Peltier-Type Chiller
Thermo-con (Water-cooled)
HEC-W Series

Note) Except HEC006, 012

How to Order

140 W, 320 W **HEC 003 – W 5 B –** ☐

Cooling capacity

001	140 W
003	320 W

Radiating method

W	Water-cooled

Power supply

5	100 to 240 VAC

Communication

A	RS-485
B	RS-232C

∗ Select B when communication is not used.

Option

Nil	None
F	With flow switch
N	NPT thread
L	With level switch

∗ The option should be specified when ordering.

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

Model		HEC001-W5A	HEC001-W5B	HEC003-W5A	HEC003-W5B
Cooling method		Thermoelectric device (Thermo-module)			
Radiating method		Water-cooled			
Control method		Cooling/Heating automatic shift PID control			
Ambient temperature/humidity		10 to 35°C, 35 to 80%RH (no condensation)			
Circulating fluid system	**Circulating fluid**	Tap water, 20% ethylene glycol			
	Operating temp. range	10.0 to 60.0°C (no condensation)			
	Cooling capacity	140 W∗1		320 W∗1	
	Heating capacity	400 W∗1		770 W∗1	
	Temperature stability∗2	±0.01 to 0.03°C			
	Pump capacity	Refer to performance chart.			
	Tank capacity	Approx. 1.2 L			
	Port size	IN/OUT: Rc3/8 Drain: Rc1/4 (with plug)			
	Fluid contact material	PPE, PP glass 10%, Alumina ceramics, Carbon, EPDM, Stainless steel 303, Stainless steel 304, PE, PP, NBR			
Facility water system	**Temperature range**	10 to 35°C (no condensation)			
	Pressure range	Within 1 MPa			
	Required flow rate∗3	3 to 7 L/min			
	Port size	IN/OUT: Rc3/8			
	Fluid contact material	Stainless steel 304			
Electrical system	**Power supply**	Single-phase 100 to 240 VAC ±10%, 50/60 Hz			
	Overcurrent protector	10 A			
	Current consumption	3.5 A (100 VAC) to 1.5 A (240 VAC)		5.5 A (100 VAC) to 2.5 A (240 VAC)	
	Alarm	Refer to alarm function.			
	Communications	RS-485	RS-232C	RS-485	RS-232C
Weight		Approx. 12 kg		Approx. 13 kg	
Accessories		Power cable, Foot for fixing, Splashproof cover			
Safety standards		CE/UKCA marking, UL (NRTL) standards, SEMI			

∗1 Circulating fluid/Tap water conditions: Circulating fluid set temperature 20°C, Flow rate 5 L/min., Facility water temperature 20°C, Flow rate 5 L/min., Ambient temperature 25°C
∗2 The indicated values are with a stable load without turbulence in the operating conditions. It may be out of this range in some other operating conditions.
∗3 The flow rate beyond the proper range may deteriorate performance or generate noise, causing the piping to break.

How to Order

600 W, 1200 W **HEC 012 – W 2 B –** □

Cooling capacity

006	600 W
012	1200 W

Radiating method

W	Water-cooled

Power supply

2	200 to 220 VAC

Option

Nil	None
N	NPT thread

∗ The option should be specified when ordering.

Communication

A	RS-485
B	RS-232C

∗ Select B when communication is not used.

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

Model		HEC006-W2A	HEC006-W2B	HEC012-W2A	HEC012-W2B
Cooling method		Thermoelectric device (Thermo-module)			
Radiating method		Water-cooled			
Control method		Cooling/Heating automatic shift PID control			
Ambient temperature/humidity		10 to 35°C, 35 to 80%RH (no condensation)			
Circulating fluid system	**Circulating fluid**∗1	Tap water, Fluorinated fluid (Fluorinert™ FC-3283, GALDEN® HT135)			
	Operating temperature range	10.0 to 60.0°C (no condensation)			
	Cooling capacity	600 W (Tap water), 400 W (Fluorinert™ FC-3283)∗2		1200 W (Tap water), 800 W (Fluorinert™ FC-3283)∗3	
	Heating capacity	900 W (Tap water), 600 W (Fluorinert™ FC-3283)∗2		2200 W (Tap water), 1500 W (Fluorinert™ FC-3283)∗3	
	Temperature stability∗4	±0.01 to 0.03°C			
	Pump capacity	Refer to performance chart.			
	Tank capacity	Approx. 3 L		Approx. 5 L	
	Port size	IN/OUT: Rc3/8 Drain: Rc1/4 (with plug)		IN/OUT: Rc3/4 Drain: Rc1/4 (with plug)	
	Fluid contact material	Stainless steel 303, Stainless steel 304, EPDM, Ceramics, PPS glass 30%, Carbon, PE, Polyurethane		Stainless steel 303, Stainless steel 304, EPDM, Ceramics, PP, PE, Polyurethane, SiC, PPS	
Facility water system	**Temperature range**	10 to 35°C (no condensation)			
	Pressure range	Within 1 MPa			
	Required flow rate∗5	8 to 15 L/min		10 to 15 L/min	
	Port size	IN/OUT: Rc3/8		IN/OUT: Rc1/2	
	Fluid contact material	Stainless steel 303, Stainless steel 304			
Electrical system	**Power supply**	Single-phase 200 to 220 VAC ±10%, 50/60 Hz			
	Overcurrent protector	10 A		15 A	
	Current consumption	5 A		10 A	
	Alarm	Refer to alarm function.			
	Communications	RS-485	RS-232C	RS-485	RS-232C
Weight		Approx. 25 kg (including foot for fixing)		Approx. 40 kg (including foot for fixing)	
Accessories		Power cable, Foot for fixing			
Safety standards		CE/UKCA marking			

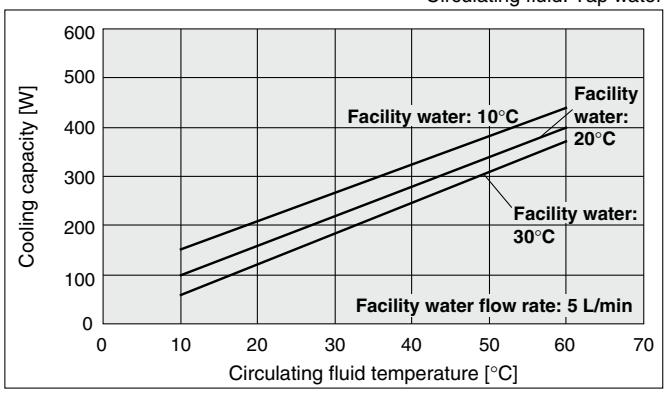
∗1 GALDEN® is a registered trademark, belonging to the Solvay Group or its corresponding owner. Fluorinert™ is a trademark of 3M. Regarding the fluid other than the above, please consult with SMC.
∗2 Conditions: Set temperature 25°C, Facility water temperature 20°C, Facility water flow rate 8 L/min, Ambient temperature 25°C.
∗3 Conditions: Set temperature 25°C, Facility water temperature 20°C, Facility water flow rate 10 L/min, Ambient temperature 25°C.
∗4 The indicated values are with a stable load without turbulence in the operating conditions. It may be out of this range in some other operating conditions.
∗5 The flow rate beyond the proper range may deteriorate performance or generate noise, causing the piping to break.

The values shown on the performance chart are not guaranteed, but typical. Allow margins for safety when selecting the model.

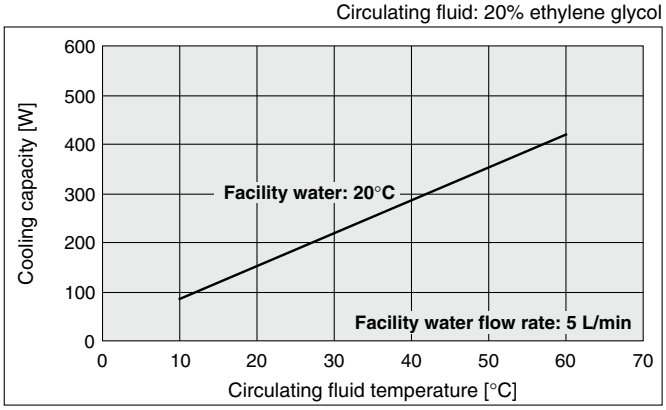
Cooling Capacity

HEC001

Circulating fluid: Tap water

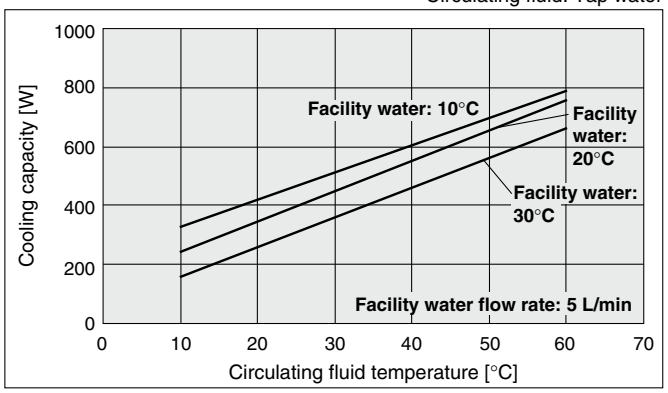


Circulating fluid: 20% ethylene glycol

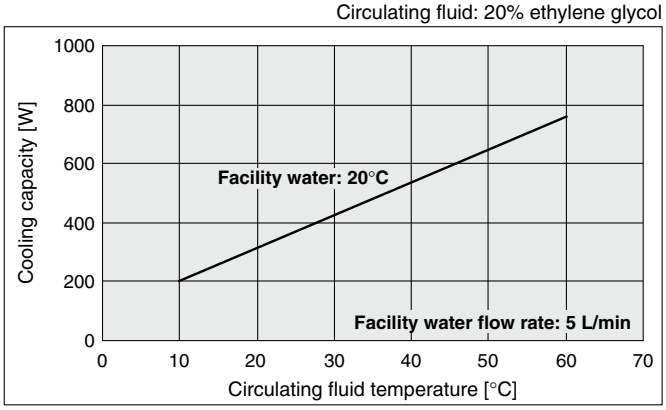


HEC003

Circulating fluid: Tap water

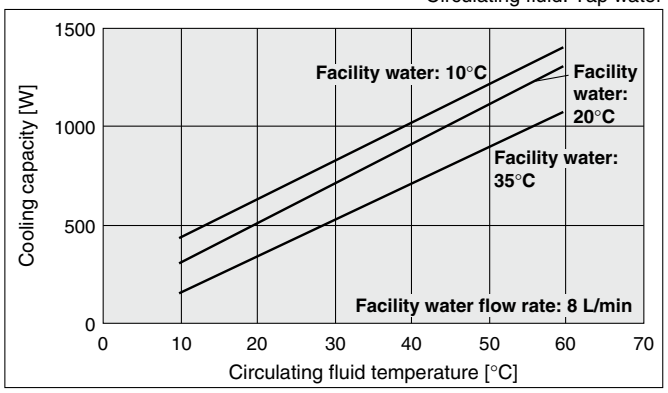


Circulating fluid: 20% ethylene glycol

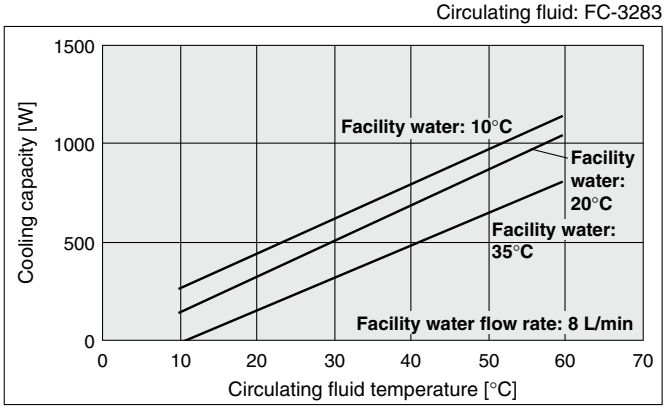


HEC006

Circulating fluid: Tap water

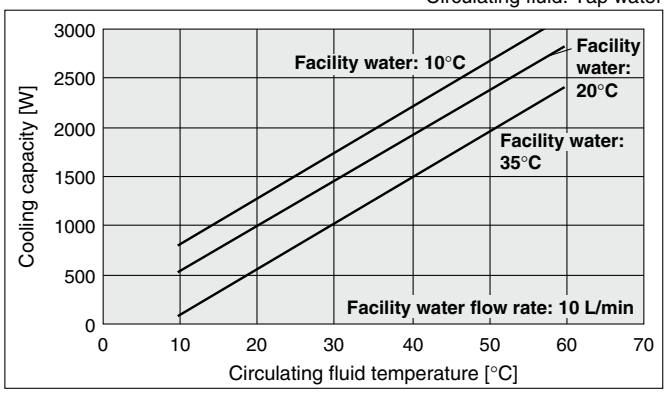


Circulating fluid: FC-3283

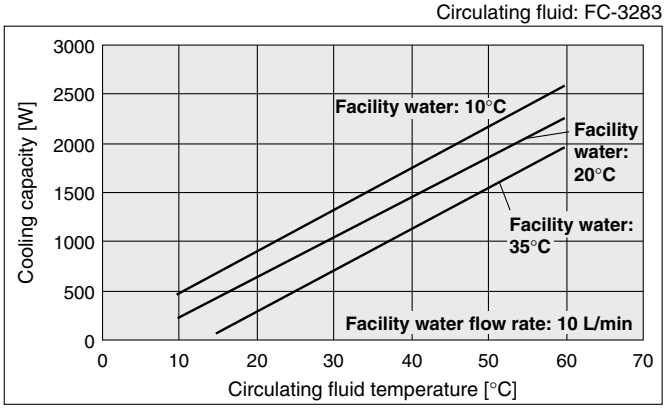


HEC012

Circulating fluid: Tap water



Circulating fluid: FC-3283

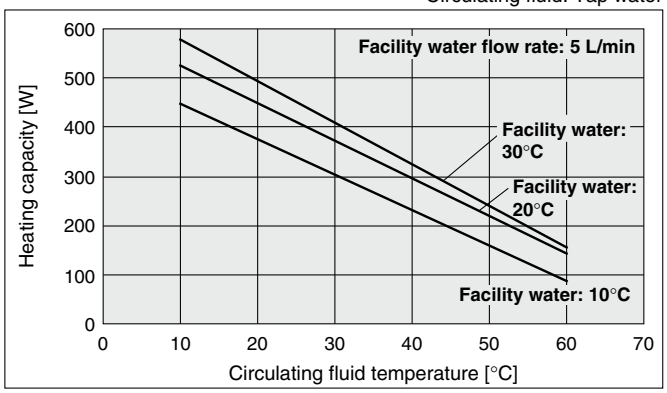


The values shown on the performance chart are not guaranteed, but typical. Allow margins for safety when selecting the model.

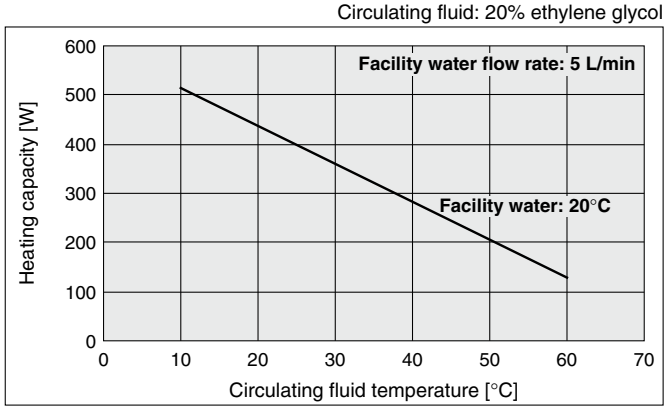
Heating Capacity

HEC001

Circulating fluid: Tap water

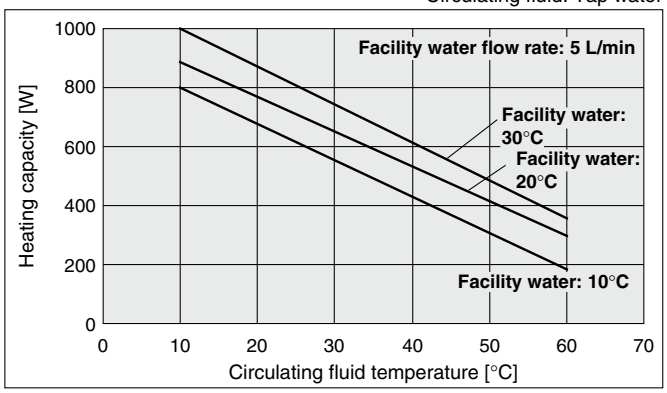


Circulating fluid: 20% ethylene glycol

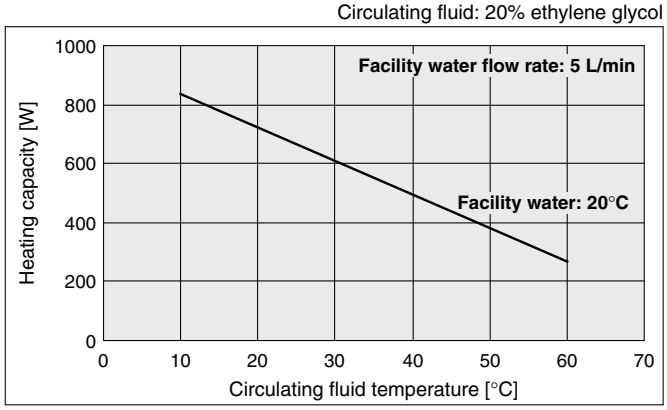


HEC003

Circulating fluid: Tap water

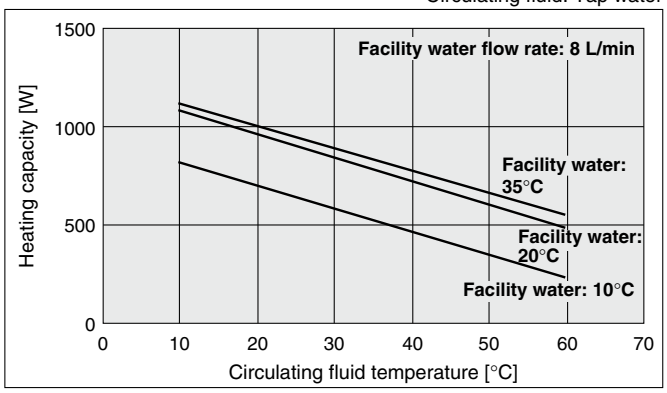


Circulating fluid: 20% ethylene glycol

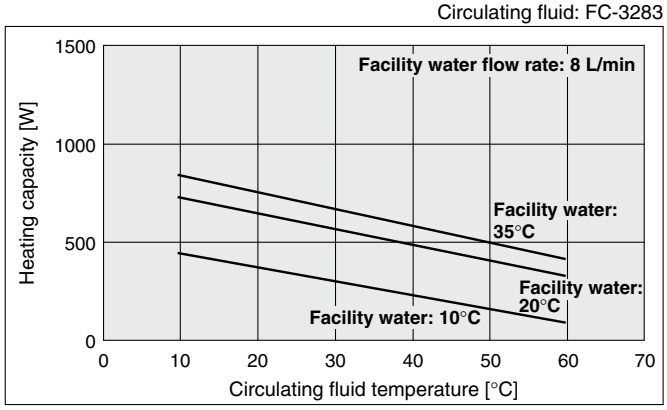


HEC006

Circulating fluid: Tap water

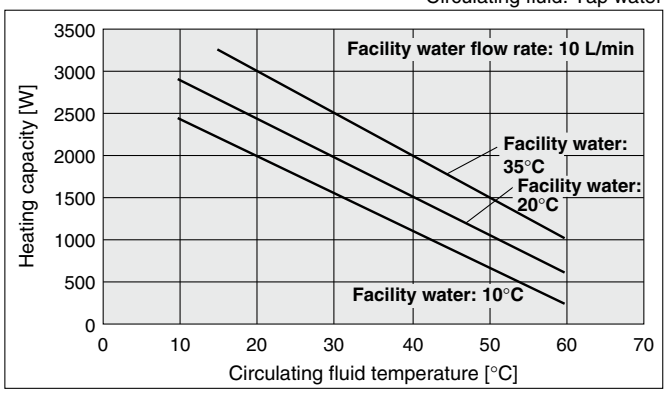


Circulating fluid: FC-3283

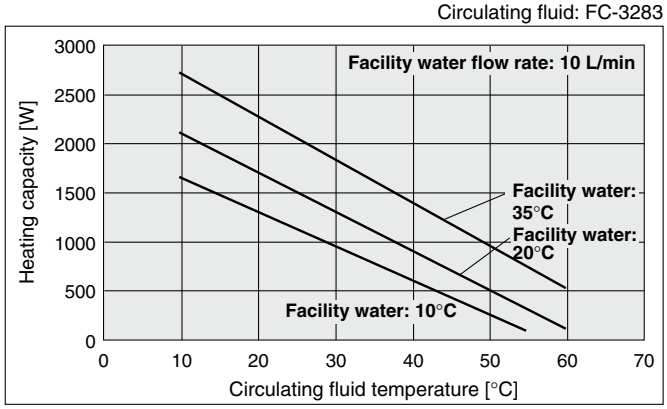


HEC012

Circulating fluid: Tap water

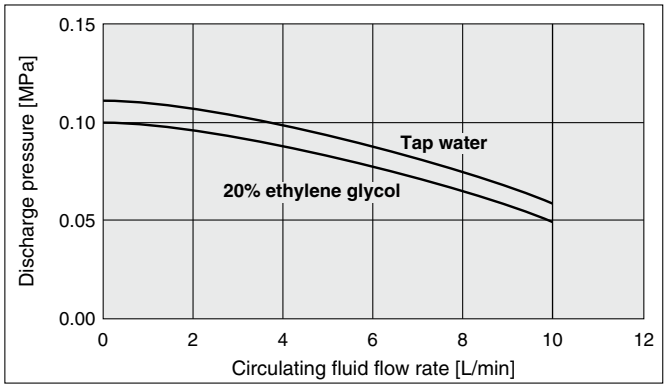


Circulating fluid: FC-3283

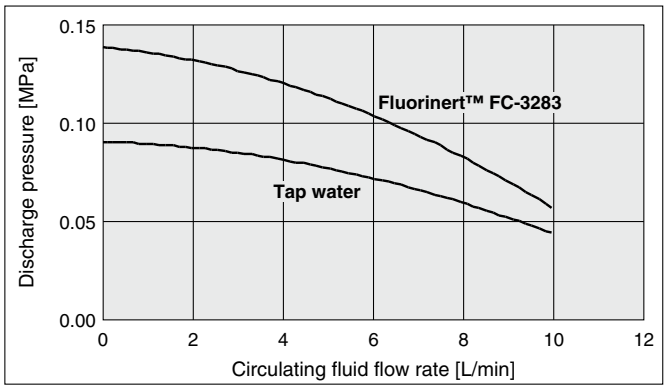


Pump Capacity (Thermo-con Outlet)

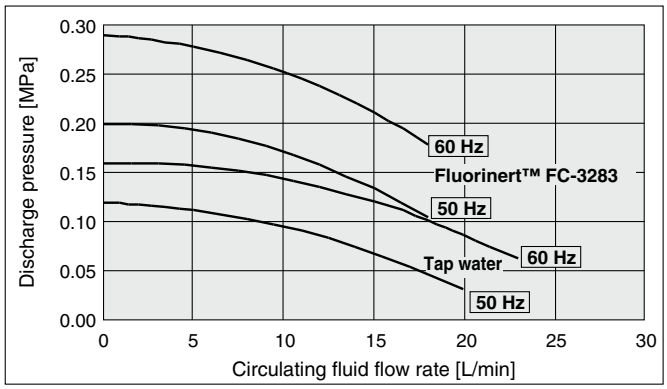
HEC001/003
Since a DC pump is used, the unit is not affected by power requirements.



HEC006
Since a DC pump is used, the unit is not affected by power requirements.

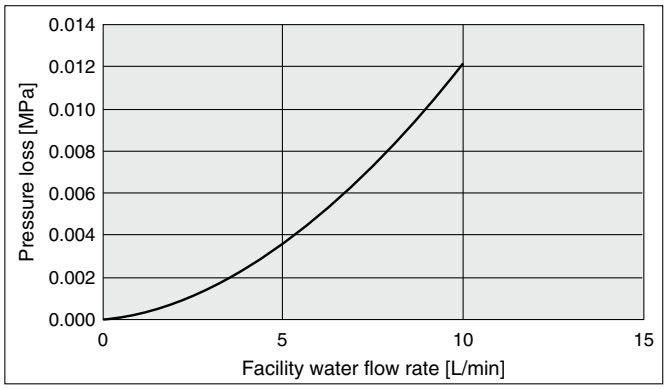


HEC012

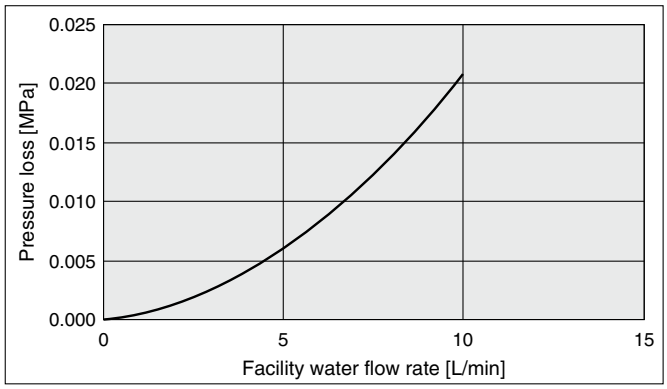


Pressure Loss in Facility Water Circuit

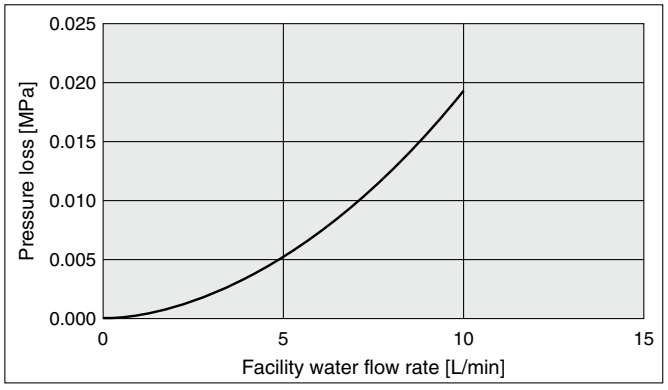
HEC001



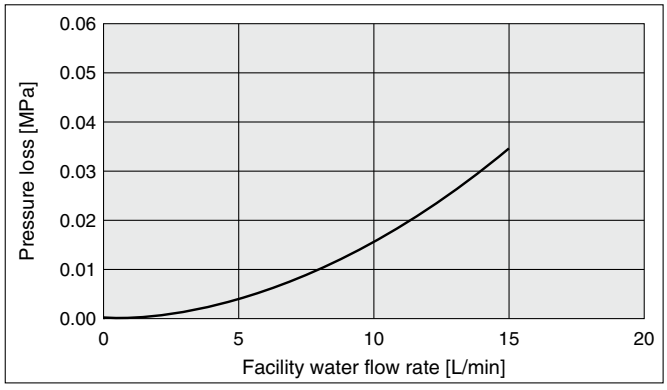
HEC003



HEC006

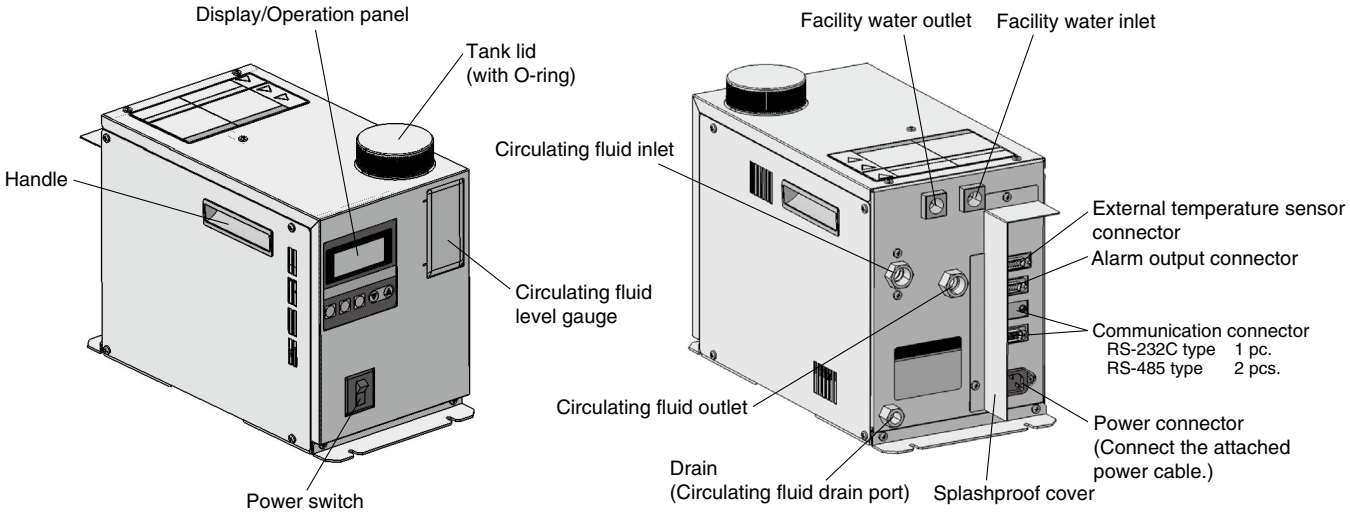


HEC012

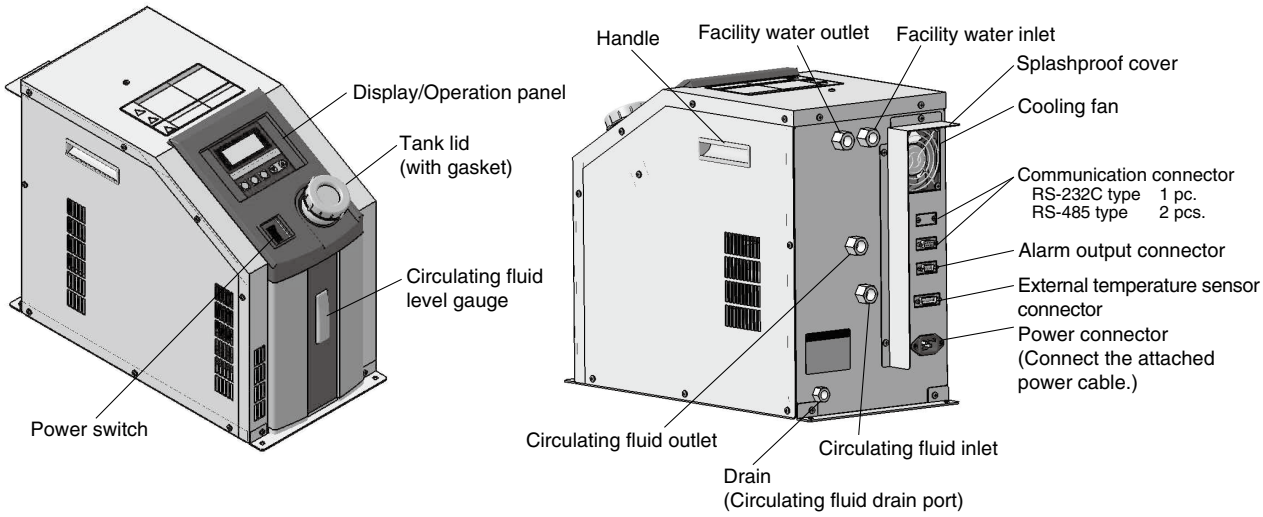


Parts Description

HEC001/003

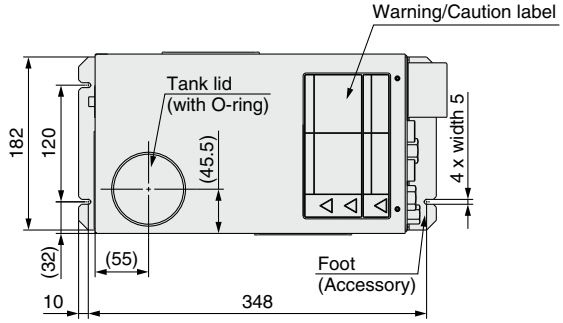


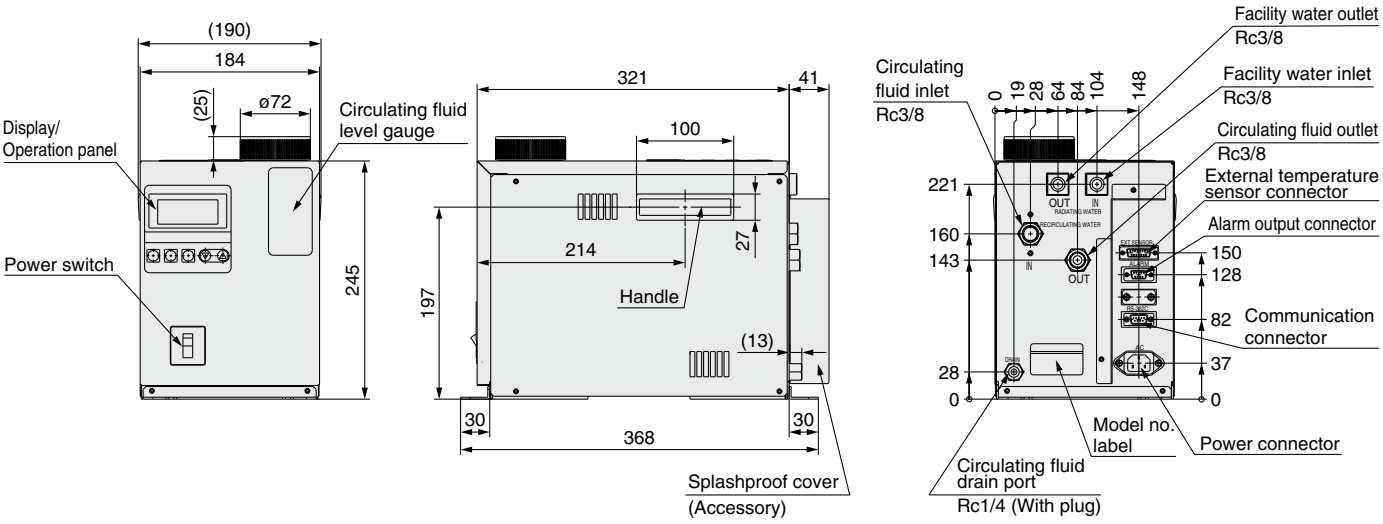
HEC006/012



Dimensions

HEC001-W5□
HEC003-W5□



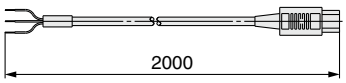


For NPT thread specification (-N), all fittings (including those at the circulating fluid drain port) are made of NPT.

Power Cable (Accessory)

Connector: IEC 60320 C13 or equivalent
Cable: 14AWG, O.D. ø8.4

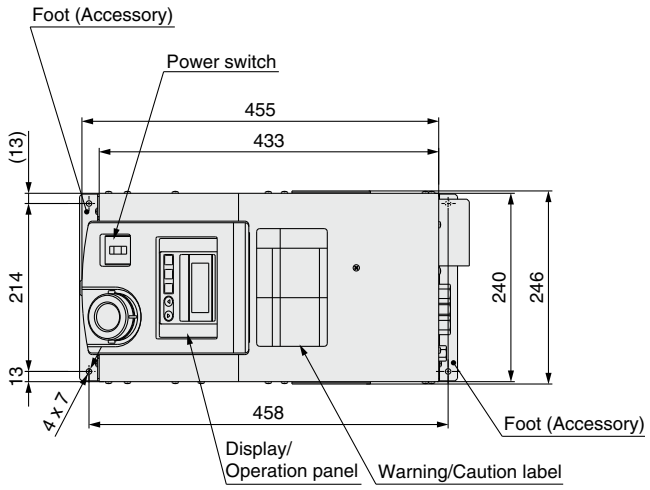
Wire color	Contents
Black	100 to 240 VAC
Black	100 to 240 VAC
Green/Yellow	PE

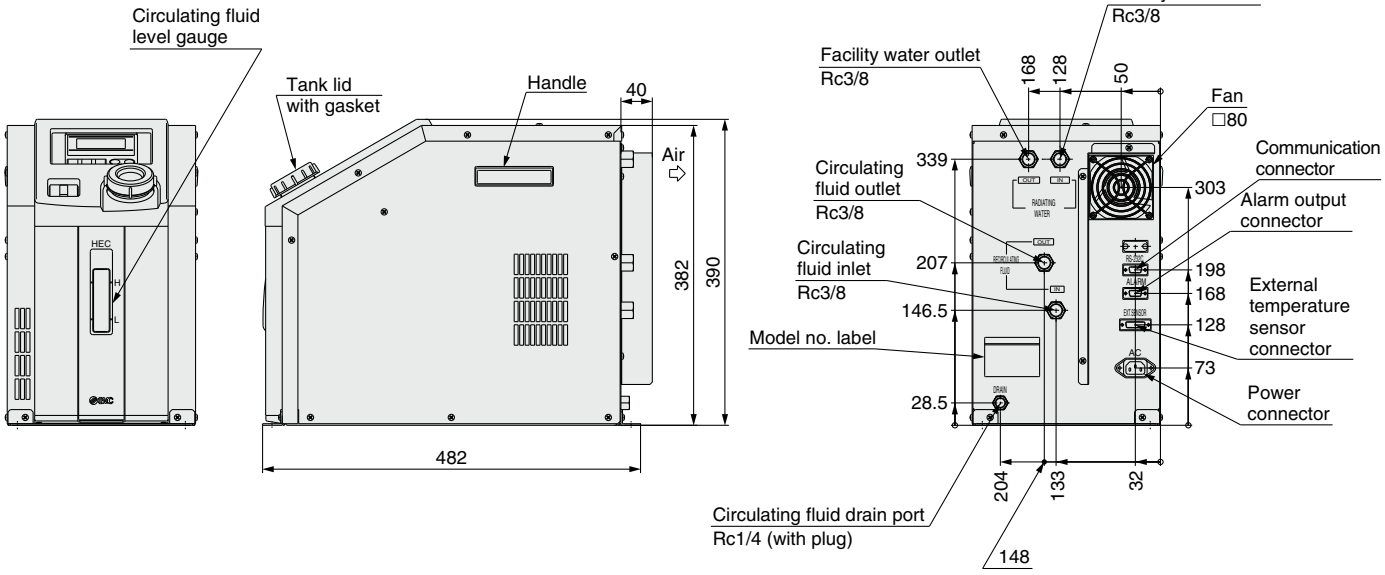


Power cable (Accessory)

Dimensions

HEC006-W2□



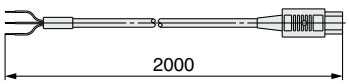


For NPT thread specification (-N), all fittings (including those at the circulating fluid drain port) are made of NPT.

Power Cable

Connector: IEC 60320 C13 or equivalent
Cable: 14AWG, O.D. ø8.4

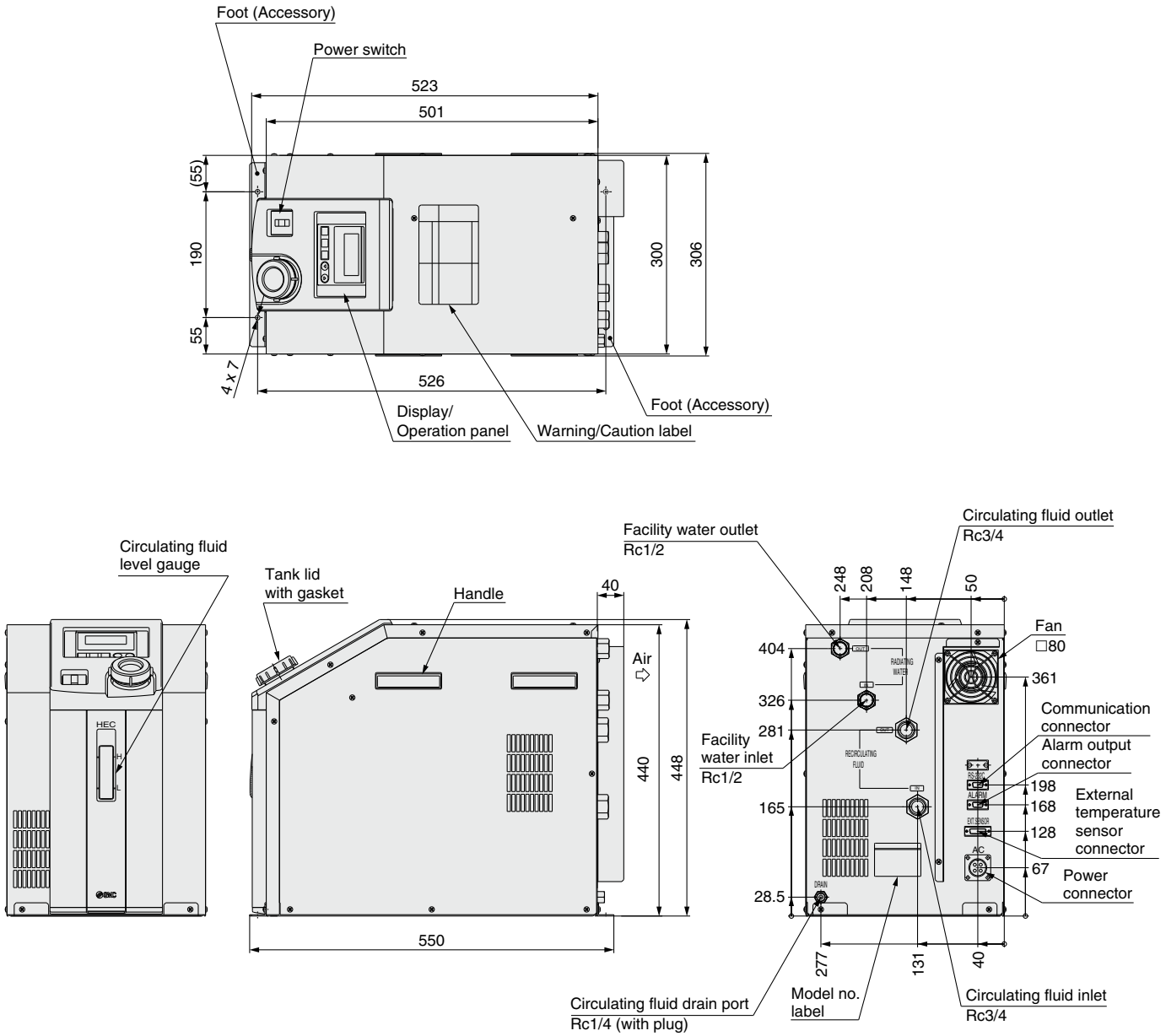
Wire color	Contents
Black	200 to 220 VAC
Black	200 to 220 VAC
Green/Yellow	PE



Power cable (Accessory)

Dimensions

HEC012-W2□

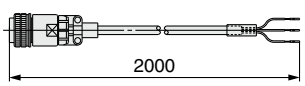


For NPT fitting specification (-N), all fittings (including those at the circulating fluid drain port) are made of NPT.

Power Cable

Connector: DDK CE05-6A18-10SD-D-BSS or equivalent
Cable: 14AWG, O.D. ø8.4

Wire color	Contents
Black	200 to 220 VAC
Black	200 to 220 VAC
Green/Yellow	PE



Power cable (Accessory)

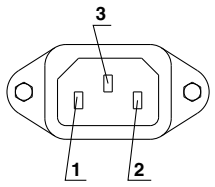
Connectors

HEC006-W2□/001-W5□/003-W5□

1. Power connector (AC)
IEC 60320 C14 or equivalent **HEC001-W5□**
HEC006-W2□ **HEC003-W5□**

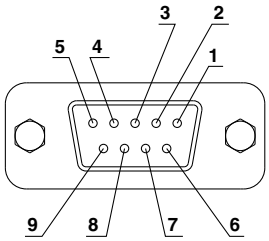
Pin No.	Contents
1	200 to 220 VAC
2	200 to 220 VAC
3	PE

Pin No.	Contents
1	100 to 240 VAC
2	100 to 240 VAC
3	PE



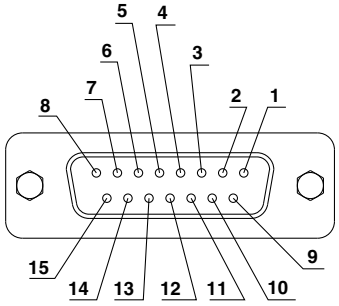
2. Communication connector (RS-232C or RS-485)
D-sub 9 pin (socket)
Holding screw: M2.6

Pin No.	Signal contents	
	RS-232C	RS-485
1	Unused	BUS+
2	RD	BUS–
3	SD	Unused
4	Unused	Unused
5	SG	SG
6-9	Unused	Unused



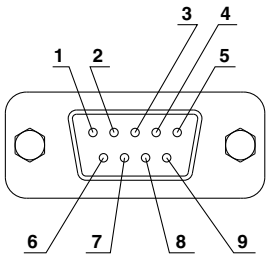
3. External sensor connector (EXT.SENSOR)
D-sub 15 pin (socket)
Holding screw: M2.6

Pin No.	Signal contents
1-2	Unused
3	Terminal A of resistance temperature detector
4	Terminal B of resistance temperature detector
5	Terminal B of resistance temperature detector
6-14	Unused
15	FG



4. Alarm output connector (ALARM)
D-sub 9 pin (pin)
Holding screw: M2.6

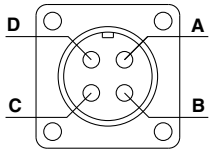
Pin No.	Signal contents
1	Contact a for output cut-off alarm (open when alarm occurs)
2	Common for output cut-off alarm
3	Contact b for output cut-off alarm (closed when alarm occurs)
4-5	Unused
6	Contact a for upper/lower temp. limit alarm (open when alarm occurs)
7	Common for upper/lower temp. limit alarm
8	Contact b for upper/lower temp. limit alarm (closed when alarm occurs)
9	Unused



HEC012-W2□

Power connector (AC)
DDK CE05-2A18-10PD-D or equivalent

Pin No.	Contents
A	200 to 220 VAC
B	200 to 220 VAC
C	Unused
D	PE



Other connectors are the same as those for the HEC006-W2□.

Alarm

This unit is equipped as standard with a function allowing 16 kinds of alarms to display on the LCD and can be read out by serial communication. Also, it can generate relay output for upper/lower temperature limit alarm and output cut-off alarm.

Alarm code	Alarm description	Operation status	Main reason
WRN	Upper/Lower temp. limit alarm	Continue	The temperature has exceeded the upper or lower limit of the target temperature.
ERR00	CPU hung-up	Stop	The CPU has crashed due to noise, etc.
ERR01	CPU check error	Stop	The contents of the CPU cannot be read out correctly when the power supply is turned on.
ERR03	Back-up data error	Stop	The contents of the back-up data cannot be read out correctly when the power supply is turned on.
ERR04	EEPROM writing error	Stop	The data cannot be written to EEPROM.
ERR05	EEPROM input over time error*4	Stop	The number of times of writing to EEPROM has exceeded 1 million times.
ERR11	DC power supply failure	Stop	The DC power supply has failed (due to abnormal high temperature) or an irregular voltage has occurred or the thermo-module has been short-circuited.
ERR12	Internal temp. sensor high temp. error	Stop	The internal temperature sensor has exceeded the upper limit of cut-off temperature.
ERR13	Internal temp. sensor low temp. error	Stop	The internal temperature sensor has exceeded the lower limit of cut-off temperature.
ERR14	Thermostat alarm	Stop	The thermostat has been activated due to insufficient of the facility water or high temperature.
ERR15	Abnormal output alarm	Continue	The temperature cannot be changed even at 100% output due to overload or disconnection of the thermo-module.
ERR16	Pump failure*1 or low circulating fluid level alarm*2	Stop	The pump has been overloaded*1 or the flow switch is activated*2.
ERR17	Internal temp. sensor disconnection alarm	Stop	The internal temperature sensor has been disconnected or short-circuited.
ERR18	External temp. sensor disconnection alarm	Continue	The external temperature sensor has been disconnected or short-circuited. (Only detected when in learning control or external tune control.)
ERR19	Abnormal auto tuning alarm	Stop	Auto tuning has not been completed within 20 minutes.
ERR20	Low fluid level alarm*3	Stop	The amount of circulating fluid in the tank has dropped and the level switch is activated.

*1 The HEC012 only
*2 Optional for the HEC001 and HEC003 only (Not available for the HEC006)
*3 Optional for the HEC001 and HEC003
*4 The HEC001 and HEC003 only

Maintenance

Maintenance of this unit is performed only in the form of return to and repair at SMC's site. As a rule, SMC will not conduct on-site maintenance. Separately, the following parts have a limited life and need to be replaced before the life ends.

Parts Life Expectation

Description	Expected life	Possible failure
Pump	3 to 5 years	The bearing is worn so the pump fails to transfer the circulating fluid, which results in temperature control failure.
Fan	5 to 10 years	The bearing uses up lubrication and makes the fan unable to supply enough air, which increases the internal temperature of the thermo-con, and activates the overheat protection of the power supply and generates the alarm.
DC power supply	5 to 10 years	The capacity of the electrolytic condenser decreases, and causes abnormal voltage which results in DC power supply failure and stops the thermo-con.
Display panel	50,000 hours (approx. 5 years)	The display turns off when the backlight of the LCD reaches the end of its life.

HEC-W Series
Options

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

F Option symbol

With Flow Switch

HEC□□□-□□□-F

With flow switch

This is an ON/OFF switch detecting low levels of the circulating fluid.
When the fluid volume is 1 L/min. or less, “ERR16” is displayed and the thermo-con stops. This switch is installed between the circulating fluid inlet and the tank, and built into the Thermo-con.
Refer to page 442.

Type	Applicable model
Water-cooled	**HEC001-W5□-F**
	HEC003-W5□-F

N Option symbol

NPT Thread

HEC□□□-□□□-N

NPT thread

The connection parts of circulating fluid piping, facility water piping and circulating fluid drain port are NPT thread type.

Type	Applicable model
Water-cooled	**HEC001-W5□-N**
	HEC003-W5□-N
	HEC006-W2□-N
	HEC012-W2□-N

L Option symbol

With Level Switch

HEC□□□-□□□-L

With level switch

This switch is used to detect a LOW level of tank fluid. When the fluid level becomes below the LOW level, “ERR20” is displayed and the thermo-con stops. This switch is installed in the circulating fluid tank and built into the thermo-con.
Refer to page 442.

Type	Applicable model
Water-cooled	**HEC001-W5□-L**
	HEC003-W5□-L

Other models include a level switch as standard equipment.