



ORIGINAL INSTRUCTIONS

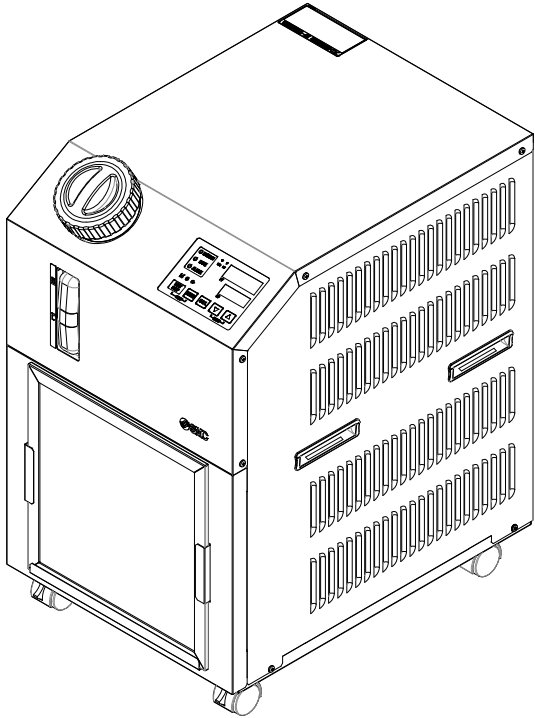


Refer to Declaration of
Conformity for relevant
Directives

Instruction Manual

Thermo Chiller

HRS018/030-A*-20-*-R



This product uses a built-in pump to circulate a liquid such as water, adjusted to a constant temperature by the refrigeration circuit. This circulating liquid cools parts of customer's machine that generates heat.

1 Safety Instructions

These safety instructions are intended to prevent hazardous situations and/or equipment damage. These instructions indicate the level of potential hazard with the labels of "Caution," "Warning" or "Danger." They are all important notes for safety and must be followed in addition to International Standards (ISO/IEC)^(*), and other safety regulations.

^(*) ISO 4414: Pneumatic fluid power - General rules relating to systems.
ISO 4413: Hydraulic fluid power - General rules relating to systems.
IEC 60204-1: Safety of machinery - Electrical equipment of machines. (Part 1: General requirements)
ISO 10218-1: Manipulating industrial robots -Safety. etc.

- Refer to product catalogue, Operation Manual and Handling Precautions for SMC Products for additional information.
- Keep this manual in a safe place for future reference.

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

Warning

- **Always ensure compliance with relevant safety laws and standards.**
- All work must be carried out in a safe manner by a qualified person in compliance with applicable national regulations.

2 Specifications

2.1 Product Specifications

Model		HRS018-A	-20-	R	HRS030-A	-20-	R
Cooling method		Air-cooled					
Refrigerant		R410A (HFC)					
Quantity of refrigerant	kg	0.39					
Control method		PID control					
Ambient temperature and humidity ^{*1}		Temperature: 5 to 45°C, Humidity: 30 to 70%, Tap water, 15% ethylene glycol aqueous solution ^{*4}					
Circulating fluid system	Circulating fluid ^{*2}		Tap water, 15% ethylene glycol aqueous solution ^{*4}				
	Operating temperature range ^{*1}	°C	5 to 40				
	Cooling capacity ^{*3} (50/60Hz)	W	1700 / 1900		2500 / 2900		
	Temperature stability ^{*5}	°C	±0.1				
	Pump capacity ^{*6} (50/60Hz)	MPa	0.13 (at 7 L/min) / 0.18 (at 7 L/min) For option -T: 0.35 (at 10L/min)/0.35 (at 14L/min)				
	Rated flow ^{*7} (50/60Hz)	L/min	7/7 For option -T : 10/14				
	Tank capacity	L	Approx. 5 For option -L : Approx. 12				
Port size		Rc1/2		Rc1/2			
Wetted material		Stainless steel, Copper (Heat exchanger brazing), Bronze, Alumina ceramic ^{*12} , Carbon, PP, PE, POM, FKM, EPDM, PVC					
Automatic fluid filling ^{*4}	Feed water pressure range	MPa	0.2 to 0.5				
	Feed water temperature range	°C	5 to 40				
	Feed water capacity	L/min	Approx. 1				
	Automatic fluid filling Port size		Rc 3/8				
	Overflow port size		Rc 3/4				
Electric system	Power supply		Single-phase 200 to 230 VAC (50/60 Hz) Allowable voltage range ±10% (No continuous voltage fluctuation)				
	Applicable earth leakage breaker capacity ^{*8}	A	10 For option T:15				
	Rated operating current ^{*3} (50/60Hz)	A	5.1 / 5.6 For option T:6.2/7.7		5.4 / 6.1 For option T:6.4/7.8		
	Rated power consumption ^{*3} (50/60Hz)	kVA	1.0 / 1.1 For option T:1.3/1.6		1.1 / 1.2 For option T:1.4/1.7		
	IP rating (Electrical BOX)		IP54 (Cable gland: IP67)				
Noise level ^{*9} (50/60Hz)		dB	62 / 65				
Dimensions ^{*10}		mm	W377xD500xH615				
Accessory		Fitting (for drain outlet) 1 pc. ^{*13} , Input/output signal connector 1 pc., Operation Manual (for installation/operation) 1, Alarm code list sticker 1, Ferrite core (for communication) 1 pc., Power supply cable: to be prepared by user.					
Weight ^{*11}	kg	45					

- ^{*1} Use the product in conditions where freezing will not occur. Consult with SMC if using in a season or region where the ambient temperature will fall below zero.
- ^{*2} If tap water is used, use water which satisfies the standard of The Japan Refrigeration And Air Conditioning Industry Association (JRA GL-02-1994/Cooling water system - circulation type - make-up water)
- ^{*3} (1)AC Input: 200VAC, (2)Operating ambient temp.: 25°C, (3)Circulating fluid temp.: 20°C, (4)Circulating fluid rated flow, (5)Circulating fluid : Tap water
The cooling capacity will be reduced by 300W when option T is selected.
- ^{*4} Use a 15% ethylene glycol aqueous solution if operating in a place where the circulating fluid temp. is lower than 10°C.
- ^{*5} Outlet temp. when the circulating fluid flow is rated flow, and the circulating fluid outlet and the return are directly connected. Installation environment and power supply are within specification range and stable.
- ^{*6} The capacity at the thermo-chiller outlet when the circulating fluid temp. is 20°C.
- ^{*7} Fluid flow to maintain the cooling capacity and the temperature stability.
The specification of the cooling capacity and the temperature stability may not be satisfied if the flow rate is lower than the rated flow.
- ^{*8} To be prepared by the customer. Use an earth leakage breaker with sensitivity of 15mA or 30mA/100V in power supply specification.
- ^{*9} Front 1m/Height 1m/No heat load applied. See note 3 for other conditions.
- ^{*10} Dimension between panels. Projection is not included.
- ^{*11} Weight when the circulating fluid is not included.
The weight will increase by 1kg when option J [Automatic fluid filling] is selected.
The weight will increase by 1kg when option L [Large capacity tank] is selected.
The weight will increase by 2kg when option B [Earth leakage breaker] is selected.
The weight will increase by 6kg when option T [High pressure pump] is selected.
- ^{*12} In case option T [High pressure pump] selected.
- ^{*13} In case option T [High pressure pump] selected, this fitting is not enclosed as accessory.
- ^{*14} In case option J [Automatic fluid filling] selected.

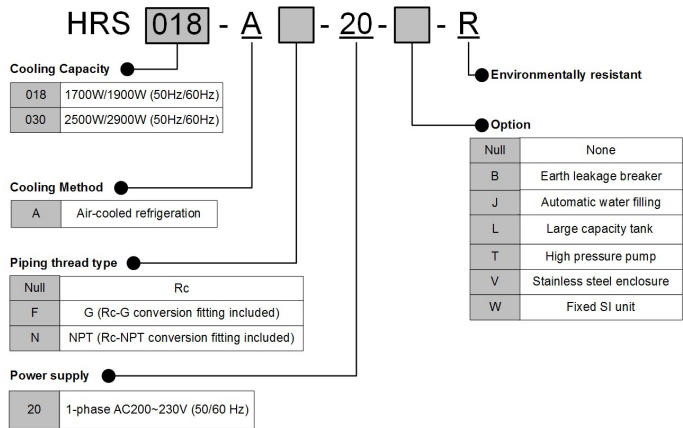
2 Specifications - Continued

2.2 Production Serial Number Code

The production serial number code printed on the label indicates the month and year of production as per the following table:

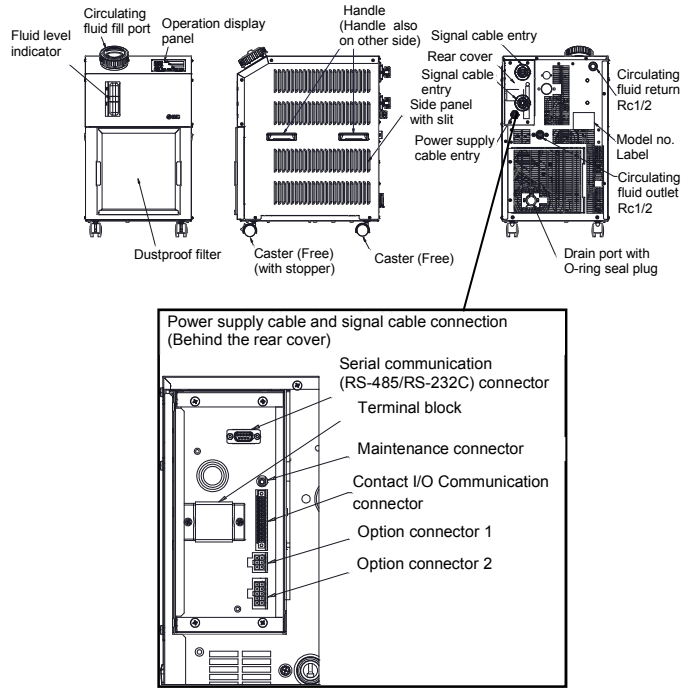
Year	2020	2021	2022	...	2025	2026	2027	...
Month	y	Z	A	...	D	E	F	...
Jan	o	yo	Zo	Ao	Do	Eo	Fo	...
Feb	P	yP	ZP	AP	DP	EP	FP	...
Mar	Q	yQ	ZQ	AQ	DQ	EQ	FQ	...
Apr	R	yR	ZR	AR	DR	ER	FR	...
May	S	yS	ZS	AS	DS	ES	FS	...
Jun	T	yT	ZT	AT	DT	ET	FT	...
Jul	U	yU	ZU	AU	DU	EU	FU	...
Aug	V	yV	ZV	AV	DV	EV	FV	...
Sep	W	yW	ZW	AW	DW	EW	FW	...
Oct	X	yX	ZX	AX	DX	EX	FX	...
Nov	y	yy	Zy	Ay	Dy	Ey	Fy	...
Dec	Z	yZ	ZZ	AZ	DZ	EZ	FZ	...

3 How to Order



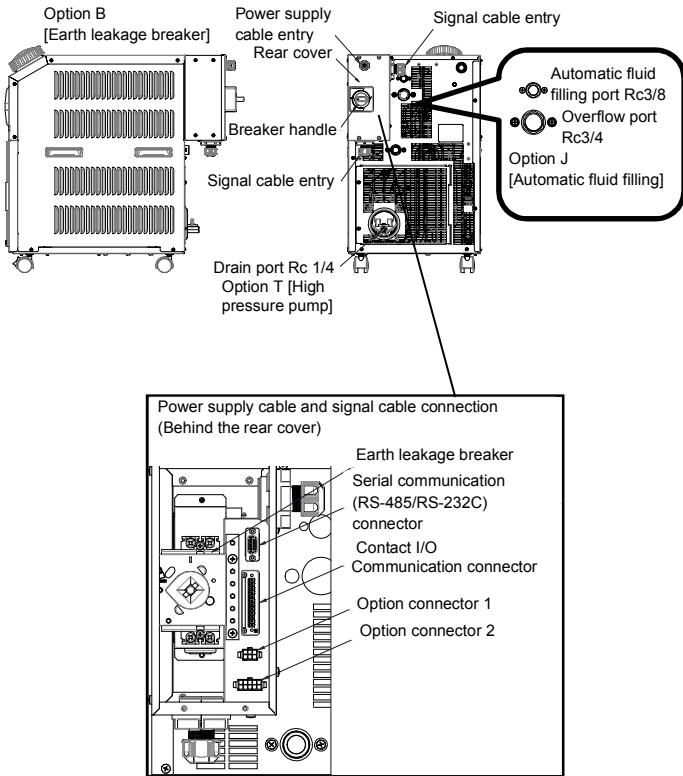
4 Names of Parts and Accessories

4.1 Names of Parts – Standard without options



4 Names of Parts and Accessories – Continued

4.2 Names of Parts - With Options



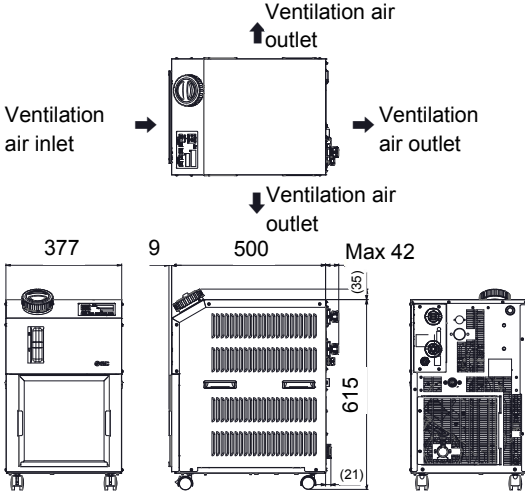
4.3 Accessory List

1	Operation Manual		2pcs (Jpn: 1pc., Eng:1pc.)
2	Alarm code list label		1pc.
3	Sequence I/O command signal connector		1pc.
4	Fitting (for drain port) ^{*1}		1pc.
5	Ferrite core (for communication)		1pc.
6	For HRS***-AF-20-** G thread adapter set For HRS***-AN-20-** NPT thread adapter set		1set

^{*1}: Not included when option [High pressure pump] is selected.

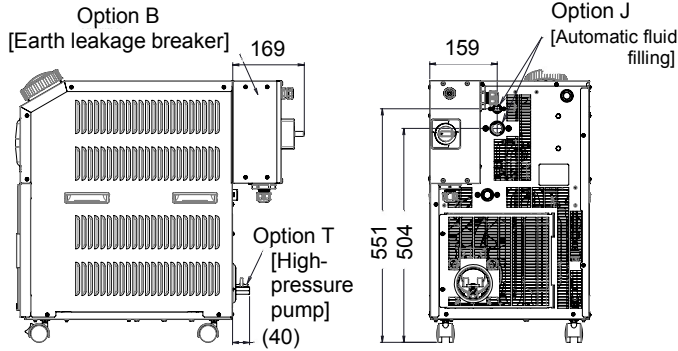
5 Outline Dimensions (mm)

5.1 Standard without options selected



5 Outline Dimensions (mm) - continued

5.2 With options selected



6 Installation

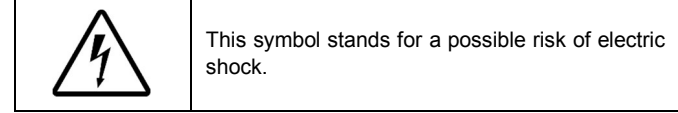
6.1 Installation

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

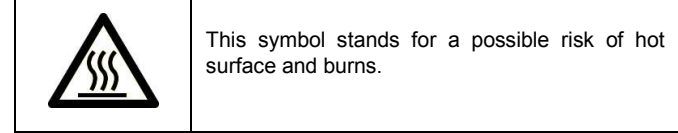
6.2 Types of Hazard Labels

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

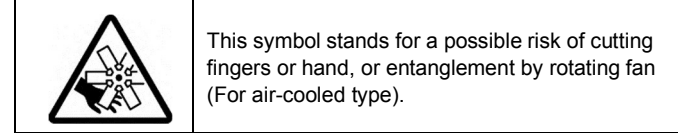
Warning related to Electricity



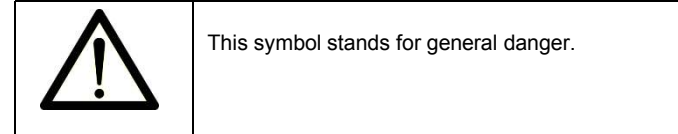
Warning related to High Temperatures



Warning related to Rotating Objects



Warning related to other General Dangers



6.3 Environment

Warning

- Do not use in an environment where corrosive gases, chemicals, salt water or steam are present.
- Do not use the product in an area of high temperature and humidity which cannot be exhausted, or where it is exposed to corrosive substances. Cooling failure can result.
- Do not use the product outdoors. If the product is exposed to rain or water splashes 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.
- Do not install in a location without adequate space for maintenance.

6 Installation - continued

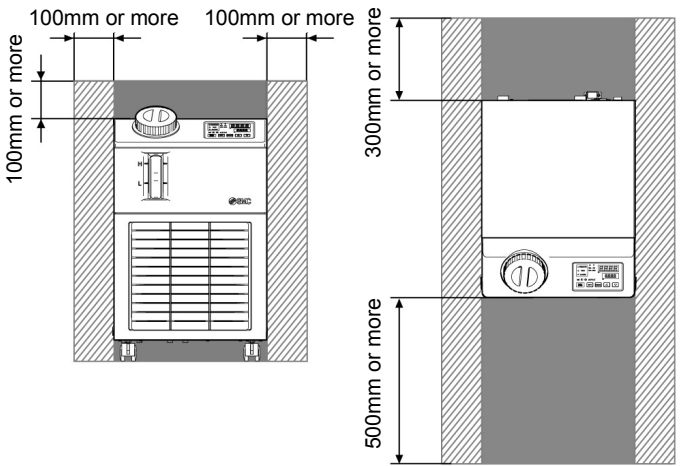
6.4 Mounting

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

Caution

- Have enough space for ventilation for the product. Otherwise it 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 M8 anchor bolts that are suitable to the floor that the product will be installed.

6.5 Installation and Maintenance Space



Caution

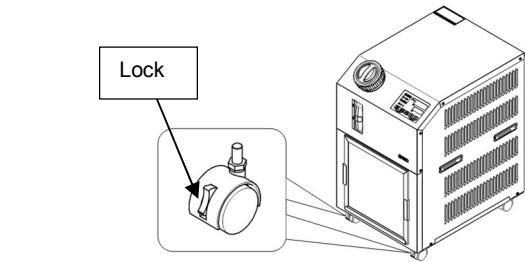
- The temperature of the outlet for the ventilation of the thermo-chiller and the panel surface may become approximately 50°C or higher. When placing the thermo-chiller, ensure the thermo-chiller does not affect surrounding environment.

6.6 Mounting

- Mount the product on a flat and stable floor with no vibrations.
- Refer to "5. Outline dimensions" for dimensional information of the product.

How to mount the product:

- Move the product to the installation area.
- After moving, lock the front casters again.



<Fixture>

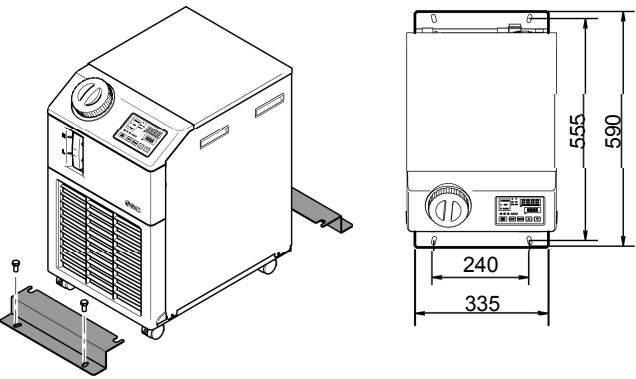
Follow the procedure below when fixing the thermo-chiller to the floor or the mounting frame.

- Prepare the fixing bracket shown below (Not included in the package).

Item	Part number
Anti-seismic brackets	HRS-TK001

- Use M8 foundation bolts to fix the product with the dimensions below.

6 Installation - continued



* 4 (four) M8 foundation bolts should be prepared by the customer.

6.7 Electrical Wiring

- Warning**
- The electrical facilities should be installed and wired in accordance with local laws and regulations of each country and by the person who has knowledge and experience.
 - Do not modify the internal electrical wiring of the product. Incorrect wiring may cause electrical shock or fire. Also, modifying the internal wiring will void the product's warranty.
 - Do not connect the ground to water line, gas pipe or lightning conductor.

Caution

- Only qualified persons are allowed to wire the product.
- Be sure to shut off the user's power supply. Wiring with the product energized is strictly prohibited.
- The wiring must be conducted using cables complying with table below firmly and secured to the product to prevent the external force of cables being applied to the terminals. Incomplete wiring or improper securing of wiring may cause electrical shock, excessive heat and fire.
- Ensure a stable power supply with no voltage surges.
- Ensure that an Earth Leakage Breaker is used in the power supply of the product. See Table below.

- Use a power supply suitable for the specifications of the product.
- Be sure to connect the ground connection.
- Ensure that a lock out facility is available on the power supply.
- Each product must have its own separate Earth Leakage Breaker. Otherwise there can be a risk of electric shock or fire.

Power supply cable and Earth Leakage Breaker

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.

If communication with the user's machine is necessary, use the following signal cable.

Model	Power supply voltage	Cable qty. x size	Recommended earth leakage breaker		
			Rated voltage [V]	Rated current [A]	Sensitivity of leak current [mA]
HRS018-A*-20-R HRS030-A*-20-R	1-phase 200-230V AC (50/60Hz)	3 wires x14AWG (3 wires x 2.0mm ²) (including ground) Cable diameter: 8.5 to 11.5 mm	200, 230	10	30
HRS0**-A*- 20-T-R (High pressure pump [Optional])				15	30

6.8 Preparation and wiring of power supply cable

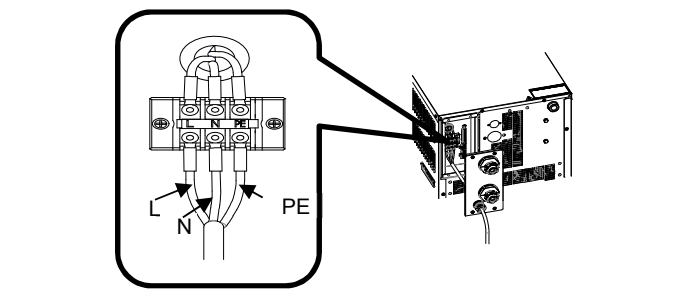
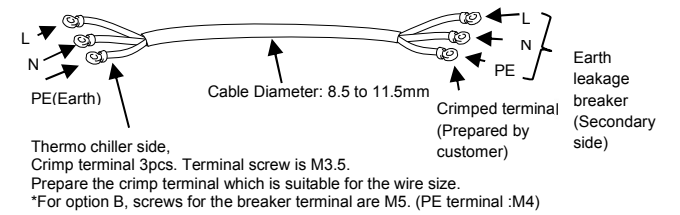
- The electrical facilities should be installed and wired in accordance with local laws and regulations of each country and by a person who has knowledge and experience.
- Check the power supply. Operation with voltages, capacities and frequencies other than the specified values can cause fire and electrical shock.
- Wire with an applicable cable size and terminal. Forcibly mounting with an unsuitable size cable may result in heat generation or fire

6 Installation – continued

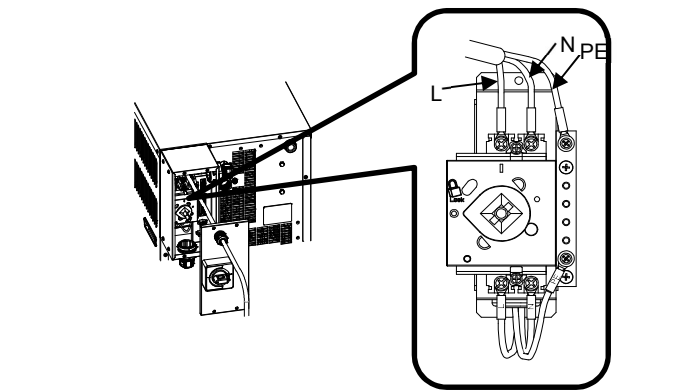
- After tightening the terminal screws, please visually check that the screws are not loose, and pull the cables to ensure that the screws are tightened completely. Otherwise, there can be a risk of heat generation or fire.

Preparation for operation

- Strip the sheath from both ends of the cable.
- Connect a crimp terminal (mounting screw diameter: M3.5) to one end of the cable. *For option B, screws for breaker terminal are M5. (screw of PE terminal is M4)
- Connect the other end of the cable to the crimped terminal that is compatible to the secondary side of the earth leakage breaker.
- Remove the screws (4pcs) on the backside.
- Remove rear cover.
- Insert power cable to the cable gland and mount.
- Plug the power supply cable into the power cable connector on the product.
-

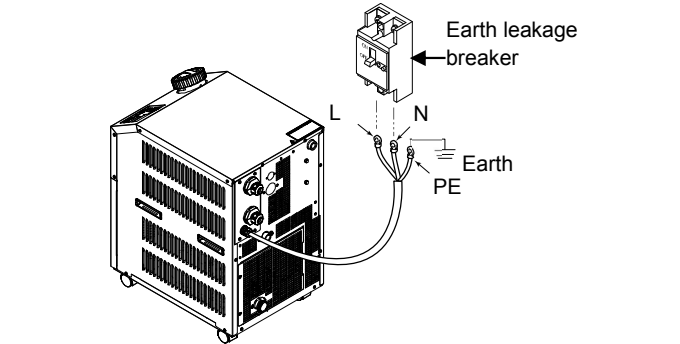


For option B



Connecting to earth leakage breaker

- Connect the power supply cable to the secondary side of the earth leakage breaker and grounding



6 Installation – continued

Piping

Caution

- Before connecting piping make sure to clean up chips, cutting oil, dust etc.
- When installing piping or fittings, ensure sealant material does not enter inside the port. When using seal tape, leave 1 thread exposed on the end of the pipe/fitting.
- Tighten fittings to the specified tightening torque.
- Check the model number of this product in "3. How to Order" before connecting piping.
- Model number: HRS0***N-*0
The transition connector from Rc to NPT is enclosed as an accessory. For NPT piping, be sure to use this connector.
- Model number: HRS0***F-*0
The transition connector from Rc to G is enclosed as an accessory. For G piping, be sure to use this connector

Name	Port size*1	Recommended tightening torque	Recommended proof pressure for piping
Circulating fluid supply	Rc1/2	28 to 30N·m	0.8MPa more
Circulating fluid return	Rc1/2	28 to 30N·m	0.8MPa more
Automatic water-fill port *2	Rc3/8	22 to 24N·m	1.0MPa more (Automatic water-fill pressure 0.2 to 0.5MPa)
Overflow port *2	Rc3/4	28 to 30N·m	Inside diameter 19mm more of piping

*1 For NPT and G thread, use a conversion connector available as an accessory separately.

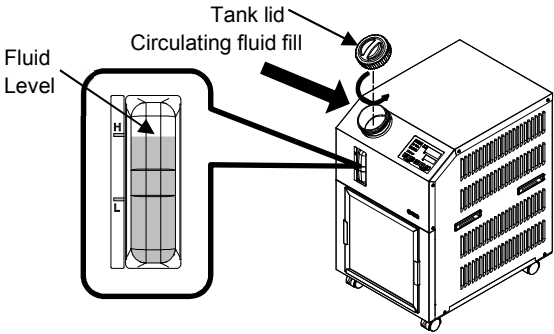
*2 For automatic fluid filling [Option].

6.9 Fill of circulating fluid

Caution

- Check the drain port is plugged or closed by the valve to prevent the supplied circulating fluid from draining out.
- Supply the circulating fluid up to the "H" mark on the tank. Operation will stop when the fluid level falls lower than "L".
- When the temperature of the circulating fluid is set to lower than 10°C, use a 15% aqueous solution of ethylene glycol. Tap water may freeze in the thermo-chiller, leading to malfunction.

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



7 Start, Stop and Temperature Settings

7.1 Before Starting - Check the following items before starting the product.

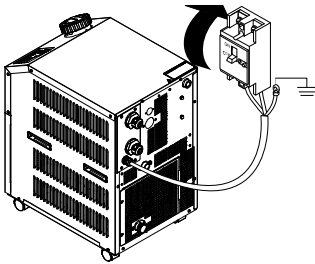
- Installation conditions
 - Check the product is installed horizontally.
 - Check that there are no heavy objects on the product, and the external piping is not applying excessive force to the product.
- Connection of cables
 - Check the power, ground and communications (optional) cables are correctly connected.
- Circulating fluid
 - Check proper connection of piping at inlet and outlet.
- Automatic fluid filling piping (When option J [With automatic fluid filling] is selected)
 - Confirm that the automatic fluid filling port piping is connected properly.
- Over flow port piping (When option J [With automatic filling] is selected).
 - This is necessary when automatic fluid filling function is used.
- Fluid level indicator (for tank)
 - Ensure that the fluid level is on "H".

7.2 Preparation for Start

7.2.1 Power Supply

Supply the power. The operation panel displays the following conditions.

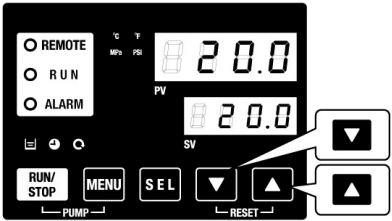
The initial screen (HELLO screen) is displayed for 8 seconds on the operation display panel. Then, the display changes to the main screen which displays the circulating fluid outlet temperature.



The set value of circulating fluid temperature is displayed as SV on the panel.

The present value of circulating fluid temperature is displayed as PV on the panel.

7.2.2 Setting of circulating fluid temperature



Press the [▼] and [▲] buttons on the operational panel to change the SV to required value.

When the temperature of the circulating fluid is set by the communication, refer to "Communication" in the supplementary operation manual.

7.3 Preparation of circulating fluid

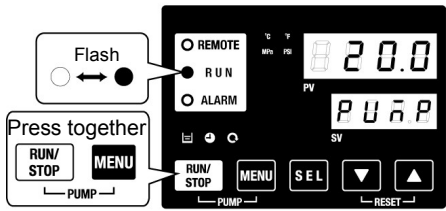
When the circulating fluid tank is filled the user's machine and piping remains empty. In that condition, the circulating fluid flows out to the user's machine and piping and the tank level decreases and may require a refill. In that case, refill the circulating fluid in the following procedure.

- Press the [PUMP] key on the operation display panel (press the [RUN/STOP] key and [MENU] key simultaneously). The pump operates independently while the [PUMP] key is pressed. The [RUN] lamp (green) flashes while the pump is operating independently, and the circulating fluid in the tank is supplied to the customer's device and piping. This can be done to check for leakage, and to discharge air from the piping. If the fluid level in the tank reaches the lower limit, a buzzer will sound, and alarm no. "AL01 (tank fluid level is low)" is displayed on the digital display PV. The [ALARM] lamp (red) flashes, the [PUMP] lamp turns on, and the independent operation of the pump is stopped.

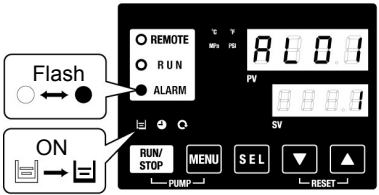
Caution

If leakage occurs due to faulty piping including an opened fitting of eternal piping, stop manual operation of the pump and fix the leak.

7 Start, Stop and Temperature Settings - Continued

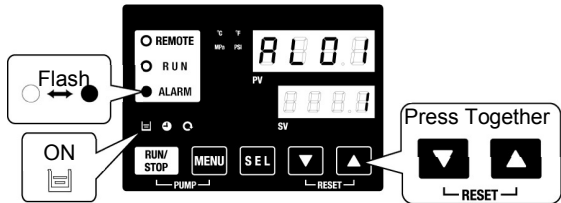


Manual operation of the pump



Low tank level alarm

- Press the [RESET] key ([▼] and [▲] keys simultaneously) to stop the alarm buzzer.



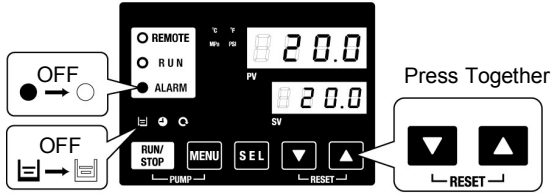
Caution

Be sure to reset the alarm on the operation display panel of the alarm. Alarm reset is not accepted from any screen except the alarm display menu.

- Open the tank lid and supply the circulating fluid up to the "H" mark on the tank.

- Press the [RESET] key ([▼] and [▲] keys simultaneously) to reset the alarm.

The alarm (tank fluid level is low) is reset, and the [ALARM] lamp and [PUMP] lamp are turned off. The display returns to the initial screen of the main menu: "Circulating fluid temp. / Circulating fluid set temp." Press the [PUMP] key (press [RUN/STOP] key and [MENU] key simultaneously) to start independent operation of the pump.



Alarm release

- Repeat steps 1 to 4 to supply the circulating fluid to the customer's device and piping. The tank level must be "H" on the tank liquid level indicator

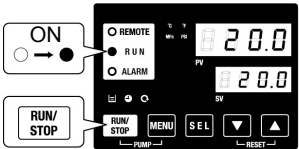
7.3 Starting and Stopping

7.3.1 Starting the product

Caution

Allow at least five minutes before restarting the product.

- Press the [RUN/STOP] key on the operation panel. The [RUN] lamp lights up (in green) and the product starts running. The circulating discharge temperature (PV) is controlled to the set temperature (SV).

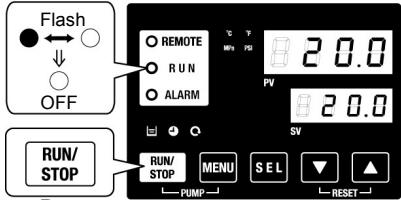


Press

7 Start, Stop and Temperature Settings - Continued

7.3.2 Stopping the product

- Press the [RUN/STOP] button on the operation panel. The [RUN] lamp on the operation panel flashes green at 1 second intervals and continues operation to prepare to stop. After approx. 15 seconds, the [RUN] lamp goes off and the product stops.
- Shut off the breaker. All LEDs go off.



Press

Caution

Except in case of emergency, do not shut off the power supply until the product has stopped completely. Doing so could cause failure.

8 Maintenance

8.1 General Maintenance

Caution

- Not following proper maintenance procedures could cause the product to malfunction and lead to equipment damage.
- Before performing maintenance, turn off the power supply. After installation and maintenance, turn on power to the equipment and perform appropriate functional and leakage tests to make sure the equipment is installed correctly.
- Do not make any modification to the product.
- Do not disassemble the product, unless required by installation or maintenance instructions.

8.2 Inspection and Cleaning

Warning

- Do not operate with wet hands and do not touch the electrical parts such as the connector. It might cause electric shock.
- Do not touch the fins directly when cleaning the dustproof filter. It might cause injury.

- Shut off the power supply of the product when performing cleaning, maintenance or inspection. It might cause electric shock, injury or burn, etc.
- Replace all panels removed for inspection or cleaning. It might cause injury or electric shock if it is operated with the panel removed or open.

8.2.1 Daily check

Check each item of the following Table, and if any error is seen, stop the operation of the product and turn off the user's power supply, and service the product.

Item	Content of check	
Installation condition	Check the installation conditions of the product.	There is no heavy object on the product or excessive force on the piping.
		Temperature and humidity are within the specified range of the product.
Fluid leakage	Check the connected part of piping	There is no circulating fluid leakage from the connected part of piping.
Fluid amount	Check the liquid level indicator.	The circulating fluid must enter the scale of "H".
Operation panel	Check the display.	The numbers on the display are clear.
	Check the function.	The [RUN/STOP] and [MENU], [SEL], [▼], [▲] buttons operate properly.
Circulating fluid discharge pressure	Check on the operation panel.	There is no problem for use.
Operating conditions	Check the operation condition.	There is no abnormal noise, vibration, smell and smoke. There should be no active alarm signal.
Ventilating condition	Check the condition of the ventilation grille.	Make sure the ventilation grille is not obstructed.

8 Maintenance - Continued

8.2.2 Monthly check

Item	Content of check	
Ventilating condition	Clean the ventilation grille.	Make sure the ventilation grille is not clogged with dust, etc.
Automatic water supply (Option J: Automatic water supply)	Check the supply water.	Make sure the supply water is clean and contains no foreign matter.

8.2.3 Cleaning of air vent



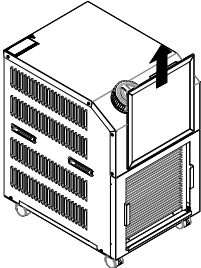
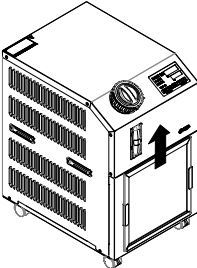
Caution

- If the fins of the air-condenser become clogged with dust or debris, heat radiation performance reduces. This results in the reduction of cooling performance and may stop the operation because the safety device is triggered. Shut off the power supply of the product when performing cleaning, maintenance or inspection. It might cause electric shock, injury or burn, etc.
- Replace all panels removed for inspection or cleaning. It might cause injury or electric shock if it is operated with the panels removed or opened.
- Use a long-bristled brush or air gun to clean the condenser to prevent the fins from being deformed or damaged.

8.2.4 Removal of the dustproof filter

1. The dustproof filter is installed at the lower part of the front face of the thermo-chiller.
2. Slide the dustproof filter upwards to remove.
3. Care should be taken not to deform or scratch the air-cooled condenser.

Removal of dustproof filter



8.2.5 Cleaning of filter

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

8.3 Inspection every 3 months

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

- Replacement of circulating fluid
 - Clean the tank and replace the circulating fluid.

8 Maintenance - Continued

- For the circulating fluid, select from the specification range shown in "Table 8-1 Quality standard for fresh water (tap water)" of operation manual.
- When using 15% ethylene glycol solution, check that the concentration is within the range of 15% +5/-0.

8.4 Inspection every 6 months

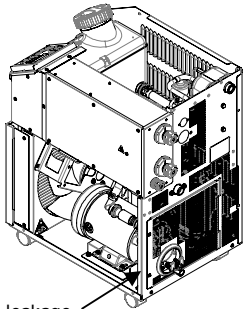
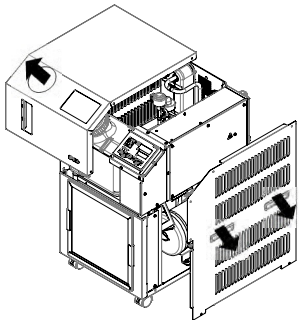
- Check for water leakage from pump (For option T [High pressure pump])

Remove the panel and check the pump for excessive leakage. If a leakage is found, replace the mechanical seal. Order the mechanical seal described in operation manual "8.3 Consumables" as a service part.



Caution

- Leakage from the mechanical seal
It is impossible to prevent the leakage from the mechanical seal completely because of its structure. Although the leakage is described as 3cc/hr or less.
- The manufacturer recommends mechanical seal replacement after 6000 to 8000 hours (usually 1 year)



Check point to see leakage

9 Troubleshooting

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

Code	Description	Operation	Cause / Remedy (Press the reset key after eliminating the cause.)
AL01	Low level in tank	Stop ^{*1}	The fluid level has fallen below the level indicator. Fill with circulating fluid.
AL02	High circulating fluid discharge temp.	Stop	• Ensure that the circulating fluid flow is 5l/min. or more. • Reduce the ambient temperature or heat load.
AL03	Circulating fluid discharge temp. rise	Continued ^{*1}	• Wait until the temperature decreases.
AL04	Circulating fluid discharge temp.	Continued ^{*1}	Check the ambient temperature condition and the temperature of supplied circulating fluid.
AL05	High circulating fluid return temp.	Stop	• Ensure that the circulating fluid flow is 5l/min. or more. • Check the heat load is within the specified range.
AL06	High circulating fluid discharge pressure	Stop	Check the user's piping for bends, squashes and foreign matter.
AL07	Abnormal pump operation	Stop	Restart and check the pump is operating.
AL08	Circulating fluid discharge pressure rise	Continued ^{*1}	Check the user's piping for bends, pinching or blockage by foreign matter.
AL09	Circulating fluid discharge pressure drop	Continued ^{*1}	• Restart and check the pump is operating. • Ensure that the tank level is within the appropriate range.
AL10	High compressor intake temp.	Stop	Check the temperature of the circulating fluid returning to the product.
AL11	Low compressor intake temp.	Stop	• Check the circulating fluid flows. • Check the circulating fluid in the evaporator is not frozen. • Use a 15% ethylene glycol aqueous solution if operating with a set temperature lower than 10°C.
AL12	Low super heat temperature	Stop	

9 Troubleshooting - Continued

Code	Description	Operation	Cause / Remedy (Press the reset key after eliminating the cause.)
AL13	High compressor discharge pressure	Stop	Reduce the ambient temperature or heat load.
AL15	Refrigerant circuit pressure (high pressure side) drop	Stop	• Check the ambient temperature is within the specified range. • It is possible that refrigerant is leaking. Ask for a service.
AL16	Refrigerant circuit pressure (low pressure side) rise	Stop	Reduce the ambient temperature or heat load.
AL17	Refrigerant circuit pressure (low pressure side) drop	Stop	• Check the circulating fluid flows. • It is possible that refrigerant is leaking. Ask for a service.
AL18	Compressor overload	Stop	Stop the chiller for 10 minutes and restart, and check the compressor is operating.
AL19 ^{*2}	Communication error ^{*2}	Continued ^{*1}	The request message from the host computer has not arrived. Send it again.
AL20	Memory error	Stop	Written data is different from read data. Ask for the service of RAM.
AL21	DC line fuse cut	Stop ^{*1}	DC circuit fuse of the communication connector for the contact input/output is short circuited. Ask for the service of the fuse of the DC circuit. Confirm there is no incorrect wiring or load of 500mA or larger.
AL22	Circulating fluid discharge temp. sensor failure	Stop	The temperature sensor is short-circuited or opened. Ask for the service of the temperature sensor.
AL23	Circulating fluid return temp. sensor failure	Stop	
AL24	Compressor intake temp. sensor failure	Stop	

Code	Description	Operation	Cause / Remedy (Press the reset key after eliminating the cause.)
AL25	Circulating fluid discharge pressure sensor failure	Stop	The pressure sensor is short-circuited or opened. Ask for the service of the pressure sensor.
AL26	Compressor discharge pressure sensor failure	Stop	
AL27	Compressor intake pressure sensor failure	Stop	
AL28	Maintenance of pump	Continued	The timing for a periodical check is informed. Recommended to ask for the check and service of the pump, fan motor and compressor. Refer to operation manual "5.18 Accumulated time reset function"
AL29	Maintenance of fan motor	Continued	
AL30	Maintenance of compressor	Continued	
AL31 ^{*3}	Contact input1 signal detection ^{*3}	Stop ^{*1}	Contact input is detected.
AL32 ^{*3}	Contact input 2 signal detection ^{*3}		
AL33	Unused	Stop	Check if "SE.18" is OFF.
AL34	Unused	Continued	Check if "SE.19" is OFF.
AL35	Unused	Continued	Check if "SE.19" is OFF.
AL36	Unused	Continued	Check if "SE.19" is OFF.

*1: "Stop" or "Continued" are default settings. The user can change them to "Continued" and "Stop". For details, refer to "5.16 Alarm customize function" in operation manual.

*2: "AL19, Communication error" is disabled in the default setting. When this function needs to be enabled, refer to "5.19 Communication function" in operation manual.

9 Troubleshooting - Continued

*3: The functions of "AL31 Contact input 1 Signal detection" and "AL32 Contact input 2 Signal detection" are not default settings. If these functions are used, refer to "5.19 Communication function" in operation manual.

*4: Notice on mechanical seal replacement. Mechanical seal replacement is limited to 2 times. If the cumulative operation time of the pump exceeds 20,000 hours, please consider replacing the pump as detailed in service manual.

10 Limitations of Use

10.1 Limited warranty and Disclaimer/Compliance Requirements

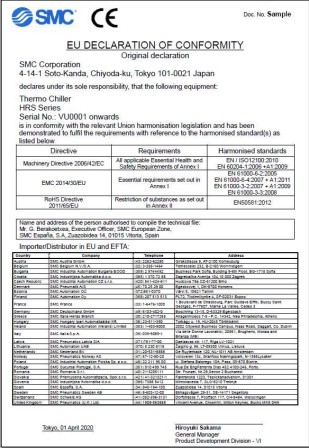
Refer to Handling Precautions for SMC Products.

11 Product disposal

This product should not be disposed of as municipal waste. Check your local regulations and guidelines to dispose this product correctly, in order to reduce the impact on human health and the environment.

12 Declaration of conformity

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



13 Contacts

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

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*SMC Corporation, Akihabara UDX15F, 4-14-1, Sotokanda, Chiyoda-ku, Tokyo 101 0021
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