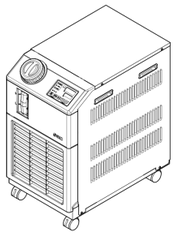
ORIGINAL INSTRUCTIONS

Instruction Manual

Thermo-chiller

HRS040 Series

Refer to Declaration of Conformity for relevant Directives.



The intended use of this product is to use a built-in pump to circulate a liquid such as water, adjusted to a constant temperature by the refrigeration circuit. This circulating liquid cools parts of customer's machine that generate 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)*1), and other safety regulations.

*1) ISO 4414: Pneumatic fluid power - General rules relating to systems.
ISO 4413: Hydraulic fluid power - General rules relating to systems.
IEC 60204-1: Safety of machinery - Electrical equipment of machines. (Part 1: General requirements)
ISO 10218-1: Manipulating industrial robots -Safety. etc.

- 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.

⚠ **Caution**	Caution indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.
⚠ **Warning**	Warning indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.
⚠ **Danger**	Danger indicates a hazard with a high level of risk which, if not avoided, will result in death or serious 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 Product specifications

HRS040-＊＊-20-Options

Model		HRS040-A*-20-(BJMTW)	HRS040-W*-20-(BJMTW)
Cooling method		Air-cooled refrigerated	Water-cooled refrigerated
Refrigerant		R410A (HFC)	
Quantity of Refrigerant		0.53kg	0.6kg
Control method		PID control	
Ambient temperature and humidity*1		Temperature: 5 ~ 40°C ; Humidity: 30 ~ 70%	
Circulating fluid system	Circulating fluid*2	Tap water, Ethylene glycol aqueous solution 15%*4	
	Operating temp. range*1 (°C)	5 to 40	
	Cooling Capacity*4 (50/60Hz) (W)	3800 / 4200	
	Temperature stability*5 (°C)	±0.1	
	Pump capacity*6 (50/60Hz) (MPa)	0.13 (at 7 l/min) / 0.18 (at 7 l/min)	
		For option -T : 0.18 (at 23 l/min) / 0.23 (at 28 l/min)	
	Rated flow*7 (50/60Hz) (l/Min)	7 / 7	
		For option -T : 23 / 28	
	Tank capacity (l)	Approx. 5	
	Port size	Rc1/2	
	Wetted material	Stainless steel, Copper brazing (Heat exchanger)*13, Bronze*13 Brass*13, SIC, Carbon, PP, PE, POM, FKM, EPDM, PVC, NBR	

2 Specifications (Continued)

Model		HRS040-A*-20-(BJMTW)	HRS040-W*-20-(BJMTW)
Facility water system*16	Temperature range (°C)	---	5 ~ 40
	Pressure range (MPa)	---	0.3 ~ 0.5
	Required flow*13 (L/min)	---	15
	Facility water press. differential (L/min)	---	0.3 or more
	Port size	---	Rc3/8
	Wetted material	---	Stainless steel, Copper brazing, Bronze, Synthetic rubber
Automatic fluid filling*12	Feed water pressure range (MPa)	0.2 to 0.5	
	Feed water temperature range (°C)	5 to 40	
	Feed water capacity (l/min)	Approx. 1	
	Filling port size	Rc3/8	
	Overflow port size	Rc3/4	
Electric system	Power supply	1-phase AC200 to 230V 50/60Hz. Allowable voltage range ±10%	
	Circuit protector*14 (A)	20	
	Applicable earth leakage breaker capacity*8 (A)	20	
	Maximum operating current (A)	14 (For option -T: 17)	
	Rated operating current*3 (A) (50/60Hz)	7.9 / 9.6	6.9 / 8.4
	Rated power consumption*3 (50/60Hz) (kVA)	1.6 / 1.9	1.5 / 1.7
Noise level*9 (50/60Hz) (dB)		64 / 66	
Dimensions*11 (mm)		W377 x D592 x H676 (W14.8 x D 23.3 x H26.6 Inch)	
Accessory		Fitting (for drain port) 1pc.,Sequence I/O command signal connector 1pc., Operation manual (Installatio･Operation) 1pc, Alarm code list label 1pc., Ferrite core (For communication)	
Weight*12 (kg)		53	

Notes:
*1 Use the product in conditions where freezing will not occur.
Consult with SMC if using in a season or region where the ambient temperature will fall below zero.
*2 If tap water is used, use water which satisfies the standard of The Japan Refrigeration and Air Conditioning Industry Association (JRA GL-02-1994/Cooling water system - circulation type - make-up water)
*3 (1) Operating ambient temp.: 25°C, (2) Circulating fluid temp.: 20°C, (3) Circulating fluid rated flow, (4) Circulating fluid: Tap water,
(5) Facility water temp.: 25°C (*16). The cooling capacity will be reduced by 300W when option T [High pressure pump] is selected.
*4 Use a 15% ethylene glycol aqueous solution if operating in a place where the circulating fluid temp. is lower than 10°C.
*5 Outlet temp. when the circulating fluid flow is rated flow, and the circulating fluid outlet and the return are directly connected. Installation environment and power supply are within specification range and stable.
*6 The capacity at the thermo-chiller outlet when the circulating fluid temp. is 20°C.
*7 Fluid flow to maintain the cooling capacity and the temperature stability.
The specification of the cooling capacity and the temperature stability may not be satisfied if the flow rate is lower than the rated flow.
*8 To be prepared by the customer. Use an earth leakage breaker with sensitivity of 30mA/200V in power
supply specification.
*9 Front 1m/Height 1m/Static with no load. See note 3 for other conditions.
*10 Dimension between panels. Projection is not included.
*11 Weight when the circulating fluid and facility water (for water-cooled type) is not included. The weight will increase by 1kg when option J [Automatic fluid filling] is selected.
*12 For option J [Automatic fluid filling port].
*13 Copper, bronze and brass are not included when option M [DI water piping] is selected.
*14 In case of option B [Earth leakage breaker], the breaker is changed to an earth leakage breaker.
*15 This fitting is not included when option T [High pressure pump] are selected.
*16 For water -cooled type.
*17 There is required flow when adding load described on cooling capacity in case of note 3 conditions.

2 Specifications (Continued)

2.1 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

Month \ Year		2020	2021	2022	….	2025	2026	2027	….
		y	Z	A	….	D	E	F	….
Jan	o	yo	Zo	Ao	….	Do	Eo	Fo	….
Feb	P	yP	ZP	AP	….	DP	EP	FP	….
Mar	Q	yQ	ZQ	AQ	….	DQ	EQ	FQ	….
Apr	R	yR	ZR	AR	….	DR	ER	FR	….
May	S	yS	ZS	AS	….	DS	ES	FS	….
Jun	T	yT	ZT	AT	….	DT	ET	FT	….
Jul	U	yU	ZU	AU	….	DU	EU	FU	….
Aug	V	yV	ZV	AV	….	DV	EV	FV	….
Sep	W	yW	ZW	AW	….	DW	EW	FW	….
Oct	X	yX	ZX	AX	….	DX	EX	FX	….
Nov	y	yy	Zy	Ay	….	Dy	Ey	Fy	….
Dec	Z	yZ	ZZ	AZ	….	DZ	EZ	FZ	….

3 Installation

3.1 Installation

⚠ Warning

- Do not install the product unless the safety instructions have been read and understood.

3.2 Types of Hazard Labels

⚠ Warning

- The product has various potential hazards and they are marked with warning labels.

Warning related to Electricity

⚠	This symbol stands for a possible risk of electric shock.

Warning related to High Temperatures

⚠	This symbol stands for a possible risk of hot surface and burns.

Warning related to Rotating Objects

⚠	This symbol stands for a possible risk of cutting fingers or hand, or entanglement by rotating fan (For air-cooled type).

Warning related to other General Dangers

⚠	This symbol stands for general danger.

3.3 Environment

⚠ Warning

- Do not use in an environment where corrosive gases, chemicals, salt water or steam are present.
- Do not use the product in an area of high temperature and humidity which cannot be exhausted, or where it is exposed to corrosive substances. Cooling failure can result.
- Do not use the product outdoors. If the product is subjected to rain or water splash it may cause electrical shock, fire or failure.
- Do not use in an explosive atmosphere.
- Do not expose to direct sunlight. Use a suitable protective cover.
- Do not mount in a location exposed to radiant heat.
- Do not install in a location subject to vibration or impact. Check the product specifications.
- Do not use in locations at altitudes of 3000m or higher (except for product storage and transport), refer to the Operation Manual.

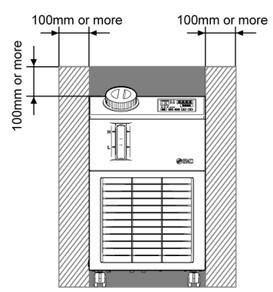
3 Installation (Continued)

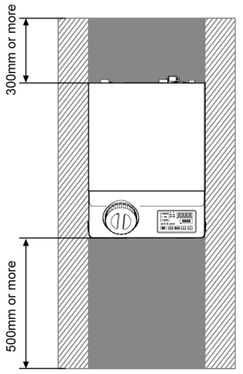
3.4 Mounting

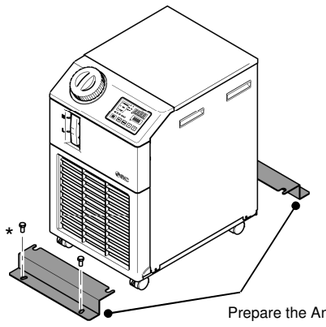
⚠ Warning

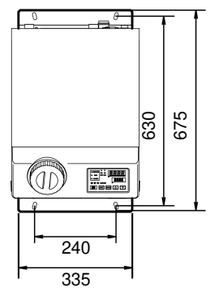
- The Installer / End User is responsible for carrying out a noise risk assessment on the equipment after installation and taking appropriate measures as required.

1) Select a hard flat and level surface suitable to support the weight of the product and which will reduce the effect of vibration.
2) Install the product so the operation panel is easily visible and accessible, electrical and fluid connections can be easily made at the rear of the product and the air inlet and outlet vents are clear of obstructions. After moving into position, lock the front caster wheels again.
3) Fix the product to the floor or base using the anti-quake bracket (prepared separately).









Prepare the Anti-quake as shown (Not included in the package. Part number: HRS-TK002)

*4 (four) M8 foundation bolts must be prepared by the end user.

3.5 Piping

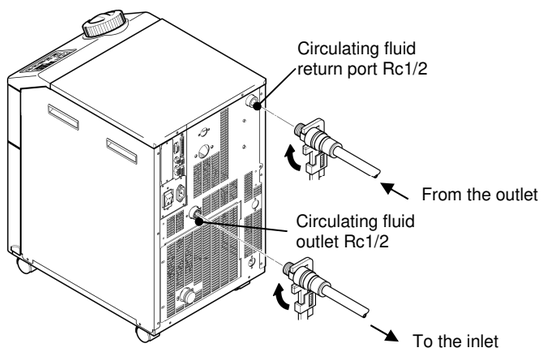
⚠ Caution

- Before piping make sure to clean up chips, cutting oil, dust etc.
- When installing piping or fittings, ensure sealant material does not enter inside the port. When using seal tape, leave 1.5 to 2 threads exposed on the end of the pipe/fitting.
- Tighten fittings to the specified tightening torque.

Thread	Tightening Torque (N·m)
Rc 3/8	22 to 24
Rc 1/2	28 to 30
Rc 3/4	28 to 30

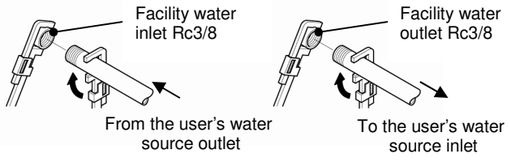
1) Connect the circulating fluid return port with the user's machine outlet.
2) Connect the circulating fluid discharge port with the user's machine inlet.

3 Installation (Continued)



<Water-cooled refrigeration type HRS*-W>**

1) Connect the facility water inlet with the user's water source outlet.
2) Connect the facility water outlet with the user's water source inlet.

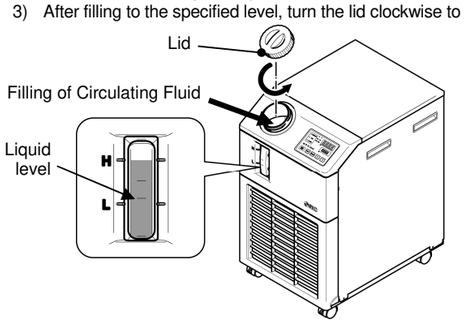


3.6 Filling of Circulating Fluid

Caution

- When the temperature of the circulating fluid is set to lower than 10°C, use a 15% aqueous solution of Ethylene Glycol. Tap water may freeze in the Thermo-chiller, leading to malfunction.
- If using Ethylene Glycol, refer to the suppliers Material Safety Data Sheet (MSDS) and wear Personal Protective Equipment (PPE) as appropriate.

1) Check the drain port is plugged or closed by the valve to prevent the supplied circulating fluid from draining out.
2) Turn the lid for the circulating fluid fill port counter clockwise to open and fill the circulating fluid up to "H" of the level indicator scale.
3) After filling to the specified level, turn the lid clockwise to close.



3.7 Wiring of Power Supply Cable

Warning

- The electrical facilities should be installed and wired in accordance with local laws and regulations of each country and by the person who has knowledge and experience.
- Check the power supply. Operation with voltages, capacities, frequencies and cable sizes other than those specified can cause heat, fire and electrical shock.
- Wire with an applicable cable size and terminal.
- Be sure to shut off the user's power supply. Wiring with the product energized is strictly prohibited.

3 Installation (Continued)

Caution

- Use an individual socket or earth leakage breaker.
- Be sure to provide grounding. Incomplete grounding can cause failure and electrical shock.

3.7.1 Preliminary preparation for wiring:

1) Prepare the cable and individual socket or earth leakage breaker shown in the table below.
2) Strip the sheath from both ends of the cable.
3) Disassemble the power supply connector (supplied as an accessory) and mount one end of the cable to the L, N and E terminals and reassemble the power supply connector.
4) Connect the other end of the cable to a plug or crimped terminal that is connectable to the secondary side of the earth leakage breaker.

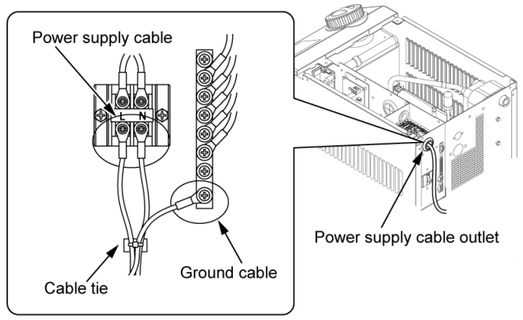
Power supply cable and Earth Leakage Breaker (Recommended)

Model	Power supply voltage	Cable qty. x size	Recommended earth leakage breaker		
			Rated voltage [V]	Rated current [A]	Sensitivity of leak current [mA]
HRS040-A*-20 HRS040-W*-20	1-phase 200-230V AC (50/60Hz)	3 cores x12AWG (3 cores x3.5mm²) (including ground)	200, 230	20	30

Terminal block screw diameter: M4. Recommended crimp terminal: 5.5-4.

3.7.2 Wiring of Power Supply

1) Remove six screws to remove the upper panel.
2) Pull the upper panel towards the back of the product and lift it to remove.
3) Connect the power supply cable and earth cable as shown in the figure below.



4 Name of Parts and Accessories

4.1 Accessories

- Check the enclosed accessories with the delivered thermo-chiller.

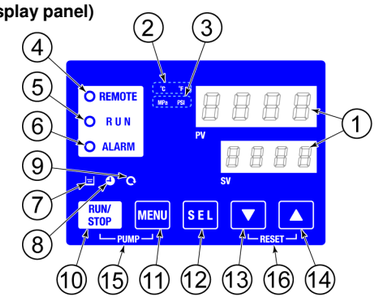
1	Installation and Maintenance Manual (this manual)		1 (with a clear cover)
2	Alarm code list label		1
3	Operation Manual		1
4	Cable tie (for power supply cable fixture)		1
5	Sequence I/O command signal connector*		1
6	Fitting (for drain port) *		1
7	Ferrite core*		1

*These accessories are not explained in this manual. For details, read the Operation Manual attached.

4.2 Main Parts

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

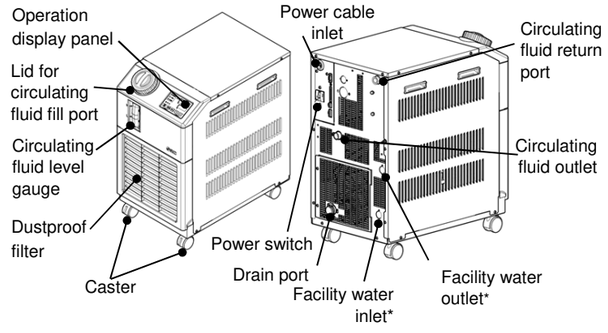
(Operation display panel)



No	Description	Function	
1	Digital display (7-segment, 4 digits)	PV	Displays the temperature and pressure of the circulating fluid and alarm codes.
		SV	Displays the discharge temperature of the circulating fluid and the set values of other menus.
2	[°C] [°F] lamp	Equipped with a unit conversion function. Displays the unit of display temperature (default setting °C).	
3	[MPa] [PSI] lamp	Equipped with a unit conversion function. Displays the unit of display pressure (default setting MPa).	
4	[REMOTE] lamp*	Enables the remote operation (start and stop) by communication. Lights up during remote operation.	
5	[RUN] lamp	Lights up when the product is started and in operation. Goes off when the product is stopped. Flashes during stand-by for stop or anti-freezing function, or independent operation of the pump.	
6	[ALARM] lamp	Flashes with buzzer when alarm occurs.	
7	[ ] lamp	Lights up when the surface of the level indicator falls below the LOW level.	
8	[ ] lamp*	Lights up while the run timer or stop timer function is working.	
9	[ ] lamp*	Lights up when the product is in automatic operation.	
10	[RUN/STOP] key	Makes the product start or stop.	
11	[MENU] key*	Shifts the main menu (display screen of temperature) and secret menu (entry of set values and monitor screen).	
12	[SEL] key*	Changes the item in menu and enters the set value.	
13	[▼] key	Decreases the set value.	
14	[▲] key	Increases the set value.	
15	[PUMP] key	Keep the [MENU] and [RUN/STOP] keys pressed down simultaneously. The pump starts running independently to make the product ready for start-up (release the air).	
16	[RESET] key	Keep the [▼] and [▲] keys pressed down simultaneously. This will stop the alarm buzzer and reset the [ALARM] lamp.	

*These lamps and keys are not used in this manual. For details, read the Operation Manual attached.

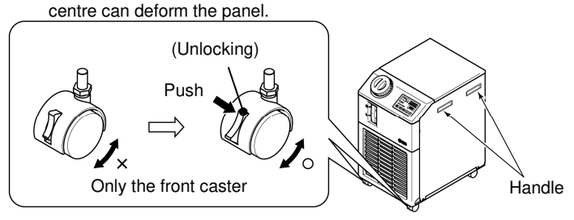
4 Name of Parts and Accessories (Continued)



*Water-cooled refrigeration type HRS***-W

5 Transportation, Transfer and Moving

1) Be sure to unlock the caster (only at the front wheel). There is no lock function with the rear casters.
2) Push the left and right panels with the handle and move.
3) Use corners when pushing the front or rear panel. Pushing at the centre can deform the panel.



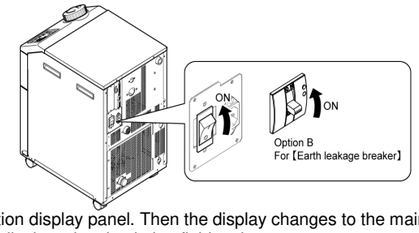
6 Start, Stop and Temperature Settings

6.1 Preliminary preparation for start-up:

6.1.1 Supply of Power

1) Turn on the power switch.

⇒ The initial screen (HELLO screen) is displayed for approx. 8 seconds on the operation display panel. Then the display changes to the main screen, which displays the circulating fluid outlet temperature.



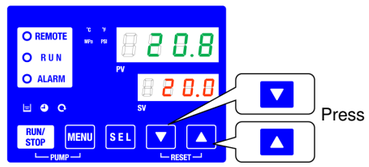
6.1.2 Air Release

1) Press the [PUMP] key ([RUN/STOP] key and [MENU] key simultaneously). The [RUN] lamp flashes and only the pump continues to operation. This operation allows the discharge of the circulating fluid and enables checking leakage from the piping and air release.
2) At this time, the fluid level can lower and cause the alarm "AL01; Low tank level", which will lead to the stop of the product.
3) In that case, check that there is no leakage from the user's piping, fill the circulating fluid as specified in "6.6 Filling of Circulating Fluid" and take necessary actions in "8. Reset Alarms".
4) Repeat steps 1) to 3) until the alarm ("AL01; Low tank level") is no longer generated.

7 Start, Stop and Temperature Settings (Continued)

7.1.1 Temperature Setting

1) Press the [▼] and [▲] keys to change the SV to the required value.

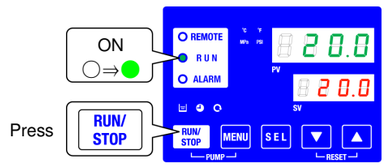


Example: “Set value of circulating fluid discharge temperature” 20.0ºC (Default value)

7.2 Starting the Product:

1) Keep the [RUN/STOP] key pressed for approx. 2 seconds.

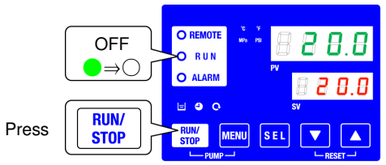
⇒The [RUN] lamp lights up (in green) and the product starts running. The circulating fluid discharge temperature (PV) is controlled to the set temperature (SV).



7.3 Stopping the product:

1) Keep the [RUN/STOP] key pressed for approx. 2 seconds.

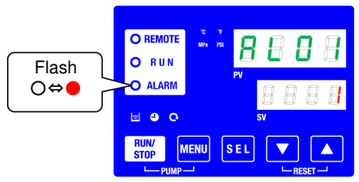
⇒The [RUN] lamp flashes (in green) and continues the operation until the product is ready to stop. After approx. 10 seconds, the [RUN] lamp goes off and the product stops.



8 Resetting Alarms

Caution

- Should some error occur, the [ALARM] lamp flashes (in red) and the buzzer sounds to inform the user of the ‘Error’.
- The alarm code will be displayed on the operation panel so that the cause can be checked on “see Troubleshooting”.



Example:
“AL01”
“Low level in tank”

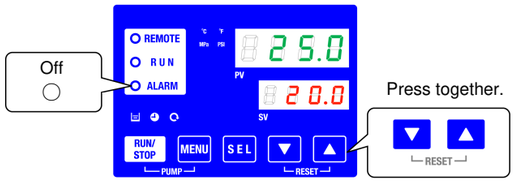
- Before resetting the alarm, read the “Causes and Remedies” of “Troubleshooting” and eliminate the cause explained there. Otherwise, the same alarm may be repeated.
- As accessories, the clear cover (for this manual) and alarm code list label are enclosed. Stick the label to the panel to check the contents of alarm codes.

8 Resetting Alarms (Continued)

Resetting of alarm

1) Press the [RESET] key ([▼] and [▲] keys simultaneously).

⇒The buzzer and then [ALARM] lamp (red) go off.



9 Troubleshooting

9.1 Troubleshooting

The troubleshooting method depends on which alarm has been generated. Refer to “Alarm code list and Troubleshooting”.

Warning

In the event of an unexpected problem or malfunction, switch off the product and investigate the cause. If the cause of the problem cannot be determined, do not use the product, but contact SMC for assistance.

Alarm code list and Troubleshooting

Code	Description	Operation	Cause/Remedy (Press the reset key after eliminating the cause.)
AL01	Low level in tank	Stop*1	The fluid level has fallen below the level indicator. Fill the circulating fluid.
AL02	High circulating fluid discharge temp.	Stop	・Ensure that the circulating fluids flow is 5 L/min. or more. ・Reduce the ambient temperature or heat load. ・Wait until the temperature decreases.
AL03	Circulating fluid discharge temp. rise	Continued*1	
AL04	Circulating fluid discharge temp.	Continued*1	Check the ambient temperature condition and the temperature of supplied circulating fluid.
AL05	High circulating fluid return temp.	Stop	・Ensure that the circulating fluids flow is 5 L/min. or more. ・Check the heat load are within the specified range.
AL06	High circulating fluid discharge pressure	Stop	Check the user's piping for bends, squash and foreign matters.
AL07	Abnormal pump operation	Stop	Restart and check the pump is operating.
AL08	Circulating fluid discharge pressure rise	Continued*1	Check the user's piping for bends, pinching or blockage by foreign matters.
AL09	Circulating fluid discharge pressure drop	Continued*1	・Restart and check the pump is operating. ・Ensure that the tank level is within the appropriate range.
AL10	High compressor intake temp.	Stop	Check the temperature of the circulating fluid returning to the product.
AL11	Low compressor intake temp.	Stop	・Check the circulating fluid flows. ・Check the circulating fluid in the evaporator is not frozen. ・Use a 15% ethylene glycol aqueous solution if operating with a set temperature lower than 10ºC.
AL12	Low super heat temperature	Stop	
AL13	High compressor discharge pressure	Stop	Reduce the ambient temperature or heat load
AL15	Refrigerant circuit pressure (high pressure side) drop	Stop	・Check the ambient temperature is within the specified range. ・It is possible that refrigerant is leaking. Ask for the service. Reduce the ambient temperature or heat load.
AL16	Refrigerant circuit pressure (low pressure side) rise	Stop	
AL17	Refrigerant circuit pressure (low pressure side) drop	Stop	Check the circulating fluid flows.
AL18	Compressor overload	Stop	Leave for 10 minutes and restart, and check the compressor is operating.
AL19*2	Communication error *2	Continued *1	The request message from the host computer has not arrived. Send it again.
AL20	Memory error	Stop	Written data is different from read data. Ask for the service of RAM.
AL21	DC line fuse cut	Stop *1	DC circuit fuse of the communication connector for the contact input/output is short circuited. Ask for the service of the fuse of the DC circuit. Confirm there is no incorrect wiring or load of 500mA or larger.
AL22	Circulating fluid discharge temp. sensor failure	Stop	The temperature sensor is short-circuited or opened. Ask for the service of the temperature sensor.
AL23	Circulating fluid return temp. sensor failure	Stop	

9 Troubleshooting (Continued)

Code	Description	Operation	Cause/Remedy (Press the reset key after eliminating the cause.)
AL24	Compressor intake temp. sensor failure	Stop	The temperature sensor is short-circuited or opened. Ask for the service of the temperature sensor.
AL25	Circulating fluid discharge pressure sensor failure	Stop	The pressure sensor is short-circuited or opened. Ask for the service of the pressure sensor.
AL26	Compressor discharge pressure sensor failure	Stop	
AL27	Compressor intake pressure sensor failure	Stop	
AL28	Maintenance of pump	Continued	The timing of a periodical check is informed. Recommended to ask for the check and service of the pump, fan motor and compressor
AL29 *3	Maintenance of fan motor *3	Continued	
AL30	Maintenance of compressor	Continued	
AL31 *2	Contact input1 signal detection *2	Stop *1	Contact input is detected.
AL32 *2	Contact input 2 signal detection *2	Stop *1	
AL33	Water leakage	Stop *1	・Check if the leakage sensor is connected. ・Leakage occurred. Check the leakage point.
AL34	Electric resistivity / conductivity rise	Continued	Electrical resistivity is larger than the set value.
AL35	Electric resistivity / conductivity drop	Continued	Electrical resistivity is smaller than the set value. Replace the DI filter.
AL36	DI sensor error	Continued	・Check if the resistivity sensor is connected. ・There may be short circuit or open wire of the resistivity sensor. Replace the sensor.

＊1”Stop” or “Continued” are default setting. The user can change them to “Continued” / “Stop”. For details, read the Operation Manual attached.

＊2 ”AL19, AL31, AL32” is disabled in the default setting. When this function needs to be enabled, refer to the Operation Manual attached.

＊3 HRS＊＊＊-A＊-＊＊(Air-cooled refrigeration type).

＊4 Refers to the “Operation Manual” separate sheet for other alarms.

9.2 Other Errors

The causes and remedies for failures that are not indicated by alarm numbers as shown in ‘Alarm code list and Troubleshooting’ table.

Causes and remedies for failures without alarm number

Content of Failure	Cause	Remedy
The operation panel displays nothing	The power supply switch is not turned on.	Turn on the power supply switch.
	Failure of power supply switch	Replace the power supply switch.
	No power supply (The breaker for the power supply is not turned on.)	Supply the power.
	Trip of breaker due to short-circuit and current leakage	Repair the short-circuit or current leaking part.
The [RUN] LED does not light up even when the [RUN/STOP] switch is pressed.	Communication is set.	Check the presence of communication setting.
	Failure of the [RUN] LED	Replace the controller.
	Failure of the [RUN/STOP] switch	Replace the controller.

10 How to Order

HRS 040 - A □ - 20 - □

①Cooling capacity

040	3800W/4200W (50/60Hz)

②Cooling method

A	Air-cooled refrigerated type
W	Water-cooled refrigerated type

③Piping thread type

Null	Rc
F	G (PT-G conversion fitting is included)
N	NPT (PT-NPTconversion fitting is included)

④Power supply

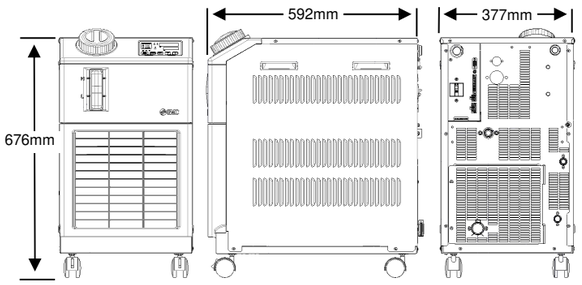
20	1-phase AC200 to 230V(50/60Hz)

⑤Option

Null	None
B	Earth leakage breaker
J	Automatic water-fill
M	DI water piping
T	High-pressure pump
W	Fixed SI unit(*1)

*1) Unit : MPa/ ºC(degree Celsius)

11 Outline Dimensions



12 Maintenance

12.1 General Maintenance

Warning

- Do not operate switches, etc. with wet hands and do not touch the electrical parts such as the power supply plug. It might cause electric shock.
- Do not splash water directly on the product and do not wash with water. It might cause electric shock and fire, etc.
- Do not touch the fins directly when cleaning the dustproof filter. It might cause injury.
- Remount all panels removed for inspection or cleaning. As this might cause injury or electric shock if the prodcut is operated without the panels.

Caution

- Not following proper maintenance procedures could cause the product to malfunction and lead to equipment damage.
- Before performing maintenance, turn off the power supply. After installation and maintenance, turn on power to the equipment and perform appropriate functional and leakage tests to make sure the equipment is installed correctly.
- Do not make any modification to the product.
- Do not disassemble the product, unless required by installation or maintenance instructions.

12.2 Control of Circulating Fluid Quality

Warning

- Use specified circulating fluids only. If other fluids are used, they may damage the product or result in dangerous hazards.
- When using fresh tap water ensure that it satisfies the water standard shown in the Table 6 below.

12 Maintenance (Continued)

⚠ Caution

Clean the tank, circulating fluid circuit, and change the circulating fluid in the tank if any problems are found during the regular check. Even if no problems are found, it is recommended to change the fluid once every 3 months in case evaporation of the fluid causes concentration of impurities.

12.3 Daily check

⚠ Caution

Check each item of “Daily checklist”, and if any error is seen, stop the operation of the product and turn off the user's power supply, and service the product.

Daily checklist

Item	Description of checking	
Installation condition	Check the installation conditions of the product.	There is no heavy object on the product or excessive force on the piping.
		Temperature and humidity are within the specified range of the product.
Fluid leakage	Check the connected part of piping	There is no circulating fluid leakage from the connected part of piping.
Fluid amount	Check the liquid level indicator.	The circulating fluid must enter between the scales of ‘‘H’’ and ‘‘L’’
Operation panel	Check the display.	The numbers on the display are clear.
	Check the function.	The [RUN/STOP] and [MENU], [SEL], [▼], [▲] buttons operate properly.
Circulating fluid temperature	Check on the operation panel.	There is no problem for use.
Operating conditions	Check the operation condition.	There is no abnormal noise, vibration, smell and smoke.
Facility water*	Facility water condition	Temperature, flow rate and pressure are within the specified range.

＊For water-cooled type

12.4 Monthly Check

Cleaning of air vent (For air-cooled type)

⚠ Caution

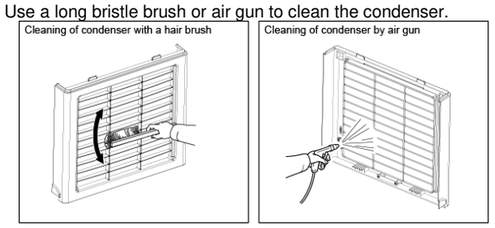
- If the fins of the air-condenser become clogged with dust or debris, heat radiation performance reduces. This results in the reduction of cooling performance, and may stop the operation because the safety device is trigger. Shut off the power supply of the product when performing cleaning, maintenance or inspection. Otherwise,it might cause electric shock, injury or burn, etc.
- Replace all panels removed for inspection or cleaning. It might cause injury or electric shock if it is operated with the panel removed or opened.

12.4.1 Removal of the Dustproof Filter

1) The dustproof filter is installed at the lower part of the front face of the thermo-chiller. It is mounted with a magnet. Pull out the lower part of the side surface of the dustproof filter.
2) When the magnet comes off, pull the dustproof filter downwards to remove. Care should be taken not to deform or scratch the air-cooled condenser.

12.4.2 Cleaning of filter

1) Use a long bristle brush or air gun to clean the condenser.



2) Insert the collar in reverse order of removal, then mount the dustproof filter. The magnet clicks when mounted.

12 Maintenance (Continued)

12.5 Inspection every 3 months

12.5.1 Replacement of circulating fluid

- Clean the tank and replace the circulating fluid (clean water).

12.5.2 Replacement of facility water (For water cooled type)

- Clean the facility water source and replace the facility water

12.6 Inspection every 6 months

⚠ Caution

- It is impossible to prevent the leakage from the mechanical seal completely because of its structure. Although the leakage is described as 3cc/hr or less (reference value) based on the JIS.
- The recommend lifetime of the mechanical seal before needing replacement is 6000 to 8000 hours (usually 1 year).

12.6.1 Check for water leakage from pump (Option: T [High head pump])

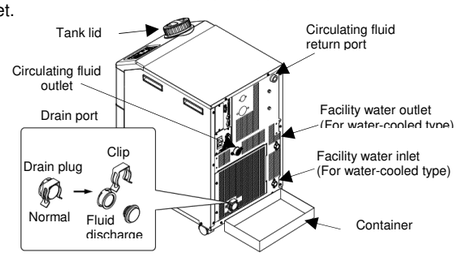
- Remove the panel and check the mechanical seal of the pump for excessive leakage. If the leakage is found, replace the mechanical seal. Order the mechanical seal described in ’12.9 Consumable parts’.

12.7 Discharge of the Circulating Fluid and Facility Water

⚠ Warning

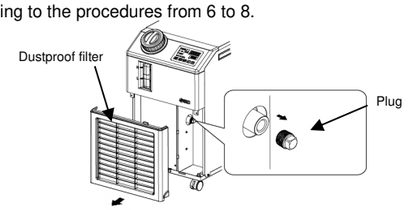
- Stop the customer device and release the residual pressure before discharging the circulating fluid.
- Before discharging the facility water, in case of water-cooled refrigerated type, stop the equipment for the facility water, or stop the facility water circuit to release the residual pressure.

1) Place a container with a capacity of approx. 10L underneath the drain outlet.



2) Remove the tank lid.
3) Remove the drain plug on the drain port on the piping to discharge the fluid.
4) An ‘O’ ring is used for the drain plug. Take care not to damage the ‘O’ ring.
5) Confirm that a enough circulating fluid has been drained from the user’s machine and piping and apply air purge from the circulating fluid return port.
6) After discharging the circulating fluid in the tank, refit the drain plug, clip and close the tank lid.

- For the water-cooled refrigeration chiller, drain the facility water according to the procedures from 6 to 8.



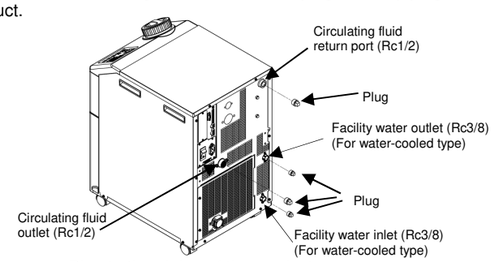
7) Remove the piping of the outlet of the facility water.
8) Remove the dustproof filter to remove the plug.

12 Maintenance (Continued)

⚠ Caution

- **Just removing the facility water piping does not discharge the facility water completely. Remove the plug to discharge the facility water.**

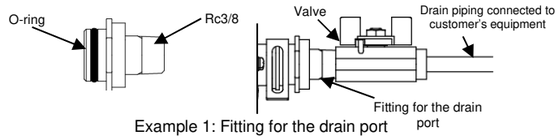
9) After ensuring that the facility water is completely discharged, apply the sealant tape to the plugs which are removed during step 8 for mounting.
10) Refer to the below diagram to mount the plug to the piping of the product.



Plug to the piping of the product

12.8 Fitting for the Drain Port (Accessory)

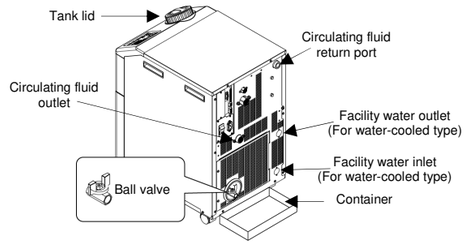
- The thermo-chiller includes the fitting for the drain port shown in Example 1.
- Discharging of the drain will be easier if end user prepares a valve. The valve has to be connected to the drain port fitting. If the valve is connected far away from the drain port fitting, it causes an air trap.



Example 1: Fitting for the drain port

12.8.1 Option T [High head pump]

- The ball valve is mounted to the drain port. Open the ball valve to discharge the circulating fluid in the same way as procedure 1 to 9. Close the ball valve after discharging the circulating fluid.



12.9 Consumable parts

Description	Part No.	Remark
Dustproof filter	HRS-S0001	For spare
Mechanical seal set	HRG-S0211	Option T or MT (High head pump)

13 Limitations of Use

13.1 Limited warranty and Disclaimer/Compliance Requirements

Refer to Handling Precautions for SMC Products.

⚠ Caution

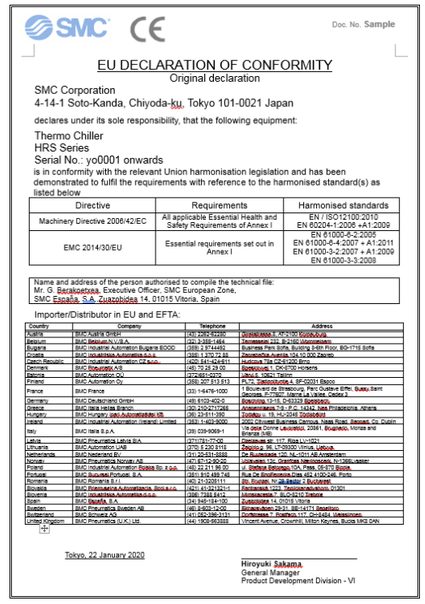
Refer to section 2. Specifications for product specific Limitations of Use.

14 Product disposal

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

15 Declaration of Conformity

Below is a sample Declaration of Conformity used for this product. An actual Declaration of Conformity will be supplied with each product.



SMC CE

Doc. No. Sample

EU DECLARATION OF CONFORMITY
Original declaration

SMC Corporation
4-14-1 Soto-Kanda, Chiyoda-ku, Tokyo 101-0021 Japan

declares under its sole responsibility, that the following equipment:

Thermo Chiller
HRS Series
Serial No.: yo0001 onwards

is in conformity with the relevant Union harmonisation legislation and has been demonstrated to fulfil the requirements with reference to the harmonised standard(s) as listed below

Directive	Requirements	Harmonised standards
Machinery Directive 2006/42/EC	All applicable Essential Health and Safety Requirements of Annex I	EN ISO12100:2010 EN 60204-1:2006 +A1:2009
EMC 2014/30/EU	Essential requirements set out in Annex I	EN 61000-6-2:2005 EN 61000-6-4:2007 + A1:2011 EN 61000-3-2:2007 + A1:2009 EN 61000-3-3:2008

Name and address of the person authorised to compile the technical file:
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Tokyo, 22 January 2020

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