

VIP® ECO SMART

MDF-DU503VHA-PA ENERGY STAR® Certified Dual Voltage 115V | 220V Natural Refrigerant
-86°C Ultra Low Temperature Freezer



Technical Data Sheet

General Specifications		
Volume	cu.ft. liters	18.6 528
Temperature Control Range	°C	-40 to -86
External Dimensions (W x D x H)	inches mm	31.1 x 34.7 x 78.5 790 x 882 x 1993
Internal Dimensions (W x D x H)	inches mm	24.8 x 23.6 x 55.1 630 x 600 x 1400
Footprint	ft² m²	7.49 0.70
Stainless Steel Shelf (adjustable)	qty	3
Power Supply (Dual Voltage)		115V, 60HZ, NEMA 5-15P, 8 ft cord length 220V, 60HZ, NEMA 6-15P, 8 ft cord length
Factory Certification		ISO9001, ISO13485, ISO14001
NRTL Testing Lab Mark		QPS Listed
Net Weight	lbs kg	531 241
Noise Level ¹⁾	dB(A)	46

Storage Specifications		
Racks per Freezer	qty	16
Racks per Shelf	qty	4
2" Boxes per Freezer	qty	384
3" Boxes per Freezer	qty	256

¹⁾ Actual value, background noise 20 dB(A).

Multiple options are available for racking including side opening and front loading trays. The information provided is for the most common racks. We also offer double height racks and other configurations, as well as customized racking for cryoboxes and other containers. Please speak to your local representative for more information.

Refrigeration	
Refrigeration System	Synchronized variable differential cascade system
Compressors	(2) 750 watt – Variable speed compressors (completely enclosed reciprocating type)
Condenser	High-Stage: fin and tube type Low-Stage: flat plate (brazen plate)
Evaporator	High-Stage: patented reverse flow heat exchanger Low-Stage: tube on sheet type (cold wall)
Refrigerant	High-Stage: R-290 natural refrigerant 135 grams 4.76 oz Low-Stage: R-170 natural refrigerant 73 grams 2.57 oz

Cabinet Construction	
Insulation	Rigid polyurethane foamed-in-place + VIP Plus® vacuum insulated panels: 3.1" (80 mm) thick
Exterior Material	Painted electrogalvanized steel
Interior Material	Powder coated electrogalvanized steel
Outer Door	Painted electrogalvanized steel exterior, Rigid polyurethane foamed-in-place + VIP Plus® vacuum insulated panels with EZlatch, key lock, with electronic access control ²⁾ , and handle can accommodate padlock.
Vacuum Relief	1: in door (auto release)
Inner Doors	2 (insulated, ABS, stainless steel frames, positive latches)

²⁾ Access control standard feature electric lock with password or facial access. NFC is an optional accessory.



Model MDF-DU503VHA-PA showing insulated inner doors and EZlatch access.



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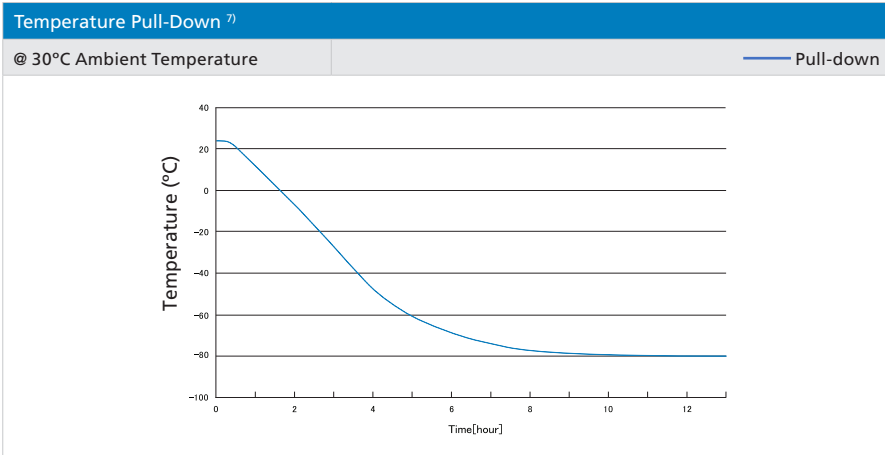
ENERGY STAR – Certification Number 4790599807

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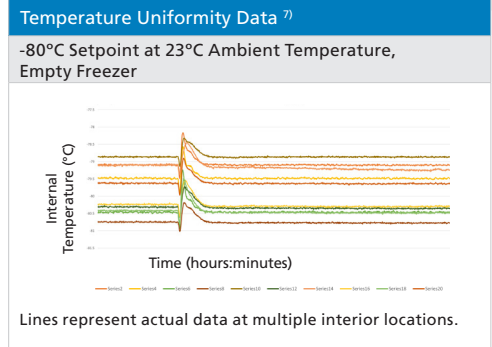
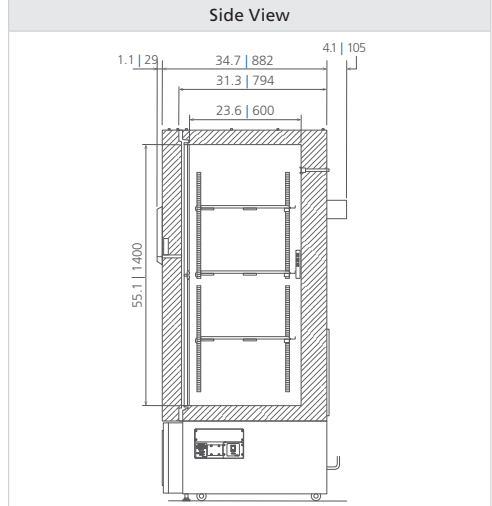
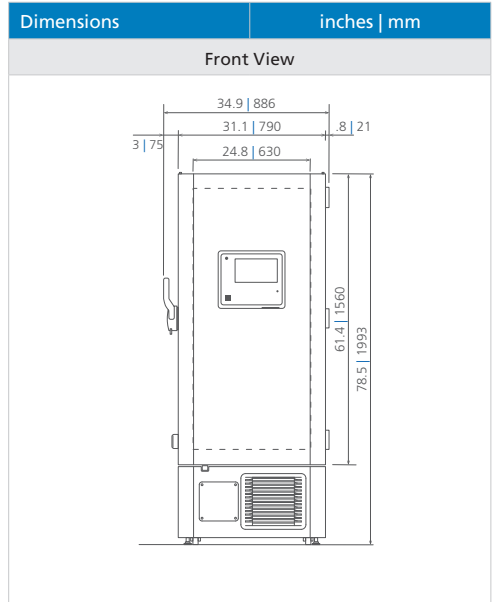
Performance Characteristics	
24°C Ambient, empty chamber, measured at center of chamber	
Energy Consumption ¹⁾	
Daily Consumption (6x door openings) ²⁾	
Setpoint -70°C Setpoint -80°C	4.3 kWh/day 5.4 kWh/day
Steady State (no door openings)	
Setpoint -70°C Setpoint -80°C	4.0 kWh/day 5.1 kWh/day
MDEC (max. daily energy consumption)	
Steady State	4.97 kWh/day/18.6 cu.ft. = 0.27 kWh/day/cu.ft.
Performance	
Interior Uniformity	
Setpoint -70°C Setpoint -80°C	±3°C <±3°C
Average Steady State Temperature ⁴⁾	
Setpoint -70°C Setpoint -80°C	-69.91°C -79.39°C
Temperature Recovery ²⁾⁵⁾	
Setpoint -70°C Setpoint -80°C	10 minutes 15 minutes
Refrigeration System Heat Rejection ⁶⁾	
Setpoint -70°C Setpoint -80°C	577 BTU/Hr 725 BTU/Hr
Pull-Down Time from 20°C Ambient	
Setpoint -80°C	5.23 hours 5 hours

¹⁾ Energy consumption per day, EPA Test, Version 1.1, Section 7, Reporting, G2c.
²⁾ Based on inner door opening time of 15 seconds per ENERGY STAR testing protocol with all mapped temperature points to within ±5C of setpoint.
³⁾ Calculation of ENERGY STAR based on performance of setpoints -70°C or -80°C.
⁴⁾ Overall average for all recorded interior temperature measurements at setpoints of -70°C or -80°C.
⁵⁾ Temperature recovery to ±5°C of setpoint.
⁶⁾ Based on standard calculations.

Based on independent, third-party testing at time of publication. ENERGY STAR test results for submitted products can be compared for performance across the competitive market. Results are published on the ENERGY STAR website at www.energystar.gov. See Certification Number 4790599807. Detailed test results are available, including additional tests at ambient temperature of 20°C and 30°C.



¹⁾ The data reflects performance metrics rather than official product specifications. Results from technical data sheet tests should not be used to establish regulatory parameters for specific customer applications.
²⁾ The performance of the freezer will depend on factors such as the volume of customer products, storage configuration, selected options, operating conditions, test methods, and adherence to recommended maintenance practices.
³⁾ Ongoing product improvements may lead to changes or omissions in this technical data sheet without prior notice. PHC Corporation of North America disclaims responsibility for any damage, injury, loss, or expenses arising from the misuse of the information provided.



⁷⁾ Data points available upon request.
Specifications are subject to change without notice.
 For latest specification information contact PHC Corporation of North America at info@us.phchd.com.



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