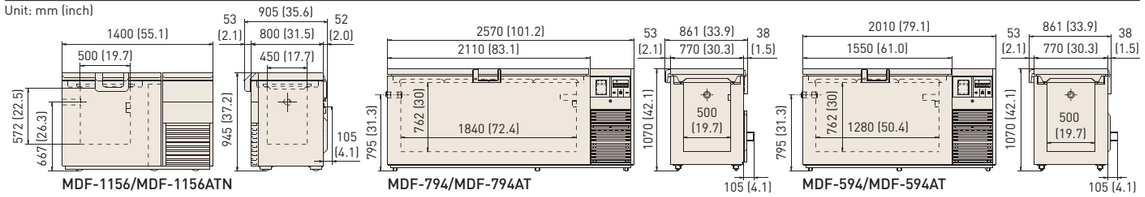
Specifications

		Model No.		
220 V, 50 Hz		MDF-1156-PB / MDF-1156ATN-PB	MDF-794-PB	MDF-594-PB / MDF-594AT-PB
220 V, 60 Hz		MDF-1156-PK / MDF-1156ATN-PK	MDF-794-PK / MDF-794AT-PK	MDF-594-PK
230 V/240 V, 50 Hz (CE)		MDF-1156-PE / MDF-1156ATN-PE	MDF-794-PE / MDF-794AT-PE	MDF-594-PE / MDF-594AT-PE
Temperature Range		−130°C to −152°C	−20°C to −86°C	
External Dimensions (W x D x H)*1		1400 x 800 x 945 (mm) 55.1 x 31.5 x 37.2 (inch)	2570 x 770 x 1070 (mm) 101.2 x 30.3 x 42.1 (inch)	2010 x 770 x 1070 (mm) 79.1 x 30.3 x 42.1 (inch)
Internal Dimensions (W x D x H)		500 x 450 x 572 (mm) 19.7 x 17.7 x 22.5 (inch)	1840 x 500 x 762 (mm) 72.4 x 19.7 x 30.0 (inch)	1,280 x 500 x 762 (mm) 50.4 x 19.7 x 30.0 (inch)
Effective Capacity		128 liters (4.5 cu.ft.)	701 liters (24.8 cu.ft.)	487 liters (17.2 cu.ft.)
Exterior Cabinet		Galvanised steel with baked on finish		
Interior Cabinet		Aluminum plate	Stainless steel	
Inner Lid		1	4	3
Insulation		Foamed-in-place rigid polyurethane		
Compressor	**High stage side**	Hermetic type, 1,100 W		
	Low stage side	Hermetic type, 1,100 W		
Evaporator	**High stage side**	Cascade condenser		
	Low stage side	Tube on sheet (shared with interior)		
Condenser	**High stage side**	Fin and tube type		
	Low stage side	Shell and tube type		Cascade condenser
Temperature Control		Microprocessor control system, Non-volatile memory	Microprocessor: Keypad input Set value memory: non-volatile memory	
Temperature Display		Digital display		
Sensor		Platinum resistance (Pt. 100 Ω)		
Safety		Cylinder key on the lid handle		
Alarm system		Selectable high temp. alarm (+10°C & +15°C from set point)		
		Power failure alarm, Filter check lamp, Remote alarm contact		
Net Weight (Approx.)		265 **kg** (584 lbs.) —1156 272 **kg** (600 lbs.) —1156ATN	335 **kg** (739 lbs.) —794 345 **kg** (761 lbs.) —794AT	291 **kg** (642 lbs.) —594 301 **kg** (664 lbs.) —594AT

ATN: LN_2 backup system, temperature recorder AT: LCO_2 backup system, temperature recorder
*1 External dimensions of main cabinet only - see dimension drawings showing handles and other external projections.

Dimensions

Unit: mm (inch)



Optional Accessories

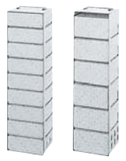
Storage Racks (Aluminium)

Model No.	MDF-49SC-PW	MDF-59SC-PW
Case Dimensions (W x D x H)	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)
Number of Drawers	4	5
Applicable Model (Rack capacity)	MDF-1156/1156ATN (6)	MDF-594/594AT (18) MDF-794/794AT (24)


MDF-59SC-PW

Inventory Racks (Stainless steel)

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


IR-209C-PW IR-306C-PW

Temperature Recorder

Model No.	MTR-85H-PW	MTR-155H-PW
Recording Range	−100 to +50°C	−170 to +30°C
Freezer Model	MDF-594 MDF-794	MDF-1156

ULT-Freezer Backup Kits

CVK-UB2-PW:
LCO_2 Backup Kit for MDF-794/594

CVK-UBN2-PW:
LN_2 Backup Kit for MDF-794/594

CVK-AT2-PW:
LCO_2 Backup Kit for MDF-1156

CVK-ATN2-PW:
LN_2 Backup Kit for MDF-1156

*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: PHC Corporation guarantees the product under certain warranty conditions. PHC Corporation is in no way shall be responsible for any loss of content or damage to content.
• Appearance and specifications are subject to change without notice.

Preservation (freezers, refrigerators) and Culturing (incubators) Equipment
The management of the design, development, production, sales support, and servicing of the above.
PHC Corporation, Biomedical Division
1-1-1 Sakada, Oizumi-machi, Ora-gun, Gunma 370-0596, Japan

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Cryogenic Freezers
Ultra-Low Temperature Freezers

Cryogenic Freezers and ULT Freezers

PHCbi Cryogenic Freezers and Ultra-Low Temperature Freezers support the forefront of life science research.

PHC Corporation, Biomedical Division
Formerly Known as Panasonic Healthcare , Biomedical

Life Science Innovator Since 1966

The Ideal –152˚C, –86˚C Freezing Environment in Capacities from 128 L to 701 L

Ideal for long term preservation of biologicals and various cell line, PHCbi 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˚C

Cryogenic Freezers

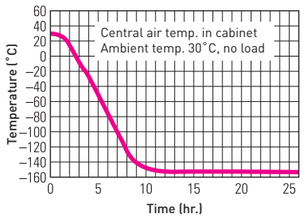
For stable long-term storage

MDF-1156
MDF-1156ATN

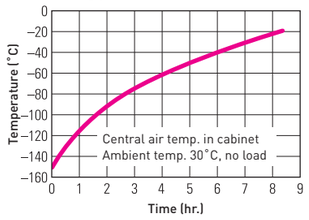
MDF-1156

Performance Data

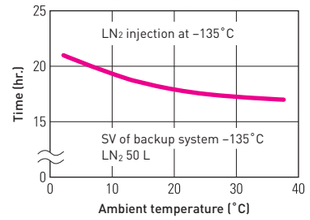
Pull-down characteristics under no-load condition



Pull-up characteristics during power failure



Effect of ambient temp. on holding time of liquefied gas



Temperature
–152˚C

Effective Capacity
128 L
(4.5 cu.ft.)

–86˚C

Ultra-Low Temperature Freezers

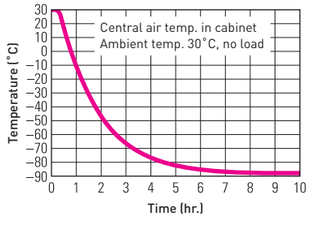
Ideal for middle-sized installation space

MDF-594
MDF-594AT

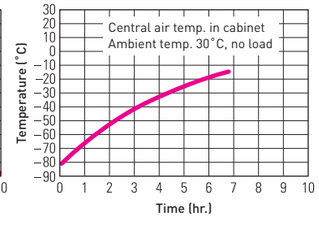
MDF-594AT

Performance Data

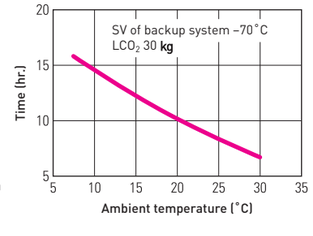
Pull-down characteristics under no-load condition



Pull-up characteristics during power failure



Effect of ambient temp. on holding time of liquefied gas



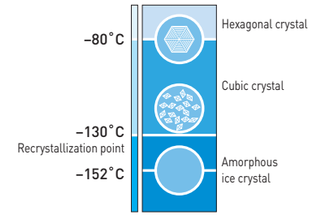
Temperature
–86˚C

Effective Capacity
487 L
(17.2 cu.ft.)

For MDF-1156/MDF-1156ATN

Why Freeze to –152˚C ?

Recrystallization Mechanism (Artist's Concept)



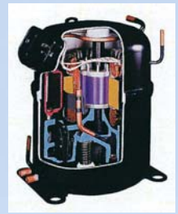
–152˚C freezer ensures stable cell and tissue preservation

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 a cryogenic freezer at –152˚C which is far lower than the recrystallization point (–130˚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.
PHCbi's MDF-1156 and MDF-1156ATN make long-term storage below the recrystallization point easier and more stable than ever before.

Advanced Features

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

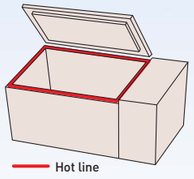
Extremely accurate, easy-to-read display. The temperature inside the freezer can be set and monitored easily by means of a microprocessor temperature control with an LED digital display. The thermostat incorporates a platinum resistor (Pt. 100Ω), precision and durability.

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.



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

Filter check lamp notifys 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 CO_2 or N_2 which is selfactivated when a power outage occurs are also available separately (comes standard with the AT series). This equipment helps insure that the contents will be protected in the event of any power failure or mechanical trouble.

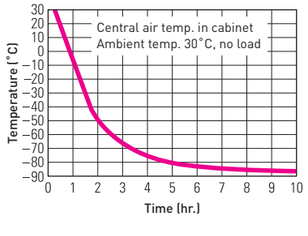
Ideal for large-capacity preservation

MDF-794
MDF-794AT

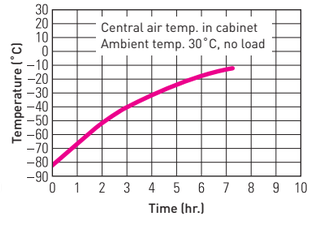
MDF-794AT

Performance Data

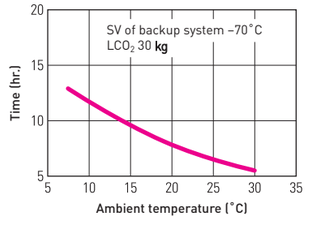
Pull-down characteristics under no-load condition



Pull-up characteristics during power failure



Effect of ambient temp. on holding time of liquefied gas



Temperature
–86˚C

Effective Capacity
701 L
(24.8 cu.ft.)