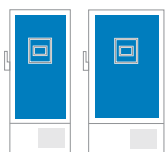




-86°C ULTRA-LOW TEMPERATURE FREEZERS

PHCbi's FrostLess ultra-low temperature freezers are designed for long-term storage and preservation of high value biologicals and critical materials while reducing maintenance requirements.



FrostLess

Models:

MDF-DU700ZHA-PA | MDF-DU700ZH-PA

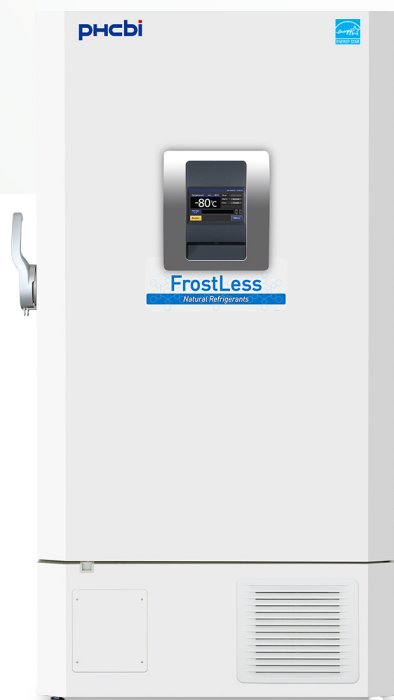
MDF-DU500ZHA-PA

Frost buildup isn't just an inconvenience—it can cause damage to your freezer, interrupt your workflow, and compromise valuable samples.

FrostLess

Harnessing more than fifty years of innovation.

Since 1966, PHC Corporation has introduced next generation cold storage solutions with documented success, each better than the last and each created and tested for reliability and performance. Our manufacturing engineering group invests in the latest industrial design techniques to ensure continuous improvement. We consult with our customers and we listen. As we continue this journey at your side, the PHCbi brand promise will remain the industry standard for performance, reliability, and energy efficiency — without compromise.



25.6 cu.ft. (725 L)
MDF-DU700ZHA-PA
MDF-DU700ZH-PA

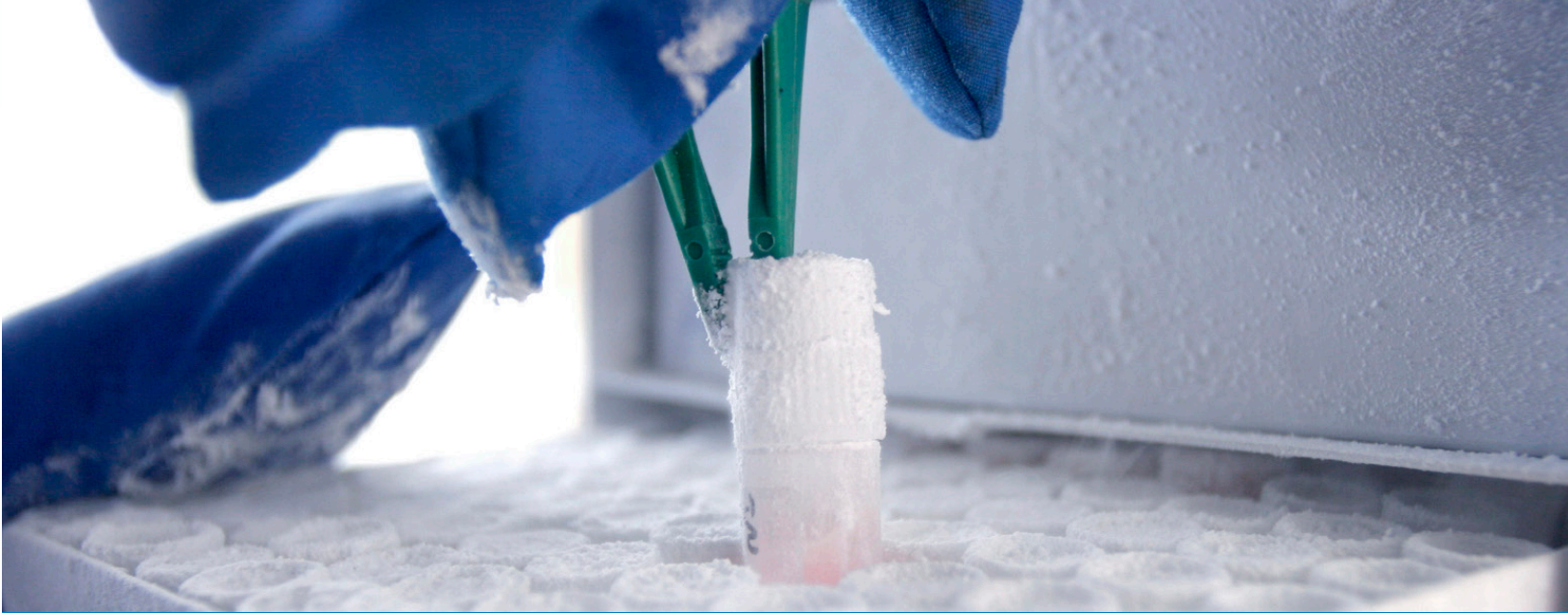


18.5 cu.ft. (525 L)
MDF-DU500ZHA-PA

Designed with Purpose.

Frost buildup isn't just an inconvenience—it can cause damage to your freezer, interrupt your workflow, and compromise valuable samples. The all-new thermal insulation design of the FrostLess prevents large amounts of frost buildup from accumulating outside the inner doors, minimizing stress on the outer door and latching mechanism. Using the residual heat from the refrigeration system, the perimeter heater under the gasket allows for gentle warmth, further reducing ice buildup on the door gasket.

These technological advances help reduce manual labor spent during freezer defrosting, improves lab workflow, and ensures freezer performance. This means less maintenance, greater peace of mind, and more time to focus on what matters most—your research.



Performance, Reliability and Energy Management

3

The FrostLess is designed to mitigate frost buildup more than our category-leading models while maintaining the reliability and energy efficiency that today's laboratories require.

PERFORMANCE

Superior performance cannot be compromised for any reason. We measure performance based on temperature stability in the steady state, quick pull-down on initial startup, fast recovery following a routine door opening, and slow warm-up during a power outage.

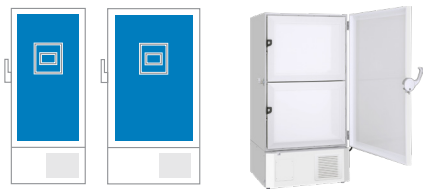
RELIABILITY

While performance is the first test of our product, long-term reliability is essential for protection of your research, peace of mind in your workflow and return on your investment.

ENERGY MANAGEMENT

The use of energy efficient, natural refrigerants in the FrostLess combined with an inverter-controlled compressor, helps reduce operational costs, environmental impact, and total cost of ownership. The MDF-DU700ZHA-PA FrostLess ULT has a daily energy usage of 7.9 kWh (steady state at -80°C in a 23°C ambient), a reduction of approximately 32% compared to conventional models.ⁱ





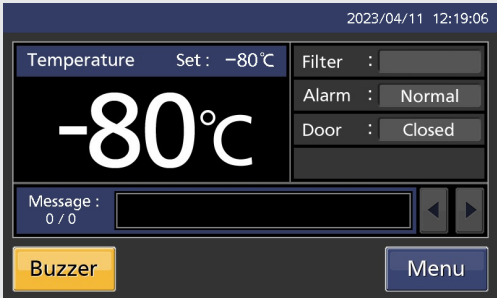
Selection

FrostLess ultra-low temperature freezers are available in two cabinet size variations, each designed to reduce routine maintenance requirements to assist in streamlining your workflow. A variety of options for the freezers include inventory management accessories including racks and cloud based alarm/monitoring systems that use the latest in secure wireless technology.

FrostLess freezers are designed to be compatible with inventory racks from other PHCbi freezers and those of many competitive manufacturers, permitting a quick transfer of stored product for replacement installations.

CONTROL, MONITORING AND SECURITY

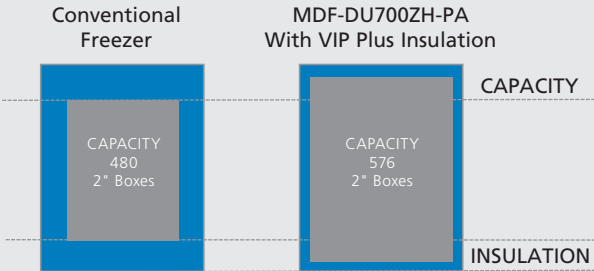
An eye-level, door-mounted color LCD touchscreen allows full user control while the USB port makes transferring logged data to a PC convenient. All performance attributes are displayed, and an internal temperature log is expressed in graphic form over time. Optional cloud services for remote monitoring are available.



VIP® PLUS INSULATION

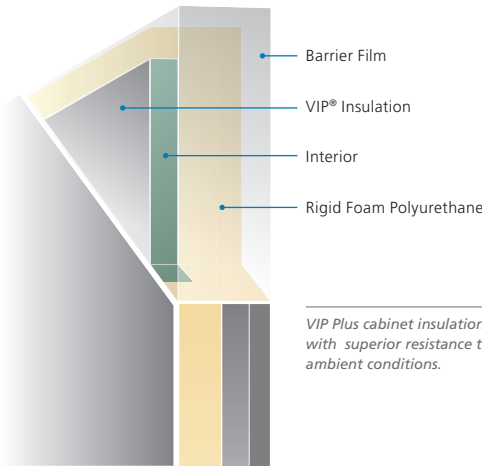


The FrostLess features VIP Plus vacuum insulation on the inner doors for improved insulation performance and reduced frost buildup. Additionally, the shape and materials of the inner door frame design have been revamped to further improve heat insulation performance, greatly suppressing the formation of frost, including frost formation around the gasket.



Integrated Access and Frost Mitigation

Opening the door of any ultra-low temperature freezer is not an insignificant event. Because extreme inside/outside temperature differentials often exceed 100°C (212°F), careful planning is encouraged before accessing the interior.



VIP Plus cabinet insulation offers a thin-profile with superior resistance to heat loss in higher ambient conditions.

DESIGN AND CONSTRUCTION

Frost Control, Upright Cabinets

- VIP Insulated inner doors with gaskets minimize cold air loss during door openings and include positive latches to hold firmly against all compartments.
- Multi-point door gaskets create micro air breaks around the face of the cabinet, restricting moisture migration into the cabinet and minimizing frost. Gasket composition withstands extreme relative temperature differentials ensuring a full peripheral door seal.
- To minimize frost and protect the cabinet seal, all materials at the door/cabinet interface are engineered to minimize passive heat transmission from the outside to the inside and to reduce cold surfaces in contact with moist, ambient air.
- A measured portion of heat output from the refrigeration system is diverted to non-temperature conducting extrusions to resist moisture accumulation which can cause frost and ice build-up.

Inner Doors

FrostLess upright freezer cabinets include two new thermally insulated inner doors which have been specifically engineered to minimize frost buildup during operation. The inner door construct consists of Rigid Foam Urethane and VIP Plus Vacuum Insulated Panels, combined. The VIP Vacuum Insulation adds an additional layer of depth to the inner door. The VIP Vacuum Insulation was ultimately designed to maximize the temperature stability of the Ultra-Low Temperature freezers, which include it within their construct. PHC has successfully integrated that same VIP Vacuum Insulation within the construct of the newly featured inner doors, creating an additional layer of resistance towards ambient temperature conditions, while also ensuring temperature stability.

Vacuum Breaker

The unit is designed with a manual vacuum break, strategically positioned on the side near the handle, to facilitate access. This feature helps users open the unit without compromising the internal environment, thereby maintaining the integrity of the stored materials. The convenient placement of the vacuum break enhances user experience by providing easy and immediate access, making it an essential component for efficient and effective operation.

ENHANCED EAGLE BEAK INNER DOOR LATCH

The inner door latch assists in opening and closing our VIP Insulated inner doors while simultaneously giving a positive reinforcement for sealing during closing.



Multi-point peripheral gasket mounted on the face of the cabinet. The

wider gasket provides an expanded seal, keeping the cold in and safeguarding your freezer's performance for years to come.

DESIGN AND CONSTRUCTION



Model MDF-DU700ZHA-PA

- A Expansive door gasket for a secure seal
- B Perimeter heater (eco-powered) to reduce frost on gasket
- C Adjustable leveling feet and recessed casters for mobility
- D Unique vacuum breaker for re-entry after recent door closure
- E EZlatch door handle with key lock
- F Door mounted control panel for eye level viewing
- G VIP Plus vacuum insulated panels, only 2.8" thick
- H Remote alarm contacts
- I Wall security brackets
- J Easy-to-clean condenser filter
- K Rounded cabinet corners for easy cleaning
- L Stainless steel shelves and adjustable shelf clips
- M 3 shelves adjustable on ½" centers, standard
- N 2 VIP Plus vacuum insulated inner doors
- O Enhanced eagle beak latch
- P Temperature sensor



Model MDF-DU500ZHA-PA

- A Expansive door gasket for a secure seal
- B Perimeter heater (eco-powered) to reduce frost on gasket
- C Adjustable leveling feet and recessed casters for mobility
- D Unique vacuum breaker for re-entry after recent door closure
- E EZlatch door handle with key lock
- F Door mounted control panel for eye level viewing
- G VIP Plus vacuum insulated inner doors
- H Remote alarm contacts
- I Wall security brackets
- J Easy-to-clean condenser filter
- K Rounded cabinet corners for easy cleaning
- L Stainless steel shelves and adjustable shelf clips
- M 3 shelves adjustable on ½" centers, standard
- N 2 VIP Plus vacuum insulated inner doors
- O Enhanced eagle beak latch
- P Temperature sensor

Additional Features:

- Frost prohibitive inner doors
- ENERGY STAR® Certified : Unique ID 2732254

Standard on all models:

- Non-temperature conducting cabinet extrusion
- Heated cabinet periphery to resist moisture accumulation
- Quiet operating condenser fan
- Thermal mastic evaporator surface enhancement






5-YEAR
PARTS & LABOR
WARRANTY

Warranty

PHC Corporation of North America offers 5-year, parts and labor warranty protection on FrostLess -86°C Freezers (North America only).

SPECIFICATIONS

Model Number		MDF-DU700ZHA-PA	MDF-DU700ZH-PA	MDF-DU500ZHA-PA
External Dimensions (W x D x H) ¹⁾	inches mm	40.6 X 34.7 x 78.5 1030 x 882 x 1993		31.1 x 34.7 x 78.5 790 x 882 x 1993
Internal Dimensions (W x D x H)	inches mm	34.3 x 23.9 x 55.1 870 x 607 x 1400		24.8 x 23.9 x 55.1 630 x 607 x 1400
Volume	cu.ft. liters	25.6 725		18.5 525
Net Weight	lbs kg	622 282		547 248
Box Capacity	2" 3"	528 336		352 224
2" Racks	qty	(12) SUR 624 and (12) SUR 524 or (12) SDR 624 and (12) SDR 524		(8) SUR 624 and (8) SUR 524 or (8) SDR 624 and (8) SDR 524
3" Racks	qty	(12) SUR 434 and (12) SUR 334 or (12) SDR 434 and (12) SDR 334		(8) SUR 624 and (8) SUR 524 or (8) SDR 624 and (8) SDR 524
Performance				
Temperature Control Range	°C	-40 to -86		
Uniformity ²⁾	°C	±5 (-80 Set point)		
Power Consumption	kWh/Day	7.90 (-80°C Steady state)		6.57 (-80°C Steady state)
BTU Nominal	Per Hour	1118		924
Noise Level ³⁾	dB(A)	52		52
Ambient Temperature Operating Range	°C	+5 to +30		
Control				
Controller		Microprocessor with non-volatile memory, USB data retrieval		
Digital Temperature Display		LCD Touchscreen		
Controller Security		Screen lock w/ password protection		
Temperature Sensor		RTD		
Refrigeration				
Cooling Method		Cold Wall (Synchronized variable speed cascade system)		
Compressors	High Stage Low Stage	920 W Variable 920 W Variable		
Refrigerant Type (Natural Refrigerant)	High Stage Low Stage	R-290 R-170		
Insulation		Rigid polyurethane foam (PUF) + VIP Plus vacuum insulated panels		
Construction				
Exterior Material		Painted Steel		
Interior Material				
Outer Door	qty	1 lock with set of 2 keys (provision for optional pad lock)		
Inner Doors	qty	2 VIP insulated with latch		
Shelves	qty	2 Stainless Adjustable Dedicated Center Shelf		
Shelf Dimensions (W x D)	inches mm	2 Stainless Adjustable: 33.7 x 21 855 x 534 1 Dedicated Center: 33.7 x 18.1 855 x 461	2 Stainless Adjustable: 33.7 x 21 855 x 534 1 Dedicated Center: 33.7 x 18.1 855 x 461	2 Stainless Adjustable: 24.2 x 21 615 x 534 1 Dedicated Center: 24.2 x 18.1 615 x 461
Max. Load per Shelf	lbs kg	110 50		
Access Ports, Qty, Position, Diameter	qty	3: upper wall (back-up system), bottom left (recorder sensor), bottom right (access) 0.6 in 17mm		
Casters Leveling Legs	qty	4 2		
Vacuum Release	qty	1 Manual		
Alarms (V= Visual Alarm, B= Buzzer Alarm, R= Remote Alarm, A= Adjustable, L= Logged)				
Power Failure		V-B-R-L		
Temperature (High and Low)		V-B-R-L-A		
Sensor Failure		V-B-R-L		
Door Open		V-B-L		
Maintenance Alert		V-L		
Remote Alarm Contacts		DC 30V 2A (normally open, normally closed, common)		
Electrical				
Power Supply		 115V, NEMA 5-15P, 60Hz 8ft cord length	 220V, NEMA 6-15P, 60 Hz 8ft cord length	 115V, NEMA 5-15P, 60Hz 8ft cord length
Running Amps Max Amps		2.2 10.5		
Options				
Circular Type Chart Recorders		MTR-G85A	MTR-G85C	MTR-G85A
Chart Paper/ Ink Pen		RP-G85-PW / PG-R-W		
Backup System		MDF-UB7-PW MDF-UB7-PW-LNZ		
Optional Communication System				
Wireless, Cloud-Based, Automatic Data Management		LabAlert® LabSVIFT® Gen 2 V-SafeRX®		
4-20mA Output Module		MTR-420MA-PW-Integrated MTR420MAL- Loop Powered® MTR420MAC- Equipment Powered®		
Certifications and Warranty				
Certification		QPS Listed and Energy Star		
Warranty ⁴⁾		5 years parts and labor		

¹⁾ Exterior dimensions of cabinet excluding handle, rear stand-off brackets and other external projections.

²⁾ Factory testing at ambient temperature of 23°C using 17 points.

³⁾ Nominal value, background noise 20 dB(A).

⁴⁾ Requires MTR-480 to operate as Gen 2 on LabSVIFT System.

⁵⁾ Current warranty offered at time of printing and may be subject to change; US and Canada only.

*Manufactured by others

Specifications are subject to change without notice.

⁶⁾ Based on independent third-party ENERGY STAR test results at the time of publication.

For results, see the ENERGY STAR website <https://www.energystar.gov/productfinder/product/certified-lab-grade-refrigeration/details/2732254>.



MONITORING SYSTEMS AND COMMUNICATIONS

PHCNA offers real-time monitoring and notification systems designed to safeguard your investment in stored products. Our independent wireless monitoring solutions for refrigerators and freezers utilize a secure, cloud-based platform, that provide easy access and customizable dashboards without the need for software installation. Compliant with FDA 21 CFR Part 11, our systems ensure alerts, logging and reports for pharmaceuticals and vaccines. Scalable to meet the needs of growing facilities, they support multiple units and locations by adapting seamlessly to various scenarios.

CALIBRATION SERVICES

PHC Corporation of North America offers both pre-delivery and on-site calibration services. Services are specifically designed to verify quality compliance and ensure display accuracy to manufacturing and regulatory specifications. Procedures and documentation are designed to conform to NIST/ISO requirements. ISO/IEC 17025* calibration is available upon request.

VALIDATION SERVICES

PHC Corporation of North America offers a full line of validation services that range from pre-delivery to comprehensive on-site equipment qualification. Services are specifically designed to verify quality compliance to manufacturing and regulatory specifications. Advanced technology is integrated alongside contemporary processes for turnkey solutions using NIST/ISO calibrated instrumentation for calibration, validation and qualification in accordance with current GxP regulations [GMP, GLP, GCP], ISO, CAP, AABB, CLIA, USDA, local standards and other regulations. We offer assistance in product selection that meets customer applications, including equipment, service and support.

*ISO/IEC 17025:2005 specifies the general competence to carry out testing and/or calibration including sampling. It covers testing and calibration performed using standard methods, non-standard methods and laboratory-developed methods.
(Ref: ISO Web Site, May 2016).



Specifications are subject to change without notice.
For latest specification information contact PHC Corporation of North America
at info@us.phcd.com.



PHC Corporation of North America

PHC Corporation of North America
1300 Michael Drive, Suite A, Wood Dale, IL 60191
Toll Free USA (800) 858-8442, Fax (630) 238-0074
www.phcd.com/us/biomedical

PHC Corporation of North America

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