Thermo-chiller Fluorinated Fluid Type

Series HRW

How to Order

Fluorinated Fluid Type **HRW** **002** – **H** – □

Cooling capacity

Symbol	Cooling capacity
002	2 kW
008	8 kW
015	15 kW
030	30 kW

Temperature range setting

Symbol	Temperature range setting
H	20 to 90°C

Option

Symbol	Option
Nil	None
C	Analog communication
D	DeviceNet™ communication
N	NPT fitting
Z	Circulating fluid automatic recovery

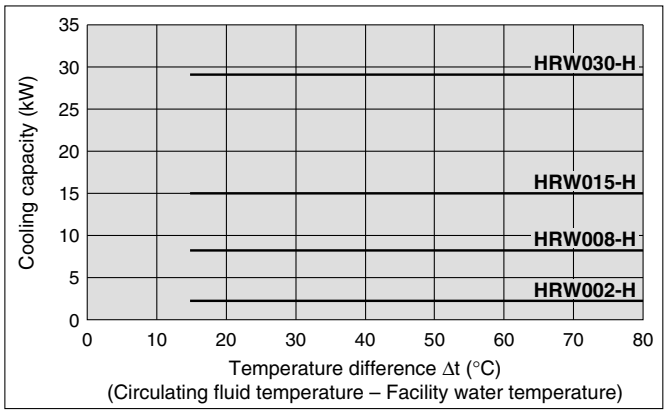
Specifications (For details, please consult our "Product Specifications" information.)

Model			HRW002-H	HRW008-H	HRW015-H	HRW030-H
Cooling method			Water-cooled type			
Ambient temp./humidity Note 1)			Temperature: 10 to 35, Humidity: 30 to 70%RH			
Circulating fluid system	**Circulating fluid** Note 2)		Fluorinert™ FC-40/GALDEN® HT200			
	Temp. range setting Note 1)	(°C)	20 to 90			
	Cooling capacity (50/60 Hz common)	(kW)	2	8	15	29
	Conditions Circulating fluid temperature	(°C)	Facility water temperature + 15			
	Conditions Facility water temperature	(°C)	10 to 35			
	Conditions Circulating fluid rated flow	(ℓ/min)	4	30	40	40
	Conditions Facility water required flow	(ℓ/min)	10	20	25	40
	Temp. stability Note 3)	(°C)	±0.3			
	Pumping capacity Note 4) **(50/60 Hz)**	(MPa)	0.40/0.60 (at 4 ℓ/min)	0.45/0.65 (at 30 ℓ/min)	0.40/0.60 (at 40 ℓ/min)	0.40/0.60 (at 40 ℓ/min)
	Tank capacity Note 5)	(ℓ)	Approx. 13		Approx. 14	
	Circulating fluid recovery tank volume Note 6)	(ℓ)	12			
	Port size		Rc3/4			
	Wetted parts material		Copper brazing (Heat exchanger), Stainless steel, EPDM, Silicon, PPS, Fluororesin			
Facility water system	**Temperature range**	(°C)	10 to 35			
	Required flow Note 7)	(ℓ/min)	10	20	25	40
	Inlet pressure range	(MPa)	0.3 to 0.7			
	Port size		Rc3/4			
	Wetted parts material		Copper brazing (Heat exchanger), Stainless steel, EPDM, Silicon, Bronze, Brass			
Electrical system	**Power supply**		3-phase 200/200 to 208 VAC ± 10%			
	Max. operating current	(A)	26			
	Breaker capacity	(A)	30			
	Communications		Serial RS-485 (Dsub-9 Pin) and Contact input/output (Dsub-25 Pin)			
Dimensions Note 8)		(mm)	W380 x D665 x H860			
Weight Note 9)		(kg)	Approx. 90		Approx. 100	
Safety standard			UL, CE marking, SEMI (S2-0703, S8-1103, F47-0200), SEMATECH (S2-93, S8-95)			

Note 1) It should have no condensation.
Note 2) Fluorinert™ is a trademark of 3M and GALDEN® is a registered trademark of Solvay Solexis, Inc. Regarding the fluid other than the above, please contact us.
Note 3) Temperature at the outlet of the thermo-chiller obtained 10 minutes after the external load is stabilized. There shall be rated flow of the circulating fluid and facility water with the circulating fluid supply and return directly connected. Also, the installation environment, power supply and facility water shall be stable within the specified range. It may be out of ±0.3°C in some other operating conditions.
Note 4) Circulating fluid temperature: The capacity of the circulating fluid discharge port at 20°C.
Note 5) Minimum volume required for operating only the thermo-chiller. (Circulating fluid temperature: 20°C, including the thermo-chiller's internal pipings or heat exchanger)
Note 6) To recover the circulating fluid inside the external pipings, the automatic circulating fluid recovering function will be provided by selecting "Z" for options.
Note 7) Required flow for cooling capacity or maintaining the temperature stability.
Note 8) Panel dimensions. All dimensions shown in the leaflet do not include possible protrusions e.g. a breaker handle.
Note 9) Weight in the dry state, without circulating fluids.

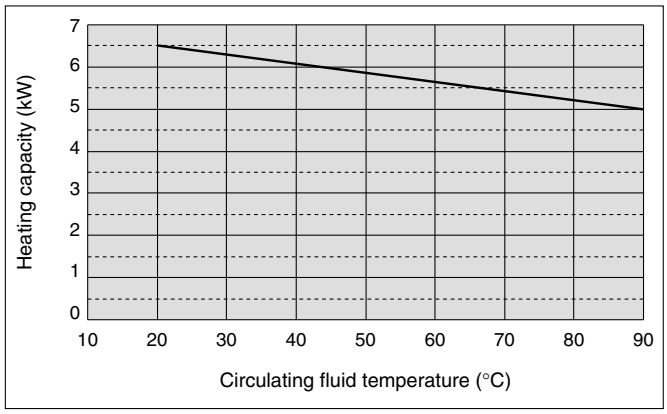
Cooling Capacity

HRW002-H/008-H/015-H/030-H



Heating Capacity

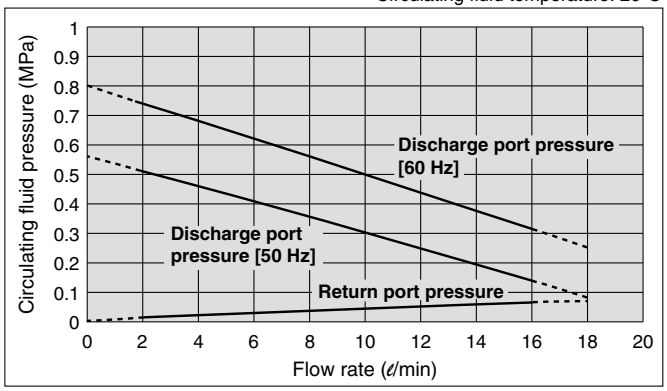
HRW002-H/008-H/015-H/030-H



Pumping Capacity

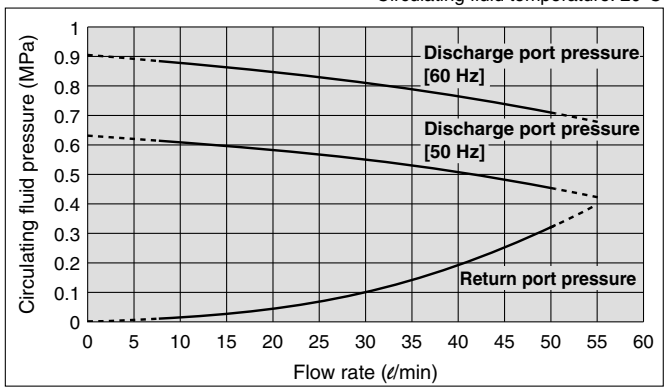
HRW002-H

Circulating fluid: Fluorinated fluids
Circulating fluid temperature: 20°C



HRW008-H/015-H/030-H

Circulating fluid: Fluorinated fluids
Circulating fluid temperature: 20°C



∗ When the circulating fluid flow is below
- 2 ℓ/min (HRW002-H)
- 8 ℓ/min (HRW008-H, 015-H, 030-H),

the built-in operation stop alarm will be activated. It is not possible to run the equipment.

Thermo-chiller Ethylene Glycol Type

Series HRW

How to Order

Ethylene Glycol Type **HRW** **002** – **H** **1** – □

Cooling capacity

Symbol	Cooling capacity
002	2 kW
008	8 kW
015	15 kW
030	30 kW

Temperature range setting

Symbol	Temperature range setting
H	20 to 90°C

Ethylene glycol type

Option

Symbol	Option
Nil	None
C	Analog communication
D	DeviceNet™ communication
N	NPT fitting
Y	DI control kit
Z	Circulating fluid automatic recovery

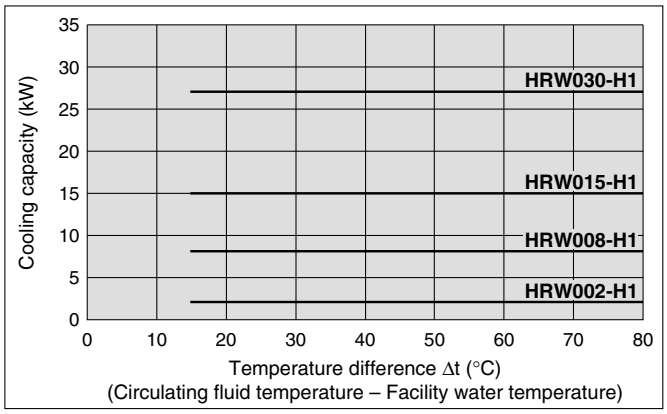
Specifications (For details, please consult our "Product Specifications" information.)

Model			HRW002-H1	HRW008-H1	HRW015-H1	HRW030-H1
Cooling method			Water-cooled type			
Ambient temp./humidity Note 1)			Temperature: 10 to 35, Humidity: 30 to 70%RH			
Circulating fluid system	**Circulating fluid** Note 2)		Ethylene glycol aqueous solution: 60%			
	Temp. range setting Note 1)	**(°C)**	20 to 90			
	Cooling capacity (50/60 Hz common)	**(kW)**	2	8	15	27
	Conditions **Circulating fluid temperature**	**(°C)**	Facility water temperature + 15			
	Conditions **Facility water temperature**	**(°C)**	10 to 35			
	Conditions **Circulating fluid rated flow**	**(ℓ/min)**	4	15	30	40
	Conditions **Facility water required flow**	**(ℓ/min)**	10	15	25	40
	Temp. stability Note 3)	**(°C)**	±0.3			
	Pumping capacity Note 4) **(50/60 Hz)**	**(MPa)**	0.35/0.55 (at 4 ℓ/min)	0.45/0.65 (at 15 ℓ/min)	0.40/0.60 (at 30 ℓ/min)	0.35/0.55 (at 40 ℓ/min)
	Tank capacity Note 5)	**(ℓ)**	Approx. 13			
	Circulating fluid recovery tank volume Note 6)	**(ℓ)**	12			
	Port size		Rc3/4			
	Wetted parts material		Nickel brazing (Heat exchanger), Stainless steel, EPDM, Silicon, PPS, Fluororesin			
Facility water system	**Temperature range**	**(°C)**	10 to 35			
	Required flow Note 7)	**(ℓ/min)**	10	15	25	40
	Inlet pressure range	**(MPa)**	0.3 to 0.7			
	Port size		Rc3/4			
	Wetted parts material		Nickel brazing (Heat exchanger), Stainless steel, EPDM, Silicon, Bronze, Brass			
Electrical system	**Power supply**		3-phase 200/200 to 208 VAC ± 10%			
	Max. operating current	**(A)**	26			
	Breaker capacity	**(A)**	30			
	Communications		Serial RS-485 (Dsub-9 Pin) and Contact input/output (Dsub-25 Pin)			
Dimensions Note 8)		**(mm)**	W380 x D665 x H860			
Weight Note 9)		**(kg)**	Approx. 90			
Safety standard			UL, CE marking, SEMI (S2-0703, S8-1103, F47-0200), SEMATECH (S2-93, S8-95)			

Note 1) It should have no condensation.
Note 2) Dilute pure ethylene glycol with clean water. Additives invading wetting parts material such as antiseptics cannot be used.
Note 3) Temperature at the outlet of the thermo-chiller obtained 10 minutes after the external load is stabilized (after stabilization with no load for HRW030-H1). There shall be rated flow of the circulating fluid and facility water with the circulating fluid supply and return directly connected. Also, the installation environment, power supply and facility water shall be stable within the specified range. It may be out of this range when a DI control kit (Option "Y") is used or in some other operating conditions.
Note 4) Circulating fluid temperature: The capacity of the circulating fluid discharge port at 20°C.
Note 5) Minimum volume required for operating only the thermo-chiller. (Circulating fluid temperature: 20°C, including the thermo-chiller's internal pipings or heat exchanger)
Note 6) To recover the circulating fluid inside the external pipings, the automatic circulating fluid recovering function will be provided by selecting "Z" for options.
Note 7) Required flow for cooling capacity or maintaining the temperature stability.
Note 8) Panel dimensions. All dimensions shown in the leaflet do not include possible protrusions e.g. a breaker handle.
Note 9) Weight in the dry state, without circulating fluids.

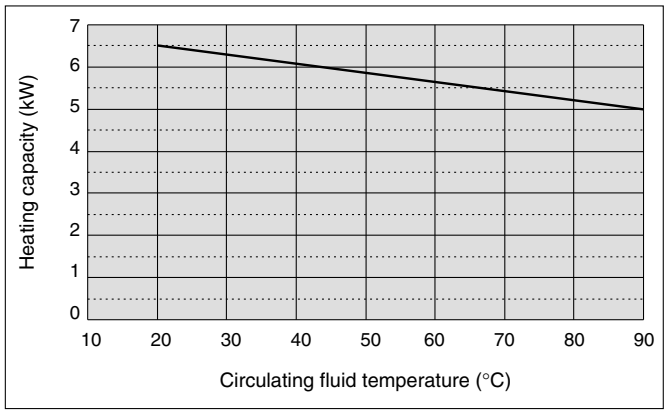
Cooling Capacity

HRW002-H1/008-H1/015-H1/030-H1



Heating Capacity

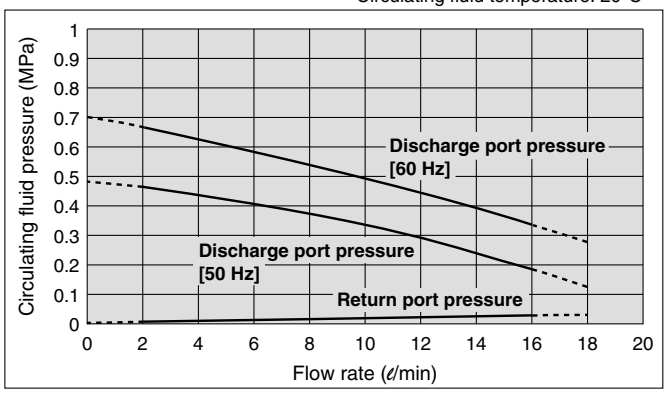
HRW002-H1/008-H1/015-H1/030-H1



Pumping Capacity

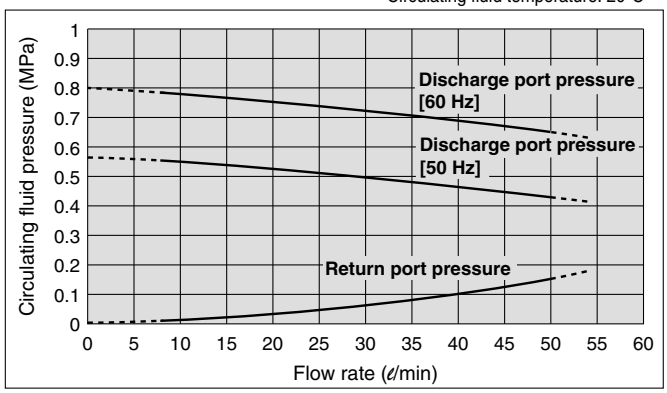
HRW002-H1

Circulating fluid: Ethylene glycol 60%
Circulating fluid temperature: 20°C



HRW008-H1/015-H1/030-H1

Circulating fluid: Ethylene glycol 60%
Circulating fluid temperature: 20°C



∗ When the circulating fluid flow is below
- 2 ℓ/min (HRW002-H1)
- 8 ℓ/min (HRW008-H1, 015-H1, 030-H1),

the built-in operation stop alarm will be activated. It is not possible to run the equipment.

Thermo-chiller Clean/DI Water Type

Series HRW

How to Order

Clean/DI Water Type **HRW** **002** – **H** **2** – □

Cooling capacity

Symbol	Cooling capacity
002	2 kW
008	8 kW
015	15 kW
030	30 kW

Temperature range setting

Symbol	Temperature range setting
H	20 to 90°C

Clean/DI water type

Option

Symbol	Option
Nil	None
C	Analog communication
D	DeviceNet™ communication
N	NPT fitting
Y	DI control kit
Z	Circulating fluid automatic recovery

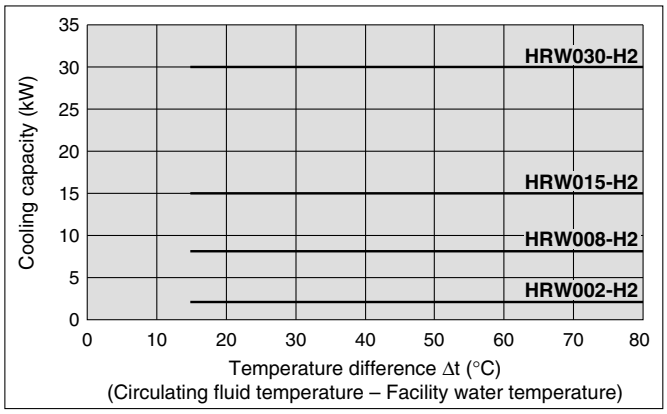
Specifications (For details, please consult our "Product Specifications" information.)

Model			HRW002-H2	HRW008-H2	HRW015-H2	HRW030-H2
Cooling method			Water-cooled type			
Ambient temp./humidity Note 1)			Temperature: 10 to 35, Humidity: 30 to 70%RH			
Circulating fluid system	**Circulating fluid** Note 2)		Clean water, DI water			
	Temp. range setting Note 1)	**(°C)**	20 to 90			
	Cooling capacity (50/60 Hz common)	**(kW)**	2	8	15	30
	Conditions **Circulating fluid temperature**	**(°C)**	Facility water temperature + 15			
	Conditions **Facility water temperature**	**(°C)**	10 to 35			
	Conditions **Circulating fluid rated flow**	**(ℓ/min)**	4	15	30	40
	Conditions **Facility water required flow**	**(ℓ/min)**	10	15	25	40
	Temp. stability Note 3)	**(°C)**	±0.3			
	Pumping capacity Note 4) **(50/60 Hz)**	**(MPa)**	0.35/0.55 (at 4 ℓ/min)	0.45/0.65 (at 15 ℓ/min)	0.40/0.60 (at 30 ℓ/min)	0.35/0.55 (at 40 ℓ/min)
	Tank capacity Note 5)	**(ℓ)**	Approx. 13			
	Circulating fluid recovery tank volume Note 6)	**(ℓ)**	12			
	Port size		Rc3/4			
	Wetted parts material		Nickel brazing (Heat exchanger), Stainless steel, EPDM, Silicon, PPS, Fluororesin			
Facility water system	**Temperature range**	**(°C)**	10 to 35			
	Required flow Note 7)	**(ℓ/min)**	10	15	25	40
	Inlet pressure range	**(MPa)**	0.3 to 0.7			
	Port size		Rc3/4			
	Wetted parts material		Nickel brazing (Heat exchanger), Stainless steel, EPDM, Silicon, Silicon, Brass			
Electrical system	**Power supply**		3-phase 200/200 AC to 208 V ± 10%			
	Max. operating current	**(A)**	26			
	Breaker capacity	**(A)**	30			
	Communications		Serial RS-485 (Dsub-9 Pin) and Contact input/output (Dsub-25 Pin)			
Dimensions Note 8)		**(mm)**	W380 x D665 x H860			
Weight Note 9)		**(kg)**	Approx. 90			
Safety standard			UL, CE marking, SEMI (S2-0703, S8-1103, F47-0200), SEMATECH (S2-93, S8-95)			

Note 1) It should have no condensation.
Note 2) If clean water or DI water is used, it should be in accordance with the Water Quality Standard of The Japan Refrigeration and Air Conditioning Industry Association (JRA GL-02-1994/cooling water system - circulation type - make-up water). The electrical conductivity of the DI water used as the fluid varies depending on operating conditions.
Note 3) Temperature at the outlet of the thermo-chiller obtained 10 minutes after the external load is stabilized (after stabilization with no load for HRW030-H2). There shall be rated flow of the circulating fluid and facility water with the circulating fluid supply and return directly connected. Also, the installation environment, power supply and facility water shall be stable within the specified range. It may be out of this range when a DI control kit (Option "Y") is used or in some other operating conditions.
Note 4) Circulating fluid temperature: The capacity of the circulating fluid discharge port at 20°C.
Note 5) Minimum volume required for operating only the thermo-chiller. (Circulating fluid temperature: 20°C, including the thermo-chiller's internal pipings or heat exchanger)
Note 6) To recover the circulating fluid inside the external pipings, the automatic circulating fluid recovering function will be provided by selecting "Z" for options.
Note 7) Required flow for cooling capacity or maintaining the temperature stability.
Note 8) Panel dimensions. All dimensions shown in the leaflet do not include possible protrusions e.g. a breaker handle.
Note 9) Weight in the dry state, without circulating fluids.

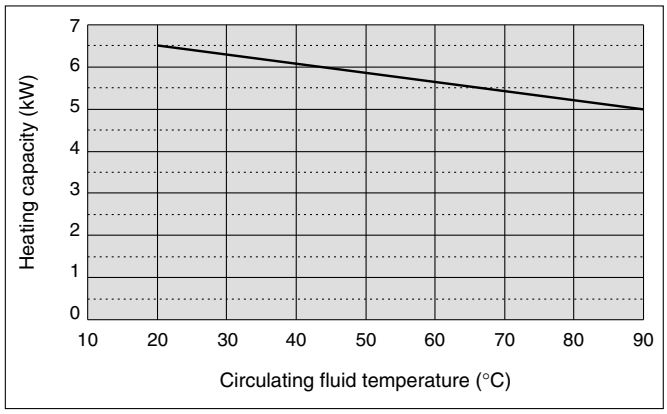
Cooling Capacity

HRW002-H2/008-H2/015-H2/030-H2



Heating Capacity

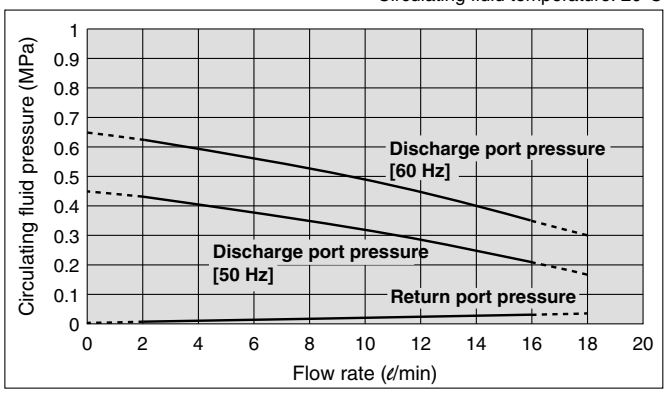
HRW002-H2/008-H2/015-H2/030-H2



Pumping Capacity

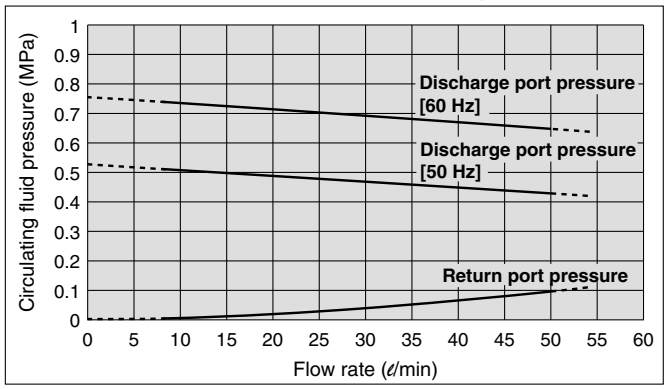
HRW002-H2

Circulating fluid: Clean water
Circulating fluid temperature: 20°C



HRW008-H2/015-H2/030-H2

Circulating fluid: Clean water
Circulating fluid temperature: 20°C

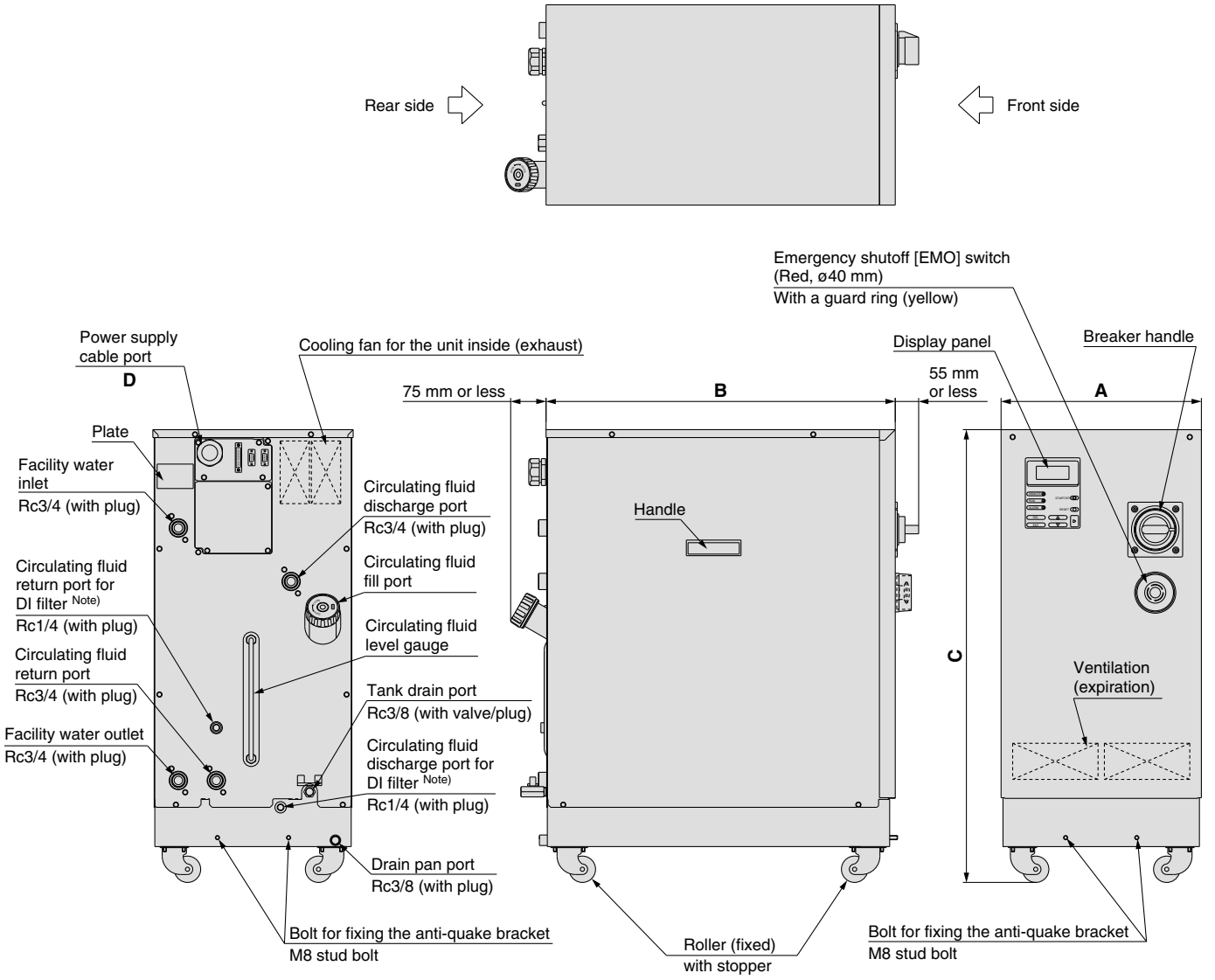


∗ When the circulating fluid flow is below
- 2 ℓ/min (HRW002-H2)
- 8 ℓ/min (HRW008-H2, 015-H2, 030-H2),

the built-in operation stop alarm will be activated. It is not possible to run the equipment.

Common Specifications

Dimensions



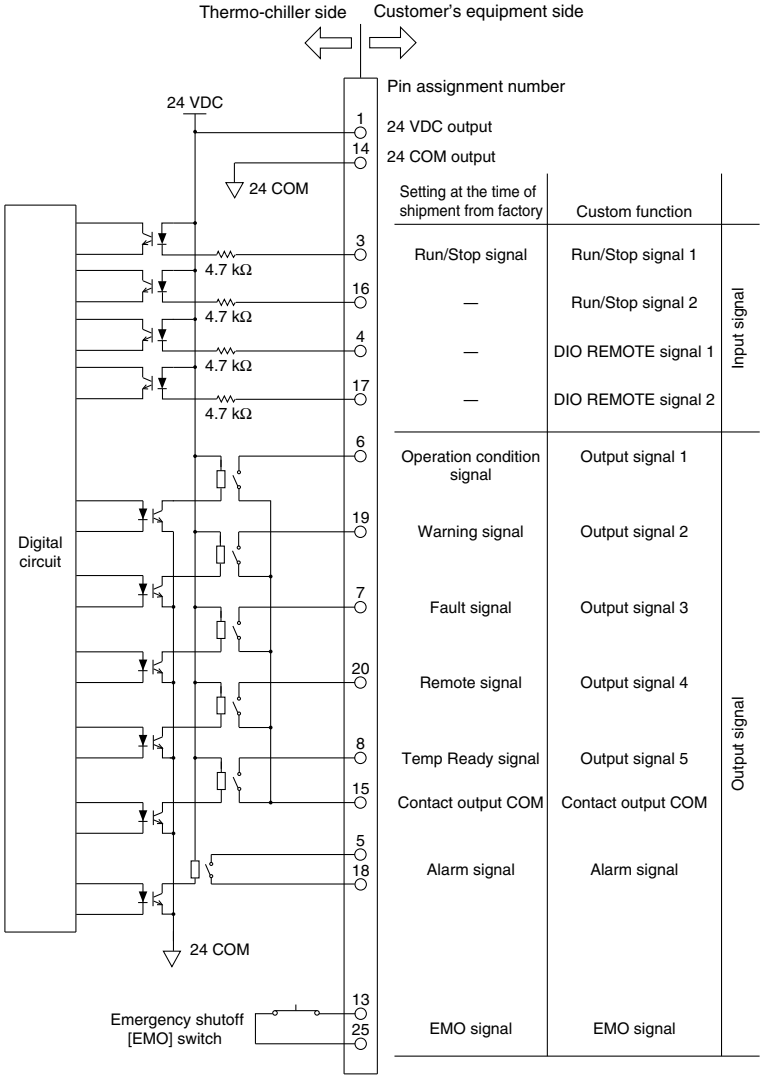
Note) Only when the DI control kit (Option "Y") is selected.

(mm)

Model			A	B	C	D
Fluorinated fluid type	Ethylene glycol type	Clean/DI water type				
HRW002-H **HRW008-H** **HRW015-H** **HRW030-H**	**HRW002-H1** **HRW008-H1** **HRW015-H1** **HRW030-H1**	**HRW002-H2** **HRW008-H2** **HRW015-H2** **HRW030-H2**	380	665	860	ø18.5 to 20.5

Communications (For details, please consult our “Communication Specifications” information.)

Contact Input/Output

Item		Specifications
Connector no.		P1
Connector type (on this product side)		D-sub 25 P type, Female connector
Fixing bolt size		M2.6 x 0.45
Input signal	Insulation method	Photocoupler
	Rated input voltage	24 VDC
	Operating voltage range	21.6 to 26.4 VDC
	Rated input current	5 mA TYP
	Input impedance	4.7 kΩ
Output signal	Rated load voltage	48 VAC or less / 30 VDC or less
	Maximum load current (total)	When using the power supply of the thermo-chiller: DC 200 mA (resistance load / inductive load) When using the power supply of the customer’s equipment: AC/DC 800 mA (resistance load / inductive load)
Alarm signal	Rated load voltage	48 VAC or less / 30 VDC or less
	Maximum load current	AC/DC 800 mA (resistance load / inductive load)
EMO signal	Rated load voltage	48 VAC or less / 30 VDC or less
	Maximum load current	AC/DC 800 mA (resistance load / inductive load)
Circuit diagram		

Note) The custom function is equipped for contact input/output. Using the custom function enables the customer to set the signal type for contact input/output or pin assignment numbers. For details, please consult “Communication Specifications” information.

Communications (For details, please consult our “Communication Specifications” information.)

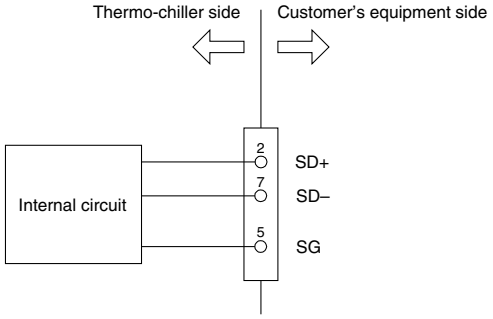
Serial RS-485

The serial RS-485 enables the following items to be written and read out.

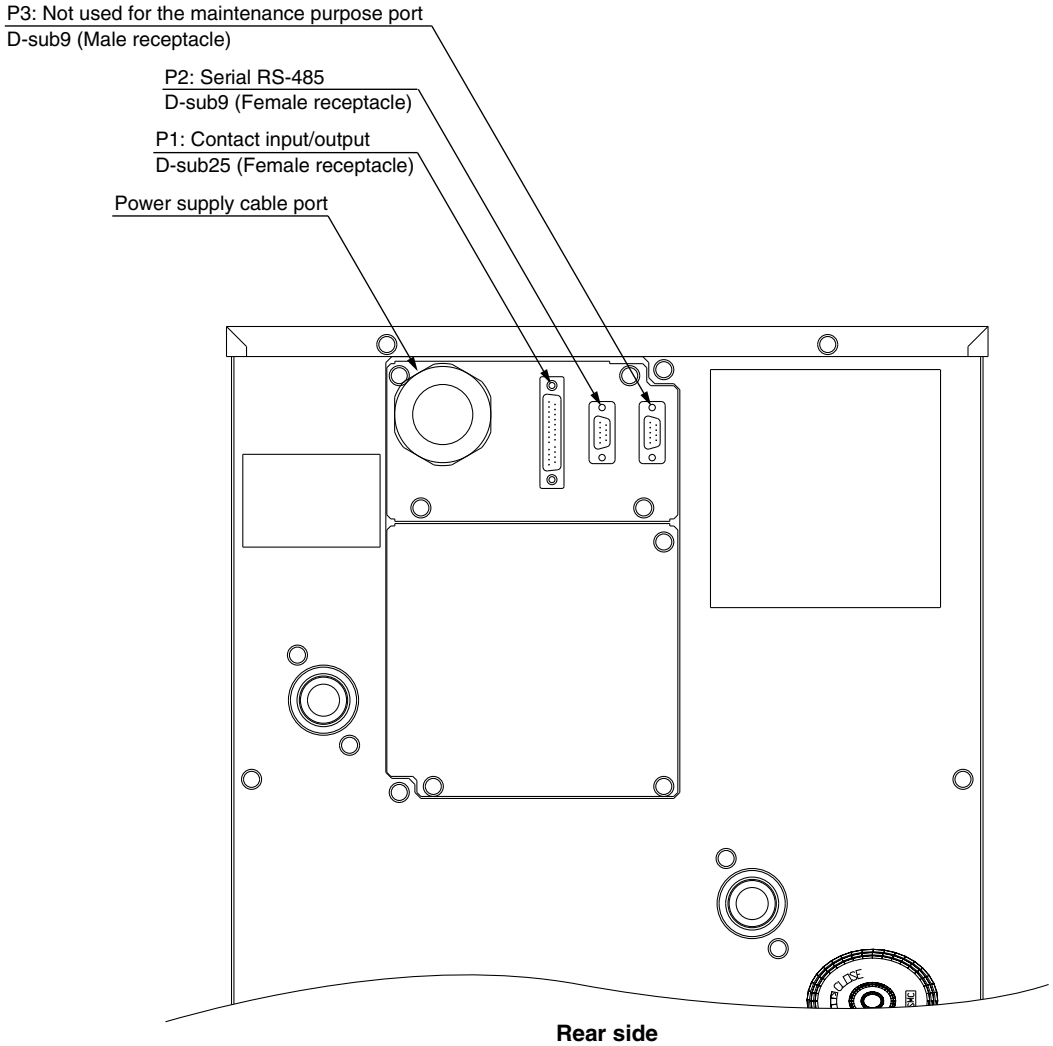
<Writing>
Run/Stop
Circulating fluid temperature setting
Circulating fluid automatic recovery start/stop*1

<Readout>
Circulating fluid present temperature
Circulating fluid flow
Circulating fluid discharge pressure
Circulating fluid electric resistivity*2
Alarm occurrence information
Status (operating condition) information

*1 Only when the circulating fluid automatic recovery function (Option “Z”) is selected.
*2 Only when the DI control kit (Option “Y”) is selected.

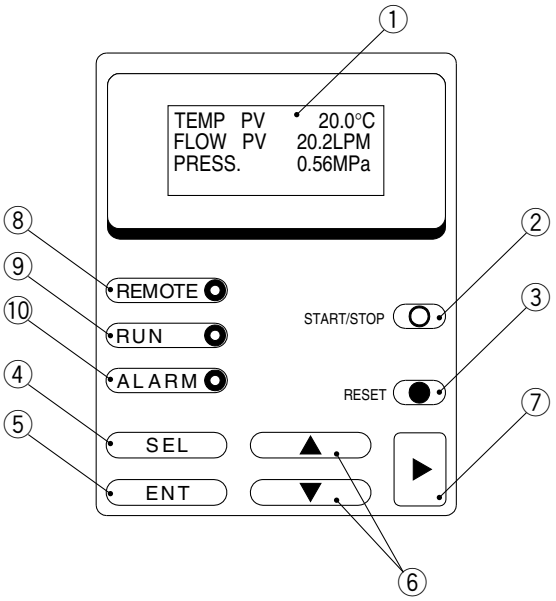
Item	Specifications
Connector no.	P2
Connector type (on this product side)	D-sub 9 P type, Female connector
Fixing bolt size	M2.6 x 0.45
Standard	EIA RS485
Protocol	Modicon Modbus
Circuit diagram	

Connector location



Rear side

Operation Panel Display



No.	Description	Function
①	**LCD screen**	Operating condition of this unit / Circulating fluid discharge temperature / Circulating fluid flow / Circulating fluid discharge pressure / Setting value / Alarm message, etc. are displayed.
②	**(START/STOP) key**	Starts/Stops the operation.
③	**(RESET) key**	Stops the alarm buzzing. Resets the alarm.
④	**(SEL) key**	Switches the display.
⑤	**(ENT) key**	Decides the settings.
⑥	**(▲) (▼) key**	Moves the cursor and changes the setting values.
⑦	**(▶) key**	Moves the cursor.
⑧	**(REMOTE) indicator light**	Blinks when the unit is in the remote status.
⑨	**(RUN) indicator light**	Blinks when the unit is in the operating status.
⑩	**(ALARM) indicator light**	Blinks when the unit is alarming.

Alarm

This unit can display 23 kinds of alarm messages as standard. Also, it can read out the serial RS-485 communication.

Alarm no.	Alarm message	Operation condition	Main reason
01	Water Leak Detect FLT	Stop	Liquid deposits in the drain pan of this unit.
02	Incorrect Phase Error FLT	Stop	The power supply to this unit is incorrect.
05	Reservoir Low Level FLT	Stop	The amount of circulating fluid tank is running low.
06	Reservoir Low Level WRN	Continue	The amount of circulating fluid tank is running low.
07	Reservoir High Level WRN	Continue	The amount of circulating fluid in the tank has increased.
08	Temp. Fuse Cutout FLT	Stop	Temperature of the circulating fluid tank is raised.
09	Reservoir High Temp. FLT	Stop	Temperature of the circulating fluid has exceeded the limitation.
10	Return High Temp. WRN	Continue	Temperature of returning circulating fluid has exceeded the limit.
11	Reservoir High Temp. WRN	Continue	Temperature of the circulating fluid has exceeded the limitation set by customer.
12	Return Low Flow FLT	Stop	The circulating fluid flow has gone below the limit.
13	Return Low Flow WRN	Continue	Flow rate of the thermo-chiller has dropped below the set value.
15	Pump Breaker Trip FLT	Stop	The protective equipment in the circulating fluid driving line has started.
17	Interlock Fuse Cutout FLT	Stop	Overcurrent is flown to the control circuit.
18	DC Power Fuse Cutout WRN	Continue	Overcurrent has flowed to the (optional) solenoid valve. (Only for the automatic circulating fluid recovery function - Option “Z”)
19	FAN Motor Stop WRN	Continue	Cooling fan inside the refrigerator has stopped.
21	Controller Error FLT	Stop	The error occurred in the control systems.
22	Memory Data Error FLT	Stop	The data stored in the controller of this unit went wrong.
23	Communication Error WRN	Continue	The serial communications between this unit and customer's system has been suspended.
24	DI Low Level WRN	Continue	DI level of the circulating fluid has gone below the limitation set by customer. (Only for DI control kit - Option “Y”)
26	DNET Comm. Error FLT	Stop	The DeviceNet communications between this unit and customer’s system has been suspended. (Only for DeviceNet communication specification - Option “D”)
27	DNET Comm. Error WRN	Continue	An error has occurred in the DeviceNet communication system of this unit. (Only for DeviceNet communication specification - Option “D”)
29	F.Water Low Temp. WRN	Continue	Temperature of facility water has dropped below the set temperature.
30	F.Water High Temp. WRN	Continue	Temperature of facility water has exceeded the set temperature.

Series HRW
Options

Note) Options have to be selected when ordering the thermo-chiller. It is not possible to add them after purchasing the unit.

C Option symbol: Analog Communication

HRW□□□ – □□ – C

Analog communication

In addition to the standard contact input/output signal communication and the serial RS-485 communication, analog communication function can be added.
The analog communication function enables to write and read out the following items.

<Writing>	<Readout>
Circulating fluid temperature setting	Circulating fluid present temperature
	Electric resistivity*

* Only when the DI control kit (Option "Y") is selected.

Scaling voltage - circulating fluid temperature can be set arbitrarily by customer.
For details, please consult our "Communication Specifications" information.

D Option symbol: DeviceNet™ Communication

HRW□□□ – □□ – D

DeviceNet™ communication

In addition to the standard contact input/output signal communication and the serial RS-485 communication, DeviceNet™ function can be added.
DeviceNet™ function enables to write and read out the following items.

<Writing>	<Readout>
Run/Stop	Circulating fluid present temperature
Circulating fluid temperature setting	Circulating fluid flow
	Circulating fluid discharge pressure
Circulating fluid automatic recovery start/stop*1	Electric resistivity*2
	Alarm occurrence information
	Status (operating condition) information

*1 Only when the circulating fluid automatic recovery function (Option "Z") is selected.
*2 Only when the DI control kit (Option "Y") is selected.

For details, please consult our "Communication Specifications" information.

N Option symbol: NPT Fitting

HRW□□□ – □□ – N

NPT fitting

Includes an adapter which converts the connection of the circulating fluid pipe or facility water pipe to NPT thread type. The adapter should be installed on the thermo-chiller by the customer.

Y Option symbol: DI Control Kit

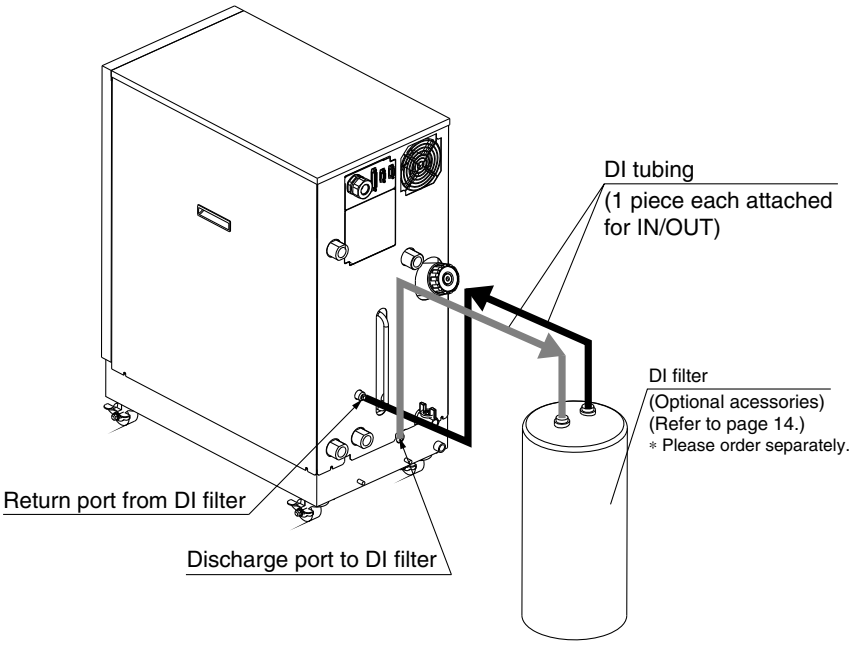
HRW□□□ – □□ – Y

DI control kit

Select this option if you want to maintain the electric resistivity (DI level) of the circulating fluid at a certain level. However, some components have to be fitted by customer. For details, refer to specification table for this option.
Please note that this is not applicable to the fluorinated liquid type.

Applicable models		HRW0□□-H1-Y	HRW0□□-H2-Y
Allowable circulating fluids	—	Ethylene glycol aqueous solution: 60%	DI water
DI level display range	MΩ•cm	0 to 20	
DI level set range	MΩ•cm	0 to 20 Note)	
Solenoid valve hysteresis for control	MΩ•cm	0 to 0.9	
DI level reduction alarm set range	MΩ•cm	0 to 20	

Note) The DI filter is needed to control the DI level. (SMC Part No.: HRZ-DF001)
Please purchase additionally because the DI filter is not included in this option. Also, if necessary, additionally purchase the insulating material for the DI filter. (SMC Part No.: HRZ-DF002)



* Install the DI filter outside the thermo-chiller for piping. Secure the space for installing the DI filter in the back side of the thermo-chiller.
* It may go outside of the temperature stability range of ±0.3°C when this option is used in some operating conditions.

Z Option symbol

Circulating Fluid Automatic Recovery

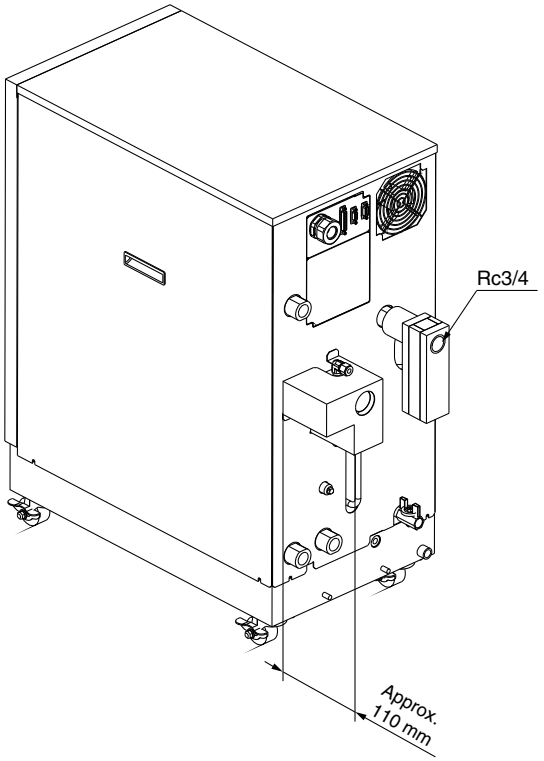
HRW□□□-□□-Z

Circulating fluid automatic recovery

Select this option for customers who want to use the circulating fluid automatic recovery function.
The automatic recovery function is a device which can recover the circulating fluid inside pipings into a sub tank of the thermo-chiller by the external communication or operating display panel.
Some components need to be fitted by the customer. For details, consult "Product Specifications" information for these options.

Applicable models		Common for all models
Circulating fluid recoverable volume Note 1)	ℓ	12
Purge gas	—	Nitrogen gas
Purge gas supply port	—	Self-align fitting for O.D. ø8 Note 2)
Purge gas supply pressure	MPa	0.4 to 0.7
Purge gas filtration	μm	0.01 or less
Regulator set pressure	MPa	0.15 to 0.3 Note 3)
Recoverable circulating fluid temperature	°C	10 to 40
Recovery start/stop	—	Start: External communication Note 4) or operation display panel / Stop: Automatic
Timeout error	sec	Timer from recovery start to completion Stops recovering when the timer turns to set time. Possible set range: 60 to 300, at the time of shipping from the factory: 300
Height difference with the customer system side	m	10 or less

Note 1) This is the space volume of the sub tank when the liquid level of the circulating fluid is within the specification. Guideline of the recovery volume is 80% of the circulating fluid recoverable volume.
Note 2) Before piping, clean inside the pipings with air blow, etc. Use the piping with no dust generation by purge gas. When using resin tubing, where necessary, use insert fittings, etc. in order not to deform the tubings when connecting to self-align fittings.
Note 3) At the time of shipping from factory, it is set to 0.2 MPa.
Note 4) For details, please consult our "Communication Specifications" information.



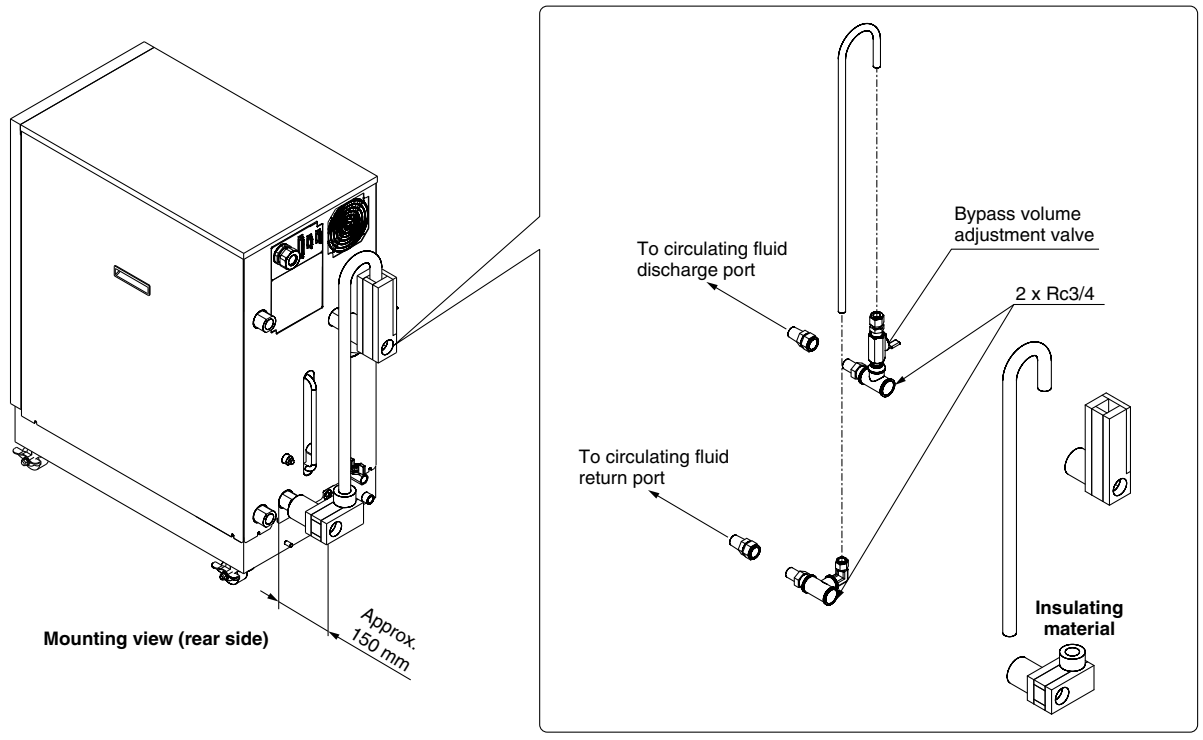
Optional Accessories

Note) Necessary to be fitted by the customer.

Bypass Piping Set

When the circulating fluid goes below the rated flow, cooling capacity will be reduced and the temperature stability will be badly affected. In such a case, use the bypass piping set.

Part no.	Applicable models
HRW-BP001	Common for all models

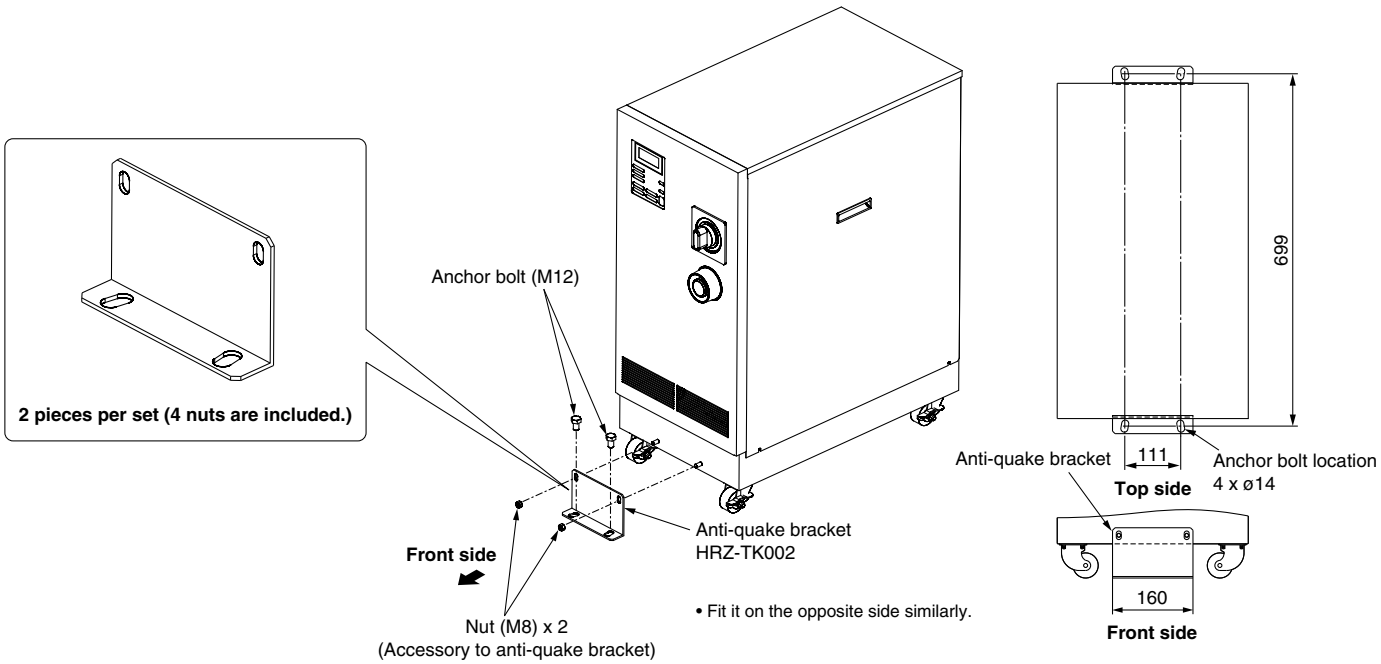


Anti-quake Bracket

Bracket for earthquakes
Prepare the anchor bolts (M12) which are suited to the floor material by customer.

Part no.	Applicable models
HRZ-TK002	Common for all models

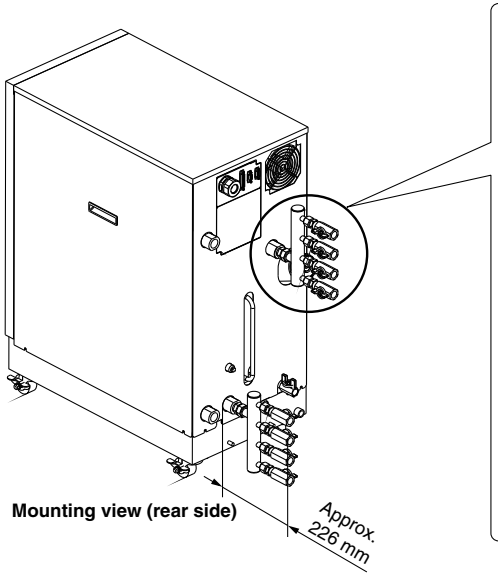
Note) 2 pieces per set (for 1 unit) (HRZ-TK002)



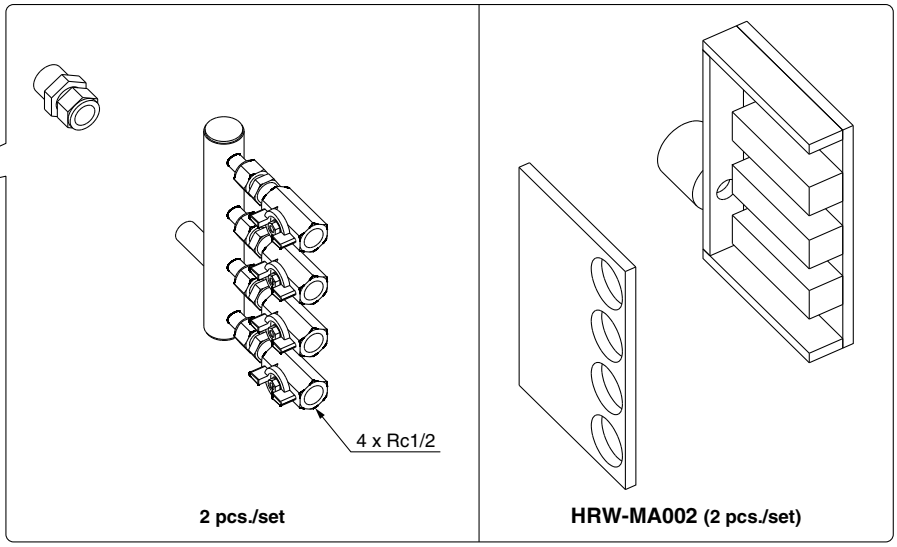
4 Port Manifold

4-branching the circulating fluid enables 4 temperature controls at the maximum with the 1 unit thermo-chiller. Order the heat insulator for 4 port manifold (HRW-MA002) separately if necessary.

Part no.	Applicable models
HRW-MA001	Common for all models
HRW-MA002	



Mounting view (rear side)



2 pcs./set

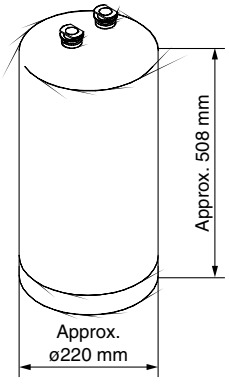
HRW-MA002 (2 pcs./set)

DI Filter

This is the ion replacement resin to maintain the electric resistivity of the circulating fluid.
Customers who selected the DI control kit (Option "Y") need to purchase the DI filter separately.

Part no.	Applicable models
HRZ-DF001	Common for all models which can select the DI control kit. (Option "Y")

Note) The DI filters are consumable. Depending on the status (electric resistivity set value, circulating fluid temperature, piping volume, etc.), product life cycles will vary accordingly.

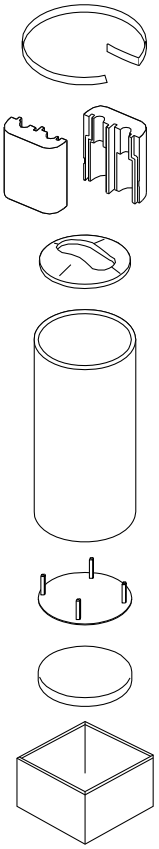


Weight: Approx. 20 kg

Insulating Material for DI Filter

When the DI filter is used at a high temperature, we recommend that you use this insulating material to protect the radiated heat from the DI filter or possible burns. We also recommend that you use this to prevent heat absorption from the DI filter and to avoid forming condensation.

Part no.	Applicable models
HRZ-DF002	Common for all models which can select the DI control kit. (Option "Y")



Contaminant Filter

A filter mounted in the circulating fluid circuit to eliminate the dust which is contained in the circulating fluid. (Filtration: 20 μm) It is provided with its own heat insulator.

Part no.	Applicable models
HRW-CF001	Common for all models
HRW-CF002	

Note) The internal element of the contaminant filter (part no.: HRW-CF002) is a replacement part. The period in service depends on the operating conditions.