

# Preservation

sub-zero

## ULT Chest Freezers

SANYO Ultra-Low Temperature Chest Freezer lineups for ultra-low temperature storage needs to support the forefront of life science researches.



MDF-1156ATN

# The Ideal $-152^{\circ}\text{C}$ , $-86^{\circ}\text{C}$ Freezing Environment in Capacities from 86 L to 701 L

Ideal for long term preservation of biologicals, blood components and various cell line, Panasonic preservation systems employ microprocessor control to maintain a high-precision temperature environment. They are not affected by ambient temperature, minimizing uneven temperature distribution within the chamber, and a temperature rise during door opening.

## $-152^{\circ}\text{C}$ Ultra-Low Temperature Chest Freezer

For stable long-term storage

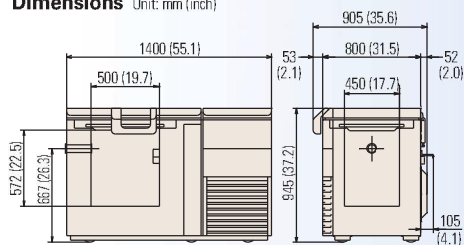
**MDF-1156/1156ATN**

TEMPERATURE

EFFECTIVE CAPACITY

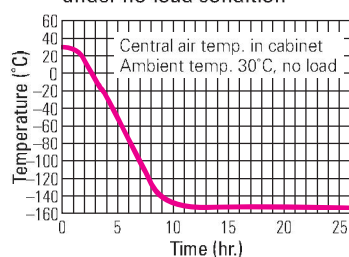
**$-152^{\circ}\text{C}$  128 L (4.5 cu.ft.)**

Dimensions Unit: mm (inch)

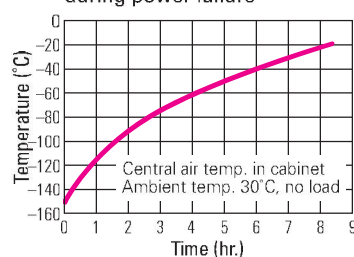


### Performance Data

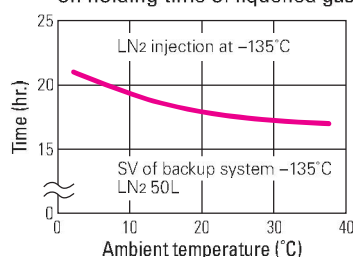
Pull-down characteristics under no-load condition



Pull-up characteristics during power failure



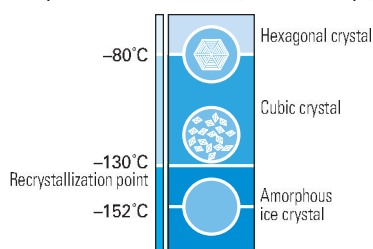
Effect of ambient temp. on holding time of liquefied gas



## For MDF-1156/1156ATN

### Why Freeze to $-152^{\circ}\text{C}$ ?

Recrystallization Mechanism (Artist's Concept)



### World's lowest $-152^{\circ}\text{C}$ freezer ensures stable cell and tissue preservation

An important factor to consider when preserving cells or tissue at ultra-low temperatures is to prevent amorphous ice crystals from recrystallizing within and outside the cells. Samples that are maintained in an ultra-low temperature freezer at  $-152^{\circ}\text{C}$  which is far lower than the recrystallization point ( $-130^{\circ}\text{C}$  for pure water) can be preserved semi-permanently. Preservation at ultra-low temperatures maintains vitrification without crystallization occurring inside and outside cells. In contrast to conventional liquid nitrogen preservation containers, freezer preservation has numerous advantages: no sample contamination, no sudden liquid eruptions, as well as low operational costs. Panasonic's MDF-1156 and 1156ATN make long-term storage below the recrystallization point easier and more stable than ever before.

### Specially designed compressor and cascade refrigeration system

Specially designed for rugged ultra-low temperature applications in a laboratory environment (HFC refrigerants only).



### Micro-processor Temperature Control with LED Digital Display

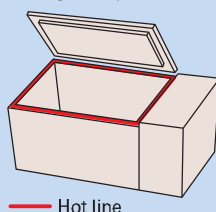
Extremely accurate, easy-to-read display. The temperature inside the freezer can be set and monitored easily by means of a microprocessor temperature control with an LED digital display. The thermostat incorporates a platinum resistor (Pt.  $100\Omega$ ), precision and durability.

### Integrated Cabinet Design

High-performance refrigeration system with foamed-in-place cabinet insulation maximizes interior temperature uniformity and protects against fluctuating ambient temperatures.

### Hot line for secure sealing

Moisture condensation at the top edges of the cabinet due to differences in temperature inside and out causes frost and icing problems that may reduce heat insulation efficiency and obstruct door movements. These problems are prevented by the "hot line" by means of which hot gas from the higher temperature circuit is circulated through the problem areas.



Hot line

## Advanced Features

### Self-diagnostic function

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

### Ring back function

The alarm buzzer can be silenced by pressing the BUZZER key on the control panel. (The remote alarm signal is not cancelled.) Should the alarm condition continue after a certain suspension, the alarm buzzer sound will resume.

### Easy Maintenance

(MDF-193/193AT have no filters)

Filter check lamp notifies the user of a clogged condenser filter. The condenser filter is situated at the front panel to make filter removing and cleaning easier.



**Note:** The position of the filter check lamp is shown on the control panel (see photo shown at the bottom of this page).

### Standard casters and levelling feet

Standard-equipped heavy duty casters make it easy to move a freezer when necessary. The levelling feet keep a freezer level and firm on the floor.

## Safety Device

### Built-In Temperature & Power Failure Alarms (Lamp/Buzzer)

In case of power failure or an irregular rise in temperature, a rechargeable battery-operated indicator lamp and alarm will be activated. A compact recording unit which automatically records the inside temperature, and a backup system with liquefied  $\text{CO}_2$  or  $\text{N}_2$  which is self-activated when a power outage occurs are also available separately. This equipment helps insure that the contents will be protected in the event of any power failure or mechanical trouble.

### Control panel



MDF-394AT

- ① Alarm lamp and buzzer
- ② Filter check lamp
- ③ Buzzer key
- ④ Alarm test key
- ⑤ Mode setting key
- ⑥ Digit shift key
- ⑦ Numerical value shift key
- ⑧ Power switch
- ⑨  $\text{CO}_2$  back-up test switch (AT type only)
- ⑩  $\text{CO}_2$  back-up switch (AT type only)
- ⑪ Battery switch
- ⑫ Temperature recorder



## Specifications

<b>Model No.</b>	<b>MDF-1156/1156ATN</b>	
<b>Temperature Range</b>	-130°C to -152°C	
<b>Exterior Dimensions (W x D x H)</b>	1400 x 800 x 945 (mm) 55.1 x 31.5 x 37.2 (inch)	
<b>Interior Dimensions (W x D x H)</b>	500 x 450 x 572 (mm) 19.7 x 17.7 x 22.5 (inch)	
<b>Effective Capacity</b>	128 liters (4.5 cu.ft.)	
<b>Exterior Cabinet</b>	Galvanized steel with baked on finish	
<b>Interior Cabinet</b>	Aluminum plate	
<b>Inner Lid</b>	1	
<b>Insulation</b>	Foamed-in-place rigid polyurethane	
<b>Compressor</b>	<b>High stage side</b>	Hermetic type, 1,100 W
	<b>Low stage side</b>	Hermetic type, 1,100 W
<b>Evaporator</b>	<b>High stage side</b>	Cascade condenser
	<b>Low stage side</b>	Tube on sheet (shared with interior)
<b>Condenser</b>	<b>High stage side</b>	Fin and tube type
	<b>Low stage side</b>	Cascade condenser
<b>Temperature Control</b>	Microprocessor control system, Non-volatile memory	
<b>Temperature Display</b>	Digital display	
<b>Sensor</b>	Platinum resistance (Pt. 100 W)	
<b>Safety</b>	Cylinder key on the lid handle	
<b>Alarm system</b>	Selectable high temp. alarm (+10°C & +15°C from set point)	
	Power failure alarm, Filter check lamp (Except MDF-193/193AT which have no filters), Remote alarm contact	
<b>Net Weight (Approx.)</b>	265kg (584 lbs.) —1156	
	272kg (600 lbs.) —1156ATN	

## Voltage specification by destination

<b>Representative destination</b>	Europe 230V, 50Hz (CE)	MDF-1156-PE/1156ATN-PE
	Korea 220V, 60Hz	MDF-1156-PK/1156ATN-PK
	Thailand 220V, 50Hz	MDF-1156-PB/1156ATN-PB

ATN: LN<sub>2</sub> backup system, temperature recorder  
AT: LCO<sub>2</sub> backup system, temperature recorder

## Optional Accessories

### Storage Racks (Aluminium)

Model No.	MDF-19SC-PW	MDF-39SC-PW	MDF-49SC-PW	MDF-59SC-PW
<b>Case Dimensions (W x D x H)</b>	207 x 144 x 413 (mm) 8.1 x 5.7 x 16.3 (inch)	155 x 155 x 515 (mm) 6.1 x 6.1 x 20.3 (inch)	207 x 144 x 539 (mm) 8.1 x 5.7 x 21.2 (inch)	207 x 144 x 665 (mm) 8.1 x 5.7 x 26.2 (inch)
<b>Number of Drawers</b>	3	4	4	5
<b>Applicable Model (Rack capacity)</b>	MDF-193/193AT (6)	MDF-394 (20)	MDF-1156/1156ATN (6)	MDF-594/594AT (18) MDF-794/794AT (24)

### Inventory Racks (Stainless steel)

Model No.	Box Type (Capacity)	External Dimensions (mm)			Freezer Model (Rack capacity)
		Width	Depth	Height	
IR-207C-PW	2" (7)	144	142	405	MDF-193 (6)
IR-209C-PW	2" (9)	144	142	518	MDF-394 (21), 1156 (9)
IR-213C-PW	2" (13)	144	142	592	MDF-594 (24), 794 (36)
IR-305C-PW	3" (5)	144	142	405	MDF-193 (6)
IR-306C-PW	3" (6)	144	142	518	MDF-394 (21), 1156 (9)
IR-309C-PW	3" (9)	144	142	747	MDF-594 (24), 794 (36)



\*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.

Caution: Panasonic guarantees the product under certain warranty conditions. Panasonic in no way shall be responsible for any loss of content or damage to content.

• Appearance and specifications are subject to change without notice.

### Temperature Recorder

Model No.	MTR-85H-PW	MTR-155H-PW
<b>Recording Range</b>	-100 to +50°C	-170 to +30°C
<b>Freezer Model</b>	MDF-193 MDF-394 MDF-594 MDF-794	MDF-1156

### ULT-Freezer Backup Kits

<b>CVK-UB2-PW/UB2I-PW:</b> LCO <sub>2</sub> Backup Kit for MDF-794/594/394	
<b>CVK-UBN2-PW/UBN2I-PW:</b> LN <sub>2</sub> Backup Kit for MDF-794/594/394	
<b>CVK-AT2-PW:</b> LCO <sub>2</sub> Backup Kit for MDF-1156	
<b>CVK-ATN2-PW:</b> LN <sub>2</sub> Backup Kit for MDF-1156	
I : version for North America only	



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**Medical devices quality management system: ISO13485**



Panasonic Healthcare Co., Ltd., Gunma Factory is certified for:  
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