-86°C Ultra-Low Freezers

SANYO

A member of the Panasonic Group

MDF-U500VXC
MDF-U700VXC

Twin Guard Series™

The Industry's Safest Ultra-Low Storage Solution

Features:

- SANYO -86 Dual°Cool ultra-low freezer is designed for -86°C storage of high-value biologicals
- Includes integrated LCD performance monitor and digital controller for comprehensive system management

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My Life. My Work. My Choice.

MDF-U500VXC
MDF-U700VXC

Twin Guard Series™ -86°C Ultra-Low Freezers Featuring SANYO -86 Dual°Cool Independent Refrigeration Systems

The industry's safest ultra-low storage solution for high value biologicals.

The 18.3 cu.ft. / 519 L MDF-U500VXC and the 25.7 cu.ft. / 728 L MDF-U700VXC V.I.P. PLUS™ insulated, includes integrated LCD performance monitor and digital controller for comprehensive system management, data logging, remote communications, alarms, predictive performance and validation. Maintenance-free, filterless design.

- The innovative design utilizing two independent systems allows the unit to continue to run continuously at -65°C in the unlikely event of one compressor failure.
- The combination of additional refrigeration intelligently managed by intuitive microprocessor controls and integrated into SANYO's patented V.I.P. PLUS™ vacuum panel cabinet make the most efficient use of available floor space.
- Twin Guard Series™ freezers significantly increase ultra-low protection while minimizing energy costs through a unique EcoMode™ function. EcoMode™ optimizes power consumption by orchestrating run times for each refrigeration system in response to cooling demands.

The SANYO Twin Guard Series™ -86°C ultra-low freezer with dual, independent refrigeration systems increases reliability.

Pictured: MDF-U700VXC

Twin Guard Series™ -86°C Ultra-Low Upright Freezer Selection

Model Number	Temperature Range	Interior Volume	Area Footprint (nominal)	Storage (2"/ 51 mm boxes)	Storage (3"/76 mm boxes)	Storage (2ml vials in boxes)	Electrical, 60Hz
MDF-U500VXC	-50°C to -86°C	18.3 cu.ft. 519 L	8.37 sq.ft. 0.78 m²	352	224	35,200	208/230V NEMA 6-15
MDF-U700VXC	-50°C to -86°C	25.7 cu.ft. 728 L	9.51 sq.ft. 0.88m²	576	384	57,600	208/230V NEMA 6-15

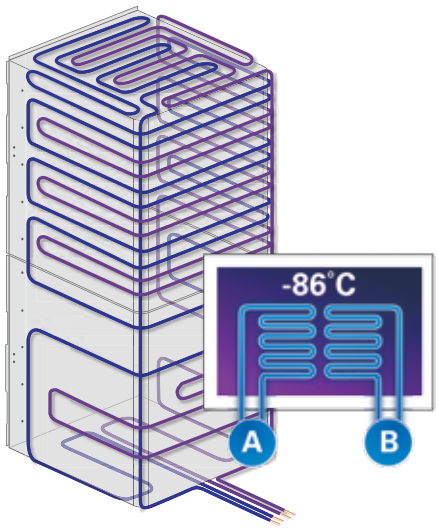
The SANYO MDF-500VXC and MDF-U700VXC Twin Guard Series™ ultra-low freezers are designed for -86°C storage of high-value biologicals. Ideal for critical material storage in repositories, highly secure BSL3/4 labs, hospitals, clinics and medical research facilities. The Twin Guard Series™ introduces the concept of dual, independent, auto cascade refrigeration systems contained within a single cabinet.

Ultra-Critical Installations and Applications Overview

Application	Justification	Benefit
Stem Cells, Cord Blood, T-Cells, Engineered Tissue, Organ/Tissue, Vaccines, Bone Marrow, Hybridomas, Lymphocytes, Cancer Cells, Clinical Specimens, Fibroblasts, Ova, Sperm	Highly sensitive to temperature fluctuations or uneven storage temperatures at different positions within the interior chamber.	Enhanced temperature uniformity, top-to-bottom, front-to-back, assures sample stability at all inventory locations.
BSL-3/4 or Highly Secured Labs	Restricted access to the contained laboratory limits serviceability.	Twin Guard Series™ extends critical time necessary to react in the event of mechanical failure.

The Safest Ultra-Low Freezers for Long-Term Storage of Ultra-Critical Biologicals

The SANYO Twin Guard Series™ satisfies the industry demand for safe, long-term storage for the most high-valued materials. Two independent refrigeration systems, combined with optional liquid nitrogen or liquid CO_2 back-up systems, offer a circle of protection unmatched in the marketplace. Developed for use with conventional inventory racks and boxes, the Twin Guard Series™ is ideal for storage of sensitive stem cells, embryos, cell lines, and other rare specimens.



Independent systems efficient ultra-low cooling is achieved through two independent evaporator circuits surrounding the interior chamber.

Twin Guard Series™ -86 Dual°Cool Refrigeration System

The Twin Guard Series™ Ultra-Low Freezer avoids conventional cascade refrigeration technology by using two completely independent one-compressor, autocascade cooling systems, each capable of maintaining ultra-low temperatures.

- Each refrigeration circuit includes a closed-loop cold-wall evaporator configured in parallel to the other.
- Independent evaporators and cooling fans assure back up status at all times, eliminating system failure due to sub-component failure in conventional cascade systems configured of mutually dependent high- and low-stage systems.
- In the unlikely event of a compressor failure in one system, the remaining system will automatically maintain a minimum of -65°C for an indefinite period.
- In the event of a facility power failure with optional CO_2 or LN_2 backup system installed, the freezer will maintain -65°C storage temperature for up to eight hours (CO_2 backup system) and -65°C storage temperature for up to 15 hours (LN_2 backup system).
- A unique EcoMode™ deploys both systems in overlapping cycles to maintain -86°C and to reduce energy consumption by as much as 15%.
- Evaporator coils embedded in the patented, high-tech, SANYO V.I.P. PLUS™ vacuum-insulated thin-wall cabinet are strategically oriented to deliver the best temperature uniformity at all shelf levels, top-to-bottom and front-to-back.
- New SANYO-designed Cool Safe™ refrigeration compressors feature innovative refrigerant feedback processes to reduce compressor temperature, thereby extending compressor life and minimizing heat output.

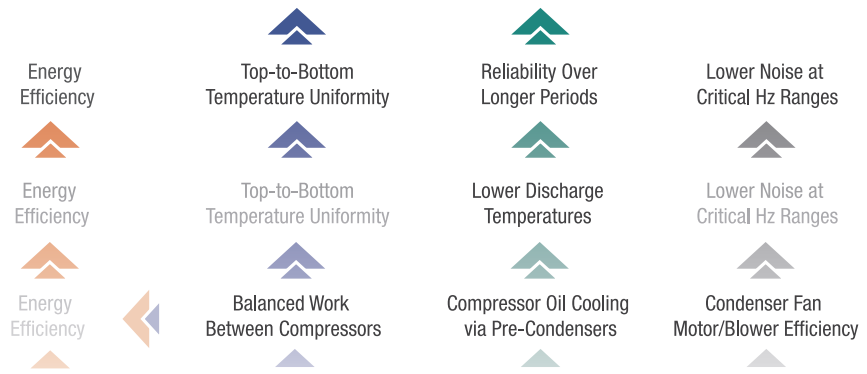
Twin Guard Series™ -86ºC Ultra-Low Freezers Features

SANYO Twin Guard Series™ -86°C Ultra-Low Freezers

Designed for long-term storage of stem cells, cord blood, T-cells, engineered tissue, organ/tissue, bone marrow, hybridomas, lymphocytes, cancer cells, clinical specimens, fibroblasts and other life science samples.

Twin Guard Series™ Features, Benefits and Performance Advantages

What It Is	What It Does	Why It Is Important
Energy-Efficient Refrigeration	Microprocessor control over all cooling functions delivers cooling on demand.	Optimizes run time to minimize energy consumption.
SANYO Cool Safe™ Compressors	Designed specifically for ultra-low applications to reduce compressor temperature & improve longevity	Increases compressor longevity and reliability. Reduces heat output to room and lowers HVAC loads in room.
Environmentally Friendly Refrigerants	Eliminates potential for ozone depletion while maintaining cooling capacity.	Complies with the Montreal Protocol and IEC for safety and efficiency.
Integrated Control Center	Combines all control, alarm, monitoring and data management functions into a single system.	High visibility LCD alphanumeric display provides a convenient user interface to setpoints, alarm parameters, internal diagnostics, communications and security.
Cabinet Design	Integrates inventory management, access and site installation.	Cabinet design attributes include high-strength, lockable door latches and doors, latchable inner doors, adjustable shelves, locking casters and seismic restraints to simplify operation, installation and to satisfy local codes.
Compliant to International Standards	Assures quality standards, safety and performance criteria are met or exceeded.	Essential for compliance with LEEDs, RoHS, OSHA other third-party standards and recommended practices.
Green Design Attributes	Integrates design, construction, refrigeration and operation functions into an energy efficient friendly system.	Minimizes carbon footprint, assists building owners in LEED Certification best practices.
Ergonomic Design	One-handed outer and inner door latches and quiet-running compressors improve convenience, minimize sound.	Easy access to controls, displays, inventory racks, while low noise operation permits a wider choice of installation locations.



Improved cell viability through SANYO Ultra-Low Refrigeration Technology

SANYO Refrigeration Delivers Uniform Temperature

The SANYO cascade refrigeration system uses SANYO designed compressors for high-performance, reliability and peace of mind. Refrigeration components are carefully selected and matched for optimum operation under demanding laboratory environments.

- Increased reserve cooling capacity improves temperature recovery after door openings.
- Quieter operation is achieved through condenser fan blade design, noise abatement insulation and anti-vibration mounts.
- Voltage boost and surge protection devices permit dependable operation over wider power ranges and environmental conditions.

Twin Guard Series™ Green Features

Because modern laboratories are energy-intensive, SANYO has developed a corporate-wide energy savings and environmental impact approach to new product development. The Twin Guard Series™ freezers offer significant benefits through a balance of refrigeration power, cabinet construction and intelligent control over all functions.

Eco Friendly Technology

- SANYO freezers are designed to support LEED certification associated with the U.S. Green Building Council recommendations.
- Components are compliant with RoHS directives on the use of hazardous materials in electrical and electronic equipment.
- Noise reduction and operating cost efficiencies are integrated into the refrigeration system.
- Heat output is limited to minimize the impact on facility HVAC demands.
- A microprocessor controller oversees the refrigeration system to regulate cooling cycles, reducing energy consumption.
- SANYO Cool Safe™ compressor technology for lower compressor heat internally and externally lower HVAC loads.

SANYO is conscious of the need to protect our environment and conserve energy. As a corporate pioneer in life science laboratory equipment and appliances, and as a global source of solutions ranging from energy management to solar power and alternative energies, SANYO remains committed to providing the best possible laboratory equipment for research and clinical needs.

Uniformity Performance

The placement of evaporator surfaces within the cabinet walls achieve exceptional documented ultra-low temperature uniformity, thereby permitting investigators more freedom in placing valuable cell lines and biologicals within the interior cabinet, and assuring uniform cell viability when harvesting products from the ultra-low archive.

CFC Free Refrigerants

SANYO was the first ultra-low freezer manufacturer to employ non-HCFC R508 low-stage refrigerant, now recognized as today's industry standard and widely available. This non-proprietary refrigerant is available to refrigeration service professionals on the open market.

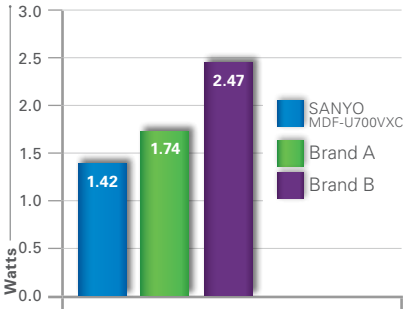
The high stage refrigerant is available to refrigeration professionals on the open market as well.

SANYO Twin Guard Series™ Green Initiative Program

With a capacity of up to 57,600 two-inch vials in fiberboard boxes, the energy-saving advantages of this efficient SANYO system extend to lower per-unit storage costs regardless of the preferred inventory configuration.

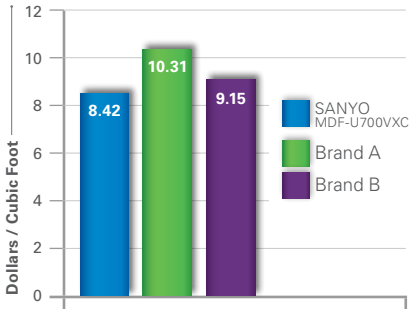
Twin Guard Series™ Comparative Energy Performance

Power Consumption by Capacity (KW/day/box Efficiency)



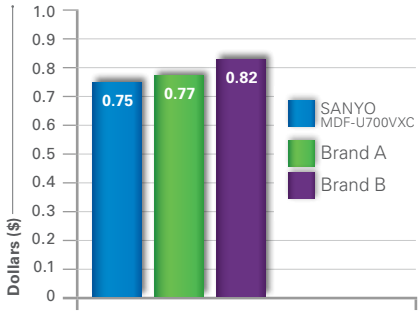
SANYO freezers provide reduced operational cost for highly efficient sample storage.*

Total Annual Electrical Cost per Box Capacity



SANYO freezers emit less heat into the laboratory, minimizing air conditioning costs.*

Annual CO_2 Emissions by Box Capacity



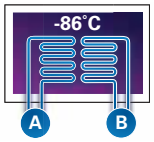
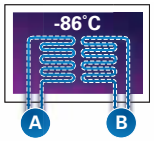
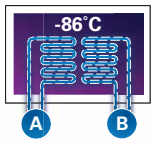
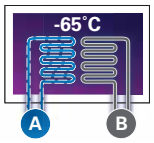
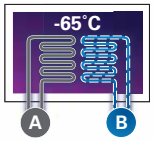
SANYO freezers help the environment by reducing carbon footprint.*

**Based on internal performance data. Tested in 25°C ambient environment. Freezer cycling at -80°C. Cabinet volume, 25.7 cu. ft. Average cabinet temperature based on temperature mapping (15 thermocouples).*

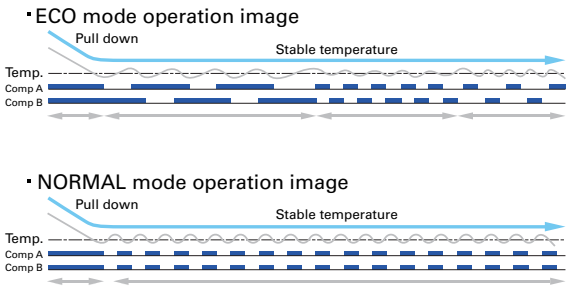
Twin Guard ™ Dual°Cool Refrigeration System

Dual, independent refrigeration systems operate in Normal or energy-saving EcoMode™ which is selected by the user and engaged through the LCD controller. Normal Mode is used for the strictest of GMP applications. EcoMode™ is applicable to 90-95% of applications.

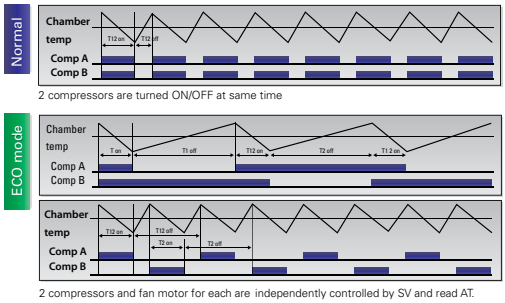
Twin Guard ™ Dual°Cool Refrigeration System

Status	Function	Performance	
System A and B ON	Maximum Pull-Down and Recovery Capcity	Establishes highly uniform -86°C storage temperature; maximizes recovery following door openings and heat load additions	
System A and B ON, Cycling On/Off	EcoMode™	Maintains better energy management at high or low ambient temperatures as well as excellent top-to-bottom uniformity.	
System A and B ON, Cycling On/Off	Normal Mode	Maintains excellent top-to-bottom uniformity. Maintains most repeatable, cycling wave form for the strictest of GMP applications.	
System A ON	Back-Up for System B	Maintains minimum -65°C reserve temperature	
System B ON	Back-Up for System A	Maintains minimum -65°C reserve temperature	

EcoMode™ vs. Normal Mode



This chart shows the repeatable cycling wave form of normal mode vs. eco mode. Normal mode is for strict GMP applications.

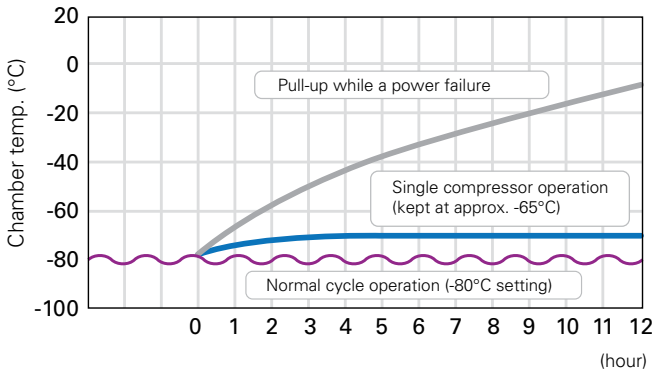


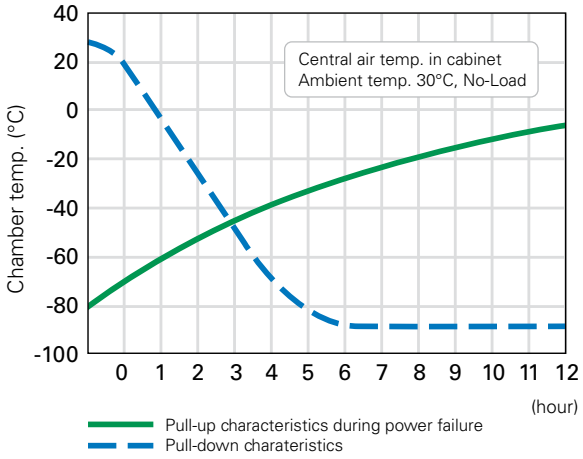
The SANYO Twin Guard Series™ Freezer can be set for Normal or EcoMode™ operation. EcoMode™ establishes an overlapping cycle to significantly reduce energy consumption.

Failure Mode Comparison

Twin Guard Series™ vs. Conventional Cascade Freezer

Event	Conventional Freezer No Back-Up	Conventional Freezer, with Back-Up System	SANYO Twin Guard Series™
Fan Failure	Freezer Fails	Freezer fails, CO_2 or LN_2 back-up system offers short term protection until contents can be removed and repairs initiated	If one fan fails the second fan automatically maintains energy exchange
High Stage Compressor Failure	Freezer Fails		No high or low stage used. Two refrigeration systems, each with a separate compressor, operate independently in overlapping cycles during normal operation. If one compressor fails internal temperature is maintained indefinitely at -65°C with backup compressor. Optional LN_2 or CO_2 back-up system offers additional protection
Low Stage Compressor Failure	Freezer Fails		





Performance Chart, power-failure situation Normal operation and Twin Guard Series™ backup.

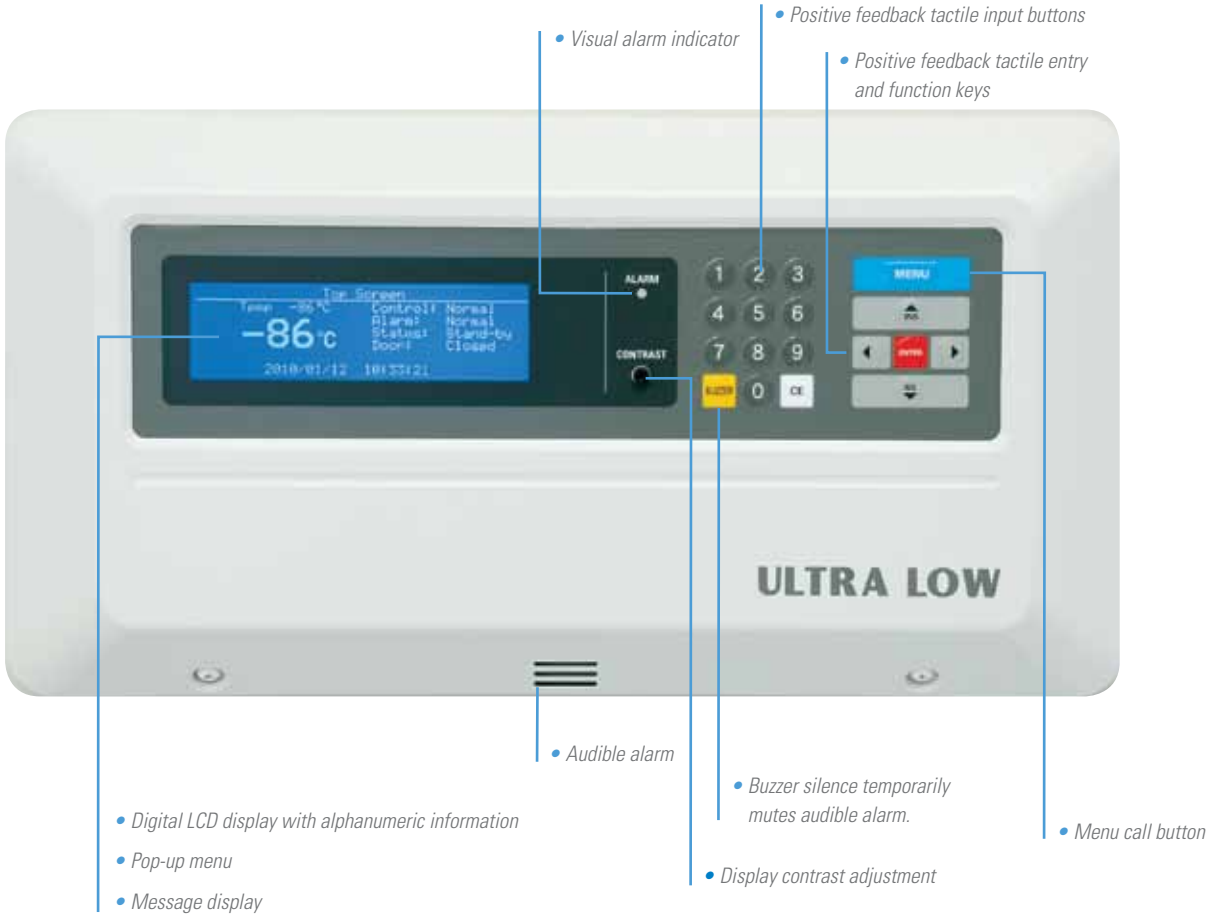
Reduced Power Consumption

The SANYO Twin Guard Series™ Freezer can be set for Normal or EcoMode™ operation, depending on ambient temperature and load. EcoMode™ is recommended for 90-95% of applications. Although both refrigeration systems are completely independent, EcoMode™ establishes an overlapping cycle to significantly reduce energy consumption while optimizing interior uniformity from top-to-bottom and front-to-back for protection of high value materials.

Power Consumption Benefits

Model Number	MDF-U500VXC		MDF-U700VXC	
Ambient Temperature	15°C	23°C	15°C	23°C
Normal Savings	-9.7%	-7.8%	-16.7%	-17.5%
EcoMode™ Savings	-16.8%	-14.1%	-18.5%	-18.3%

Control, Alarm and Monitoring



Integrated LCD Control with Graphical Display

The Twin Guard Series™ is managed by an integrated microprocessor controller with LCD information center to simplify all freezer functions. Uniform ultra-low temperature is achieved through a combination of performance systems supervised by the controller complete with alarm, programming and diagnostic protocols.

- The control panel is center mounted in the outer door for easy, eye-level access.
- Control and information center includes an intuitive pop-up menu, high resolution LCD for inputs, outputs and performance at-a-glance.
- Multi-point data logging offers a graphical display for temperature verification at-a-glance.
- Precise logic systems control and adjust to temperature setpoints and alarm parameters.
- Setpoint, alarm and programmable inputs are established through pop-up menus and function keys.
- Logged parameters can be exported to remote databases, off-site alarm or data capture systems through optional communications board module for compliance monitoring. An optional PC interface permits remote transmission; see Accessories.
- Standard parameters are factory-set for quick start-up, and all parameters can be changed as required.
- A remote alarm terminal mounted at the side of the cabinet can be connected to an external alarm system.
- Tactile feedback, touch pad data shift and entry keys simplify operation. All setpoint and alarm functions are entered through an intuitive keypad with visual prompts.
- Both refrigeration systems, including compressors and fan motors are background monitored for performance.
- Out-of-compliance notifications and warnings are automatically displayed with audible warnings when necessary.

Control, Alarm and Monitoring

Twin Guard Series™ -86°C Ultra-Low Freezers

Alarm & Safety Features	Events	Visual	Audible	Signal to Alarm Contact
Status Alert	Abnormal ambient (too high or too low), or abnormal freezer loading (too much warm product at one time).	Notification of error on graphical display	None	None
High Temperature (+40°C)*	Interior chamber warms beyond high temp setpoint		Intermittent tone. Time delay of 15 minutes after reaching alarm setpoint avoids false alarms. Intermittent tone.	Yes
Low Temperature (-40°C)*	Interior chamber warms beyond low temp setpoint			Yes
Power Failure	Loss of power		Intermittent Tone	N/A
Control Temperature Sensor Failure	Sensor probe disconnect short circuit or failure		Solid Tone	No
Auto Return	Touch key is not pressed for 90 minutes	Reverts to chamber temperature display	None	No
Door Alarm	Door open	Notification of error on graphical display	Solid tone sounds after 2 minutes	Yes

**New extended range is important for GxP applications to reduce potential incident event reporting.*

The integrated microprocessor control aggregates information from the entire system and compares to normal or setpoint values. Out-of-compliance events are announced by visual and audible warnings, and remote alarm when connected to an external system.

All performance attributes are displayed on a large, visually intuitive alpha-numeric display.

Internal temperature log files are expressed in graphical form over time.

Out-of-compliance events are announced by visual and audible warnings. Error codes quickly identify problem sources and permit fast diagnosis and remediation.

Twin Guard Series™ Features

Product Features

1. SANYO patented V.I.P. PLUS™ vacuum insulation panel cabinet construction for high insulating value and increased interior volume in the same footprint. The V.I.P. PLUS™ minimizes energy transfer to and from the ultra-low temperature interior. The composite construction, complete with reflective barrier film and structural closed-cell foam, is used on all walls and the outer door.

   This advanced insulation technology offers structural stability to eliminate distortion, and inhibits moisture accumulation that can lead to icing. Aggregate insulation efficiency minimizes compressor cycle run-time to lower energy costs.

2. Easy-In/Easy-Out™ door latch for smooth, one-handed operation, positive seal against gasket. Key lock provision standard.
3. Universal keyed door lock offers added security.
4. Integrated, microprocessor-based control system and LCD display information center includes comprehensive setpoint, alarm, monitoring, diagnostic and communications functions.
5. Circular-chart temperature recorder (optional) mounts easily in pre-engineered mounting space.
6. Insulated and gasketed inner doors seal inside to offer additional protection, improve uniformity. Inner door latches are standard.
7. New, air-cooled Super Condenser energy transfer technology maintains optimum condenser air flow and eliminates the need for an air filter or periodic cleaning and maintenance required by other manufacturers.
8. High impact, recessed casters and leveling feet simplify installation.
9. Seismic restraints secure cabinet to building superstructure to meet local codes.
10. New generation SANYO designed Cool Safe™ compressors are specifically designed for one-compressor, autocascade applications.
11. Twin Guard Series™ redundant refrigeration -86 Dual°Cool™ circuits offer two systems in one, each providing back-up for the other, or working together in EcoMode™ operation for additional energy savings.
12. Multiple access ports permit insertion of independent probes, instrumentation or liquid nitrogen or liquid CO_2 back-up injectors.
13. CFC-refrigerants are highly efficient, environmentally safe, non-ozone depleting.
14. Internal voltage and power management systems assure component protection over wide voltage ranges.
15. A vacuum relief valve is mounted in the left wall.
16. Remote alarm contacts and optional communication port available; see Accessories.
17. Vacuum relief valve

HIGH DENSITY
ULTRA-LOW STORAGE

SANYO V.I.P. PLUS™ Series freezers offer high-density storage that effectively reduces the volumetric unit costs of ultra-low storage.

HC FREE

Patented SANYO refrigerants are non-ozone depleting, non-flammable and environmentally safe in compliance with the Montreal Protocol.

Twin Guard Series™ Features

A vacuum relief valve is mounted in the left wall.

The SANYO ergonomic design features a high-security Easy-In/Easy-Out door latch designed for simplicity and safety. Also allows for one handed operation.

Twin Guard Series™ Features

Cabinet Construction

The Twin Guard Series™ cabinet features a patented SANYO V.I.P. PLUS™ vacuum insulated panel design which optimizes interior volume in the smallest footprint possible. The high-tech, composite thin-wall cellular construction combines the vacuum panel insulation with polyurethane foam for structural stability and high insulation values to minimize energy use.

- An Easy-In/Easy-Out outer door latch permits one-handed operation. A locking provision is designed for use with a conventional padlock.
- A universal keyed door lock prevents the outer door from opening.
- The outer door closes uniformly against a multi-point gasket to form a tight seal and prevent moisture migration leading to frost or ice build-up.
- The interior inventory system is based on a center shelf and two latching insulated inner doors designed for one-handed operation. Inner doors minimize exposure during routine door openings.
- The two primary compartments can be sub-divided by adjustable shelves to accommodate standard stainless steel inventory racks for 2″ or 3″ boxes (see Accessories).
- Rounded interior corners enhance temperature uniformity and simply cleaning and decontamination when required.

RoHS Compliance

In 2006, RoHS (Restriction of Hazardous Substances) legislation (EU Directive 2003/95/EU) became effective. RoHS relates to the restriction of hazardous substances and reductions in environmental pollution.

Through RoHS legislation the EU and other participating countries are banning toxic substances in electrical equipment such as lead, cadmium, mercury, chromium 6+, PBB and PBDE.

While compliance with this legislation has posed a significant challenge for SANYO, all SANYO ultra-low freezers and components are now 100% compliant to RoHS standards.

Electrical Standards

All SANYO products including ultra-low temperature freezers are tested and certified by an NRTL (National Recognized Testing Laboratory) to assure compliance with US and International standards for electrical safety prescribed in 29 CFR 1910.7(c).

Noise Reduction

Ultra-low freezers are often located within research and hospital laboratories or production facilities. Users prefer close proximity for easy access to valuable stored products.

If operating noise from refrigeration compressors is excessive, and/or compounded by installation of multiple freezers in adjacent locations, the working environment is severely compromised.

SANYO has included advanced noise abatement in all contemporary ultra-low freezers and noise reduction levels are well below those of competitive freezers. Data is available upon request.

MDF-U500VXC

MDF-U700VXC

Options & Accessories

Twin Guard Series™ Accessories

Accessory	Description	Catalog Number
Digital Temperature Recorder	Auxiliary Data Logger	HAMSTERDT2
Liquid CO_2 Back-Up System	Auxiliary tank back in event of power failure	CVK-UB2(I)
Liquid N_2 Back-Up System	Auxiliary tank back in event of power failure	CVK-UBN2
Chart Recorder	Circular Chart Temperature Recorder, 7 Day	MTR-C954
Chart Paper	6" Diameter, 7 Day Chart	C7100386REV
Inner Door Configurations	See icons and key to catalog numbers	MDF-5ID, MDF-7ID
Replacement Pen, Red	Felt tip pens, 6 per pack	R252
Replacement Pen, Blue	Felt tip pens, 6 per pack	R253

Rack Systems

SANYO freezers are available with a variety of inventory racks to meet specific applications. Freezers can be ordered with full-load inventory systems by selecting one catalog number. For individual racks, boxes and dividers see the Storage Capacity Chart.

SANYO's sliding drawer rack with fiberboard boxes, catalog Number SDR-624, shown here.

The Digital Temperature Recorder (optional)

The recorder mounts on the cabinet door and is programmable to capture and store non-corruptible data points for downloading to an independent data management system to meet criteria outlined in U.S. FDA21CFR Part II directives. An independent probe is placed in the interior chamber.

Manufactured by Elpro, Switzerland.

Inventory

LCO_2 Backup System **(CVK-UB2 [I])**

LN_2 Backup System **(CVK-UBN2)**

Circular Recorder **(MTR-C954)**

Strip Chart Recorder **(MTR-85H)**

Recorder Mounting Bracket **(MDF-S3085)** (for MTR-85H)

MDF-U500VXC
MDF-U700VXC

Twin Guard Series™ -86°C Ultra-Low Freezers

Description		
Model Number	MDF-U500VXC	MDF-U700VXC
Temperature Setpoint Range	-50°C to -86°C	
Design Cooling Performance -86 Dual°Cool (both compressors)	-86°C (ambient temperature 30°C)	
Single System Cooling Performance (Indefinite)	-86°C (ambient temperature 30°C)	

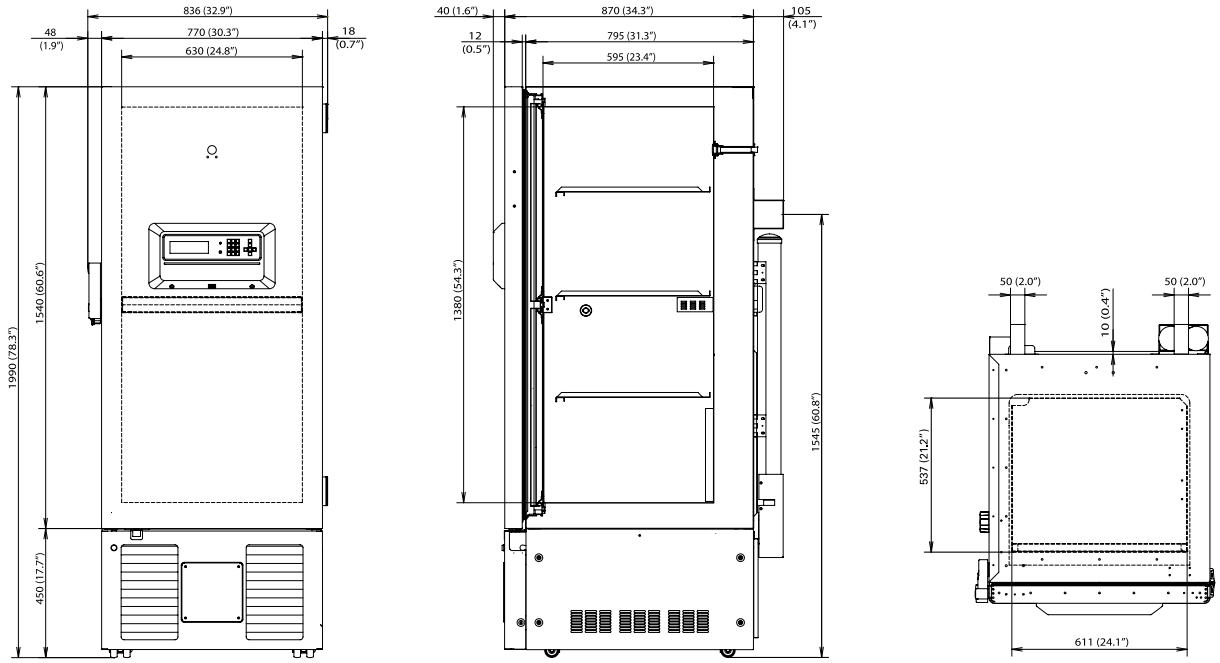
Cabinet Design and Construction		
Cabinet Insulation	Patented V.I.P. PLUS™ composite wall, energy savings	
Exterior Dimensions (w x f-b x h)	35.3" x 34.1" x 78.3" 770 x 870 x 1990 mm	39.8" x 34.3" x 79.1" 1010 x 870 x 2010 mm
Interior Dimensions (w x f-b x h)	25.6" x 23.6" x 54.3" 630 x 600 x 1380 mm	34.3" x 23.6" x 55.1" 870 x 600 x 1400 mm
Volume	18.3 cu.ft. 519 liters	25.7 cu.ft. 728 liters
Shelves	3, adjustable, stainless steel (4 compartments)	
Access Port	Diameter = 0.5"/17mm; 3 locations	
Vacuum Release Port	Standard, Manual	

Refrigeration System	
Refrigeration Technique	SANYO -86 Dual°Cool independent, redundant cooling systems with automatic switchover
Compressors	Per system: Single, hermetically-sealed 1100W SANYO Cool Safe compressor, air-cooled
Refrigerant	Environmentally safe HFC refrigerant
Air Exchange	Dual condenser fans with particulate trap; no filters are required
Cycle Options	Standard or energy-saving EcoMode™ operation

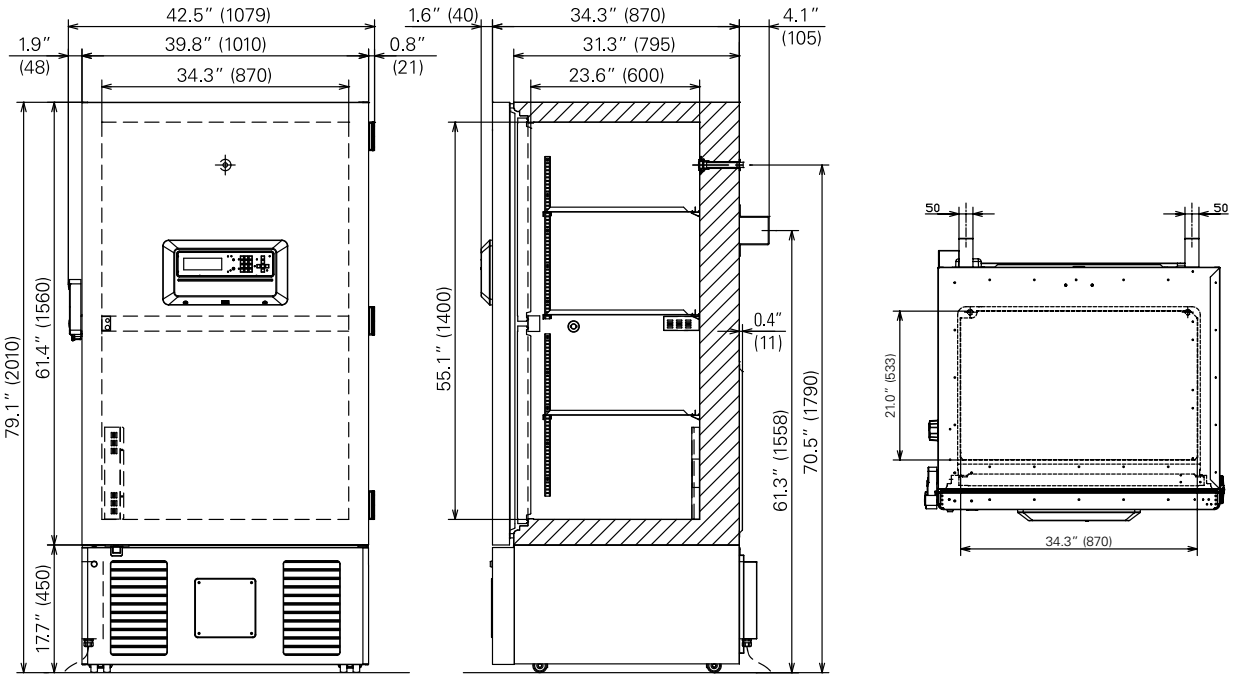
Controls, Alarm, Monitoring	
Controller	SANYO microprocessor-based, door-mounted control with graphical LCD information center
Data Management	Internal data log with log file memory
Communications	Data can be transmitted via RS485
Alarms	High/Low temperature, door ajar, power failure, remote alarm contact, part replacement notification, fan motor lock, individual cooling circuit check
Remote Alarm Contacts	Standard; normally open and normally closed, dry contacts
Electrical	208V-203V, AC, 60Hz, 1 phase, NEMA 6-15, 15 amp separate breaker recommended

Dimensional Drawings

MDF-U500VXC



MDF-U700VXC



Service and Technical Support

Unique SANYO Services

- On-site consultation
- Specialized documentation for each individual unit
- Customized testing procedures based on personalized customer requirements

SANYO Connect

SANYO's customer-driven biomedical service program guarantees local attention from qualified SANYO service representatives, whenever and wherever you need it.

- New Unit Installation and Training
- Preventative Maintenance
- Warranty and Non-Warranty Repairs
- Calibration/Validation Services
- Refurbishment and Reconditioning
- Customized Service and Warranty Programs
- In-Stock Parts for Immediate Delivery

Predelivery and On-Site Services

Predelivery services include factory acceptance testing, calibration, and temperature mapping. On-site services include installation qualification, operational qualification, performance qualification, calibration and temperature mapping.

Product conforms to RoHS (European Restriction of Hazardous Substance directives)

SANYO Electric Co.,Ltd., Biomedical Division, Gumma is certified for quality management system:ISO9001/medical devices quality management system:ISO13485/environmental management system:ISO14001

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