-86°C Ultra-Low Freezers

SANYO

A member of the Panasonic Group

MDF-U33V
MDF-U53VA
MDF-U56VC
MDF-U76VC

VIP® Series

The Industry's Most Complete Ultra-Low Storage Solution

GREEN product

Features:

- Industry leading -86°C preservation for uniformity, reliability and optimized footprint.
- New SANYO Cool Safe refrigeration system designed to deliver energy-saving, high performance cooling.

www.sanyobiomedical.com

My Life. My Work. My Choice.

General Features & Benefits

SANYO VIP® Series -86°C Freezers

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

VIP® 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	Specific to ultra-low applications. Reduces compressor temperatures internally and externally.	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 LED display provides a convenient user interface to setpoints, alarm parameters, internal diagnostics, communications and security.
Structural Enhancement	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, UL and other third-party standards and recommended practices.
Green Design Attributes	Integrates design, construction, refrigeration and operation functions into an environmentally 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 and inventory racks, while low noise operation permits a wider choice of installation locations.

VIP® Upright Freezer Selection

Model Number	Interior Volume	Exterior (w x f-b x h)	Area Footprint, Nominal	Fiberboard Boxes, 2" high (2ml) in SANYO Racks	Sample Vials, 2ml (2" box), 100-Cell Dividers	Electrical, 60Hz
MDF-U33V	11.8 cu.ft. 334 L	26.4" x 34.1" x 73.2" 670 x 867 x 1860 mm	6.25 sq.ft. 0.58 m^2	216	21,600	115V, AC, 15 amp
MDF-U53VA	18.3 cu.ft. 519 L	30.3" x 34.4" x 78.3" 770 x 870 x 1990 mm	7.24 sq.ft. 0.68 m^2	352	35,200	115V, AC, 20 amp
MDF-U56VC*	18.6 cu.ft. 526 L	30.3" x 34.4" x 78.3" 770 x 870 x 1990 mm	7.24 sq.ft. 0.68 m^2	384	38,400	208/230V, AC, 15 amp
MDF-U76VC	25.7 cu.ft. 728 L	39.8" x 34.4" x 78.3" 1010 x 870 x 1990 mm	9.51 sq.ft. 0.88 m^2	576	57,600	208/230V, AC, 15 amp

**MDF-U56VC available Fall 2011*

Integrated Solutions for Biological Safety, Security, Performance and Energy Savings

SANYO VIP® ultra-low freezers represent the industry's most complete combination of refrigeration, control, alarm, monitoring and accessibility for product safety at -86°C. Ideal for material storage in repositories, hospitals, clinics and medical research facilities, the VIP® Series is designed to reduce energy consumption.

VIP® Series ULT Freezers

SANYO VIP® Series -86ºC ultra-low temperature freezers maintain internal temperatures as low as -86°C (-123°F). All models use SANYO uniquely designed compressors for ultra-low temperature applications. Manufactured with high density foamed-in-place insulation, they are ideally suited for use in laboratories and hospitals for long-term preservation, specimens and components, as well as materials testing. Whatever your preservation needs are, SANYO provides the right equipment for the right application. SANYO preservation systems employ advanced technology to insure a high precision temperature environment.

Enhanced Performance, Energy Efficiency, and Reliability

SANYO VIP® Series upright freezers represent the industry's most advanced combination of cabinet design, electronics, refrigeration and critical components for enhanced security, better performance, product safety and cost effective operation at -86°C.

- The newly developed energy efficient refrigeration system and sound abatement feature minimizes intrusive operating noise.
- The newly developed back cover combined with new aerodynamically designed and placed components in the refrigeration compartment provide superior air flow to drastically reduce the stress to the freezer and contributing to excellent durability.
- Two independent and insulated inner doors ensure maximum interior chamber uniformity at all points in the chamber.

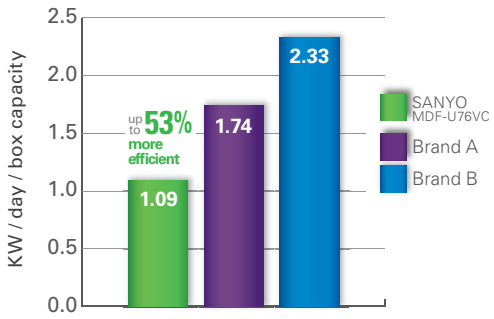
SANYO Heat Exchanger Design Increases Energy Efficiency[1]

Every traditional ultra-low freezer design utilizes a heat exchanger. By increasing the efficiency of the heat exchanger through an improved new design incorporating more surface area contact at critical points in the refrigeration system, we are able to improve the overall efficiency and reduce compressor running time. This along with other improvements to heat exchanger in the refrigeration system translates to a substantial increase in energy efficiency.

[1]Applies to models MDF-U53VA, MDF-U56VC, MDF-U76VC

MDF-U76VC

Power Consumption By Capacity (KW/day/box capacity)



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

SANYO Refrigeration Delivers Uniform Temperature

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

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

Patented VIP® PLUS Vacuum Insulation Panel[2]

Combination of multiple high-performance vacuum panels with newly developed high-density foam insulation achieves thin-wall profile for maximum interior volume in a compact footprint. Increased cooling capacity improves temperature recovery after door openings.

Inner Doors Improve Uniformity

Easy-In/Easy-Out SANYO Eagle inner door latches feature ergonomic design to seal firmly against the cabinet with one hand. High-strength, sealing, insulated inner doors help minimize change in interior temperatures during routine door openings.

Microprocessor

Comprehensive setpoint, alarm, monitoring and diagnostic functions supervised by SANYO-built microprocessor controller with digital display of all input/output functions.

[2]Applies to models MDF-U56VC, MDF-U76VC

VIP® Series Features

Product Features

1. Easy-In/Easy-Out door latch for smooth, one-handed operation, positive seal against gasket. Padlock provision standard.
2. Universal keyed door lock offers added security.
3. Integrated, microprocessor-based control system and LED display includes comprehensive setpoint, alarm, monitoring, diagnostic and communications functions.
4. Circular-chart temperature recorder (optional) mounts easily in pre-engineered mounting space.
5. Insulated and gasketed inner doors seal inside to offer additional protection and improve uniformity. Inner door latches are standard. Doors can be easily removed for defrosting.
6. Front access to washable, electrostatic condenser filter for routine condenser air filter cleaning.
7. High impact, recessed casters and leveling feet simplify installation.
8. New generation SANYO designed Cool Safe compressors are specifically designed for low temperature applications.
9. Multiple access ports permit insertion of independent probes, instrumentation or liquid N_2 or liquid CO_2 back-up injectors.
10. Commercially available HFC-refrigerants are highly efficient, environmentally safe and non-ozone depleting.
11. Internal voltage and power management systems assure component protection over wide voltage ranges.
12. Remote alarm contacts and optional communication port available; see Accessories.
13. Vacuum relief valve (Available on the MDF-U56VC and MDF-U76VC)

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.

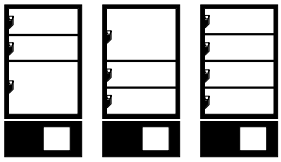
VIP® Series Design

Cabinet Construction

The cabinet features a patented SANYO VIP® 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.

- 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. Door gaskets are multi-point compression for a long-lasting, tight seal around the periphery of the cabinet thermal break.
- An Easy-In/Easy-Out outer door latch permits one-handed operation.
- A locking provision is designed for use with a conventional padlock.
- The interior inventory system is based on a center shelf and two latching insulated inner doors designed for one-handed operation.
- Insulated inner doors are steel-framed, high-impact polyurethane with newly developed foamed-in-place insulation and minimize exposure during routine door openings.
- Dual inner door configuration (standard), with optional half-inner door accessories available for field-installation. For a four-door configuration order two sets of half inner doors.
- A universal keyed door lock prevents the outer door from opening.
- 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). Shelf brackets are incrementally adjustable.
- Rounded interior corners enhance temperature uniformity and simply cleaning and decontamination when required.
- Multiple access ports permit use of back-up injection tubes, probes, leads or instrumentation.

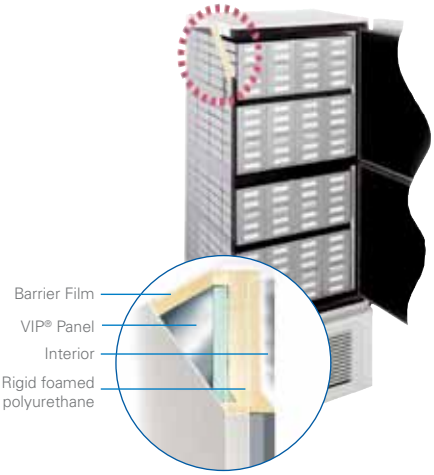
Superior Footprint



The center shelf forms the base of a convenient and flexible inventory system using conventional racks with boxes, microplates or other storage protocols. Stainless steel shelf and insulated inner-door combinations create choices of interior compartments that can be arranged for long-term, low access biologicals or short-term, frequently accessed material. (Inner door option can affect overall uniformity)

- Easy-In/Easy Out SANYO Eagle inner door latches feature ergonomic design to seal firmly against the cabinet with one hand.
- High strength, insulated inner doors help minimize change in interior temperatures during routine door openings.
- Additional half-door configuration permits additional inner door orientations. Half doors are available in pairs only. See Accessories.

SANYO Inner Door Latches provide single-hand access. The outer door latch closes smoothly with a single-hand action over a cam action bearing.



Patented VIP® PLUS Insulation[3]

The SANYO Patented VIP® Vacuum Insulation Panel thin-wall composite is a high-efficiency design that yields more interior storage volume in a conventional freezer footprint. The VIP® 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.

[3]Applies to models MDF-U56VC, MDF-U76VC

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

HIGH DENSITY
ULTRA-LOW STORAGE

SANYO VIP® PLUS Series freezers offer high-density storage that effectively reduces the volumetric unit costs of ultra-low storage.

VIP® Series -86°C Freezer Energy Efficient Cascade Cooling System

One of the most important concepts in designing a superior energy saving ultra-low freezer is how efficiently heat is exchanged between the high and low stage circuits. By providing optimum heat exchange pathways in the design, it not only increases efficiency of the system, leading to greater energy savings, but it will also have an effect of reducing stress on the compressors, leading to greater overall system reliability. SANYO's new cap tube heat exchanger is but the latest step in increasing the available heat exchange areas in the system. This patent pending innovation drastically increases the efficiency of the entire system. The end result is less energy consumption, while improving the overall efficiency of the freezer.

Low Stage Capillary Tube. *Liquid refrigerant under pressure is passed through the capillary tube where it flash evaporates in the low stage evaporator to absorb energy (heat) from the product stored in the freezer.*

Freezer Cabinet with Evaporator. *The evaporator coil is strategically wrapped around to provide optimum temperature uniformity within the composite wall of vacuum insulation panels and conventional foamed-in-place urethane insulation.*

NEW Capillary Tube (Patent Pending). *Low stage capillary tube heat exchanger provides optimum heat transfer between high and low temperature points in the low stage leading to greater energy efficiency.*

Low Stage Refrigerant. *Commonly available worldwide, R508.*

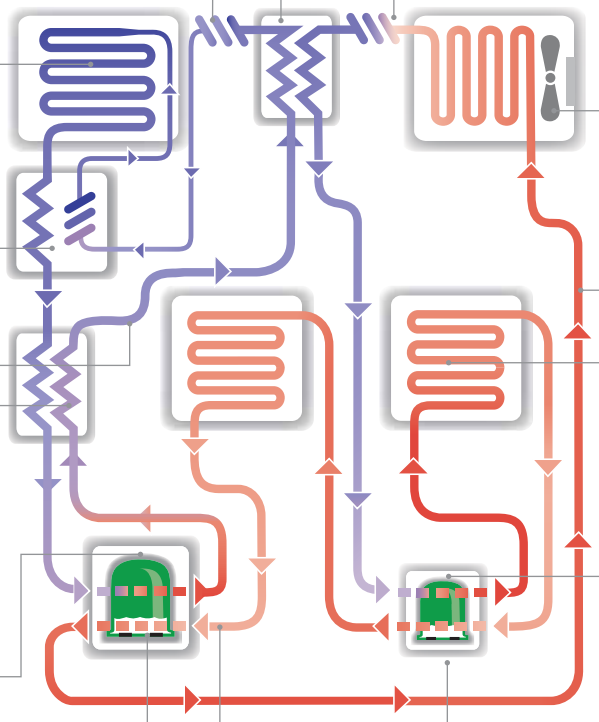
Low Stage Heat Exchanger. *Heat is efficiently transferred from the low stage to the high stage.*

Low Stage Compressor. *The compressor pumps refrigerant through the low stage circuit.*

Low Stage Oil Heat Exchanger. *SANYO exclusive high stage refrigerant passes through the low-stage oil sump to cool lubricating oil resulting in high-stage refrigerant being used to increase the durability of the low stage compressor.*

Air Cooled Pre-Condenser. *Removes energy (heat) from the high stage refrigerant enroute to the low stage compressor.*

Interstage Heat Exchanger. *To increase overall system efficiency heat energy is transferred to the high stage circuit.*



High Stage Capillary Tube. *Liquid refrigerant under pressure is passed through the capillary tube where it flash evaporates in the interstage heat exchanger to absorb energy (heat) from the low stage refrigerant circuit.*

Main Condenser and Motor/Fan Assembly. *SANYO's exclusive triple pass forced air condenser increases overall system efficiency by providing maximum surface area for heat retection*

High Stage Refrigerant. *Commonly available worldwide. Selected for optimum cooling performance in compliance with international environmental protection laws.*

Air Cooled Pre-Condenser. *Removes energy (heat) from the high stage refrigerant enroute to the high stage oil reservoir.*

High Stage Compressor. *The compressor pumps refrigerant through the high stage circuit.*

High Stage Oil Heat Exchanger. *SANYO exclusive high stage refrigerant passes through the high stage oil to cool lubricating oil enroute to the low stage compressor through the air-cooled pre-condenser. Thereby increasing the reliability of the high stage compressor.*

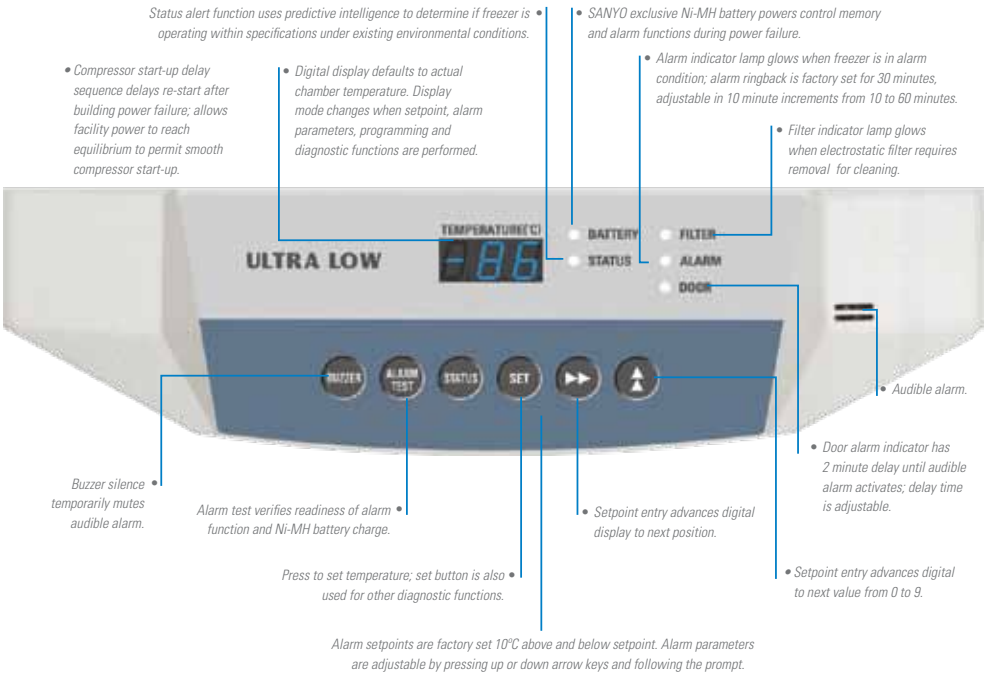
Instrumentation (Not Shown). *Temperature and pressure sensors throughout the high and low stage circuits transmit information to the SANYO Status 3 central controller for operation, monitoring, interpretation and component protection.*

VIP® Series Control, Alarm & Monitoring

The SANYO microprocessor control system is secure, easy to use and comprehensive. Setpoint, alarm parameters and self-diagnostic functions are accessed through a tamper-resistant keypad protocol. Control inputs are managed with convenient push-ad buttons on a unitized, sealed control overlay. The panel is door-mounted and angled for easy access.

VIP® Series

Alarm Safety Features	Event	Visual	Audible	Signal to Alarm Contact
Status Alert	Abnormal ambient (too high or too low), or abnormal freezer loading (too much warm product at once)	STATUS lamp flashes	None	None
High Temperature	Interior chamber warms beyond high temp setpoint	ALARM lamp flashes; digital display flashes actual chamber temperature	Intermittent tone; time delay of 15 min. after reaching alarm setpoint avoids false alarms. Intermittent tone	Yes
Low Temperature	Interior chamber cools beyond low temp setpoint			Yes
Power Failure	Loss of Power		Intermittent tone	Yes
Control Temperature Sensor Failure	Loss of Power	ALARM lamp flashes	Solid tone	No
Filter Sensor Failure	Loss of Power			No
Interstage Refrigeration Sensor	Loss of Power			No
Filter Check	Clogged or dusty condenser filter	FILTER lamp flashes	None	No
Auto Return	Touch key is not pressed for 90 seconds	Reverts to chamber temperature display		No
Door Alarm	Door Open	OPEN lamp on	Solid tone sounds after	Yes



VIP® 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 VIP® Series freezers offer significant benefits through a balance of refrigeration power, cabinet construction and intelligent control over all functions.

SANYO VIP® 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.

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.

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.

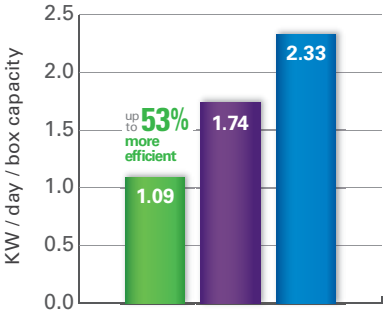
HCFC Free Refrigerants

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 R404 refrigerant is available to refrigeration professionals on the open market as well.

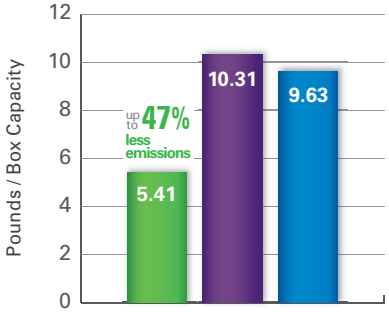
VIP® Series Comparative Energy Performance

Power Consumption By Capacity (KW/day/box capacity)



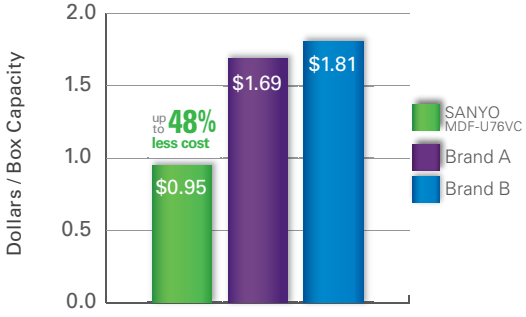
SANYO freezers provide reduced operational cost for highly efficient sample storage.*

Annual CO_2 Emissions by Box Capacity



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

Total Annual Operating Cost for Operational and Cooling 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).*

VIP® Series Green Features

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.

Inventory Management

The concept of High Density Storage is enabled by advances in SANYO Cool Safe compressor design. The cost per 2" box of interior storage space is significantly lower in a SANYO ultra-low freezer, generating immediate return on investment based on first costs, operating costs and maintenance costs over time.

Additionally, 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.

Because benefits of the SANYO Cool Safe compressor design extend to evaporator tubing surrounding the interior chamber, and the interior chamber is part of the thin-wall composite based on the patented VIP® vacuum insulation panel cabinet, SANYO can offer more usable storage volume within the same sq.ft. of floor space than competitive models.

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.

Water Cooled Option (MDF-WCL)

Now a water cooled condenser option is available for facilities equipped with water recirculation cooling systems. This option utilizes the cascade refrigeration design to reuse the energy produced by an ultra low freezer while delivering energy-savings and high performance cooling.

Ideal for material storage in repositories, hospitals, clinics and medical research facilities, the water cooled system is designed to significantly reduce energy consumption.

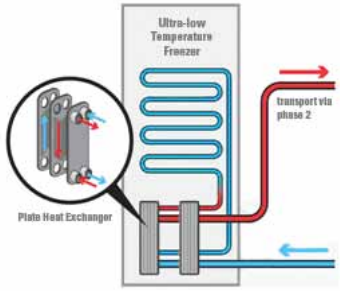
- Energy efficiency
- Cost saving
- Re-use of energy
- Faster recovery time
- Improved sample security

Water Cooled Option (MDF-WCL) How It Works

Phase 1
Heat generated from the freezer compartment is transferred to a water circuit using a plate heat exchanger

Phase 2
Transport the absorbed heat/energy

Phase 3
Able to re-use heat/energy on other heat/energy demanding systems.



Applies to MDF-U33V, MDF-U53VA, MDF-U56VC, MDF-U76VC

VIP® Series Door Configuration

Maximum Sample Storage Capacity

Description				
Model Number	MDF-U33V	MDF-U53VA	MDF-U56VC	MDF-U76VC
Rack Positions, Standard Configuration	 3 Columns 4 Rows	 4 Columns 4 Rows	 4 Columns 4 Rows	 6 Columns 4 Rows
Fiberboard Boxes, 2" high (2ml) in SANYO Racks	216	352	384	576
Sample Vials, 2ml (2" box), 100-Cell Dividers	21,600	35,200	38,400	57,600
Fiberboard Boxes, 3" high (4ml) in SANYO Racks	144	224	224	384
Sample Vials, 4ml (3" box), 100-Cell Dividers	14,400	22,400	22,400	38,400
Standard Microplate with Foil Tape, in Racks	1,298	2,112	2,112	3,456
Standard Microplate with Cover Lid, in Racks	1,008	1,632	1,632	2,596

Fully Loaded Inventory Systems	Catalog Number	Catalog Number	Catalog Number	Catalog Number
Maximum Vial Capacity Includes full quantity of storage racks, boxes and dividers				
Sliding Drawer Inventory Racks 2" High Boxes (2ml Sample) 100-Cell Divider	(6) SDR-424-2S100 (6) SDR-524-2S100	(8) SDR-624-2S100 (8) SDR-524-2S100	(8) SDR-434-2S100 (8) SDR-524-2S100	(24) SDR-624-2S100
Sliding Drawer Inventory Racks, 3" High Boxes (4ml Sample) 100-Cell Divider	(12) SDR-334-3S100	(8) SDR-434-3S100 (8) SDR-334-3S100	(8) SDR-434-3S100 (8) SDR-524-3S100	(24) SDR-434-3S100

Individual Storage Rack System	Catalog Number	Catalog Number	Catalog Number	Catalog Number
Sliding Drawer Sample Racks for Fiberboard Storage Boxes (Boxes Not Included)				
Sliding Drawer Rack, for 2" high (2ml sample) boxes; holds 6 boxes high x 4 boxes deep		SDR-624-N Capacity 8	SDR-624-N Capacity 16	SDR-624-N Capacity 24
Sliding Drawer Rack, for 2" high (2ml sample) boxes; holds 5 boxes high x 4 boxes deep	SDR-524-N Capacity 6	SDR-524-N Capacity 8		
Sliding Drawer Rack, for 2" high (2ml sample) boxes; holds 4 boxes high x 4 boxes deep	SDR-424-N Capacity 6			
Sliding Drawer Rack, for 3" high (4ml sample) boxes; holds 4 boxes high x 4 boxes deep		SDR-434-N Capcity 8	SDR-434-N Capcity 8	SDR-434-N Capacity 24
Sliding Drawer Rack, for 3" high (4ml sample) boxes; holds 3 boxes high x 4 boxes deep	SDR-334-N Capacity 12	SDR-334-N Capacity 8	SDR-334-N Capacity 8	
Standard Cellular Inventory Racks for Fiberboard Storage Boxes (Boxes Not Included)				
Inventory Rack for 2" (2ml sample) boxes; 6 boxes high x 4 boxes deep		SUR-624-N Capacity 8	SUR-624-N Capacity 16	SUR-624-N Capacity 24
Inventory Rack for 2" (2ml sample) boxes; 5 boxes high x 4 boxes deep	SUR-524-N Capacity 6	SUR-524-N Capacity 8		
Inventory Rack for 2" (2ml sample) boxes; 4 boxes high x 4 boxes deep	SUR-424-N Capacity 6			
Inventory Rack for 3" (4ml sample) boxes; 4 boxes high x 4 boxes deep		SUR-434-N Capacity 8	SUR-434-N Capacity 8	SUR-434-N Capacity 24
Inventory Rack for 3" (4ml sample) boxes; 3 boxes high x 4 boxes deep	SUR-334-N Capacity 12	SUR-334-N Capacity 8	SUR-334-N Capacity 8	

VIP® Series Door Configuration

Maximum Sample Storage Capacity

Description				
Model Number	MDF-U33V	MDF-U53VA	MDF-U56VC	MDF-U76VC
Individual Storage Rack System	**Catalog Number**	**Catalog Number**	**Catalog Number**	**Catalog Number**
Microplate Storage Racks (Plates Not Included)				
Inventory Rack for Microplates, with locking rod; 108 Standard Plates with Cover Lid Per Rack	15 amp	20 amp	20 amp	15 amp
Inventory Rack for Microplates, with locking rod; 96 Standard Plates with Cover Lid Per Rack		SUMPR-611-LR Capacity 8	SUMPR-611-LR Capacity 8	
Inventory Rack for Microplates, with locking rod; 60 Standard Plates with Cover Lid Per Rack	SUMPR-616-LR Capacity 6			
Fiberboard Storage Boxes and Dividers				
Inventory Box, 2" high (2ml sample) with 100-Cell Divider	B2C-S100	B2C-S100	B2C-S100	B2C-S100
Inventory Box, 3" high (4ml sample) with 100-Cell Divider	B3C-S100	B3C-S100	B3C-S100	B3C-S100
Inventory Box, 2" high (2ml sample) without Divider	B2C	B2C	B2C	B2C
Inventory Box, 3" high (4ml sample) without Divider	B3C	B3C	B3C	B3C
Box Divider, 81-Cell	D81	D81	D81	D81
Box Divider, 64-Cell	D64	D64	D64	D64

Options & Accessories

Water Cooled Option Features	Description
Water Pressure & Temperature	Maximum Water Pressure: 150psig, Minimum Water Pressure Differential: 15psig, Maximum Water Temperature: 30°C
Connections	Typically ½" compression fittings on inlet and outlet but can be customized for customer needs
Required Water Flow Rate (Maximum)	Tower Water: 11.4 liters per minute City Water: 4 liters per minute (City water requires drain)
Installation	Qualified technician required at time of installation to balance water flow requirements. Efficiencies can be easily obtained regarding water usage by balancing the water flow to optimum usage and freezer efficiency dependent upon the specific site installation

Accessory	Description	Catalog Number
Half Inner Door	Set of two; Field Installed; replaces half inner door; for a four-door configuration order two sets	MDF-5ID (MDF-U53VA), MDF-5ID1 (MDFU-56VC), MDF-7ID1 (MDF-U76VC)
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
Replacement Pen, Red	Felt tip pens, 6 per pack	R252
Replacement Pen, Blue	Felt tip pens, 6 per pack	R253

VIP® Series Specifications

Description				
Model Number	MDF-U33V	MDF-U53VA	MDF-U56VC	MDF-U76VC
Interior Volume	11.8 cu.ft. 334 L	18.3 cu.ft. 519 L	18.6 cu.ft. 526 L	25.7 cu.ft. 728 L
Area Footprint, Nominal	6.25 sq.ft. 0.58 m^2	7.24 sq.ft. 0.68 m^2	7.24 sq.ft. 0.68 m^2	9.51 sq.ft. 0.88 m^2
Electrical, 60 Hz	115V, AC, 15 amp	115V, AC, 15 amp	208/230V, AC, 15 amp	208/230V, AC, 15 amp

Patented VIP® Construction	
Insulated Inner Door	Steel-framed, high impact plastic with foam-in place insulation
Inner Door Configuration	Two
Door Gaskets	Multi-point compression gaskets
Condenser Filter, Easy Cleaning	Electrostatic filter standard, front accessible for easy access, no tools required
Rounded Interior Corners	Simplify Cleaning
Shelf Brackets	Incrementally adjustable
Casters	High-impact multi-wheel
Seismic Restraints	Standard; hard connection to facility wall
Access Ports	Multiple ports allow use of injection tubes, probes, leads, instrumentation

Dimensions & Weight				
Interior (w x f-b x h)	19.3" x 23.6" x 44.9" 490 x 600 x 1140 mm	24.8" x 23.6" x 54.3" 630 x 600 x 1380 mm	24.8" x 23.6" x 55.1" 630 x 600 x 1400 mm	34.2" x 23.6" x 55.1" 870 x 600 x 1400 mm
Exterior (w x f-b x h)	26.4" x 34.1" x 73.2" 670 x 867 x 1860 mm	30.3" x 34.4" x 78.3" 770 x 870 x 1990 mm	30.3" x 34.4" x 78.3" 770 x 870 x 1990 mm	39.8" x 34.4" x 78.3" 1010 x 870 x 1990 mm
Net Weight, Empty	562 lbs 255 kg	660 lbs 299 kg	672 lbs 305 kg	805 lbs 365 kg

Refrigeration System, HFC Refrigerants, SANYO Cool Safe High Performance Compressors				
High Stage	1 HP	½ HP	1½ HP	1½ HP
Low Stage	¾ HP	1 HP	1½ HP	1½ HP
Voltage Booster, Built-In	Not Available	Not Available	Standard	Standard
Sound Abatement	Standard	Standard	Standard	Standard

Refrigeration System, HFC Refrigerants, SANYO Cool Safe High Performance Compressors				
Power, AC, 1 Phase	115V	115V	208-230V	208-230V
Recommended Breaker, Dedicated	15 amp	20 amp	15 amp	15 amp
NEMA Plug / Receptacle	5-15P/5-15R 	5-20P/5-20R 	5-15P/5-15R 	5-15P/5-15R 

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