

# SMC Information

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10-E569  
D-DN Printing PQ 12450SZ

## Circulating Fluid Temperature Controller Thermo-chiller Compact Type Series HRS



**4700 w/5100 W (50/60 Hz) cooling capacity added! (HRS050)**

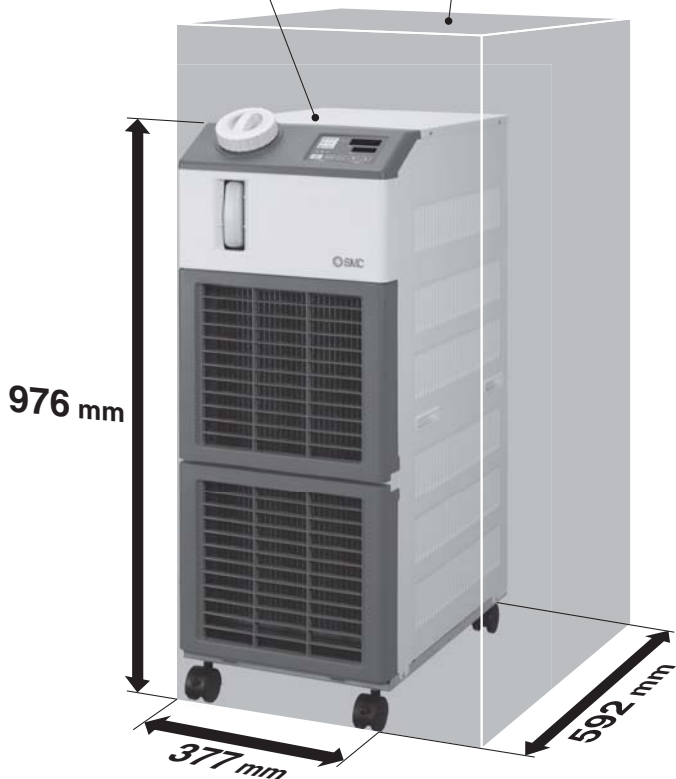


**Compact/  
Space-saving**

**Lightweight**

**New HRS050**  
**Weight 69 kg**

**HRG(C)005**  
(Conventional model)



- Footprint reduced by **32%**
- Volume reduced by **42%**
- Weight reduced by **43%**

### Comparison with Conventional Model HRG(C)005

| Series                                   | Width (mm) | Depth (mm) | Height (mm) | Weight (kg) |
|--|------------|------------|-------------|-------------|
| <b>HRS050</b>                            | 377        | 592        | 976         | 69          |
| <b>HRG(C)005</b><br>(Conventional model) | 550        | 595        | 1150        | 120         |

Production of HRG(C)005 will be discontinued at the end of March 2011.

- Temperature stability: **±0.1°C**
- Temperature range setting: **5 to 40°C**
- High-lift pump available as standard  
(For HRS050)

### Options

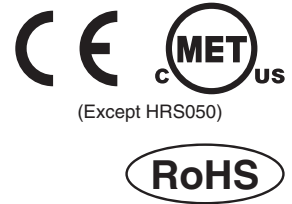
- With earth leakage breaker
- With automatic water supply function
- Applicable to DI water (deionized water) piping

### Variations

| Model             | Cooling capacity (W) | Cooling method   | Power supply                                     | International standards |
|-------------------|----------------------|--|--|-------------------------|
| <b>HRS012</b>     | 1100/1300 (50/60 Hz) | Air-cooled refrigeration<br>Water-cooled refrigeration | Single-phase 100 VAC (50/60 Hz), 115 VAC (60 Hz) | CE/UL*                  |
| <b>HRS018</b>     | 1700/1900 (50/60 Hz) |  | Single-phase 200 to 230 VAC (50/60 Hz)           |                         |
| <b>HRS024</b>     | 2100/2400 (50/60 Hz) |  | Single-phase 200 to 230 VAC (50/60 Hz)           |                         |
| <b>New HRS050</b> | 4700/5100 (50/60 Hz) | <b>Air-cooled refrigeration</b>                        | <b>Single-phase 200 to 230 VAC (50/60 Hz)</b>    | Scheduled for 2011      |

# Thermo-chiller Compact Type

# Series HRS



## How to Order

Single-phase 100/115 VAC

HRS 018 - A - 10 -



### Cooling capacity

|     |   | CE/UL |
|-----|---|-------|
| 012 | Cooling capacity 1100/1300 W (50/60 Hz) | ●     |
| 018 | Cooling capacity 1500/1700 W (50/60 Hz) | ●     |

Note) UL standards: Applicable to 60 Hz only

### Cooling method

|   |                            |
|---|----------------------------|
| A | Air-cooled refrigeration   |
| W | Water-cooled refrigeration |

### Pipe thread type

|     |  |
|-----|--|
| Nil | Rc                                       |
| F   | G (with PT-G conversion fitting set)     |
| N   | NPT (with PT-NPT conversion fitting set) |

### Option

| Symbol | Option  |
|--------|---|
| Nil    | None  |
| B      | With earth leakage breaker                      |
| J      | With automatic water supply function            |
| M      | Applicable to DI water (deionized water) piping |

• When multiple options are combined, indicate symbols in alphabetical order.

### Power supply Note)

| Symbol | Power supply                                       |
|--------|--|
| 10     | Single-phase 100 VAC (50/60 Hz)<br>115 VAC (60 Hz) |

Note) UL standards: Applicable to 60 Hz only

## Specifications \* There are different values from standard specifications.

| Model   |  | HRS012-A□-10   | HRS012-W□-10               | HRS018-A□-10             | HRS018-W□-10               |
|---|--|--|----------------------------|--------------------------|----------------------------|
| Cooling method                                      |  | Air-cooled refrigeration   | Water-cooled refrigeration | Air-cooled refrigeration | Water-cooled refrigeration |
| Refrigerant   |  | R407C (HFC)  |                            |                          |                            |
| Control method                                      |  | PID control  |                            |                          |                            |
| Ambient temperature/humidity <small>Note 2)</small> |  | Temperature: 5 to 40°C, Humidity: 30 to 70%  |                            |                          |                            |
| Circulating fluid system                            | Circulating fluid <small>Note 3)</small>                             | Clear water, 15% ethylene glycol aqueous solution <small>Note 5)</small>   |                            |                          |                            |
|   | Temperature range setting <small>Note 2)</small> (°C)                | 5 to 40  |                            |                          |                            |
|   | Cooling capacity <small>Note 4)</small> (50/60 Hz) (W)               | 1100/1300  |                            | 1500/1700                |                            |
|   | Temperature stability <small>Note 6)</small> (°C)                    | ±0.1   |                            |                          |                            |
|   | Pump capacity <small>Note 7)</small> (50/60 Hz) (MPa)                | 0.13/0.18 (at 7 L/min)   |                            |                          |                            |
|   | Rated flow <small>Note 8)</small> (50/60 Hz) (L/min)                 | 7/7  |                            |                          |                            |
|   | Tank capacity (L)  | Approx. 5  |                            |                          |                            |
|   | Port size  | Rc1/2  |                            |                          |                            |
| Wetted parts material                               |  | Stainless steel, Copper (Heat exchanger brazing), Bronze, Alumina ceramic, Carbon, Polypropylene, PE, POM, FKM, EPDM, PVC  |                            |                          |                            |
| <small>Note 1)</small> Facility water system        | Temperature range (°C)   | —  | 5 to 40                    | —                        | 5 to 40                    |
|   | Pressure range (MPa)   | —  | 0.3 to 0.5                 | —                        | 0.3 to 0.5                 |
|   | Required flow rate <small>Note 12)</small> (50/60 Hz) (L/min)        | —  | 8                          | —                        | 12                         |
|   | Inlet-outlet pressure differential of facility water (MPa)           | —  | 0.3 or more                | —                        | 0.3 or more                |
|   | Port size  | Rc3/8  |                            |                          |                            |
| Wetted parts material                               |  | Stainless steel, Copper (Heat exchanger brazing), Bronze, Synthetic rubber   |                            |                          |                            |
| Electrical system                                   | Power supply   | Single-phase 100 VAC (50/60 Hz), 115 VAC (60 Hz)<br>Allowable voltage range ±10%   |                            |                          |                            |
|   | Circuit protector (A)  | 15   |                            |                          |                            |
|   | Applicable earth leakage breaker capacity <small>Note 9)</small> (A) | 15   |                            |                          |                            |
|   | Rated operating current (50/60 Hz) (A)                               | 7.5/8.3  |                            | 7.7/8.4                  |                            |
|   | Rated power consumption <small>Note 4)</small> (50/60 Hz) (kVA)      | 0.7/0.8  |                            | 0.8/0.8                  |                            |
| Noise level <small>Note 10)</small> (50/60 Hz) (dB) | 58/55  |  |                            |                          |                            |
| Accessories   |  | Fitting (for drain outlet) 1 pc., Input/output signal connector 1 pc., Power supply connector 1 pc., Operation manual (for installation/operation) 1, Quick manual (with a clear case) 1, Alarm code list sticker 1, Ferritic core (for communication) 1 pc. |                            |                          |                            |
| Weight <small>Note 11)</small> (kg)                 |  | 40   |                            |                          |                            |

Note 1) For water-cooled refrigeration

Note 2) It should have no condensation.

Note 3) If clear water is used, use water that conforms to Water Quality Standards of the Japan Refrigeration and Air Conditioning Industrial Association (JRA GL-02-1994 cooling water system - circulating type - make-up water).

Note 4) ① Ambient temperature: 25°C, ② Circulating fluid temperature: 20°C, ③ Rated circulating fluid flow rate, ④ Circulating fluid: Clear water, ⑤ Facility water temperature: 25°C

Note 5) Use a 15% ethylene glycol aqueous solution if operating in a place where the circulating fluid temperature is 10°C or less.

Note 6) Outlet temperature when the circulating fluid flow is rated flow, and the circulating fluid outlet and return port are directly connected. Installation environment and the power supply are within specification range and stable.

Note 7) The capacity at the Thermo-chiller outlet when the circulating fluid temperature is 20°C.

Note 8) Required flow rate for cooling capacity or maintaining 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.

Note 9) Purchase an earth leakage breaker with current sensitivity of 15 mA or 30 mA separately. (A product with an optional earth leakage breaker (option B) is also available.)

Note 10) Front: 1 m, height: 1 m, stable with no load, Other conditions → Note 4)

Note 11) Weight in the dry state without circulating fluids

Note 12) Required flow rate when a load for the cooling capacity is applied at a circulating fluid temperature of 20°C, and rated circulating fluid flow rate and facility water temperature of 25°C.

How to Order

Single-phase 200 to 230 VAC **HRS 018 - A - 20 -**



| Cooling capacity |   | CE/UL              |
|------------------|---|--------------------|
| 012              | Cooling capacity 1100/1300 W (50/60 Hz) | ●                  |
| 018              | Cooling capacity 1700/1900 W (50/60 Hz) | ●                  |
| 024              | Cooling capacity 2100/2400 W (50/60 Hz) | ●                  |
| 050              | Cooling capacity 4700/5100 W (50/60 Hz) | Scheduled for 2011 |

Note) UL standards: Applicable to 60 Hz only

Cooling method

| Symbol | Cooling method             | Applicable model |        |        |                      |
|--------|----------------------------|------------------|--------|--------|----------------------|
|        |                            | HRS012           | HRS018 | HRS024 | HRS050               |
| A      | Air-cooled refrigeration   | ●                | ●      | ●      | ●                    |
| W      | Water-cooled refrigeration | ●                | ●      | ●      | — Scheduled for 2011 |

Pipe thread type

|     |  |
|-----|--|
| Nil | Rc                                       |
| F   | G (with PT-G conversion fitting set)     |
| N   | NPT (with PT-NPT conversion fitting set) |

Option

| Symbol | Option   |
|--------|--|
| Nil    | None   |
| B      | With earth leakage breaker                                     |
| J      | With automatic water supply function                           |
| M      | Applicable to DI water (deionized water) piping                |
| T      | High-lift pump <sup>Note 1)</sup>                              |
| G      | High-temperature environment specifications <sup>Note 2)</sup> |

• When multiple options are combined, indicate symbols in alphabetical order.

Note 1) The cooling capacity reduces about 300 W from the value in the catalog. For HRS050, high-lift pump is available as standard.

Note 2) Air-cooled 200 V types, HRS012/018/024 only  
Not UL-compliant (scheduled for 2011)

Power supply <sup>Note)</sup>

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

Note) UL standards: Applicable to 60 Hz only

Specifications \* There are different values from standard specifications.

| Model   |   | HRS012-A□-20  | HRS012-W□-20               | HRS018-A□-20             | HRS018-W□-20               | HRS024-A□-20             | HRS024-W□-20               | HRS050-A□-20             |  |
|---|---|---|----------------------------|--------------------------|----------------------------|--------------------------|----------------------------|--------------------------|--|
| Cooling method                                  |   | Air-cooled refrigeration  | Water-cooled refrigeration | Air-cooled refrigeration | Water-cooled refrigeration | Air-cooled refrigeration | Water-cooled refrigeration | Air-cooled refrigeration |  |
| Refrigerant                                     |   | R407C (HFC)   |                            |                          |                            |                          |                            |                          | R410A (HFC)                              |
| Control method                                  |   | PID control   |                            |                          |                            |                          |                            |                          |  |
| Ambient temperature/humidity <sup>Note 2)</sup> |   | Temperature: 5 to 40°C, High-temperature environment specifications (option): 5 to 45°C, Humidity: 30 to 70%              |                            |                          |                            |                          |                            |                          |  |
| Circulating fluid system                        | Circulating fluid <sup>Note 3)</sup>  | Clear water, 15% ethylene glycol aqueous solution <sup>Note 5)</sup>  |                            |                          |                            |                          |                            |                          |  |
|   | Temperature range setting <sup>Note 2)</sup> (°C)   | 5 to 40   |                            |                          |                            |                          |                            |                          |  |
|   | Cooling capacity <sup>Note 4)</sup> (50/60 Hz) (W)  | 1100/1300   |                            | 1700/1900                |                            | 2100/2400                |                            | 4700/5100                |  |
|   | Temperature stability <sup>Note 6)</sup> (°C)   | ±0.1  |                            |                          |                            |                          |                            |                          |  |
|   | Pump capacity <sup>Note 7)</sup> (50/60 Hz) (MPa)   | 0.13/0.18 (at 7 L/min)  |                            |                          |                            |                          |                            |                          | 0.24 (at 23 L/min)<br>0.32 (at 28 L/min) |
|   | Rated flow <sup>Note 8)</sup> (50/60 Hz) (L/min)  | 7/7   |                            |                          |                            |                          |                            |                          | 23/28                                    |
|   | Tank capacity (L)   | Approx. 5   |                            |                          |                            |                          |                            |                          |  |
| Facility water system <sup>Note 1)</sup>        | Port size   | Rc1/2   |                            |                          |                            |                          |                            |                          |  |
|   | Wetted parts material   | Stainless steel, Copper (Heat exchanger brazing), Bronze, Alumina ceramic, Carbon, Polypropylene, PE, POM, FKM, EPDM, PVC |                            |                          |                            |                          |                            |                          |  |
|   | Temperature range (°C)  | —   | 5 to 40                    | —                        | 5 to 40                    | —                        | 5 to 40                    | —                        |  |
|   | Pressure range (MPa)  | —   | 0.3 to 0.5                 | —                        | 0.3 to 0.5                 | —                        | 0.3 to 0.5                 | —                        |  |
|   | Required flow rate <sup>Note 12)</sup> (50/60 Hz) (L/min)   | —   | 8                          | —                        | 12                         | —                        | 14                         | —                        |  |
|   | Inlet-outlet pressure differential of facility water (MPa)  | —   | 0.3 or more                | —                        | 0.3 or more                | —                        | 0.3 or more                | —                        |  |
|   | Port size   | Rc3/8   |                            |                          |                            |                          |                            |                          |  |
| Electrical system                               | Wetted parts material   | Stainless steel, Copper (Heat exchanger brazing), Bronze, Synthetic rubber  |                            |                          |                            |                          |                            |                          |  |
|   | Power supply  | Single-phase 200 to 230 VAC (50/60 Hz)<br>Allowable voltage range ±10%  |                            |                          |                            |                          |                            |                          |  |
|   | Circuit protector (A)   | 10  |                            |                          |                            |                          |                            |                          |  |
|   | Applicable earth leakage breaker capacity <sup>Note 9)</sup> (A)  | 10  |                            |                          |                            |                          |                            |                          |  |
|   | Rated operating current (50/60 Hz) (A)  | 4.6/5.1   |                            | 4.7/5.2                  |                            | 5.1/5.9                  |                            | 8/11                     |  |
|   | Rated power consumption <sup>Note 4)</sup> (50/60 Hz) (kVA)   | 0.9/1.0   |                            | 0.9/1.0                  |                            | 1.0/1.2                  |                            | 1.7/2.2                  |  |
|   | Noise level <sup>Note 10)</sup> (50/60 Hz) (dB)   | 60/61   |                            |                          |                            |                          |                            |                          | 65/68                                    |
| Accessories                                     | Fitting (for drain outlet) 1 pc. <sup>Note 13)</sup> , Input/output signal connector 1 pc., Power supply connector 1 pc. <sup>Note 13)</sup> , Operation manual (for installation/operation) 1, Quick manual (with a clear case) 1 <sup>Note 13)</sup> , Alarm code list sticker 1, Ferritic core (for communication) 1 pc. <sup>Note 13)</sup> |   |                            |                          |                            |                          |                            |                          |  |
| Weight <sup>Note 11)</sup> (kg)                 | 43  |   |                            |                          |                            |                          |                            | 69                       |  |

Note 1) For water-cooled refrigeration

Note 2) It should have no condensation.

Note 3) If clear water is used, use water that conforms to Water Quality Standards of the Japan Refrigeration and Air Conditioning Industrial Association (JRA GL-02-1994 cooling water system - circulating type - make-up water).

Note 4) ① Ambient temperature: 25°C, ② Circulating fluid temperature: 20°C, ③ Rated circulating fluid flow rate, ④ Circulating fluid: Clear water, ⑤ Facility water temperature: 25°C

Note 5) Use a 15% ethylene glycol aqueous solution if operating in a place where the circulating fluid temperature is 10°C or less.

Note 6) Outlet temperature when the circulating fluid flow is rated flow, and the circulating fluid outlet and return port are directly connected. Installation environment and the power supply are within specification range and stable.

Note 7) The capacity at the Thermo-chiller outlet when the circulating fluid temperature is 20°C.

Note 8) Required flow rate for cooling capacity or maintaining 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.

Note 9) Purchase an earth leakage breaker with current sensitivity of 30 mA separately. (A product with an optional earth leakage breaker (option B) is also available.)

Note 10) Front: 1 m, height: 1 m, stable with no load, Other conditions → Note 4)

Note 11) Weight in the dry state without circulating fluids

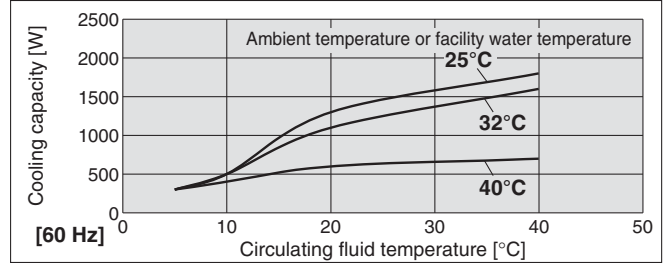
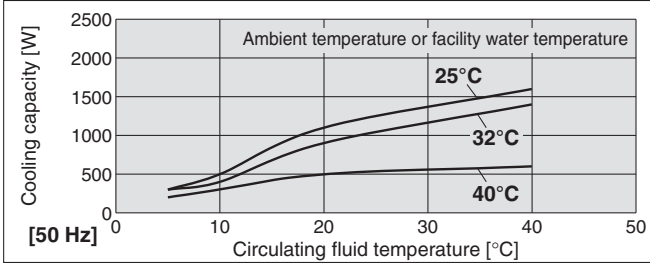
Note 12) Required flow rate when a load for the cooling capacity is applied at a circulating fluid temperature of 20°C, and rated circulating fluid flow rate and facility water temperature of 25°C.

Note 13) It is not provided for HRS050.

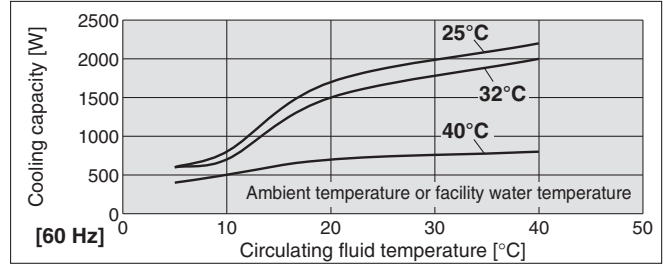
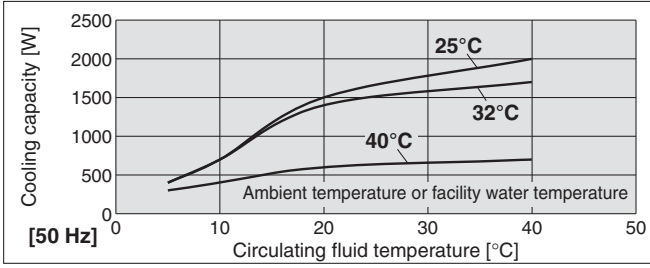
# Series HRS

## Cooling Capacity

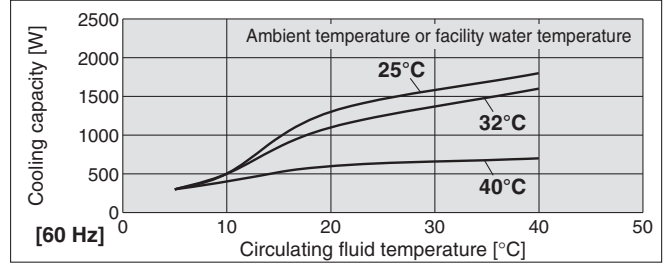
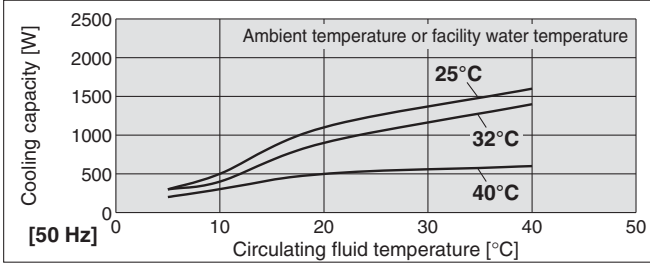
### HRS012-A-10/HRS012-W-10 (Single-phase 100/115 VAC)



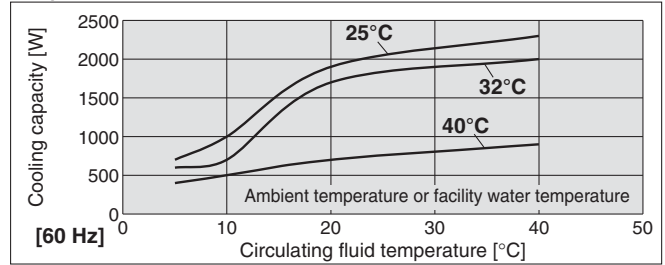
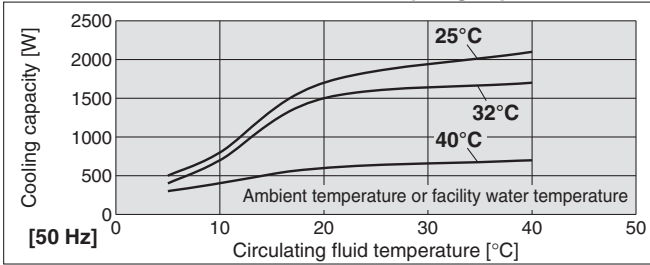
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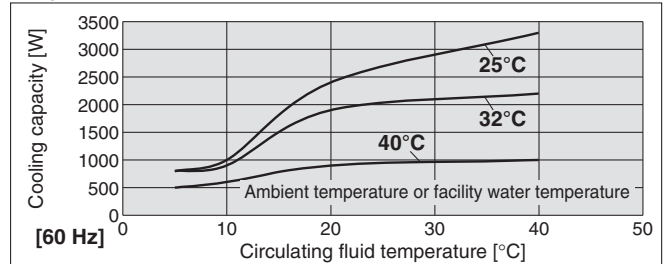
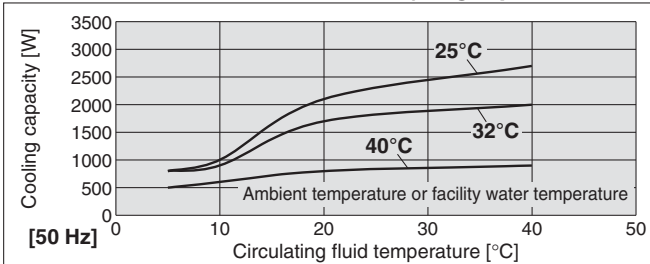
### HRS012-A-20/HRS012-W-20 (Single-phase 200 to 230 VAC)



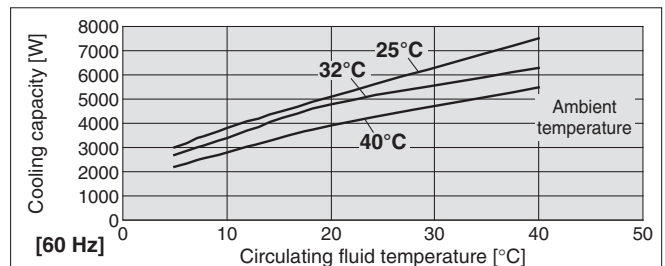
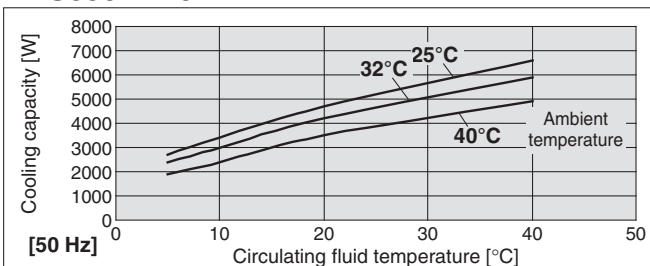
### HRS018-A-20/HRS018-W-20 (Single-phase 200 to 230 VAC)



### HRS024-A-20/HRS024-W-20 (Single-phase 200 to 230 VAC)

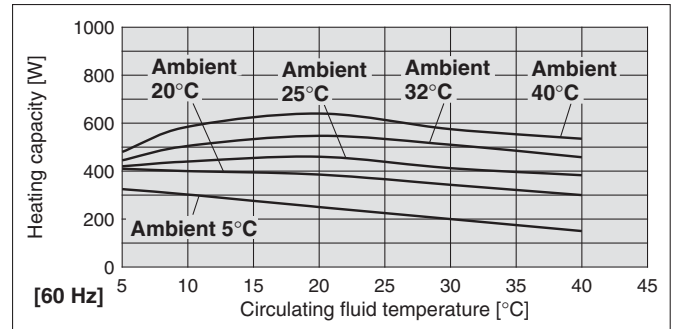
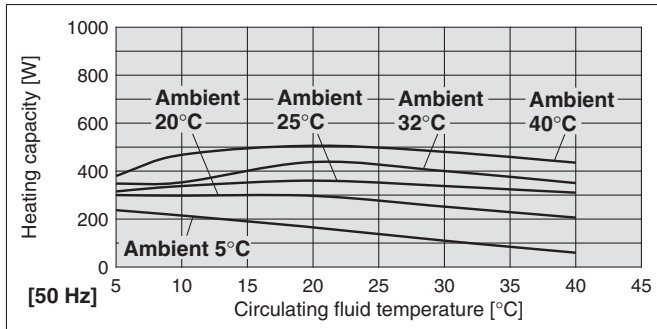


### HRS050-A-20

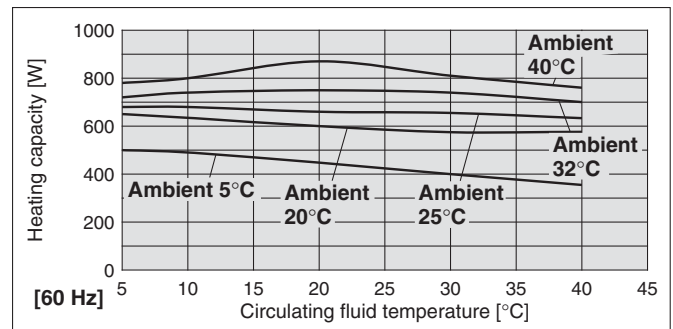
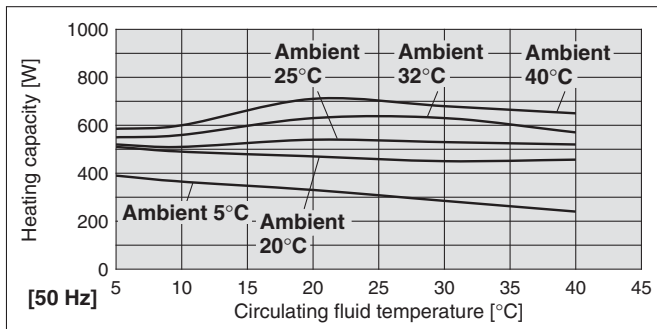


### Heating Capacity

**HRS<sup>012</sup><sub>018</sub>-A<sub>W</sub>-10** (Single-phase 100/115 VAC)

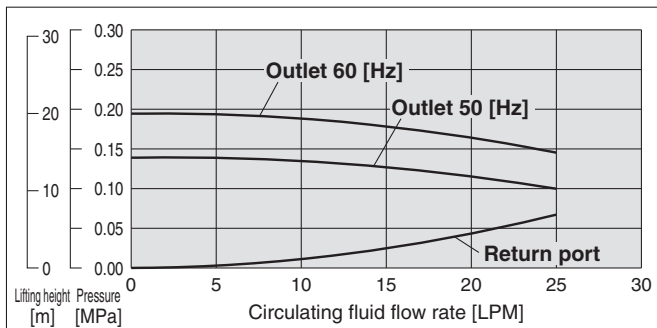


**HRS<sup>012</sup><sub>018</sub>-A<sub>W</sub>-20** (Single-phase 200 to 230 VAC)

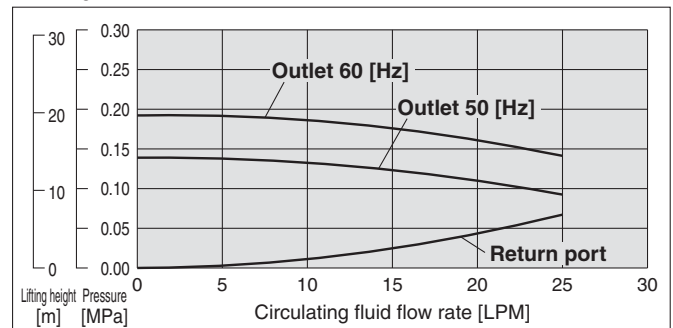


### Pump Capacity

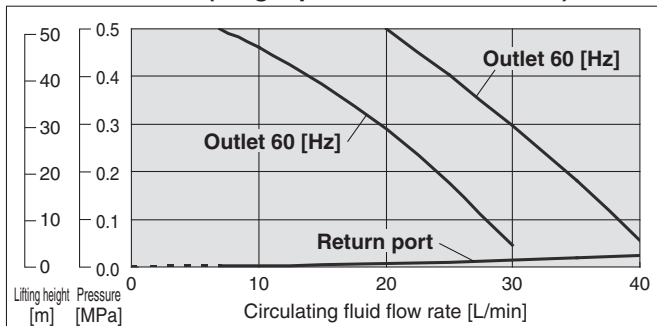
**HRS<sup>012</sup><sub>018</sub>-A<sub>W</sub>-10** (Single-phase 100/115 VAC)



**HRS<sup>012</sup><sub>024</sub>-A<sub>W</sub>-20** (Single-phase 200 to 230 VAC)

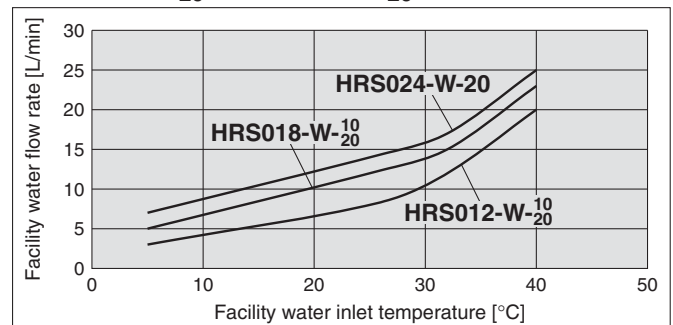


**HRS050-A-20** (Single-phase 200 to 230 VAC)



### Required Facility Water Flow Rate

**HRS012-W-<sup>10</sup><sub>20</sub>, HRS018-W-<sup>10</sup><sub>20</sub>, HRS024-W-20**

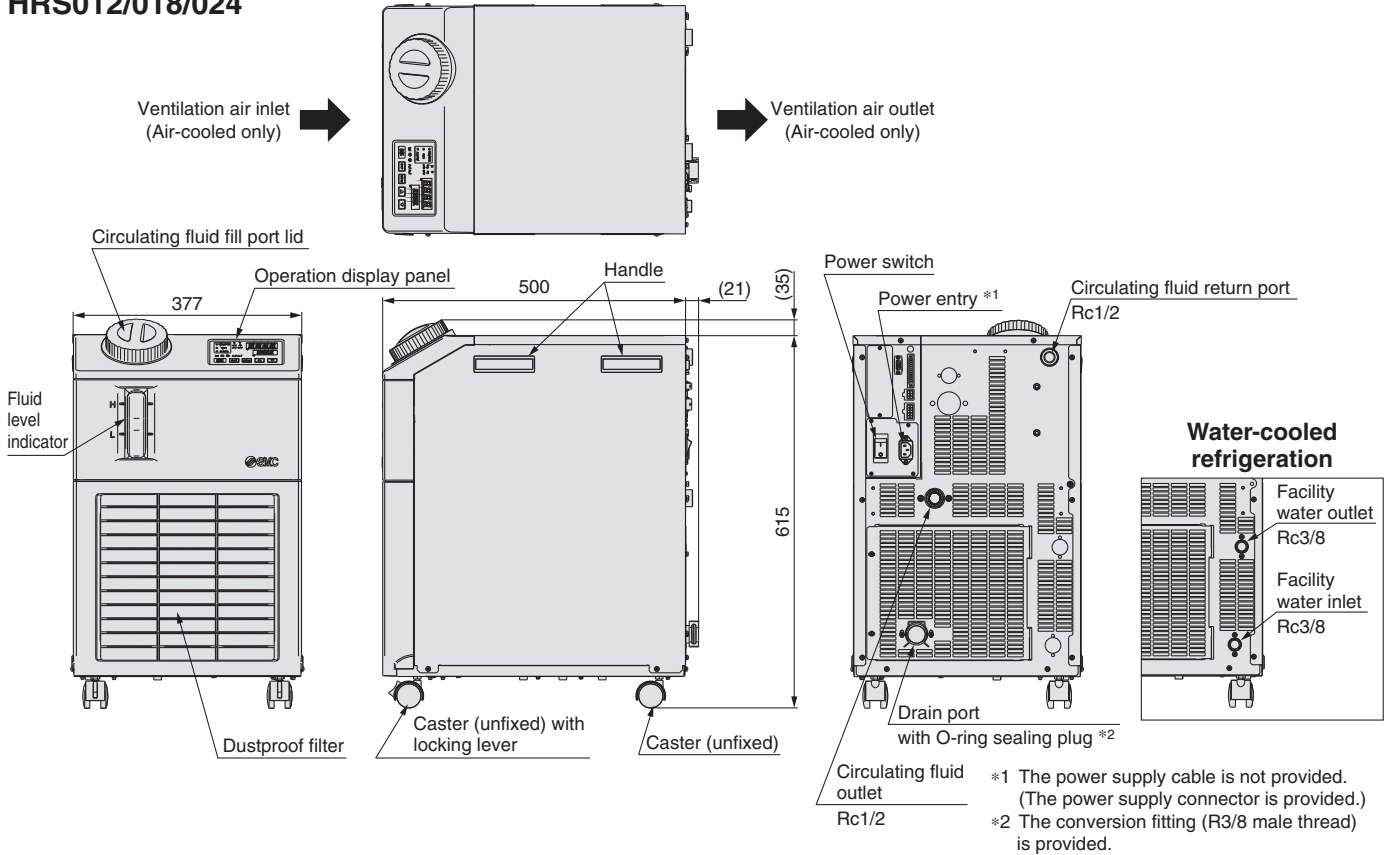


\* This is the facility water flow rate at the circulating fluid rated flow rate and the cooling capacity listed in the "Cooling Capacity" specifications.

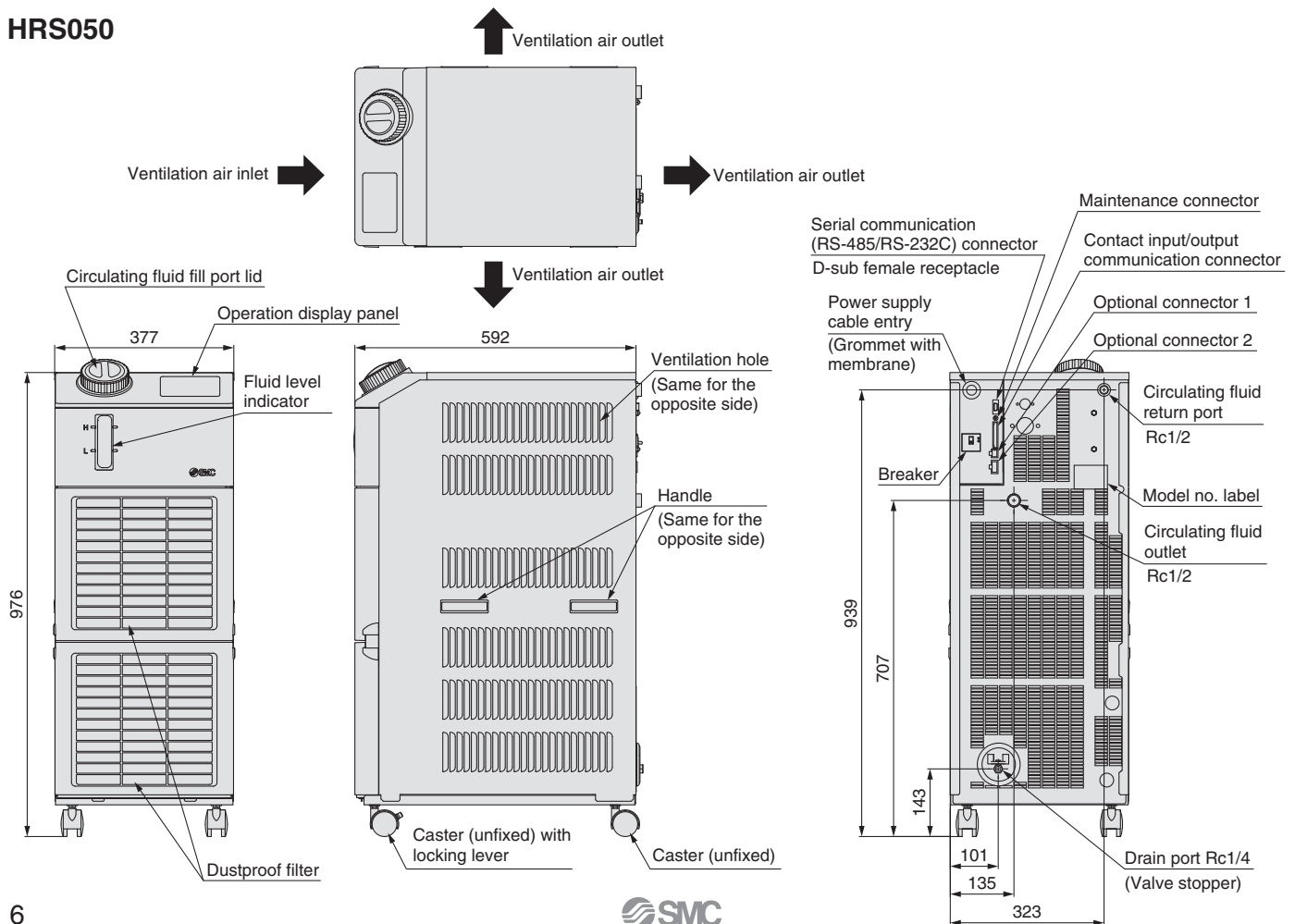
# Series HRS

## Dimensions

### HRS012/018/024



### HRS050



# Global Manufacturing, Distribution and Service Network

## Worldwide Subsidiaries

### North & South America

- U.S.A. SMC Corporation of America
- CANADA SMC Pneumatics (Canada) Ltd.
- MEXICO SMC Corporation(México), S.A. de C.V.
- BRAZIL SMC Pneumáticos do Brasil Ltda.
- CHILE SMC Pneumatics (Chile) S.A.
- COLOMBIA SMC Colombia Sucursal de SMC Chile S.A.
- ARGENTINA SMC Argentina S.A.
- BOLIVIA SMC Pneumatics Bolivia S.r.l.
- VENEZUELA SMC Neumatica Venezuela S.A.
- PERU (Distributor) IMPECO Automatización Industrial S.A.C.
- ECUADOR (Distributor) ASSISTECH CIA. LTDA.

### Asia/Oceania

- CHINA SMC(China)Co.,Ltd.
- CHINA SMC Pneumatics (Guangzhou) Ltd.
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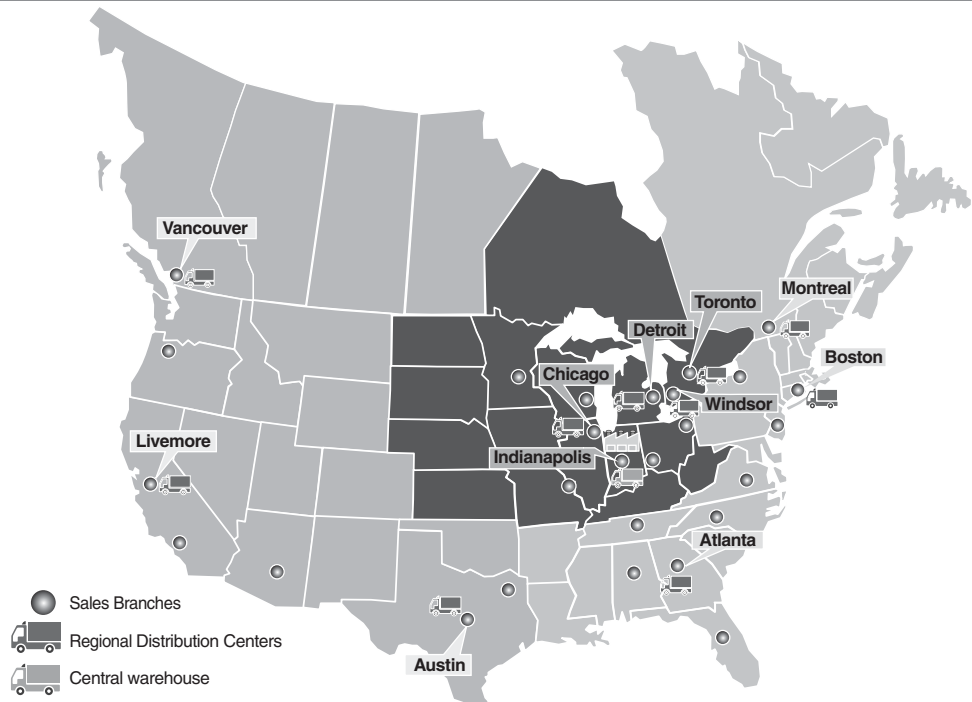
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