

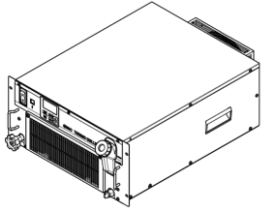


ORIGINAL INSTRUCTIONS



Refer to Declaration of  
Conformity for relevant  
Directives

Instruction Manual  
Thermo Chiller  
HRR010



This product uses 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 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 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.

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

Model	HRR010-A□- 10-□U□	HRR010-W□- 10-□U□	HRR010-A□- 20-□U□	HRR010-W□- 20-□U□
Cooling Method	Air-cooled		Water-cooled	
Refrigerant	R134a(HFC)		R410A(HFC)	
Quantity of refrigerant (kg)	0.24	0.17	0.22	0.15
Control Method	PID Control			
Ambient temperature, humidity and altitude <sup>**1)*5</sup>	Temperature: 5 to 40°C, Humidity: 30 to 70%, Altitude: less than 3000m			
Circulating fluid system	Circulating fluid <sup>**2</sup>			
	Tap water, Ethylene glycol aqueous solution 15%			
	Operating temperature range <sup>**1)</sup> (°C)			
	15 to 35			
	Cooling Capacity (50/60Hz) <sup>**3</sup> (W)			
	770 / 950	720 / 860	950 / 1100	1000 / 1100
	Heating Capacity (50/60Hz) <sup>**4</sup> (W)			
	340 / 430	360 / 480	250 / 300	200 / 200
	Temperature Stability <sup>**5</sup> (°C)			
	±0.1			
	Pump Capacity (50/60Hz) <sup>**6</sup> (MPa)			
	0.09(at 5 L/min) / 0.11 (at 5 L/min)			
	For option -T1: 0.35(at 5L/min) / 0.35(at 5L/min)			
	Rated Flow (50/60Hz) <sup>**7</sup> (L/min)			
	5 / 5			
	For option -T1: 5 / 5			
	Flow display range <sup>**1)</sup> (L/min)			
	2 to 16			
	Electric conductivity display range (μS/cm)			
	0.1 to 48 (For option -DM)			
	Electric conductivity setting range (μS/cm)			
	0.5 to 45(For option -DM)			
	Particle filter nominal filtration rating <sup>**8)</sup> (μm)			
	35			
	Bypass Valve <sup>**9)</sup>			
	Installed			
	Tank Capacity (L)			
	Approx. 3			
	Fluid Outlet and Return Port Size			
	Rc 1/2			
	Drain Port Size			
	Rc 1/4 With cap			
	Leakage Protection			
	Drain pan structure (With water leakage detector <sup>**10)</sup> )			
	Stainless steel, Copper brazing (Heat exchanger) <sup>**12)</sup> , Aluminium oxide ceramic, Carbon, PP, PE, PPE, POM, PET, PA, FKM, EPDM, NBR, PVC, PPS, fluoropolymer <sup>**13)</sup> , Ion exchange resin <sup>**13)</sup>			
	Fluid contact part material			

2 Specifications – Continued

Model	HRR010-A□- 10-□U□	HRR010-W□- 10-□U□	HRR010-A□- 20-□U□	HRR010-W□- 20-□U□
Facility Water Outlet system	Temperature range (°C)	5 to 35		5 to 35
	Pressure range (MPa)	0.3 to 0.5		0.3 to 0.5
	Required flow <sup>**14</sup> (L/min)	6		6
	Facility water pressure difference (MPa)	0.3 more		0.3 more
	Port size	Rc 3/8		Rc 3/8
Electrical system	Fluid contact material	Stainless steel, Copper brazing, Bronze, Synthetic rubber		Stainless steel, Copper brazing, Bronze, Synthetic rubber
	Power supply	1-phase AC100V (50/60Hz) 1-phase AC115V (60Hz) Allowable voltage fluctuations±10% <sup>**16</sup>	1-phase AC200 to 230V 50/60Hz Allowable volatage fluctuation 10% <sup>**16</sup>	
	Circuit protector (A)	15	10	
	Applicable earth leakage breaker <sup>**8</sup>	Rated current: 15A Sensitivity current: 30mA	Rated current: 10A Sensitivity current: 30mA	
	Cable Qty x size (Including ground) <sup>**16</sup>	3core x 14AWG (3 core x 2.0mm <sup>2</sup> )		
		6.2 / 7.7	5.4 / 6.6	2.5 / 3.0
	Rated operating current (50/60Hz) <sup>**18</sup> (A)	For option – T1		
		9.5 / 10.7	8.7 / 9.6	4.3 / 4.7
		0.50 / 0.67	0.43 / 0.57	0.48 / 0.60
		(0.56 / 0.70)	(0.49 / 0.60)	(0.51 / 0.61)
Rated operating consumption (50/60Hz) <sup>**18</sup> (kW (kVA))	For option – T1			
	0.72 / 0.84	0.65 / 0.74	0.73 / 0.80	0.72 / 0.78
Communication function		Contact input/output, Serial RS-485 / RS-232C		
Noise level (50/60Hz) <sup>**9</sup> (dB(A))		60 / 60	60 / 60	59 / 59
Dimensions <sup>**10</sup> (mm)		W483 x D550 x H221		
Accessory <sup>**19</sup>		Power supply connector, Operation manual, Particle filter element <sup>**20</sup>		
Weight <sup>**11</sup> (kg)		32	30	29

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—circulating type - make-up water).
- \*3: (1) Ambient temp: 25°C, (2) Facility water temp 25°C, (3) Circulating fluid temp: 20°C, (4) Circulating fluid rated flow, (5) Circulating fluid: Tap water, (6) Power

- supply: 100V type: AC100V, 200V type: AC200V, (7) Piping length: Shortest The cooling capacity will be reduced by 300W when option T1 [Inverter pump] is selected.
- \*4: (1) Ambient temp: 25°C, (2) Facility water temp: 25°C, (3) Circulating fluid temp: 20°C, (4) Circulating fluid rated flow, (5) Circulating fluid: Tap water, (6) Power supply: 100V type: AC100V, 200V type: AC200V, (7) Piping length: Shortest
- \*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 30mA/200V in power supply specification.
- \*9: Front 1m/Height 1m/Static with no load. See \*4 for other conditions.
- \*10: Dimension between panels. Projection is not included. When option Y [With feet, and no Rack Mounting bracket] is selected, refer to operation manual [6.4. Option Y [With feet and no Rack Mounting bracket] ].
- \*11: Weight when the circulating fluid and facility water (for water-cooled type) is not included. The weight will increase by 1kg when option DM [Electric conductivity control + Applicable to deionized water piping], is selected. The weight will increase by 2kg when option T1 [Inverter pump] is selected.
- \*12: Copper is not included when option M [Applicable to deionized water piping] is selected.
- \*13: When option DM [Electric conductivity control + Applicable to deionized water piping] is selected, these materials are included.
- \*14: Required flow rate when a load for the cooling capacity is applied at a condition of \*3.
- \*15: If the altitude is 1000 m or more, please refer to operation manual "P.3-3 When Thermo-chiller installation in high altitude of 1000 meters or more".
- \*16: No continuous voltage fluctuation.
- \*17: To be prepared by the customer.
- \*18: (1) Ambient temp: 25°C, (2) Facility water temp: 25°C, (3) Circulating fluid temp: 20°C, (4) Circulating fluid rated flow, (5) Circulating fluid: Tap water, (6)Power supply: 100V type: AC100V, 200V type: AC200V, (7)Piping length: Shortest, (8)Rated cooling load is applied.
- \*19: When Option DM [Electric conductivity control + Applicable to deionized water piping] is selected, DI filter will be added.  
Piping thread type : When F is selected, G thread adapter set will be added.  
Piping thread type : When N is selected, NPT thread adapter set will be added.  
Not included for options Z and Z1.
- \*20: Not included for option Z is selected.
- \*21: Not included for options Z, Z1 is selected.

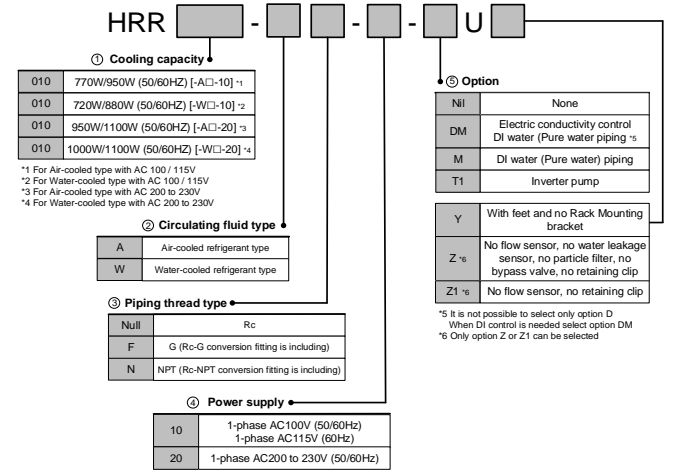
2 Specifications - Continued

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	2020	2021	2022	...	2025	2026	2027	...
Month	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 How to Order

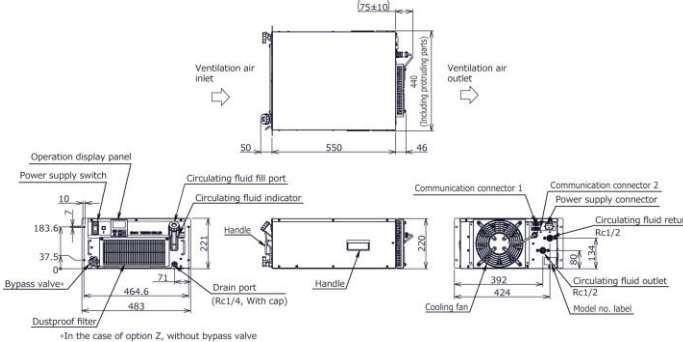


4 Names of Parts and Accessories

4.1 Outline Dimensions and Names of Parts

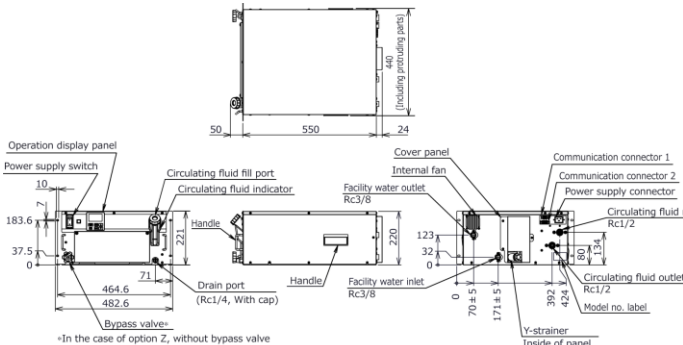
4.1.1 HRR010-A-10/20-□

For Option Y(With feet and no Rack Mounting bracket), refer to operation manual [6.4 Option Y(With feet and no Rack Mounting bracket).



4.1.2 HRR010-W-10/20-□

For Option Y(With feet and no Rack Mounting bracket), refer to operation manual [6.4 Option Y(With feet and no Rack Mounting bracket).



4 Names of Parts and Accessories – Continued

4.2 Accessory List

(1)	Operation manual	2 copies (English 1 copy/ Japanese 1 copy)	
(2)	Power supply connector	1 pc.	
(3)	Particle filter element <sup>**1</sup>	1 pc.	
(4)	For option DM DI filter	1 pc.	
(5)	For HRR010-AF/WF-10/20-□ G thread adapter set	1 set	
	For HRR010-AN/WN-10/20-□ NPT thread adapter set	1 set	

\*1 In the case of option Z, not included.

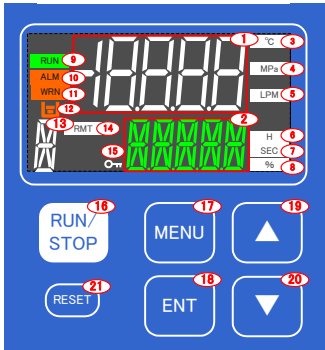
4.3 Function of parts

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

Name	Description
Operation display panel	Runs and stops the product and performs settings such as the circulating fluid temperature. For details, refer to operation manual "2.4 Operation display panel"
Fluid level gauge	Indicates the circulating fluid level of the tank. For details, refer to operation manual "3.5 Fill of circulating fluid"
Power supply switch	Shuts off the power supply to the internal equipment of product.
Model label	Shows the part number of the product. For details, refer to operation manual "1.4 Product Label".
Circulating fluid outlet port	The circulating fluid flows out from the outlet port.
Circulating fluid return port	The circulating fluid returns to the return port.
Drain port	Port to drain the circulating fluid out of the tank.
Power supply connector	Connect the power cable to the Power supply connector accessory, and then plug it in. For details, refer to operation manual "3.3.3 Preperation and wiring of power supply cable".
Communication connector CN1, CN2	Use for contact input / output, serial communication. For details, refer to operation manual "3.3.3 Preperation and wiring of power supply cable".
Facility water inlet (For water-cooled type)	A facility water inlet to which the facility water is fed through piping. The pressure of facility water should be in a range of 0.3 to 0.5MPa.
Facility water outlet (For water-cooled type)	A facility water outlet from which the facility water returns to the user's machine through piping.

4.3.1 Operation Display Panel

The operation panel on the front of the product controls the basic operation of the product.




Display panel functions.Reference pages are found in operation manual.


No	Name	Function	Reference page
(1)	Digital display (7 segments, 5 digits)	Displays the temperature, pressure and flow rate of the circulating fluid and the set values of other menus.	5.2
(2)	Digital display (11 segments, 5 digits)	Displays the discharge temperature of the circulating fluid and the set values of other menus.	
(3)	[°C] lamp	Lights up when temperature is displayed on the digital display.	
(4)	[MPa] lamp	Lights up when pressure is displayed on the digital display.	
(5)	[LPM] lamp	Lights up when flow rate is displayed on the digital display.	
(6)	[H] lamp	Lights up when time is displayed on the digital display.	
(7)	[SEC] lamp	Lights up when seconds are displayed on the digital display.	
(8)	[%] lamp	Lights up when pump output setting value is displayed on the digital display.	




4 Names of Parts and Accessories – Continued

No	Name	Function	Reference page
(9)	[RUN] lamp	Lights up when the product is started and in operation.	4
(10)	[ALM] lamp	Lights up when a fault occurs. (This product will stop.)	7
(11)	[WRN] lamp	Lights up when a warning occurs. (This product will continue operation.)	
(12)	[  ] lamp	Lights up when 「AL.01 Tank level drop failure」 or AL.02 Tank level drop」 alarm is generated.	-
(13)	Digital display (11 segment, 1 digits)	「X」 is displayed when notice for maintenance is generated.	5.4.4
(14)	[RMT] amp	Lights up during remote operation by communication function.	5
(15)	[KEYLOCK] amp	Lights up when key lock setting is active.	5.5.3
(16)	[RUN/STOP] key	Press and hold for 1 second to start or stop.	4.2
(17)	[MENU] key	Switching of each menu and cancellation of setting values.	5
(18)	[ENT] key	Switch to setting mode and set values.	
(19)	[▲] key	Move item upward or increase the set value.	-
(20)	[▼] key	Move item downward or decrease the set value.	-
(21)	[RESET] key	Reset the alarm.	7


5 Transport

 **Warning**

- Only persons who have sufficient knowledge and experience about the product and system are allowed to transport and set up the product.
- Especially pay attention to personal safety.

 **Caution**


Never lay the product on its side. The compressor oil will leak in to the refrigerant piping, which may cause early failure of the compressor.

 **Caution**


- Drain the residual fluid from the piping as much as possible to prevent any spillage.

6 Installation

6.1 Installation


 **Warning**

- Do not install the product unless the safety instructions have been read and understood
- Do not set up the product in places possibly exposed to leakage of flammable gas. Should any flammable gas stay around the product, the product may cause a fire.
- Do not use the product outdoors. If the product subjected to rain or water splash it may cause electrical shock, fire or failure.

 **Caution**


- Keep the product upright on a rigid and flat floor which can resist the weight of the product, and take measures to prevent the product from tipping over. Improper installation may cause water leakage, tipping, damage of the product or injure the operator.
- Keep the ambient temperature of the product between 5 to 40°C. Operation out of this ambient temperature range may cause a malfunction of the product. Operating the product in an environment temperature of 40°C may reduce the heat discharging efficiency of the heat exchanger and the safety device may function, which stops the product operation.
- The installer/end user is responsible for carrying out an acoustic noise risk assessment on the equipment after installation and taking appropriate measures as required.

6.2 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.


6 Installation - Continued

**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**

The product must not be operated, installed, stored or transported in the following conditions. Potential malfunction or damage to the product may occur if these instructions are disregarded.

- Location that is outside.
- Location that is exposed to steam, saltwater or oil.
- Location that is exposed to dust or powder material.
- Location that is exposed to corrosive gas, organic solvent, chemical solution, or flammable gas. (The product is not explosion-proof.)
- Location where the ambient temperature is out of the following range:  
In transportation and in storage 0 to 50°C (with no water or circulating fluid in piping). During operation 5 to 40°C
- Location where the ambient humidity is out of the following range or where condensation occurs: In transportation and storage 15 to 85%, In operation 30 to 70%
- Location that is exposed to direct sunlight or heat radiation.
- Location that is near heat sources and poor in ventilation.
- Location that is subjected to abrupt changes in temperature.
- Location that is subjected to strong electromagnetic noise (intense electric field, intense magnetic field, or surges).
- Location that is subjected to static electricity, or conditions where static electricity can discharge to the product.
- Location that is subjected to strong high frequencies radiation (microwaves).
- Location that is subjected to potential lightning strike.
- Location at altitude of 3000m or higher (except during product storage and transport). For details, refer to operation manual “3.2.1 Environment”.

- Location where the product is affected by strong vibrations or impacts.
- Condition that applies external force or weight causing the product to be damaged. Do not stack on top of each other.
- Location without adequate space for maintenance as required.
- For the product installation or operation in accordance with UL standards, refer to operation manual “3.2.1 Environment”.

6.4 Location

 **Caution**

The air cooled product radiates heat from the air vent of the cooling fan. If the product is operated with insufficeient air ventilation, the internal temperature can exceed 40°C, which can cause and affect the performance and life of the product. To prevent this, ensure that suitable ventilation is available.


Required ventilation for air cooled type

Model	Heat radiation (kW)	Required ventilation amount (m³/min)	
		Differential temp. of 3 °C between inside and outside of installation area	Differential temp. of 6 °C between inside and outside of installation area
HRR010-A-10/20-□	Approx.2	40	20


Required facility water system for water cooled type

Model	Heat Radiated (kW)	Facility water temp. Range (°C)	Required facility water flow rate (l/min)		
			Facility water temperature		
HRR010-W-10/20-□	Approx.2	5 to 35 (Rating 25)	25 °C	32 °C	35 °C
			6	10	13

6.5 Installation and Maintenance Space

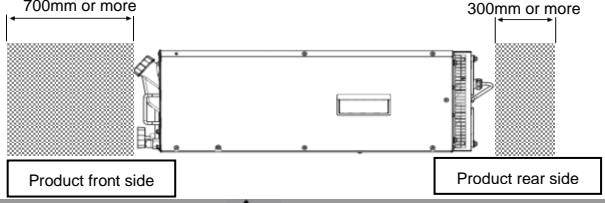
 **Caution**


Have enough space for the ventilation for the product. Otherwise it may cause a lack of cooling capacity or/ and stoppage of the product. Ensure there is enough space for maintenance.

 **Caution**


The temperature of the outlet of for the ventilation of the thermo-chiller and the panel surface may become approx. 50° C or higher. When placing the thermo-chiller, ensure the thermo-chiller does not affect surrounding environment.

6 Installation - Continued



 **Caution**

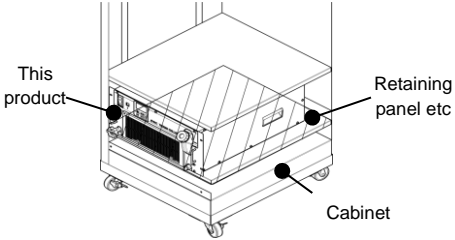
Have enough space for the ventilation for the product. Otherwise it may cause a lack od cooling capacity and/or stoppage of the product. Ensure there is enough space for maintenance.

 **Caution**


The temperature of the outlet for the ventilation of the thermo-chiller and the panel surface may become approx.. 50°C or higher. When placing the thermo-chiller, ensure the thermo-chiller does not affect the surrounding environment.

6.6 Mounting


- When mounting the product to a cabinet, use a design which shall hold the weight at the bottom. Ensure safety with transportation test if the product is to be installed on a transportation device such as a trailer. Mount the product using the fixing holes in the front of the product. Use M5, M6 screws (bolts) or equivalent to fix the product. Do not drag this product after mounting, as the feet may be damaged (option -Y).
- In the case of air cooling type, this product sucks air from the front and discharges it to the back. Please do not block the suction and the discharge air. Please do not install in a sealed place. (For details, refer to operation manual “3.2.3 Installation and maintenance space”.)



6.7 Electrical Wiring

 **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.
- Do not modify the internal electrical wiring of the product. Incorrect wiring may cause electrical shock or fire. Also, modifying the internal wiring will void the product's warranty.
- Do not connect the ground to water line, gas pipe or lightening conductor.

 **Caution**

- The installation of electrical equipment and wiring work should be preformed by personnel with sufficient knowledge and experience..
- Be sure to shut off the user's power supply. Wiring with the product energized is strictly prohibited.
- The wiring must be conducted using cables complying with Table 1 firmly and secured to the product to prevent the external force of cables being applied to the terminals. Incomplete wiring or improper securing of wiring may cause electrical shock, excessive heat and fire.
- Ensure a stable power supply with no voltage surges.
- Ensure that an Earth Leakage Breaker is used in the power supply of the product. See Table 1.
- Use a power supply suitable for the specifications of the product.
- Use a power supply of over voltage category 3 (IEC60664-1)\*
- Be sure to connect the ground connection.
- Ensure that a lock out facility is available on the power supply.
- Each product must have its own separate Earth Leakage Breaker. Otherwise there can be a risk of electric shock or fire.
- Ensure that no harmonics are superimposed at the power supply. (Do not use inverters, etc.)
- Supply a steady supply voltage which is not affected by surges or distortion, as it may cause malfunction.

\*: For the product operation in the UL compliant conditions, please refer to "Installation/Operation in accordance with the UL standard"

6 Installation – Continued

**Power supply specifications, cable and Earth Leakage Breaker**  
Prepare the power supply shown in Table 1. For the connection between the product and power supply, use the power supply cable and earth leakage breaker shown below. An earth leakage breaker must be mounted to a position where the breaker is easily accessible and close to the thermo-chiller.

Model	Power supply voltage	Cable qty. x size	Recommended earth leakage breaker		
			Rated voltage [V]	Rated current [A]	Sensitivity of leak current [mA]
HRR010-A/W-10-*	1-phase 100V AC (50/60Hz) 115V AC (50/60Hz)	3 cores x 14AWG (3 cores x 2.0mm²) (including ground)	100, 115	15	30
HRR010-A/W-20-*	1-phase 200-230V AC (50/60Hz)		200, 230	10	


Installation/operation in accordance with the UL standard

For the product operation in the UL compliant conditions, the conditions shown below must be satisfied:

- Use power supply of overvoltage category 2 (transient overvoltage 2500 V or less) \*1


\*1 When using a power supply in the overvoltage category 3, take measures such as mounting an isolation transformer between the product and the power supply or keep the transient overvoltage of the power supply to 2500 V or less by using a varistor, etc.

6.8 Preparation and wiring of power supply cable

 **Warning**

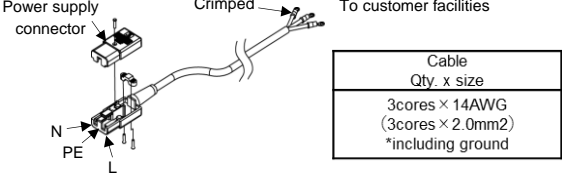
- The electrical facilities should be installed and wired in accordance with local laws and regulations of each country and by a person who has knowledge and experience.
- Check the power supply. Operation with voltages, capacities and frequencies other than the specified values can cause fire and electrical shock.
- Wire with an applicable cable size and terminal. Forcibly mounting with an unsuitably size cable may result in heat geration of fire.
- Be sure to lock out and tag out the breaker of the facility power supply (customer power supply facility) before wiring.
- Be sure to connect the power supply cable from the product side first,

and then connect the breaker of the facility power supply (the user's machine power supply).

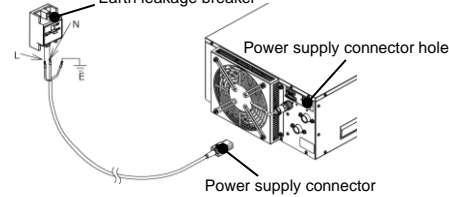
 **Caution**

- Please wear protective gloves.
- Use a separate outlet or earth leakage breaker.
- Be sure to preform grounding (earth).
- Failure to do so may cause malfunction or electrical shock.

6.9 Preparation for operation

- Prepare the cable and individual socket or earth leakage breaker shown in the Table 1.
  - Strip the sheath from both ends of the cable.
  - Disassemble the power supply connector (supplied as an accessory) and mount one end of the cable to the L,N and PE terminals and reassemble the power supply connector.
  - Connect the other end of the cable to the crimped terminals that are connectable to the power supply facility.
- 

Cable Qty. x size
3cores × 14AWG (3cores × 2.0mm2) *including ground
- Insert the power supply connector to the power supply connector socket.
  - Connect the crimped terminals to the secondary side of the earth leakage breaker and grounding on the power supply facility.





6 Installation – Continued

6.10 Piping

Caution

- Connect piping firmly, incorrect piping might cause leakage of supplied or drained fluid and wet surrounding area and facility.
- Use caution not to allow dust and foreign matter to enter the water circuit, etc. during connection of piping.
- Securely connect the piping at the piping port with specific wrench when tightening.
- Incorrect piping can burst in service.
- Use non-corrosive material for fluid contact parts of circulating fluid and/or facility water. Using materials that tend to rust or corrode may cause clogging and/or leakages of the circulating fluid and facility water fluid circuits. In case of using these kinds of materials, consider and carry out some prevention against the rusting or corrosion by the customer side.
- Do not generate a rapid change of pressure by water hammer, etc. Internal parts of the product and/or the piping may be damaged.
- It is recommended to use heat insulation to reduce the heat radiation and absorption to/from the customer's piping.

Caution

Check the model number if this product in the operation manual “1.4 Product Label” before connecting piping.  
Model number: HRR010-AN/WN-10/20  
The transition connector from Rc to NPT is enclosed as an accessory.  
For NPT piping, be sure to use this connector.  
Model number: HRR010-AF/WF-10/20  
The transition connector from Rc to G is enclosed as an accessory.  
For G piping, be sure to use this connector.

6.10.1 Piping port size

Name	Port size	Recommended tightening torque	Recommended proof pressure for piping
Circulating fluid outlet port	Rc1/2 <sup>*1</sup>	28 to 30N·m	0.4MPa more <sup>*2</sup>
Circulating fluid return port	Rc1/2 <sup>*1</sup>	28 to 30N·m	0.4MPa more <sup>*2</sup>
Facility water inlet port <sup>*3</sup>	Rc3/8	22 to 24N·m	1.0MPa or more. (Supply pressure: 0.3 to 0.5MPa)
Facility water outlet port <sup>*3</sup>	Rc3/8	22 to 24N·m	

<sup>\*1</sup> For NPT and G thread, use a conversion connector available as an accessory separately.

<sup>\*2</sup> For automatic option T1 [Inverter pump], 1.0MPa or more.

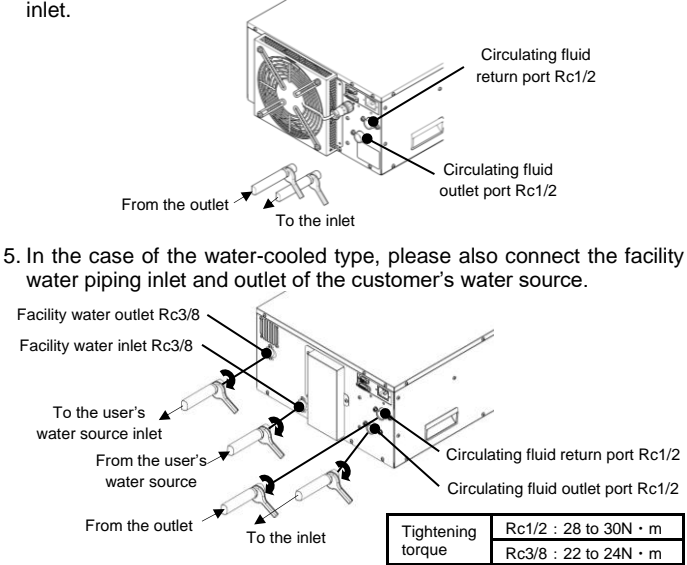
<sup>\*3</sup> For water-cooled type.

6.10.2 How to connect piping

Caution

Make piping so that the circulating fluid always flows. The product will break down if it is operated with no circulating fluid flowing.

1. Ensure that the power source and the power supply of the product is turned off (or the power plug is disconnected).
2. This product generates an alarm and stops running when the circulating fluid flow rate becomes 2L/min or less. Please make piping that flows more than 2L/min.  
(No alarm is generated for options Z and Z1)  
\*When using option T1 (inverter pump), if the circulating fluid discharge pressure becomes 0.35MPa or more, an alarm occurs.
3. Connect the circulating fluid return port with the user's machine outlet.
4. Connect the circulating fluid discharge port with the user's machine inlet.



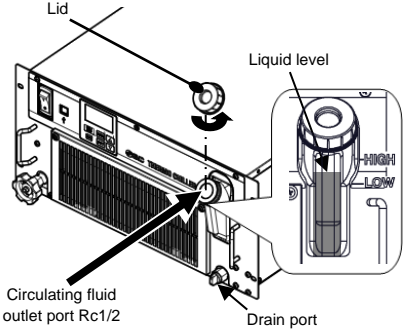
6 Installation – Continued

6.11 Fill of circulating fluid

1. Ensure that the power source and the power supply of the product is turned off.
2. Check the drain port is plugged to prevent the supplied circulating fluid from draining out.
3. Open the circulating fluid inlet cap by turning it counterclockwise and fill the circulating fluid within the range from LOW to HIGH shown on the level gauge. Use tap water which satisfies the water quality standard shown in Table 8-1 of operation manual, or a 15% aqueous solution of ethylene glycol.
4. After filling to the specific level, turn the lid clockwise to close.

When a 15% aqueous solution of ethylene glycol is used, prepare the ethylene glycol aqueous solution separately.

To control the concentration of the ethylene glycol aqueous solution, a concentration meter is available separately from SMC.



Item	No	Remarks
Ethylene glycol aqueous solution 60%	HRZ-BR001	Please dilute to 15% with tap water for use.
Densitometer	HRZ-BR002	-

7 Start, Stop and Temperature Settings

Caution

Only people who have sufficient knowledge and experience about the product and its accessories are allowed to start and stop the product.

7.1 Before Starting - Check the following items:

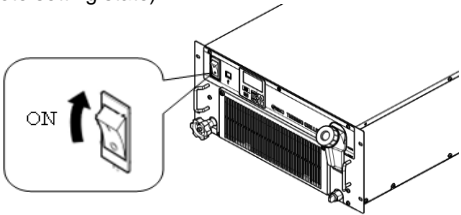
- *Installation conditions*
  - Check the product is installed horizontally.
  - Check that there are no heavy objects on the product, and the external piping is not applying excessive force to the product.
- *Connection of cables*
  - Check the power, ground and communications (optional) cables are correctly connected.
- *Circulating fluid piping*
  - Check proper connection of piping at inlet and outlet.
- *Fluid level indicator (for tank)*
  - Confirm that the fluid level is between 'HIGH' and 'LOW' levels of the fluid gauge.
- *Bypass value (for other than option Z)*
  - Check that the bypass valve can open. When delivered, the bypass valve of this product is in the "open" state.
- *Facility water piping (for water cooled type)*
  - Check that the piping is correctly connected to the facility water inlet and outlet ports.
  - Confirm that the facility water source is in operation.
  - Confirm that the facility water circuit is not closed with a valve, etc.

Caution

Facility water quality must satisfy the quality standard shown in the operation manual “8.1 Quality Control of Circulating Fluid and Facility Water” and the conditions shown in “9.1 Specifications”.

7.2 Starting the product

1. Supply power to the product.  
Turn on the power switch. The operation display panel lights up. At this point, the product is in the “Stopped” state (Please note that operation is started after the power is turned on when the operation signal is sent in the remote setting state).



7 Start, Stop and Temperature Settings - Continued

2. Set the circulating fluid temperature. When you press the “ENT” key, the set temperature (lower part of the numerical value display: green) flashes. Press the [▲] [▼] key to set the target temperature, then press the "ENT" key to set.  
(Flashing ends when set.) Please refer to various setting / display in operation manual.
3. Press and hold [RUN / STOP] key for 1 second. The [RUN] lamp lights up and operation starts.  
\* When you operate for the first time after piping, the circulating fluid in the tank decreases until the circulating fluid is filled in the piping. (An alarm occurs when the liquid level falls below "LOW".) When the circulating fluid in the tank decreases, repeat "Circulating liquid supply" procedure so that the liquid level is within the range from LOW to HIGH.  
\* 30 seconds after start of operation, if the circulating fluid flow rate is less than 2 L / min, an alarm occurs and the product stops. Ensure that the circulating fluid flow rate will be 2 L / min or more.  
\* For option Z, Z1, an alarm is not generated when flow rate decreases. Make piping so that the circulating fluid always flows. The product will break down if it is operated with no circulating fluid flowing.  
\* When using option T1 (inverter pump), if the circulating fluid discharge pressure becomes 0.35 MPa or more, an alarm occurs.  
The factory default pump output setting is 90%.



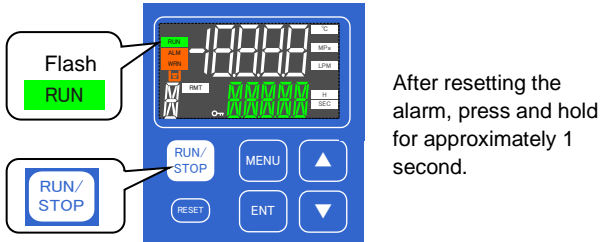
7.2.1 Restart When an Alarm is Generated

This product has two types of operation depending on the alarm being generated. The restart is different depending on the operation mode.  
[1] When the following alarm occurs, this product stops.

- AL01 : Low level in tank
- AL17 : Flow rate failure (Not generated for options Z and Z1.)
- AL18 : High circulating fluid discharge temp
- AL19 : High circulating fluid return temp.
- AL21 : High circulating fluid discharge pressure
- AL22 : Low circulating fluid discharge pressure
- AL24 : Memory abnormal
- AL27 : Stop has been forced
- AL30 : Refrigerant circuit abnormal
- AL31 : Sensor abnormal
- AL32 : Controller abnormal

- After resetting the alarm, when resuming operations press and hold the [RUN / STOP] key for approximately 1 second. (Refer to “Chapter 7 Alarm Notification and Troubleshooting of the operation manual”)  
[2] When alarms except those shown above are generated the compressor stops, and the circulating fluid pump continues running for a fixed time (The time to run the pump can be set within the range of "0 to 9999 seconds". The factory setting is "0 seconds"). At this time, the "RUN" lamp flashes.

In case of resetting the alarm (Refer to 7.3 "What to do when an alarm occurs" in the operation manual) while the pump is operating, pressing the "RUN / STOP" key once (1 second) causes the compressor to operate and the operation of the product will resume. (This operation only occurs when this function is set. For details, refer to 5.3.6 Alarm Setting menu in the operation manual)



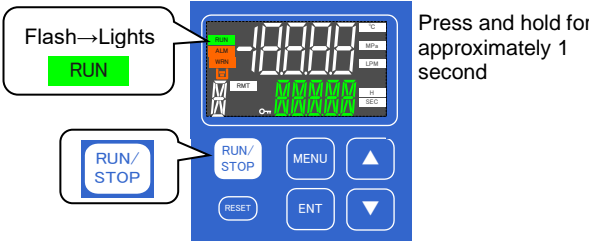
7 Start, Stop and Temperature Settings - Continued

To stop the product when only the pump is running, press and hold the [RUN / STOP] key for approximately 5 seconds. (When this operation is performed, an alarm "AL27: forced a stop " occurs.)



7.2.2 Stopping the product

Press and hold the [RUN / STOP] key for 1 second. [RUN] lamp goes out and operation stops.  
\*It takes about 10 seconds of operation to prepare to stop before it stops. During the stopping preparation the [RUN] lamp flashes.



Caution

Except in case of an emergency, do not turn OFF the breaker before the thermo-chiller stops operation completely.

8 Maintenance

8.1 General Maintenance

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.

8.2 Inspection and Cleaning

Warning

- Do not operate with wet hands and do not touch the electrical parts such as the connector. It might cause electric shock.
- Do not touch the fins directly when cleaning the dustproof filter. It might cause injury.
- Shut off the power supply of the product when performing cleaning, maintenance or inspection. It might cause electric shock, injury or burn, etc.
- When the panel has been removed for the purpose of inspection or exchange or cleaning, mount the panel after the work is completed. If the product is operated with panel removed or open, it may cause injury or electric shock.

8.2.1 Control of Circulating Fluid Quality

Warning

Use specified fluids only. If other fluids are used, they may damage the product, causing fluid leakage, or result in hazards such as electric shock or leakage of electricity.  
When using clear water (tap water), ensure that it satisfies the water quality criteria shown in the operation manual.

Caution

Replace the circulating fluid and/or the facility water if any problems are found in the regular check. Even if no problems are found, some of the water in the tank evaporates and impurity concentration in the circulating fluid increases. Replace the circulating fluid on the tank once in every 3 months. (Please refer to operation manual table 8-1 for quality criteria of clean water).



8 Maintenance – Continued

8.2.2 Daily check

Check the items listed in the table on the next page. If any abnormality is found, stop the operation of the product and turn the power supply OFF, and ask for service.

Daily Check Items

Item	Contents of check	
Installation condition	Check the installation conditions of the product.	• Check that there is no heavy object on the product or excessive force applied to the piping. • Temperature should be within the specification range of the product. • Make sure the ventilation grille is not obstructed. (For air-cooled type)
Fluid leakage	Check the installation conditions of the product.	Check that there is no fluid leakage from the connected parts of the piping.
Amount of circulating fluid	Check the liquid level indicator.	Fluid level should be between "HIGH" and "LOW" levels of the fluid level meter.
Operation panel	Check the indications on the display.	The numbers shown on the display should be clear and legible.
	Check the functionality.	Check that the keys, [RUN/STOP], [MENU], [ENT], [▼], and [▲], operate correctly.
Circulating fluid temperature	Check on the operation panel.	There should be no problem for operation.
Circulating fluid discharge pressure	Check on the operation panel.	There should be no problem for operation.
Circulating fluid flow rate	Check the operating condition of the product (except option Z, Z1)	There should be no problem for operation. If the flow rate is decreasing, check the particle filter for contamination, and if it is dirty, replace the element.
Operating condition	Check the operation condition.	• There should be no abnormality with noise, vibration, smell, or generation of smoke. • There should be no active alarm signal.
Facility water (for water-cooled type)	Check the facility water condition.	Temperature, flow rate and pressure are within the specified range. If the flow rate is decreasing, check the Y type strainer for clogging and clean the strainer.
Ventilating condition (for Air-cooled type)	Check the condition of the ventilation grille.	• Make sure the ventilation grille is not obstructed.

8.2.3 Monthly check

Item	Contents of check	
Ventilating condition (air cooled type)	Clean the ventilation grilles.	Make sure the ventilation grilles are not clogged with dust, etc.
Facility water (water cooled type)	Check the facility water.	Make sure the facility water is clean and contains no foreign matter.

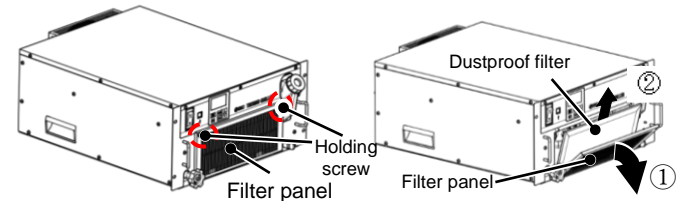
8.3 Cleaning of air vent

Caution

If the dustproof filter at the ventilation inlet is clogged with dust or debris, heat radiation performance declines. This will result in a reduction of cooling performance and may stop the operation because the safety device is triggered.

8.3.1 Removal of the dustproof filter

- 1.The dustproof filter is installed in the inside of the filter panel at the front of the product.
- 2.Loosen the filter panel holding screws by using a cross slot screwdriver.
- 3.There is a dustproof filter inside the filter panel. Remove the dustproof filter



8.3.2 Cleaning of filter.

Use a long-bristled brush or air gun to clean the filter.

8.3.3 Mounting of dust-proof filter.

Reassemble the filters in the reverse order to the removing procedure. (Recommended tightening torque of panel holing screws: 1.5N · m)

8 Maintenance - Continued

8.4 Inspection every 3 months

Item	Contents of check	
Power supply	Check the power supply voltage.	- Make sure the supply voltage is within the specification range.
Circulating fluid	Replace the circulating water periodically. Clean the tank.	- Ensure that the water has not been contaminated and that there is no algae growth. - Circulating water inside the tank must be clean and there must not be foreign matter inside. - Use clean water or pure water. The water quality must be within the range shown in Table 8-1 of operation manual. * It is recommended to replace the circulating fluid every 3 months when periodic maintenance is performed.
	Density control (When using 15% concentration ethylene glycol aqueous solution)	- Density must be within the range of 15 % +5/-0.
Facility water (For water-cooled type)	Check the water quality.	- Ensure that the water is clean and contains no foreign matter. Also check that the water has not been contaminated and there is no algae growth. - The water quality must be within the range shown in Table 8-1 of operation manual.

8.4.1 Replacement of circulating fluid

- Replace the circulating fluid with new clean fluid periodically, or it may get algae or decompose.
- Circulating fluid to be supplied in the tank should satisfy the water quality specified in the operation manual ("Table 8-1: Quality criteria for clean water (tap water)")
- Make sure that the concentration of ethylene glycol aqueous solution is 15%+5/0 when 15% ethylene glycol solution is used.
- If the particle filter element is dirty, replace the element. (See 8.4.1 Replacing Particle Filter.)

8.4.2 Cleaning of the facility water system (Water cooled type)

- Clean the customer's facility water system and replace facility water.
- Facility water quality must satisfy the criteria specified in operation manual ("Table 8-1 Quality criteria for clean water (tap water)").
- Check the strainer and clean it if it is dirty. Refer to operation manual "Cleaning of Y - strainer".

Caution

If there is foreign matter accumulated or clogging in the facility water system, pressure loss increases with less flow rate, and it may damage the screen mesh.

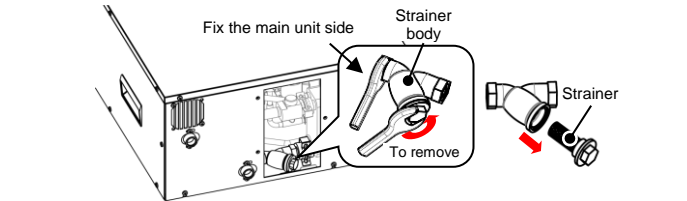
8.4.3 Cleaning of Y- strainer

When cleaning Y-strainer, facility water must be discharged. Refer to operation manual "8.3.2 Discharge of the facility water "for further instructions.

Warning

Before discharging the facility water, stop operation of the user's equipment and release the residual pressure. Wear protective equipment like gloves to avoid getting injured like cutting hand by sharp edge of panel.

1. Discharge the facility water. Refer to operation manual "8.3.2 Discharge of the facility Water".
2. The strainer is installed on the back of the product. Remove the strainer using a tool such as a spanner. When removing the strainer, product should be fixed to not move.



3. Clean the strainer.
4. After cleaning, please install the strainer by the reverse procedure.
5. Install the cover panel.

9 Troubleshooting

Refer to section '7.3 Troubleshooting' in operation manual for alarm code list and troubleshooting procedures.

Alarm No.	Description	Initial value	Display Unit		Cause/Remedy (Press the reset key after eliminating the cause.)
			Upper stage (White)	Lower Stage (Green)	
AL01	Low level in tank	FLT	AL01	LOW⇒LEVEL⇒FLT	Fluid level has fallen, add circulating fluid.
AL02	Low level in tank	WRN	AL02	LOW⇒LEVEL⇒WRN	
AL04	Water leakage <sup>6</sup>	WRN <sup>1</sup>	AL04	WATER⇒LEAK	Circulating fluid leakage inside unit is suspected.

9 Troubleshooting - Continued

Alarm No.	Description	Initial value	Display Unit		Cause/Remedy (Press the reset key after eliminating the cause.)
			Upper stage (White)	Lower Stage (Green)	
AL05	Pump inverter error <sup>8</sup>	WRN	AL05	PUMP⇒INV	Check the installation environment. Clean the dust filter of the ventilation.
AL06	Internal fan stop <sup>9</sup>	WRN	AL06	FAN⇒ERROR	Check for fan rotation.
AL09	Circulating fluid discharge pressure rise	FLT <sup>2</sup>	AL09	HIGH⇒PRESS	Piping resistance increased. Check valve opening, blockage of piping, clogging of filter.
AL10	Flow rate reduction <sup>7</sup>	WRN <sup>1</sup>	AL10	LOW⇒FLOW⇒WRN	
AL11	Outside ambient temperature range <sup>3</sup>	OFF <sup>1</sup>	AL11	AMB⇒TEMP⇒OUT	Check the installation environment. Clean the dust filter.
AL12	Electric conductivity rise <sup>4</sup>	WRN <sup>5</sup>	AL12	DI⇒ERROR	Replace the DI filter.
AL13	NOT TEMP READY	OFF <sup>1</sup>	AL13	TEMP⇒READY⇒ERROR	Overloaded, cooling failure, insufficient circulating fluid flow rare, large fluctuation of the heat load, etc. Increase the flow rate through the chiller. (Adjust the bypass valve)
AL14	Circulating fluid temperature range rise	OFF <sup>1</sup>	AL14	TEMP⇒OUT.HI	
AL15	Circulating temperature range drop	OFF <sup>1</sup>	AL15	TEMP⇒OUT.LO	
AL17	Low flow rate <sup>7</sup>	FLT <sup>1</sup>	AL17	LOW⇒FLOW⇒FLT	Display flow rate: 2 LPM or less, piping is thin, external valve closed, pinching or blockage of piping or clogging of filter.
AL18	High circulating fluid discharge temp.	FLT	AL18	TEMP⇒FLT	Discharge temperature 45°C or higher. Overload, cooling failure, insufficient flow rate, etc. Increase the chiller flow rate. (Adjust the bypass valve)
AL19	High circulating fluid return temp.	FLT	AL19	RET⇒TEMP⇒FLT	Return temperature: 45°C or higher. Insufficient flow rate, overload etc. Increase the chiller flow rate. (Adjust the bypass valve)

Alarm No.	Description	Initial value	Display Unit		Cause/Remedy (Press the reset key after eliminating the cause.)
			Upper stage (White)	Lower Stage (Green)	
AL21	High circulating fluid discharge pressure	FLT	AL21	HIGH⇒PRESS⇒FLT	Display pressure: 0.5 MPa or more. Connect piping so that the pressure is 0.5 MPa or less. Adjust the bypass valve.
AL22	Low circulating fluid discharge pressure	FLT	AL22	LOW⇒PRESS⇒FLT	Displayed pressure:0.03MPa or less. Check that the pump has not stopped.
AL24	Memory error	FLT	AL24	MEM⇒ERROR	Turn off the power supply switch and restart. If the error occurs again, ask for service.
AL25	Contact input 1 signal detection	FLT <sup>1</sup>	AL25	INP1⇒ERROR	Contact input has been detected.
AL26	Contact input 2 signal detection	FLT <sup>1</sup>	AL26	INP2⇒ERROR	
AL27	Forced stop	FLT	AL27	FORCE⇒STOP	Isolated operation of the pump is stopped(press "RUN/STOP" key for 5 seconds)
AL28	Notice for maintenance	OFF <sup>1</sup>	AL28	MANT⇒ALARM	Notice for maintenance, perform maintenance for part for which alarm is generated.
AL29	Communication error	WRN <sup>1</sup>	AL29	COMM⇒ERROR	No request message from the host computer. Try to send request message again.
AL30	Compressor circuit error	FLT	AL30	REF⇒ERROR⇒0000	Error occurred in the refrigerated circuit. Ask for service.
AL31	Sensor error	FLT	AL31	SENS⇒ERROR⇒0000	An error occurred in a sensor. Ask for service.
AL32	Controller error	FLT	AL32	CTRL⇒ERROR⇒0000	An error occurred in the controller. Ask for service.

<sup>1</sup> Selectable from OFF / WRN / FLT.  
<sup>2</sup> Selectable from WRN / FLT  
<sup>3</sup> Only air-cooled type can be set.  
<sup>4</sup> Option DM [With electric conductivity control function , DI water (pure water) piping] only. When entering the range, the alarm is released automatically.  
<sup>5</sup> Selectable from OFF / WRN.  
<sup>6</sup> Not generated for option Z.  
<sup>7</sup> Not generated for options Z and Z1.  
<sup>8</sup> For option T1.  
<sup>9</sup> Option T1 only for water-cooled type.

10 Limitations of Use

10.1 Limited warranty and Disclaimer/Compliance Requirements

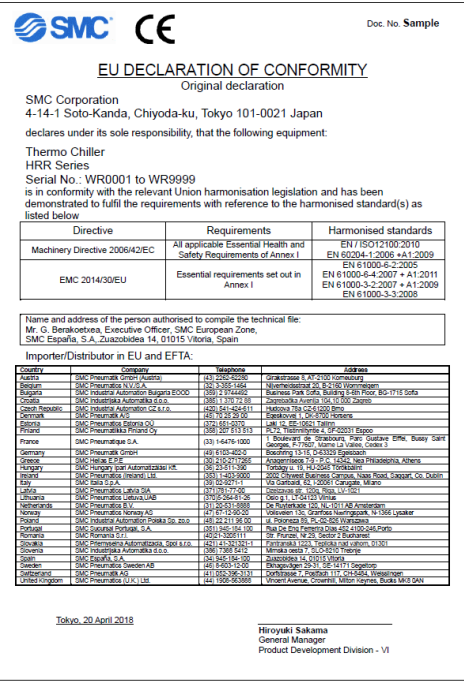
Refer to Handling Precautions for SMC Products.

11 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.

12 Declaration of conformity

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



13 Contacts

Country	Company	Address
Austria	SMC Austria GmbH	Girakstrasse 8, AT-2100 Korneuburg
Belgium	SMC Belgium N.V./S.A.	Ternesselei 232, B-2160 Wommelgem
Bulgaria	SMC Industrial Automation Bulgaria EOOD	Business Park Sofia, Building 8-6th Floor, BG-1715 Sofia
Croatia	SMC Industrijska Automatika d.o.o.	Zagrebačka Avenija 104, 10 000 Zagreb
Czech Republic	SMC Industrial Automation CZ s.r.o.	Hudcova 78a CZ-61200 Brno
Denmark	SMC Pneumatik A/S	Egeskovvej 1, DK-8700 Horsens
Estonia	SMC Automation OU	Värvi 5, 10621 Tallinn
Finland	SMC Automation Oy	PL72, Tiistinnityntie 4, SF-02031 Espoo
France	SMC France	1 Boulevard de Strasbourg, Parc Gustave Eiffel, Bussy Saint Georges, F-77607, Marne La Vallée, Cedex 3
Germany	SMC Deutschland GmbH	Boschring 13-15, D-63329 Egelsbach
Greece	SMC Italia Hellas Branch	Anagenniseos 7-9 - P.C. 14342, Nea Philadelphia, Athens
Hungary	SMC Hungary Ipari Automatizálási Kft.	Torbágy u. 19, HU-2045 Törökbálint
Ireland	SMC Industrial Automation (Ireland) Limited	2002 Citywest Business Campus, Naas Road, Saggart, Co. Dublin
Italy	SMC Italia S.p.A.	Via delle Donne Lavoratrici, 20861, Brugherio, Monza and Brianza (MB)
Latvia	SMC Pneumatics Latvia SIA	Dzelzavas str. 117, Riga LV-1021
Lithuania	SMC Automiaton UAB	Žalgirio g. 96, LT-09300 Vilnius, Lietuva
Netherlands	SMC Nederland BV	De Ruyterkade 120, NL-1011 AB Amsterdam
Norway	SMC Pneumatics Norway AS	Vollsvæien 13c, Granfoss Næringspark, N-1366Lysaker
Poland	SMC Industrial Automation Polska Sp. z o.o.	ul. Stefana Batorego 10A, Pass, 05-870 Blonie, z o.o.
Portugal	SMC Sucursal Portugal, S.A.	Rua De EngFerreira Dias 452 4100-246, Porto
Romania	SMC Romania S.r.l.	Str. Frunzei, Nr.29, Sector 2 Bucharest
Slovakia	SMC Priemyselna Automatizacia, Spol.s.r.o.	Fantranská 1223, Teplickanadvahom, 01301
Slovenia	SMC Industrijska Avtomatika d.o.o.	Mirnskecesta 7, SLO-8210 Trebnje
Spain	SMC España, S.A.	Zuazobidea 14, 01015 Vitoria
Sweden	SMC Pneumatics Sweden AB	Ekhagsvägen 29-31, SE-14171 Segeltorp
Switzerland	SMC Schweiz AG	Dorfstrasse 7, Postfach 117, CH-8484, Weisslingen
United Kingdom	SMC Pneumatics (U.K.) Ltd.	Vincent Avenue, Crownhill, Milton Keynes, Bucks MK8 0AN

SMC Corporation

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