



ORIGINAL INSTRUCTIONS

Instruction Manual

Thermo-chiller

HRW0##-H#S-40/46 Series



The intended use of this product used a built-in pump to circulate a liquid such as water, adjusted to a constant temperature by a circulate pump and facility water circuit. This circulating fluid cools the customer's machine that generates heat.

1 Safety Instructions

These safety instructions are intended to prevent hazardous situations and/or equipment damage. These instructions indicate the level of potential hazard with the labels of "Caution," "Warning" or "Danger." They are all important notes for safety and must be followed in addition to International Standards (ISO/IEC)<sup>1)</sup>, and other safety regulations.

- <sup>1)</sup>ISO 4414: Pneumatic fluid power — General rules and safety requirements for systems and their components.
- ISO 4413: Hydraulic fluid power — General rules and safety requirements for systems and their components
- IEC 60204-1: Safety of machinery - Electrical equipment of machines. Part 1: General requirements
- ISO 10218-1: Robots and robotic devices - Safety requirements for industrial robots - Part 1: Robots

1 Safety Instructions (continued)

- Refer to product catalogue, Operation Manual and Handling
- Precautions for SMC Products for additional information.
- Keep this manual in a safe place for future reference.

	<b>Danger</b>	Danger indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.
	<b>Warning</b>	Warning indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.
	<b>Caution</b>	Caution indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.

**Warning**

- Always ensure compliance with relevant safety laws and standards.
- All work must be carried out in a safe manner by a qualified person in compliance with applicable national regulations.

2 Specifications

2.1 HRW0##-H#S-## Specifications

Table 8-1 Specification for Fluorinated fluid

Model	HRW008-HS-40 HRW008-HS-46			HRW015-HS-40 HRW015-HS-46			HRW030-HS-40 HRW030-HS-46			
	Model	Water cooling								
Cooling method	Water cooling									
Cooling capacity (50Hz/60Hz)	kW	8			15			29		
* Under conditions below	Facility water temp. +15°C									
Circulating fluid temp	°C	Facility water temp. +15°C								
Circulating fluid rated flow rate	L/min	30			40			40		
Facility water minimum necessary flow rate	L/min	20			25			40		
Heater	kW	-40: 6(±7%) at 400VAC -46: 6(±7%) at 460VAC								
Operating temperature range	°C	20 to 90								
Temperature stability <sup>1)</sup>	°C	± 0.1								
Circulating fluid <sup>2)</sup>	Galden® HT200 or Fluorinert™ FC-40									
Pump capacity (50Hz/60Hz) <sup>3)</sup>	MPa	0.45 / 0.65 (At 30L/min)			0.40 / 0.60 (At 40L/min)			0.40 / 0.60 (At 40L/min)		
Circulating fluid flow rate display range	L/min	0 to 50								
Operating range of circulating fluid flow rate <sup>4)</sup>	L/min	9 to 50								
Tank capacity <sup>5)</sup>	L	Approx. 13			Approx. 14					
Tank space capacity	L	Approx. 2.5								
Circulating fluid port	Rc 3/4									
Facility water	Facility water IN temp	°C 10 to 35								
	Facility water IN pressure <sup>11)</sup>	MPa 0.7 Maximum								
Facility water port	Rc 3/4									
Power supply <sup>6)</sup>	-40 : 3-phase Y 380~415V±10%(50Hz)									
	3-phase Y 380V±10%(60Hz)									
	-46 : 3-phase Y 460~480V-									
Main breaker size	A	15								
Main breaker amperes interrupting capacity	kA	30								
SCCR	kA	5								
Dimensions <sup>7)</sup>	mm	W380xD665xH860 (W14.96xD26.18xH33.86 [inch])								
Weight <sup>8)</sup>	kg	Approx. 95 (209 [lbs])			Approx. 105 (232 [lbs])					
Communication	Serial RS-485 (Dsub-9pin), Contact signal (Dsub-25pin)									

Table 8-2 Specification for Ethylene Glycol aqueous solution

Model	HRW008-H1S-40 HRW008-H1S-46			HRW015-H1S-40 HRW015-H1S-46			HRW030-H1S-40 HRW030-H1S-46			
	Model	Water cooling								
Cooling method	Water cooling									
Cooling capacity (50Hz/60Hz)	kW	8			15			27		
* Under conditions below	Facility water temp. +15°C									
Circulating fluid temp	°C	Facility water temp. +15°C								
Circulating fluid rated flow rate	L/min	15			30			40		
Facility water minimum necessary flow rate	L/min	15			25			40		
Heater	kW	-40: 6(±7%) at 400VAC -46: 6(±7%) at 460VAC								
Operating temperature range	°C	20 to 90								
Temperature stability <sup>1)</sup>	°C	± 0.1								
Circulating fluid <sup>2)</sup>	Ethylene glycol solution : 60%									
Pump capacity (50Hz/60Hz) <sup>3)</sup>	MPa	0.45 / 0.65 (At 15L/min)			0.40 / 0.60 (At 30L/min)			0.35 / 0.55 (At 40L/min)		
Circulating fluid flow rate display range	L/min	0 to 50								
Operating range of circulating fluid flow rate <sup>4)</sup>	L/min	9 to 50								
Tank capacity <sup>5)</sup>	L	Approx. 13								
Tank space capacity	L	Approx. 2.5								
Circulating fluid port	Rc 3/4									
Facility water	Facility water IN temp	°C 10 to 35								
	Facility water IN pressure <sup>11)</sup>	MPa 0.7 Maximum								
Facility water port	Rc 3/4									
Power supply <sup>6)</sup>	-40 : 3-phase Y 380~415V±10%(50Hz)									
	3-phase Y 380V±10%(60Hz)									
	-46 : 3-phase Y 460~480V-10%+4%(60Hz)									
Main breaker size	A	15								
Main breaker amperes interrupting capacity	kA	30								
SCCR	kA	5								
Dimensions <sup>7)</sup>	mm	W380xD665xH860 (W14.96xD26.18xH33.86 [inch])								
Weight <sup>8)</sup>	kg	Approx. 95 (209 [lbs])								
Communication	Serial RS-485 (Dsub-9pin), Contact signal (Dsub-25pin)									

2 Specifications (continued)

Table 8-3 Specification for Water and DI water

Model	HRW008-H2S-40 HRW008-H2S-46			HRW015-H2S-40 HRW015-H2S-46			HRW030-H2S-40 HRW030-H2S-46			
	Model	Water cooling								
Cooling method	Water cooling									
Cooling capacity (50Hz/60Hz)	kW	8			15			30		
* Under conditions below	Facility water temp. +15°C									
Circulating fluid temp	°C	Facility water temp. +15°C								
Circulating fluid rated flow rate	L/min	15			30			40		
Facility water minimum necessary flow rate	L/min	15			25			40		
Heater	kW	-40: 6(±7%) at 400VAC -46: 6(±7%) at 460VAC								
Operating temperature range	°C	20 to 90								
Temperature stability <sup>1)</sup>	°C	± 0.1								
Circulating fluid <sup>10)</sup>	Water, DI water									
Pump capacity (50Hz/60Hz) <sup>3)</sup>	MPa	0.45 / 0.65 (At 15L/min)			0.40 / 0.60 (At 30L/min)			0.35 / 0.55 (At 40L/min)		
Circulating fluid flow rate display range	L/min	0 to 50								
Operating range of circulating fluid flow rate <sup>4)</sup>	L/min	9 to 50								
Tank capacity <sup>5)</sup>	L	Approx. 13								
Tank space capacity	L	Approx. 2.5								
Circulating fluid port	Rc 3/4									
Facility water	Facility water IN temp	°C 10 to 35								
	Facility water IN pressure <sup>11)</sup>	MPa 0.7 Maximum								
Facility water port	Rc 3/4									
Power supply <sup>6)</sup>	-40 : 3-phase Y 380~415V±10%(50Hz)									
	3-phase Y 380V±10%(60Hz)									
	-46 : 3-phase Y 460~480V-10%+4%(60Hz)									
Main breaker size	A	15								
Main breaker amperes interrupting capacity	kA	30								
SCCR	kA	5								
Dimensions <sup>7)</sup>	mm	W380xD665xH860 (W14.96xD26.18xH33.86 [inch])								
Weight <sup>8)</sup>	kg	Approx. 95 (209 [lbs])								
Communication	Serial RS-485 (Dsub-9pin), Contact signal (Dsub-25pin)									

Notes:

- It indicates discharge temperature when connecting outlet and return of circulating fluid directly, flow rate of both circulating fluid and facility water are within each specification and stable. Stability is the value after heat load is steady for 10 minutes. There are some cases that the stability is out of +/- 0.1 deg C due to operating condition.
- Galden® is a registered trademark of Solvay Solexis, and Fluorinert™ is a trademark of U.S. 3M.
- The capacity is derived at the Outlet of this system when the circulating fluid is at 20°C. Pumping capacity under 60Hz is the maximum capacity.
- According to piping specification on customer's side, there is the case this system cannot control the flow rate at setting value.
- This is a minimum amount of the fluid for operation of a discrete chiller outfitted with chiller internal piping and heat exchanger. Circulating fluid temp.: 20°C
- The power supply to this unit must be star-Y wired. Use of delta-Δ wiring may result in damage to the unit.
- This is the dimensions of panels, which is derived without protrusions such as a breaker handle.
- This is the mass of the system with no circulating fluid.
- Pure ethylene glycol needs dilution with water (required quality see Chapter 7.1) before use. Ethylene glycol with additives such as preservatives is NOT available.
- SMC recommends satisfying the water quality standards of the Japan Refrigeration and Air Conditioning Industry Association (JRA GL-02-1994/Cooling water system - Recirculation type – Make-up water) (See 2-3 Facility Water Circuit Specifications for more details). Alternatively, we also recommend "Distilled water", "RO filtered water" or "Tap water (Total hardness is less than 70 [mg/L]. Tap water with high hardness cannot be used.)"
- When there is water hammer, reduce the inlet pressure not to make water hammer.

2 Specification (continued)

**Warning**

Special products (-X) might have specifications different from those shown in this section. Contact SMC for specific drawings.

2.2 Production Serial Number Code

The production serial number code printed on the label indicates the month and year of production as per the following table:

Year	2023 2024 2025 ... 2028 2029 2030 ...											
	Month	B	C	D	...	G	H	I	...	L	M	N
Jan	o	Bo	Co	Do	...	Go	Ho	Io	...	Lo	Mo	No
Feb	p	BP	CP	DP	...	GP	HP	IP	...	LP	MP	NP
Mar	q	BQ	CQ	DQ	...	GQ	HQ	IQ	...	LQ	MQ	NQ
Apr	r	BR	CR	DR	...	GR	HR	IR	...	LR	MR	NR
May	s	BS	CS	DS	...	GS	HS	IS	...	LS	MS	NS
Jun	t	BT	CT	DT	...	GT	HT	IT	...	LT	MT	NT
Jul	u	BU	CU	DU	...	GU	HU	IU	...	LU	MU	NU
Aug	v	BV	CV	DV	...	GV	HV	IV	...	LV	MV	NV
Sep	w	BW	CW	DW	...	GW	HW	IW	...	LW	MW	NW
Oct	x	BX	CX	DX	...	GX	HX	IX	...	LX	MX	NX
Nov	y	By	Cy	Dy	...	Gy	Hy	Iy	...	Ly	My	Ny
Dec	z	BZ	CZ	DZ	...	GZ	HZ	IZ	...	LZ	MZ	NZ

3 Transportation, Transfer and Moving

3.1 Installation

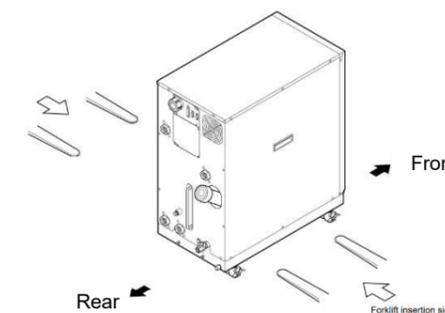
**Caution**

- Do not set this system on its side during transportation.
- 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.

3.2 Transporting with a Forklift

**Warning**

- This product 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 fork 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.



3.3 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.

## 4 Installation

### 4.1 Installation

#### Warning

- Product installation should be kept from areas with the potential of flammable gas leak. Ignition may occur if leaked gas is collected around the product.
- This product is NOT designed for outside use. Potential electric shock, fire and product damage may occur if exposed to rain, water, and dust.

#### 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

This product is to be installed on a level floor that can withstand the weight of this product. Potential water leak and personal injury due to system tipping over may occur if disregarded.

### 4.2 Environment

#### Warning

- Clean room specifications are not applied to this unit. The pump and ventilating fan installed in this unit generate particles.
- 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.

- Location where ambient temperature is out of the following range:
  - In transportation -40 to 70°C (with no water or circulating fluid in piping)
  - In storage 0 to 50°C (with no water or circulating fluid in piping)
  - In operation 10 to 35°C

- Location where ambient humidity is out of the following range or where condensation forms:
  - In transportation and storage 15 to 85%
  - In operation 30 to 70%
- 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.
- 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.
- Do not install or store on an incline.

#### Caution

- When installing this product, it is recommended to attach anti-quake bracket.
- Preparation of anchor bolts suitable for floor material is your responsibility. M12-anchor bolts (4 pcs.) are required.

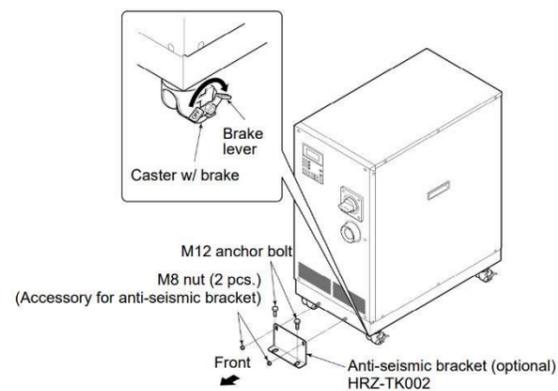
#### 4.2.1 Procedure to install anti-quake bracket

- 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.

## 4 Installation (continued)



### 4.3 Wiring

#### Warning

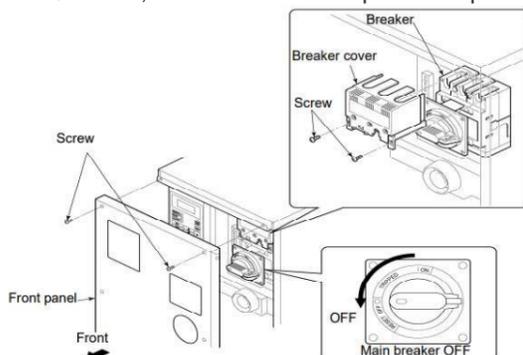
- Only designated personnel are allowed to install wiring.
- Be sure to turn OFF the power prior to wiring to assure safety. Do not do any wiring when the system is energized.
- The system wiring requires not only a thorough connection with the designated cable but also securing to prevent loose connection. Poor connection and securing may cause electric shock, heat sports, 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.

#### 4.3.1 Wiring Installation

Item	Cable Specifications	
	Size (recommended)	12AWG x4-conductor
Power cable	Crimp Contact (recommended)	Breaker R5. 5-8
		Earth bar R5. 5-8
Torque (recommended)	Breaker	5.8 N•m
	Earth bar	12.5 N•m
Main breaker		15A

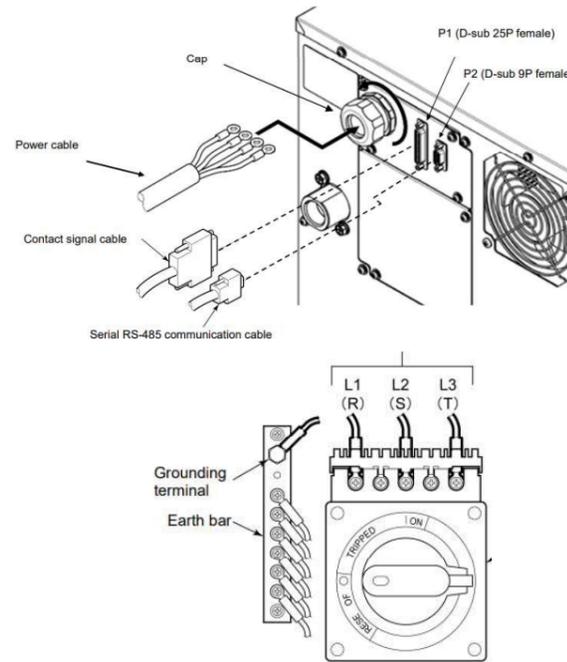
#### 4.3.2 Procedures for wiring installation

- 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.) to remove the breaker cover.
  - Make sure the breaker is at the 'Off' position.
  - Otherwise, the removal of the front panel is not possible.



## 4 Installation (continued)

- 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. Use a 13-mm open end wrench. Recommended torque: 12.5 N•m.
- 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.



### 4.4 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 or foaming of the circulating fluid in the tank.
- 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 and other problems. Provide protection against corrosion when using this product.
- Always insulate external circulating piping, as this may affect cooling performance.
- Install circulating fluid piping not to exceed 10m high. The maximum amount of circulating fluid in piping, including your system, should remain under 2.5L if 7m or higher circulating fluid piping is installed (for HRW\*\*\*-HS). An alarm may be raised, or potential fluid leak from the tank may occur at system stop if disregarded.
- The total capacity of circulating fluid required by external piping should remain under the capacity of the 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.

## 4 Installation (continued)

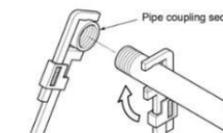
- Install valves in circulating fluid piping for flow rate adjustment and maintenance. As the value of flow rate displayed on the screen will be less than proper value when flow rate is excessive, flow rate adjustment should be started with the valves shut.
- Do not return the circulating fluid to the 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.

#### 4.4.1 Pipe Diameter

Pipe	Diameter	Recommended torque
Facility water inlet	Rc3/4	60 N • m
Facility water outlet	Rc3/4	60 N • m
Circulating fluid supply	Rc3/4	60 N • m
Circulating fluid return	Rc3/4	60 N • m
Tank drain port	Rc3/8 (with valve)	Piping not necessary
Drain pan port	Rc3/8	Piping not necessary

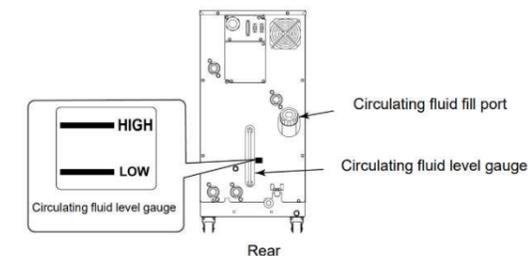
#### 4.4.2 Procedure for piping installation

Secure the pipe coupling section with a pipe wrench and provide proper tightening to the pipe.



#### 4.4.3 Supply of circulating fluid

- Remove the circulating fluid fill cap and fill the circulating fluid until it reaches its specified level.
- The circulating fluid specified level is a ranged between "HIGH" and "LOW".
- Be sure to tighten the cap after fluid supply to avoid evaporation loss.



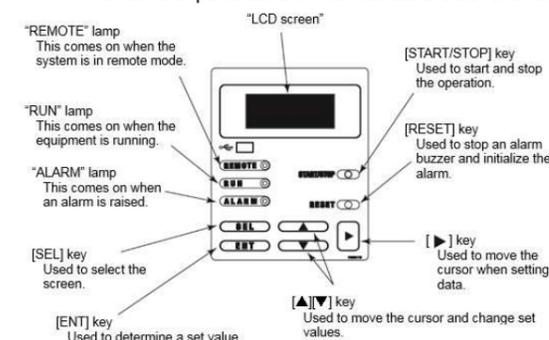
- If the circulating fluid is supplied over the specified level, follow the procedure provided in the operation manual section 7.3.1 "Draining of circulating fluid out of tank" to drain excess fluid until it reaches the specified level.

- Note: Level between "HIGH" and "LOW" represents liquid in normal running conditions. The fluid level will start to drop, so additional fluid must be added until it is at the specified level.
- When the circulating fluid is an ethylene glycol aqueous solution Always check the concentration of the circulating fluid.
  - Normal concentration: 55 to 60%

## 5 Start, Stop and Temperature Settings

### 5.1 Operation Display Panel

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



**5 Start, Stop and Temperature Settings (continued)**

**5.2 Power On**

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

**5.3 System Startup and Shutdown**

**5.3.1 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.

**5.3.2 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 screen is returned to the "Setting screen 1", which prompts the [RUN] lamp to go out.

**5.4 Different Modes and LED Screen**

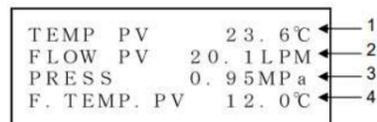
There are many screens and mode that they system has. Using keys on the display panel, you can change the mode and information displayed. The LED screen can display up to four lines of text, in the following format. Please refer to the operation manual section 5.3 "Operation Screen" for the full flow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

**5.4.1 Status Screens**

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

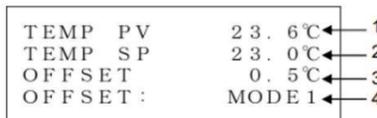
Status Screen 1		
No.	Item	Description
1	TEMP PV	Discharge temperature of the circulating fluid (A value derived according to the offset <sup>*1</sup> if applied)
2	FLOW PV	Flow rate of the circulating fluid
3	PRESS	Discharge pressure of the circulating fluid
4	F.TEMP PV	Facility water inlet temperature

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



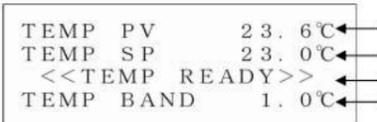
Status Screen 2		
No.	Item	Description
1	TEMP PV	Discharge temperature of the circulating fluid (A value derived according to the offset <sup>*1</sup> if applied)
2	TEMP SP	Set circulating fluid temperature
3	OFFSET	Set offset
4	OFFSET	The current offset mode

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



Status Screen 3		
No.	Item	Description
1	TEMP PV	Discharge temperature of the circulating fluid
2	TEMP SP	Set circulating fluid temperature
3	<<TEMP READY>>	Displays the BAND/READY [Displayed when set value conditions are satisfied] <sup>*1</sup>
4	TEMP BAND	Set value of BAND range <sup>*1</sup>

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



**5 Start, Stop and Temperature Settings (continued)**

Status Screen 4		
No.	Item	Description
1	FLOW PV*1	Discharge flow rate of the circulating fluid
2	PRESS* 1	Set Discharge flow rate
3	IV Freq	Pump inverter frequency
4	FLOW SP	Set discharge flow rate of the circulating fluid

\*1 When using accessory [by-pass piping set] flow becomes total of flow on customer side and flow on by-pass.

**5.4.2 Alarm Display Screen**

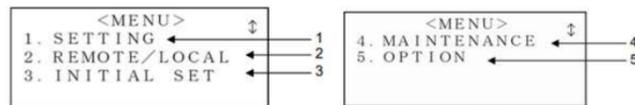
In case of an alarm, the screen will switch to the alarm display screen. It will display the alarm code and message.



**5.4.3 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.

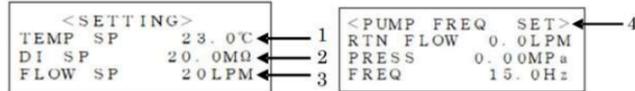
No.	Item	Descriptions
1	SETTING	Switches to the "Setting screen" with the press of the [ENT] key.
2	REMOTE/LOCAL	Switches to the "Mode Selection screen" with the press of the [ENT] key.
3	INITIAL SET	Switches to the "Initial Setting screen 1" with the press of the [ENT] key.
4	MAINTENANCE	Switches to the "Initial Setting screen 1" with the press of the [ENT] key.
5	OPTION	Switches to the "Option screen" with the press of the [ENT] key



**5.4.4 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

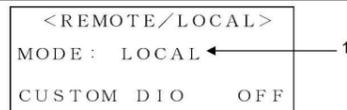
No.	Item	Setting Range
1	TEMP SP	20.0 to 90.0°C
2	DI SP	DI SP is only indicated on HRW***-H*Y and Setting is available
3	FLOW SP	9 to 50 L/min
4	PUMP FREQ SET	Displays only when PUMP IV is FREQ and can be set.



**5.4.5 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

No.	Item	Setting
1	LOCAL	System start/stop, and TEMP SP value setting are available only from the operation display panel.
	DIO REMOTE	System start/stop is allowed only through contact signal. TEMP SP value setting is available only from the operation display panel.
	SER REMOTE	System start/stop, and TEMP SP value setting are available only through serial RS-485 communication.
	DNET REMOTE	System start/stop, TEMP SP and FLOW SP value setting are available only through DNET communication.
	IOL REMOTE	System start/stop, TEMP SP and FLOW SP value setting are available only through IO-Link communication.

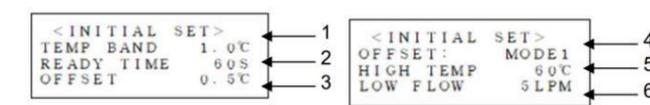


**5 Start, Stop and Temperature Settings (continued)**

**5.4.6 Initial Setting Screen**

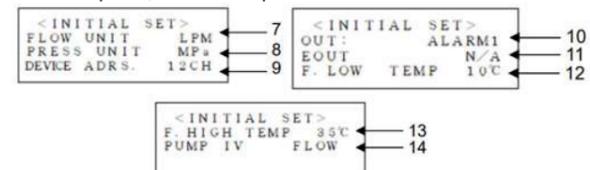
[▲] or [▼] key is used for selecting "Item." And pressing [ENT] key enabling changing the set point. Use the [▲] or [▼] key to change the set point value. Press [SEL] to return to the setting screen.

No.	Item	Setting Range	Descriptions
1	TEMP BAND	1.0 to 5.0°C *1	Allows the selection of the band width for TEMP SP
2	READY TIME	10 to 480 sec	Allows the setting of the time from TEMP PV value reaching BAND range to TEMP READY is displayed and put out
3	OFFSET	-20.0 to 20.0°C	Calibrates variations in temperature between this system and your system. (See Operation manual 8.4 Offset Function" in Chapter 8.)
4	OFFSET	OFF, MODE1, MODE2, MODE3	
5	HIGH TEMP	20 to 93°C	Issues An alarm of "Reservoir High Temp WRN" if the circulating fluid exceeds the set temperature.
6	LOW FLOW	HRW008-H*S HRW015-H*S HRW030-H*S: 0, 8 to 50LPM	Issues an alarm of "Return Low Flow WRN" if the circulating fluid does not reach the set flow rate. Lift this alarm if the selection is "0".
7	FLOW UNIT	LPM, GPM	Allows the selection of the unit of flow rate.
8	PRESS UNIT	MPa, PSI	Allows the selection of the unit of pressure.
9	DEVICE ADRS.	1 to 16CH	Allows the selection of the device address for serial RS-485 communication.



No.	Item	Setting Range	Descriptions
10	OUT	N/A ALARM1 to 30	Allows the selection of alarm signals for contact signal. (See Operation manual 8.1.3 Alarm signal selection.)
11	E_OUT	TEMP READY, AUTO PURGE	Allows the selection of EVENT Output. (See Operation Manual Appendix 8.1.2 Communication specification)
12	F.LOW TEMP	5 to 10°C	Issues an alarm of "F.Water Low Temp WRN" if the facility water falls below the set temperature.
13	F.HIGH TEMP	35 to 50°C	Issues an alarm of "F.Water High Temp WRN" if the circulating fluid exceeds the set temperature.
14	PUMP IV	FLOW, FREQ	The control mode of the circulating fluid pump can be switched.
	DI HYS <sup>*1</sup>	0.0 to 0.9M ohm	Hysteresis of circulating fluid electrical resistivity can be set.
	LOW DI <sup>*1</sup>	0.0 to 20.0M ohm	"DI Low Level WRN" occurs when the circulating fluid resistivity falls below this setting.
	PURGE TIME <sup>*2</sup>	60 to 600sec	"TIME OUT" is displayed on the purge mode screen when the circulating fluid collection time exceeds the set value.

\*1: For 'Y' option ; \*2: For 'Z' option



**5 Start, Stop and Temperature Settings (continued)**

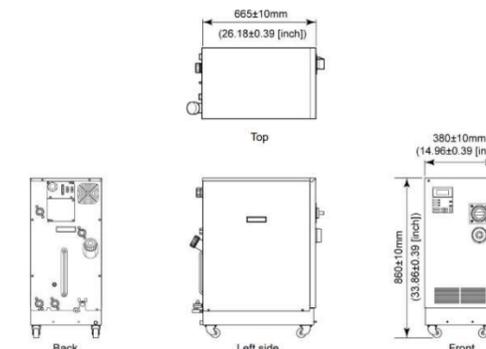
**5.4.7 Maintenance Screen**

[▲] 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.

No.	Item	Setting	
1	VALVE	OPEN	The facility water solenoid valve is opened forcefully.
		CLOSE	The facility water solenoid valve is closed forcefully.

**6 Outline Dimensions**

**6.1 Dimensions of HRW#-H#S-40/46**



**7 Alarms and Troubleshooting**

**7.1 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.

**7.2 Troubleshooting**

The procedure for error recovery varies with alarm types:

- Alarm Code 01 to 07, 09 to 19, 22,24,25,29,30: 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 08: Eliminate the error cause. After replacing thermal fuse, press the [RESET] key on the operation display panel or power cycle the main breaker to enable error recovery to take effect.
- Alarm Code.21: Eliminate the error cause, and power cycle the main breaker to enable error recovery to take effect.
- Alarm Code.23, 26, 27: Automatic error recovery is implemented upon elimination of the error.
- Alarm Code.24, 26, 27: 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	Operation Condition	Cause	Remedies
01	Water Leak Detect FLT	Stop	The fluid is pooled at the base of this system.	Check for fluid leak.
05	Reservoir Low Level FLT	Stop	An insufficient amount of the circulating fluid is observed in the tank.	Refill the circulating fluid.
06	Reservoir Low Level WRN	Continued	An insufficient amount of the circulating fluid is observed in the tank.	Refill 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.	Check the load specification. Replacement of the thermal fuse is required. Call the supplier for service

## 7 Alarms and Troubleshooting (continued)

Code	Error Message	Operation Condition	Cause	Remedies
09	Reservoir High Temp. FLT	Stop	The temperature of the circulating fluid exceeded the specified value.	Check the load specification.
10	Return High Temp WRN	Continued	The temperature of the circulating fluid exceeded the specified value.	Check the circulating fluid flow rate, load specification.
11	Reservoir High Temp. WRN	Continued	The temperature of the circulating fluid exceeded your set value.	Reset the setting temperature.
12	Return Low Flow FLT	Stop	The flow rate of the circulating fluid falls below specified value.	Check that the external valve is opened. Prepare a thicker external pipe or install bypass piping.
13	Return Low Flow WRN	Continued	The flow rate of the circulating fluid falls below your set value.	Reset the setting flow rate.
15	Pump Breaker Trip FLT	Stop	The breaker for the circulating pump power line was tripped.	Check that the power supply to this product is compliant with the specification
19	FAN Motor Stop WRN	Continued	The ventilation fan inside the product has stopped.	Check that the air vent on the back of the product is not blocked off.
21	Controller Error FLT	Stop	An error was detected in the control system.	Contact the system supplier for request of inspection and repair.
22	Memory Data Error FLT	Stop	An error was detected in data stored in the controller of this system.	Reset your specified value.
23	Communication Error WRN	Continued	An interruption of serial communication occurred in this system.	Check that a signal is being issued from your system. Check for disconnection of the communication connector from this system.

Code	Error Message	Operation Condition	Cause	Remedies
24	DI Low Level WRN	Continued	Electrical resistivity of the circulating fluid falls short of your specified value.	Lower the setting for resistivity. Replacement of the DI filter is required.
25	Pump Inverter Error FLT	Stop	An error was detected in the system inverter.	Contact the system supplier for request of inspection and repair.
26	DNET Comm. Error FLT	Stop	An error was detected in the DeviceNet communication system.	Contact the system supplier for request of inspection and repair.
27	DNET Comm. Error WRN	Continued	DeviceNet communication was disconnected between this system and customer's system.	Check that a signal is being issued from your system. Check for disconnection of the communication connector from this system.
29	F.Water Low Temp. WRN	Continued	The temperature of facility water falls below your specified value.	Reset the setting temperature.
30	F.Water High Temp. WRN	Continued	The temperature of facility water falls below your specified value.	Reset the setting temperature.

## 8 Maintenance

### 8.1 General maintenance

#### Caution

- Not following proper maintenance procedures could cause the product to malfunction and lead to equipment damage.
- If handled improperly, compressed air can be dangerous.
- Maintenance of pneumatic systems should be performed only by qualified personnel.
- Before performing maintenance, turn off the power supply and be sure to cut off the supply pressure. Confirm that the air is released to atmosphere.

## 8 Maintenance (continued)

- After installation and maintenance, apply operating pressure and power to the equipment and perform appropriate functional and leakage tests to make sure the equipment is installed correctly.
- If any electrical connections are disturbed during maintenance, ensure they are reconnected correctly, and safety checks are carried out as required to ensure continued compliance with applicable national regulations.
- Do not make any modification to the product.
- Do not disassemble the product, unless required by installation or maintenance instructions.

### 8.2 Water Quality Management

#### Caution

Only designated circulating fluid is permitted to use for this system. Potential system failure and fluid leak may occur if disregarded, which results in electric shock, ground fault, and freeze. Be sure to use fresh water (tap water) compliant with water quality standards in the table below for ethylene glycol aqueous solution and facility water. See operation manual section '7.1 Water Quality Management' for full details.

### 8.3 Inspection and cleaning

#### Warning

- Do not touch any electrical parts with wet hands. Keep wet hands away from electrical parts. Potential electric shock can occur if disregarded.
- Keep this system from water. Potential electric shock or fire can occur if disregarded.
- If the inspection and cleaning require the removal of the panel, be sure to re-attach the panel upon completion. Potential personal injury or electric shock may occur if operated with the panel opened or removed.

### 8.3.1 Daily Inspection

Inspection item	Inspection method	
Installation condition	Check of the condition of system installation	No heavy object is placed on this system. This system should not be subjected to external force. Temperature and humidity fall within the specified range.
Fluid leak	Check of the piping connector section	No leak of facility water and circulating fluid from the piping connector section
Fluid level	Reading of the level of the circulating fluid	Level falls within the circulating fluid specified level between "High" and "Low".
Operation display panel	Display check	Clarity of letters and numbers on the LCD display should be assured.
	Function check	[RUN] lamp is ON.
Circulating fluid temperature	Confirm the reading on the LCD screen	Temperature should be within setpoint.
Discharge pressure of circulating fluid	Confirm the reading on the LCD screen	Reading should not have deviated much from last inspection.
Circulating fluid flow rate	Confirm the reading on the LCD screen	Reading should not have deviated much from last inspection.
Operating condition	Operating condition check	No abnormal noise, vibration, odour, and smoke
Facility water	Check of the facility water	Temperature, flow rate and pressure fall within the specified range.
Circulating fluid supply port cap	Check by providing manual tightening	No looseness

### 8.3.2 Quarterly Inspection

#### Warning

Quarterly inspection requires an advance lockout/tagout of this system. See section 7.2.2 in the operation manual.

Inspection item	Inspection method
Circulating fluid	Circulating fluid is to be drained for check. Fluid should be free of particles, moisture <sup>1)</sup> and foreign substances.
	For ethylene glycol solution, confirm that the concentration falls within the specified range. Recommended to replace the water.
	Facility water
Facility water	Facility water quality should fall within the standards specified.
Ventilation hole and electrical parts	No particles and dust should be present.

## 8 Maintenance (continued)

#### Caution

Moisture trapped in the fluorinated fluid freezes in the heat exchanger element and piping, which may lead to system failure.

### 8.4 Storage

The following should be performed for system long-term storage.

- Drain circulating fluid.
- Drain facility water.
- Cover the system with a plastic sheet for storage.

### 8.5 Draining of Circulating Fluid out of Tank

#### Warning

- If the recovered circulating fluid is contaminated by foreign substances, completely remove them. Do not reuse contaminated fluid.
- Potential insufficient cooling, system failure and froth in the circulating fluid may occur if disregarded.
- Recovered circulating fluid must be sealed in a container to prevent contamination from moisture or foreign substances.
- Store in a cool, dark place.

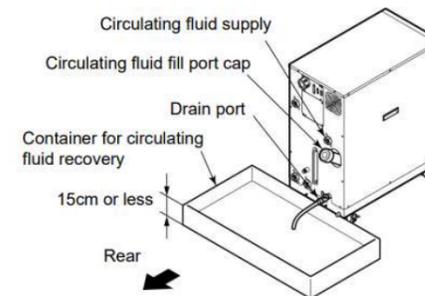
#### Caution

- Use the clean container for circulating fluid recovery. Reuse of the recovered circulating fluid with contaminated will cause insufficient cooling and system failure.
- Be sure to wait until the circulating fluid obtains room temperature for its draining. Potential burns and dew intrusion may occur if disregarded.

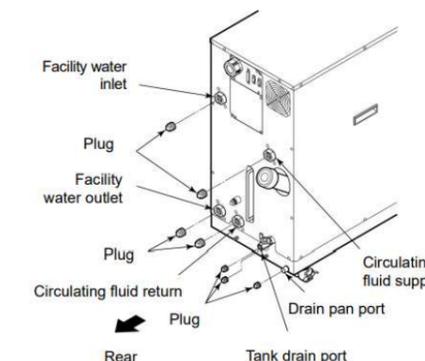
- Prepare the container for circulating fluid recovery at the back of this system.
- Connect the drain hoses to the tank drain ports. Insert the tip of the hose into the container.
  - Prepare a drain hose (Rc3/8-diameter) on your responsibility.
- Remove the cap of the circulating fluid port.
- Open the valves of the tank drain ports to drain the circulating fluid.

- Apply air purge from the circulating fluid return to push the

circulating fluid remaining in the heat exchange back in the tank and drain it.



- Upon completion of fluid draining, close the valves of the tank drain ports.
- Add plugs to seal off ports on the rear of this system.



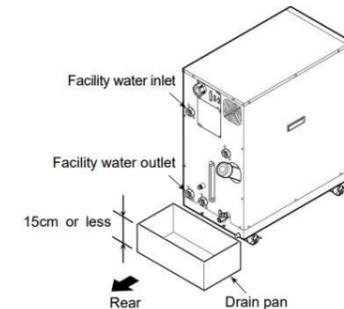
## 8 Maintenance (continued)

#### Caution

Be sure to drain the facility water only when it is at room temperature. Trapped fluid inside the system can still be hot. Potential burns can occur if disregarded.

### 8.5.1 Draining of Facility Water

- Place the drain pan underneath the piping connections on the rear of this system.
  - A 3L-capacity or bigger drain pan is required.
- Remove facility water piping.
  - Remove the joints such as unions if present.
- Drain the facility water using the facility water outlet port.



### 8.6 Periodic Replacement Parts

Replacement of consumables listed in the following table is recommended. Contact the system supplier for request of part replacements.

Part	Recommended replacement cycle*
Circulating pump	Every 3 years
Ventilation fan	Every 3 years
Inverter cooling fan	Every 2 years
Solenoid valve ass'y for facility water	Every 3 years

\*Note: A replacement cycle may vary with your operation conditions.

## 9 Limitations of Use

### 9.1 Limited warranty and disclaimer/compliance requirements

Refer to Handling Precautions for SMC Products.

## 10 Product Disposal

This product shall not be disposed of as municipal waste. Check your local regulations and guidelines to dispose this product correctly, to reduce the impact on human health and the environment.

## 11 Declaration of Conformity

Below is a sample Declaration of Conformity (DoC) used in this product.



## 12 Contacts

Refer to [www.smcworld.com](http://www.smcworld.com) or [www.smc.eu](http://www.smc.eu) for your local distributor/importer.

## SMC Corporation

URL : <https://www.smcworld.com> (Global) <https://www.smc.eu> (Europe)  
 SMC Corporation, 4-14-1, Sotokanda, Chiyoda-ku, Tokyo 101-0021, Japan  
 Specifications are subject to change without prior notice from the manufacturer.  
 © SMC Corporation All Rights Reserved.  
 Template DKP50047-F-085N