

USER MANUAL

ARA DEEP FREEZERS

ARA M series

M80

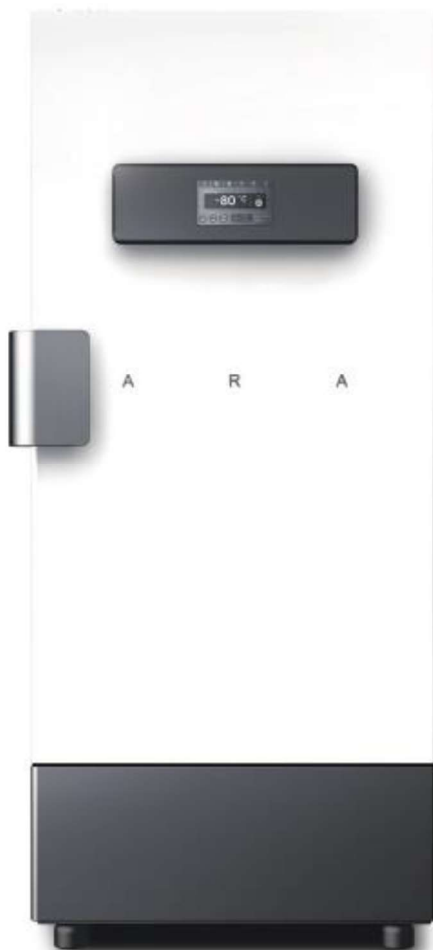
M300/MD300

M400/MD400

M500/MD500

M700/MD700

M870/MD870



ARA

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1. General information



This manual describes the performance, usage and handling precautions of the purchased product. Please read carefully before using the product.

1-1. Introduction

This product supports fast cooling speed and minimal power consumption by applying the innovative cooling system Simplified Hi-Efficiency Freezing System.

It was developed and manufactured in consideration of convenience and safety in use, and has the following features.

1. Simplified Hi-Efficiency Freezing System for high efficiency and safety simplifies the structure and electrical circuit to minimize the time to reach the target temperature and the amount of power consumption.
2. Two independent cooling structures maintain cooling temperature even if one system has a problem and have a perfect Back Up function (Only Dual Comp. Type).
3. The operation of various menus has been simplified through the 7-inch full-touch screen.
4. Urethane insulation, internal door insulation, and 3-layer insulation are installed to prevent cold air leakage and intrusion of external temperature and maximize the insulation effect.
5. By adopting an automatic vacuum canceling device, the pressure difference between the inside and outside is automatically resolved, making it easy for the user to open the door
6. It is easy to operate by adopting a solid and ergonomic door handle, and a locking function is installed for security.
7. Data can be checked with a high-resolution graphic display, and data backup and program update are possible through the USB port.
8. The LCO2 spray function is supported to prevent damage to the sample in case of sudden device shutdown (OPTION).
9. Through Eco Mode, the user selects the cross operation cycle of the compressor arbitrarily to support power saving operation (Only Dual Comp. Type).
10. Filter-Free Mechanism that structure does not require a filter, and management such as replacement or cleaning of the filter is omitted, providing the user with management convenience.

1-2. Package

Accessories are in the chamber.



1 Unit

ARA M80
ARA M(D)300
ARA M(D)400
ARA M(D)500
ARA M(D)700
ARA M(D)870

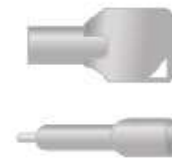


1 ea (ARA M80)
3 ea (Except ARA M80)

Stainless Steel Shelves



Hand Remover of Ice, 1 ea



For Manual model



For Auto model

Door Lock Key



User manual, 1 ea

1-3. Pictogram



Cautions and warnings



Electric shock warning



Ground guidance



Hand pinch warning



Low temperature warning

2. Installation

2-1. Installation

1. Be careful when transporting the product as it is heavy.
2. Do not put the product on its side or subject it to impact. Internal damage may occur.
3. This product is designed to operate normally at the rated voltage, so check the voltage status before installing the product.
4. Install in a place with low heat and humidity. Heat such as direct sunlight weakens the cooling power, and when it comes into contact with moisture or water, the insulation will deteriorate.
5. If there is no regular distance from the wall of the installation space, cooling power will weaken and power will be wasted. Install it at least 15cm from the rear wall and at least 10cm from the side wall, and use it at least 100cm from the ceiling.
6. The power plug of this product is a plug with grounding. Be sure to connect to an outlet with ground. Incomplete grounding may cause electric shock.
7. If there is no grounding, grounding work by an electric construction company is required.
Do not connect the ground wire to the water pipe and gas pipe (the risk of explosion or ignition), and the grounding or lightning rod (danger of lightning) of the telephone line.
8. To prevent damage to the door during product transportation, a bracket is installed on the top of the product, so be sure to remove it before opening the product door.

2-2. Technical Specifications

Model		ARA M80	ARA M300 ARA MD300	ARA M400 ARA MD400	ARA M500 ARA MD500	ARA M700 ARA MD700	ARA M870 ARA MD870
Capacity		85 Lit	317 Lit	404 Lit	514 Lit	732 Lit	876 Lit
Compressor		Single	M model : Single / MD model : Dual, Independent				
Temp.	Range	-86°C ~ -65°C	M series: -86°C~-65°C MD series: -95°C ~ -65°C (ECO MODE -86°C ~ -65°C)			M series: -80°C~-65°C MD series: -90°C ~ -65°C (ECO MODE : -80°C ~ -65°C)	M series: -80°C~ -60°C MD series: -90°C ~ -60°C (ECO MODE : -80°C ~ -60°C)
	Sensor	PT 100 Sensor					
Condenser Type	Block Condenser, NO Pin, Filter Free Mechanism						
Refrigerant	CFC Free Refrigerant System						
Controller & Display	7" Full Touch Screen TFT LCD (Touch Controller)						
Shelves	Included 3 Stainless Steel Shelves(ARA M80 - 1 shelf)						
Max. Q'ty of Racks		4 pcs of 12(3x4) Placed Rack	12pcs of 15(3x5)- Placed Rack (RFU3040)	16pcs of 15(3x5)- Placed Rack (RFU3040)	16pcs of 20(4x5)- Placed Rack (RFU50)	24pcs of 20(4x5)- Placed Rack (RFU50)	24pcs of 25(5x5)- Placed Rack (RFU50)
Material	Internal	Stainless Steel (#304)					
	External	Powder Coated Steel Plate					
	Inner Door	Powder Coated Stainless Steel (#304)					
Others	CFC-Free Refrigerants, Touch-Screen TFT LCD Controller Built-in Standard Warning and Alarm Functions						
Chamber Dimension (wXdXh, mm)	Internal	340x485x520	470x515x1,310	600x515x1,310	600x655x1,310	880x635x1,310	880x760x1,310
	External	530x687x1,147	710x750x1,990	840x750x1,990	840x890x1,990	1,120x870x1,990	1,120x995x1,990
Net Weight		102 kg	190 kg/ 220 kg	220 kg/ 260 kg	245 kg/ 300 kg	285 kg/ 320 kg	335kg/ 385kg
Packing Size (wXdXh, mm)		960x760x1,350	1,100x1,100x2,220	1,160x1,160x2,220	1,160x1,240x2,220	1,400x1,400x2,210	1,400x1,630x2,210
Power Consumption		300 W	600W / 1,200W	800W/ 1,600W			
Power Requirement	Dual Mode (MD series)	321 W/h	415 W/h	461 W/h	526 W/h	576 W/h	613 W/h
	Eco Mode		364 W/h	386 W/h	469 W/h	508 W/h	547 W/h

3. Operating

3-1. Precautions

Before Use

Carefully read this operating manual before using the device..

The device should be installed on hard and flat place.
If the device is installed in an inclined place, it causes noise and vibration.
If necessary, level the device by adjusting the 'Leveling tool'.



Be sure to operate the device only with the rated power supply, as specified on the label.
Do not connect wrong power source. It may be caused to over-heat, electric shock or fire.

If you move and reinstall the unit in a different place, let the unit stand stable for at least 3 hours.

Install the shelves before connecting the device to the power source.
After installation, wipe them with a soft cloth.
Put the samples to be stored into the chamber after reaching the set temperature.

Cautions for Safe

Be sure to operate it indoors and keep the room temperature between 5 and 30°C.
Long-term use in an environment that exceeds the allowable range may cause malfunction.

Do not modify, pull, forcibly bend, or perform any other act that may damage the power cord.



Do not spray or wash the product directly. Do not touch electrical parts such as power plugs or operate switches with wet hands. It may cause electric shock.

Do not disconnect the power plug while the product is operating.
It may cause electric shock or short circuit.

Do not hang on the door. The door may fall or the main body may fall, resulting in injury,
or a short circuit or electric shock.

Do not put bottles or cans. There is a risk that the contents will swell and burst.

Do not add commercially available bag coolant. The contents may leak out, causing rust and failure.

Do not touch samples or containers (especially metal) in storage and the walls of the refrigerator with wet or bare hands. It can cause frostbite. Be sure to wear low temperature gloves for work.

Do not place objects or containers with water on the product. It may fall, causing injury or overflowing water, resulting in poor insulation and a short circuit.

Do not put your hand into the machine room, air outlet or intake. Since the fan is running at high speed, it may cause burns or injury.

Do not install in humid or dusty places. It may cause overheating or short circuit.

Do not install at altitudes above 2,000 meters. (6,562 feet)

Do not operate the product outdoors. Do not use it in a place where there is continuous sunlight or where it may be exposed to rain. This may cause overheating or electrical defects in the product.



Do not operate the product near heaters or air conditioners.

Do not use flammable chemicals and similar products near the product. It may cause fire due to sparks from the switch.

Do not put volatile or flammable chemicals such as ether, benzene, alcohol, propane gas and similar products into this device. It may cause an explosion or fire.

Do not disassemble or modify the product by unauthorized persons. It may cause serious electrical problems and will not be covered under warranty.

Be sure to use a grounded outlet, and do not ground it on gas pipes, plastic water pipes, and telephone lines. It may cause electric shock, fire, malfunction or explosion of the device.

Regularly check the power plug for dirt. If there is dust, it may cause electric shock or fire.

Check that the power plug is connected correctly. When not in use for a long time, disconnect the power plug from the outlet for safety. Dust may cause heat generation or ignition.

When moving the product, disconnect the power plug from the outlet and move the power cord and product without damage. Damage to the power cord may cause electric shock or fire.

Removing and reconnecting the power plug, allow a time interval of 10 minutes or more. If connected immediately, a load will be placed on the freezer and it may cause a malfunction.

If gas leakage occurs near the product, first close the gas valve and ventilate it. To avoid flammable explosion, do not touch the product and outlet.

When removing the power plug, be sure to hold the plug and remove it. If not, a part of the inner cord of the cord will be cut. It may cause heat generation or fire.



If you notice unusual noise or abnormal operation during use, immediately turn off the product, disconnect the power cord, and contact Gyrozen Technical Support.

Check for foreign substances before/after using the product, and keep them clean by removing them with a neutral detergent and a dry cloth.

The fluctuation of the mains voltage must be within +/-10% of the nominal voltage. The maximum relative humidity is 80% at 31°C / 50% at 40°C.

If the product packaging is wet or if there are signs of moisture, do not use it and contact Gyrozen Technical Support.

Re-installing after moving the product

If you want to move the product, please contact technical Support team. Moving the product by a non-specialist can cause a short circuit, electric shock, fire, or damage to the product.

When moving the product, be careful not to tip or damage the product.



When moving the product, remove the power plug from the outlet and move the power cord without damage. Damage to the power cord may cause electric shock or fire.

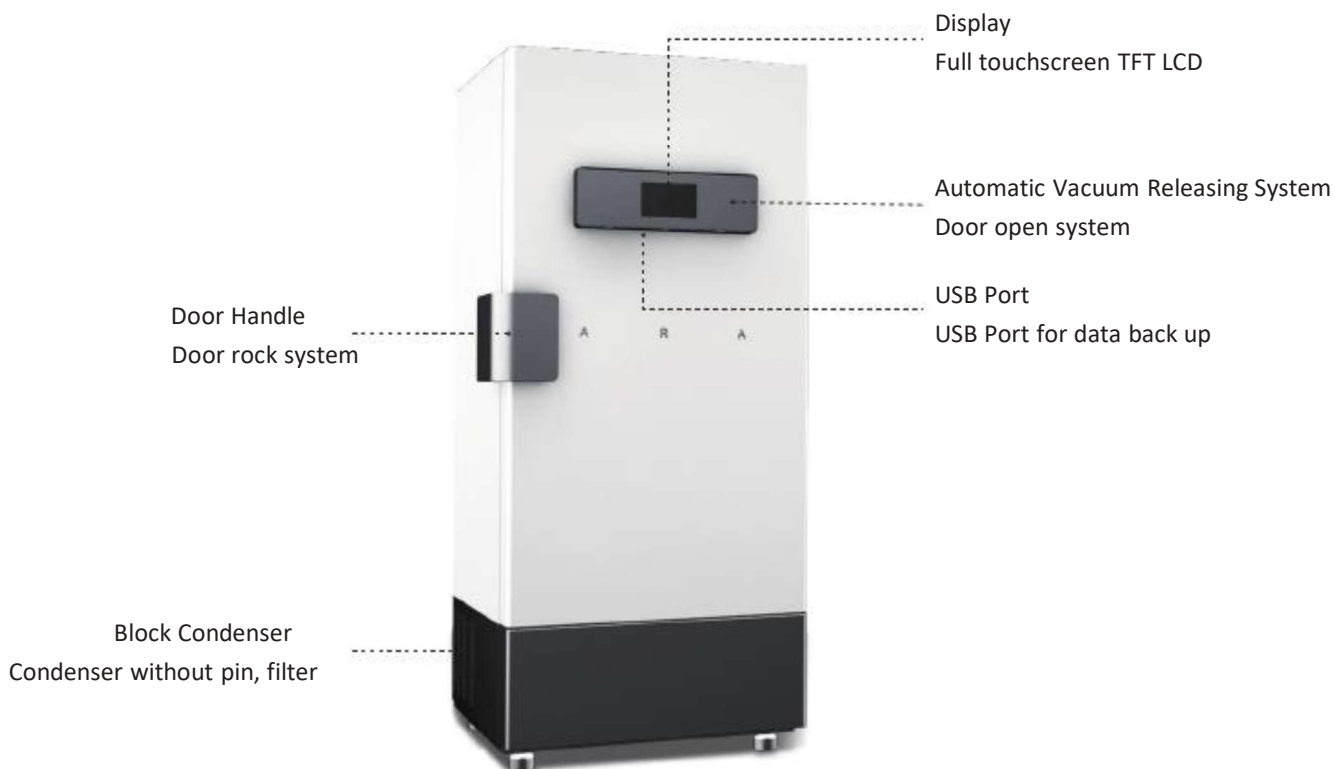
Remove all samples from the device before moving.

When installing or moving the product, moving the product while lying down may cause a malfunction. If the unit is tilted or lying down while moving, start operation after 24 hours.

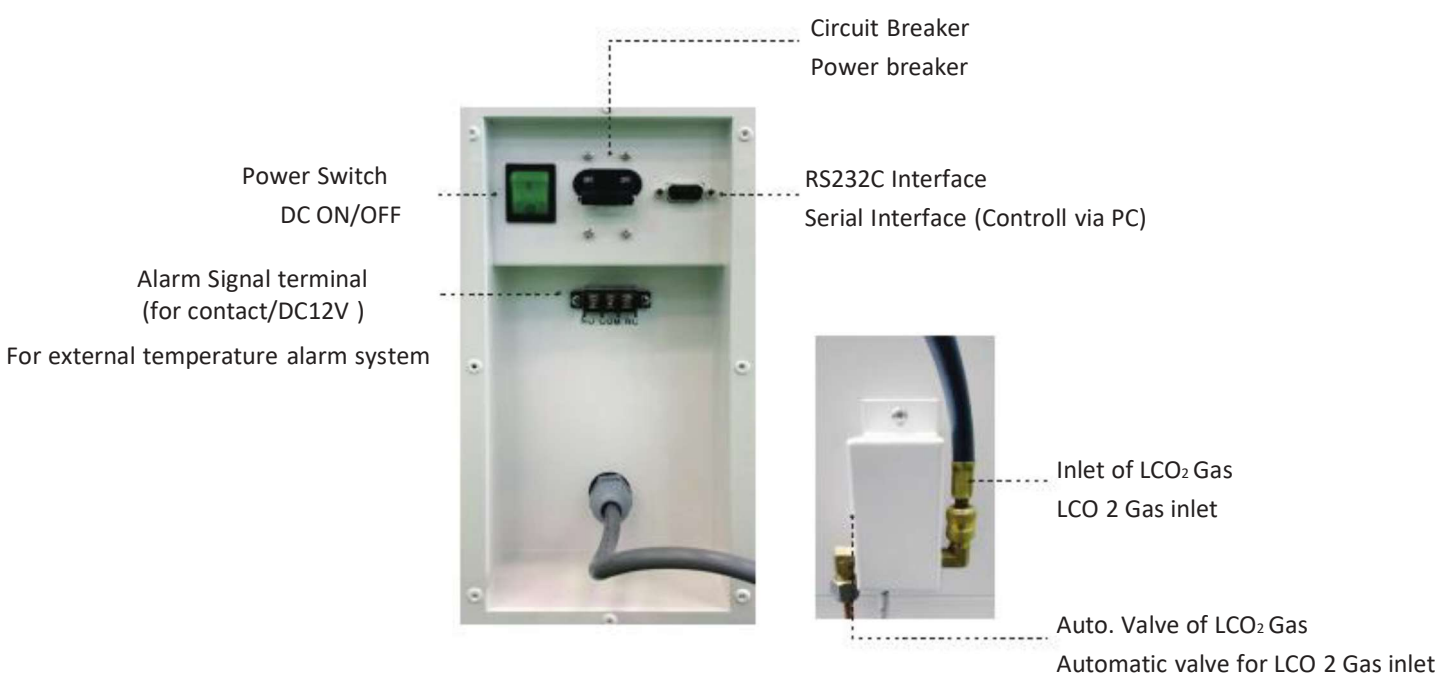
For product inquiries, repairs, or moving, please contact Hanil Scientific Technical Support..
T. 02-3452-8966 / techsupport@gyrozen.com

3-2. Product description

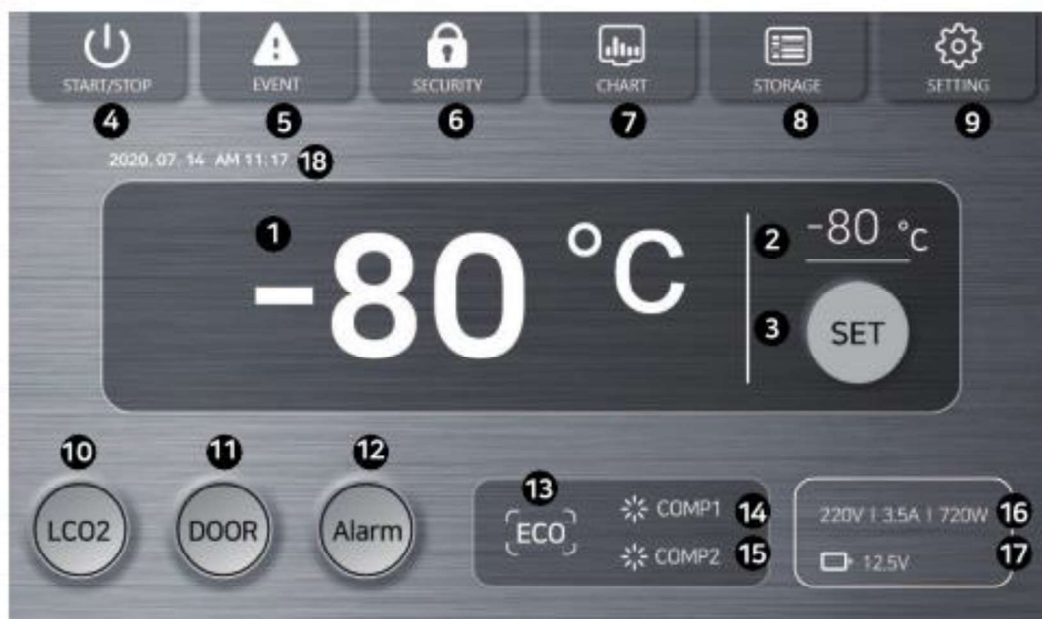
Appearance



Appearance (back)



Controller



No	Name	Description
1	Current Temperature	Displays current temperature of the chamber.
2	Set Temperature	Displays set temperature.
3	SET	Press the button to enter P/W and move to the set temperature change screen.
4	START/STOP	START / STOP button for operation. Input P/W to STOP / At START, touch for 3 seconds to START
5	EVENT ALARM	Press the button to move to the EVENT ALARM screen.
6	SECURITY	Press the button to move to the PASSWORD setting screen..
7	CHART	Press the button to move to the CHART screen..
8	STORAGE	Press the button to moves to the STORAGE screen.
9	SETTING	Press the button to move to the SETTING screen.
10	LCO2	Press the button to spray LCO2. TEST (OPTION)
11	Door Open	Press the button to show the password input window, and the door opens when the password is entered. (OPTON- Only Auto door) It turns green when the door is open.
12	ALARM	When an alarm occurs, it turns red. When alarm off, it becomes gray
13	ECO MODE	It turns green during energy saving operation. During normal operation, it becomes gray.
14	COMP1 operation	Compressor 1 is running, it becomes green. When Compressor stopped, it becomes gray.
15	COMP2 operation	Compressor 2 is running, it becomes green. When Compressor stopped, it becomes gray.
16	Check voltage, current and power	Displays voltage, current, and power values..
17	Battery	Displays the battery charge level.
18	Date and time	Displays the date and time.

3-3 Operation

1. When turning on the power of the product, be sure to turn on the circuit breaker located at the bottom of the rear of the product and then turn on the power switch.
 2. When turning off the power, turn off the power switch and turn off the circuit breaker. If you turn off the circuit breaker without turning off the power switch, the alarm will continue operating by the battery built into the product. This is to operate by the battery with built-in alarm when there is a risk of battery discharge and power supply problems such as a power outage, and to operate such as alarm and LCO2 injection.
 3. When turning the power off and then on again, operate after at least 5 minutes.
 4. The refrigerator starts operating one minute after the power is applied. After that, the freezer continues to operate and stop at regular intervals.
 5. All motions of the product are operated through the touch screen. <Initial password: 0000>
 6. For Auto Door Lock products < Initial admin ID : 00 / Password : 8888>
- ※ To register and delete Auto Door Lock settings, please check in SET Mode.

[Setting TEMPERATURE]

1. When the product is turned on, the temperature automatically reaches the set temperature.
 - 1) Operating temperature setting (SV)
SET → P/W input → Value setting
 - 2) Operation temperature upper limit setting (HI)
SETTING → SET MODE → P/W input → TEMP HIGH LIMIT → Value setting
 - 3) Operation temperature lower limit setting (LO)
SETTING → SET MODE → P/W input → TEMP LOW LIMIT → Value setting



Set temperature range

ARA MD300/400/500 : -95°C ~ -60°C
 ARA MD700/870 : -90°C ~ -60°C

ECO MODE

ARA MD300/400/500 : -86°C ~ -60°C
 ARA MD700/870 : -80°C ~ -60°C

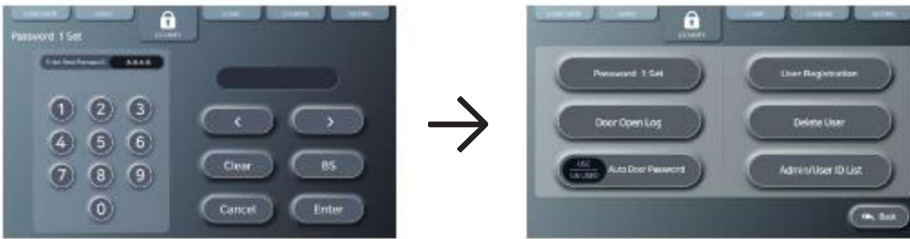
3) SECURITY

It sets PASSWORD 1, and functions related to AUTO DOOR (option).

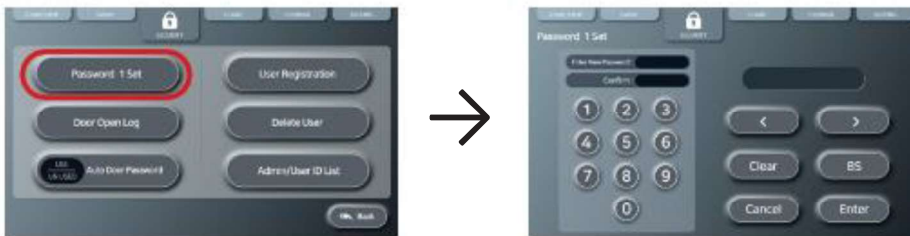
Enter the user's password to move to the SECURITY screen. (Initial password: 0000)

Enter the user's AUTO DOOR PASSWORD to move to the SECURITY screen.

(The initial password is 8888, and if Auto Door IDs 01 to 19 are set, the password is entered and entered, and the initial password cannot be entered.)



1) PASSWORD 1 SET : Set the default password.



2) DOOR OPEN LOG : When setting AUTO DOOR, DOOR OPEN LOG is displayed.



3) AUTO DOOR PASSWORD : Set whether to use AUTO DOOR PASSWORD.



4) USER REGISTRATION : Register the admin and user of AUTO DOOR.



4-1) Auto Door ID/Password registration

※ ADMIN ID is from 01 to 19 and USER ID is from 20 to 99.

Initial Admin ID :00
Initial Admin Password :8888(Default)

Case 1) Admin ID:01 registration

Admin ID:00

Admin Password:8888

New ID:01

New Password:1111

Confirm Password:1111

APPLY

Case 2) Admin ID:19 registration

Admin ID:01

Admin Password:1111

New ID:19

New Password:2222

Confirm Password:2222

APPLY

※ID:00 is used only for the first registration

Popup message is displayed for registered ID

Case 3) User ID:20 registration

Admin ID:01(Admin ID: 19 can also be approved)

Admin Password:1111

New ID:20

New Password:3333

Confirm Password:3333

APPLY

4-2) DELETE USER (OPTION - Auto Door Open ID/PW delete setting)

Case)Admin ID:01 delete

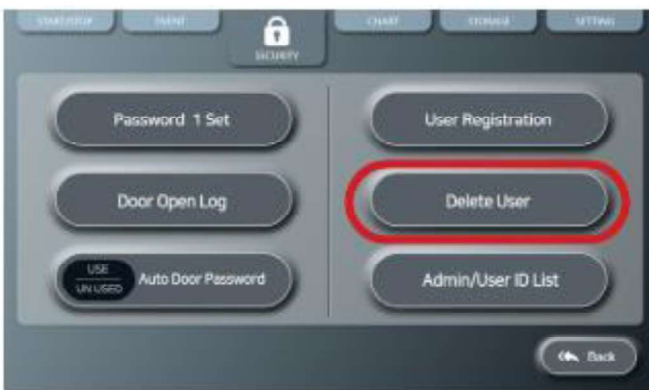
Admin ID:19

Admin Password:2222

Del ID:01

APPLY

※Popup Message displays “COMPLETED DELETE USER” and OK screen



4-3) Auto Door Open ID/PW delete setting

Case)Admin ID:01 delete

Admin ID:19

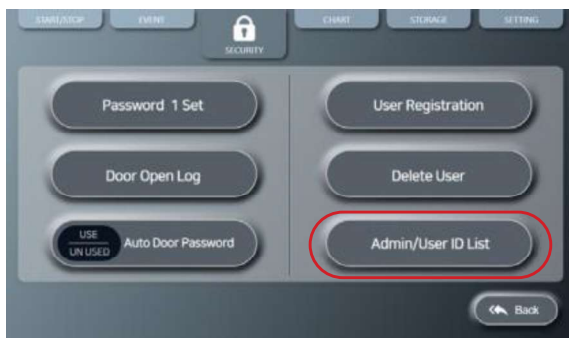
Admin Password:2222

Del ID:01

APPLY

※Popup message displays “COMPLETED DELETE USER” and OK screen

4-4) ADMIN/USER ID LIST : Displays a list of registered IDs of administrators and users.



5-1) STORAGE

This is a function that allows the user to record the location of the sample.
Increases sample retention by reducing the instrument door opening.



① STORAGE indicates the position of the rack on the device. When you touch the RACK you want to check, the box position of the corresponding rack is displayed on the right.

② Indicate the BOX position on the rack.

Pressing the ③ button in STORAGE displays a keypad for entering the RACK name. Input sample name of RACK on keypad. After inputting the RACK sample name, if you press the ④ button on the right side of the rack, you can enter an arbitrary sample name for the box. Characters entered on the keypad are available in English and numbers. (Up to 10 digits)

5-2) SETTING



- ① Press the button to move to the SET MODE screen.
 - ② Press the button to move to the PROGRAM MODE screen.
 - ③ Press the button to move to the ENGINEERING MODE screen.
 - ④ Press the button to move to the FACTORY MODE screen.
- ※ ②③④ is the mode used by engineers.

5-2) SET MODE

- Press PASSWORD1. You can move to the setting change screen and change the setting value.



- 1) SOFTWARE VERSION (Check SOFTWARE VERSION)
- 2) DATE&TIME SET (Set date and time)
- 3) TEMP HIGH LIMIT (°C) (High limit alarm temperature setting)
- 4) TEMP LOW LIMIT (°C) (lower limit alarm temperature setting)
- 5) ECO MODE (COMP1, COMP2 crossover operation use setting (ON/OFF)) <Only DOUBLE Type>
- 6) ECO CYCLE(DAY)COMP1, COMP2 crossover operation time setting <Only DOUBLE Type>
- 7) BUZZER RECYCLE ALARM (MIN) (Alarm cycle setting (unit: minute))
- 8) VOICE ALARM(KOR) (Voice guidance setting when an alarm occurs)
- 9) BACK LIGHT (Screen brightness setting (0~3))
- 10) DV SET (°C) (Set operating temperature deviation value (DIFFERENT))
- 11) CHART DATA CYCLE (MIN) (Sets the data storage and display cycle)
- 12) PRINT CYCLE(MIN) (OPTION – Set the output cycle of THERMAL PRINTER)
- 13) EXTERNAL ALARM SET (External contact operation setting for various alarms)
- 14) LOG DATA CLEAR (Saved LOG DATA delete function)

6) LCO₂ (Optional Item)

- If there is a sudden temperature rise of the device such as a power outage, the LCO₂ installed in the product can be used to prevent damage to samples.
- This operation is activated when the set (SET MODE TEMP HIGH LIMIT set value) temperature is reached, and when the temperature is higher than the temperature set in the "Temp High Limit" setting, LCO₂ is automatically injected inside. Press the LCO₂ button to check if LCO₂ is sprayed normally
- When a freezing system error occurs in a situation outside the user's control, the light is automatically lit and LCO₂ spraying operation is performed until the error situation is cleared.
- When the door is opened during operation, this function is deactivated for user safety, preventing LCO₂ spraying while the door is open. Reactivation occurs when the door is closed and the target temperature is restored.

7) Alarm Signal Terminal (ao3 output)

- The Alarm Signal Terminal supports a fatal error situation occurring in the equipment when the user wants to receive an alarm from a separate device.
- When a power failure error occurs due to a power failure during operation of the equipment, the temperature indicates an abnormal value during operation of the equipment so that an external alarm output occurs when an Out Of Control-High/Low Error occurs.
- In External Alarm Set in Set Mode, ON/OFF can be set for the output, and the alarm set to ON is output externally.
- "Remote Wire/Wireless Alarm System", an optional device, is applicable, and other users should connect separate equipment for use.



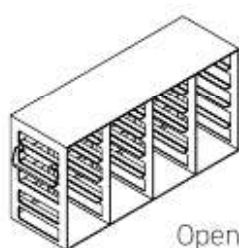
Alarm Signal
Terminal 1 contact

NO (Normal Open)
COM (Common)
NC (Normal Connect)

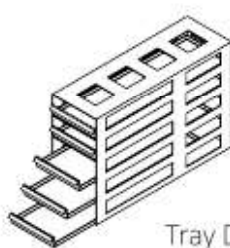
4. Product Management

4-1. Accessories (Option)

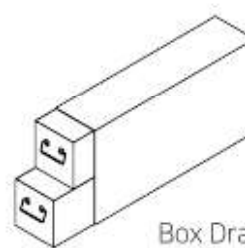
Stainless Steel Rack for Upright Type Freezer



Open Rack



Tray Drawer



Box Drawer

Rack size	Small Size Rack			Medium Size Rack			Large Size Rack		
Rack type	Open Rack	Tray Drawer	Box Drawer	Open Rack	Tray Drawer	Box Drawer	Open Rack	Tray Drawer	Box Drawer
Dimension (W x D x H, mm)	140 x 430 x 220		140 x 410 x 220	140 x 430 x 290		140 x 425 x 290	140 x 570 x 290		
Applicable Freezer	ARA M80			ARA M(D)300/400			ARA M(D)500/700		
Quantity of Available Boxes	12 ea (3 x 4)			15 ea (3 x 5)		12 ea (3 x 4)	20 ea (4 x 5)		16 ea (4 x 4)
Cat. No.	AMA-ORS	AMA-TDS	AMA-BDS	AMA-ORM	AMA-TDM	AMA-BDM	AMA-ORL	AMA-TDL	AMA-BDL

Freezer Box

Cat. No.	Product
AMA-B001	Freezer box, Paper, with Dividers for 9 x 9 holes, W127 x D127 x H52 mm
AMA-B002	Freezer box, PP, with Dividers for 9 x 9 holes, W127 x D127 x H52 mm

Others

Cat. No.	Product
AMA-TR622	Temperature Chart Recorder, TR622
AMA-LCO	LCO ₂ Backup System

4-2. Maintenance

It is designed in consideration of various situations that may occur during operation of the Ultra Low Temperature Smart Freezer.

However, in order to use it for a long period of time with stable performance, be sure to observe the following items.

Be sure to connect the power cord only to a power outlet that meets the specified voltage and current requirements.

Do not handle the device with wet hands.

The manufacturer is not in charge of breakdown caused by abnormal use or by ignoring the warnings and cautions described in this manual.

Only use parts and accessories provided by Hanil Scientific Inc.

Before cleaning the device, remove the power plug and samples.

After Defrosting, the door and the shelves should be wiped with a dry cloth dampened with warm water and a mild liquid detergent.



Clean the door packing regularly and dry it.

There is a risk of burns when touching the condenser or the freezer by hand.

Do not allow water to come in contact with the device.

Clean the dirt on the condenser and both galleries at the bottom of the device with brush at least once a year.

Unplug the power plug before cleaning or left unused for a long period of time. Clean the inside of the freezer and then open the door for 2 ~ 3 days to dry, so that the inside of the freezer does not mold or smell.

Regularly check the thickness of the frost and remove the frost at least once every six months.

4-3. Automatic emergency door

※ AUTO DOOR SYSTEM is operated by the product's built-in battery even in case of power failure. Therefore, perform emergency disassembly only when the AUTO DOOR SYSTEM is broken.

1. If the door does not open

- ① Turn off DC S/W on the back of the product.[Fig. 1]
- ② Open the rubber cover at the bottom right of the cover.[Fig. 2]
- ③ Manual open using the enclosed tool[Fig. 3-1]

Opening with an electric drill [Fig. 3-2]. (Turn it clockwise.)

* Manual open: Approx. 1 minute to 1 minute 30 seconds

* Electric drill open: about 20 seconds



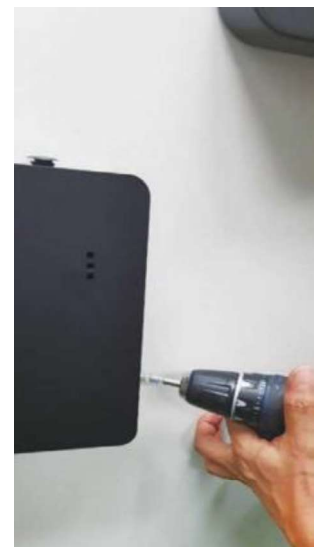
[Fig. 1]



[Fig. 2]



[Fig. 3-1]



[Fig. 3-2]

- ④ Closing the door after opening the door, perform ③ until the position where the white gasket on the door edge is in close contact with the freezer, check the gasket, and then turn on the DC S/W on the back of the product.

(At this time, if the door is automatically operated and locked, it is reset to a normal state, and if it does not operate or shows abnormal operation, it is a malfunction.

Please contact the place of purchase.)

2. If the door does not close

- ① Perform the same process as “If the door does not open ①, ②”.
- ② Perform the same process as in “If the door does not open ④”.

