Circulating Fluid Temperature Controller
Series HRS Thermo-Chiller
Improve the performance and reliability of your machine with our easy to install, high performance, compact recirculating thermochillers

■ Cooling systems and the importance of a reliable system

Today, thermo chillers are used in many industrial processes to help monitor and control the temperature of heat generating devices.

Commonly found in plastic, printing, machine tool, laboratory, diagnostic and laser machine applications, the ability to maintain a constant temperature, within strict limits, can have a dramatic effect on improved output quality, quantity and machine reliability.

Failure to control heat generation in today’s high tech machines can have serious consequences including high rejection rates, poor product quality and ultimately loss of bottom line revenue.

SMC thermochillers have been specially developed to help improve your industrial application by bringing you a reliable cooling system and complete peace of mind.

■ Gain competitive advantage by using a compact, high performance, thermo chiller from SMC

By selecting our HRS range of thermo chillers for your application needs it will help you to achieve the competitive edge.

How?
• Series HRS thermo chillers offer outstanding reliability ensuring the ideal operating conditions for your process resulting in increased productivity and maximum machine performance
• The impressive temperature stability achieved by our HRS range will help to optimise the quality of your process
• The compact dimensions of our HRS range and their ability to be mounted closely to a side panel or wall helps to ensure that overall machine size can be kept to a minimum
• Weighing from just 40Kg up to 69Kg (2100W and 4700W capacity respectively) our lightweight but robust HRS range will help to reduce the overall weight of your machine.

■ Cooling systems and the importance of monitoring the operating conditions

Even when applications seen to be working normally it’s still possible for unforeseen or unexpected things to go wrong that can severely disrupt or damage your manufacturing process.

But, thanks to the HRS thermo chillers advanced control functions, abnormalities and errors can be quickly detected before any real damage can occur.

And, when used in conjunction with other innovative products from the SMC range such as our unique digital flow switch with integrated temperature sensor - Series PF3W or our high performance Series VX fluid valve range, we can provide you with a one-stop-shop service to help you automate your process using our high quality products to meet all your needs.

■ SMC as global supplier : products and worldwide presence

With sales offices in 78 countries and 50 Subsidiaries located around the globe, SMC are recognised as the world’s leading experts in pneumatics. Our permanent workforce of over 15,000 employees, which includes more than 1,300 dedicated R&D engineers, is focused on customer satisfaction which remains a major driving force for the corporation’s continued success.

We can help support you and our products throughout the world.

Currently, our product range exceeds 11,000 basic products with more than 600,000 variant options, however we still continue to develop between 35 - 50 new or improved products each year.

We remain firmly convinced of the benefits of product innovation and continual product improvement including the use of energy efficiency components in all automated manufacturing processes.
Circulating Fluid Temperature Controller
Thermo-chiller
Compact Type

- Cooling capacity (50 Hz)
  1100 W/1700 W/2100 W/4700 W
- Lightweight 40 kg / 69 kg
- Temperature stability: ±0.1°C
- Temperature range setting: 5 to 40°C
- High-lift pump available as standard (for HRS050)
  For applications with higher pressure drop

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

- Space Saving
  Installation close to a wall is possible on both sides (except HRS050)

Convenient functions
- Timer operation function
- Low tank level detecting function
- Power failure auto-restart function
- Anti-freezing operation function

Easy maintenance
- Tool-less maintenance of filter

Self diagnosis function and check display
- 31 types of alarm codes

Communication function
- Equipped with serial communication (RS232C, RS485) and contact I/Os (2 inputs and 3 outputs) as standard.
### Specifications

<table>
<thead>
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</thead>
<tbody>
<tr>
<td>Control method</td>
<td>PID control</td>
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<tr>
<td>Ambient temperature/humidity</td>
<td>Temperature: 5 to 40°C, High-temperature environment specifications (option): 5 to 45°C, Humidity: 30 to 70%</td>
<td>Temperature: 5 to 40°C, High-temperature environment specifications (option): 5 to 45°C, Humidity: 30 to 70%</td>
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<td>Temperature: 5 to 40°C, High-temperature environment specifications (option): 5 to 45°C, Humidity: 30 to 70%</td>
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<td>Circulating fluid system</td>
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<tr>
<td>Temperature range setting</td>
<td>5 to 40°C</td>
<td>5 to 40°C</td>
<td>5 to 40°C</td>
<td>5 to 40°C</td>
<td>5 to 40°C</td>
<td>5 to 40°C</td>
<td>5 to 40°C</td>
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<tr>
<td>Cooling capacity</td>
<td>1100/1300 W (50/60 Hz)</td>
<td>1700/1900 W (50/60 Hz)</td>
<td>2100/2400 W (50/60 Hz)</td>
<td>4700/5100 W (50/60 Hz)</td>
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<tr>
<td>Temperature stability</td>
<td>±0.1</td>
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<tr>
<td>Pump capacity</td>
<td>0.13/0.18 (at 7 °C/min)</td>
<td>0.13/0.18 (at 7 °C/min)</td>
<td>0.13/0.18 (at 7 °C/min)</td>
<td>0.13/0.18 (at 7 °C/min)</td>
<td>0.13/0.18 (at 7 °C/min)</td>
<td>0.13/0.18 (at 7 °C/min)</td>
<td>0.13/0.18 (at 7 °C/min)</td>
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<td>Rated flow</td>
<td>23/28 °C</td>
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<tr>
<td>Tank capacity</td>
<td>7/7</td>
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<tr>
<td>Port size</td>
<td>Rc1/2</td>
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<tr>
<td>Wetted parts material</td>
<td>Stainless steel, Copper (Heat exchanger brazing), Bronze, Alumina ceramic, Carbon, Polypropylene, PE, POM, FKM, EPDM, PVC</td>
<td>Stainless steel, Copper (Heat exchanger brazing), Bronze, Alumina ceramic, Carbon, Polypropylene, PE, POM, FKM, EPDM, PVC</td>
<td>Stainless steel, Copper (Heat exchanger brazing), Bronze, Alumina ceramic, Carbon, Polypropylene, PE, POM, FKM, EPDM, PVC</td>
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<td>Stainless steel, Copper (Heat exchanger brazing), Bronze, Alumina ceramic, Carbon, Polypropylene, PE, POM, FKM, EPDM, PVC</td>
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<tr>
<td>Pressure range</td>
<td>0.3 to 0.5</td>
<td>0.3 to 0.5</td>
<td>0.3 to 0.5</td>
<td>0.3 to 0.5</td>
<td>0.3 to 0.5</td>
<td>0.3 to 0.5</td>
<td>0.3 to 0.5</td>
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<td>Required flow rate</td>
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<td>12</td>
<td>14</td>
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<tr>
<td>Inlet-outlet pressure differential of facility water (MPa)</td>
<td>0.3</td>
<td>0.3</td>
<td>0.3</td>
<td>0.3</td>
<td>0.3</td>
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<tr>
<td>Port size</td>
<td>Rc3/8</td>
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<td>Electrical system</td>
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<td>Circuit protector</td>
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<td>10</td>
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<td>10</td>
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<td>10</td>
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<tr>
<td>Applicable earth leakage breaker capacity</td>
<td></td>
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<tr>
<td>Power supply</td>
<td></td>
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<tr>
<td>Rated operating current</td>
<td>5.1/5.9</td>
<td>5.1/5.9</td>
<td>5.1/5.9</td>
<td>5.1/5.9</td>
<td>5.1/5.9</td>
<td>5.1/5.9</td>
<td>5.1/5.9</td>
</tr>
<tr>
<td>Rated power consumption</td>
<td>0.9/1.0</td>
<td>0.9/1.0</td>
<td>0.9/1.0</td>
<td>0.9/1.0</td>
<td>0.9/1.0</td>
<td>0.9/1.0</td>
<td>0.9/1.0</td>
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<tr>
<td>Noise level</td>
<td>60/61 (50/60 Hz)</td>
<td>65/68 (50/60 Hz)</td>
<td>60/61 (50/60 Hz)</td>
<td>65/68 (50/60 Hz)</td>
<td>60/61 (50/60 Hz)</td>
<td>65/68 (50/60 Hz)</td>
<td>60/61 (50/60 Hz)</td>
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<tr>
<td>Accessories</td>
<td>Fitting (for drain outlet) 1 pc.</td>
<td>Fitting (for drain outlet) 1 pc.</td>
<td>Fitting (for drain outlet) 1 pc.</td>
<td>Fitting (for drain outlet) 1 pc.</td>
<td>Fitting (for drain outlet) 1 pc.</td>
<td>Fitting (for drain outlet) 1 pc.</td>
<td>Fitting (for drain outlet) 1 pc.</td>
</tr>
</tbody>
</table>

**Note 1:** For water-cooled refrigeration  
**Note 2:** It should have no condensation.  
**Note 3:** It 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:** Use a 15% ethylene glycol aqueous solution if operating in a place where the circulating fluid temperature is 10°C or less.  
**Note 5:** Condensed water must be used.  
**Note 6:** Outlet temperature when the circulating fluid flow is rated flow, and the circulating fluid outlet and return ports 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:** The cooling capacity reduces about 300 W from the value in the catalog.  
**Note 9:** For water-cooled refrigeration  
**Note 10:** Purchase an earth leakage breaker with sensitivity of 30 mA separately. (A product with an optional earth leakage breaker (option B) is also available.)  
**Note 11:** The cooling capacity reduces about 300 W from the value in the catalog.  
**Note 12:** Not UL-compliant (scheduled for 2011)  
**Note 13:** The cooling capacity reduces about 300 W from the value in the catalog.
Cooling Capacity

HRS012-A-20/HRS012-W-20

HRS018-A-20/HRS018-W-20

HRS024-A-20/HRS024-W-20

HRS050-A-20

Heating Capacity

Required Facility Water Flow Rate

Pump Capacity

HRS050-A-20

HRS018-A-20

HRS012-A-20

HRS012-W-20, HRS018-W-20, 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.
**Related product**

**SMC Temperature Control Equipment Guide**

*Note* This table is a guide to select models. Refer to individual catalogues for detailed specifications.

<table>
<thead>
<tr>
<th>Series</th>
<th>Features</th>
<th>Temperature range</th>
<th>Max. cooling capacity</th>
<th>Temperature stability</th>
<th>Pump capacity</th>
<th>Applicable fluid</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Series PX</strong>&lt;br&gt;Thermo-chiller&lt;br&gt;Series HRS&lt;br&gt;(Built-in inverter)</td>
<td>High-performance chiller&lt;br&gt;Wide temperature range&lt;br&gt;High precision temperature control with fast temperature response: adaptable to short cycles and continuous changes in process conditions&lt;br&gt;Error diagnosis, external communications...&lt;br&gt;Ideal for semiconductor industry</td>
<td>-20 to 40°C&lt;br&gt;20 to 90°C</td>
<td>15 kW</td>
<td>±0.1°C</td>
<td>4 min</td>
<td>Fluorinated fluid&lt;br&gt;Clear water&lt;br&gt;Demineralized water&lt;br&gt;Ethylene glycol aqueous solution</td>
</tr>
<tr>
<td><strong>Series VX</strong>&lt;br&gt;Thermo-chiller&lt;br&gt;Series HRS&lt;br&gt;(Water-cooled)</td>
<td>High performance&lt;br&gt;Wide temperature range&lt;br&gt;No compressor, refrigerant free&lt;br&gt;Error diagnosis, external communications...&lt;br&gt;Ideal for semiconductor industry</td>
<td>20 to 90°C</td>
<td>30 kW</td>
<td>±0.3°C</td>
<td>4 min</td>
<td>Fluorinated fluid&lt;br&gt;Clear water&lt;br&gt;Demineralized water&lt;br&gt;Ethylene glycol aqueous solution</td>
</tr>
<tr>
<td><strong>Series HED</strong>&lt;br&gt;Thermo-con&lt;br&gt;Series HEC</td>
<td>High precision temperature control Peltier system&lt;br&gt;Compact, low noise and low vibration design&lt;br&gt;Exclusive design to provide consistent temperature at any position in the bath (vessels with chemicals, cooling coils...)</td>
<td>-15 to 60°C</td>
<td>140 W</td>
<td>±0.01°C</td>
<td>N/A</td>
<td>Clear water&lt;br&gt;Demineralized water&lt;br&gt;Chemical</td>
</tr>
<tr>
<td><strong>Series HZ</strong>&lt;br&gt;Bath&lt;br&gt;Series HEC</td>
<td>High precision temperature control Peltier system&lt;br&gt;Compact, low noise and low vibration design&lt;br&gt;Exclusive design to provide consistent temperature at any position in the bath (vessels with chemicals, cooling coils...)</td>
<td>-15 to 60°C</td>
<td>140 W</td>
<td>±0.01°C</td>
<td>N/A</td>
<td>Clear water&lt;br&gt;Demineralized water&lt;br&gt;Chemical</td>
</tr>
</tbody>
</table>

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**Related product**

**Series PF3W**
3-colour display digital flow switch for water with temperature sensor

**Series VX**
Direct operated 2 port solenoid valve for air, water, oil, steam