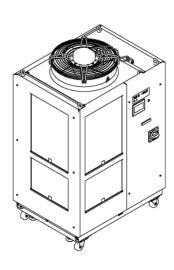
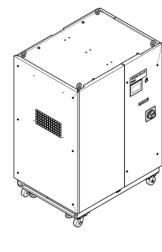


ORIGINAL INSTRUCTIONS

Instruction Manual Thermo-chiller HRL ***-A *-40 Series HRL***-W*-40 Series





The intended use of this product used a built-in pump to circulate a liquid such as water, adjusted to a constant temperature by 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) *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.

A	Caution	Caution indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.
A	Warning	Warning indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.
A	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

HRL100/200/300 - A * - 40

Ë				HRL100)-A+-40	HRL20	D-A+-40	HRL300	D-A+-40
	,	Model		CH1	CH2	CH1	CH2	CH1	CH2
	Coolii	ng method				Air-cooled	refrigerated		
	Ref	rigerant		R410A (HFC) ; 2088 (GWP)					
	Quantity of r	efrigerant	kg	1.	.4		.8	2	.5
	Contr	ol method				PID c		•	
	Ambient ter	°C			2 to				
	Circ	culating fluid				lear Water ^{*1} , [Clear Water ^{*1} ,			
	Operating	°C			CH1: 5 to 35;				
	Cooling	Cooling capacity ² kV			1'8	19	1'8	26	1'8
	Heating capacity ^{'3}			1.5	1	4	1	6	1
	Temperati	ure stability ^{*4}	°C			CH1: ±0.1	CH2: ±0.5		
		Rated flow rate (outlet)	L/min	45 (0.43 MPa)	10 (0.45 MPa)	45 (0.45 MPa)	10 (0.45 MPa)	125 (0.45 MPa)	10 (0.45 MPa)
m	Pump capacity ^{*13}	Max. flow rate	L/min	120	16 ^{*12}	130	16 ^{*12}	180	16 ^{*12}
Circulating fluid system		Max. lifiting height	m	50	49	55	49	68	49
s p	Set pressure range '5			0.10 to 0.50	0.10 to 0.49	0.10 to 0.55	0.10 to 0.49	0.10 to 0.68	0.10 to 0.49
Ę.		rating flow rate ^{'6}	L/min L	20	2	25	2	40	2
ing	Tank capacity 14			42	7	42	7 It-in	60	7
ılat		iss (with valve)			0.51: 45		0.5 to 45	F	0.51-45
ic		conductivity on accuracy (Accessory)	μS/c uS	0.5 to 45 ^{*9}	0.5 to 45 5	0.5 to 45 ^{*9}	0.5 to 45	0.5 to 45 ^{*9}	0.5 to 45 5
0				CH 1:	3		F : G1,Symb		,
	Circulating fluid	Outlet and Return port	-14	CH 2:	R			bol N : NPT1/	2)
	Toni	k drain port ^{*14}		CH 1:				ibol N : NPT3/	
	Tall	k uranı port		CH 2: Rc1/2 (Symbol F : G1/2,Symbol N : NPT1/2)					
				Stainless steel, Copper (Brazing filler metal for the heat					
				CH 1: exchanger) ^{*10} , Brass ^{*10} , Bronze ^{*10} , Fluoropolymer, PP, PBT, POM,					
	We	tted material		PU, PC, PVC, EPDM,NBR, lon-exchange resin ¹⁹ .					
				CH 2: Stainless, Alumina ceramic, Carbon, Fluoropolymer, PP, PBT, POM, PU, PVC, PPS, AS, PS, EPDM, NBR, Ion-exchange resin.					
				3-phase 380 to 415VAC (50/60Hz)					
						Allowable volta			
	Po	ower supply				continuous vi I-phase 460 to			
te l						i-pnase 460 to owable voltage			
sys				(Max				s voltage fluctu	ation)
Electric system	Recommended earth leakage	Rated current	Α	2		3			0
Ele	breaker	Sensitivity	mA			3	0		
		ating current ^{'4}	Α	8	.5	1	5	1	9
	Poted news consumption'4 kW				.6		.4		2.3
	KVA				.9).2		3.0
	Noise level (Front 1m / Height 1m) ^{*4} dB(A)				7	5		7	1
				Opera	tion manual (f			glish 1, Japan	ese 1)
	Ac	cessory		Particle filter set for CH1 Particle filter set for CH2					
		•			Anchor brac	ket 2pcs. (inc		of M8 bolts)*7	
	Weight (dry c	ondition)*11	kg	Appro	x. 240	Appro	x. 260	Appro	x. 330

HRL100/200 - W * - 40

II LE TOC)/200 - VV			HRL10	0-W≠-40	HRL20	0-W•-40
		Model		CH1 CH2 CH1 CH2			
	Coo	ling method		Water-cooled refrigerated			
	Re	efrigerant		R410A (HFC) ; 2088 (GWP)			
	Quantity of	refrigerant	kg	1.8 1.8			
	Con	trol method	•	PID control			
	Ambient te	mperature	°C		2 to	45	
	Ci	rculating fluid			H1: Clear Water ¹ , E CH2: Clear Water ¹ ,		
-	Oneratin	g temp. range	°c			CH2: 10 to 40	-,
		g capacity ²	kW	10	1'8	21.5	1*8
		g capacity ³	kW	1.5	1.0	4.0	1.0
		ture stability ^{*4}	°C			CH2: ±0.5	
	Tempera	· ·		45	10	45	10
		Rated flow rate (outlet)	L/min	(0.43 MPa)	(0.45 MPa)	(0.45 MPa)	(0.45 MPa)
Pum	p capacity ^{*13}	Max. flow rate	L/min	120	16 ^{*12}	130	16*12
		Max. lifiting height	m	50	49	55	49
	Set pres	ssure range ^{*5}	MPa	0.10 to 0.50	0.10 to 0.49	0.10 to 0.55	0.10 to 0.49
		erating flow rate ^{'6}	L/min	20	2	25	2
		capacity	L	42	7	42	7
	By-	pass (with valve)			Bui	lt-in	
P		conductivity ng range	μS/cm	0.5 to 45*9	0.5 to 45	0.5 to 45*9	0.5 to 45
			μS	5	5	5	5
<u> </u>	Particle filter filtration accuracy (Accessory)			CH 1:	Rc1 (Symbol F : G1,Symbol N : NPT1)		
	Circulating fluid Outlet and Return port			CH 2:	Rc1/2 (Symbol F : G1/2,Symbol N : NPT1/2		
				CH 1:	Rc3/4 (Symbol F : G3/4,Symbol N : NPT3/4)		
	T	ank drain port		CH 2:		ol F : G1/2,Symbol	
	Wetted material			CH 1:	PBT, POM, PU, Stainless, Alumi	ass*10, Bronze*10, F PC, PVC, EPDM,N resin*9. na ceramic, Carbon U, PVC, PPS, AS,	BR, Ion-exchang
						lon-exchange resin	L
:		rature range	°C			35	
		sure range	MPa		0.3 t		
·		uired flow	L/min	- 2	25		50
Inle	t-outlet pressure o	lifferential of facility water	MPa			more	
Inle	w	Port size		Rc1 Stainless steel, Copper (Brazing filler metal for the heat exchanger)*10, Brass*10, Bronze*10, PTFE, NBR, EPDM			
		Power supply		3-phase 380 to 415VAC (50/60Hz) Allowable voltage range ±10% (No continuous voltage fluctuation)			
Rec		,		(Max. voltage		480VAC 60Hz) range +4%, -10% no continuous volt	age fluctuation)
Rec	commended	Rated current	Α	- 8	30	30	
earth le	eakage breaker	Sensitivity	mA	4.		0	2.0
	Rated ope	rating current*4	Α		2.7		3.3
	Rated power	er consumption'4	kW	7.9 8.6			
		·	kVA	8	1.8		.2
	Noise level (Front	1m / Height 1m) ⁻⁴	dB(A)			2	
		acce ssory		Operation mar	nual (for installation/ Particle filte		1, Japanese 1)
	P	,					h-H-*7
	Weight (dry	•	kg		r bracket 2pcs. (inc	luding 6 pcs. of M8	bolts)*7

2 Specification (continued)

Notes:
*1 Use fluid for circulating fluid that conforms to: Clean water: Water Quality Standards of the Japan Refrigeration and Air Conditioning Industrial Association (JRA GL-02-1994)
*2 (1)Ambient/facility water temperature:32°C,(2) Circulating fluid: Clean water, (3) Circulating fluid temperature: CH1 20°C /CH2 25°C, (4) Circulating fluid flow rate: Rated flow rate, (5) Power

supply: 400 VAC. For option T2 or T3 * CH2 High-Pressure Pump mounted" (For water-cooled T2 only). For details refer to the operation manual 'Chapter 6 Option'.

"3 (1)Ambient/facility water temperature:32°C,(2) Circulating fluid: Clean water, (3) Circulating fluid flow rate: Rated flow rate,(4)Power supply: 400 VAC.

*4 (1)Ambient/facility water temperature:32°C,(2) Circulating fluid: Clean water, (3) Circulating fluid temperature: CH1 20°C /CH2 25°C, (4) Load: Refer to the specified cooling capacity,

(5) Circulating fluid flow rate: Rated flow rate, (6) Power supply: 400 VAC, (7) Pignig length: Minimum.

*5 With the pressure control mode that controls the pressure automatically with the inverter.If the pressure control mode is not necessary, use the flow control function or the pump output setting

*6 Required flow rate to maintain the cooling capacity. When the flow rate is lower than the rated flow, use a by-pass piping set. For option T2 or T3 " CH2 High-Pressure Pump mounted" (For water-cooled T2 only). For details refer to the operation manual 'Chapter 6 Option'.

*7 The anchor brackets (including M8 bolt x 6pcs.) are used for fixation with the skid when this product is packed. The anchor bolts are not attached.

*8 Up to 1.5kW. However, when 1.5kW heat load is applied, the colling capacity of CH1 will decrease

*10 Option D1 "with electrical conductivity control function" only.
*10 In the case of option D1 " with electrical conductivity control function", it is not included.

*11 The weight will increase by:

> 1kg: Option D1 "CH1 and CH2 Electrical conductivity control" when selected

> 1kg: Option T2 "High-Pressure pump" when selected > 18kg: Option T3 "High-Pressure pump" when selected (only applicable HRL300-A-40)

*12 The usable flow rate range is varied depending on the Pump control mode. For details refer to the operation manual 'Chapter 9.5 Pump Capacity curves Fig.9-26'.
*13 In the case of option T2 or T3 "CH2 High-Pressure Pump Mounted" (For water-cooled T2 only).

For details refer to the operation manual 'Chapter 6 Option'.

*14 In the case of option T3 "CH2 High-Pressure Pump Mounted". For details refer to the operation manual 'Chapter 6 Option'

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	2022	 2025	2026	2027	2028	2029	
1	Month	/	Α	 D	E	F	G	Н	
	Jan	0	Ao	 Do	Eo	Fo	Go	Ho	
	Feb	Р	AP	 DP	EP	FP	GP	HP	
	Mar	ρ	AQ	 DQ	EQ	FQ	GQ	HQ	
	Apr	R	AR	 DR	ER	FR	GR	HR	
	May	S	AS	 DS	ES	FS	GS	HS	
	Jun	T	AT	 DT	ET	FT	GT	HT	
	Jul	U	AU	 DU	EU	FU	GU	HU	
	Aug	٧	AV	 DV	EV	FV	GV	HV	
	Sep	W	AW	 DW	EW	FW	GW	HW	
	Oct	Х	AX	 DX	EX	FX	GX	HX	
	Nov	у	Ay	 Dy	Ey	Fy	Gy	Hy	
	Dec	Z	AZ	 DZ	EZ	FZ	GZ	HZ	

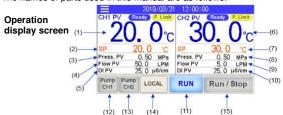
4 Name of Parts and Accessories (continued)

4	HRL***-A/WF-** G thread adapter set HRL***-A/WN-** NPT thread adapter set	•	d	1 set
5	Anchor brackets*			2pcs
6	DI Filter*	□	For option – D1: DI Filter (CH1 only)	1pc

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

4.2 Main Parts

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



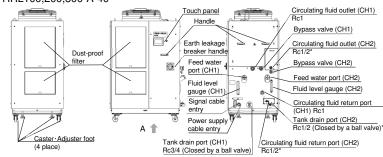
No	Category	Channel Number	Item	Description		
1			Circulating fluid Temperature	Indicates the current temperature.		
2			Circulating fluid: Set temperature	Indicates the set temperature.		
3		CH 1			Circulating fluid: Discharge pressure	Indicates the discharge pressure.
4	Display		Circulating fluid: Flow rate	Indicates flow rate with or without by- pass circuit. This is not measured by a flow meter and should be used as a reference value.		
5			Circulating fluid: Electric conductivity	Indicates electric conductivity. Only when option 'D1' is selected.		

6			Circulating fluid Temperature	Indicates the current temperature.
7			Circulating fluid: Set temperature	Indicates the set temperature.
8		CH 2	Circulating fluid: Discharge pressure	Indicates the discharge pressure.
9	Display		Circulating fluid: Flow rate	Indicates flow rate measured by a flow meter. This does not indicate flow rate in a by-pass circuit.
10			Circulating fluid: Electric conductivity	Indicates electric conductivity.
11		Common	Operation condition display	Indicates the run and stop status of the product.
12		CH 1	Pump operation only	CH 1 pump only continues operating while the button is pressed.
13		CH 2	Pump operation only	CH 2 pump only continues operating while the button is pressed.
14	Button	Common	Operation mode*	To select an operation mode from the touch panel: ('LOCAL' mode), Contact input ('DIO' mode) or serial communication ('SERIAL' mode).
15		Common	Run / Stop	To run or stop the product.

^{*}Operation modes not explained in this manual. For details, read the Operation Manual

4.3 Name of parts and Outline Dimension

HRL100,200,300-A-40



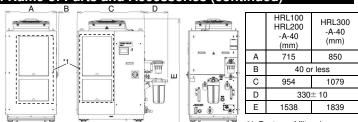
Note: View 'A' see section 6.6 Anchor bolts

*In case of HRL300-A-40-T3, the size is different.

		HRL10	00-W +-40	HRL20	0-W•-40	2 L	low t	Ordor		
		CH1	CH2	CH1	CH2	<u>ა </u>	10W LO	Order Order		
				ed refrigerated			_			
			R410A (HFC)); 2088 (GWP)				HRL	- 40	1 -
	kg		1.8	1	1.8			···-		
			PID	control						
	°C		2 t	0 45			_			
			CH1: Clear Water*1,				(1)	Cooling capacity		5 Options
			CH2: Clear Water*1,	DI Water (pure wat	ter)			CH1 CH2		Nill CH2
	°C		CH1: 5 to 35	; CH2: 10 to 40		ĺ				Electric conductivi
	kW	10	1*8	21.5	1"8	ĺ		Air Water Air/Water		D1 CH 1 and C Electric conductivi
	kW	1.5	1.0	4.0	1.0		100	9 kW 10 kW 1 kW		
	°C		CH1: ±0.1	; CH2: ±0.5	,		200	19 kW 21.5 kW 1 kW		T2 High-Pressure
et)	L/min	45	10	45	10			 		T3 ^{*2} High-Pressure
, , , , , , , , , , , , , , , , , , ,		(0.43 MPa)	(0.45 MPa)	(0.45 MPa)	(0.45 MPa)		300"	26 kW 1 kW		*2 Applicable only to HRL300-A-40
	L/min	120	16 ^{*12}	130	16*12		*1 Not	applicable to Water-cooled refrigeration		2 Applicable only to FINESOU-A-40
	m	50	49	55	49					O
	MPa	0.10 to 0.50	0.10 to 0.49	0.10 to 0.55	0.10 to 0.49			Cooling method	• (Power supply
	L/min	20	2	25	2		A	Air-cooled refrigeration	40	3 phase AC380-415V (50 /
	L	42	7	42	7			-		3 phase AC460-480V (60
			Bu	uilt-in			W*1	Water-cooled refrigeration		
	μS/cm	0.5 to 45*9	0.5 to 45	0.5 to 45*9	0.5 to 45			Piping thread type		
	μS	5	5	5	5					
		CH 1:	Rc1 (Syn	nbol F ; G1,Symbo	N · NPT1)		Nil	Rc		
		CH 2:		bol F : G1/2,Symbo	,		F	G (Rc-G thread adapter set is included)	
		CH 1:		bol F : G3/4,Symbo					-	
		CH 2:		ool F : G1/2,Symbo			N	NPT (Rc-NPT thread adapter set is included)	led)	
				Copper (Brazing fille						
		CH 1:		rass ^{*10} , Bronze ^{*10} , I						
		0.11.	PBT, POM, PU,	PC, PVC, EPDM,N	IBR, Ion-exchange	4 N	lama	of Parts and Acc	accaria	96
			0	resin ^{*9} . nina ceramic, Carbo		نعظ	Tairie	or raits and Acc	CSSUIT	-3
		CH 2:		PU, PVC, PPS, AS			A			
		0112.		Ion-exchange resir		4.1	Acce	ssories		
	°C	İ		to 35		• C	hook th	e enclosed accessories	with the	Jolivarad Tharma ab
	MPa		0.3	to 0.5		i • <u>∟</u>	HECK IN	e enclosed accessories	with the 0	ienvereu memio-cn
	L/min		25		50]	. _			
r	MPa			more]]	1 Ope	ration manual (English)		
			F	Rc1						برا
		Stainless steel	I, Copper (Brazing fi	ller metal for the he	at exchanger)*10,			·		(C)25

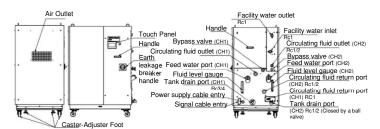
1	Operation manual (English)		1pc
2	Particle filter set (for CH1)*		1 set
3	Particle filter set (for CH2)*	(Option - T3)	1 set

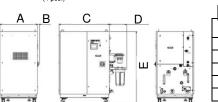
4 Name of Parts and Accessories (continued)



HRL100,200-W-40

*1: Dust-proof filter sizes are different for each model size





5 T	ransportation,	
	HRL100, HRL200 -W-40 (mm)	
Α	715	
В	40 or less	
С	954	
D	330± 10	
Е	1369	

Transfer and Moving

5.1 Moving by forklift and slinging or by casters

♠ Warning

- The product is a heavy object (Refer to 2.1 Product specification for weights). · Moving by forklift and slinging should be done by persons who have required
- 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

Marning

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

Warning related to Electricity



This symbol stands for a possible risk of electric shock

Warning related to High Temperatures



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

Warning related to Rotating Objects



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

Warning related to other General Dangers



This symbol stands for general danger.

6 Installation (continued)

6.3 Environment

Marning

- . Do not use in an environment where corrosive gases, chemicals, salt water or
- Do not use the product in an area of high temperature and humidity which cannot be exhausted, or where it is exposed to corrosive substances. Cooling failure can result.
- . Do not use the product outdoors. If the product is exposed to rain or water splash it may cause electrical shock, fire or failure.
- Do not use in an explosive atmosphere.
- Do not install in a location exposed to direct sunlight and radiant heat.
- Do not install in a location subjected to vibration or impact.
- · Do not install subjected to strong electromagnetic noise (intense electric field, intense magnetic field, or surges)
- · Do not install subjected to static electricity, or conditions where static electricity can discharge to the product.
- Do not install subjected to strong high frequencies radiation.
- Do not use in locations at altitudes of 3000m or higher (except for product storage and transport), refer to the Operation Manual section '3.2.1 Environment[®]
- Do not install in a location without adequate space for maintenance.

6.4 Mounting

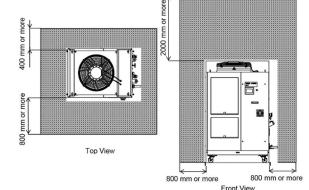
▲ Warning

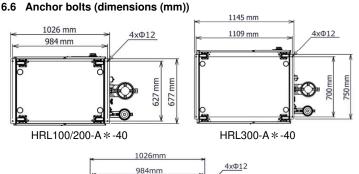
• The Installer / End User is responsible for carrying out a noise risk assessment on the equipment after installation and taking appropriate measures as required.

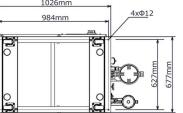
A Caution

- 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 '6.6 Anchor bolts' for outline dimensions for the position of the anchor bolts.

6.5 Recommended installation Space

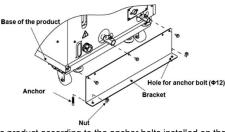






HRL100/200-W * -40

6 Installation (continued)



- Install this product according to the anchor bolts installed on the level floor.
- Fasten the nuts to the anchor bolts.
- Make sure that there is no looseness on all the anchor bolts and nuts.

6.6.1 Use the adjuster-foot

A Caution

In case of using "Caster Adjuster-foot", be sure to use the adjuster foot to install on the floor. The adjuster foot is not earthquake-proof. If necessary make an earthquakeresistant measure on the customer side.



Lower the adjuster to the level floor to fix the product in place

6.7 Piping

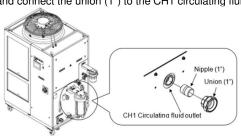
↑ Caution

- 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.

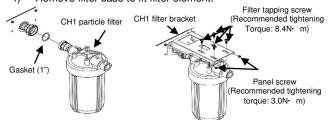
6.7.1 Installation of particle filters:

6.7.1.1 Installation of CH1 Particle Filter.

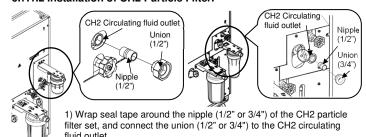
1) Wrap seal tape around the nipple (1") of the CH1 particle filter set, and connect the union (1") to the CH1 circulating fluid outlet.



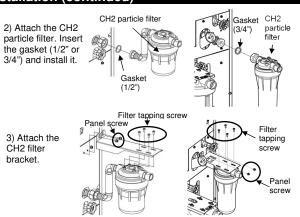
- Insert the gasket (1") and install CH1 particle filter
- Install CH1 filter bracket. 3)
- 4) Remove filter case to fit filter element.



6.7.1.2 Installation of CH2 Particle Filter.



6 Installation (continued)



6.7.2 Pining Port Size

0.7.2	7.2 Fibring Fort Size									
CH No.	Descr	iption	Port size	Recommended tightening torque	Recommended piping specification					
	Circulating fluid Chiller sid		1" union	178 to 185N•m						
CH1	outlet port	Filter side	Rc1 ^{*1}	36 to 38N·m	1.0 MPa or more					
СПІ	Circulat returr		Rc1*2	36 to 38N·m	1.0 MPa or more					
	Tank dr	ain port	Rc3/4*2	28 to 30N·m						
		Chiller side		64 to 70N·m						
	Circulating fluid outlet port	Option: T3	3/4" union ⁻³	106 to 115N∙m						
		Filter side	Rc1/2*1	20 to 25N·m	0.8 MPa or more					
CH2		Option: T3	Rc3/4*1*3	28 to 30N·m	0.6 WFa of filore					
	Circulating fluid		Rc1/2*2	20 to 25N·m	0.8 MPa or more					
	return port	Option: T3	Rc3/4*2*3	28 to 30N·m	0.6 INF a OF HIGH					
	Tank drain port		Rc1/2*2	20 to 25N·m						
		Option: T3	Rc1/4*2*3	8 to 12N⋅m						
-	Facility wa	ater inlet*4	Rc1	36 to 38N·m	1.0 MPa or more					
-	Facility wa	ter outlet*4	Rc1	36 to 38N·m	1.0 MPa or more					

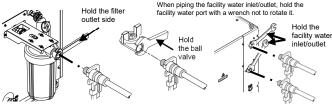
- When the piping thread type "F (G thread)" or "N (NPT thread)" is selected, it becomes "G
- When the piping screw type "F (G thread)" or "N (NPT thread)" is selected, a conversion joint
- Option T3 "CH2 High-Pressure Pump Mounted". For details refer to the operation manual 'Chapter 6 Option
- For water-cooled type

6.7.3 Connecting to the Circulating fluid port and Drain Port.

↑ Caution

Without using a wrench to hold either the circulating fluid outlet's filter side fitting or the drain port's ball valve, the fitting or the ball valve may rotate. This could cause fluid leakage and/or product malfunction. Ensure the filter side fitting and ball valve of the drain port is held securely.

- Circulating fluid port: To pipe to the circulating fluid outlet, hold the filter outlet side fitting with a wrench. Do not rotate the wrench.
- Drain port: To pipe the pump drain port, hold the ball valve of the drain port with a wrench. Do not rotate the wrench.



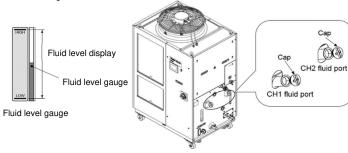
6.7.4 Installation of the DI filter.

Is not explained in this manual. Please refer to the Operation Manual "8.4.2 Replacing the DI filter".

6.8 Filling of Circulating Fluid

Caution

- When deionized water is used the conductivity should be 1µS/cm or higher (Electrical resistivity: $1M\Omega \cdot cm$ or lower).
- · Confirm that the fluid level is between "High" and "Low" level of the fluid level gauge for CH1 and CH2.
- Check drain port is closed by the valve to prevent the supply circulating fluid from draining out.



6 Installation (continued)

6.9 Wiring of Power Supply Cable

Marning

- 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.

6.9.1 Preliminary Preparation for Wiring

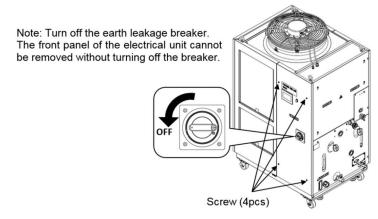
Prepare the power supply shown in the following table. For the connection between the product and power supply, use the power supply cable and earth leakage breaker shown below. An earth leakage breaker must be mounted to a position where the breaker is easily accessible and close to the thermo-chiller.

	Power	Terminal	Drawagad	Cable	Earth le		
Model	supply voltage	block screw diameter		specification	Rated current [A]	Sensitivity of leak current [mA]	
HRL100-A*-40			R5.5-5	4 cores x 5.5mm ²	20		
HRL200-A*-40	3 phase 380-415			(4 cores x AWG10)			
HRL100/200- W*-40	VAC 50/60 Hz	M5		*including ground	30		
HRL300-A*-40	3 phase 460-480 VAC 60 Hz	i M5	R8-5	4 cores x 8mm² (4 cores x AWG8) *including ground	40	30	

^{*1:} Continuous allowable operating temperature of 70 °C, with an operating voltage of 600 V and two kinds of plastic insulated wires at an ambient temperature of 30 °C. Please select the proper size cables according to the actual condition.

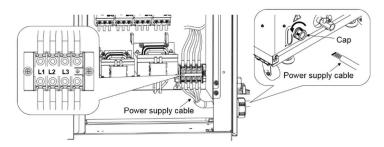
6.9.2 Wiring of Power Supply

- 1) Turn off the breaker handle
- 2) Remove 4 screws to remove the front panel.
- 3) Hold the handle and pull up the front panel of the electrical unit, and remove.



4) Loosen the power cable outlet cap and insert the power cable.

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



• Connect an over current protection to the power cable connected to the equipment to avoid hazard.

7 Start, Stop and Temperature Settings

7.1 Preliminary Preparation for Start-up

7.1.1 Supply of Power

1) Turn on the breaker handle.



 The 'Startup' screen first appears on the touch panel and then switches to the 'Operation / Home' screen.



Start-up screen

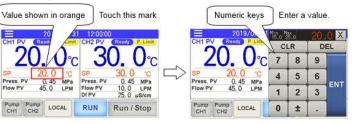
Operation / Home screen

7.1.2 Preparation of circulating fluid

- 1) Touch [Pump | button or [Pump | button on the touch panel. Pump operates independently while pressing the [Pump | Pump | button. [Pump | Pump | button (blue) lights up during independent pump operation. The circulating fluid is then supplied to user's device and the piping to bleed the air inside the piping.
- If the fluid level in the tank drops, an alarm is activated and "AL02 CH1 Low Level WRN" or "AL04 CH2 Low Level WRN" is displayed on the screen.
- Supply circulating fluid in the range between HIGH and LOW to turn off the alarm. After supplying the circulating fluid, press [Alarm | Alarm | Button to turn off the alarm. The displayed alarm will be turned off.
- 4) Touch [(menu key)] to display the menu. When [Home] button is pressed, the home screen will be displayed.

7.1.3 Temperature Setting

 Press the [SP] value on the touch panel (home screen) to display numeric keys to set the circulating fluid set temperature. Enter the set temperature for CH1 and CH2.

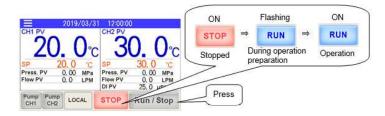


7.2 Start of the Product

1) Press [Run / Stop] button on the home screen.

CH1 and CH2 will start the operation.

The operating condition display switches from [STOP] to [RUN] and flashes during the operation preparation. The display turns on [RUN] when it starts operating.



7 Start, Stop and Temperature Settings (continued)

7.3 Stop of the Product

1) Press [Run / Stop] button on the home screen.

CH1 and CH2 will stop the operation.

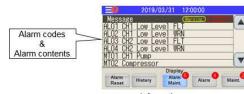
The operating condition display switches from [RUN] to [STOP] and flashes during the operation preparation. The display turns on [STOP] when it starts operating.



8 Alarms

The product makes notification in the order shown below when any alarm is generated.

 The screen automatically moves to the "Information" screen and displays alarm codes with their contents. (Refer Operation manual section "5.4.4 Information screen" for the operation method of "Information" screen.).



Information screen

- 2) When an alarm occurs, this product operates in two ways depending on the content of the alarm:
- Operation continuation alarm: When an alarm occurs, this product continues to operate. The alarm content will display "WRN".
- Operation stop alarm: When an alarm occurs, this product stops. The alarm content will display "FLT".

8.1 Reset of alarm

- 1) Press the button [Alarm]
- 2) The alarm is reset



A Caution

 Before resetting the alarm, read the "Causes and Remedies" of "10.1 Troubleshooting" and eliminate the cause as explained. Otherwise, the same alarm may be repeated.

9 Maintenance

9.1 General Maintenance

Marning

- 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 (continued)

9.2 Control of Circulating Fluid Quality

Marning

- Use specified circulating fluids only. If other fluids are used, they may damage the product or result in dangerous hazards.
- When using tap water ensure that it satisfies the water standard shown in the Operation Manual.
- When deionized water is used, the conductivity should be 1.0 µS/cm or higher (Electrical resistivity: 1 MΩ·cm or lower).

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.

aily checklist

Item	Description of checking			
Installation condition	Check the installation conditions of the product.	Check that there is no heavy object on the product or excessive force applying to the piping. Temperature should be within the specification range of the product. Make sure the ventilation grilles are not obstructed. (For air-cooled type)		
Fluid leakage	Check the connected part of piping	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.		
Touch panel	Check the indications on the display.	The display on the screen is clear.		
Circulating fluid temperature	Check on the touch panel.	There should be no problem during operation.		
Circulating fluid discharge pressure	Check on the touch panel.	There should be no problem during operation.		
Circulating fluid flow rate	Check on the touch panel.	There should be no problem during operation. If flow rate becomes low, check for clogging in the particle filters.		
Operating conditions	Check the operation condition.	There should be no abnormality with noise, vibration, smell, or generation of smoke.		
Facility water (for- watercooled type	Check the facility water condition.	Check that the temperature, pressure and flow rate are within specification ranges.		

9.4 Monthly Check

Item	Contents of check			
Ventilating condition (air cooled type)	Clean the ventilating grilles.	Make sure the ventilating 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.		

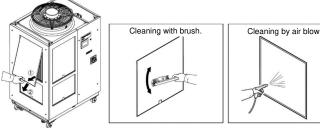
Cleaning of air vent (Air-cooled type)

A Caution

 If the air ventilation of the product have 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 (For air-cooled type)

- 1) The dust-proof filters are installed on the front and left side of the product. In total there are two or 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

- 1) Clean the dust filter with a long bristled brush or by air purging.
- 2) Mount the dustproof filter in reverse order of removal.

9 Maintenance (continued)

9.5 Inspection every 3 Months

3.5 Inspection every 3 Months					
Item		Description of checking			
Power	Check the power	Make sure the supply voltage is within the			
Supply	supply voltage.	specification range.			
Circulation fluid	Replace the circulating fluid (tap water) periodically.	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. Refer to operation manual section Table 8.1-1 Quality criteria for clean water (tap water). It is recommended to replace the circulating fluid every 3 months when periodic maintenance is performed.			
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 operation manual section Table 8.1-1 Quality criteria for clean water (tap water)			

9.5.1 Replacement of Circulating Fluid

- Replace the existing circulating fluid with new circulating fluid periodically. Otherwise algae or decompose may occur.
- · Do not use any chlorinated detergents and cleansers.

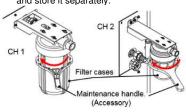
9.6 Inspection every 6 months

• Option T3: Refer to operation manual section 8.2.4.

9.7 Draining of the Circulating Fluid



- Before draining the circulating fluid, stop the user's equipment and release the
- Turn OFF the breaker of the user's power supply.
- Open the supply port cap.
- Open the ball valve of the pump drain port and drain the circulating fluid.
- 4) Use the maintenance handle, to remove the filter cases for CH1 and CH2. Drain fluid and remove element from cases. When reusing the removed element, dry it and store it separately









- 5) Attach the filter cases by hand.
- Make sure that the circulating fluid has been sufficiently drained from the product, customer's facilities and piping. Perform an air purge (pressure less than 0.1 MPa, approximately 1 minute) from the circulating fluid outlet of the product. Purge both CH1 and CH2, circulating fluid is drained from the drain port.
- Close the ball valve after draining the circulating fluid.
- Close the supply cap.

9.8 Replacing the DI filter

Is not explained in this manual. Please refer to the Operation Manual section 8.4.2 Replacing the DI filter.

9.9 Consumable Parts

Part No.	Description	Qty	Remark
HRS-S0213	Dust-proof filter (Lower)	1 pc.	HRL200-A: 2 pcs. are used per unit
HRS-S0214	Dust-proof filter (Upper)	1 pc.	HRL100/200-A: 2 pcs. are used per unit
HRS-S0185	Dust-proof filter	1 pc.	HRL300-A: 4 pcs. are used per unit
HRS-PF006	Particle filter element	1 pc.	Common to each model: For CH1
EJ202S-005X11	Particle filter element	1 pc.	Common to each model: For CH2
EJ302S-005X11	Particle filter element	1 pc.	For option T3: For CH2
HRR-DF001	DI filter replacement cartridge	1 pc.	Common to each model: For CH2
HRR-DF002	DI filter replacement cartridge	1 pc.	Common to each model: For CH1 (Option D1 only)

10 Troubleshooting

10.1 Troubleshooting

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

Marning

• 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

Alarm	Alarm Description	Default Setting		Cause/Remedy (Press the reset key after	
Code	Sub Code	Operation	Threshold	eliminating the cause.)	
AL01 AL02 AL03 AL04	CH1 Low Level FLT CH1 Low Level WRN CH2 Low Level FLT CH2 Low Level WRN	FLT WRN FLT WRN		The circulating fluid level of CH1 has decreased. Refilling circulating fluid. The circulating fluid level of CH2 has decreased. Refilling circulating fluid.	
AL06*5	Fan Inverter	FLT		Check that there is no abnormality with the power supply system (e.g. ground fault, short-circuit, voltage fluctuation, abnormal interphase voltage, open phase, surge).	
AL07*6	Internal Cooling Fan	WRN		Air exhaust fan failure. Ask for service for the air exhaust fan.	
AL09	CH1 High Temp. FLT	FLT	55°C	Check that the ambient temperature and heat load satisfy the specifications and that the circulating fluid flow rate is	
AL10	CH1 High Temp.	OFF*1	45°C*3	more than the minimum flow rate. • Please review the setting value.	
AL11	CH1 Low Temp.	OFF"	5°C'³	Check the effect of ambient temperature. Please review the setting value.	
AL12	CH1 TEMP READY ALARM	OFF [™]	±1 °C*³	There may be causes such as large load fluctuation and flow rate fluctuation. Please review the setting value.	
AL13	CH2 High Temp. FLT	FLT	50°C	 Check that the ambient temperature and heat load satisfy the specifications and that 	
AL14	CH2 High Temp.	OFF"	45°C*3	the circulating fluid flow rate is more than the minimum flow rate. Please review the setting value.	
AL15	CH2 Low Temp.	OFF*1	5°C*³	Check the effect of ambient temperature. Please review the setting value.	
AL16	CH2 TEMP READY ALARM	OFF ⁻¹	±1 °C*3	There may be causes such as large load fluctuation and flow rate fluctuation. Please review the setting value.	

Alarm		Alarm Description	Alarm Description Default Setting		Cause/Remedy
Code		Sub Code	Operation	Threshold	(Press the reset key after eliminating the cause.)
AL17	CH1 HX In High Temp. FLT		FLT	60°C	Check that the circulating fluid flow rate is more than the minimum flow rate. Check that the heat load is within the specified range.
AL18	CH1	Press. Sensor	FLT*1	1	 Short-circuit or broken wire of the pressure sensor. Ask for the service.
AL19	CH1	High Press.	FLT*1	0.50 MPa ^{*3}	Check that there is no bending, collapse, or clogging with the external piping. Check that there is no clogging of the particle filter.
AL20	CH1	Low Press.	FLT"	0.03 MPa*3	Restart the thermo-chiller and check if the pump runs.
AL21	CH2	2 Press. Sensor	FLT"		Short-circuit or broken wire of the pressure sensor. Ask for the service.
AL22	CH2	2 High Press. Error	FLT	0.50 MPa	 Check that there is no bending, collapse, or clogging with the external piping.
AL23	CH2	2 High Press.	FLT*1	0.50 MPa*3	 Check that there is no clogging of the particle filter.
AL24	-	2 Low Press.	FLT*1	0.03 MPa*3	Restart the thermo-chiller and check if the pump runs.
AL25	CH2	2 Low Press. Error	FLT	0.03 MPa	(Check the flow rate display value.)
AL26	CH2	2 Flow Sensor	FLT"		Short-circuit or broken wire of the flow rate sensor. Ask for the service.
AL27		2 High Electric conductivity	WRN ^{*2}	45.0µS/cm*3	Replace CH2 DI filter.
AL28*4		High Electric conductivity	WRN*2	45.0µS/cm*3	Replace CH1 DI filter.
AL30 AL31		tal input 1 tal input 2	FLT ^{*1}		Contact input has been detected.
AL33		2 Low Flow FLT	FLT	Less than 2.0LPM - T2 < 5.0 LPM - T3 < 10.0 LPM	Display flow rate: Threshold or less. Check piping no bending closed external valve, clogging of filter.
AL34	Con	nmunication	WRN*1	-	No request message from the host computer. Try to send the request message again.
AL35		pient Temp.	OFF*2	2°C / 45°C	Check the environment.
	Mai	ntenance		00 0001	
		1 CH1 Pump maintenance.		20,000h	
	-	2 Compressor maintenance.		30,000h	
	F	3 Fan maintenance*5 4 Dust-proof filter maintenance*5		30,000h 500h*3	
	-	5 CH2 DI filter maintenance.		500h*3	
	6 CH2 Pump maintenance.			20,000h	
	-	7 Battery maintenance.		20,00011	
AL36	 	A Maintenance of CH1 circulating fluid discharge pressure sensor. 9 Maintenance of CH2 circulating fluid discharge pressure sensor. 10 Maintenance of CH2 10 Maintenance of CH2	OFF ^{*2}	Abnormal occurrence	"Maintenance reminder" Please maintain the corresponding part.
		circulating fluid flow sensor.			
	 	11 CH1 DI filter maintenance*4		500h*3	

10 Troubleshooting (continued)

Alarm	Alarm Description	Default Setting		Cause/Remedy (Press the reset key after
Code	Sub Code	Operation	Threshold	eliminating the cause.)
	Refrigeration Circuit			
	1 High compressor intake		60°C	
	temp.			
	2 Low compressor intake temp.		0°C	Refrigerant circuit failed.
	3 Super heat temp.		0°C	
	5 Refrigeration circuit high	1		
	press. rise			 Check that the ambient
AL37	6 Refrigeration circuit high			temperature, heat load satisfy the
71207	press. drop	FLT		specifications.
	8 Refrigeration circuit low press. drop			Check that the circulating fluid flow rate is more than the
	9 Refrigeration circuit low			minimum flow rate.
	press. rise			 Ask for the service.
	11 Compressor running			
	failure			
	12 Compressor discharge			
	temp. rise Sensor			
	1 CH1 Circulating fluid temp.			
	sensor.		-	Short-circuit or broken wire of the sensor. Ask for the service
	2 CH1 Heat exchanger inlet			
	temp. sensor.			
	 Compressor discharge temp. sensor. 			
	4 Compressor intake temp.			
	sensor.			
	5 CH2 Heat exchanger outlet			
AL38	temp. sensor.	FLT		
	6 Ambient temp. sensor.			
	9 Refrigeration circuit high press. sensor			
	10 Refrigeration circuit low			
	press. sensor			
	12 CH2 DI sensor			
	13 CH2 Circulating fluid			
	temp. sensor			
	15 CH1 DI sensor*4			
	Controller 1 EEPROM error			Т
	2 Internal communication			Controller failed. Shut off the power and restart the product.If it does not return to normal, ask for service.
AL39	error			
AL39	3 FRAM error	FLT		
	5 Ref. memory error			
	6 Cir. memory error			
AL40	Compressor Inverter	FLT	-	Check that there is no abnormality with the power supply system (e.g. ground fault, short-circuit, voltage fluctuation, abnormal interphase voltage, open phase, surge).

	Alarm		Alarm Description Default Setting		Cause/Remedy (Press the reset key after	
	Code		Sub Code	Operation	Threshold	eliminating the cause.)
	AL41	С	empressor Inverter Comm.	FLT	_	Check that there is no abnormality
ſ	AL42	CH	11 Pump Inverter	FLT	-	with the power supply system
ſ	AL43	CH	11 Pump Inverter Comm.	FLT	-	(e.g. ground fault, short-circuit, voltage fluctuation,
ſ	AL44	CH	12 Pump Inverter	FLT	-	abnormal interphase voltage,
	AL45	CH	12 Pump Inverter Comm.	FLT	_	open phase, surge).

- *1 : Selectable from "OFF" / "WRN" / "FLT"
- *2 : Selectable from "OFF" / "WRN" *3 : The setting value can be changed.
- *4 : In the case of option D1 "CH1 with electrical conductivity control" can be set.
- *5 : Only for air-cooled type
- *6; Only for water-cooled type

10.2 Other Errors

The causes and remedies for failures that are not indicated by alarm numbers are

Content of Failure	Cause	Remedy
	The breaker of the user's power supply or/and the breaker is not turned ON.	Turn ON the breaker.
	The breaker of this product is broken.	Replace the breaker.
Touch panel displays nothing.	No power supply. (e.g. Breaker(s) in the power supplying route has not been turned ON.)	Supply the power.
	The breaker for the user's facility or the optional breaker has tripped due to short-circuit or leakage of electricity.	Repair the short-circuited part or the electricity leaking part.
	The DC power supply has failed.	Replace the DC power.
The product does not operate after pressing the Run/Stop] button.	Communication setting has been turned ON.	Check the setting of the operation mode.

11 Limitations of Use

11.1 Limited warranty and Disclaimer/Compliance Requirements Refer to Handling Precautions for SMC Products



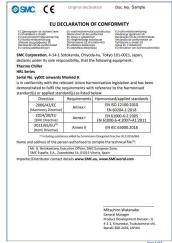
Refer to 'Section 2. Specifications' for the product limitations of use.

12 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.

13 Declaration of Conformity

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





14 Contacts

Refer to $\underline{\text{www.smc.eu}}$ or $\underline{\text{www.smc.eu}}$ for your local distributor/importer.

SMC Corporation

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