Circulating Fluid Temperature Controller

Thermo-chiller Low-temperature Type

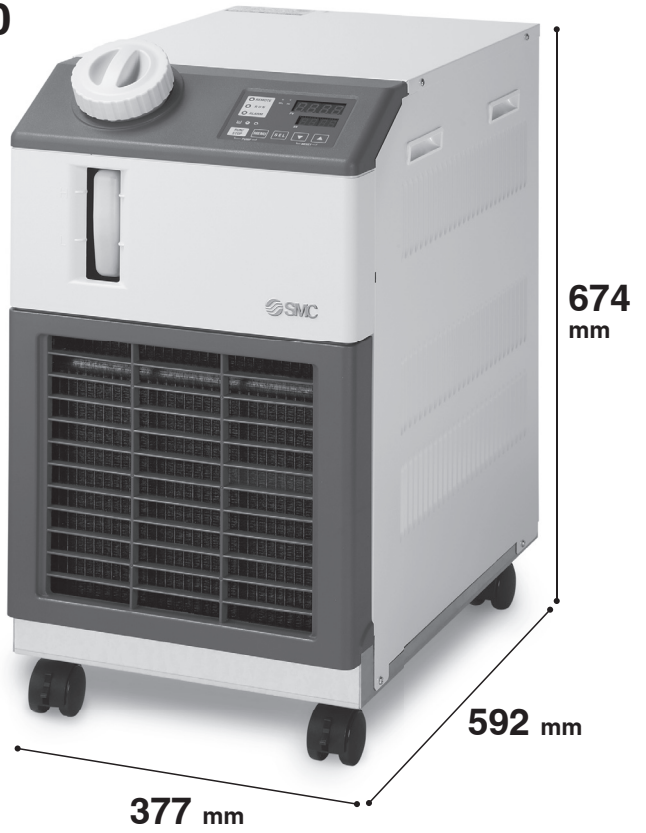
(UL Standards)

RoHS

Supports low temperatures of up to -10 °C

Air-cooled refrigeration

- **Compact:**
  Equivalent in size to the HRS040
- **Cooling capacity: 1 kW**∗1
  ∗1 At –10 °C
- **Temperature stability: ±0.1 °C**
- **Set temperature range:**
  -10 °C to 40 °C



How to Order

Air-cooled refrigeration **HRS 040 – A – 20 – T1 – X158**

Cooling method

A	Air-cooled refrigeration

Power supply

Symbol	Power supply
20	Single-phase 200 to 230 VAC (50/60 Hz)

Symbol	UL standards
X158	Compliant
X164	Not compliant

HRS040-A-20-T1-X158/X164

HRS040-A-20-T1-X158/X164

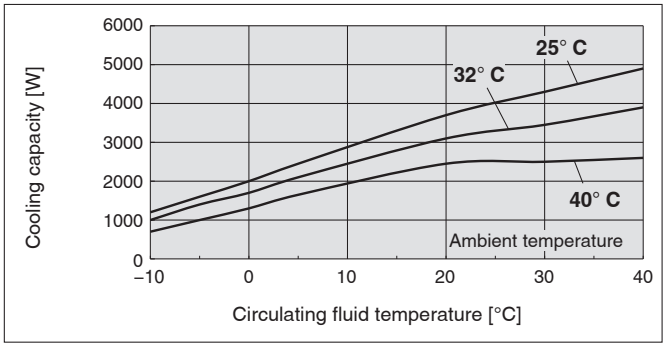
Specifications

Model			X158	X164
Cooling method			Air-cooled refrigeration	
Temperature control method			PID control	
Set temperature range/Temperature stability		°C	−10 to 40/±0.1*1, *4	
Cooling capacity (50/60 Hz)		W	1000/1000*3	
Installation environment	Ambient temperature	°C	5 to 40*1	
	Ambient humidity	%RH	30 to 70 (No condensation) 1	
	Altitude	m	1000 or less	
	Atmosphere		No corrosive or flammable gases For other precautions, refer to the catalogue and operation manual.	
Refrigerant			R410A (HFC), 0.53 kg	
Circulating fluid	Fluid type		50% ethylene glycol aqueous solution*2	
	Pump capacity (50/60 Hz)	MPa	0.11 (15 l/min)/0.36 (15 l/min)*5	
	Rated flow (50/60 Hz)	l/min	15/15*5, *6	
Tank capacity		L	Approx. 5	
Operation display panel			7-segment digital display	
Communication functions			Contact input/output, Serial RS-485/RS-232C (D-sub9 female)	
Power supply	Voltage	V	Single-phase 200 to 230 VAC (50/60 Hz) Allowable voltage range ±10 [%]	
	Breaker	A	20	
	Rated operating current	A	8.8/11.2*3	
	Applicable earth leakage breaker capacity	A	20*7	
	Rated power consumption	kVA	1.7/2.2*3	
Circulating fluid contact material			Stainless steel, Copper brazing (Heat exchanger), Brass, Carbon, SiC PP, PE, POM, FKM, EPDM, PVC, NBR	
Weight (dry state)		kg	64	65
Coating color			White	
UL standard			Compliant	Not compliant

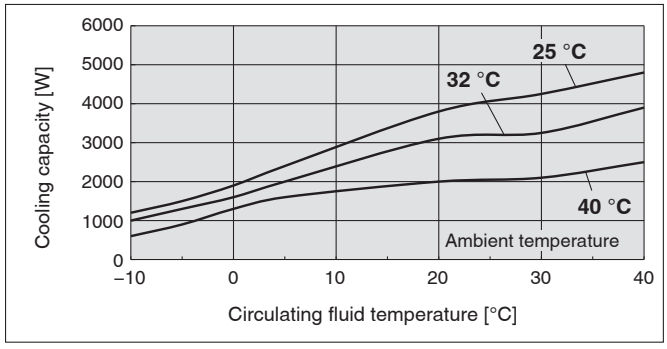
1 No condensation should be present.
2 Dilute pure ethylene glycol with tap water to create the solution. Additives such as preservatives cannot be used.
3 ① Ambient temperature: 32 °C, ② Circulating fluid temperature: -10 °C, ③ Circulating fluid at the rated flow, ④ Circulating fluid: 50 % ethylene glycol aqueous solution
4 The temperature at the thermo-chiller outlet when the circulating fluid flow is at the rated flow and the circulating fluid outlet and return port are directly connected
When the installation environment and power supply are within the specification range and stable
5 The capacity at the circulating fluid outlet when the circulating fluid temperature is -10 °C
6 The required flow rate for maintaining the cooling capacity or temperature stability.
The cooling capacity and the temperature stability specifications may not be satisfied if the flow rate is lower than the rated flow.
7 Use an earth leakage breaker with a sensitivity of 30 mA and a 200 V power supply (to be prepared by the customer).

Cooling Capacity

HRS040-A-20-T1-X158/X164 (Single-phase 200 to 230 VAC) [50 Hz]

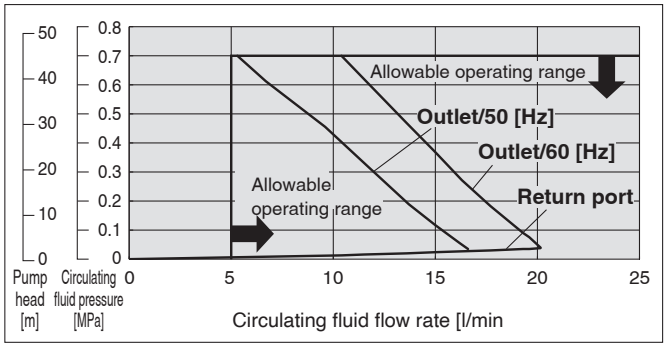


[60 Hz]



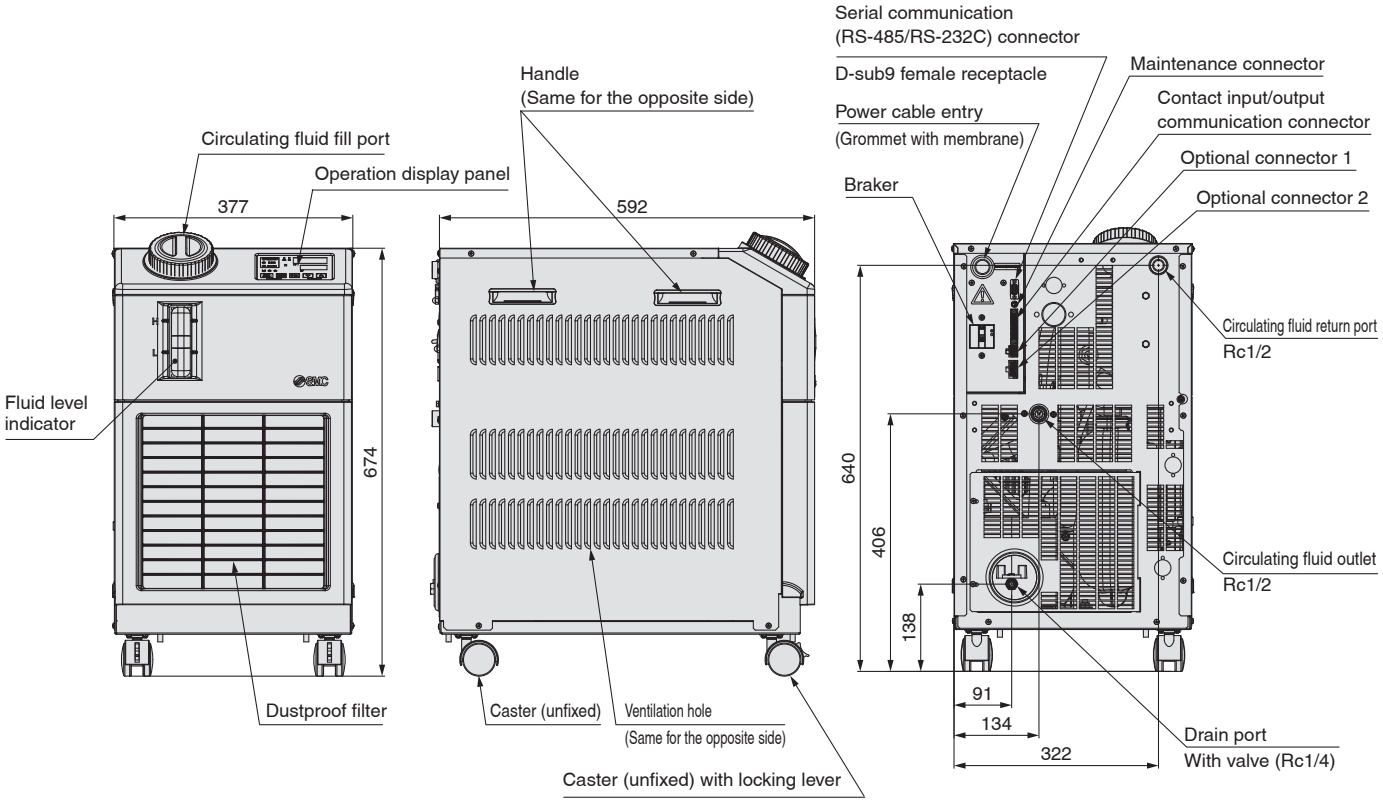
Pump Capacity

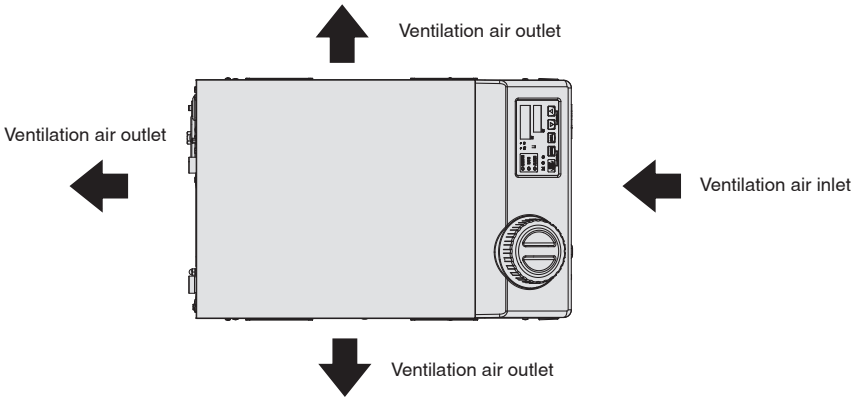
HRS040-A-20-T1-X158/X164 (Single-phase 200 to 230 VAC)



Dimensions

HRS040-A-20-T1-X158/X164





Power Cable Specifications

Applicable model	Rated value for thermo-chiller			Power cable examples		
	Power supply	Applicable breaker rated current	Terminal block screw diameter	Cable size	Recommended crimped terminal	Optional accessories
HRS040-A-20-T1-X158/164	Single-phase 200 to 230 VAC (50/60 Hz)	20 A	M4	3 cores x 3.5 mm^2 (3 cores x AWG12) Including grounding cable	R5.5.4	HRS-CA004

⚠ Safety Instructions

These safety instructions are intended to prevent hazardous situations and/or equipment damage. These instructions indicate the level of potential hazard with the labels of **"Caution," "Warning"** or **"Danger."** They are all important notes for safety and must be followed in addition to International Standards (ISO/IEC) [1], and other safety regulations.

⚠ **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.

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

⚠ Warning

1. The compatibility of the product is the responsibility of the person who designs the equipment or decides its specifications.
Since the product specified here is used under various operating conditions, its compatibility with specific equipment must be decided by the person who designs the equipment or decides its specifications based on necessary analysis and test results. The expected performance and safety assurance of the equipment will be the responsibility of the person who has determined its compatibility with the product. This person should also continuously review all specifications of the product referring to its latest catalogue information, with a view to giving due consideration to any possibility of equipment failure when configuring the equipment.

2. Only personnel with appropriate training should operate machinery and equipment.
The product specified here may become unsafe if handled incorrectly. The assembly, operation and maintenance of machines or equipment including our products must be performed by an operator who is appropriately trained and experienced.

3. Do not service or attempt to remove product and machinery/ equipment until safety is confirmed.
1. The inspection and maintenance of machinery/equipment should only be performed after measures to prevent falling or runaway of the driven objects have been confirmed.
2. When the product is to be removed, confirm that the safety measures as mentioned above are implemented and the power from any appropriate source is cut, and read and understand the specific product precautions of all relevant products carefully.
3. Before machinery/equipment is restarted, take measures to prevent unexpected operation and malfunction.

4. Contact SMC beforehand and take special consideration of safety measures if the product is to be used in any of the following conditions.
1. Conditions and environments outside of the given specifications, or use outdoors or in a place exposed to direct sunlight.
2. Installation on equipment in conjunction with atomic energy, railways, air navigation, space, shipping, vehicles, military, medical treatment, combustion and recreation, or equipment in contact with food and beverages, emergency stop circuits, clutch and brake circuits in press applications, safety equipment or other applications unsuitable for the standard specifications described in the product catalogue.
3. An application which could have negative effects on people, property, or animals requiring special safety analysis.
4. Use in an interlock circuit, which requires the provision of double interlock for possible failure by using a mechanical protective function, and periodical checks to confirm proper operation.

⚠ Caution

1. The product is provided for use in manufacturing industries.
The product herein described is basically provided for peaceful use in manufacturing industries.
If considering using the product in other industries, consult SMC beforehand and exchange specifications or a contract if necessary.
If anything is unclear, contact your nearest sales branch.

Limited warranty and Disclaimer/Compliance Requirements

The product used is subject to the following "Limited warranty and Disclaimer" and "Compliance Requirements".Read and accept them before using the product.

Limited warranty and Disclaimer

1. The warranty period of the product is 1 year in service or 1.5 years after the product is delivered, whichever is first. [2] Also, the product may have specified durability, running distance or replacement parts. Please consult your nearest sales branch.
2. For any failure or damage reported within the warranty period which is clearly our responsibility, a replacement product or necessary parts will be provided. This limited warranty applies only to our product independently, and not to any other damage incurred due to the failure of the product.
3. Prior to using SMC products, please read and understand the warranty terms and disclaimers noted in the specified catalogue for the particular products.

2) Vacuum pads are excluded from this 1 year warranty.
A vacuum pad is a consumable part, so it is warranted for a year after it is delivered. Also, even within the warranty period, the wear of a product due to the use of the vacuum pad or failure due to the deterioration of rubber material are not covered by the limited warranty.

Compliance Requirements

1. The use of SMC products with production equipment for the manufacture of weapons of mass destruction (WMD) or any other weapon is strictly prohibited.
2. The exports of SMC products or technology from one country to another are governed by the relevant security laws and regulations of the countries involved in the transaction. Prior to the shipment of a SMC product to another country, assure that all local rules governing that export are known and followed.

⚠ Caution

SMC products are not intended for use as instruments for legal metrology.
Measurement instruments that SMC manufactures or sells have not been qualified by type approval tests relevant to the metrology (measurement) laws of each country.
Therefore, SMC products cannot be used for business or certification ordained by the metrology (measurement) laws of each country.