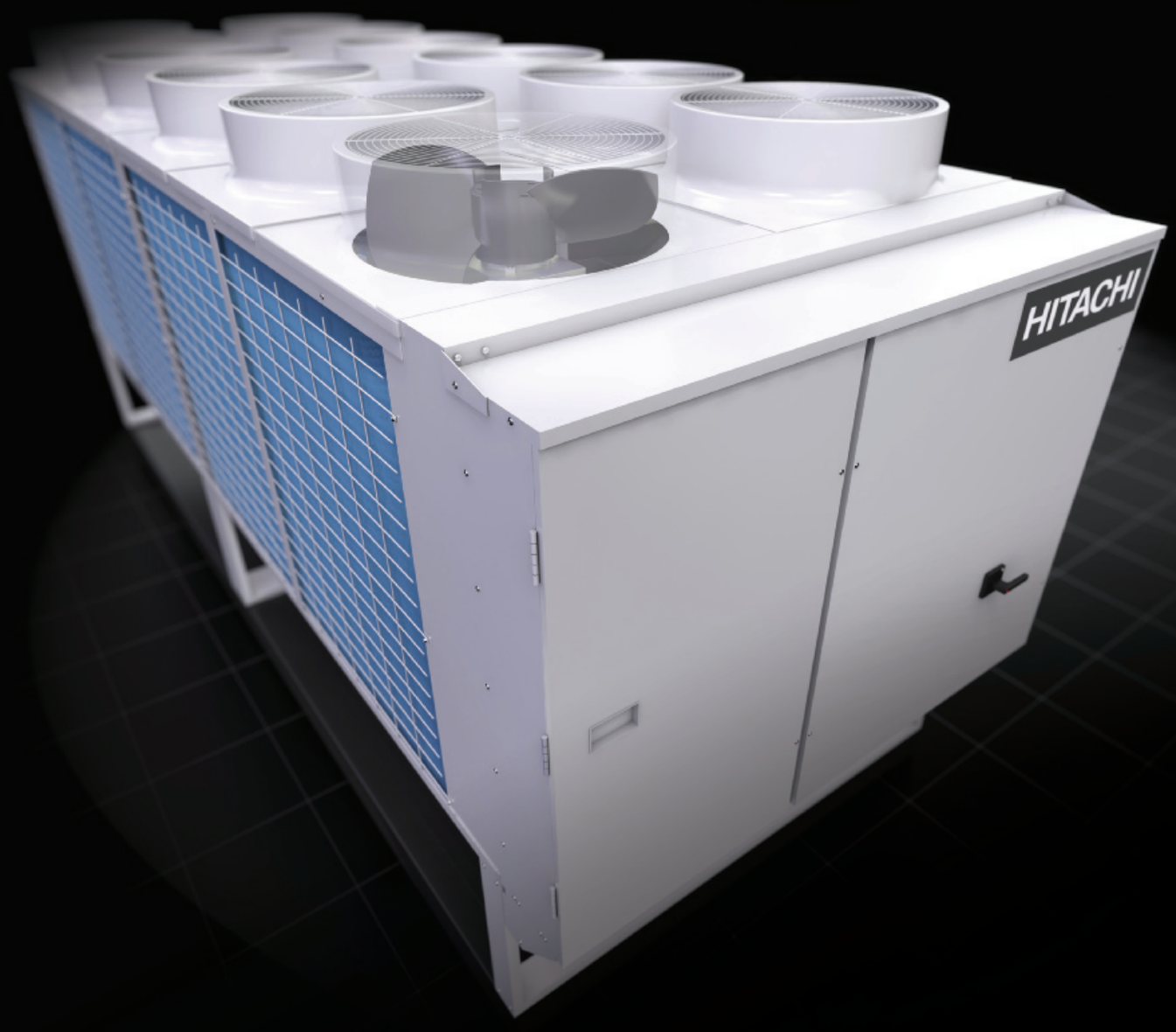
Hitachi Air Conditioning

Engineering for tomorrow. And the tomorrow after that.

Samurai

Samurai Chiller



Samurai

Chillers for Industry and Commerce

HITACHI
Inspire the Next

Company profile

Small beginnings

The establishment of an electrical repair shop for a copper mining company in Japan marked the birth of Hitachi in 1910. Today it is evident that Hitachi Ltd., has grown tremendously, now being one of the largest industrial corporations worldwide.

Our corporate statement “Inspire the Next” is a declaration of our vow that the Hitachi brand will continue to meet the expectations of our customers and society in this age of information, knowledge and the empowered consumer.

This statement embodies Hitachi’s commitment to continue to inspire coming generations with the latest products, systems and services, for a more vibrant society.

It is also an expression of our strong commitment to boldly face whatever new challenges the times bring us: whatever comes “Next.”

Hitachi business groups

Hitachi Europe Ltd., is a wholly owned subsidiary of Hitachi Ltd., Japan, headquartered in Maidenhead, UK and comprises nine key business areas: air conditioning and refrigeration systems, digital media products, display products, European procurement and sourcing, industrial components and equipment, via mechanics, information systems, power and industrial systems, and rail.

Hitachi Air Conditioning

Hitachi prides itself on providing high quality, efficient and reliable air conditioning solutions across the globe. By investing heavily in research and development, Hitachi have been able to remain at the forefront of the industry, and with the opening of HAPE, a purpose-built factory in Barcelona, manufacturing and delivery procedures have become even more streamlined.

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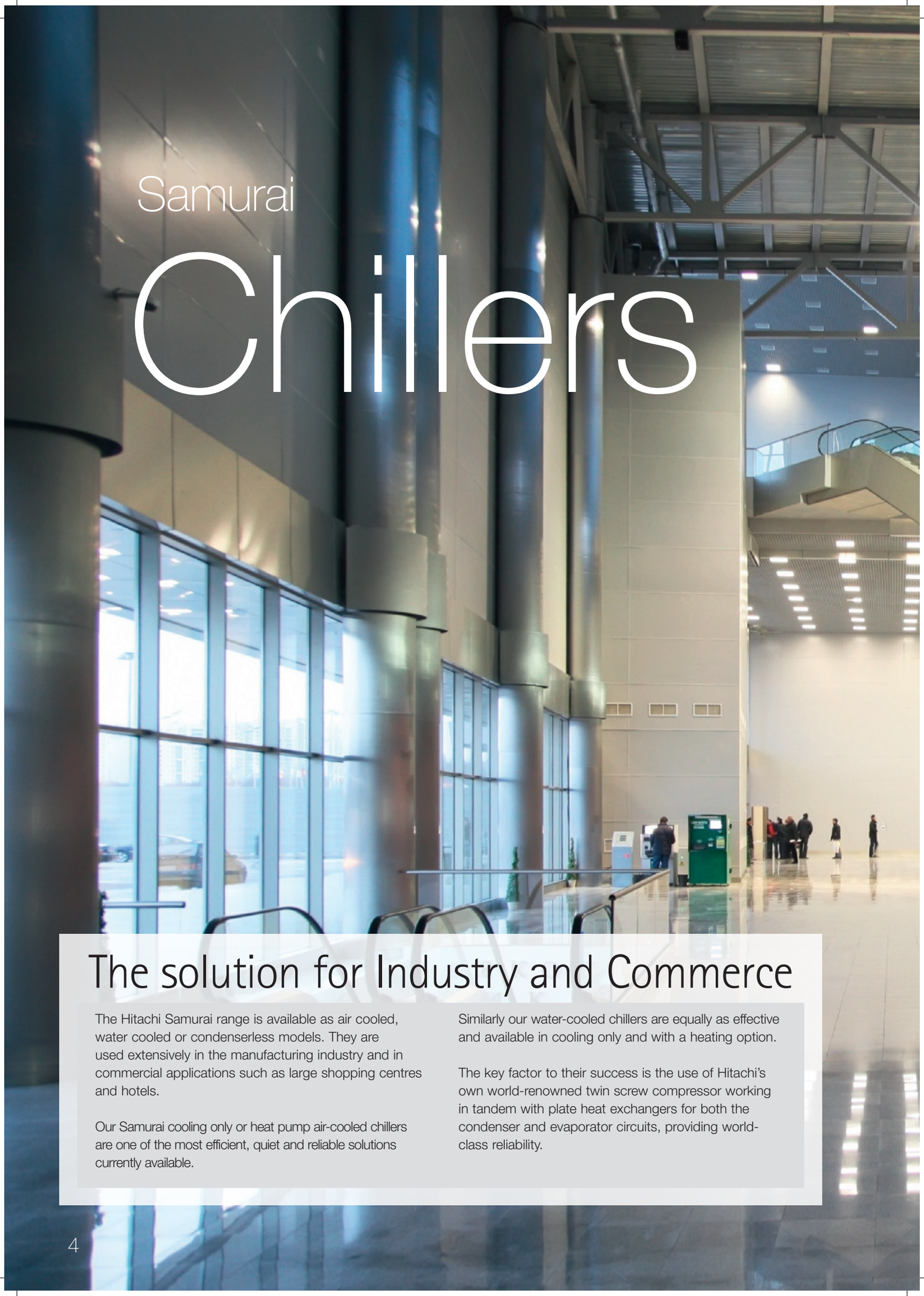


Samurai

Chillers

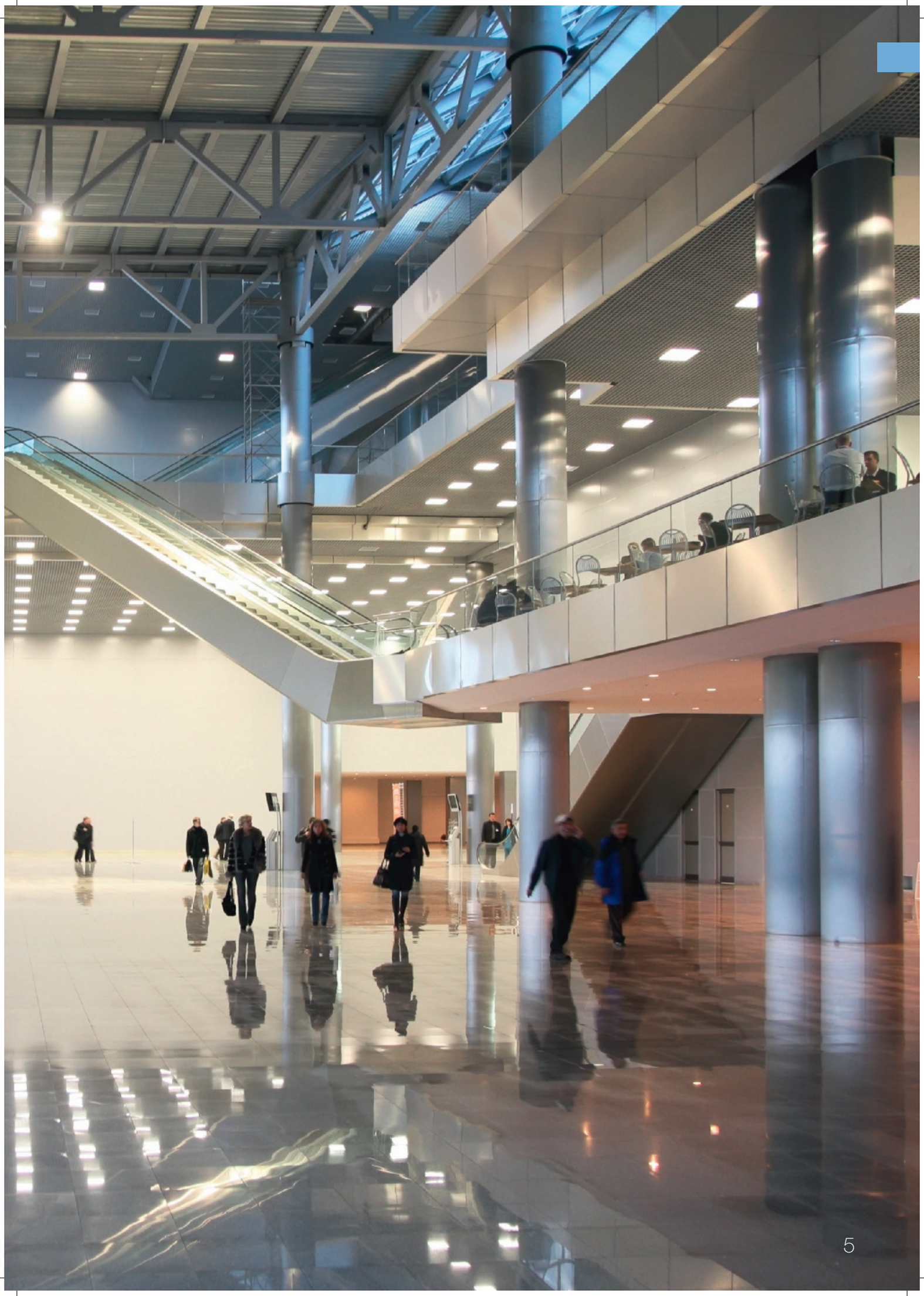
The solution for Industry and Commerce

The Hitachi Samurai range is available as air cooled, water cooled or condenserless models. They are used extensively in the manufacturing industry and in commercial applications such as large shopping centres and hotels.

Our Samurai cooling only or heat pump air-cooled chillers are one of the most efficient, quiet and reliable solutions currently available.

Similarly our water-cooled chillers are equally as effective and available in cooling only and with a heating option.

The key factor to their success is the use of Hitachi's own world-renowned twin screw compressor working in tandem with plate heat exchangers for both the condenser and evaporator circuits, providing world-class reliability.



RCUE-40 ~ 100WG2

Samurai chillers

SAMURAI RCUE		40WG2	50WG2	60WG2	80WG2	100WG2
Cooling Capacity[1]	kW	134	160	194	232	320
Heating Capacity[2]	kW	161.1	192.3	233.9	274.7	384.7
Power Input (Cooling)[1]	kW	33.5	40.0	49.1	54.5	80.0
Power Input (Heating)[2]	kW	39.8	47.5	58.3	64.7	95.0
EER		4.00	4.00	4.00	4.30	4.00
COP		4.00	4.00	4.00	4.20	4.00
ESEER		4.52	4.52	4.46	4.81	4.52
Sound Power Level	dB(A)	83	84	86	86	88
Sound Pressure Level	dB(A)	68	69	71	71	72
Dimensions Height	mm	1520	1520	1520	1520	1700
Width	mm	1105	1105	1105	1105	1105
Depth	mm	850	850	850	850	1465
Net Weight	Kg	750	765	830	950	1570
Capacity Control	-	Continuous Capacity Control				
	%	15 ~ 100				
Number of Circuits	-	1	1	1	1	2
Water Pipe Connection (Evaporator)	inches	3" Victaulic (1 x Inlet / 1 x Outlet)				
	inches	-				
Water Pipe Connection (Condenser)	inches	3" Victaulic (1 x Inlet / 1 x Outlet)				
	inches	-				
Leaving Water Outlet Temperature (Cool)	°C	5 ~ 15 (-10 option)				
Leaving Water Outlet Temperature (Heat)	°C	25 ~ 55				
Condenser Water Outlet Temperature[3]	°C	22 ~ 45 (55* option)				

[1] The nominal cooling capacities are based on the European Standard EN12055.
Chilled Water Inlet / Outlet Temperature: 12 / 7°C
Cooling Water Inlet / Outlet Temperature: 30 / 35°C

[2] The nominal heating capacities are only for Heat Pump Operation Option and based on following conditions.
Chilled Water Inlet / Outlet Temperature: 12 / 7°C
Hot Water (Condenser) Inlet / Outlet Temperature: 40 / 45°C

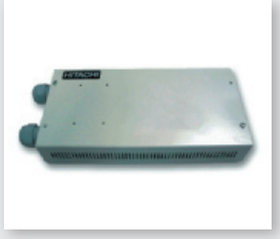
[3] ( ) in case of high condensing option and heat pump operation option.

Control systems - options

Remote control (CSC-5S)

Developed specifically for the Hitachi Samurai Chiller, the CSC-5S delivers individual control and monitoring. It checks and controls up to eight chillers, entirely customised to the needs of the customer. These functions can be conveniently monitored remotely from a control room. Unlike conventional controllers, no visit to the plant room to check the equipment is needed.

BMS Interface - ModBus (HC-A32MB)



Interface to allow any Modbus compatible building management system to control and monitor up to eight chillers.

BMS interface - LonWorks® (HARC70-CE1/OP)

Interface to allow integration of Hitachi H-LINK and LonWorks® BMS systems. Two options are available dependent on the level of control required.

HARC70-CE1

- Four setting points
- Seven monitoring points
- Connection of up to four chillers

HARC70-CE1/OP

- Four setting points
- Forty four monitoring points
- Connection to one chiller

For these functions, the interface HARC70-CE1 must be selected from the options list. Through this interface, the connection of up to four machines via H-LINK connection (Hitachi communication protocol) is possible. The communications protocol is LonWorks®.

CS Net Web

Hitachi's CS Net Web is a standalone control system that allows users to fully monitor and control their air conditioning from anywhere with web access. Up to eight chillers can be monitored from one central point and the user can ascertain the system performance at all times. CS Net Web also provides a ModBus output.

Optional touchscreen

Hitachi's touchscreen allows intuitive control of up to four CS Net Web central controllers. It can be mounted on either a wall or table with the supplied mounting bracket.

Options and accessories

Noise

Low noise (AG2)
The compressor housing is lined with polyurethane foam, reducing noise by about 2dB compared to the standard version.

Super Low Noise (AG2)
To achieve a -4dB noise level reduction compared to the standard model, the compressor housing is double insulated with Polyurethane Foam + Ethylene Propylene Diene M-class rubber.

Low water temperatures

The minimum cold water outlet temperature achievable with standard models is 5°C. For applications requiring temperatures below this, three options are available as follows:

Low 1: +4 ~ 0°C
Low 2: -1 ~ -5°C
Low 3: -6 ~ -10°C

If the chiller is operated at an outlet temperature below 5°C, anti-freeze must be added.

Control system options

CSC-5S
Eight chillers and eight centralised CSC-5S remote addresses can be connected to an H-LINK. An external input connector is provided for a possible connection to a timer. Basic function, heating-cooling mode and temperature setting are displayed.
If an error occurs, an alarm code immediately provides detailed information. The alarms are divided into the following groups to facilitate maintenance work:

- Start / Stop
- Mode (cooling / heating)
- Temperature settings (cold / hot)

CS Net Web
The building control system, CS Net Web, can work with all devices remotely. All temperatures and system pressures can be viewed. It can be installed at any point in the building and is accessible from any computer on site that is connected to the same network and is configured appropriately. As an accessory, a touch screen for the centralised control of the building can be ordered. BMS connection (ModBus) is standard.

BMS interfaces HARC-70CE1/OP LonWorks®
ModBus HC-A32MB
To integrate the chiller into a building control system, you will require this interface. This system is easy to install, as only a two-core cable is used for the connection between the devices and the control unit via the HARC-70CE1. It will then be possible to turn the device on or off and select the required values for the chilled water outlet temperature. The following monitoring information is available:

- Device status (ON / OFF mode)
- Water outlet and inlet temperature and the actual value
- Error codes
- System pressures

Heat exchanger

Copper fins
For some special applications it may be necessary to use copper fins to prevent corrosion. In addition, the Samurai chiller structural components can be treated with anti corrosion paint.

Blygold coil protection
Contact your local sales representative to discuss this option.

Refrigeration cycle

Suction and discharge valves for the compressor
To shut off the refrigeration system directly at the compressor, ball valves can be installed. This simplifies the maintenance of the facility.

Additional compressor pressure relief valve
Single or double safety valve for the compressor (high pressure side). Note: A simple safety valve in the hot gas line is installed as standard.

Dual safety valve
Two safety valves are installed in parallel in the pressure line but only one is operational. This allows a valve to be replaced without recovery of the refrigerant.

Suction pressure relief valve
An additional safety valve can be installed on the intake side (High temperature version).

Suction line insulation
To avoid condensation and loss of cooling capacity, the suction line can be insulated (with WG2 and CLG2 this option is standard).

Heat recovery (plate heat exchanger Hot Gas)
To recover the heat from the refrigeration process, an additional plate heat exchanger can be installed to enable generation of hot water for heating / domestic water supply.

- In the cooling mode, (depending on the model), 30 ~ 35% of "heat output" can be recovered
- 70°C flow temperature is achievable at maximum capacity.

Water cycle

PN16 flange (with counter flange)
The PN16 flange is required for the Victaulic screw connection.

Differential pressure switch (WT In-/Outlet)
This monitors the difference between inlet and outlet water pressure. If there is no water flow, the compressor is not started.

Water flow switch (on site mounting)
The flow switch is supplied loose with the E-box and needs to be installed on site. This must be built into the water pipe by the customer. If there is no water flow, the compressor is not started.

Plate heat exchangers trace heater
To protect the heat exchanger from freezing at low temperatures, an electric heater is installed. This is activated when the ambient temperature falls below 2°C.

Common water pipe (only one connection)
With this option it is possible to have only one inlet and one outlet connection for multiple plate heat exchanger units.

Water pipes made of stainless steel (AISI 304)
To prevent corrosion, the piping can be made in stainless steel (AISI 304).

Pressure tapping WT
(not with flange PN16 or a common water pipe)
To be able to measure the pressure difference, these connections can be installed.

Water filters
A water filter should be installed on the inlet side of the chiller. A 16 or 20 meshed filter is available as an option.

Hydraulic modules on request
(for RCU2E-40 ~ 80AG2 & RHU2E-40 ~ 80AG2).

For further details, see page 9 or contact your local sales representative.

Options and accessories

Special operations

Heat pump operation (WG2)
The Samurai WG2 has a factory fitted option for heating operation.

Heat Pump-operation at high outdoor temperatures
For the Heat pump (RHU2E AG2) units this allows operation at higher outdoor temperatures facilitating the production of hot water during the summer months.

- Maximum outdoor temperature 40°C
- Factory fitted option for heating operation

If the hot gas temperature is too high, coolant is injected through a solenoid valve into the compressor.

Miscellaneous

Witness test I and II
If the customer wishes to witness the testing of the machine in the factory. There are two different options:
Witness Test I: Eurovent conditions
Witness Test II: Customer-specified test conditions

Rubber anti-vibration pads
To reduce the vibration transmission, anti-vibration mats can be ordered. These are delivered with the cabinet.

Spring anti-vibration dampers
To reduce the vibration transmission, spring anti-vibration dampers can be ordered. These are delivered with the cabinet.

Opposite control panel position
If desired, the control panel can be installed on the opposite side of the chiller.

Shipped in wooden crate
For special delivery conditions, the chiller can be packed in a wooden box.

Enhanced corrosion protection of housing
To improve corrosion resistance, the main parts are coated with corrosion protection. In the case of a salty or corrosive environment, this should be ordered together with a copper/copper condenser coil.

Bottom guard
To protect the system components, a grid for the bottom of the machine can be ordered.

Increased transport model (struts)
The machine can be secured for long distance transportation under extreme conditions (cross-struts, flexible pipe connectors, special screw locks, etc.)

Double foil packaging for transport
The cooling unit can be packed twice in plastic film.

Circuit breakers for each compressor
The standard fuses can be replaced with magnetic circuit breakers in the compressors. The circuit breakers allow the power circuit to be reset immediately, without replacing components (H fuse).

Circuit breakers per fan
For each fan, magnetic circuit breakers can be installed as overcurrent protection (fuse std.).

Specifications in this catalogue are subject to change without notice in order that Hitachi may bring the latest innovations to their customers, omitting typing errors.

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