Think GAIA
For Life and the Earth

SANYO

Ultra-Low Temperature V.I.P.™ Series Freezers

VIP series
Vacuum Insulation Panel

Integrated Ultra-Low Temperature Storage Solutions for Biosafety, Security and Performance

The ultra-low temperature freezer VIP series lineup meets diversifying needs for ultra-low temperature storage, including storage of large quantities of biological genetic material, quality control, environmental consciousness, etc.

VIP series
Vacuum Insulation Panel

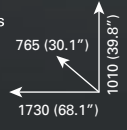
Evolutionary design

SANYO VIP series ultra-low temperature freezers with patented vacuum insulation cabinet construction, microprocessor controls and high-performance refrigeration achieve the most efficient storage capacity in the industry.

MDF-C2156VAN

Temperature	Effective capacity
-150°C (Ambient temp. 30°C)	231ℓ (8.2 cu.ft.)

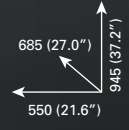
140 pcs. 2″ inventory boxes
98 pcs. 3″ inventory boxes



MDF-C8V

Temperature	Effective capacity
-80°C (Ambient temp. 30°C)	84ℓ (3.0 cu.ft.)

42 pcs. 2″ inventory boxes



Exterior Dimensions
Unit: mm (inch)

The history of SANYO Ultra-Low Temperature Freezers, which constantly push the limits of ever more advanced refrigerating/freezing technology, closely follows the history of biotechnology.

History of SANYO Ultra-Low Temperature Freezers

1953 Watson & Crick discovered DNA double helix structure

1955 Kornburg discovered DNA polymerase

1970 Khorana succeeded in synthesis of active DNA

–40°C Freezer **1973** Cohen & Boyer established gene recombination technology

1975 Dangerousness of gene engineering study was discussed in Asilomar conference

–80/85°C Ultra-low temp. freezers **1976**

1978 Successful human insulin production in E.coli

1984 Mullis developed PCR method

–135°C Ultra-low temp. freezer **1986**

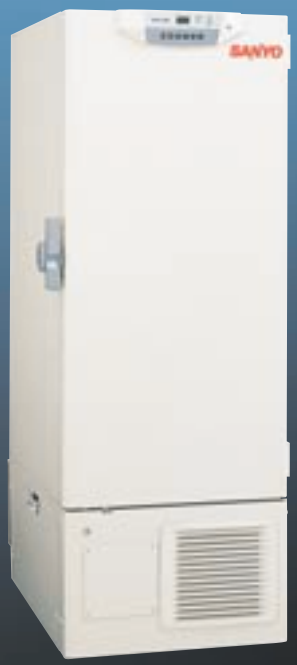
–152°C Ultra-low temp. freezer **1991** Human Genome Project began

–86°C VIP series freezers **1997**

2003 Human Genome Project completed

–80°C VIP PLUS freezer **2005**

–150°C VIP PLUS freezer **2006**



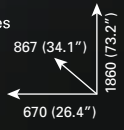
MDF-U32V

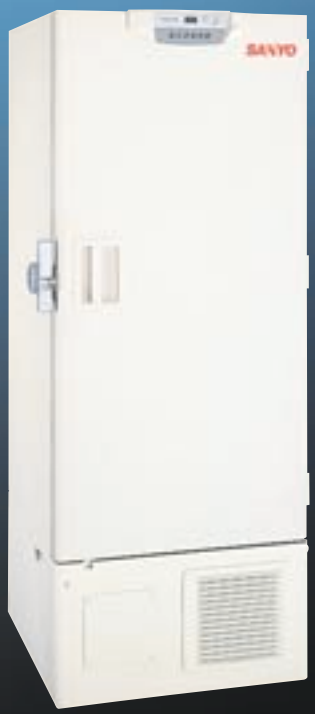
Temperature **–86°C** (Ambient temp. 30°C)

Effective capacity **333ℓ** ***(11.8 cu.ft.)***

264 pcs. 2″ inventory boxes

144 pcs. 3″ inventory boxes





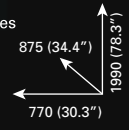
MDF-U53V

Temperature **–86°C** (Ambient temp. 30°C)

Effective capacity **519ℓ** ***(18.3 cu.ft.)***

352 pcs. 2″ inventory boxes

224 pcs. 3″ inventory boxes



MDF-U73V

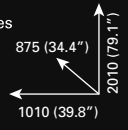
Temperature **–86°C** (Ambient temp. 30°C)

Effective capacity **728ℓ** ***(25.7 cu.ft.)***

528 pcs. 2″ inventory boxes

336 pcs. 3″ inventory boxes

576 pcs. 2″ inventory boxes
for North America only.



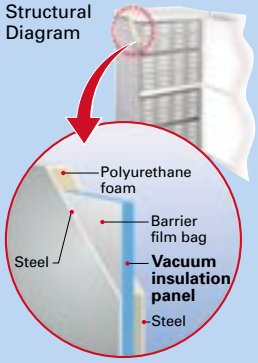
Design advantages

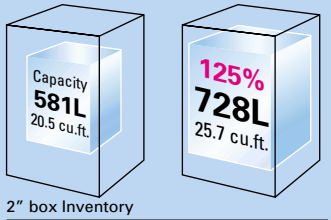
Construction

Patented VIP insulation technologies

SANYO pioneered a revolutionary vacuum insulation cabinet construction that reduces the wall thickness to approximately one half and achieves up to 30% more storage capacity than a conventionally insulated freezer without increasing the footprint. VIP Insulation maximises storage capacity when space is limited. When using multiple units, large amounts of space can be saved compared to conventionally insulated freezers.

Structural Diagram





Advanced ultra-low temperature refrigeration system

The SANYO cascade refrigeration system is specifically designed for ultra-low temperature applications and offers superior performance and durability, even in high ambient temperatures and in response to frequent door openings. The cooling system maintains uniform temperatures with quiet, energy efficient operation.

Accurate microprocessor temperature control

The SANYO microprocessor control system utilises SANYO made electronic components to ensure precise and reliable ultra-low temperature operation.

Reliability

Status alert

For improved reliability, Status alert function monitors ambient and system conditions continuously and notifies of any abnormalities before a problem occurs.

LCD	Status details	Countermeasure
E 1	Abnormality in ambient temperature	Recheck air conditioning of installation location.
E 2	Drop in power supply voltage	Use exclusive power supply.
E 3	Overloaded operation	Sort contents; inspect door sealing condition.

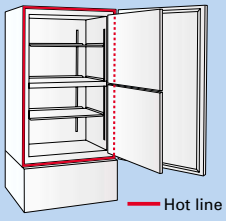
• For upright types

Filter-clog check

A microprocessor controlled filter check function protects the refrigeration circuit by notifying the user of a blocked condenser filter via an alarm lamp. (Except MDF-C8V which is filter-less).

Frost reduction

SANYO's unique combination of a "hot line", routed around the door seal, and insulated inner doors provide an excellent airtight seal which prevents ice build-up around the door.



Safety

Alarms

- An alarm lamp and buzzer offer secure warning of power failure or abnormal temperature increase. In addition, battery back-up allows the internal temperature to be checked during a power failure.
- High and low temperature warnings provide an audible and visual alarm when the temperature deviates more than ±5°C to ±20°C (adjustable) from the set point.
- Alarm ring back function ensures that the buzzer resumes operation, should alarm conditions continue after it is silenced.
- Remote alarm terminals are also provided as standard equipment for individual or group control.

Notifications

A battery life notification function is also provided to notify users of accumulated battery time.

Self diagnostic

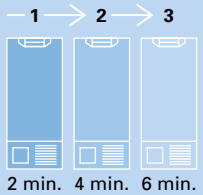
The temperature sensor, filter sensor and cascade sensor monitor operation conditions continuously. Should an abnormality be picked up, an error code and the current freezer temperature will be displayed in turn.

Tamper proof

To prevent unauthorised access to freezer settings, a key-lock function is provided that blocks changes being made through the keypad.

Delay start

On power failure recovery, typically every unit in the lab will try to start-up simultaneously. This can create a significant drain on the electricity supply and a drop in voltage that may cause the breaker to trip again. SANYO's exclusive compressor start-up delay function enables compressor startup during recovery after a power failure to be delayed for several minutes, in order to reduce and distribute the sudden electrical load during recovery and enable smooth restarting of laboratory operations. Start-up delay is programmable from 2 to 15 min. The advantage of this system is that the start-up of multiple freezers can be staggered over a period of up to 15 minutes, which provides an even electrical load on power failure recovery.

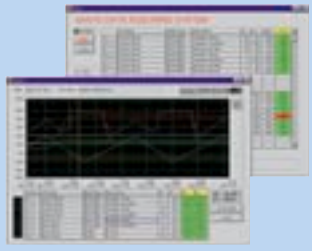


Start-up sequence

Convenience

Data acquisition

The SANYO DAQ system, SANYO's original data acquisition software, enables remote setting and monitoring of VIP freezers. (Option)



Easy-access filter

The condenser filter is situated at the bottom right side of the front panel to make filter removal and cleaning easier. (Except MDF-C8V which is filter-less)

Vacuum Insulation Panel VIP series

Special advantages

Upright freezers
MDF-U32V/U53V/U73V
Offers maximum storage volume in the least footprint

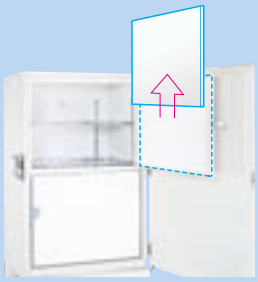
MDF-U53V

-86°C

Provides large capacity in a limited space and helps to meet constantly increasing sample storage needs.

Cabinet Construction
Insulated inner doors with gasket offer additional protection during door opening and improve overall energy efficiency in response to ambient temperature change.

Easily removable inner doors
Inner doors are removable to allow easy cleaning and defrosting.

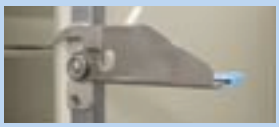


Inner door

Easy-to-use tight-sealing door latches

Large door latch

- The rugged, one-handed operated outer door latch can accommodate a padlock for added protection of valuable samples.
- A beak style inner door latch tightly closes the inner door against the freezer frame. It also helps make opening and closing the door smoother.



Inner door latch

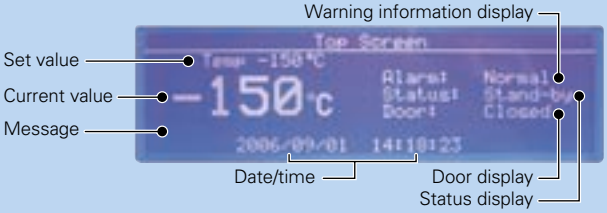
Control panel
The control panel features a clear LED display and a logical keypad layout for easy setting and operation.

Chest freezer
MDF-C2156VAN
for cryogenic preservation

-150°C

Using ultra-low temperature freezer storage for long-term preservation of valuable specimens eliminates worries of contamination, reduces running costs, and enables long-term storage at ultra-low temperatures far below the recrystallization point.

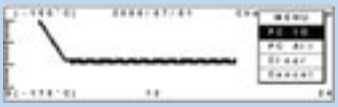
Innovative control panel
A graphic LCD display panel with pop-up menu function allows simple, intuitive operation and provides detailed information of freezer status.



Full suite of sample protection measures
Advanced design, construction and control features provide added safety for valuable specimens.

- New double type lid gasket ensures an effective seal and suppresses cold air loss.
- New VIP PLUS insulation material improves the insulation perfor mance of the cabinet.
- Equipped with new Status alert function.
- Equipped with LN_2 backup system as standard to prepare for any contingency.

Data logging function



Internal temperature and times when the outer lid has been opened for more than 2 minutes can be recorded for up to 1 month. Logged data can also be easily sent to a PC using the optional communication interface.

Chest freezer
MDF-C8V
Perfect size for personal use

-80°C

Space-saving design enables effective use of valuable laboratory space.

Simplified high-efficiency refrigerating system
- Use of a newly developed single-compressor system achieves an approximately 40% reduction in power consumption.
- Low-noise design provides quiet, unobtrusive operation ideal for in-lab use.

New cooling circuit enables filter-less design
Filter-less design makes the routine maintenance procedure of cleaning the condenser filter unnecessary.

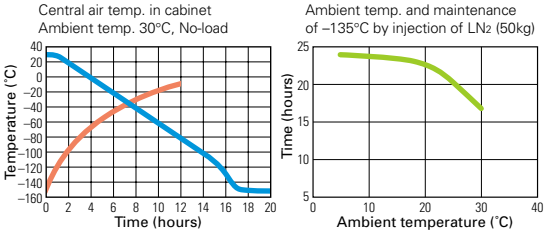
High-density storage

	MDF-U32V	MDF-U53V	MDF-U73V	MDF-C2156VAN	MDF-C8V
2″ box rack	IR-A216U(6) + IR-220U(6)	IR-220U(8) + IR-224U(8)	IR-220U(12) + IR-224U(12)	IR-210C(14)	IR-207C(6)
Number of 2″ boxes	264	352	528	140	42
3″ box rack	IR-312UN	IR-312U + IR-316U	IR-312U + IR-316U	IR-307C(14)	—
Number of 3″ boxes	144	224	336	98	—

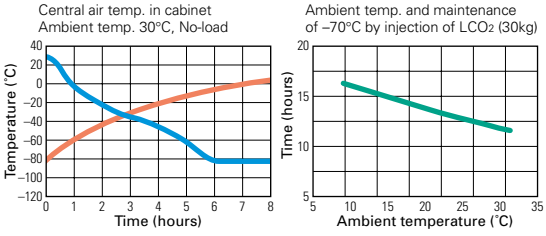
Performance Data

Pull-down characteristics
Pull-up characteristics during power failure
LN_2 backup system operation characteristics
CO_2 backup system operation characteristics

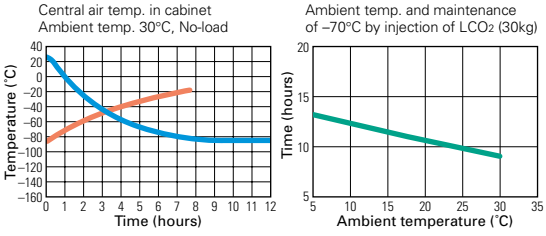
MDF-C2156VAN



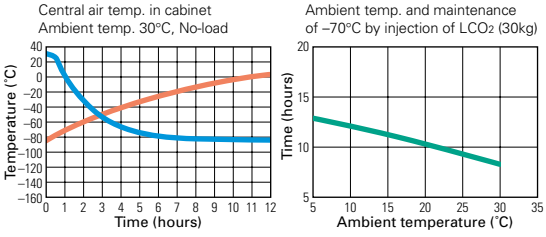
MDF-C8V



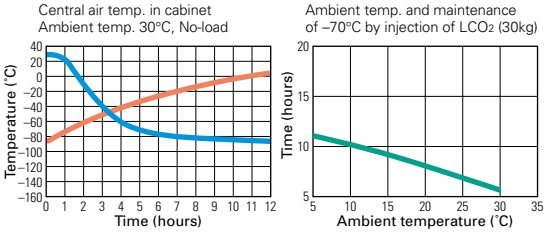
MDF-U32V



MDF-U53V



MDF-U73V



- All data shown here are measured based on our company standards. If detailed data is required, please contact our company.
- If product inspection records are required, please contact our company. (There will be a charge for the records.) Please note that the records do not include temperature adjustment range or data on temperature distribution inside the unit.

Specifications

Model	MDF-C2156VAN	MDF-C8V
Temperature range	-125°C to -150°C (1°C increments)	-60 to -80°C (1°C increments)
Maximum cooling performance	-150°C (Ambient Temp. 30°C)	-80°C (Ambient temp. 30°C)
Exterior dimensions (W x D x H)	1730 x 765 x 1010 mm (68.1" x 30.1" x 39.8")	550 x 685 x 945 mm (21.6" x 27.0" x 37.2")
Interior dimensions (W x D x H)	760 x 495 x 615 mm (29.9" x 19.5" x 24.2")	405 x 490 x 425 mm (15.9" x 19.3" x 16.7")
Net weight	Approx. 319 kg (703lbs.)	Approx. 67 kg (148lbs.)
Effective capacity	231 Liters (8.2 cu.ft.)	84 Liters (3.0 cu.ft.)
Access port	40 mm diameter, 1 location	17 mm diameter, 2 locations backside, bottom
Compressor	Hermetic type, Output: 1100W (high stage side), 1100W (low stage side)	Rotary type, Output: 400W
Refrigerant	HFC	
Alarm system	High/Low temperature, Power failure, Filter check, Self diagnosis, Door check, Part replacement notification	High/Low temp. alarm (±5°C to ±20°C), Power failure alarm, Remote alarm contact: DC30V, 2A
Remote alarm contact	Allowable contact capacity, DC 30V, 2A	
Accessories	1 set of keys, 1 scraper, Connecting tube for LN_2 backup system	1 set of keys, 1 scraper

Model	MDF-U32V	MDF-U53V	MDF-U73V
Temperature range	–50˚C to –86˚C (1˚C increments)		
Maximum cooling performance	–86˚C (Ambient temp. 30˚C)		
Exterior dimensions (W x D x H)	670 x 867 x 1860mm (26.4" x 34.1" x 73.2")	770 x 875 x 1990mm (30.3" x 34.4" x 78.3")	1010 x 875 x 2010mm (39.8" x 34.4" x 79.1")
Interior dimensions (W x D x H)	490 x 600 x 1140mm (19.3" x 23.6" x 44.9")	630 x 600 x 1380mm (24.8" x 23.6" x 54.3")	870 x 600 x 1400mm (34.2" x 23.6" x 55.1")
Net weight	Approx. 258kg (569 lbs.)	Approx. 299kg (659 lbs.)	Approx. 350kg (772 lbs.)
Effective capacity	333 Liters (11.8 cu.ft.)	519 Liters (18.3 cu.ft.)	728 Liters (25.7 cu.ft.)
Shelves	Stainless steel, 3 shelves		
Access port	17mm diameter, 3 locations (back, bottom left/right corners)		
Compressor	Hermetic type, Output: 400 W (high stage side), 600 W (low stage side)	Hermetic type, Output: 1100 W (high stage side), 1100 W (low stage side)	
Refrigerant	HFC		
Alarm system	Temperature, Power failure, Filter check, Self diagnostics, Remote alarm contact	High/low temperature, Power failure, Filter check, Self diagnostics, Door check, Part replacement nortification	
Remote alarm contact	Allowable contact capacity: DC 30V, 2A		
Accessories	1 set of keys, 1 scraper		

*Appearance and specifications are subject to change without notice.
*Cooling performance is indicated by the temperature reached at the center of the freezer (at ambient temperature of 30°C with no load). In order to use the freezer at a stable temperature for a long time, it is recommended that the temperature be set to at least 5°C higher than the indicated lowest temperature. In addition, depending on the usage conditions, it may not be possible to reach the indicated lowest temperature.

Options

Model	MDF-C8V	MDF-C2156VAN	MDF-U32V	MDF-U53V	MDF-U73V
LCO_2 backup system	CVK-UB4	—	CVK-UB2	CVK-UB2	CVK-UB2
LN_2 backup system	—	Equipped	CVK-UBN2	CVK-UBN2	CVK-UBN2
Backup system mounting kit	MDF-UBK	—	—	—	
Circular recorder	MTR-G85	—	MTR-G85	MTR-G85	MTR-G85
Chart paper	RP-G85	—	RP-G85	RP-G85	RP-G85
Ink pen	PG-R	—	PG-R	PG-R	PG-R
Slip chart recorder	MTR-85H	MTR-155H	MTR-85H	MTR-85H	MTR-85H
Chart paper	RP-85	RP-155	RP-85	RP-85	RP-85
Ink pen	DF-38FP	DF-38FP	DF-38FP	DF-38FP	DF-38FP
Recorder mounting bracket	MDF-S3085 (for MTR-85H)	MDF-S30150 (for MTR-155H)	MDF-S3085 (for MTR-85H)	MDF-S3085 (for MTR-85H)	MDF-S3085 (for MTR-85H)
Sensor cover	MTR-C8	—	—	—	—
Storage racks	—	—	MDF-30SC	MDF-70SC	MDF-70SC
3 drawers (for lower chamber)	—	—	MDF-30R	MDF-50R	—
SANYO DAQ (Data Acquisition) system	MTR-480 MTR-2000	MTR-480 MTR-2000	MTR-480 MTR-2000	MTR-480 MTR-2000	MTR-480 MTR-2000

Further details regarding our products can be accessed at **http://www.sanyo.co.jp/cmg/biomedical**

We design and manufacture products in accordance with ISO9001 & 14001 requirements.
RoHS (European Restriction of Hazardous Substances directives) compliant

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