



## 5 Transportation, Transfer and Moving

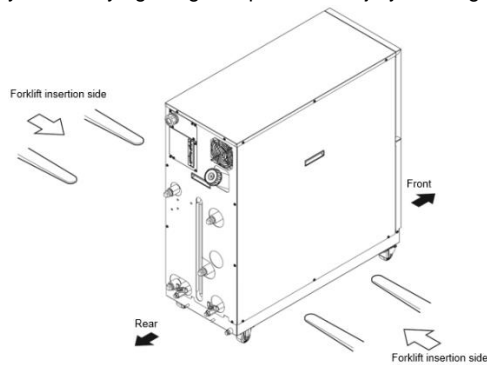
### Caution

- Do not set this system on its side during transportation. Oil in the compressor drains into the refrigerant pipe, which causes lubricant shortages, leading to damage to the compressor.
- Drain the remaining fluid out of the pipe as much as possible. The remaining fluid may spill if disregarded.
- Exercise caution not to damage the panel and piping with the forklift when transporting the system.

### 5.1 Transporting with a Forklift

#### Warning

- This system is heavy and requires a forklift to safely move it.
- For transporting with the forklift, be sure to insert the fork into a designed position. Always insert the forks all the way through. Be careful not to hit the casters and adjustable feet.
- Forklift insertion positions are on either left or right side of this system. Do not insert the from the front or the rear.
- Do not set this system on its side for transportation. Potential damage to this system carrying danger of personnel injury if disregarded.



### 5.2 Transporting with Caster

#### Warning

This system is heavy, which requires assistance for this work. Exercise caution and look out for sloped surfaces such as ramps, etc.

### Caution

Do not grab piping on the back of this system or panel handles when transporting with the casters. Potential damage to piping and panels may occur if disregarded.

## 6 Installation

### 6.1 Environment

#### Warning

- Do not use in an environment where dust, powder, corrosive gases, flammable gases, chemicals, oil, salt water or steam are present.
- Do not use in an explosive atmosphere.
- Do not expose to direct sunlight. Use a suitable protective cover.
- Do not install in a location subject to vibration or impact in excess of the product's specifications.
- Do not install in an environment that is subject to abrupt changes in temperature.
- Do not install in an environment that is subject to intense electromagnetic noise (intense electric field, intense magnetic field or surges) or strong high frequencies.
- Do not install in an environment that is subject to static electricity, or condition that discharges static electricity to the system.
- Do not install in an environment that is subject to potential lightning damage.
- Do not install where the altitude is 1000m or higher.
- Do not mount in a location exposed to radiant heat that would result in temperatures in excess of the product's specifications.
- Ambient temperature of the environment must be 10 to 35 °C in operation and 0 to 50 °C in storage.
- Humidity of the environment must be 30 to 70% in operation and 15 to 85% in storage.
- Do not install in conditions that apply an external force or weight causing system deformation.
- Do not install if there is no adequate space for maintenance in the installation site.

## 6 Installation (continued)

### 6.2 Installation

#### Warning

- The Installer / End User is responsible for carrying out a noise risk assessment on the equipment after installation and taking appropriate measures as required.

#### Caution

- Anti-seismic bracket is an optional part (except for the HRZ008-L-F and HRZ008-L1-F), which is required for the installation of this system.
- Preparations of anchor bolts suitable for floor material is your responsibility. M8-anchor bolts (8 pcs.) are required for HRZ008-L-F and HRZ008-L1-F and HRZ008-L1-F, and M12-anchor bolts (4 pcs.) for other models.

#### 6.2.1 Procedure to install HRZ\*\*\*-WS/W1S/W2S-F

- Transfer system to the installation site.
- Lock the brakes on casters (2pcs. On the front).
- Using a 13-mm open end wrench, attach the anti-seismic brackets to the front and back.

#### Caution

- Drain pan port is assigned to the bottom on the back of the system. Exercise caution not to damage the drain pan port when attaching the seismic bracket.

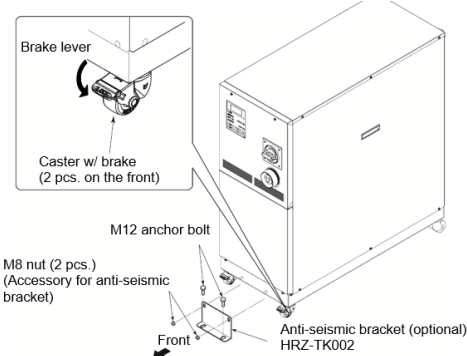
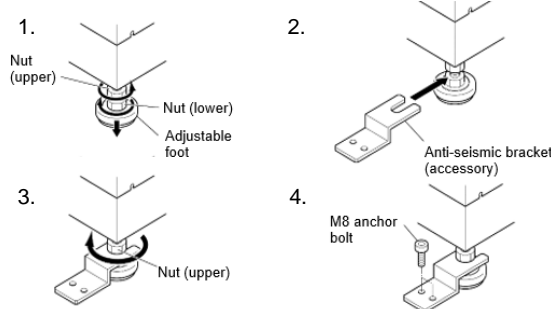


Figure 3-4 Anti-seismic Bracket Attachment

#### 6.2.2 Procedure to Install HRZ008-L/L1-F

- Transfer this system to the installation site.
- Adjust the adjustable foot with a 24-mm open end wrench.
  - Level the system (using a leveller) by adjusting the adjustable feet.
  - All adjustable feet (4pcs.) must be touching the floor completely.
  - Castors need not be touching the floor.
- Attach the anti-seismic bracket to the adjustable foot and tighten the nut (upper) of the adjustable foot to lock it in.
- Secure the anti-seismic bracket with the anchor bolts. Repeat the procedures for additional brackets.



### 6.3 Wiring

#### Warning

- Only designated personnel are allowed to install wiring.
- Be sure to turn OFF the power prior to wiring to assure safety. Do not do any wiring when the system is energized.
- The system wiring requires not only a thorough connection with the designated cable but also securing to prevent loose connection. Poor connection and securing may cause electric shock, heat spots, fire or communication errors.
- Be sure to supply the power to this system according to specifications.
- Supply pure AC power. Potential malfunction may occur if a rectified AC with voltage rise (dv/dt) at zero crossing exceeds 40V /200µ sec.
- Always establish a connection to a ground for safety.
- Be sure that no ground connection is made to a water pipe, gas pipe and lighting rod.

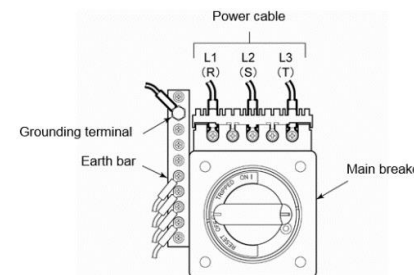
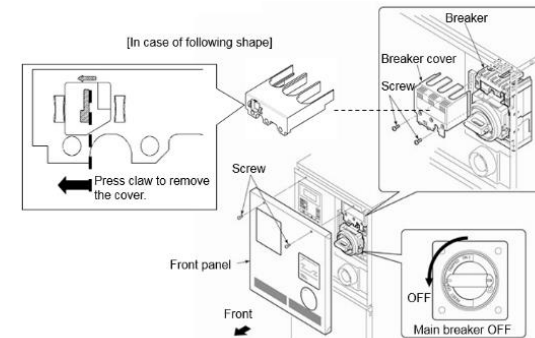
## 6 Installation (continued)

### 6.3.1 Wiring Installation

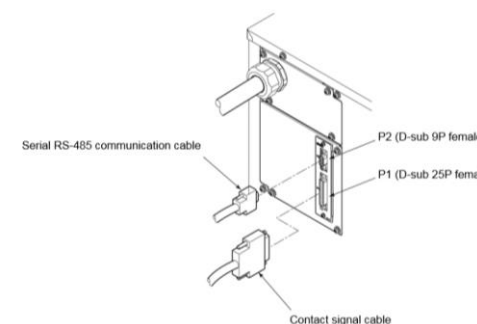
Item	HRZ002-W'S-F	HRZ004/008-W'S-F	HRZ008-L-F	HRZ010-W'S-F
Size (recommended)	10AWG x4-conductor	10AWG x4-conductor	4AWG x4-conductor	10AWG x4-conductor
Crimp Contact (recommended)	Breaker	R5, 5-5	R5, 5-5	R22-8
	Earth bar	R5, 5-8	R5, 5-8	R5, 5-8
Torque (recommended)	Breaker	2.5 N·m	2.5 N·m	6 N·m
	Earth bar	12.5 N·m	12.5 N·m	12.5 N·m
Main breaker (This system)	20A	30A	60A	30A

### 6.3.2 Procedures for wiring installation

- Turn OFF the power breaker on the customer side (primary side), and then use the assigned procedures to perform lockout/tagout.
  - Connection of the power cable with this system must be established first. Do not connect the cable with the factory side at this point.
- Turn OFF the main breaker of this system.
- Undo the screws (2 pcs.) to remove the front panel.
- Undo the screws (2 pcs.) or press claw to remove the breaker cover.
  - Make sure the breaker is at the 'Off' position.
  - Otherwise, the removal of the front panel is not possible.
- Loosen the cap at the power cable access (strain relief) and insert the power cable.
- Connect the power cables to the breaker terminal, correct phase rotation is required.
- Connect the ground terminal (M8) of the power cable to the earth bar.



- Attach the breaker cover to the breaker.
- Attach front panel.
- Connect the power cable to the power breaker on the customer/primary side.
- Connect the communication cables with P1 and P2.



### 6.4 Piping

#### Caution

- Before connecting piping make sure to clean up chips, cutting oil, moisture, dust, and other particles. Apply air blow to the parts before using. The presence of particles, oil or moisture in the circulating fluid circuit causes insufficient cooling, system failure attributed to moisture freeze when entering the system or foaming of the circulating fluid in the tank.

## 6 Installation (continued)

- When installing piping or fittings, ensure sealant material does not enter inside the port. When using seal tape, leave 1 thread exposed on the end of the pipe/fitting.
- Tighten fittings to the specified tightening torque.
- Consider the suitability for the operating pressure and temperature of the circulating fluid and facility water, to minimise risk of pipes bursting during operation.
- Do not use corrosive materials such as aluminium and iron for fluid contact parts, like piping, as this may lead to clogging or leakage in the circulating fluid and facility water circuits, refrigerant leakage and other problems. Provide protection against corrosion when using this product.
- Always insulate external circulating piping, as this may affect cooling performance.
- When using fluorinated liquid as the circulating fluid, do not use pipe tape as leakage may occur. We recommend that you use the following sealant: SMC Part No. HRZ-S0003 (Silicone sealant)
- The total capacity of circulating fluid required by external piping should remain under the capacity of the sub tank.
- Be sure to choose a circulating fluid pipe capable of letting the fluid flow at the rated flow rate or better. See "Pump performance" defined in the operation manual, appendix 8.1.1 "System specification" for the flow rate rating.
- Have a drip pan available in case of a fluid leak.
- Do not return the circulating fluid to the unit by installing a pump in the user system.
- Make sure of the locations of ports for the circulating fluid supply, return, facility water inlet, outlet and their corresponding connections are correct.
- Do not give an impact when the piping connector section is fixed or tightened. It may damage the piping or cause leakage.
- The flow rate of the facility water is automatically adjusted depending on using conditions. The facility water outlet temperature can be up to 60°C.

### 6.4.1 Pipe Diameter

Pipe	Diameter	Recommended torque
Facility water inlet	Rc1/2	28 to 30 N·m
Facility water outlet	Rc1/2	28 to 30 N·m
Circulating fluid supply	Rc3/4	28 to 30 N·m
Circulating fluid return	Rc3/4	28 to 30 N·m
Main tank drain port	Rc3/8 (with valve)	Piping not necessary
Sub tank drain port	Rc3/8 (with valve)	Piping not necessary
Drain pan port	Rc3/8	Piping not necessary

### 6.5 Circulating fluid

#### Caution

Circulating fluids to use vary with system models. See the operation manual section 8.1.1 "System specification" for the designated fluid for a specific model

#### 6.5.1 Circulating fluid is 60% ethylene glycol aqueous solution

#### Caution

- Always check the concentration of the circulating fluid
- Low concentration EG in the circulating fluid may cause system failure due to it being frozen in the system.
- High concentration EG in the circulating fluid may cause circulating pump overload, which triggers "Return Low Flow FLT"
- Potential cooling error may occur if the circulating fluid varies in concentration.

#### 6.5.2 Circulating fluid is fluorinated fluid

#### Caution

Make sure of no oil, moisture, and other foreign materials contaminate the circulating fluid. Potential cooling error or system failure, due to contaminant freezes internally, may occur if disregarded.

#### 6.5.3 Circulating fluid is water

#### Caution

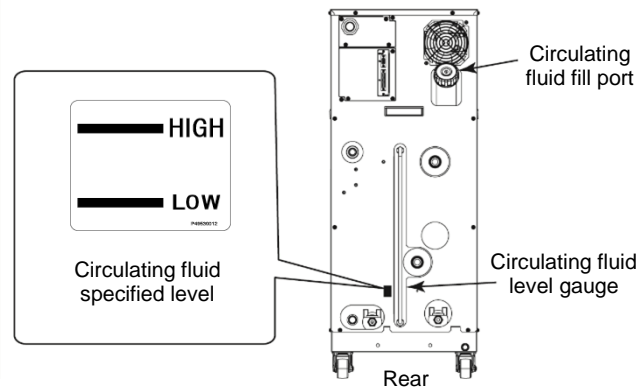
Attention should be taken on water quality. Ensure water quality is within specified range, and other foreign materials contaminate the circulating fluid. Potential cooling error or system failure, due to contaminant freezes internally, may occur if disregarded.

### 6 Installation (continued)

#### 6.5.4 Supply of circulating fluid

- Remove the circulating fluid fill cap and fill the circulating fluid until it reaches its specified temperature.
- The circulating fluid specified level is a ranged between "HIGH" and "LOW".
- Be sure to tighten the cap until it clicks after fluid supply.
- If the circulating fluid is supplied over the specified level, follow the procedure provided in the operation manual section 7.3.1 "Draining of circulating fluid out of tank" to drain excess fluid until it reaches the specified level.

Note: Level between "HIGH" and "LOW" represents liquid in normal running conditions. As you start filling up the chiller, the internal transferring pump will start pumping fluid from the Sub Tank into the Main Tank. The fluid level will start to drop, so additional fluid must be added until it is at the specified level. During initial priming of external piping, additional fluid must be added until it is at the specified level.



#### Warning

Circulating fluid must be supplied to be in the range between "HIGH" and "LOW". Potential overflow of hot circulating fluid may occur due to excessive volume. Total fluid volume use to fill up the system including initial priming should not exceed combined volume of Sub Tank and Main Tank. If level is below the "LOW" mark, this system will trigger an alarm.

#### Caution

When supplying the circulating fluid, make sure that the fluid inside this system has dropped to room temperature for the prevention of burn.

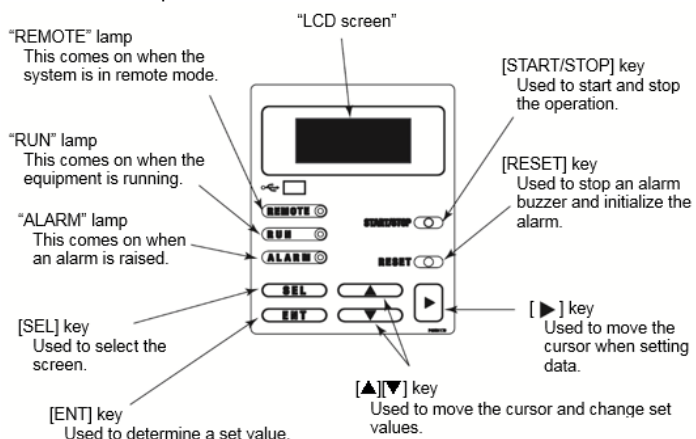
#### Caution

To prevent moisture, which is formed by condensation of a flowed air, from finding its way into the tank, ensure the circulating fluid at room temperature when supplying the fluid. Be sure to tighten the cap until it clicks after fluid supply. Potential circulating fluid vaporization or moisture intrusion due to condensation of flowed air may occur if disregarded.

### 7 Settings

#### 7.1 Operation Display Panel

- The name of parts used in this manual are as follows:



#### 7.2 Power On

- Turn on the breaker handle. The model and revision number of the system should be visible on the LCD display.
- This screen remains ON for approx. 5 seconds and is automatically switched to "Status screen 1".
- The "Alarm Display screen" is displayed if error occurs in this system.

### 7 Settings (continued)

#### 7.3 System Startup and Shutdown

System startup:

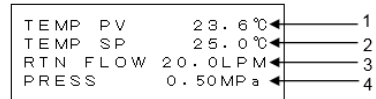
- Press the [START/STOP] key on the operation display panel.
- The [RUN] lamp on the operation display panel comes on, and the "System Information screen" is flashing. The screen then changes to the "Status screen 1", which initiates system operation.

System shutdown:

- Press the [START/STOP] key on the operation display panel.
- The "System Information screen" is flashing on the LCD screen, and the [RUN] lamp comes on. The compressor comes to a halt approx. 20 seconds after circulating pump stop for protection of the compressor. The screen is returned to the "Setting screen 1", which prompts the [RUN] lamp to go out.

#### 7.4 Different Modes and LED Screen

There are many screens and mode that they system has. Using keys on the display panel, you can change the mode and information displayed. The LED screen can display up to four lines of text, in the following format. Please refer to the operation manual section 5.3 "Operation Screen" for the full flow chart and details of the screens.



#### 7.4.1 Status Screens

Cycle through screens 1 to 4 by pushing the [▼] and [▲] keys.

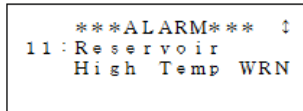
Item	Description
<b>Status Screen 1</b>	
TEMP PV	Discharge temperature of the circulating fluid
TEMP SP	Set value of circulating fluid discharge temperature
RTN FLOW	Return flow rate of the circulating fluid
PRESS	Discharge pressure of the circulating fluid
<b>Status Screen 2</b>	
TEMP PV	Discharge temperature of the circulating fluid
TEMP SP	Set circulating fluid temperature
<< TEMP READY >>	Displays the BAND/READY [Displayed when set value conditions are satisfied]*1
TEMP BAND	Set value of BAND range*1

Item	Description
<b>Status Screen 3</b>	
OFFSET	The current offset mode
OFFSET	Set offset
<b>Status Screen 4</b>	
DI PV	Circulating fluid electric resistivity.
DI SP	Set value of circulating fluid electric resistivity.
DI ACC	Accumulated time that the solenoid valve in DI circuit is activated.
DI SV	Open/close status of solenoid valve in DI circuit.

\*1 – See in operation manual "Appendix 8.4 BAND/READY" on offset features

#### 7.4.2 Alarm Display Screen

In case of an alarm, the screen will switch to the alarm display screen. It will display the alarm code and message.



#### 7.4.3 Menu Screen

Press [SEL] key when on a status screen to change it to the menu screen. Press the [▼] and [▲] keys to select the item. Press the [ENT] key to switch to the selected screen. Press [SEL] to return to the status screens.

Item	Descriptions
SETTING	Switches to the "Setting screen" with the press of the [ENT] key.
REMOTE MODE	Switches to the "Mode Selection screen" with the press of the [ENT] key.
MAINTENANCE	Switches to the "Initial Setting screen 1" with the press of the [ENT] key.

#### 7.4.4 Setting Screen

Press the [▼] and [▲] keys to select the item. Press the [ENT] key to switch to the selected screen. Press [SEL] to return to the menu screen.

Item	Descriptions
CONTROL SET	Switches to the "Control Setting screen 1" with the press of the [ENT] key.
ALARM SET	Switches to the "Alarm Setting 1" with the press of the [ENT] key.
INITIAL SET	Switches to the "Initial Setting 1" with the press of the [ENT] key.

### 7 Settings (continued)

#### 7.4.4.1 Control setting features:

[▲] or [▼] key is used for selecting "Item." And pressing [ENT] key enabling changing the set point. Use the [▲] or [▼] key to change the set point value. Press [SEL] to return to the setting screen.

Item	Descriptions	Setting Range	Factory Default
TEMP SP	Allows the sett of circulating fluid discharge temperature.	HRZ002-WS/W1S-F -10.0 to 90.0 °C HRZ004/008/010-WS/W1S-F -20.0 to 90.0 °C HRZ***-W2S-F 10.0 to 60.0 °C HRZ008-L/L1-F -20.0 to 40.0 °C	25.0 °C
OFFSET	Allows the setting of OFFSET value	-20.0 to 20.0 °C	0.0 °C
PUMP SP	Allows the setting of circulating fluid flow rate. (PUMP IV set to FLOW)	HRZ***-W***-F 10.0 to 40.0 LPM HRZ008-L-F 15.0 to 40.0 LPM HRZ008-L1-F 10.0 to 40.0 LPM	HRZ***-W***-F 20.0 LPM HRZ008-L-F 30.0 LPM HRZ008-L1-F 20.0 LPM
	Allows the setting of circulating fluid discharge pressure. (PUMP IV set to PRESS)	0.10 to 1.00MPa	0.10MPa
Allows to switch to the pump frequency set screen by pressing [ENT] on this "item" (PUMP IV set to FREQ)			
DI SP	Allows the setting of circulating fluid electric resistivity.	0.0 to 2.0MΩ	0.5MΩ
DI HYS	Allows the setting of hysteresis for circulating fluid electric resistivity.	0.0 to 0.9MΩ	0.3MΩ

Pump frequency set screen:

To get to this screen, PUMP IV in Initial Settings must be set to FREQ, then go to the Control Settings and press [ENT] on PUMP SP.

Item	Descriptions	Setting Range	Factory Default
RTN FLOW	Return flow rate of circulating fluid	-	-
PRESS	Discharge pressure of circulating fluid	-	-
FREQ	Allows the setting of pump frequency.	15.0 to 60.0Hz	15.0Hz

Note: Refer to operational manual section 5.3.12 "Control Setting screen 3-2" for full details.

#### 7.4.4.2 Alarm setting features:

[▲] or [▼] key is used for selecting "Item" and move to other Alarm Setting screens. And pressing the [ENT] key enabling to change the set value. Press [SEL] to return to the setting screen.

- Alarm is raised when circulating fluid temperature exceeds or falls below the set value.
  - Alarm is raised when flow rate falls below set value. Can be turned on/off.
  - Alarm is raised when DI value falls below the set value. Alarm is cancelled if the set value is 0, only if DI control kit is provided.
- See operation manual section 5.3.13-15 "Alarm Setting screen" for full details.

#### 7.4.4.3 Initial setting features:

[▲] or [▼] key is used for selecting "Item" and move to other Initial Setting screens. And pressing the [ENT] key enabling to select the setting. Press [SEL] to return to the setting screen.

- Allows selection of the units for the flow rate and pressure.
- Allows selection of the offset mode.
- Options to store TEMP SP and FLOW SP values with serial communications. Also, setting for the device address for serial communication and selection of system conditions when an error occurs.
- Allow the setting of the device address for serial communication.
- Allows the selection of the control for pump operation: PUMP IV. FREQ: Pump frequency control. FLOW: Circulating fluid flow rate control. PRESS: Pump discharge pressure control.
- Allows the setting of pump discharge upper limit value. Can be turned on/off.
- Allows the selection of automatic collection stop mode. It is displayed only if the Circulating Fluid Automatic Collector is provided.
- Setting of buzzer during key input. Can be turned on/off.
- Setting of alarm buzzer. Can be turn on/off.

### 7 Settings (continued)

- Allows the selection of a function that restricts input from the operation device panel to prevent the unintended change of the setting value from the operation touch panel. Various settings dependant on communication mode.
- Allows setting of band range to TEMP PV and when "TEMP READY" is displayed on the operation display panel and Ready signal is output.
- Allows for a contact signal for a selection of alarms.
- Allows output pin no 8 to send a signal when the conditions for TEMP READY or AUTO PURGE have been completed.
- Allows setting for customised DIO signal. Can be turned on/off.
- See operation manual section 5.3.16-23 "Initial Setting screen" for full details.

#### 7.4.5 Remote Mode

Allows the selection of the communication mode. Options include LOCAL, DIO REMOTE, SER REMOTE. DNET REMOTE is only available with option D. [▲] or [▼] key is used for selecting "Item" And pressing the [ENT] key enabling to select the setting. Press [SEL] to return to the menu screen. See operation manual section 5.3.24 for full details on each communication mode.

#### 7.4.6 Maintenance Screen

Shows VALVE OPEN, ALARM HISTORY, RUNNING DATA, MONITOR items. AUTOPURGE is provided with the circulating fluid automatic collector option and DI ACC RESET with the DI control kit. [▲] or [▼] key is used for selecting "Item" And pressing the [ENT] key enabling to select the setting. Press [SEL] to return to the menu screen. See operation manual section 5.3.25-32 for full details on each item and following screens and options.

### 8 Alarms and Troubleshooting

#### 8.1 Error Message

The following are to be performed in the event of an error in the system:

- The "ALARM" lamp comes on.
- Alarm buzzer comes on.
- The "Alarm Display screen" is displayed on the LCD screen.
- Error signal is issued through external communication.
- This system is brought to a stop forcefully according to error types.

#### 8.2 Troubleshooting

The procedure for error recovery varies with alarm types:

- Alarm Code 01 to 21, 24, 25, 28\*, 29, 32: Eliminate the error cause. Press the [RESET] key on the operation

display panel or power cycle the main breaker to enable error recovery to take effect.

\*Alarm code 02 and 16 are alarms only for HRZ008-L/L1-F.

\*Alarm code 28 is an alarm only for HRZ010-W\*S-F.

- Alarm Code 22: Eliminate the error cause, and power cycle the main breaker to enable error recovery to take effect.
- Alarm Code 23: Automatic error recovery is implemented upon elimination of the error.
- Alarm Code 24: This is an alarm for accessories (optional). No alarm of this type is issued if the system is outfitted with no accessories.

Alarm code list and troubleshooting:

Code	Error Message	System condition	Cause	Remedies
01	Water Leak Detect FLT	Stop	The fluid is pooled at the base of this system.	Check for fluid leak.
02	Incorrect Phase Error FLT	Stop	The power phase rotation is wrong.	Check that a proper connection is established between the power cable and main breaker of this system.
03	RFGT High Press FLT	Stop	The pressure of the refrigerant circuit exceeded the specified value*1.	Check that facility water is being supplied to this system.
04	CPRSR Overheat FLT	Stop	The temperature in the compressor was excessive*1.	Check that facility water is being supplied to this system.
05	Reservoir Low Level FLT	Stop	An insufficient amount of the circulating fluid is observed in the tank.	Replenish the circulating fluid.
06	Reservoir Low Level WRN	Continued	An insufficient amount of the circulating fluid is observed in the tank.	Replenish the circulating fluid.
07	Reservoir High Level WRN	Continued	An excessive amount of the circulating fluid is observed in the tank.	Drain the circulating fluid.
08	Temp. Fuse Cutout FLT	Stop	The circulating fluid tank was raised in temperature. Thermal fuse cutout temperature: 98°C	Check the load specification. Replacement of the thermal fuse is required. Call the supplier for service.

