

# HyperCOOL

## HC4055 / HC4110

### User Manual



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This manual is for the users who operate the device for the first time.  
This manual provides information on the detailed instructions, precaution, troubleshooting and maintenance care.

## 1. Meanings of Labels & Safety Precautions

### 1.1 Safety Labels on the Instrument

The labels on the instrument represent safety instructions and directions.

Label	Meaning	Label	Meaning
	Attention and warning		Attention and warning for electric shock

## 1.2 Safety Precautions

Before using the instrument, please read this operation manual to ensure correct usage. Incorrect handling of the instrument may possibly result in personal injury or physical damage on the instrument or its accessories.

1. ALWAYS locate the instrument on a flat, rigid and stable table capable of withstanding the weight of the instrument and its operation.
2. ALWAYS make a safety zone of 30 cm around the instrument to indicate that neither hazardous materials nor persons should be permitted within the area during operation.
  - ▶ ALWAYS position the instrument with enough space on each side of instrument to ensure proper air circulation.
3. The line voltage of the installation site should be within the rated voltage of this product. If not complied, the instrument can be damaged.
4. Only use accessories manufactured by GYROZEN Co., Ltd. GYROZEN does not guarantees any problems occurred by using incompatible accessories.
5. Remove any contaminants inside the chamber before operating the instrument.
6. Should not use flammable, toxic, radioactive, explosive or corrosive materials.
7. The containers should be kept level while drying the samples in them.
8. Any kind of instrument repair must be performed only by GYROZEN-authorized service engineers.
9. A proper disinfection procedure should be carried out before delivering the instrument to service engineer.
10. Maintain all the accessories dry and clean to keep the best condition and to increase the lifespan.

## 2. Product Description

### 2.1 Product Description

Power Outlet for Vacuum Pump



Vacuum Release Valve



Tube Connection to Vacuum Pump



Mains Inlet



Mains Switch

Air Inlet

Drain Valve

Accessory



User Manual



AC Power Cord



Hose



Clamp

## 2.2 Technical Specifications

<b>Model</b>	<b>HC-4055</b>	<b>HC-4110</b>
Ultimate Chamber Temp (at RT) (°C)	-55	-110
Chamber Volume (L)	4	
Trap (Chamber) Size (Ø x L)	165 x 202	
ICE Condensing Capacity (kg)	3	
ICE Condensing Performance (kg/day)	2.5	
Compressor	1/2HP	1/3HP x 2
Refrigerant	R507	R507/R1150
Power supply(V/Hz)	220/50~60	
Power Requirement (Resting, VA)	642	819
Dimension (W x D x H, mm)	400 x 660 x 570	
Weight (kg)	58	72
Digital Readout	Temperature, Time	
Function	KEYLOCK, DEFROST , VACUUM, TIME	

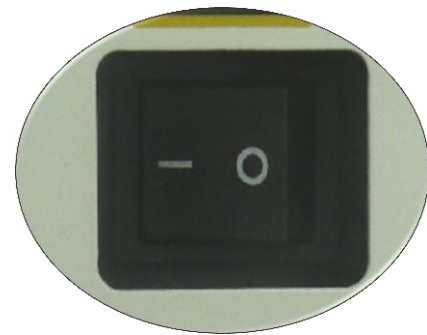
## 3. Installation

### 3.1 Power ON / OFF

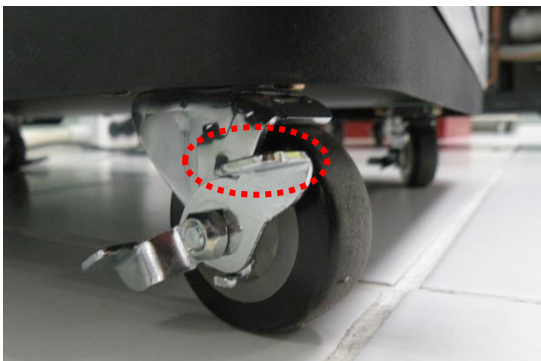
#### Action

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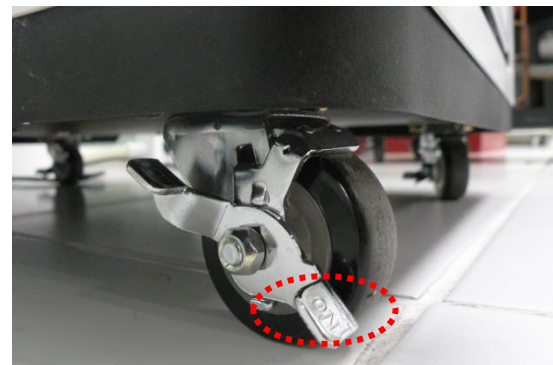
- 1 Connect the AC power cord to the mains inlet on the backside of the instrument and put the plug into a mains socket.  
  
▶ Check the proper power and the fuse specification.
  
- 2 Power on the instrument by pressing the mains switch on the right side of the instrument. Turn on the switch to [ I ].



### 3.2 Wheel Lock



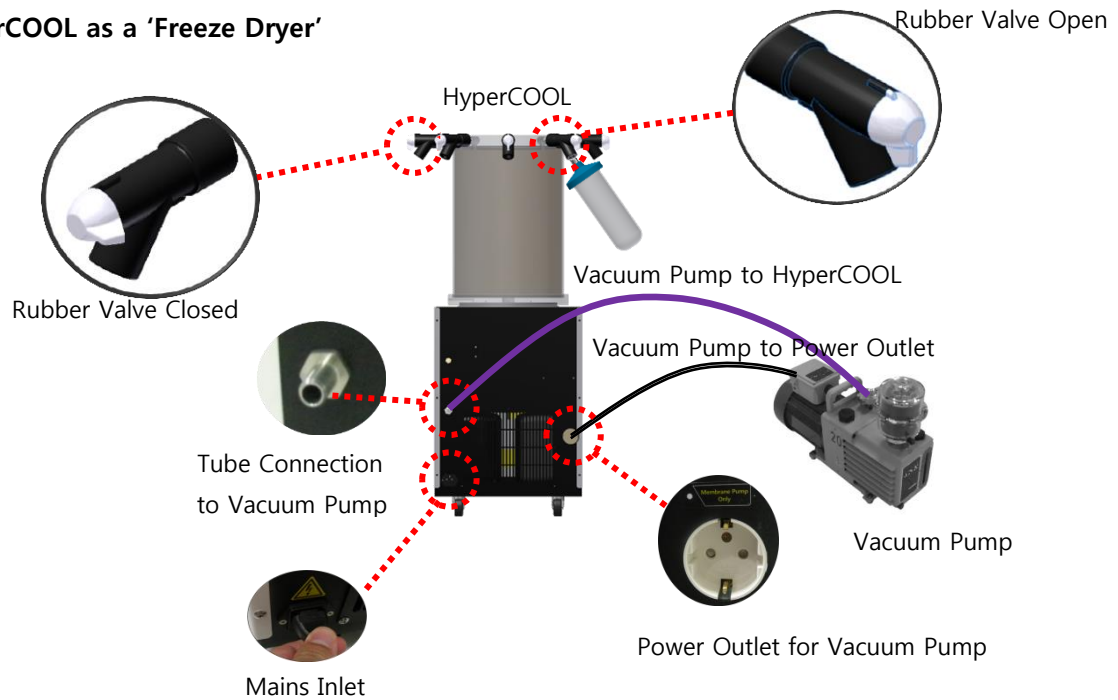
Press lever of the swivel caster to lock the wheel.



Wheel locked

### 3.3 HyperCOOL Connection

#### 1) HyperCOOL as a 'Freeze Dryer'



#### ► Preparation of Chamber

- Ensure all the vacuum valves are firmly closed.
- Ensure all the connections and attachment from the chamber are tightly sealed.
- Ensure the drain valve does not contain any water.
- Ensure both the drain valve and the vacuum release valve are fully closed.
- Check the status of all the rubber valve handles are closed.



- Closed -



- Open -



- Vacuum Release -

#### ► Preparation of Vacuum Pump

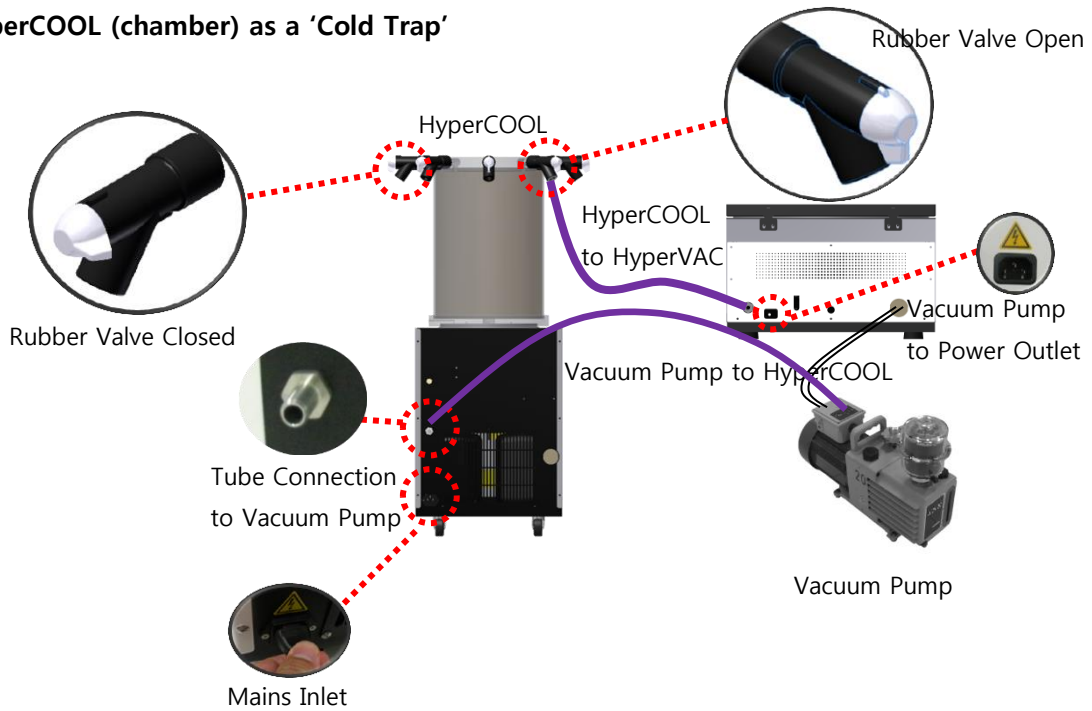
- Connect vacuum hose to the vacuum pump inlet and firmly clamp it not to release vacuum.
- Connect vacuum hose to the HyperVAC vacuum nozzle and firmly clamp it.

#### ► Preparation of Accessories

- Chamber or manifold should be mounted on top of HyperCOOL for freeze-drying samples.
- Ensure all the connections are tightly sealed.



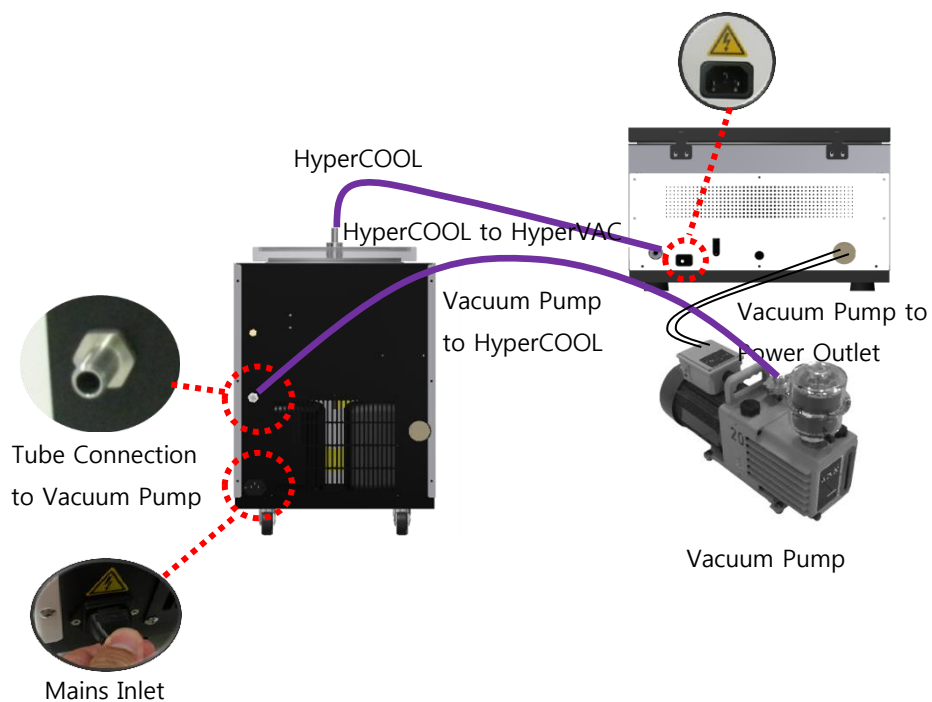
## 2) HyperCOOL (chamber) as a 'Cold Trap'



### ► Precaution

- DEFROST should be performed only when the vacuum pump is off. While DEFROST function is activated, HyperVAC (the vacuum concentrator) should be run at lower than 1,000 rpm not to turn on the vacuum pump.

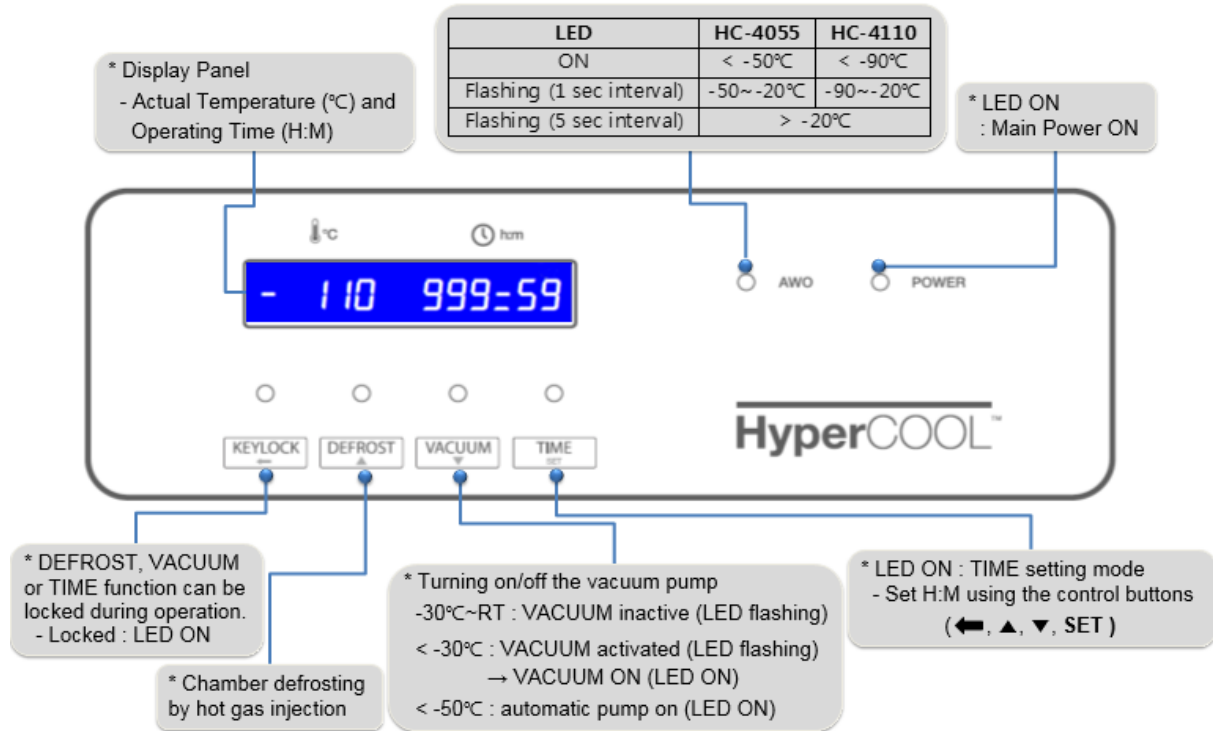
## 3) HyperCOOL (HC-CPP) as a 'Cold Trap'



► **Precaution** (same as in the [2] HyperCOOL (chamber) as a 'Cold Trap')

## 4. Operation

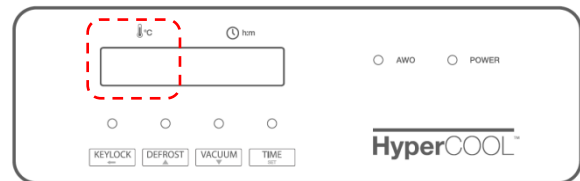
### 4.1 Key Functions of Control Panel



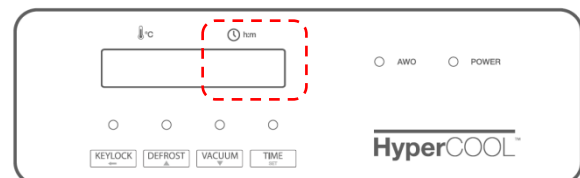
### 4.2 Main Display

#### Action

- 1 Temperature: displays actual temperature (°C)



- 2 Time : displays operating time (H:M)  
▶ The range of time displayed is 999 hours and 59 minutes.



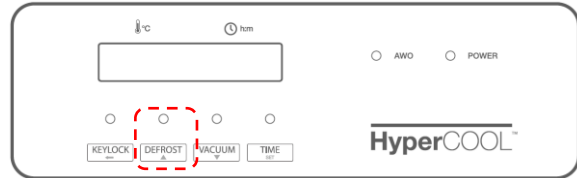
### 4.3 DEFROST

DEFROST function is used to remove ice or frost in the chamber.

#### Action

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- 1 Defrosting function is activated with the LED on when the DEFROST button is pressed.



- ※ To perform the DEFROST function, vacuum release process should be followed not to allow additional moisture into chamber. It can be done by opening the vacuum release valve on the backside of the HyperCOOL and will take up to a minute.
- ※ After the vacuum release process, press the DEFROST button to start defrosting.
- ※ Open the drain valve to remove the water melted from the chamber ice.



To open the drain valve, turn it counterclockwise.

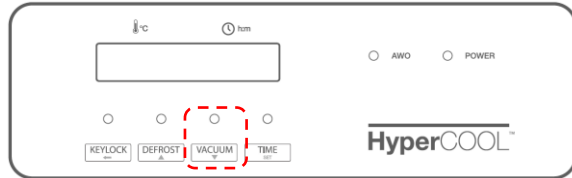
### 4.4 VACUUM

VACUUM function is to turn on or off the vacuum pump, where the VACUUM LED indicates current status of the vacuum pump.

- 1) While the vacuum pump is resting, the VACUUM LED flashes.
- 2) While the vacuum pump is running, the VACUUM LED is ON. The vacuum pump is turned off by pressing VACUUM button.

## Action

- 1 Press VACUUM button to evacuate the HyperCOOL chamber.
  - ▶ VACUUM LED flashes when the vacuum pump is off and turns on when the pump starts to operate.
  - ▶ When the temperature of the condenser reaches  $-50^{\circ}\text{C}$ , the vacuum pump automatically starts to operate.
    - The pump can turn on by pressing the VACUUM button when the temperature reaches  $-30^{\circ}\text{C}$ .



- 2 When the pump is on, it turns off by pressing the VACUUM button. The HyperCOOL allows air into the chamber by opening the vacuum release valve on the backside.
  - ▶ The vacuum release can be adjusted by turning the release valve.
    1. Tightened by turning clockwise
    2. Loosened by turning counterclockwise

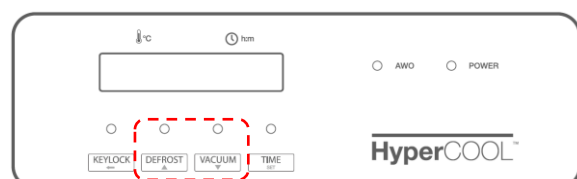


## 4.5 TIME

Operating time can be set up to 999 hours and 59 minutes, or 'continuous running' is also available.

## Action

- 1 The operating time can be set by pressing TIME and ▲/▼ buttons.
  - ▶ TIME (when pressed once, activates time setting mode.) → ▲/▼ (sets H:M) → TIME (fixes the set value)
  - ▶ At continuous running mode (0:00), TIME counts up from (0:00).
  - ▶ When the ▲ is kept pressed, 'M'

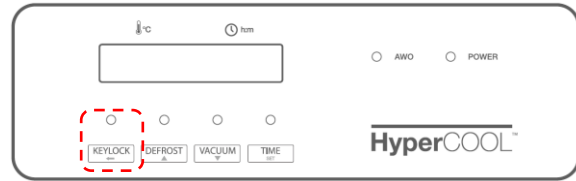


increases till it reaches 59 minutes.

'H' follows afterwards and goes up acceleratedly.

The TIME setting can be canceled by pressing ←.

► The factory default setting is continuous running mode (0:00).



- 2 When the operation is completed, "End" message comes up with beep sound.

► Press any button (KEYLOCK, DEFROST, VACUUM or TIME) to silence the beep sound.

#### \* Time LED Status

- LED OFF : at continuous runningmode (00:00)
- LED flashing : at TIME setting mode
- LED ON : at running for the set TIME

## 4.6 KEYLOCK

The KEYLOCK function is available to prevent unwanted interruption of operation or change of the current setting.

### Action

- 1 The Keylock mode is activated when the KEYLOCK button is pressed. When KEYLOCK LED turns on, all the other buttons are frozen to prevent parameter change.
- 2 The Keylock mode is deactivated by pressing KEYLOCK once again.



## 5. Maintenance

### 5.1 Outer Part of the Instrument

1. Clean the outside of the instrument with dry soft cloth. If necessary, dip the cloth in neutral detergent and clean any contaminants. Keep it completely dry after cleaning.
2. Do not use any volatile chemicals such as alcohol, benzene, benzole, and thinner, etc.
3. Be careful not to make scratches on the surface of the instrument.
  - ▶ Scratches may cause corrosion on the surface of the instrument.
  - ▶ Rusted parts should be cleaned with neutral detergents and kept dry.

### 5.2 Inside the Chamber

1. Keep dry inside the chamber after every use.
2. If the chamber is contaminated, clean contaminated area with the cloth dipped in neutral detergent.

### 5.3 Removing Dirt on the Condenser

- ▶ Dirt should be removed periodically to keep the best performance of the condenser. The electric power should be OFF during the cleaning process.



The front air panel can be easily removed by pulling it by hands.



Get rid of any dirt or contaminants on the compressor.

## 5.4 Fuse Replacement

Fuse replacement may be required when the main power does not turn on by switching on the power. Please, follow the below instruction.

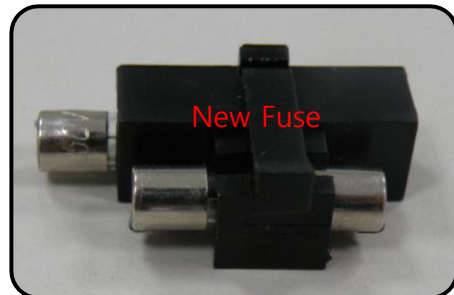
### Action

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- 1 Remove the AC power cord and open the fuse case using a (-) screw driver.



- 2 Replace the damaged fuse by the new spare fuse (below in the right picture).



## 6. Troubleshooting

### 6.1 Checklist

If any problems occur in the instrument, please check the following list before contact your local GYROZEN partner.

Symptom	Checklist
Power failure	Make sure the AC Power cord completely connects the instrument to the mains outlet. Check the power switch is on. Refer to [3.1 Power ON / OFF]. If it still does not work, please replace the fuse by a new one. Refer to [5.2 Fuse Replacement].
Vacuum failure	Make sure the silicon packing keeps the right position and normally seals with no leak.



## 6.2 Error Codes

Please, check the serial number of the instrument indicated on the product label to request an A/S service.

Error	Possible Causes	Action
Error 1	Chamber temperature	This message may come up if the chamber temperature goes out of range. Turn off the main power and call GYROZEN field service engineer.
Error 3	Comp1 temperature	This message may come up if the temperature of the compressor 1 goes out of range. Turn off the main power and call GYROZEN field service engineer.
Error 4	Comp2 temperature	This message may come up if the temperature of the compressor 2 goes out of range. Turn off the main power and call GYROZEN field service engineer (for the HC-4110 model only).
Error 5	Comp1 temperature sensor	This message may come up if the temperature sensor of the compressor 1 does not normally work. Turn off the main power and call GYROZEN field service engineer.
Error 6	Comp2 temperature sensor	This message may come up if the temperature sensor of the compressor 2 does not normally work. Turn off the main power and call GYROZEN field service engineer (for the HC-4110 model only).
Error 7	Chamber temperature sensor	This message may come up if the temperature sensor of the chamber does not normally work. Turn off the main power and call GYROZEN field service engineer.

## 6.3 Compliance

1. Comply with the instruction on the safety label.
2. Use genuine GYROZEN products and parts. The best performance can be guaranteed only for the GYROZEN-approved products. The customer service may not be provided for using any unauthorized products.
3. The customer service may not be provided when the product is opened or disassembled arbitrarily by users.

## 7. Ordering Information

**GZ-HC4055** HyperCOOL -55°C Cooling Trap, 4L, Teflon Coated, w/ Digital Display and Time Control incl. a Vacuum Hose and Clamps (220V, 50/60Hz)

**GZ-HC4110** HyperCOOL -110°C Cooling Trap, 4L, Teflon Coated, w/ Digital Display and Time Control incl. a Vacuum Hose and Clamps (220V, 50/60Hz)

### HyperCOOL Cover Plate

HC-CPP HyperCOOL Trap Plate for Connection Vacuum Hose to Vacuum Concentrator

HC-CPB HyperCOOL Acrylic Base for Manifold or Chamber

### Manifold and Chamber

HC-MFB-4V 4-Valve Manifold Basic with four rubber valves on a stainless steel bar, 30cm

HC-MFB-6V 6-Valve Manifold Basic with six rubber valves on a stainless steel bar, 30cm

HC-MFE-4V 4-Valve Manifold Extension with four rubber valves on a stainless steel bar, 20cm

HC-MFE-6V 6-Valve Manifold Extension with six rubber valves on a stainless steel bar, 20cm

HC-CH30P Acrylic Chamber Trunk and Plain Top, ø30cm, height 40cm

HC-CH30-4V Acrylic Chamber Trunk and Top with 4 Rubber Valves, ø30cm, height 40cm

HC-CH30-8V Acrylic Chamber Trunk and Top with 8 Rubber Valves, ø30cm, height 40cm

### Rack, Flask, and Others

HC-CR25 Stainless Steel Rack with 3 Sets of SS Shelves and Trays, ø25cm (Trays can be inserted up to 5)

HC-CR-TS A Set of a Tray and a Shelve

HC-GF150 Freeze Drying Glass Flask 150ml with rubber lid and stainless steel connector

HC-GF300 Freeze Drying Glass Flask 300ml with rubber lid and stainless steel connector

HC-GF600 Freeze Drying Glass Flask 600ml with rubber lid and stainless steel connector

HC-GF900 Freeze Drying Glass Flask 900ml with rubber lid and stainless steel connector

HC-GF1200 Freeze Drying Glass Flask 1200ml with rubber lid and stainless steel connector

HC-AA Acetal Adaptor for the connection Vacuum Hose to Rubber Valve

HC-VH Vacuum Hose with 2 Clamps, 100cm

GVP-W2V20 High Vacuum Rotary Vane Pump, 0.4kW(0.5HP), 200 L/min, 1X10<sup>-3</sup> torr

GVP-WOF150 Oil Mist Trap

## HyperCOOL PACKAGE INFORMATION

GZ-HC4055-M4B	Manifold Type Freeze Drying System -55°C with 4 Valves Basic incl. a Rotary Vane Pump, Oil Mist Trap & Connections (GZ-HC4055 + HC-CPB + HC-MFB-4V + HC-VH + GVP-W2V20 + GVP-WOF150)
GZ-HC4110-M4B	Manifold Type Freeze Drying System -110°C with 4 Valves Basic incl. a Rotary Vane Pump, Oil Mist Trap & Connections (GZ-HC4110 + HC-CPB + HC-MFB-4V + HC-VH + GVP-W2V20 + GVP-WOF150)
GZ-HC4110-CHR	Chamber Type Freeze Drying System -110°C with 3 Shelves Rack incl. a Rotary Vane Pump, Oil Mist Trap & Connections (GZ-HC4110 + HC-CPB + HC-CH30P + HC-CR25 + HC-VH + GVP-W2V20 + GVP-WOF150)
GZ-HC4110-CH4VR	Multi-Type Freeze Drying System -110°C with 3 Shelves Rack & 4 Valves Chamber incl. a Rotary Vane Pump, Oil Mist Trap & Connections (GZ-HC4110 + HC-CPB + HC-CH30-4V + HC-CR25 + HC-VH + GVP-W2V20 + GVP-WOF150)
GZ-HC4110-CH8VR	Multi-Type Freeze Drying System -110°C with 3 Shelves Rack & 8 Valves Chamber incl. a Rotary Vane Pump, Oil Mist Trap & Connections (GZ-HC4110 + HC-CPB + HC-CH30-8V + HC-CR25 + HC-VH + GVP-W2V20 + GVP-WOF150)
GZ-MHC4110-M4EC	Multi-Purpose, Vacuum Concentration and Freeze Drying System -110°C with 8 Valves Manifold incl. a Rotary Vane Pump, Oil Mist Trap, Connections & a Table B (GZ-VC2200 + GVCT-MB + GZ-HC4110 + HC-CPB + HC-MFB-4V + HC-MFE-4V + two HC-VH + GVP-W2V20 + GVP-WOF150 )
GZ-MHC4110-CH8VRC	Multi-Purpose, Vacuum Concentration and Freeze Drying System -110°C with 3 Shelves Rack & 8 Valves Chamber incl. a Rotary Vane Pump, Oil Mist Trap, Connections & a Table B (GZ-VC2200 + GVCT-MB + GZ-HC4110 + HC-CPB + HC-CH30-8V + HC-CR25 + two HC-VH + GVP-W2V20 + GVP-WOF150)