

**V.I.P.® Series -86°C Ultra Low Freezers**

MDF-U33V  
MDF-U52VA  
MDF-U53VC  
MDF-U73VC



Ideally suited for ultra low storage solutions and long term preservation of biologics, reagents, specimens, components and in testing of various types. SANYO ultra low freezers provide energy savings while minimizing carbon footprint throughout the laboratory without compromising performance.

Model: MDF-U73VC

# The Integrated Solutions to Ultra Low Temperature Storage

V.I.P.® Upright Freezer Selection	MDF-U33V	MDF-U52VA	MDF-U53VC	MDF-U73VC
Temperature Range	-50°C to -86°C	-50°C to -86°C	-50°C to -86°C	-50°C to -86°C
Interior Volume	12 cu.ft./334 liters	18 cu.ft./518 liters	18 cu.ft./518 liters	26 cu.ft./727 liters
Area Footprint, Nominal	6.25 sq.ft./0.58m <sup>2</sup>	7.24 sq.ft./0.68m <sup>2</sup>	7.24 sq.ft./0.68m <sup>2</sup>	9.51 sq.ft./0.88m <sup>2</sup>
Electrical, 60Hz	115V, AC 15amp	115V, AC 20amp	208-230V, AC 15amp	208-230V, AC 15amp

## Enhanced Performance and Reliability

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

## Stronger Security with Two Levels of Access Restriction

As government and institutional safety guidelines become more aggressive in the wake of global terrorism threats, SANYO products help laboratory managers and clinical investigators comply with emerging rules for access and accountability of stored products. SANYO offers many security features, both standard and optional, to meet a range of inventory access restrictions.

- The smooth operating, Easy-In / Easy Out™ outer door latch is designed to be secured with a conventional padlock.
- A universal keyed door lock prevents the outer door from opening.



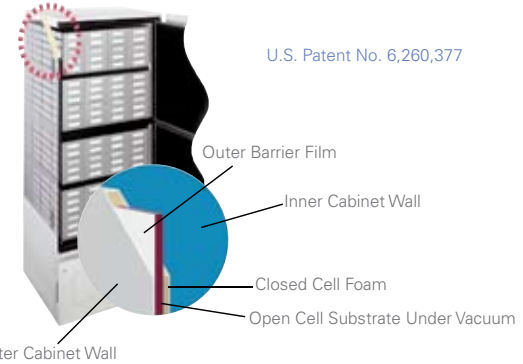
The SANYO ergonomic design features Easy-In / Easy Out™ door latches that close securely with less power.

## Patented V.I.P.® Insulation Increases Interior Volume by as Much as 25%

SANYO patented V.I.P. Vacuum Insulation Panel technology and high-tech, thin profile cabinet walls increase interior volume by as much as 25% for high density storage in a minimal cabinet footprint. Cellular wall construction combines vacuum insulation

with polyurethane foam for structural stability and highest insulation values while reducing wall thickness by as much as 50% over conventional methods.

SANYO patented V.I.P.® vacuum panels are formed individually into a unitized composite of panel sections, sealed with reflective barrier film, arranged within the steel inner and outer walls, then pressure laminated with high-density, closed-cell injected foam to form this high technology freezer.



U.S. Patent No. 6,260,377

## Inner Doors Improve Uniformity

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.

- 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.
- Two inner doors are standard, creating two compartments that can be sub-divided with interior shelves.
- Multiple inner door configurations available on MDF-U53VC and MDF-U73VC models permit creation of additional compartments.



New SANYO Eagle™ inner door latches provide single-hand access. The outer door latch closes smoothly with a single-hand action over a cam action bearing. The door can be secured with an independent padlock provided by customer.

## SANYO V.I.P. Ultra Low Freezers are GREEN

As part of our global commitment to help the environment, SANYO took the initiative to revamp and redesign newer refrigeration systems that resulted in lower operating costs and efficiency (Chart 1). SANYO ultra low freezers provide energy savings while minimizing carbon footprint throughout the laboratory without compromising performance (Chart 2).

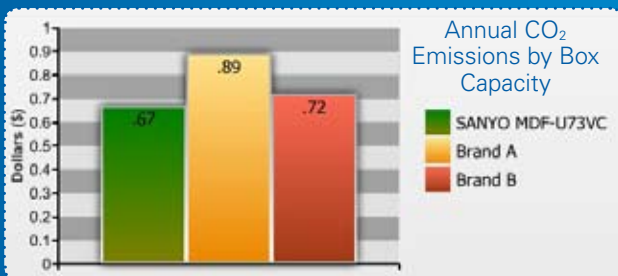


Chart 1 - SANYO Freezers help the environment by reducing carbon footprint.\*

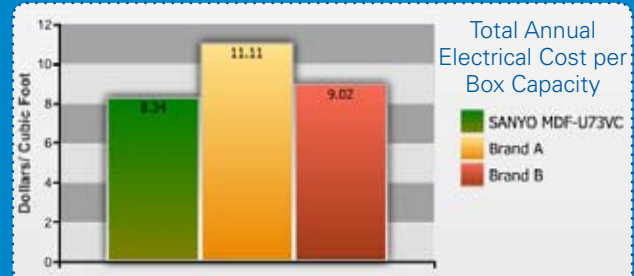


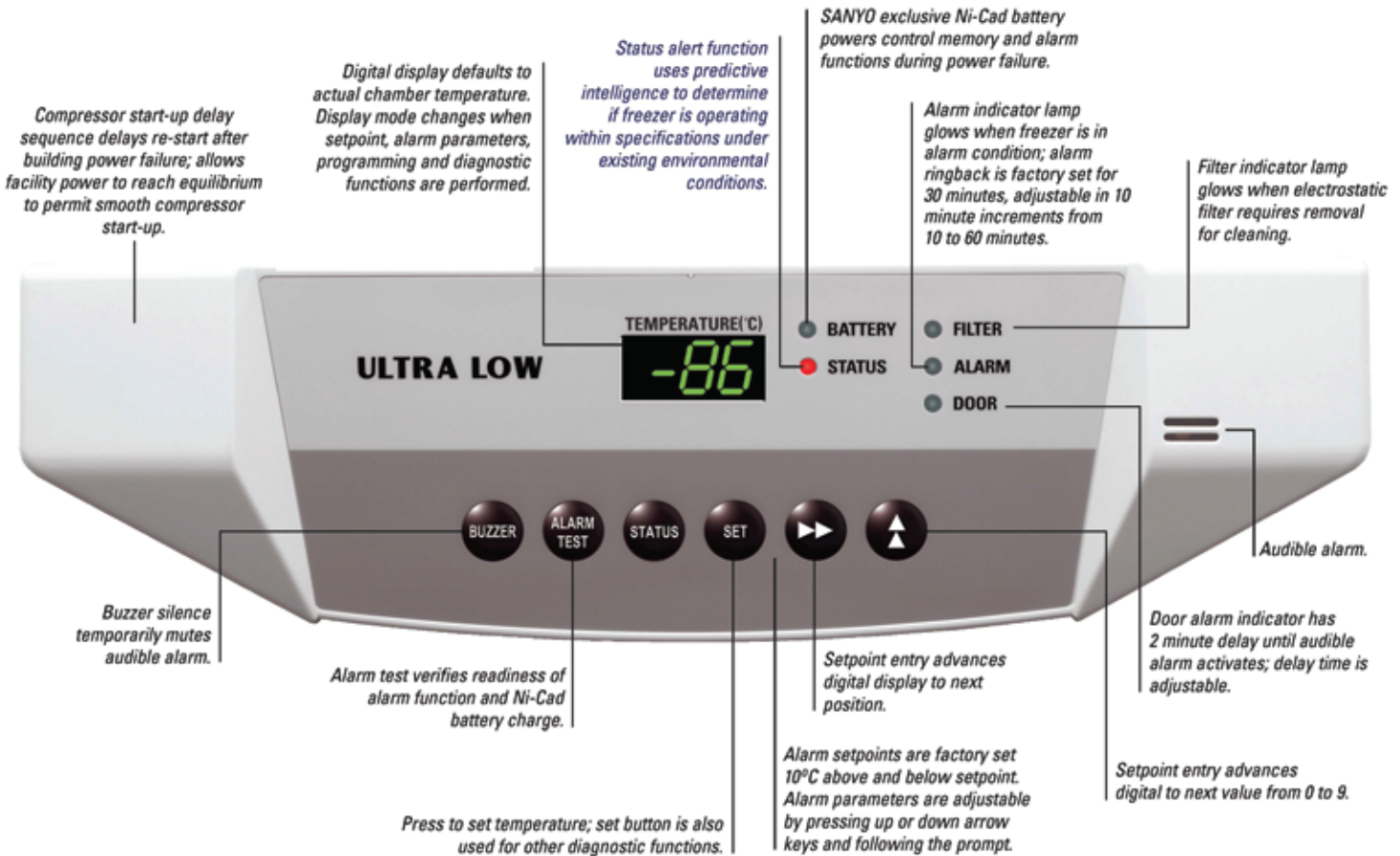
Chart 2 - SANYO Freezers emit less heat into the laboratory, minimizing air conditioning costs.\*

### SANYO GREEN Benefits:

- Minimize carbon footprint with less impact on the environment.
- Maximized lab space with smaller footprint for ultra high density storage.
- Reduced operational costs through high storage volume efficiency.
- Minimized HVAC loads and air handling requirements in facilities.
- Emits less heat into the laboratory environment, minimizing air conditioning costs.

# Microprocessor Controls




The SANYO microcompressor 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-pad buttons on a unitized, sealed control overlay. The panel is door-mounted and angled for easy access. (see diagram below)



Alarm and 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 temp	Intermittent tone; time delay of 15 minutes after reaching alarm setpoint avoids false alarms	Yes
Low Temperature	Interior chamber cools beyond low temp setpoint		Intermittent tone; time	
Power Failure	Loss of Power		Intermittent tone	
Control Temperature Sensore Failure	Sensor probe disconnect, short-circuit or failure	ALARM lamp flashes	Solid tone	No
Filter Sensor Failure				
Interstage Refrigeration Sensor Failure				
Filter Check	Clogged or dusty condenser filter	FILTER lamp flashes	None	No
AutoReturn	Touch key is not pressed for 90 seconds	Reverts to chamber temp display		
Door Alarm	Door Open	OPEN lamp on	Solid tone sounds after 2 minutes (adjustable)	Yes

# Storage Capacity



Maximum Sample Storage Capacity	MDF-U33V	MDF-U52VA MDF-U53VC	MDF-U73VC
<b>Rack Positions, Standard Configuration</b>	 3 columns 4 rows	 4 columns 4 rows	 6 columns 4 rows
Fiberboard Boxes, 2" high (2ml) in SANYO racks	216	352	576
Sample Vials, 2ml (2" box), 100-Cell Dividers	21,600	35,200	57,600
Fiberboard Boxes, 3" high (4ml) in SANYO Racks	144	224	384
Sample Vials, 4ml (3" box), 100-Cell Dividers	14,400	22,400	38,400
Standard Microplate with Foil Tape, in Racks	1296	2112	3456
Standard Microplate with Cover Lid, in Racks	1008	1632	2596

Note: Maximum storage volume varies according to storage vessel, vial configuration, preservation protocol, laboratory technique and user preference. Contact SANYO for detailed information on inventory racks, boxes and storage options.



Fully Loaded Inventory Systems	Catalog No	Catalog No	Catalog No
<b>Maximum Vial Capacity</b> 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-524-8S100	(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-524-3S100	(24) SDR-434-3S100

Individual Storage Rack Systems	Catalog No	Catalog No	Catalog No
<b>Sliding Drawer Sample Racks For Fiberboard Storage Boxes (Boxes Not Included)</b>			
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 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 Capacity 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	

Standard Cellular Inventory Racks for Fiberboard Storage Boxes (Boxes Not Included)	Catalog No	Catalog No	Catalog No
Inventory Rack for 2" (2ml sample) boxes; 6 boxes high x 4 boxes deep		SUR-624-N * Capacity 8	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 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	

Microplate Storage Racks (Plates Not Included)	Catalog No	Catalog No	Catalog No
Inventory Rack for microplates, with locking rod; 108 standard plates with cover lid per rack	SUMPR-612-LR Capacity 6	SUMPR-612-LR Capacity 8	SUMPR-612-LR Capacity 24
Inventory Rack for microplates, with locking rod; 96 standard plates with cover lid per rack		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	Catalog No	Catalog No	Catalog No
Inventory Box, 2" high (2ml sample) with 100-Cell Divider	B2C-S100	B2C-S100	B2C-S100
Inventory Box, 3" high (4ml sample) with 100-Cell Divider	B3C-S100	B3C-S100	B3C-S100
Inventory Box, 2" high (2ml sample) Without Divider	B2C	B2C	B2C
Inventory Box, 3" high (4ml sample) Without Divider	B3C	B3C	B3C
Box Divider, 81-Cell	D81	D81	D81
Box Divider, 64-Cell	D64	D64	D64

## 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.

- Interior design with insulated inner doors maintains maximum top-to-bottom temperature uniformity at all shelf levels.
- Increased 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.



SANYO is a pioneer in development of consumer products worldwide. As a result, SANYO Biomedical products include many innovative features such as patented vacuum insulation panels, keyless entry systems, quiet-running refrigeration compressors and intuitive microprocessor electronics available through our exclusive Vertical Component Integration program. This powerful corporate technology transfer capability, plus modern robotic manufacturing and quality assurance processes, guarantees that only the very best components are used in each SANYO product.



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

\* SUR-624-N and SDR-625-N racks will accommodate only fiberboard boxes.



# V.I.P.<sup>®</sup> Series Features



**1.** SANYO patented V.I.P. Vacuum Insulation Panel cabinet construction offers superior insulation with maximum use of interior space.

**2.** Easy-In / Easy Out™ outer door latch closes smoothly with a single-hand action over a cam action bearing; door can be secured with independent padlock provided by customer.

**3.** Universal keyed door lock provides additional level of security.

**4.** Microprocessor-based controller includes comprehensive setpoint, alarm, monitoring and diagnostic functions.

**5.** Remote alarm contacts can be connected to independent monitoring system.

**6.** Circular chart temperature recorder (optional) installs easily in pre-engineered mounting space.

**7.** Insulated inner doors help maintain interior temperature during routine openings. Two inner doors, shown, are standard. Multiple inner door configurations for flexible storage options are available; see accessories.

**8.** Easy-In / Easy Out™ SANYO Eagle™ inner door latches feature ergonomic design to close firmly with one hand.

**9.** Front access to washable, electrostatic condenser filter for routine condenser air filter cleaning.

**10.** High impact recessed casters simplify installation.

**11.** Seismic restraints secure cabinet to building superstructure to meet local codes.

**12.** SANYO designed compressors specifically designed for low temperature use offer maximum reliability.

**13.** Multiple access ports permit independent probes, instrumentation or liquid CO<sub>2</sub> back-up system inject tubes.

**14.** Environmentally safe CFC/HCFC-free refrigerants.

**15.** Internal voltage and power management systems assure component protection and best operation efficiencies.



*The optional Digital Temperature Recorder\* mounts on the cabinet door. The recorder is programmable to capture and store non-corruptible data points for downloading to an independent data management system to meet criteria outline in U.S. FDA 21 CFR Part II directives. An independent probe is placed in the chamber interior.*

*\*Manufactured by Elpro, Switzerland*

# Specifications

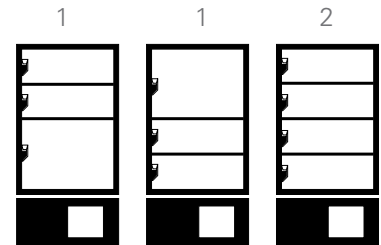


## Patented V.I.P.<sup>®</sup> Cabinet Construction

<b>Insulated Inner Door</b>	Steel-framed, high impact plastic with foam-in place insulation
<b>Inner Door Configuration, Standard</b>	two
<b>Door Gaskets</b>	multi-point compression gaskets
<b>Condenser Filter, Easy Cleaning</b>	electrostatic filter standard, front accessible for easy access, no tools required
<b>Rounded Interior Corners</b>	simplify cleaning
<b>Shelf Brackets</b>	incrementally adjustable
<b>Casters</b>	high-impact multi-wheel
<b>Seismic Restraints</b>	standard; hard connection to facility wall
<b>Access Ports</b>	multiple ports allow use of injection tubs, probes, leads, instrumentation

All V.I.P.<sup>®</sup> freezers include two inner doors, standard. Easy In/ Easy Out inner doors are available in half sets of two, permitting partitioning of interior. Two smaller doors per set. For four-door configuration order two sets. Catalog No. MDF-7ID for MDF-U73VC, MDF-5ID for MDF-U53VC/52VA

Quantity Required:



## General Specifications

	MDF-U33V	MDF-U52VA/U53VA	MDF-U53VC	MDF-U73VC
Temperature Range (Ambient 30°C)	-50°C to -86°C	-50°C to -86°C	-50°C to -86°C	-50°C to -86°C
Interior Volume	12 cu.ft./334 liters	18 cu.ft./518 liters	18 cu.ft./518 liters	26 cu.ft./727 liters
Area Footprint, Nominal	6.25 sq.ft./0.58m <sup>2</sup>	7.24 sq.ft./0.68m <sup>2</sup>	7.25 sq.ft./0.68m <sup>2</sup>	9.51 sq.ft./0.88m <sup>2</sup>

### Dimensions and Weights

	MDF-U33V	MDF-U52VA/U53VA	MDF-U53VC	MDF-U73VC
Interior	19.3" W x 23.6"D x 44.9"H 490 x 599 x 1140mm	24.8"W x 23.6"D x 54.3"H 629 x 599 x 1379mm	24.8"W x 23.6"D x 54.3"H 629 x 599 x 1379mm	34.25"W x 23.6"D x 55.1"H 869 x 599 x 1399mm
Exterior	26.4" W x 34.1"D x 73.2"H 670 x 866 x 1859mm	30.3" W x 34.4"D x 78.3"H 769 x 873 x 1988mm	30.3" W x 34.4"D x 78.3"H 769 x 873 x 1988mm	39.8" W x 34.4"D x 79.1"H 1010 x 873 x 2009mm
Net Weight, Empty	569 lbs/258 kg	660 lbs/299 kg	660 lbs/299 kg	750 lbs/340 kg

### Refrigerant System, CFC/HCFC-Free Refrigerants

High Stage Compressor	1/2 HP	3/4 HP	1 1/2 HP	1 1/2 HP
Low Stage compressor	3/4 HP	3/4 HP	1 1/2 HP	1 1/2 HP
Built-in Voltage Booster	N/A	N/A	standard	standard
Sound Abatement	standard	standard	standard	standard

### Electrical

Single Phase AC Power	115V, 60 Hz	115V, 60 Hz	208-230V, 60 Hz	208-230V, 60 Hz
Recommended Breaker	15 amp	20 amp	15 amp	15 amp
NEMA Plug Reference	5-15P	5-20P	6-15P	6-15P
NEMA Receptacle Required	5-15R	5-20R	6-15R	6-15R

### Cabinet Accessories

Digital Temperature Recorder	Hamster digital temp. recorder. Fully programmable. Includes software. Cat. No. Hamster DT2-ST
Liquid CO <sub>2</sub> Back-up System	Factory installed;specify when ordering. Catalog No. CVK-UB2(I)
Liquid N <sub>2</sub> Back-up System	Factory installed;specify when ordering. Catalog No. CVK-UB2N
Chart Recorder	Factory installed;specify when ordering. 6" Circular chart 7 day recording. Cat. No. MTR-C954
Chart Paper	Package of 50 charts. Cat. No. C71100386REV
Replacement Pens (Red)	Catalog No. RS252 (6 pens)
Replacement Pens (Blue)	Catalog No. RS253 (6 pens)

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SANYO V.I.P.<sup>®</sup> Series freezers offer high-density storage that effectively reduces the volumetric unit costs of low temperature freezers.



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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