High precision temperature control for every industry

Temperature Control Equipment
SMC Temperature Control Equipment

As a total pneumatic equipment manufacturer, SMC supplies products to a wide range of industries against a backdrop of increasing automation across the industrial sector. We have grown to be a global company with the leading market share.

The global market we built up through sales of our pneumatic equipment has yielded customers with increasingly diverse demands. This prompted us to begin developing temperature control equipment for the semiconductor and medical industry in 1978. In the more than 40 years since then, we have supplied the market with products tailored to quality, ease of use, energy efficiency, reliability and more.

We have further extended the core technologies developed in the course of manufacturing products for the healthcare and semiconductor industries, and now develop temperature control equipment suited to a vast array of applications. Based on globally-oriented design principles, we are now delivering high-quality products to clients all over the world that are tailored to their local power supplies and environmental standards.

Using the global network we have built, we at SMC will continue to supply advanced technologies and services that make a positive contribution to industrial growth.

**Demand for temperature control products in the healthcare and semiconductor industries**
- High quality
  - Maintaining high production/operation rates
- High precision (temperature accuracy)
  - Detailed machining accuracy
- Compact
  - Reduced footprints in clean rooms
- Energy saving
- Reduced environmental impact
- Globally compatible

**Core technologies developed in the course of meeting this demand**
- Durable technology in components
- Systems design techniques
- Refrigerant circuit control technology
- Compact design techniques
- Power consumption reduction techniques
- Regulatory compliance (RoHS, etc.)
- Low environmental impact refrigerant technology
- Compliance with overseas safety regulations
  - Technology compatible with differing power supply voltages

**Since 1978**

SMC Temperature Control Equipment

Quality award winner: Quality recognized by customers in the healthcare industry
2019

Technology Succession

Development of technology for temperature control products for general industry

High quality
High precision
Compact
Energy saving
Globally compatible

40 years of progress

Company Profile

<table>
<thead>
<tr>
<th>Company name</th>
<th>SMC Corporation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Head Office</td>
<td>Akihabara UDX 15F, 4-14-1, Sotokanda, Chiyoda-ku, Tokyo 101-0021, JAPAN</td>
</tr>
<tr>
<td>Established</td>
<td>27 April 1959</td>
</tr>
<tr>
<td>Stock exchange listing</td>
<td>Tokyo Stock Exchange, first section</td>
</tr>
<tr>
<td>Capital stock</td>
<td>61 billion yen</td>
</tr>
<tr>
<td>Net sales</td>
<td>576.9 billion yen (consolidated)*</td>
</tr>
<tr>
<td>Net income</td>
<td>130.6 billion yen (consolidated)*</td>
</tr>
<tr>
<td>Number of employees</td>
<td>19,746 (consolidated)*</td>
</tr>
<tr>
<td>Equity ratio</td>
<td>89.3%*</td>
</tr>
<tr>
<td>Rating</td>
<td>AA [R&amp;I (Rating and Investment Information, Inc.)]*</td>
</tr>
<tr>
<td>Purpose of business</td>
<td>Manufacture, processing and sales of automatic control equipment</td>
</tr>
<tr>
<td></td>
<td>Manufacture and sales of sintered filters and various types of filtration equipment</td>
</tr>
</tbody>
</table>

* As of end of March 2019

Global market share | Japan market share
37% | 65%

Countries/regions: 83
Local service locations: 560

Countries/regions with production facilities: 30
Employees: 19,746
Meeting the challenges of high precision, compactness and energy efficiency

SMC original chiller control is made possible by technology built up over many years, and this experience and technology underpins achievements such as high-precision temperature stability as well as our pursuit of compactness, space-savings and lower power costs.

Our extensive product range caters to a wide range of industries and machine types.

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### High precision Compact

Control technology offering temperature stability of ±0.1°C

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### Energy Saving, Reducing Power Consumption

**Triple inverter control technology**

The inverter respectively controls the number of motor rotations of the compressor, fan and pump depending on the load from the customer’s equipment.

**Circulating fluid can be heated without a heater.**

Hot discharge gas is recycled for heating. No heater is required, which helps to save energy.

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### Product Lines

<table>
<thead>
<tr>
<th>Refrigeration type</th>
<th>General Purpose</th>
<th>Laser</th>
<th>High Performance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cooling capacity</td>
<td>1.3 to 28 kW</td>
<td></td>
<td>Cooling capacity</td>
</tr>
<tr>
<td></td>
<td>±0.1°C to ±2.0°C</td>
<td></td>
<td>±0.1°C</td>
</tr>
<tr>
<td>Set temperature</td>
<td>5 to 35/40°C</td>
<td>Dual</td>
<td>Temperature stability</td>
</tr>
<tr>
<td>range</td>
<td></td>
<td>type</td>
<td>±0.1°C</td>
</tr>
<tr>
<td>Air/water-cooled</td>
<td></td>
<td>HRR</td>
<td>Set temperature range</td>
</tr>
<tr>
<td>refrigeration type</td>
<td></td>
<td></td>
<td>-20°C to 90°C</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Water-cooled</td>
</tr>
</tbody>
</table>

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Our extensive product range caters to a wide range of industries and machine types.
### Water-cooled type

<table>
<thead>
<tr>
<th>Refrigerant-free type</th>
<th>High precision</th>
<th>Direct control of chemical liquid temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cooling capacity</td>
<td></td>
<td>Cooling capacity</td>
</tr>
<tr>
<td>2 to 30 kW</td>
<td></td>
<td>300 to 750 W</td>
</tr>
<tr>
<td>Temperature stability</td>
<td></td>
<td>Temperature stability</td>
</tr>
<tr>
<td>±0.3°C</td>
<td></td>
<td>±0.1°C</td>
</tr>
<tr>
<td>Set temperature range</td>
<td></td>
<td>Set temperature range</td>
</tr>
<tr>
<td>20°C to 90°C</td>
<td></td>
<td>-10°C to 60°C</td>
</tr>
</tbody>
</table>

### Peltier type

- **Thermo-chillers HED**
- **Thermo-con HEC/HECR**
- **Chemical thermo-con HED**

Catering to a wide range of industries and equipment:

- **Semic conductors**
- **Medical**
- **Lasers**
- **Welding**
- **Machine tool**
- **Food**
- **FPD**
- **Printing**
- **Physical and Chemical**
Technology Development Capability to Meet Customers’ Needs

With “Customer First” as our motto, we are working to create highly reliable products through wide-ranging technology development from component parts upwards. This development includes improving performance, quality and endurance, high functionality, multi-functionality, compactness, new refrigerants and compliance with international standards.

**Design Quality**

- Identifying specifications that meet customer requirements
- Developing components that meet customers’ requirements

Developing highly reliable components

**Developing components cooperatively with parts manufacturers**

- Parts specifications meeting
  - SMC
  - Parts manufacturer
- Component delivery
  - Parts manufacturer
- Component evaluation
  - SMC
- Component improvement
  - Parts manufacturer
- Quality inspection
  - SMC
  - Parts manufacturer
- Improved component evaluation
  - SMC
- Improvement
  - Parts manufacturer

- Approved
- Adoption
- Improvements required

- Failed
- OK

Component parts development

Tank assessments (withstand pressure testing and deformation simulations)
Pump assessments (endurance testing)
Developing temperature control equipment that meets customers’ requirements

Extremely reliable components providing high precision temperature control and energy efficient design techniques

Simulation-based design of cooling temperature/capability

Compact design techniques achieving multi-functionality in a limited space

Rack mount chillers that are compact and allow front access

Space savings achieved by an all-in-one tank with a built-in pump and heat exchanger

Reliability assessments (compliance with international standards, etc.)

EMC testing (safety standards compliance testing)

Temperature control data measurement testing

Discharge testing

Temperature control testing / life testing

Transportation vibration testing

Noise testing
Integrated production system for the production of high-quality products

We have built a system that ensures that high-quality parts are supplied, made or shipped in any process. High reliability is ensured by 100% inspections. A dedicated temperature control equipment factory provides manufacturing consistency.

Manufacturing Quality

100% inspection

Parts machining/inspection

Preparatory work (component assembly)

100% inspection

Refrigerant circuit leakage inspection

Refrigerant gas replenishment

Plate metal machining

Tank welding

Tank leak testing

Preparatory work by staff certified in particular skills

Only high-quality parts supplied

High-quality products produced

Environmentally friendly refrigerating circuit leakage inspection using helium

Accredited work

Basic tasks such as screw fastening, gas welding, pressing, plate metal machining, wiring, adhesion, soldering, pressure bonding, brazing, refrigerant gas replenishment (recovery), assembly, inspection, finishing
The processes from parts machining and assembly through to inspection and shipping are all concentrated in the Yamatsuri 1st factory (site area: approx. 320,000 m²; total floor space: approx. 80,000 m²) with a unique SMC integrated development and production system that ensures production efficiency.

Assembly

Cooling capacity inspection

100% inspection

Finishing /Packing

High-quality products shipped

100% inspection for other items such as pump performance and safety functions

Warehouse

Assembly by multi-skilled staff

Yamatsuri 2nd Factory
Global Network Services

SMC has built a network of highly localized supply systems all over the world, working with some 560 local offices and agents in a total of 83 countries and regions in all the major nations of Asia, Oceania, America and Europe.

SMC supply system providing exhaustive coverage in every major country around the world

North, South and Central America
1. Argentina  
2. Bolivia  
3. Brazil  
4. Canada  
5. Chile  
6. Colombia  
7. Ecuador  
8. Mexico  
9. Peru  
10. United States of America <U.S.A. Central Warehouse>  
11. Venezuela

Europe
12. Albania  
13. Austria  
14. Belarus  
15. Belgium <European Central Warehouse (ECW)>  
16. Bosnia-Herzegovina  
17. Bulgaria  
18. Croatia  
19. Czech Republic  
20. Denmark  
21. Estonia  
22. Finland  
23. France  
24. Germany  
25. Greece  
26. Hungary  
27. Ireland  
28. Italy

* Icons indicate a central warehouse or logistics center.  
* SMC critical products are warehoused at each facility.  
* Countries and regions are listed alphabetically in each area.
Global Supply Network

Singapore:
Jurong Headquarters

Korea:
Korea Central Warehouse (KCW)

China:
- Logistics Center in Beijing
- Logistics Center in Hong Kong
- Logistics Center in Guangzhou
- Logistics Center in Shanghai

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- Logistics Center in Beijing
- Logistics Center in Hong Kong
- Logistics Center in Guangzhou
- Logistics Center in Shanghai

Thailand:
Bang Pa-In Central Warehouse

Korea:
Korea Central Warehouse (KCW)

Singapore:
Jurong Headquarters

Africa
- Algeria
- Cameroon
- Cote d’Ivoire
- Egypt
- Kenya
- Morocco
- Nigeria
- Senegal
- South Africa
- Tunisia

Asia/Oceania
- Australia
- Bahrain
- Bangladesh
- Cambodia
- China: <Beijing/Shanghai/Guangzhou Logistics Centers>
- Hong Kong: <Hong Kong Logistics Centers>
- India
- Indonesia
- Israel
- Japan

Korea:
- <Korean Central Warehouse (KCW)>

Kuwait
Malaysia
Myanmar
New Zealand
Oman
Pakistan
Philippines
Qatar
Saudi Arabia
Singapore: <Jurong Headquarters>
Sri Lanka
Taiwan
Thailand: <Bang Pa-In Central Warehouse>
United Arab Emirates
Vietnam
Global Engineering Network

We have Technical Centers at 5 locations worldwide that are collaborating to develop advanced technologies and comprehensive expertise that we use to address customers’ needs by supplying outstanding products and services. We also listen carefully to our customers around the world and use their feedback in our product development and quality improvement programs.

Technical Support

The ideal temperature control equipment for any customer differs depending on the industry they work in, their equipment and the applications in which it is used. At SMC, we consult closely with our customers prior to installation and provide hands-on support to help them choose the product that is right for them.

1. Performance testing

Each individual product is subjected to a range of performance tests. Through our commitment to high quality, we have achieved temperature regulation that is stable regardless of the environment.

2. Selection support

We offer technical advice to ensure that customers choose the best possible equipment for their operating conditions.

3. Loan service

This service allows customers considering a purchase to carry out tests using sample products provided for real-world evaluations.
We have established Technical Centers in the U.S.A., Europe, China and Japan.

**Engineering staff 1,600**

**U.S.A.**

**UTC (U.S. Technical Center)**

The UTC is enhancing its engineering capabilities in order to more quickly respond to the needs of the North American market through product development and the provision of technical services. There are currently around 140 employees tasked with dealing with the various needs of customers in the region.

**United Kingdom**

**ETC (European Technical Centre)**

Around 70 experienced staff members from various European countries work together to provide a wide range of services and to quickly relay accurate information regarding the various needs of our customers.

**Germany**

**GTC (German Technical Centre)**

Located at the heart of European industry in Germany, the GTC and its 80 employees support our product development and technical services in the region, responding quickly to customer requirements and issues.

**China**

**CTC (China Technical Center)**

With around 120 employees, the CTC provides a structure for product development and technical support that can respond quickly to the diverse needs of our customers in the various industries and regions of China.

**Japan**

**JTC (Japan Technical Center)**

The JTC is staffed with 1,200 employees and is the core facility for SMC research and development. It produces new products for the global market based on customers' current and future needs.
Global Maintenance Network

Our Chiller Support Teams maintain an inventory of maintenance parts and deal swiftly and appropriately with maintenance issues such as repairs and replacements. With our global high-quality after sales service, customers can rest assured after purchasing our product.

Service Quality

Rapid responses from our parts inventory

We stock replacement parts in the form of sub-assemblies, reducing the time required to replace parts in products such as heat exchangers, compressors and pumps.
So that our Chiller Support Teams can provide high-quality maintenance services, education and training is conducted in each country.

Reliable Maintenance System

Global training in service techniques

So that our Chiller Support Teams can provide high-quality maintenance services, education and training is conducted in each country.