

MVE Variō Series 1500 & 1800 *Product Guide*



*The innovative and energy efficient alternative
for ultra-low temperature to cryogenic storage*

Patent Pending



TABLE OF CONTENTS

Key Points	3
Design	4
Competition	5
Cryogenic Storage (-150°C).....	6
Inventory Configurations	6
Specifications	7

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The MVE Variō™ Series is the innovative and energy efficient alternative for ultra-low temperature to cryogenic storage. The completely dry sample storage area will maintain a user-defined temperature anywhere between -50°C and -150°C. The MVE Variō™ Series significantly reduces the possibility of sample contamination via contact with LN₂ while providing the safety margin and consistent temperature profile, even with the lid open, that is associated with LN₂ based cryogenic storage. The MVE Variō™ Series is able to provide all of this with less than 1% of the power consumption and approximately 70% overall operating cost savings when compared to the leading mechanical freezers.

KEY POINTS

Unparalleled Performance

- User defined temperature within -50°C to -150°C operating range
- Consistent temperature profile
 - Unaffected by lid openings
 - No recovery time needed
- LN₂ consumption at -80°C
 - 1500 only 9 L/day
 - 1800 only 12 L/day
- Power consumption, only 8 W (cont.)
- Improved sample processing time due to rapid temperature recovery upon introduction of warm racks or samples
- Safety margin (LN₂ supply removed until -60°C)
 - 4 days from -80°C
 - 9 days from -150°C
- 72 hour rechargeable battery backup
- Significant ambient noise reduction
- Password protected controller
- Alarms and Monitoring
 - 4-20 mA temperature output
 - Dual chamber temperature sensors
 - Event Log contains up to 30,000 unalterable, time stamped events (approx. 10 years)
 - 15 user defined audio/visual alarms
 - High temperature, lid open, and stuck valve discrete alarms
 - RS-485 communication for remote monitoring or control

Cost and Return on Investment

Higher up-front cost, but unmatched long-term value

- Affordable and simple preventative maintenance
 - No expensive compressors to replace
- Approximately 70% overall operating cost savings compared to mechanical freezers
 - Based on power consumption and LN₂ costs
 - Does not include additional HVAC requirements for mechanical freezers, which will further enhance Variō ROI
 - Please see the MVE Variō™ Cost Calculator for an ROI estimate based on your circumstances
- Convertible asset
 - Can be field retrofitted to be a traditional LN₂ freezer

Green: Environmentally Friendly

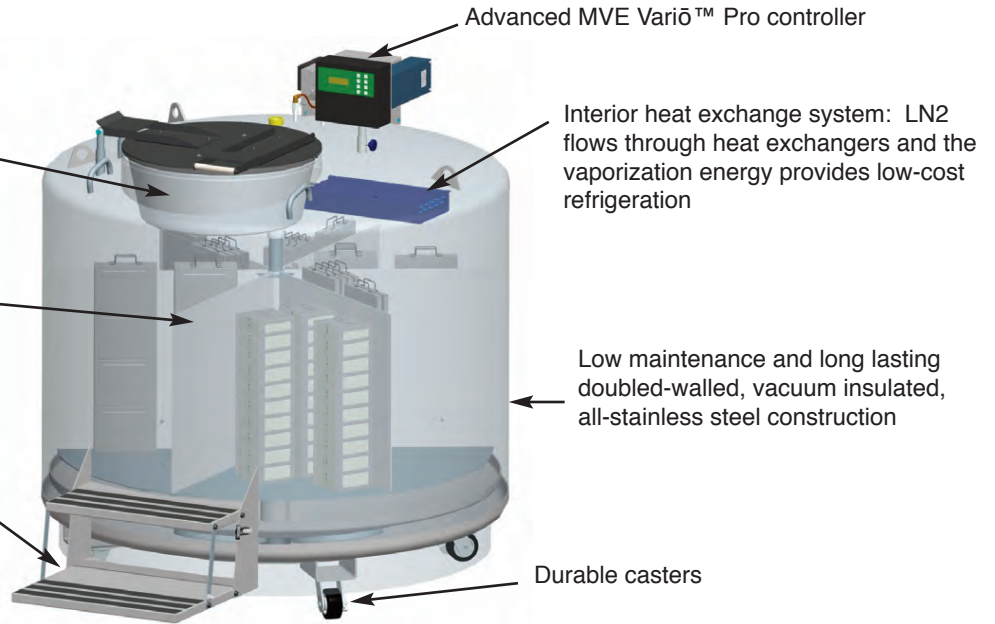
- Less than 1% of the power consumption compared to leading ultra-low temperature mechanical freezers
- No additional HVAC required due to negligible to negative thermal load
- No ozone depleting chlorofluorocarbon (CFC) or hydrofluorocarbon (HFC) refrigerants
- Zero CO₂ emissions
- No disposal issues; over 90% recyclable

DESIGN

Efficient offset neck and hinged lid design maximizes vacuum insulated surface area to maintain consistent temperature profile, even with the lid open.

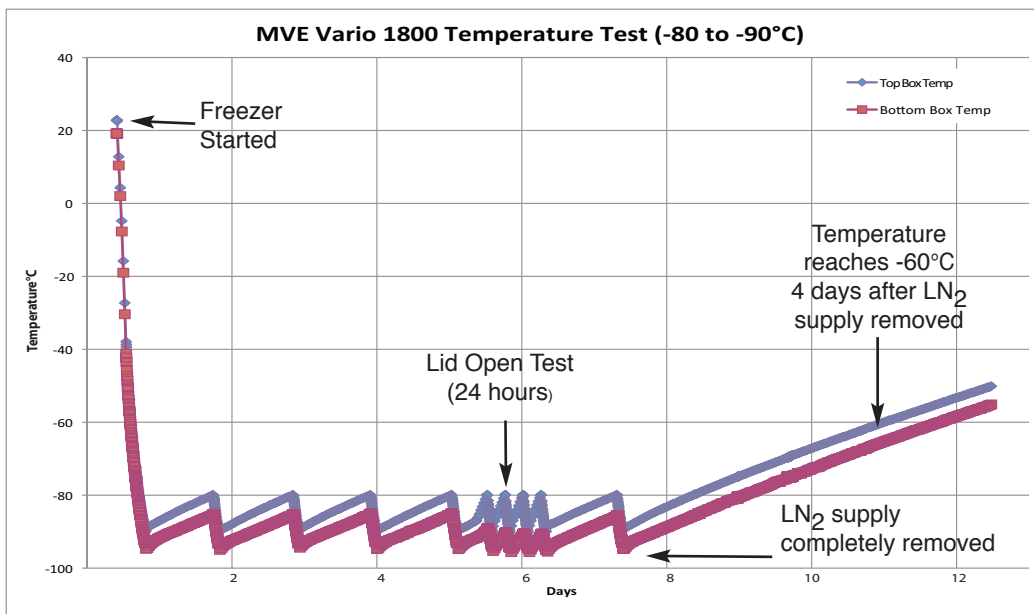
Rotating interior tray allows easy access to freezer samples.

Two-tier folding step provides lowest liftover height



MVE Variō™ Series innovative, patent-pending refrigeration system: LN₂ flows through a heat exchange system located in the top head of the freezer and the vaporization energy of the LN₂ cools the freezer. This heat transfer system was developed by MVE to fully utilize the heat capacity of LN₂ while simultaneously purging frost and moisture from the storage space. The MVE Variō Pro monitors and meters the amount of LN₂ introduced into the heat exchangers so that the completely dry storage space maintains the user defined operating temperature (+/- 5°C) anywhere from -50°C to -150°C.

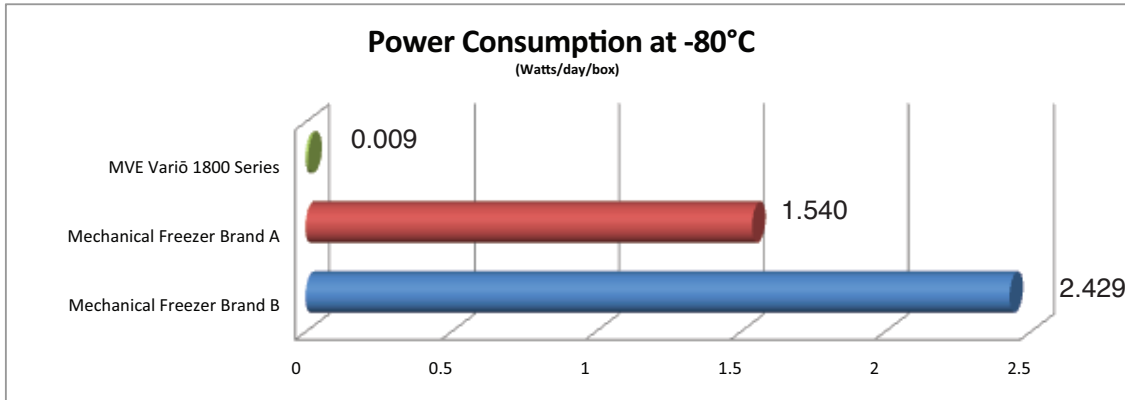
The efficient offset neck design and double-walled, vacuum insulated, all-stainless steel construction provides a consistent temperature profile throughout the storage space, even with the lid open. While the lid is open, the MVE Variō™ automatically compensates by shortening the cooling cycle interval so that the storage space temperature does not increase above the desired range.



COMPETITION

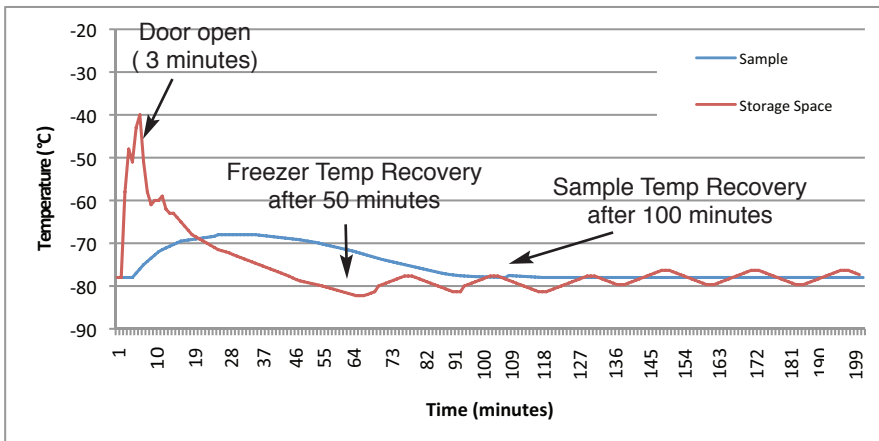
Power Consumption

The MVE Variō™ Series accommodates up to 81,900 2 mL vials while consuming less than 1% of the electricity of the leading upright ultra-low temperature competitors.



Temperature Profile

The MVE Variō™ Series provides a consistent temperature throughout the storage space. Even when the lid is open for routine sample retrieval or placement, the temperature will not rise above the desired temperature. This sample security is unmatched with any other type of ultra-low temperature storage modality.



With typical upright mechanical freezers, every time the door is opened, a large amount of heat enters the system. This results in a significant temperature change, even if the door is opened for only a matter of minutes. It can take a substantial amount of time for the temperature to recover once the door is closed.

Plot depicts the temperature of a typical upright mechanical freezer storing at -80°C when the door is open for three minutes.

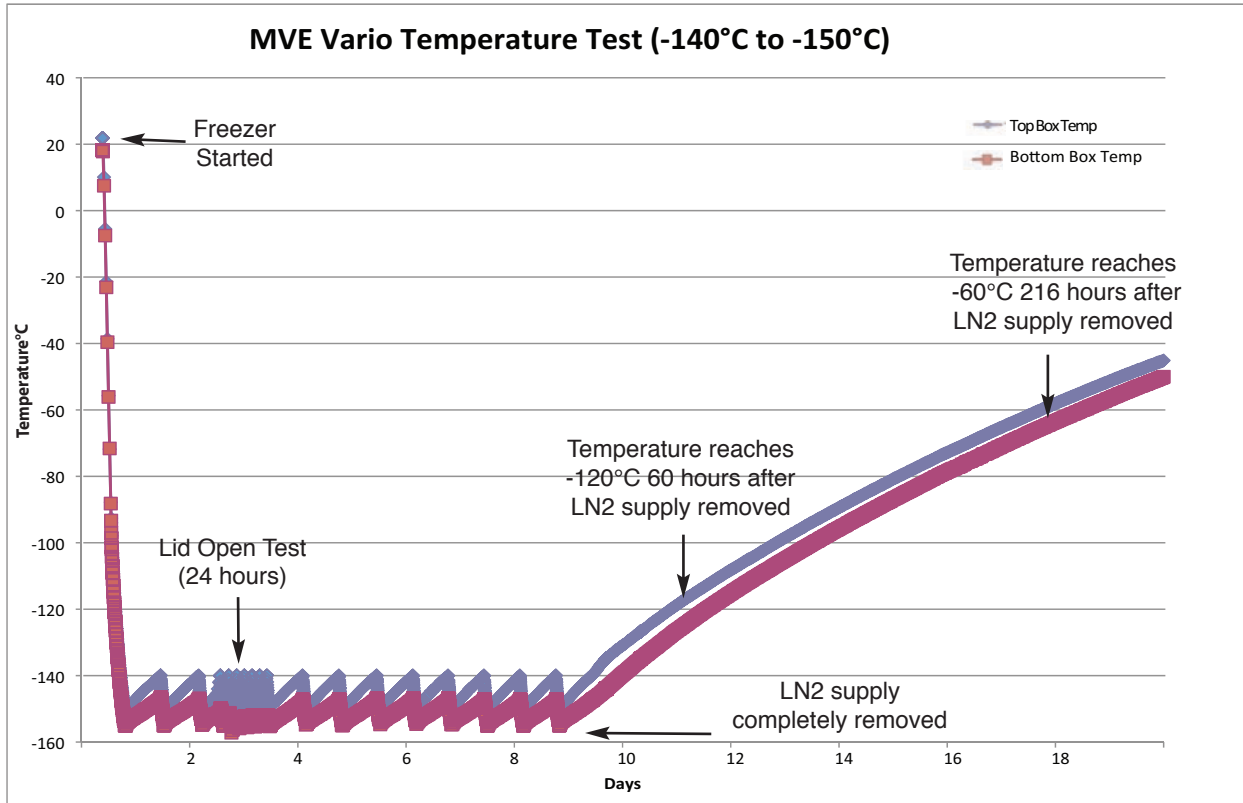
Hold Time Safety Margin

The hold time safety margin describes the period of time from refrigeration system failure until critical temperature is reached. The MVE Variō™ 1800 Series provides by far the longest hold time in the industry. When the LN₂ supply is depleted, it takes 4 days when storing at -80°C or 9 days when storing at -150°C for the chamber temperature to cross -60°C. Compared to mere hours for upright mechanical freezers, there just is no comparison.

Storage Density

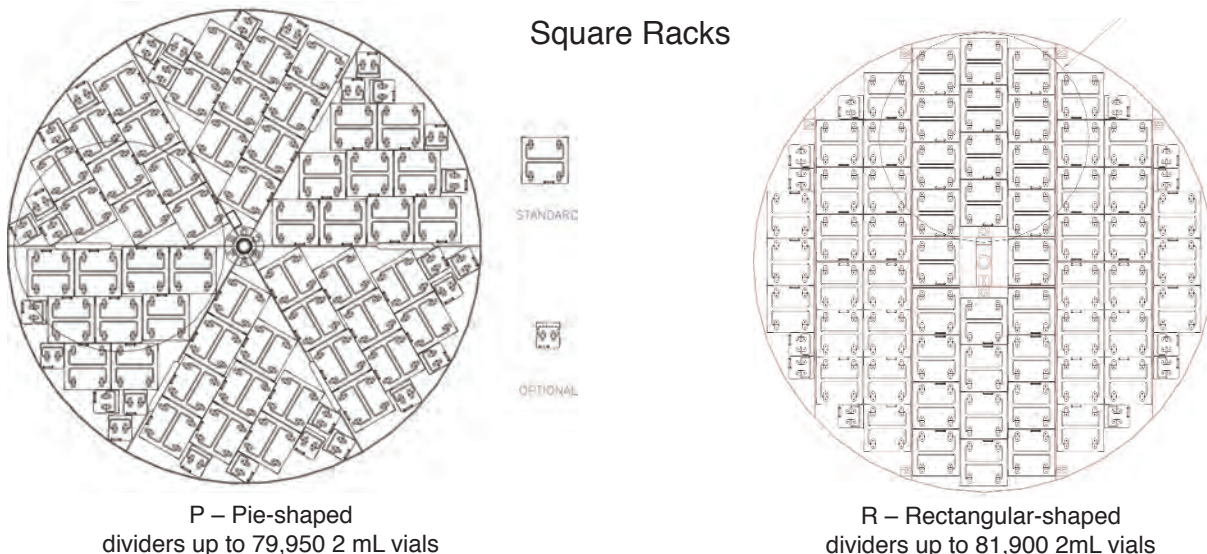
Largest storage density—store up to 81,900 2 mL vials in about a 20 ft² (1.85 m²) footprint.

CRYOGENIC STORAGE (-150°C)



Even at -150°C, the current minimum temperature, the MVE Variō™ Series still supplies a consistent temperature profile regardless if the lid is open. Changing operating temperature is as simple as keying in the desired value and letting the MVE Variō stabilize at the new temperature. Decreasing the temperature will take just a few hours, but if changing to a warmer temperature, it may take several days due to MVE's superior insulation system.

INVENTORY CONFIGURATIONS



SPECIFICATIONS

MVE Variō 1536P

MVE Variō 1539R

MVE Variō 1879P

MVE Variō 1881R

Maximum Storage Capacity

1.2 & 2 ml Vials

(Internally Threaded)	36400	39000	79950	81900
Number of Racks 100 cell boxes	24	26	54	60
Number of Racks 25 cell boxes	16	16	30	12
Number of Stages per Rack	13	13	13	13

Performance

Temperature Range	-50°C, -150°C	-50°C, -150°C	-50°C, -150°C	-50°C, -150°C
LN₂ Usage at -80°C L/day	9	9	12	12
Power consumption (cont.) W	8	8	8	8

Unit Dimensions

Neck Opening in. (mm)	17.5 (445)	17.5 (445)	25.0 (635)	25.0 (635)
Usable Internal Height in. (mm)	28.8 (732)	28.8 (732)	29.5 (749)	29.2 (741)
Inner Diameter in. (mm)	38.5 (978)	38.5 (978)	56.0 (1422)	54.8 (1391)
Overall Height in. (mm)	61.3 (1556)	61.3 (1556)	62.1 (1577)	61.3 (1556)
Door Width Requirement* in. (mm)	42.0 (1067)	42.0 (1067)	60.0 (1524)	60.0 (1524)
Weight Empty lb. (kg)	690 (313)	690 (313)	1606 (728)	1721 (781)

Blood Bag Capacities

	Total Bags	Bags/ Frame	No. Frames	Total Bags	Bags/ Frame	No. Frames	Total Bags	Bags/ Frame	No. Frames	Total Bags	Bags/ Frame	No. Frames
791 OS/U (25 ml)	3080	7	440	2786	7	398	5866	7	838	5628	7	804
Compact (25 ml)	4338	9	482	3924	9	436	8622	9	958	9414	9	1046
4R9951 (50 ml)	1488	6	248	1446	6	241	2952	6	492	2940	6	490
4R9953 (250 ml)	812	4	203	768	4	192	1584	4	396	1608	4	402
4R9955 (500 ml)	608	4	152	576	4	144	1104	4	276	1240	4	310
DF200 (200 ml)	496	4	154	488	4	122	960	4	240	984	4	246
DF700 (700 ml)	256	4	64	204	4	66	504	4	126	544	4	136

TWO Year Standard Warranty • FIVE Year Vacuum Warranty

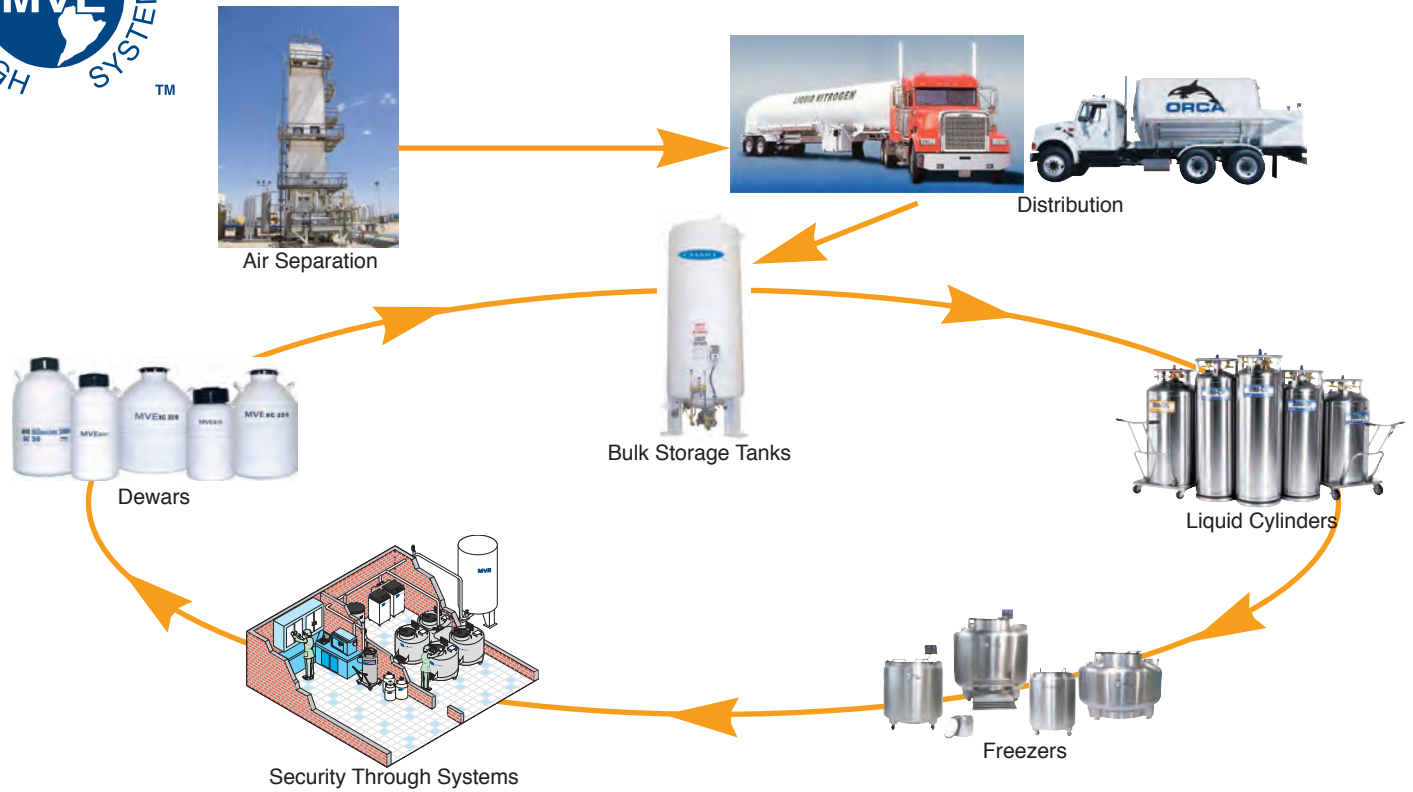
Conforms to MDD 93/42/EEC, the Medical Device Directive for the EU.

**Minimum width required for vessel to pass through opening. Footprint may vary. Contact Tech Service for detailed drawings.*

Contact your MVE Sales Representative
or Customer/Technical Service with any questions.

Please see the MVE Accessory and Inventory Systems catalog
for a full listing of racks, boxes, and value-added accessories.

Chart: Total Cryogenic Solutions



Our Global Presence



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