



ORIGINAL INSTRUCTIONS

Instruction Manual

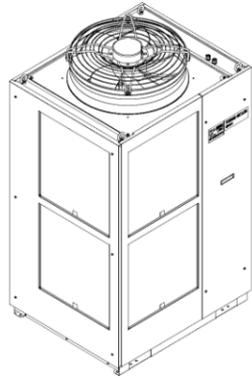
Thermo-chiller

HRSH100/150/200/250-A/W-20-*S*

HRSH100/150/200/250-A/W-40-*

HRSH300-A-20-*S*

HRSH300-A-40-*



The intended use of this product used 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 start and stop the product and reset its alarms. Read this manual before using.

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: Robots and robotic devices - Safety requirements for industrial robots - Part 1: Robots.

- 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

HRSH* *0 -A* *- * *-Options (Air-cooled version)

Model	HRSH100-A*	HRSH150-A*	HRSH200-A*	HRSH250-A*	HRSH300-A*					
	-20-S -40-*	-20-S -40-*	-20-S -40-*	-20-S -40-*	-20-S -40-*					
Cooling method	Air-cooled refrigerated									
Refrigerant	R410A : 2088									
Control method	PID control									
Ambient temperature ¹⁾ (°C)	-5 to 45									
Circulating fluid ²⁾	Clear water, 5% Ethylene glycol aqueous solution, DI water (pure water)									
Operating temp. range ³⁾ (°C)	5 to 35									
Cooling Capacity ³⁾ (kW)	10.5	15.7	20.5	25.0	28.0					
Heating Capacity ³⁾ (kW)	2.5	3.0	5.5	7.5						
Temperature stability ³⁾ (°C)	±0.1									
Pump capacity	Rate flow rate (Outlet) (L/min)	45 (0.43MPa)	45 (0.45MPa)	125 (0.5MPa)						
	Max. flow rate (L/min)	120	130	180						
	Max. lifting height (m)	50			80					
Adjustable pressure range ³⁾ (MPa)	0.1 to 0.5			0.1 to 0.8						
Min. operating flow rate ⁷⁾ (L/min)	20	25	40							
Tank capacity (L)	25	42	60							
Circulating fluid outlet, circulating fluid return port	Rc1(Symbol F: G1, Symbol N: NPT1)									
Tank drain port	Rc3/4 (Symbol F: G3/4, Symbol N: NPT3/4)									
Automatic fluid fill function (Standard)	Supply side press. range (MPa)	0.2 to 0.5								
	Supply side fluid temp. (°C)	5 to 35								
	Automatic filling port	Rc1/2 (Symbol F: G1/2, Symbol N: NPT1/2)								
Over flow port	Rc1 (Symbol F: G1, Symbol N: NPT1)									
Wetted material	Metal	Stainless steel, Copper(Heat exchanger's brazing), Brass, Bronze								
	Resin	PTFE, PU, FKM, EPDM, PVC, NBR, POM, PE, NR								
Power supply (No continuous voltage fluctuation)	AC200/200-230V 50/60Hz 3phase Allowable voltage fluctuation ±10%	√	-	√	-	√	-	√	-	
	AC380-415V 50/60Hz 3phase Allowable voltage fluctuation ±10%	-	√	-	√	-	√	-	√	
Earth leakage breaker (Standard)	Rated current (A)	30	20	30	40	30	50	30	50	30
	Sensitivity (mA)	30								
Rated operating current ⁸⁾ (A)	14	7.4	17	9.3	25	12.6	34	16	36	18
Rated power consumption ⁸⁾	kW	4.5	4.6	5.8	5.8	8.2	10.4	10.1	11.1	10.8
	kVA	4.9	5.4	6.0	6.4	8.7	8.9	11.6	11.1	12.2
Sound level (Front 1m / Height 1m) ⁹⁾ (dB)	68									71
Water-proof specification	IPX4									
Accessory	Alarm cord list label 2pc. (English 1pc./Japanese 1pc.), Operation manual 2pc. (English 1pc./Japanese 1pc.), Y strainer (40 meshes) 25A, Barrel nipple 25A									
	Anchor brackets 2pcs (including M8 bolts 6pcs.) ⁸⁾									
Weight (dry condition) (kg)	180	215	280							

HRSH* *0 -W* *- * *-Options (Water-cooled version)

Model	HRSH100-W*	HRSH150-W*	HRSH200-W*	HRSH250-W*					
	-20-S -40-*	-20-S -40-*	-20-S -40-*	-20-S -40-*					
Cooling method	Water-cooled refrigerated								
Refrigerant	R410A : 2088								
Control method	PID control								
Ambient temperature ¹⁾ (°C)	2 to 45								
Circulating fluid ²⁾	Clear water, 15% Ethylene glycol aqueous solution, DI water (pure water)								
Operating temp. range ³⁾ (°C)	5 to 35								
Cooling Capacity ³⁾ (kW)	11.5	15.7	20.6	24.0					
Heating Capacity ³⁾ (kW)	2.5	3.5	4.0	7.2					
Temperature stability ³⁾ (°C)	±0.1								
Pump capacity	Rate flow rate (Outlet) (L/min)	45 (0.43MPa)	45 (0.45MPa)						
	Max. flow rate (L/min)	120	130						
	Max. lifting height (m)	50			80				
Adjustable pressure range ³⁾ (MPa)	0.1 to 0.5			0.1 to 0.8					
Min. operating flow rate ⁷⁾ (L/min)	20	25	40						
Tank capacity (L)	25	42	60						
Circulating fluid outlet, circulating fluid return port	Rc1 (Symbol F: G1, Symbol N: NPT1)								
Tank drain port	Rc3/4 (Symbol F: G3/4, Symbol N: NPT3/4)								
Automatic fluid fill function (Standard)	Supply side press. range (MPa)	0.2 to 0.5							
	Supply side fluid temp. (°C)	5 to 35							
	Automatic filling port	Rc1/2 (Symbol F: G1/2, Symbol N: NPT1/2)							
Over flow port	Rc1 (Symbol F: G1, Symbol N: NPT1)								
Wetted material	Metal	Stainless steel, Copper(Heat exchanger's brazing), Brass, Bronze							
	Resin	PTFE, PU, FKM, EPDM, PVC, NBR, POM, PE, NR							
Temperature range (°C)	5 to 40								
	Pressure range (MPa)	0.3 to 0.5			0.5				
Required flow (L/min)	25	30	50	55					
Facility water pressure differential (MPa)	More than 0.3								
Facility water inlet, outlet port	Rc1								
Wetted material	Metal	Stainless steel, Copper(Heat exchanger's brazing), Bronze, Brass							
	Resin	PTFE, NBR, EPDM							
Power supply (No continuous voltage fluctuation)	AC200/200-230V 50/60Hz 3phase Allowable voltage fluctuation ±10%	√	-	√	-	√	-		
	AC380-415V 50/60Hz 3phase Allowable voltage fluctuation ±10%	-	√	-	√	-	√		
Earth leakage breaker (Standard)	Rated current (A)	30	20	30	40	30	50	30	
	Sensitivity (mA)	30							
Rated operating current ⁸⁾ (A)	14	7.3	17	8.8	21	10.6	25	12.8	
	4.2	4.4	5.3	5.3	6.6	6.6	8	8.2	
Rated power consumption ⁸⁾	kW	4.7	5	5.8	6.1	7	7.4	8.4	8.9
	kVA	5.1	5.5	6.3	6.7	8.1	8.4	9.6	10.1
Sound level (Front 1m / Height 1m) ⁹⁾ (dB)	61							60	61
Water-proof specification	IPX4								
Accessory	Alarm cord list label 2pc. (English 1pc./Japanese 1pc.), Operation manual 2pc. (English 1pc./Japanese 1pc.), Y strainer (40 meshes) 25A, Barrel nipple 25A								
	Anchor brackets 2pcs (including M8 bolts 6pcs.) ⁸⁾								
Weight (dry condition) (kg)	150							180	

2 Specifications (continue)

Notes:

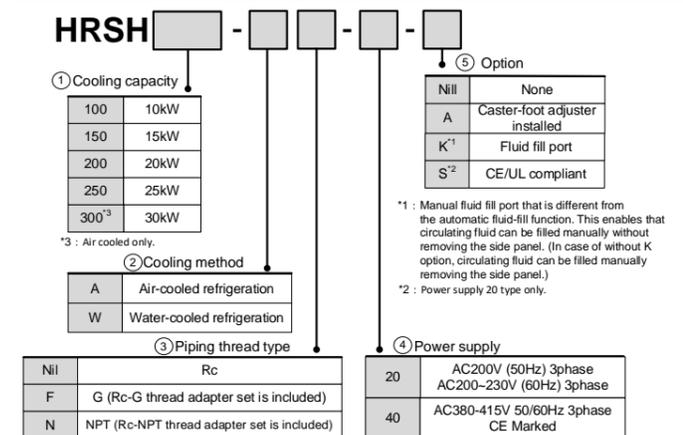
- *1 Use 15% ethylene glycol aqueous solution if operating in a place where the circulating fluid temp. or ambient temperature is lower than 10 °C. (Note: Water-cooled: Please discharge the facility water from the facility water circuit when there is a risk of freezing.)
- *2 Use fluid in condition below as the circulating fluid. Tap water: Standard of The Japan Refrigeration And Air Conditioning Industry Association (JRA GL-02-1994) 15% ethylene glycol aqueous solution: diluted by tap water in condition above without any additives such as antiseptics. Deionized water: Conductivity 1µS/cm and higher (electrical resistivity 1MΩ·cm and lower)
- *3 (1) Air-cooled: Operating ambient temp.: 32 °C or Water-cooled: Facility water temp.: 32 °C, (2) Circulating fluid : Tap water, (3) Circulating fluid temp.: 20 °C, (4) Circulating fluid flow rate : Rated flow rate, (5) Power supply: AC200V (-20-*), AC400V (-40-*).
- *4 (1) Air-cooled: Operating ambient temp.: 32 °C or Water-cooled: Facility water temp.: 32 °C, (2) Circulating fluid : Tap water, (3) Circulating fluid flow rate : Rated flow rate, (4) Power supply: AC200V (-20-*), AC400V (-40-*).
- *5 (1) Air cooled: Operating ambient temp.: 32 °C or Water cooled: Facility water temp.: 32 °C, (2) Circulating fluid : Tap water, (3) Circulating fluid temp.: 20 °C, (4) Heat load : Same as the cooling capacity, (5) Circulating fluid flow rate: Rated flow rate, (6) Power supply : AC200V (-20-*), AC400V (-40-*), (7) External piping length: Minimum
- *6 With pressure control function using an inverter. When the pressure control function is not being used, the pump power supply frequency setting function can be used.
- *7 Required flow rate to maintain the cooling capacity. When the flow rate is lower than the rated flow, use a by-pass piping set
- *8 The anchor brackets (including M8 bolts x6pcs.) are used for fixation with the skid when this product is packed. The anchor bolts are not attached.

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	2021	2022	2023	...	2026	2027	2028	...
Month	Z	A	B	...	E	F	G	...
Jan	o	Zo	Ao	Bo	...	Eo	Fo	Go
Feb	P	ZP	AP	BP	...	EP	FP	GP
Mar	Q	ZQ	AQ	BQ	...	EQ	FQ	GQ
Apr	R	ZR	AR	BR	...	ER	FR	GR
May	S	ZS	AS	BS	...	ES	FS	GS
Jun	T	ZT	AT	BT	...	ET	FT	GT
Jul	U	ZU	AU	BU	...	EU	FU	GU
Aug	V	ZV	AV	BV	...	EV	FV	GV
Sep	W	ZW	AW	BW	...	EW	FW	GW
Oct	X	ZX	AX	BX	...	EX	FX	GX
Nov	y	Zy	Ay	By	...	Ey	Fy	Gy
Dec	Z	ZZ	AZ	BZ	...	EZ	FZ	GZ

3 How to Order



4 Name of Parts and Accessories

4.1 Accessories

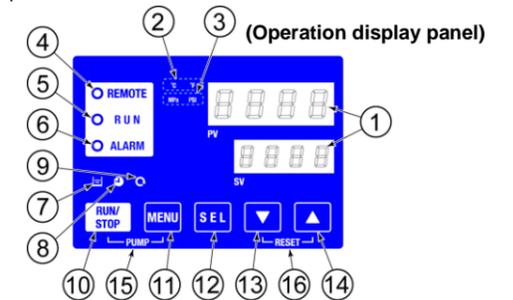
- Check the enclosed accessories with the delivered thermo-chiller.

No.	Description	Quantity	Unit
1	Alarm cord list label	2	(JPN: 1pc, ENG: 1pc)
2	Operation manual	2	(JPN: 1pc, ENG: 1pc)
3	Y strainer (40 meshes) 25A	1pc	
4	Barrel nipple 25A	1pc	
5	HRSH***-AF-** G thread adapter set (HRS-EP014) HRSH***-AN-** NPT thread adapter set (HRS-EP013) HRSH***-WF-** G thread adapter set (HRS-EP016) HRSH***-WN-** NPT thread adapter set (HRS-EP015)	1 set	
-	Anchor brackets (M8 bolts)	2 pcs. 6 pcs.	---

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

4.2 Main Parts

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



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 set 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.
6	[ALARM] lamp	Flashes with buzzer when alarm occurs. Flashes while AL25 is off.
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	When the [MENU] and [RUN/STOP] keys pressed down simultaneously, the pump starts running independently.
16	[RESET] key	Keep the [▼] and [▲] keys pressed down simultaneously for 3 seconds to reset AL46 and AL48. (After resetting AL48, WAIT "H A I L" will be displayed and the product cannot start running for 40 seconds. Restart 40 seconds later after resetting.)

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

4 Name of Parts and Accessories (continue)

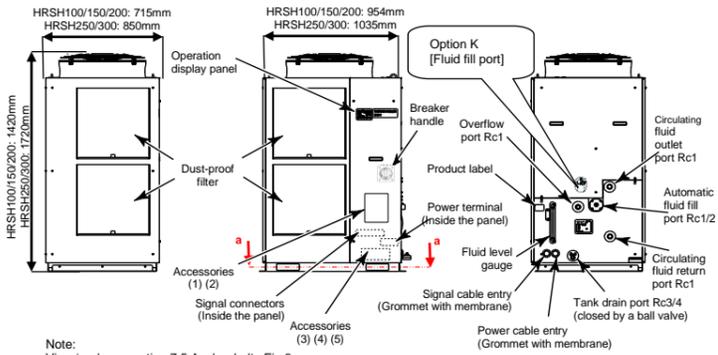


Fig.1: HRSH***-A*** (Air cooled type)

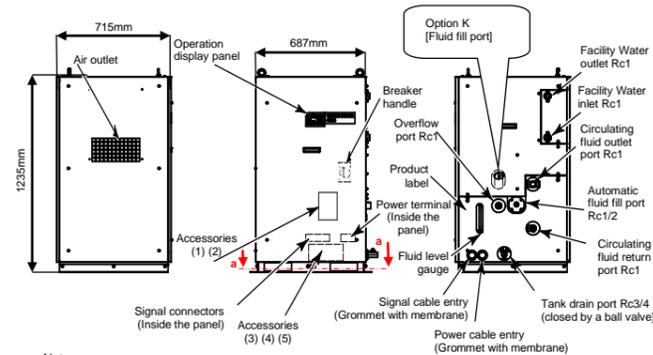


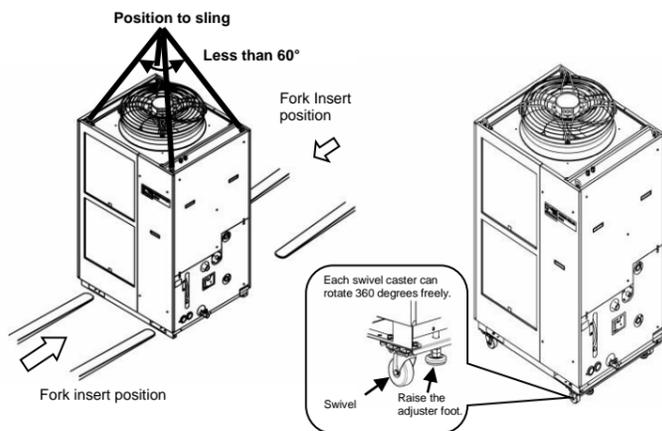
Fig.2: HRSH***-W*** (Water cooled type)

5 Transportation, Transfer and Moving

6.1 Moving by forklift and slinging or by casters

Warning

- The product is a heavy object. (Refer to 3.1 Product specification for weights).
- Moving by forklift and slinging should be done by persons who have required licenses.
- Moving the product by casters should be done by 2 persons or more



6 Installation

6.1 Installation

Warning

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

6.2 Types of Hazard Labels

Warning

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

6 Installation (continue)

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.

6.3 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 in an explosive atmosphere.
- Do not use in locations at altitudes of 3000m or higher (except for product storage and transport), refer to the Operation Manual.
- Do not install in a location exposed to direct sunlight and radiant heat.

- Do not install in a location subject to vibration or impact.
- Do not install in locations that is exposed to the splash of water that is higher than IPX4.
- Do not expose to potential lightning strike.

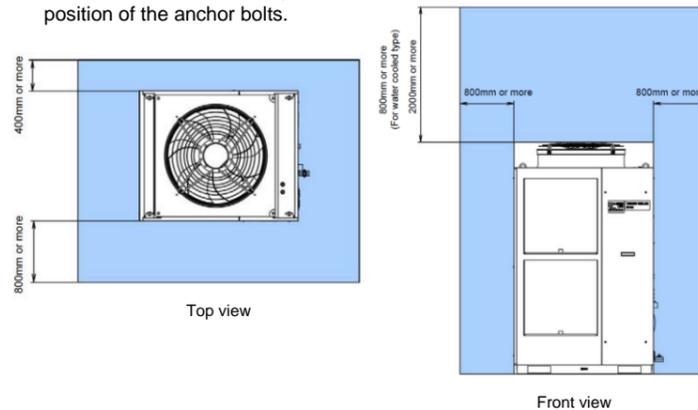
6.4 Mounting

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.

Caution

- Have enough space for ventilation for the product. Otherwise may cause a lack of cooling capacity or/and stoppage of the product.
- Have enough space for maintenance.
- Install the product on a vibration free floor.
- Prepare M10 anchor bolts that are suitable to the floor that the product will be installed. Refer to operation manual for outline dimensions for the position of the anchor bolts.



6 Installation (continue)

6.5 Anchor bolts (dimensions (mm); position view a-a)

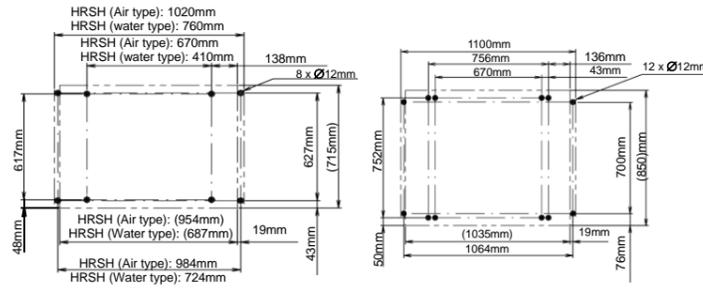
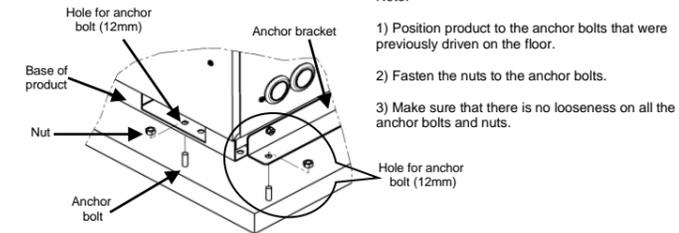


Fig.3 View 'a-a' (see Fig.1): Anchor bolts hole positions for HRSH100/150/200-A*/20/40 / HRSH100/150/200/250-W*/20/40
Fig.4 View 'a-a' (see Fig.2): Anchor bolts hole positions for HRSH250-A*/20/40 / HRSH300-A*/20/40



Note:

- Position product to the anchor bolts that were previously driven on the floor.
- Fasten the nuts to the anchor bolts.
- Make sure that there is no looseness on all the anchor bolts and nuts.

Option A [Caster Adjuster-foot kit] (HRS-KS001/KS002)

Caution



6.6 Piping

Caution

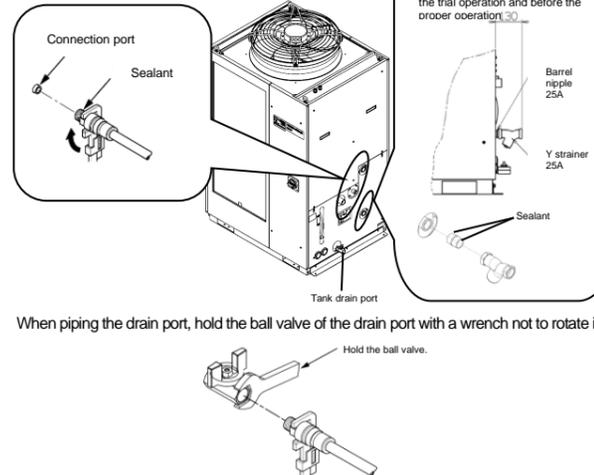
- Before piping make sure to clean up chips, cutting oil, dust etc.
- The piping should be selected with due consideration of temperature and pressure.
- Do not generate a rapid change of pressure by water hammer etc. The product and piping might be damage.
- Hold the piping port firmly with specific wrench when tightening.

Tighten fittings to the specified tightening torque.

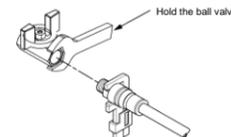
Name	Port size	Recommended tightening torque	Recommended piping specification
Circulating fluid supply	Rc1	36 to 38N·m	1.0MPa and more
Circulating fluid return	Rc1	36 to 38N·m	1.0MPa and more
Facility water inlet ^{*)}	Rc1	36 to 38N·m	1.0MPa and more. (Supply pressure : 0.3 to 0.5MPa)
Facility water outlet ^{*)}	Rc1	36 to 38N·m	1.0MPa and more. (Automatic fluid-fill pressure : 0.2 to 0.5MPa)
Automatic fluid-fill port	Rc1/2	20 to 25N·m	1.0MPa and more (Automatic fluid-fill pressure : 0.2 to 0.5MPa)
Overflow port	Rc1	36 to 38N·m	ID25mm and more Length 5m and less
Tank drain port	Rc3/4	28 to 30N·m	ID 19mm and more

^{*)} Water cooled type only

Tighten the piping to each connection as follows below:



When piping the drain port, hold the ball valve of the drain port with a wrench not to rotate it.



6 Installation (continue)

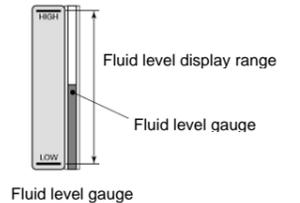
6.7 Filling of Circulating Fluid

Caution

- When the set circulating fluid temperature and/or the ambient temperature is lower than 10°C, use 15% aqueous solution of Ethylene Glycol. Tap water may freeze in the Thermo-chiller, leading to malfunction. Additives such as antiseptics cannot be used.
- If deionized water is used, the conductivity should be 1µS/cm or higher (Electrical resistivity: 1MΩ·cm and lower).
- Confirm that the fluid level is between "High" and "Low" level of the fluid level gauge.
- Connect the piping from the overflow port to the sump pit to drain the excessive fluid from the tank.
- Check drain port is closed by the valve to prevent the supply circulating fluid from draining out.

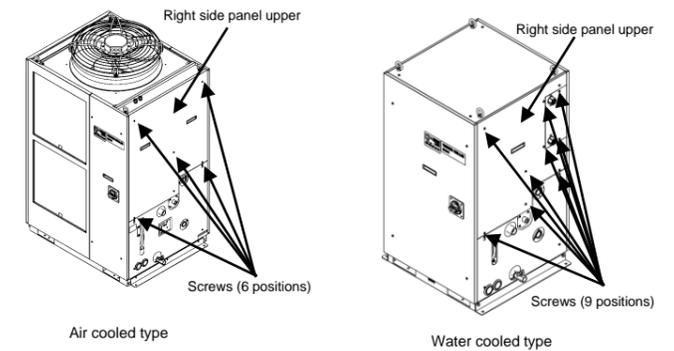
6.7.1 Auto fluid-fill function

- Open the fluid supply valve that is connected to the automatic water fill port.
- Fluid supply starts and stop automatically with ball tap in the tank.

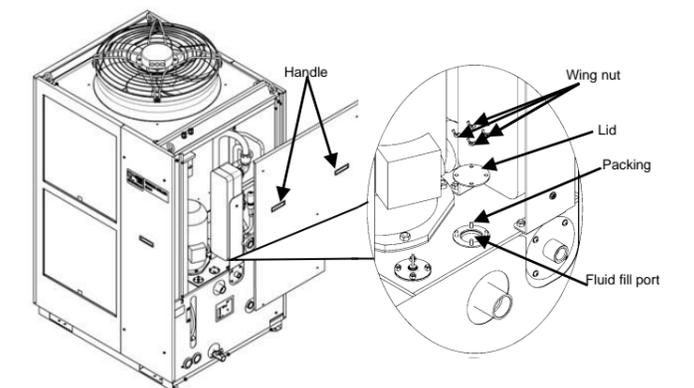


6.7.2 Fill of fluid without using the auto fluid-fill function

- Remove the screws (6 or 9 positions) to remove the right side upper panel.

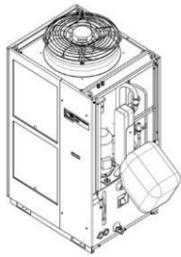


- Hold the handle and pull the upper right side panel, and, remove panel. Remove the wing nuts (x4) on top of the tank and remove the lid.

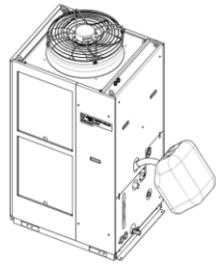


6 Installation (continue)

3. Fill the circulating fluid in the fluid port



Example: Filling the fluid to the port.



Option K (Fluid fill port)
Open cap of the fluid port and fill with circulating fluid.

6.8 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.

Caution

- Use an individual socket or earth leakage breaker.
- Be sure to provide grounding. Incomplete grounding can cause failure and electrical shock.
- When panel is removed or mount, be sure to wear protective shoes and gloves to prevent injury with the edge of the panel.

6.8.1 Preliminary Preparation for Wiring

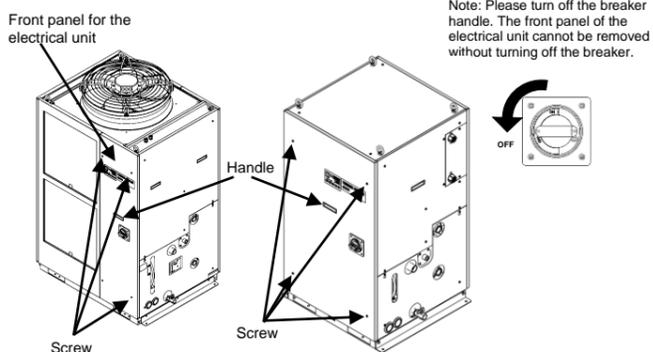
Prepare the power supply shown in the following table.

For the connection between the product and power supply, use the power supply cable and earth leakage breaker shown below:

Model	Power supply voltage	Terminal block screw diameter	Recommend crimp terminal	Cable qty. x size	Earth leakage breaker	
					Rated current [A]	Sensitivity of leak current [mA]
HRSH100-A*-20-S HRSH100-W*-20-S	AC200/ 200-230V 50/60Hz 3 phase	M5	R5.5-5	4 coresAWG10 (4cores x 5.5mm²) *including ground	30	30
HRSH150-A*-20-S HRSH150-W*-20-S					40	
HRSH200-A*-20-S HRSH200-W*-20-S			R8-5	4 coresAWG8 (4cores x 8mm²) *including ground	50	
HRSH250-A*-20-S HRSH250-W*-20-S HRSH300-A*-20-S						
HRSH100-A*-40- HRSH100-W*-40- HRSH150-A*-40- HRSH150-W*-40- HRSH200-A*-40- HRSH200-W*-40- HRSH250-A*-40- HRSH250-W*-40- HRSH300-A*-40- HRSH300-W*-40- HRSH300-A*-40- HRSH300-W*-40-	AC380- 415V 50/60Hz 3 phase	M5	R5.5-5 For power line	3x5.5mm² (3xAWG10)	20	30
R14-5 For ground line			1x14mm² (1xAWG6) For ground line	30		

6.8.2 Wiring of Power Supply

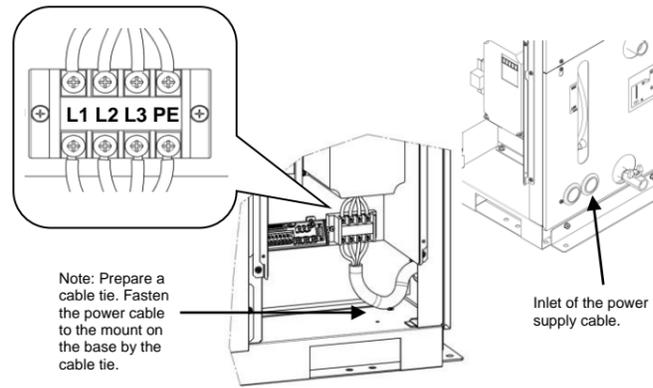
- Turn off the breaker handle.
- Remove four screws to remove the front panel.
- Hold the handle and pull up the front panel of the electrical unit, and remove.



Note: Please turn off the breaker handle. The front panel of the electrical unit cannot be removed without turning off the breaker.

6 Installation (continue)

4) Connect the power supply cable and ground cable as shown below:



Note: Prepare a cable tie. Fasten the power cable to the mount on the base by the cable tie.

Inlet of the power supply cable.

* Connect over current protection to the power cable connected to the equipment in order to avoid hazard.

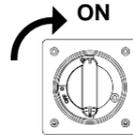
7 Start, Stop and Temperature Settings

7.1 Preliminary Preparation for Start-up

7.1.1 Supply of Power

- Turn on the breaker handle.

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



7.1.2 Preparation of circulating fluid

- Press the [PUMP] key ([RUN/STOP] key and [MENU] key simultaneously). The [RUN] lamp flashes and only the pump continues the operation. This operation allows the discharge of the circulating fluid, and enables checking leakage from the piping and air release.
- 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.
- In that case, check that there is no leakage from the user's piping, fill the circulating fluid as specified in "7.6 Filling of Circulating Fluid" and take necessary actions in "9. Reset Alarms".
- Repeat steps 1) to 3) until the alarm ("AL01; Low tank level") is no longer generated.

7.1.3 Temperature Setting

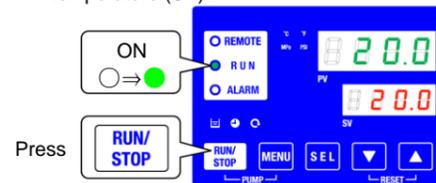
- Press the [▼] and [▲] keys to change the SV to the required value.



7.2 Start of the Product

- Press the [RUN/STOP] key pressed for approx. 2 seconds

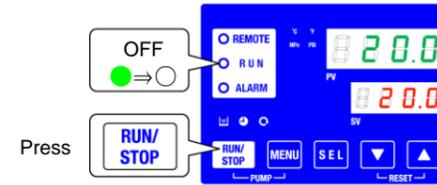
⇒The [RUN] lamp lights up (in green) and the product starts running. The circulating fluid discharge temperature (PV) is controlled to the set temperature (SV).



7 Start, Stop and Temperature Settings (continue)

7.3 Stop of the Product

- Press the [RUN/STOP] key
⇒The [RUN] lamp flashes (in green) and continues the operation until the product is ready to stop. After approx. 20 seconds, the [RUN] lamp goes off and the product stops.



8 Reset 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 "Troubleshooting".



- 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 alarm code list label are enclosed. Stick the label to the panel to check the contents of alarm codes.

Reset of alarm

- Press the [RESET] key ([▼] and [▲] keys simultaneously).
⇒The buzzer and then [ALARM] lamp (red) go off.



9 Maintenance

9.1 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 product 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.

9 Maintenance (continue)

9.2 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 Operation Manual.

9.3 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 the scale of "H".
Operation panel	Check the display.	The numbers on the display are clear.
		The [RUN/STOP] and [MENU], [SEL], [▼], [▲] buttons operate properly.
Circulating fluid temperature	Check on the operation panel.	There is no problem for use.
Circulating fluid flow rate	Check on the operation panel.	There is no problem for use. If flow rate decreasing, please check and clean the Y-strainer.
Operating conditions	Check the operation condition.	There is no abnormal noise, vibration, smell and smoke.
Facility water (water cooled type)	Facility water condition	Temperature, pressure and flow rate are within the specified range of the product.

9.4 Monthly Check

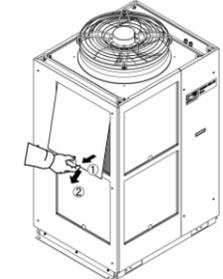
Cleaning of air vent (For air-cooled type)

Caution

- If the air ventilation of the product has clogged with dust or debris, heat radiation performance reduces. This results in the reduction of cooling performance, and may stop the operation.

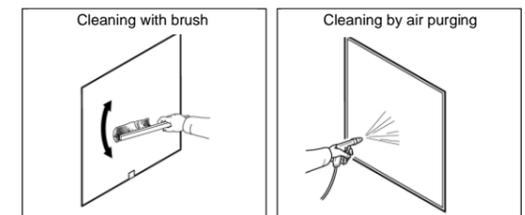
9.4.1 Removal of the Dustproof Filter

- The dust-proof filters are installed on the front and left side of the product. In total there are four filters with the same shape.
- The dustproof filters can be removed as shown in the below drawing. Care should be taken not to deform or scratch the air-cooled condenser.



9.4.2 Cleaning of Filter

- Clean the dust filter with a long bristled brush or by air purging.



- Mount the dustproof filter in reverse order of removal.

9 Maintenance (continue)

9.5 Inspection Every 3 Months

9.5.1 Replacement of Circulating Fluid

- Replace the exiting circulating fluid with new circulating fluid periodically. Otherwise algae or decompose may occur.
- In case of using the Y strainer (accessory), clean the screen mesh in the strainer when exchanging the circulating fluid.
 - Ensure that there is no circulating fluid left in the product, customer's machine and piping.
 - Remove the cap cover of the strainer and take out the screen mesh and clean with detergent or/and purge by air. Take care not to damage the screen mesh.
 - Do not use any chlorinated detergents and cleansers.

9.5.2 Replacement of Facility Water (For water cooled type)

- Clean the facility water source and replace the facility water.

Caution

- If there is foreign matter or clogging in the screen mesh, the pressure loss will become large and may break the screen mesh.

9.6 Inspection for winter season

Caution

- The power supply should be 'ON' for these functions. Otherwise these functions cannot start.
- **Anti-freezing function:** To prevent the circulating fluid freezing during winter, this function operates pump automatically to heat the circulating fluid by the pump's heat radiation. (For details refer to operation manual)
- **Warming up function:** During winter or night, this function operates pump automatically to heat the circulating fluid by the pump's heat radiation to keep the circulating fluid temperature around the warming up function set temperature. (For details refer to operation manual)
- **Anti-snow coverage function (air cooled type):** To prevent the snow coverage on the ventilation air outlet of the fan in winter, this function operates fan automatically. (For details refer to operation manual)
- **Freezing of the facility water:** Discharge the facility water circuit when there is fear of a freeze (Refer to 12.7.2).

9.7 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.

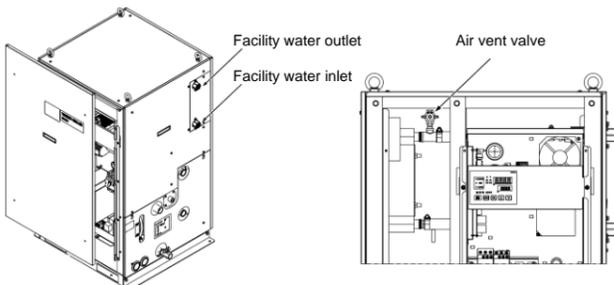
9.7.1 Drain of the circulating fluid

- 1) Shut of the breaker of the customer's power supply.
- 2) Close the valve that is connected to the auto-fill port by the customer.
- 3) Open the ball valve of the drain port and drain the fluid.
- 4) Confirm all the circulating fluid has been drained from the product, user's machine and piping, and, apply air purge from the circulating fluid return port.
- 5) After draining the circulating fluid, close the ball valve of the drain port.

9.7.2 Drain of facility water (water-cooled type)

Warning

- Stop the customer device and release the residual pressure before draining the facility water
- 1) Shut the breaker of the customer's power supply.
 - 2) Stop supply the facility water and make sure there is no pressure in the facility water piping.
 - 3) Remove the facility water piping from the product.
 - 4) Open the front panel then, open the air vent valve. The facility water in the product will be drained from the facility water inlet port.



9 Maintenance (continue)

- 5) After draining, shut the air valve and close the front panel.

9.8 Consumable Parts

Part No.	Description	Qty	Remark
HRS-S0213	Dust-proof filter (Upper)	1	HRSH100/150/200-A: 2 pcs used per unit
HRS-S0214	Dust-proof filter (Lower)	1	HRSH150/200-A: 2 pcs used per unit
HRS-S0185	Dust-proof filter	1	HRSH250/300-A: 4 pcs used per unit

10 Troubleshooting

10.1 Troubleshooting

The troubleshooting method depends on which alarm has been generated. Refer to the "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	A.STP	The fluid level of the level indicator has fallen. Fill the circulating fluid.
AL02	High circulating fluid discharge temp.	A.STP	• Check that the ambient temperature, facility water specifications and heat load are within the specified ranges. • Check circulating flow rate to keep minimum operating flow rate by check monitor menu.
AL03	Circulating fluid discharge temp. rise	A.RUN	• Check the value of [R5.04] . • Wait until the circulating fluid temperature goes down
AL04	Circulating fluid discharge temp. drop	A.RUN	• Check that the filled circulating fluid temperature is within the specified range. • Check the value of [R5.06] .
AL05	High circulating fluid return temp.	A.STP	• Check that the circulating fluid flows. • Check that the heat load is within the specified range.

Code	Description	Operation	Cause/Remedy (Press the reset key after eliminating the cause.)
AL08	Circulating fluid discharge pressure rise	A.STP	Check that there is no bend, collapse and clog on/in the external piping. In case of displaying EEEE on the PV display of the main display and check monitor menu, the pressure sensor of the circulating fluid circuit has a malfunction. Ask for service.
AL09	Circulating fluid discharge pressure drop	A.STP	Restart and check if the pump runs. In case of displaying EEEE on the PV display of the main display and check monitor menu, the pressure sensor of the circulating fluid circuit has a malfunction. Ask for service.
AL10	High compressor suction temp.	P.RUN	• Check the returned circulating fluid temperature. • Check that the heat load is within the specified range.
AL11	Low compressor suction temp.	P.RUN	• Check that the circulating fluid flows.
AL12	Low super heat temperature	P.RUN	• Use 15% ethylene glycol aqueous solution with the set temperature lower than 10°C.
AL13	High compressor discharge pressure	P.RUN	Check that the ambient temperature, facility water specifications and heat load are within the specified ranges.
AL15	Refrigerant circuit pressure (high pressure side) drop	P.RUN	Refrigeration circuit failed. Ask for the service.
AL16	Refrigerant circuit pressure (low pressure side) rise	P.RUN	Check that the ambient temperature, facility water specifications and heat load are within the specified ranges.
AL17	Refrigerant circuit pressure (low pressure side) drop	P.RUN	Check that the circulating fluid flows higher than the minimum operating flow rate.
AL18	Compressor running failure	P.RUN	Restart and check if the compressor runs after leaving for 10 minutes.
AL19	Communication error	OFF	No request message is sent from the host computer. Resend message.
AL20	Memory error	A.STP	Controller failure. Ask for service.
AL21	DC line fuse cut	A.STP	Fuse for the power supply output of the contact input/output connector has blown. Ask for service. • Check that there is no incorrect wiring and the current load is within the specified range.
AL22	Circulating fluid discharge temp. sensor failure	A.STP	Temperature sensor failure. Ask for service.

10 Troubleshooting (continue)

Code	Description	Operation	Cause/Remedy (Press the reset key after eliminating the cause.)
AL23	Circulating fluid return temp. sensor failure	A.STP	Temperature sensor failure. Ask for service.
AL24	Compressor suction temp. sensor failure	P.RUN	
AL25	Circulating fluid discharge pressure sensor failure	A.STP	Malfunction of the pressure sensor for the circulating fluid circuit occurred. EEEE is displayed on the PI display of the main display and check monitor display. Ask for service for the pressure sensor.
AL26	Compressor discharge pressure sensor failure	P.RUN	Failure of the pressure sensor for the refrigeration circuit. Ask for service.
AL27	Compressor suction pressure sensor failure	P.RUN	
AL28	Pump maintenance	OFF	Notices of the periodical maintenances.
AL29 ^{*1}	Fan maintenance	OFF	Ask for services of the pump, fan and/or compressor. Each periodical time can reset by [5.E.15] , [5.E.16] and [5.E.17] .
AL30	Compressor maintenance	OFF	Every 20,00h Every 30,00h Every 30,00h
AL31	Contact input 1 signal detection	A.STP	Contact input is detected.
AL32	Contact input 2 signal detection	A.STP	
AL37	Compressor discharge temp. sensor failure	P.RUN	Failure of the temperature sensor. Ask for service.
AL38	Compressor discharge temp. rise	P.RUN	Check that the ambient temperature, facility water specifications and heat load are within the specified ranges.
AL39	Internal unit fan stoppage	A.RUN	Failure of the internal unit fan occurred. Ask for service.
AL40 ^{*1}	Dust-proof filter maintenance	OFF	Notice of the periodical maintenance. Clean the dust-proof filter. This periodical time can reset by [5.E.30] . And [R5.29] can off this alarm.
AL41	Power stoppage	A.STP	The power was shut off during running. Restart after checking the power supply.
AL42	Compressor waiting	A.RUN	The system is waiting for the compressor to be ready to run. Wait for a while. The alarm will be reset automatically after starting operation.

Code	Description	Operation	Cause/Remedy (Press the reset key after eliminating the cause.)
AL43 ^{*1}	Fan breaker trip	P.RUN	Check that there is no power failure such as ground fault, short circuit, voltage fluctuation, abnormal interphase voltage, open phase, surge.
AL44 ^{*1}	Fan inverter error	P.RUN	
AL45	Compressor breaker trip	P.RUN	
AL46	Compressor inverter error	P.RUN	
AL47	Pump breaker trip	A.STP	
AL48	Pump inverter error	A.STP	Release the fan breaker trip refer to the operation manual. Press the [▼] and [▲] keys of the operation display panel pressed down simultaneously for 10 seconds to reset. After resetting AL48, WAIT(H R T E) will be displayed and the product cannot run for 40 seconds. Restart 40 seconds later after resetting.
AL49 ^{*2}	Internal unit fan stoppage	A.RUN	Failure of the air exhaust fan. Ask for the service.

Note:

*1: This alarm does not occur on the product of water cooled type.

*2: This alarm does not occur on the product of air cooled type.

A.STP: Stop the pump, compressor and fan with alarm.
A.RUN: Continues running the pump, compressor and fan with alarm.
P.RUN: Stop the compressor and fan, and, continues running the pump with alarm.
OFF: Does not generate alarm.

10.2 Other Errors

The causes and remedies for failures that are not indicated by alarm numbers are shown in the following table:

Content of Failure	Cause	Remedy
The operation panel displays nothing	The breaker of the customer's power supply or/and the optional breaker is/are not turned on.	Turn on the breaker.
	Failure of the breaker of the customer's power supply or/and optional power supply.	Replace the breaker.
	No power supply (The breaker for the power supply is not turned on.)	Supply the power.
	Breaker trip of the customer's power supply or/and the optional breaker due to short-circuit and current leakage.	Repair the short-circuit or current leaking part.

10 Troubleshooting (continue)

Content of Failure	Cause	Remedy
The [RUN] LED does not light up even when the [RUN/STOP] switch is pressed.	Communication is set.	Set the communication in the local mode.
	Failure of the [RUN] LED	Replace the controller.
	Failure of the [RUN/STOP] switch	Replace the controller.

11 Limitations of Use

11.1 Limited warranty and disclaimer/compliance requirements

Refer to Handling Precautions for SMC Products.

12 Product Disposal

This product shall 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.

13 Contacts

Refer to www.smcworld.com or www.smc.eu for your local distributor/importer.

SMC Corporation

URL : [https:// www.smcworld.com](https://www.smcworld.com) (Global) [https:// www.smc.eu](https://www.smc.eu) (Europe)
 SMC Corporation, 4-14-1, Sotokanda, Chiyoda-ku, Tokyo 101-0021, Japan
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