

Stirling Ultracold VAULT100™

The revolutionary ultra-low temperature freezer for modern freezer farms

The VAULT100™ from Stirling Ultracold is the ideal solution for large ULT installations and modern freezer farms. In these settings, it's not just temperature performance and sample safety that matter, but also space requirements and operating costs.

With a variable temperature range from -20 °C to -100 °C, the VAULT100™ offers maximum flexibility and additional safety margins for your most valuable samples. 795 liters of usable volume in less than one square meter of floor space enable maximum storage capacity with minimal space requirements. At the same time, the VAULT100™ reduces energy consumption, waste heat, and maintenance requirements – a decisive advantage for large installations.

Benefit from absolute reliability: We provide a 6-year warranty on the entire ultra-low temperature freezer when regular maintenance is performed.

Modern, sustainable refrigeration technology – for your most valuable samples and your entire freezer farm.



The VAULT100™ offers strategic advantage for your entire research organization

Protects your valuable samples

- ✔ A storage temperature of -100°C allows for longer door opening times and longer response times in the event of a power failure
- ✔ Faster cooling thanks to higher cooling capacity of the latest Stirling engine generation
- ✔ Highest temperature uniformity and stability on the market
- ✔ Large display with predictive diagnostics about the ULT-freezer

Protects your environment

- ✔ 100% natural refrigerants and no use of oil
- ✔ Up to 70% energy savings and significantly lower carbon footprint compared to older compressor-based systems
- ✔ Sustainable production and packaging
- ✔ Reduce the load on your air conditioning system thanks to low waste heat

Protects your budget

- ✔ 6-year warranty on the entire ultra-low temperature freezer
- ✔ Lowest total cost of ownership
- ✔ Increased service life thanks to the low-wear Stirling engine
- ✔ Optimal use of space for maximum storage capacity



Deep freeze technology -
reliable and safe.

Features



Additional Safety

With a temperature range down to -100 °C, there is additional safety margin for valuable samples. This provides more time before critical temperature limits are reached in the event of door openings, power outages, or technical malfunctions.



Maximum storage capacity

The compact and efficient design of the VAULT100™ enables record-breaking storage capacity in a minimal footprint. This makes it ideal for large ULT installations and freezer farms with high storage density.



Highest energy efficiency

Modern Stirling technology reduces energy consumption by up to 70% compared to older compressor-based systems. This significantly lowers operating costs and waste heat, thereby reducing the strain on the infrastructure.



6-Year Warranty

Thanks to reliable, low-wear Stirling technology, CryoSolutions offers a 6-year warranty on the entire ultra-low temperature freezer, provided it is maintained regularly. This ensures long-term investment security.



Options



CO2 / LN2 Backup



Rack Storage Systems



Heavy-Duty Shelving



Remote Monitoring



Specifications Stirling VAULT100™

APPLICATION, PERFORMANCE AND ELECTRICAL DATA

Application	Storage of general (non-flammable) laboratory materials
Storage Volume	795 liters
Storage Capacity	600 standard 2" boxes in optional racks, Optional 700-box system, available separately
Temperature Range	-20°C to -100°C adjustable to 1°C increments
Electric Power	120-240 VAC at 50/60 Hz
Maximum Power	1200 watts (5 amps at 240 volts), nominal
Electric Supply Rating	10 amp or greater grounded circuit
Power Plug	For power cable C13 to T12 length 3 m
Certification	cULus, CE, and ENERGY STAR® <42 dB(A) at 1 meter from front of freezer in steady state operation, > 50 dB(A) at full cooling capacity
Noise	
Use	Indoor use only
Application Environment	Non-corrosive, non-flammable, non-explosive
Ambient Operating Temperature	5°C to 35°C
Useful Life	15 years, nominal

CONTROLLER

Interface	Graphic user touchscreen interface
Controller Type	Microprocessor with touchscreen input and display
Security	Optional PIN requirement built in
Temperature Alarms	User specific customizable
Control Sensor	One RTD (PT100 Class A)
Event Log	All alarms, door openings, setpoint changes and power outages are recorded for 12 months
Temperature Log	12 months available in graphic and electronic format (downloadable)
Dry Contacts	Normally closed, normally open, common; activated by power outage or any alarm condition
Battery Back-up	24-hour battery backup for touchscreen and temperature display
Network Connectivity	Optional Ethernet connection transmitting in BACnet™
Defrost method	Door seal heating can be adjusted as required

REFRIGERATION SYSTEM

Cooling Engine	Helium-charged (10gr) free-piston Stirling engine with continuous modulation
Heat Transport System	Gravity driven thermosiphon
Refrigerant	R-170 (Ethane) 90 grams
Evaporator	Cold wall (inner liner)
Heat Rejection	Finned heat exchanger with forced air cooling. Air inlet: Top right through air filter. Air outlet: Top left, 10 cm clearance sufficient.
Defrost Method	Manual

PERFORMANCE DATA

Steady State Energy Use	5.8 kWh/day at -80°C (ENERGY STAR® Final Test Method)
Pull-Down from Ambient	5.5 hours from 25°C to -80°C (Empty Cabinet)
Recovery from Door Opening	26 minutes at -80°C (ENERGY STAR® Final Test Method)
Warm-up Profile (Empty Cabinet)	3.8 hours to -60°C at -80°C 9.3 hours to -40°C at -80°C
Heat Dissipation (Empty Cabinet)	754 BTU/h (load to HVAC) at -75°C without door opening

DIMENSIONS AND CONSTRUCTION

Interior (H x D x W)	1542 x 706 x 732 mm
Exterior (H x D x W)	1996 x 871 x 915 mm (ohne Türgriff)
Exterior (H x D x W)	1997 x 871 x 1003 mm (mit Türgriff)
Net Weight	295 kg (five shelves included, no load)
Shipping (H x D x W)	2134 x 1092 x 1168 mm
Shipping Weight	345 kg
Insulation	High performance, vacuum insulated panels and polyurethane foam using Ecomate® environmentally friendly, SNAP-compliant blowing agent
Shelves	5 stainless steel shelves, each with load capacity of 68 kg, adjustable in 12.7 mm increments
Inner Doors	3 insulated inner doors with magnetic latches

