810</td>
</tr>
<tr>
<td>Internal dimensions [W x D x H] mm</td>
<td>720 x 516 x 913</td>
</tr>
<tr>
<td>Volume liters</td>
<td>136</td>
</tr>
<tr>
<td>Net weight kg</td>
<td>415</td>
</tr>
</tbody>
</table>

Performance

<table>
<thead>
<tr>
<th>Performance</th>
<th>Temperature control range</th>
<th>2 to 14</th>
<th>-29 to -30</th>
</tr>
</thead>
</table>

Controller

- Controller: Microprocessor with non-volatile memory
- Display: Digital [White graphic OLED], 1°C [increment of 0.1]

Temperature sensor

- Thermistor

Refrigeration

- Cooling method: Fan forced air circulation
- Defrost method: Cyclical defrost
- Manual

Refrigerant

- HC refrigerant

Insulation

- PUF

Construction

- Exterior material: Painted Steel
- Interior material: ABS Resin, Painted Steel
- Outer doors: qty. 4 [glass window [2FH/2FSH]]
- Outer door lock: Y
- Shelves: qty. Tempered glass (3) Coated steel wares (2)
- Max. load - per shelf kg 25
- Access port qty. R (2), F (1)
- Access port position: Back
- Access port diameter Ø mm 30
- Casters: qty. 4
- Interior light: LED

Alarms

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Notes:

1) Exterior dimensions of main cabinet only, excluding external projections. See dimensions drawings on website for full details.
2) Air temperature measured at refrigeration compartment centre and freezer compartment centre, ambient temperature +30°C, no load.
3) Remote alarm includes optional power failure alarm MPR-48B2-PW (B-R alarm).
4) Nominal value - Background noise 20dB (A)
5) When installing temperature recorder MTR-G3504A, optional mounting hardware is necessary.
6) Only for MTR-5000 (data acquisition system) users.

Caution: PHC Corporation guarantees this product under certain warranty conditions. However, please note that PHC Corporation shall not be responsible for any loss or damage to the contents stored in the product.

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