

**HITACHI**

# — Samurai Chillers & Heat Pumps

Cooling & Heating

# Introduction

## Samurai chillers and heat pumps

Whatever the size of your building or its needs, HITACHI has the right water-cooled conditioning system for you.

HITACHI systems have proven their value in many different situations, from industrial applications to commercial spaces and from hotels to department stores.

The attention paid at the design stage to the combination of compressor and electronics management, and more than fifty years of experience as a compressor manufacturer, have enabled us to achieve extraordinary results in terms of both efficiency and durability. This combination enables HITACHI to produce various water-cooling solutions, designed specifically to use R-134a and R-410A refrigerants. HITACHI chillers offer maximum flexibility and control, all thanks to the advanced technology that underlies them. They are unique because of their precision, power, quietness, ease of maintenance and low operating costs. HITACHI chillers can create comfortable, climate-controlled spaces or provide precise control without neglecting the efficiency of plants used in processes.

The experience, reliability, and the quality of materials make HITACHI the safest choice for industry professionals who seek durable solutions.

This catalog provides an overview of HITACHI chillers and includes remote condenser systems, air or water cooled systems, as well as heat-pump options.

Each year, the demand for ever more efficient products increases, in line with the requirements of European directives for reducing energy consumption. The European Parliament's Environmental Commission has made a series of useful tools available for green design. Its requirement of energy labeling for products contributes to technological innovation and removes poorer-performing products from the market.

All these actions contribute to the achievement of the energy-efficiency goals established by the EU for 2030.

At the same time, these actions support industrial competitiveness, promoting those products that offer high environmental performance.

HITACHI's policies, which are sensitive to environmental protection and compliance with the regulatory framework, back the European Union's objectives with respect to reducing the required energy consumption, providing the market with increasingly efficient, high-performance systems and solutions.



## What is ecodesign?

Commission Regulation (EU) 2016/2281 of November 30, 2016 implementing Directive 2009/125/EC, established a framework for the setting of ecodesign requirements for energy-related products.

Mandatory requirements are implemented through specific product regulations directly applicable in all EU countries.

One of the specific product regulations has an impact on HITACHI's range of reversible heat pumps with a maximum nominal cooling capacity of up to 400 kW.



## Seasonal efficiency

Seasonal efficiency is a method for evaluating actual energy efficiency in heating and air-conditioning systems over the course of one calendar year. This type of evaluation is more realistic for evaluating a system's energy efficiency and environmental impact.

To define a system's seasonal efficiency, two new evaluation indices are used that are common to all manufacturers: one dedicated to heating (SCOP), and one dedicated to cooling (SEER). SCOP: seasonal coefficient of performance in heating. SEER: seasonal energy efficiency ratio in cooling.

Therefore, these indices measure energy consumption and annual efficiency based on (standardized) daily consumption. They also take into account the temperature variations and standby times throughout the year to give an accurate indication of the typical energy efficiency of an entire season of heating or cooling.

Specifically:

$\eta_{s, h}$  ( $\eta_{s, h}$ ) = seasonal efficiency of primary energy in heating;

$\eta_{s, c}$  ( $\eta_{s, c}$ ) = seasonal efficiency of primary energy in cooling;

# Introduction

To enable a comparison with other heating products, the percentage of primary energy is expressed and a different value to the COP and EER is mentioned, because the following factors are taken into account in the calculation:

- Operation at partial and full load, nominal efficiency with different loads and at different temperatures, instead of a single point at full load.
- The additional energy consumption of the auxiliary elements (standby, thermostat off, powered-off mode, etc.)

- Operating time at various temperatures.

For example, SCOP (seasonal coefficient of performance in heating) is a translation of the value  $\eta_{s,c}$  through the primary energy efficiency index. In Regulation (EU) 2016/2281 of November 30, 2016, the primary energy efficiency index is  $CC = 2.5$ . In other words, 2.5 kW of primary energy (fuel, gas, etc.) is needed to produce 1 kW of electricity.

Therefore:  $SCOP = \eta_s \times 2.5$

## Minimum efficiency thresholds for heat pumps

Under the ErP Regulation, we determine the efficiency class and the parameter  $\eta_{s,h}$  expressed as a percentage, or the seasonal heating energy efficiency, calculated considering the type of

heat pump and its seasonal coefficient of performance, better known by the acronym SCOP.

### From September 2015

Medium temperature, hot water at 47/55°C:  $\eta_{s,h}=100\%$  (or  $SCOP=2.5$ )

Medium temperature, hot water at 30/35°C:  $\eta_{s,h}=115\%$  (or  $SCOP=2.875$ )

### From September 2017

Medium temperature, hot water at 47/55°C:  $\eta_{s,h}=110\%$  (or  $SCOP=2.750$ )

Low temperature, hot water at 30/35°C:  $\eta_{s,h}=125\%$  (or  $SCOP=3.125$ )

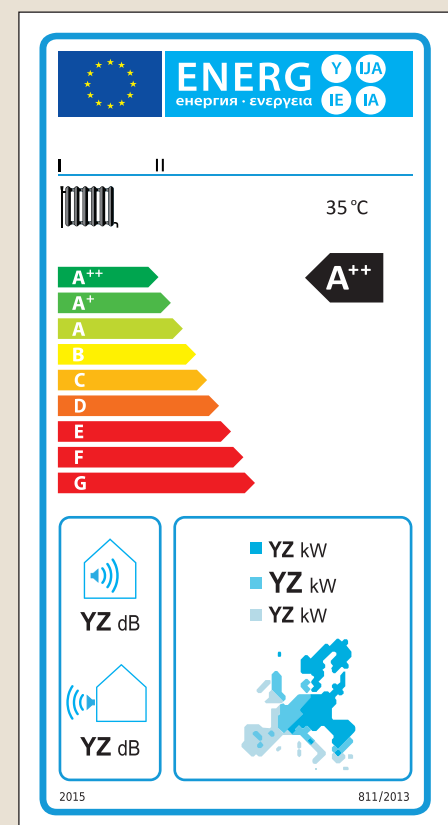


## Energy labeling

- Required on all products with a nominal heating power below 70 kW
- Gives consumers clear, easy-to-understand information.
- The energy-efficiency classes of products range from G to A

## Energy-efficiency class






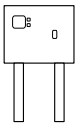
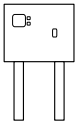
Class	Boilers and heat pumps , medium temperature (operating at 47/55°C)	Heat pump , low temperature (operating at 30/35°C)
A*** (of September 2019)	$\eta_s \geq 150$	$\eta_s \geq 175$
A**	$125 \leq \eta_s < 150$	$150 \leq \eta_s < 175$
A*	$98 \leq \eta_s < 125$	$123 \leq \eta_s < 150$
A	$90 \leq \eta_s < 98$	$115 \leq \eta_s < 123$
B	$82 \leq \eta_s < 90$	$107 \leq \eta_s < 115$
C	$75 \leq \eta_s < 82$	$100 \leq \eta_s < 107$
D	$36 \leq \eta_s < 75$	$61 \leq \eta_s < 100$
E	$34 \leq \eta_s < 36$	$59 \leq \eta_s < 61$
F	$30 \leq \eta_s < 34$	$55 \leq \eta_s < 59$
G	$\eta_s < 30$	$\eta_s < 55$



It is understood that a higher efficiency class means a higher SCOP value and a lower quantity of primary energy that is required by the heat pump to work. For example,  $\eta_{s,h} = 175\%$  means the air-to-water heat pump in low temperature applications where  $SCOP = 4.45$  will result in class A++.

# Quick selection table

Cooling only and heat pump

Ranges of nominal cooling powers (kW)										Type of compressor (Refrigerant)
<b>Samurai S</b> Heat pump 	11.2 - 18	72.00								Rotary Inverter R410A
Air Cooled										
<b>Samurai M cooling only</b> Cooling only 			44 - 254					4,064		Scroll Inverter + Scroll R410A
Air Cooled										
<b>Samurai M</b> Heat pump 			44 - 254					4,064		Scroll Inverter + Scroll R410A
Air Cooled										
<b>Samurai L</b> Cooling only 					160 - 360			2,880		Screw (R134A)
Air Cooled										
<b>Samurai L</b> Heat pump 					150 - 340			2,720		Screw (R134A)
Air Cooled										
<b>Samurai L</b> Cooling only 					140 - 250			2,000		Screw (R134A)
Water Cooled										
<b>Samurai L</b> 					135 - 215			1,720		Screw (R134A)
Condenserless										

☐ A single module    ☒ Modular system: Combinations of various modules

CONTROLS



Wired remote controller  
Compatible with the Samurai S and M range

GATEWAYS



MODBUS



BACNET

Compatible with the Samurai L and M range

# Characteristics

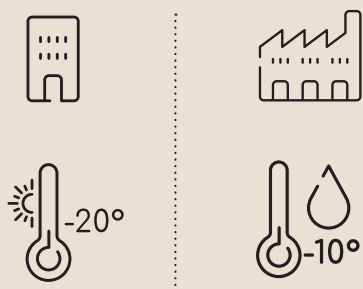
Cooling only and heat pump

## 1 Modular design adaptable to each space

Modular designs are the ideal solution for quick, compact installations requiring machines that are adaptable to the space. The highly efficient units can be combined to achieve the required power, guaranteeing functionality in the event of a partial failure.



## 2 Operating ranges suitable for PROCESS and COMFORT systems



The Samurai L, M and S ranges can be adapted perfectly both to processing plants and to air-conditioning systems. As standard, the operating range is able to satisfy multiple design conditions. Additionally, with a glycol option, the Samurai L unit can produce cold water to -10°C with outside temperatures as low as -15°C. The heat-pump versions guarantee hot-water production with exterior temperatures as low as -15°C, and -20°C in the case of the Samurai S range.

## 3 High efficiency, meeting the requirements of Ecodesign Tier 2



SEER  
4.71

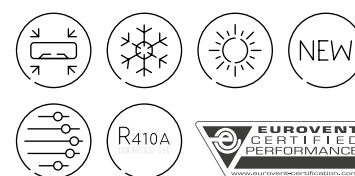
High efficiency levels in both cooling and heating modes. Meets all requirements of Ecodesign Tier 2 for:  
Reg. 813/2013 for heat pumps (2017)  
Reg. 1095/2015 for chillers for medium-temperature industrial processes (2018)  
Reg. 2016/2281 for comfort cooling and for high-temperature industrial processes (2021).

## 4 Units designed to meet the needs of small, medium and large plants

The Samurai L range, thanks to the Hitachi screw compressor, is particularly suitable for large-scale projects, both tertiary and industrial.

The Samurai M and S ranges, thanks to scroll compressors and inverter rotary compressors, are adaptable to small, medium and large applications. As standard, they come with virtually all the accessories needed for installation, to reduce the risk of error during installation and startup.





# Samurai S

Air-to-water heat pump with inverter rotary compressor



## Plug and play

The Samurai S range, for small to medium projects, is designed as a complete solution. These units include all the components needed to install and operate them. Standard components include: differential flow switch, circulating pump, water filter, safety valve and automatic fill valve.

## Installation flexibility:

### Modular approach

Can function with up to 4 units in cascade. (Fig. 1)

### Wide operating ranges

(Fig. 2)

### Available pressure

Each unit's fan has an available standard pressure of 30 Pa. (Fig. 3)

## High energy efficiency

High efficiency levels in both cooling and heating modes. In cooling mode it exceeds all Ecodesign Tier 1 requirements, and in heating mode all Tier 2 requirements. Reg 2016 /2281 for cooling, comfort and high-temperature industrial processes (2021).



Fig. 1

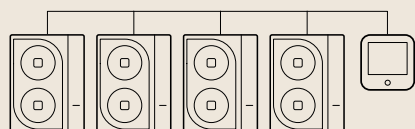


Fig. 2:

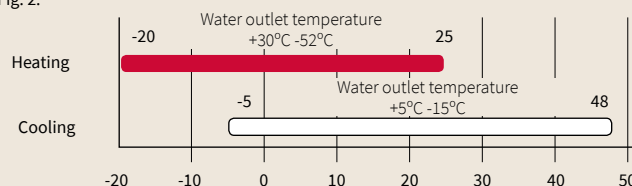
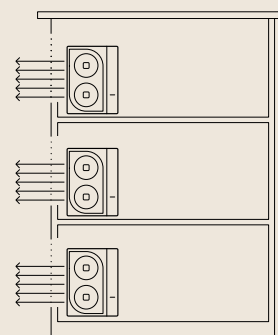
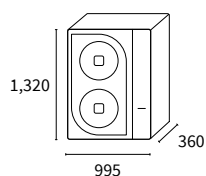


Fig. 3



## Heat pump models



RHMA-4AVN  
RHMA-5AVN  
RHMA-6AVN  
RHMA-7AVN

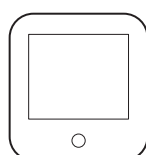
## Samurai S - RHMA-AVN - Heat pump

Heat pump models			RHMA-4AVN	RHMA-5AVN	RHMA-6AVN	RHMA-7AVN
Capacity (Net value)	Cooling (nominal)	kW	11.2	14.30	16.00	17.80
	Heating (nominal)	kW				
EER			10.90	13.10	15.40	18.50
COP			2.79	2.70	2.78	2.56
ESEER			4.10	4.10	4.10	4.10
"SEER cooling for comfort (set point variable)"			4.05/159	4.32/170	4.52/178	4.42/174
SCOP			3.47/136	3.55/139	4.02/158	390/153
Sound power (cooling)	Full load	dB(A)	68	70	70	74
	Low noise	dB(A)	64	65	65	69
"No. and type of compressor/ no. of circuits"			1 - Scroll DC Inverter	1 - Scroll DC Inverter	1 - Scroll DC Inverter	1 - Scroll DC Inverter
Refrigerant			R410A	R410A	R410A	R410A
Refrigerant charge		Kg	2.80	3.30	3.90	4.00
Capacity control		%	n.d.	n.d.	n.d.	n.d.
Heat exchanger type			Plate	Plate	Plate	Plate
Nominal flow rate	(Cooling - Heating)	l/s	0.52-0.56	0.66-0.67	0.75-0.79	0.82-1.03
Available static pressure		kPa	150	130	120	110
Water pipe diameter		inches	1	1	1	1
Fan motor			BLDC - Brushless Directive Current			
Number of fans			2	2	2	2
Working range	Cooling	°C	-5 +48	-5 +48	-5 +48	-5 +48
	Heating	°C	-20 +25	-20 +25	-20 +25	-20 +25
Water production temperatures	Cooling	°C	5 + 15	5 + 15	5 + 15	5 + 15
	Heating	°C	30 + 52	30 + 52	30 + 52	30 + 52
Power supply			1N~200V 50Hz	1N~200V 50Hz	1N~200V 50Hz	1N~200V 50Hz
Consumption	Cooling	kW	4.01	5.28	5.74	6.95
	Heating	kW	3.70	4.30	4.70	6.30
Maximum current (230V)		A	17.10	23.90	26.10	30.70
"Dimensions without hydraulic kit (H x W x D)"		mm	1,320x995x360	1,320x995x360	1,320x995x360	1,320x995x360
Operating weight		Kg	126.0	128.0	141.0	141.0

## Hydraulic elements as standard



## Control included:



Wired remote  
controller  
Included



# Samurai M cooling only

Air-water chiller with  
Scroll DC Inverter compressor



Discover  
Samurai M



## Ultra compact

With its small footprint, the Samurai M is an ideal product for the replacement market. Just 2.7 m<sup>2</sup> of space for 130 kW of heating.

## Very low noise level

The use of Inverter technology (compressor and fans) in the standard version means that it is the quietest range on the market. We also have several low noise options with reduced noise levels up to 8dB(A)

with the low  
sound level option

SEER  
4.71

## Energy excellence

By using Inverter technology, the minimum 2021 ERP seasonal energy-performance thresholds in cooling mode can be exceeded.

## Top features come as standard

The standard version of the Samurai M comes with: electronic expansion valve, condensing pressure control for operation between 17,8°C and 48°C (in cooling only versions), -8°C low-temperature water output kit, dual safety valve, MODBUS gateway, BACNET gateway (optional), differential flow switch; water filter; vitaulic connections, R401a refrigerant charge, built-in touchscreen.

## Wide operating ranges

(Fig. 1)

## Installation flexibility

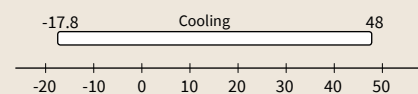
Modular approach: allows for operation of up to 16 or 32 units in cascade.

## Operating safety

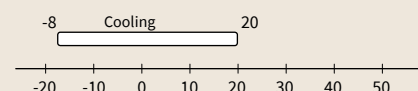
Compressor operating times are balanced automatically for longer-lived components. Automatic handling of the balance of the length of time that compressors are working makes for longer-lived components.

Fig. 1

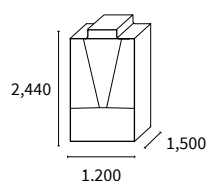
Outside temperature



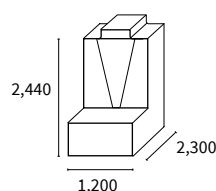
Water outlet temperature



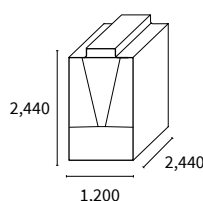
### Cooling only models



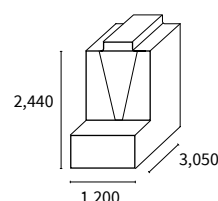
RCMA 18AN  
RCMA 24AN  
(without pump kit or with  
integrated fixed pump kit)



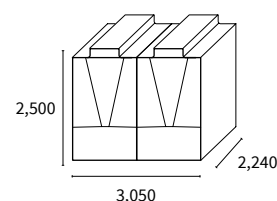
RCMA 18AN  
RCMA 24AN  
(with external variable-speed  
pump kit)



RCMA 30AN RCMA 40AN  
RCMA 50AN  
(without pump kit or with  
integrated fixed pump kit)



RCMA 30AN RCMA 40AN  
RCMA 50AN  
(with external variable-speed  
pump kit)



RCMA 60AN RCMA 75AN  
RCMA 90AN RCMA 100AN  
(without pump kit or with  
variable pump kit)



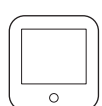
## Samurai M RCMA-AN - Cooling only

Cooling only models		RCMA-18AN		RCMA-24AN		RCMA-30AN		RCMA-40AN		RCMA-50AN	
		Standard	Low noise	Standard	Low noise	Standard	Low noise	Standard	Low noise	Standard	Low noise
Capacity	kW	44.0	41.01	60.0	56.0	78.0	75.0	99.0	92.0	122.0	117.0
EER		2.84	2.87	2.79	2.83	3.11	3.07	3.00	3.01	2.95	2.89
ESEER		4.93	5.00	4.70	4.86	4.82	4.91	4.79	4.95	4.66	4.84
SEER cooling for comfort (fixed flow temp.)		4.25	4.27	4.29	4.37	4.40	4.40	4.39	4.30	4.36	4.38
"SEER cooling for comfort (variable flow temp.)		4.38	4.61	4.50	4.71	4.43	4.24	4.24	4.43	4.42	4.37
SEPR <sub>MT</sub>		3.76	3.77	3.77	3.89	3.91	3.83	3.53	3.57	3.58	3.47
SEPR <sub>HT</sub>		5.70	5.96	5.96	6.13	5.58	5.59	5.69	Not available	5.84	5.87
Sound power (cooling)	dB(A)	80	75	82	77	81	77	83	79	84	80
Sound pressure (cooling) at 1 m	dB(A)	66	61	68	63	66	62	68	64	69	65
Sound pressure (cooling) at 10 m	dB(A)	51	46	53	48	52	48	54	50	55	51
No. and type of compressor/ no. of circuits		2 - Scroll/ 1	2 - Scroll/ 1	2 - Scroll/ 1	2 - Scroll/ 1	3 - Scroll/ 2	3 - Scroll/ 2	3 - Scroll/ 2	3 - Scroll/ 2	4 - Scroll/ 2	4 - Scroll/ 2
Refrigerant		R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A
Refrigerant charge	kg	9.5	9.5	12.3	12.3	8.5+9.1	8.5+9.1	9.5+11	9.5+11	11.4+11.4	11.4+11.4
Capacity control	%	33-100	33-100	25-100	25-100	20-100	20-100	15-100	15-100	12-100	12-100
Heat exchanger type		Plate	Plate	Plate	Plate	Plate	Plate	Plate	Plate	Plate	Plate
Nominal flow rate	l/s	2.1	2.0	2.9	2.7	3.7	3.6	4.7	4.4	5.8	5.6
Total pressure drop	kPa	32	28	25	22	27	25	30	26	36	34
Water pipe diameter	inches	2	2	2	2	2 ½	2 ½	2 ½	2 ½	2 ½	2 ½
Fan motor		EC motor	EC motor	EC motor	EC motor	EC motor	EC motor	EC motor	EC motor	EC motor	EC motor
Number of fans		1	1	1	1	2	2	2	2	2	2
Outside operating temperature	°C	-17.8 to 48	-17.8 to 48	-17.8 to 48	-17.8 to 48	-17.8 to 48	-17.8 to 48	-17.8 to 48	-17.8 to 48	-17.8 to 48	-17.8 to 48
Water production temperatures	°C	-8 to 20	-8 to 20	-8 to 20	-8 to 20	-8 to 20	-8 to 20	-8 to 20	-8 to 20	-8 to 20	-8 to 20
Power supply	V/ph/Hz	3N~400V 50Hz	3N~400V 50Hz	3N~400V 50Hz	3N~400V 50Hz	3N~400V 50Hz	3N~400V 50Hz	3N~400V 50Hz	3N~400V 50Hz	3N~400V 50Hz	3N~400V 50Hz
Consumption	kW	15.49	14.30	21.51	19.80	25.08	24.20	33.00	30.60	41.36	40.50
Maximum current at 400V	A	35.1	35.1	38.3	38.3	60.9	60.9	71.7	71.7	85.2	85.2
Dimensions without hydraulic kit (H x W x D)	mm	2,440x 1,200x 1,500	2,440x 1,200x 1,500	2,440x 1,200x 1,500	2,440x 1,200x 1,500	2,440x 1,200 x 2,240	2,440x 1,200 x 2,240	2,440x 1,200 x 2,240	2,440x 1,200 x 2,240	2,440x 1,200 x 2,240	2,440x 1,200 x 2,240
Operating weight	kg	587.0	587.0	610.0	610.0	893.0	893.0	920.0	920.0	999.0	999.0

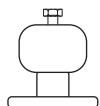
  

Cooling only models		RCMA-60AN		RCMA-75AN		RCMA-90AN		RCMA-100AN	
		Standard	Low noise	Standard	Low noise	Standard	Low noise	Standard	Low noise
Capacity	kW	159.0	157.0	188.0	180.0	222.0	214.0	254.0	245.0
EER		3.12	2.99	3.04	2.91	3.08	2.92	3.06	2.93
ESEER		4.58	4.49	4.76	4.86	4.74	4.82	4.73	4.65
SEER cooling for comfort (fixed flow temp.)		4.36	4.06	4.45	4.39	4.40	4.38	4.24	4.35
SEER cooling for comfort (fixed flow temp.)		4.24	4.06	4.28	4.39	4.17	4.38	4.34	4.68
SEPR <sub>MT</sub>		2.79	2.75	2.70	2.69	3.78	Not available	3.70	3.77
SEPR <sub>HT</sub>		5.97	5.76	5.81	5.75	5.99	5.99	6.02	5.98
Sound power (cooling)	dB(A)	86	82	87	82	88	83	89	84
Sound pressure (cooling) at 1 m	dB(A)	70	66	71	66	72	67	73	68
Sound pressure (cooling) at 10 m	dB(A)	57	52	58	53	59	54	60	55
No. and type of compressor/ no. of circuits		5 - Scroll/ 3	5 - Scroll/ 3	6 - Scroll/ 3	6 - Scroll/ 3	7 - Scroll/ 4	7 - Scroll/ 4	8 - Scroll/ 4	8 - Scroll/ 4
Refrigerant		R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A
Refrigerant charge	kg	9.5+10+10	9.5+10+10	11+10.5+10.5	11+10.5+10.5	9.5+11+ 11.4+11.4	9.5+11+ 11.4+11.4	11.4+ 11.4+11.4+11.4	11.4+ 11.4+11.4+11.4
Capacity control	%	10-100	10-100	8-100	8-100	7-100	7-100	6-100	6-100
Heat exchanger type		Plate	Plate	Plate	Plate	Plate	Plate	Plate	Plate
Nominal flow rate	l/s	7.6	7.6	9	8.6	10.6	10.3	12.1	11.8
Total pressure drop	kPa	25	24	32	30	41	38	38	36
Water pipe diameter	inches	4	4	4	4	4	4	4	4
Fan motor		EC motor	EC motor	EC motor	EC motor	EC motor	EC motor	EC motor	EC motor
Number of fans		3	3	3	3	4	4	4	4
Outside operating temperature	°C	-17.8 to 48	-17.8 to 48	-17.8 to 48	-17.8 to 48	-17.8 to 48	-17.8 to 48	-17.8 to 48	-17.8 to 48
Water production temperatures	°C	-8 to 20	-8 to 20	-8 to 20	-8 to 20	-8 to 20	-8 to 20	-8 to 20	-8 to 20
Power supply	V/ph/Hz	3N~400V 50Hz	3N~400V 50Hz	3N~400V 50Hz	3N~400V 50Hz	3N~400V 50Hz	3N~400V 50Hz	3N~400V 50Hz	3N~400V 50Hz
Consumption	kW	50.96	52.5	61.84	61.9	71.75	73.3	83.01	83.6
Maximum current at 400V	A	119.5	119.5	133.1	133.1	166.4	166.4	179.9	179.9
Dimensions without hydraulic kit (H x W x D)	mm	2,500x 3,050x2,240	2,500x 3,050x2,240	2,500x 3,050x2,240	2,500x 3,050x2,240	2,500x 3,050x2,240	2,500x 3,050x2,240	2,500x 3,050x2,240	2,500x 3,050x2,240
Operating weight	kg	1,922.0	1,922.0	2,003.0	2,003.0	2,235.0	2,235.0	2,316.0	2,316.0

## Compatible controls and accessories:



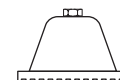
Wired remote controller



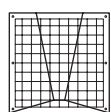
1" or 2" spring anti-vibration mounts



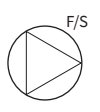
Water temperature sensor



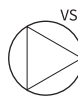
Neoprene anti-vibration mounts



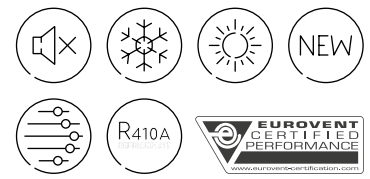
Condenser-unit protection grilles



F/S Hydronic kit with fixed-speed pump and expansion vessel



VSD Hydronic kit with variable-speed pump and expansion vessel



# Samurai M heat pump

Air-to-water chiller with Scroll DC Inverter compressor



Discover  
Samurai M



## Ultra compact

With its small footprint, the Samurai M is an ideal product for the replacement market. Just 2.7 m<sup>2</sup> of space for 130 kW of heating.

## Very low noise level

The use of Inverter technology (compressor and fans) in the standard version means that it is the quietest range on the market. We also have several low noise options with reduced noise levels up to 8dB(A)

with the low  
sound level option

SEER  
4.71

## Energy excellence

By using Inverter technology, the minimum 2021 ERP seasonal energy-performance thresholds in cooling mode can be exceeded.

## Top features come as standard

The standard version of the Samurai M comes with: electronic expansion valve, condensing pressure control for operation between 17,8°C and 48°C (in cooling only versions), -8°C low-temperature water output kit (standard in cooling only versions. Not available in heatpump versions, dual safety valve, MODBUS gateway, BACNET gateway (optional), differential flow switch; water filter; vitaulic connections, R401a refrigerant charge, built-in touchscreen.

## Wide operating ranges

(Fig. 1)

## Installation flexibility

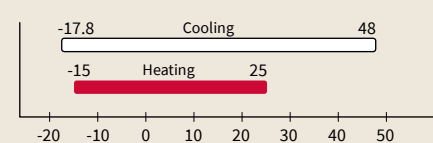
Modular approach: allows for operation of up to 16 or 32 units in cascade.

## Operating safety

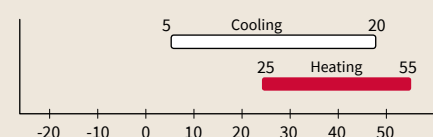
Compressor operating times are balanced automatically for longer-lived components. Automatic handling of the balance of the length of time that compressors are working makes for longer-lived components.

Fig. 1

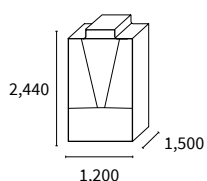
Outside temperature



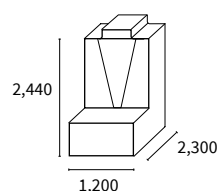
Water outlet temperature



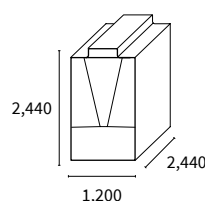
### Heat pump models



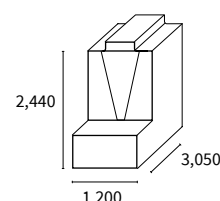
RHMA 18AN  
RHMA 24AN  
(without pump kit and with  
integrated fixed pump kit)



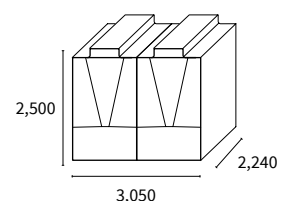
RHMA 18AN  
RHMA 24AN  
(with external variable  
-speed pump kit)



RHMA 30AN RHMA 40AN  
RHMA 50AN  
(without pump kit and with  
integrated fixed pump kit)



RHMA 30AN RHMA 40AN  
RHMA 50AN  
(with external variable  
-speed pump kit)

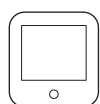


RHMA 60AN RHMA 75AN  
RHMA 90AN RHMA 100AN  
(without pump kit and with  
variable pump kit)

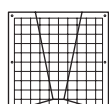
## Samurai M - RHMA-AN - Heat pump

Heat pump models			RHMA-18AN		RHMA-24AN		RHMA-30AN		RHMA-40AN		RHMA-50AN	
			Standard	Low noise	Standard	Low noise	Standard	Low noise	Standard	Low noise	Standard	Low noise
Capacity	Cooling (nominal)	kW	44.0	41.0	60.0	56.0	78.0	75.0	99.0	92.0	122.0	117.0
	Heating (nominal)		5.00	46.0	59.74	55.0	87.0	84.0	98.73	91.0	132.0	126.0
EER			2.84	2.87	2.79	2.83	3.11	3.07	3.00	3.01	2.95	2.89
COP			3.05	3.11	3.07	3.11	3.23	3.24	3.12	3.14	2.97	2.98
ESEER			4.93	5.00	4.70	4.86	4.82	4.91	4.79	4.95	4.66	4.84
"SEER cooling for comfort (fixed flow temp.)"			4.25	4.27	4.29	4.37	4.40	4.40	4.39	4.30	4.36	4.38
"SEER cooling for comfort (variable flow temp.)"			4.38	4.61	4.50	4.71	4.43	4.24	4.24	4.43	4.42	4.37
SEPR <sub>MT</sub>			3.76	3.77	3.77	3.89	3.91	3.83	3.53	3.57	3.58	3.47
SEPR <sub>MT</sub>			5.70	5.96	5.96	6.13	5.58	5.59	5.69	Not available	5.84	5.87
SCOP			3.45	3.43	3.44	3.45	3.40	3.40	3.41	3.35	3.54	3.39
Class	Heating		A+	A+	A+	A+	A+	A+	A+	A+	A+	A+
Sound power (cooling)	Cooling	dB(A)	80	75	82	77	81	77	83	79	84	80
	Heating	dB(A)	82	77	84	79	84	80	85	80	89	84
Sound pressure (cooling) at 1 m	Cooling	dB(A)	66	61	68	63	66	62	68	64	69	65
	Heating	dB(A)	68	63	70	65	69	65	70	65	74	68
Sound pressure (cooling) at 10 m	Cooling	dB(A)	51	46	53	48	52	48	54	50	55	51
	Heating	dB(A)	53	48	55	50	55	51	56	51	60	55
No. and type of compressor/ no. of circuits			2 - Scroll/ 1	2 - Scroll/ 1	2 - Scroll/ 1	2 - Scroll/ 1	3 - Scroll/ 2	3 - Scroll/ 2	3 - Scroll/ 2	3 - Scroll/ 2	4 - Scroll/ 2	4 - Scroll/ 2
Refrigerant			R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A
Refrigerant charge			kg	9.5	9.5	12.3	12.3	8.5+9.1	8.5+9.1	9.5+11	9.5+11	11.4+11.4
Capacity control			%	33-100	33-100	25-100	25-100	20-100	20-100	15-100	15-100	12-100
Heat exchanger type				Plate	Plate	Plate	Plate	Plate	Plate	Plate	Plate	Plate
Nominal flow rate	Cooling	l/s	2.1	2.0	2.9	2.7	3.7	3.6	4.7	4.4	5.8	5.6
	Heating	l/s	2.4	2.2	2.9	2.7	4.2	4.0	4.8	4.4	6.3	6.0
Total pressure drop	Cooling	kPa	32	28	25	22	27	25	30	26	36	34
	Heating	kPa	33	29	23	20	33	31	29	25	39	36
Water pipe diameter			inches	2	2	2	2	2 ½	2 ½	2 ½	2 ½	2 ½
Fan motor				EC motor	EC motor	EC motor	EC motor	EC motor	EC motor	EC motor	EC motor	EC motor
Number of fans				1	1	1	1	2	2	2	2	2
Outside operating temperature	Cooling	°C	-17.8 to 48	-17.8 to 48	-17.8 to 48	-17.8 to 48	-17.8 to 48	-17.8 to 48	-17.8 to 48	-17.8 to 48	-17.8 to 48	-17.8 to 48
	Heating	°C	-15 to 25	-15 to 25	-15 to 25	-15 to 25	-15 to 25	-15 to 25	-15 to 25	-15 to 25	-15 to 25	-15 to 25
Water production temperatures	Cooling	°C	5 to 20	5 to 20	5 to 20	5 to 20	5 to 20	5 to 20	5 to 20	5 to 20	5 to 20	5 to 20
	Heating	°C	25 to 55	25 to 55	25 to 55	25 to 55	25 to 55	25 to 55	25 to 55	25 to 55	25 to 55	25 to 55
Power supply				3N~400V 50Hz	3N~400V 50Hz	3N~400V 50Hz	3N~400V 50Hz	3N~400V 50Hz	3N~400V 50Hz	3N~400V 50Hz	3N~400V 50Hz	3N~400V 50Hz
Consumption	Cooling		15.15	14.3	21.5	19.8	25.1	24.4	33.0	30.6	41.4	40.5
	Heating	kW	16.4	14.8	19.9	17.7	26.9	25.9	31.7	29.0	44.4	42.3
Maximum current at 400V			A	35.1	35.1	38.3	38.3	60.9	60.9	71.7	71.7	85.2
Dimensions without hydraulic kit (H x W x D)			mm	2,440x 1,200x1,500	2,440x 1,200x1,500	2,440x 1,200x1,500	2,440x 1,200x2,240	2,440x 1,200x2,240	2,440x 1,200x2,240	2,440x 1,200x2,240	2,440x 1,200x2,240	2,440x 1,200x2,240
Operating weight			kg	587.0	587.0	610.0	610.0	893.0	893.0	920.0	920.0	999.0

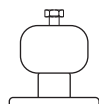
## Compatible controls and accessories:



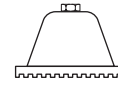
Wired remote controller



Condenser-unit protection grilles



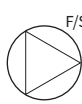
1" or 2" spring anti-vibration mounts



Neoprene anti-vibration mounts



Water temperature sensor



F/S Hydronic kit with fixed-speed pump and expansion vessel



VSD Hydronic kit with variable-speed pump and expansion vessel

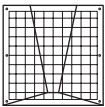


Heat pump models			RHMA-60AN		RHMA-75AN		RHMA-90AN		RHMA-100AN	
			Standard	Low noise	Standard	Low noise	Standard	Low noise	Standard	Low noise
Capacity	Cooling	kW	159.0	157.0	188.0	180.0	221.0	214.0	254.0	245.0
	Heating		161.0	156.0	191.0	182.0	231.0	214.0	254.0	245.0
EER			3.12	2.99	3.04	2.91	3.08	2.92	3.06	2.93
COP			3.26	3.18	3.22	3.17	3.22	2.92	3.06	2.93
ESEER			4.80	4.49	4.76	4.88	4.74	4.82	4.73	4.65
SEER cooling for comfort (fixed flow temp.)			4.36	4.06	4.45	4.39	4.40	4.38	4.24	4.35
SEER cooling for comfort (variable flow temp.)			4.24	4.06	4.28	4.39	4.17	4.38	4.34	4.68
SEPR <sub>MT</sub>			2.79	2.75	2.70	2.69	3.78	Not available	3.70	3.77
SEPR <sub>HT</sub>			5.97	5.76	5.81	5.75	5.99	5.99	6.02	5.98
SCOP			3.32	3.54	3.36	3.53	3.47	3.40	3.30	3.32
Class	Heating		A+	A+	A+	A+	A+	A+	A+	A+
Sound power (cooling)	Cooling	dB(A)	86	82	87	82	88	83	89	84
	Heating	dB(A)	87	82	88	83	89	84	90	84
Sound pressure (cooling) at 1 m	Cooling	dB(A)	70	66	71	66	72	67	73	68
	Heating	dB(A)	71	66	72	67	73	68	74	68
Sound pressure (cooling) at 10 m	Cooling	dB(A)	57	53	58	53	59	54	60	55
	Heating	dB(A)	58	53	59	54	60	54	61	55
No. and type of compressor/ no. of circuits			5 - Scroll/ 3	5 - Scroll/ 3	6 - Scroll/ 3	6 - Scroll/ 3	7 - Scroll/ 4	7 - Scroll/ 4	8 - Scroll/ 4	8 - Scroll/ 4
Refrigerant			R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A
Refrigerant charge			kg	9.5+10+10	9.5+10+10	11+10.5+10.5	11+10.5+10.5	9.5+11+11.4+11.4	11.4+11.4+11.4+11.4	11.4+11.4+11.4+11.4
Capacity control			%	10-100	10-100	8-100	8-100	7-100	7-100	6-100
Heat exchanger type				Plate	Plate	Plate	Plate	Plate	Plate	Plate
Nominal flow rate	Cooling	l/s	7.6	7.6	9.0	8.6	10.6	10.3	12.1	11.8
	Heating	l/s	7.8	7.5	9.2	8.7	11.1	10.8	12.3	11.8
Total pressure drop	Cooling	kPa	25	24	32	30	41	38	38	36
	Heating	kPa	24	23	31	28	43	41	36	33
Water pipe diameter			inches	4	4	4	4	4	4	4
Fan motor				EC motor	EC motor	EC motor	EC motor	EC motor	EC motor	EC motor
Number of fans				3	3	3	3	4	4	4
Outside operating temperature	Cooling	°C	-17.8 to 48	-17.8 to 48	-17.8 to 48	-17.8 to 48	-17.8 to 48	-17.8 to 48	-17.8 to 48	-17.8 to 48
	Heating	°C	-15 to 25	-15 to 25	-15 to 25	-15 to 25	-15 to 25	-15 to 25	-15 to 25	-15 to 25
Water production temperatures	Cooling	°C	5 to 20	5 to 20	5 to 20	5 to 20	5 to 20	5 to 20	5 to 20	5 to 20
	Heating	°C	25 to 55	25 to 55	25 to 55	25 to 55	25 to 55	25 to 55	25 to 55	25 to 55
Power supply			V/ph/Hz	3N~400V 50Hz	3N~400V 50Hz	3N~400V 50Hz	3N~400V 50Hz	3N~400V 50Hz	3N~400V 50Hz	3N~400V 50Hz
Consumption	Cooling			51.0	52.5	61.8	61.9	71.8	73.3	83.0
	Heating	kW		49.4	49.1	59.3	57.4	71.7	73.3	83.0
Maximum current at 400V			A	119.5	119.5	133.1	133.1	166.4	166.4	179.9
Dimensions without hydraulic kit (H x W x D)			mm	2,500x3,050x2,240	2,500x3,050x2,240	2,500x3,050x2,240	2,500x3,050x2,240	2,500x3,050x2,240	2,500x3,050x2,240	2,500x3,050x2,240
Operating weight			kg	1,922.0	1,922.0	2,003.0	2,003.0	2,235.0	2,235.0	2,316.0

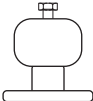
Compatible controls and accessories:



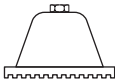
Wired remote controller



Condenser-unit protection grilles



1" or 2" spring anti-vibration mounts



Neoprene anti-vibration mounts



Water temperature sensor



F/S Hydronic kit with fixed-speed pump and expansion vessel



VSD Hydronic kit with variable-speed pump and expansion vessel





# Samurai L cooling only

Air-to-water chiller with screw compressor



## New Hitachi twin-screw compressor

The HITACHI Samurai L range is equipped with a new semi-hermetic twin-screw compressor, with continuous capacity control from 25% to 100%, optimized for R134a refrigerant. Thanks to this feature and the Hitachi electronic control, the energy supplied by the unit corresponds precisely to the hydronic circuit's demand. This standard option in the Samurai L range avoids additional accessories in the system.

- The twin-screw compressor is fitted with an EXCLUSIVE HITACHI cyclonic oil separator, which, in addition to being maintenance free, ensures that the compressor will have no lubrication issues or impurities in the suction circuit.
- Hitachi mechanical efficiency to ensure 40,000 hours of work before mechanical component inspection. (Fig. 1)

## Precise temperature control

The combination of continuous adjustment of the compressor capacity and exclusive HITACHI electronic controls means the chiller is able to precisely control the water outlet temperature, independently of the load. This control is an advantage in both comfort applications and industrial process applications (Fig. 2)

## Modular design

The possibility of installing up to eight modules in cascade with no additional controls (Master-Slave mod.) offers a wide range of powers and flexibility of installation, as it means the power and the overall size of the chiller unit can be adapted to the design requirements. (Fig. 3 on the next page)

## Wide operating range

The Samurai L range can produce cold water with positive values. Optionally, an accessory is available for the production of cold water down to  $-10^{\circ}\text{C}$ . (Fig. 4 on the next page)

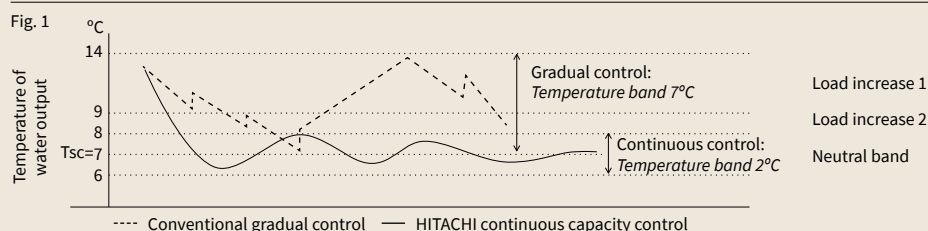
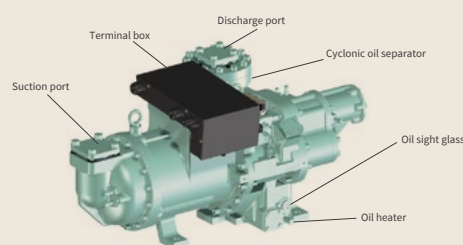
## Two operating modes

Two operating modes available as standard, to adapt the functionality in both comfort and process applications:

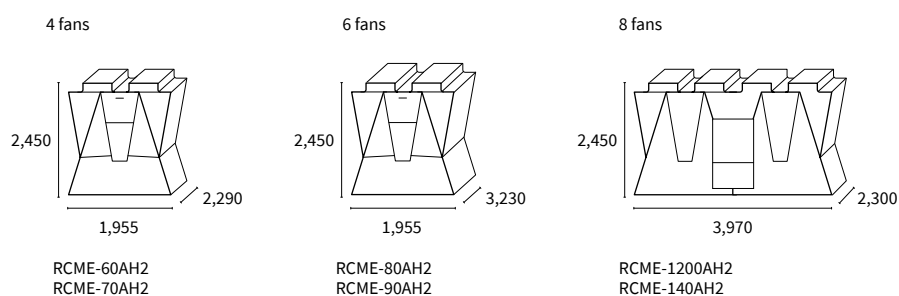
- Standard mode > Constant water outlet temperature > all compressors work with the same load.
- High-efficiency mode > Intelligent control of compressors' on/off function to optimize the system's energy performance.

## Partial heat recovery

Optionally, the Samurai L unit can be fitted with an additional heat exchanger to allow for partial heat recovery from the heat recovery from the refrigeration circuit for the production of domestic hot water, or heating, etc.



### Cooling only models





## Samurai L - RCME-AH2 - Cooling only

Cooling only models			RCME-60AH2	RCME-70AH2	RCME-80AH2	RCME-90AH2	RCME-1200AH2	RCME-140AH2
Capacity	Cooling (nominal)	kW	160	180	205	225	320	360
EER			3.14	3.14	3.16	3.20	3.14	3.14
SEER			4.11	4.13	4.12	4.12	4.18	4.19
SEPR <sub>MT</sub>			3.24	3.24	3.26	3.30	3.25	3.25
SEPR <sub>HT</sub>			5.11	5.11	5.15	5.20	5.13	5.13
Sound power (standard mod.*)		dB(A)	96	97	98	99	99	100
Sound pressure at 10 m		dB(A)	83	84	85	86	86	87
IP Rating			IPX4	IPX4	IPX4	IPX4	IPX4	IPX4
No. and type of compressor/ no. of circuits			1 - Semi-hermetic twin-screw/ 1	1 - Semi-hermetic twin-screw/ 1	1 - Semi-hermetic twin-screw/ 1	1 - Semi-hermetic twin-screw/ 1	2 - Semi-hermetic twin-screw/ 2	2 - Semi-hermetic twin-screw/ 2
Refrigerant			R134A	R134A	R134A	R134A	R134A	R134A
Refrigerant charge		kg	29	36	47	47	58	72
Capacity control		%	25-100	25-100	25-100	25-100	25-100	25-100
Water flow	Cooling (Min/Nom/Max)	m³/h	17.2-27.5-39.3	19.4-31.0-44.2	22.0-35.3-50.4	24.2-38.7-55.3	34.4-55.0-78.6	38.7-61.9-88.5
Water pipe connection	Size and type	inches	2.1/2" Victaulic					
	Quantity		1 x Inlet, 1 x Outlet			2 x Inlet, 2 x Outlet		
Minimum system water volume		m3	0.77	0.76	0.98	0.95	1.54	1.52
Fan motor			EC motor	EC motor	EC motor	EC motor	EC motor	EC motor
Number of fans			4	4	6	6	8	8
Outside operating temperatures	Cooling	°C	-15 to 46	-15 to 46	-15 to 46	-15 to 46	-15 to 46	-15 to 46
Water production temperatures	Cooling - Standard	°C	5 to 15	5 to 15	5 to 15	5 to 15	5 to 15	5 to 15
	Cooling - Low option	°C	-10 to 5	-10 to 5	-10 to 5	-10 to 5	-10 to 5	-10 to 5
	Cooling - High option	°C	15 to 30	15 to 30	15 to 30	15 to 30	15 to 30	15 to 30
Power supply			3N~400V 50Hz	3N~400V 50Hz	3N~400V 50Hz	3N~400V 50Hz	3N~400V 50Hz	3N~400V 50Hz
Consumption	Cooling (nominal)	kW	51.0	57.3	64.9	70.3	101.9	114.6
Current (maximum-startup)		A	118-240	132-240	140-240	143-240	237-259	264-262
Dimensions (H x W x D)		mm	2,450x1,955x2,290	2,450x1,955x2,290	2,450x1,955x3,230	2,450x1,955x3,230	2,450x3,970x2,300	2,450x3,970x2,300
Weight		kg	1,300.0	1,340.0	1,590.0	1,680.0	2,640.0	2,720.0

\*In the Low Noise (LN) option the values are reduced by 3 dB(A)

\*In the Super Low Noise (SLN) option, the values are reduced by 5 dB(A)

\*In the Extra Super Low Noise (XSLN) option the values are reduced by 8 dB(A)

### Modular combinations

Fig. 3

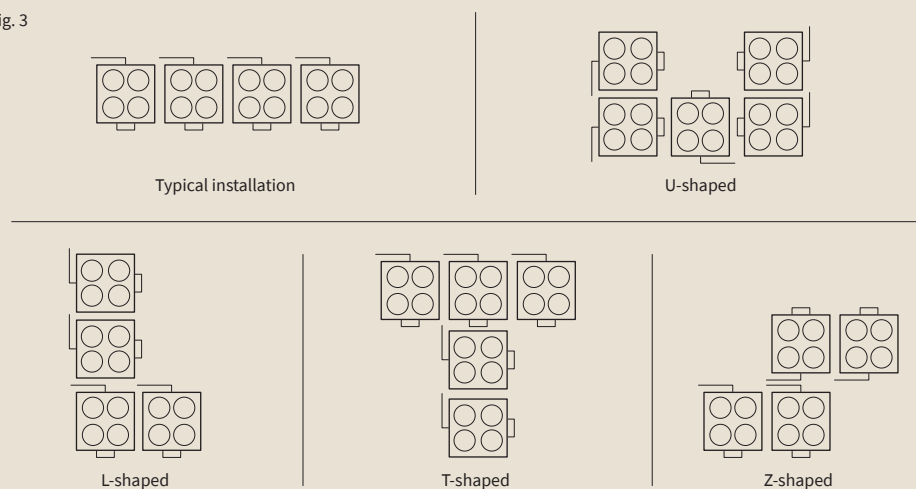
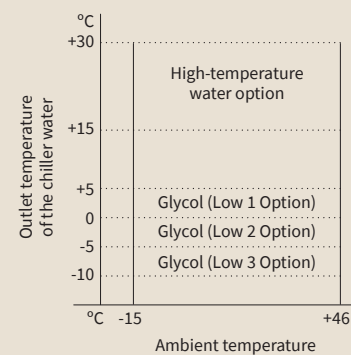
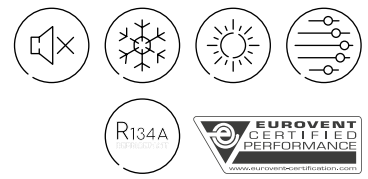


Fig. 4



### Options and accessories:

See pages 328-329



# Samurai L heat pump

Air-to-water chiller with screw compressor



## Precise temperature control

The combination of the Hitachi "continuous capacity control compressor" and Hitachi's exclusive electronic controls allows for very precise control of the water output temperature to  $\pm 0.5^\circ\text{C}$ , independently of the cooling load, which is especially important in industrial processes. (Fig. 1)

## Modular design

The combination of up to eight modules allows very precise adaptation of the production to the requirements of the installation.

## Very small footprint

The new 80 and 90 HP modules (with 6 fans) reduce the space needed for the machine's location. (Fig. 2)

## Two operating modes

Two operating modes come as standard in the system:

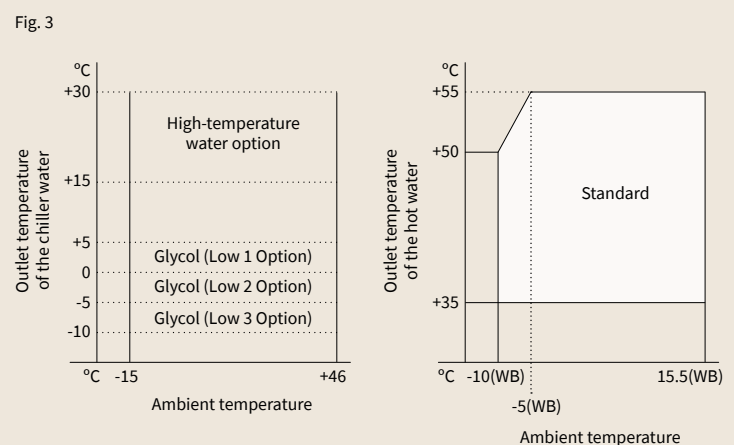
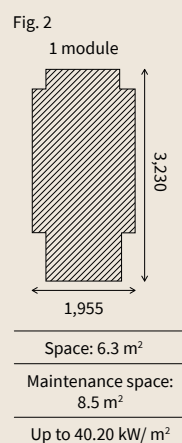
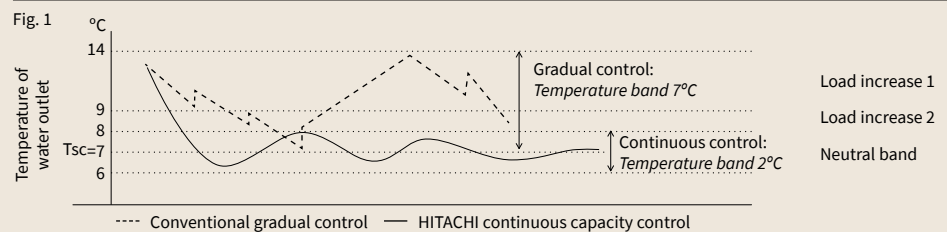
- Standard mode
- High-efficiency mode

## Chilled water from $-10^\circ\text{C}$ and hot water up to $55^\circ\text{C}$

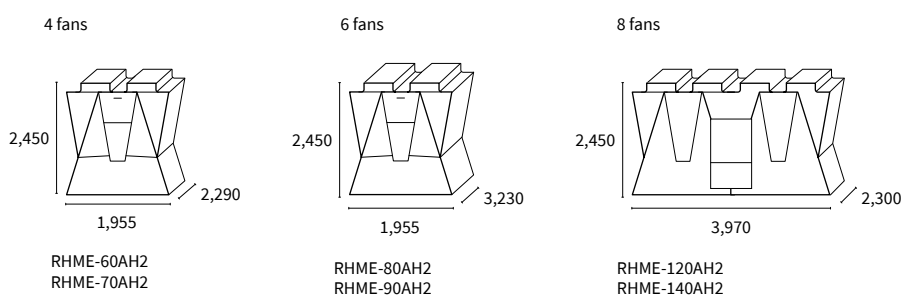
The unit can produce cold water from  $-10^\circ\text{C}$  to  $30^\circ\text{C}$ , depending on its operating mode, and hot water from  $35$  to  $55^\circ\text{C}$ . (Fig. 3)

## Partial heat recovery

Optionally, the Samurai L unit can be fitted with an additional heat exchanger to allow for partial heat recovery from the heat recovery from the refrigeration circuit for the production of domestic hot water, or heating, etc.



## Cooling only models



## Samurai L - RHME-AH2 - Heat pump

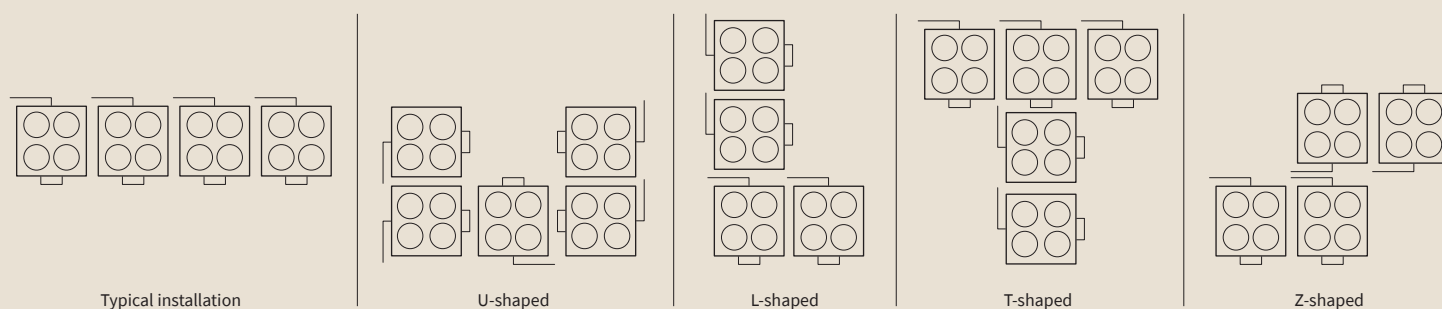
Heat pump models			RHME-60AH2	RHME-70AH2	RHME-80AH2	RHME-90AH2	RHME-120AH2	RHME-140AH2
Capacity	Cooling (nominal)	kW	150	170	195	210	300	340
	Heating (nominal)	kW	145	145	185	185	290	290
EER			2.95	2.95	2.97	3.01	2.95	2.95
COP			2.83	2.83	2.85	2.85	2.83	2.83
SEER			3.88	3.88	3.92	3.96	3.94	3.93
SEPR <sub>MT</sub>			3.24	3.24	3.26	3.30	3.25	3.25
SEPR <sub>HT</sub>			5.11	5.11	5.15	5.20	5.13	5.13
SCOP <sub>LT</sub>			3.22	3.22	3.25	3.25	3.22	3.22
Sound power (standard mod.*)		dB(A)	96	97	98	99	99	100
Sound pressure at 10 m		dB(A)	83	84	85	86	86	87
IP Rating			IPX4	IPX4	IPX4	IPX4	IPX4	IPX4
No. and type of compressor/ no. of circuits			1 - Semi-hermetic twin-screw/ 1	1 - Semi-hermetic twin-screw/ 1	1 - Semi-hermetic twin-screw/ 1	1 - Semi-hermetic twin-screw/ 1	2 - Semi-hermetic twin-screw/ 2	2 - Semi-hermetic twin-screw/ 2
Refrigerant			R134A	R134A	R134A	R134A	R134A	R134A
Refrigerant charge		kg	37	39	49	49	74	78
Capacity control		%	25-100	25-100	25-100	25-100	25-100	25-100
Water flow	Cooling (Min/Nom/Max)	m³/h	16.1-25.8-36.9	18.3-29.2-41.8	21.0-33.5-47.9	22.6-36.1-51.6	32.3-51.6-73.7	36.6-58.5-83.5
	Heating (nominal)		24.9	24.9	31.8	31.8	49.9	49.9
Water pipe connection	Size and type	inches	2.1/2" Victaulic					
	Quantity		1 x Inlet, 1 x Outlet			2 x Inlet, 2 x Outlet		
Minimum system water volume		m3	0.72	0.72	0.94	0.89	1.44	1.44
Fan motor			EC motor	EC motor	EC motor	EC motor	EC motor	EC motor
Number of fans			4	4	6	6	8	8
Outside operating temperatures	Cooling (DB)	°C	-15 to 46	-15 to 46	-15 to 46	-15 to 46	-15 to 46	-15 to 46
	Heating (DB)	°C	-9.5 to 21	-9.5 to 21	-9.5 to 21	-9.5 to 21	-9.5 to 21	-9.5 to 21
Water production temperatures	Cooling - Standard	°C	5 to 15	5 to 15	5 to 15	5 to 15	5 to 15	5 to 15
	Cooling - Low option	°C	-10 to 5	-10 to 5	-10 to 5	-10 to 5	-10 to 5	-10 to 5
	Cooling - High option	°C	15 to 30	15 to 30	15 to 30	15 to 30	15 to 30	15 to 30
	Heating	°C	35 to 55	35 to 55	35 to 55	35 to 55	35 to 55	35 to 55
Power supply			3N~400V 50Hz	3N~400V 50Hz	3N~400V 50Hz	3N~400V 50Hz	3N~400V 50Hz	3N~400V 50Hz
Consumption	Cooling (nominal)	kW	50.8	57.6	65.7	69.8	101.7	115.3
	Heating (nominal)	kW	51.2	51.2	64.9	64.9	102.5	102.5
Current (maximum-startup)		A	119-240	133-240	140-240	143-240	238-259	266-262
Dimensions (H x W x D)		mm	2,450x1,955x2,290	2,450x1,955x2,290	2,450x1,955x3,230	2,450x1,955x3,230	2,450x3,970x2,300	2,450x3,970x2,300
Weight		kg	1,400.0	1,420.0	1,680.0	1,760.0	2,820.0	2,880.0

\*In the Low Noise (LN) option the values are reduced by 3 dB(A)

\*In the Super Low Noise (SLN) option, the values are reduced by 5 dB(A)

\*In the Extra Super Low Noise (XSLN) option the values are reduced by 8 dB(A)

## Modular combinations

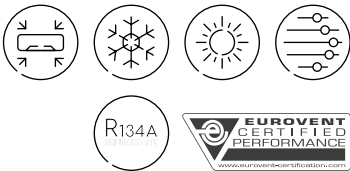


## Options and accessories:

See pages 328-329

# Samurai L

Water-to-water chiller with screw compressor



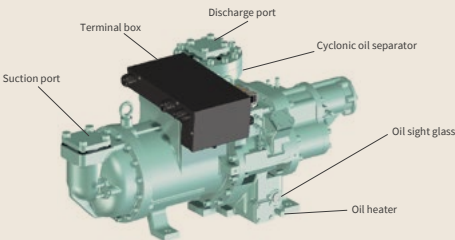
## More compact

With its small footprint, the Samurai L is an ideal unit for both new buildings and the replacement market. Just 1 m2 of space for the 250-kW unit, the most compact one on the market.

## New Hitachi twin-screw compressor

The HITACHI Samurai L range is equipped with a new semi-hermetic twin-screw compressor, with continuous capacity control from 25% to 100%, optimized for R134a refrigerant. Thanks to this feature and the Hitachi electronic control, the energy supplied by the unit corresponds precisely to the hydronic circuit's demand. This standard option in the Samurai L range avoids additional accessories in the system.

- The twin-screw compressor is fitted with an EXCLUSIVE HITACHI cyclonic oil separator, which, in addition to being maintenance free, ensures that the compressor will have no lubrication issues or impurities in the suction circuit.
- Hitachi mechanical efficiency to ensure 40,000 hours of work before mechanical component inspection. (Fig. 1)

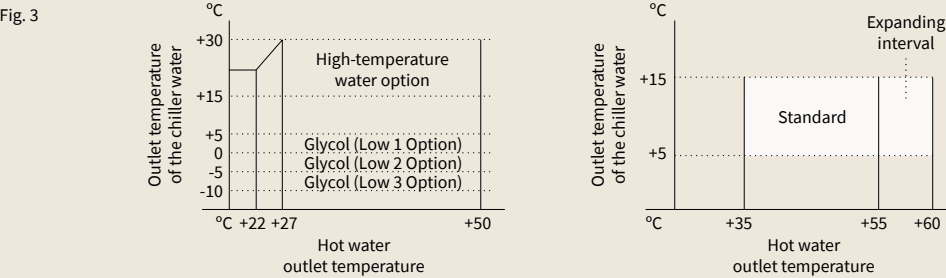
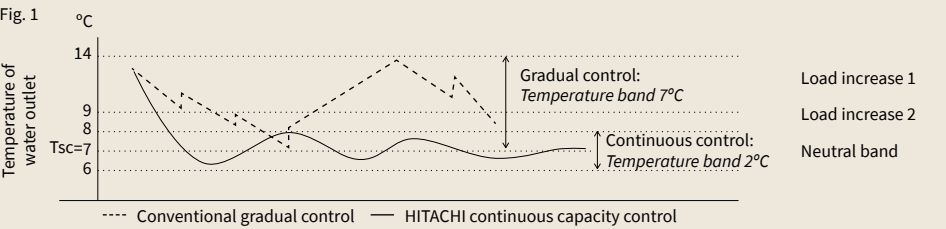


## Precise emperature control

The combination of continuous adjustment of the compressor capacity and exclusive HITACHI electronic controls means the chiller is able to precisely control the water outlet temperature, independently of the load. This control is an advantage in both comfort applications and industrial process applications (Fig. 2)

## Modular design

The possibility of installing up to eight modules in cascade with no additional controls (Master-Slave mod.) offers a wide range of powers and flexibility of installation, as it means the power and the overall size of the chiller unit can be adapted to the design requirements.



## Two operating modes

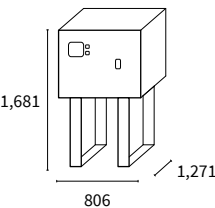
Two operating modes available as standard, to adapt the functionality in both comfort and process applications:

- Standard mode > Constant water outlet temperature > all compressors work with the same load.
- High-efficiency mode > Intelligent control of compressors' on/off function to optimize the system's energy performance.

## Cooling-only unit with heating option

The Samurai L can optionally work as a heat pump. Through an optional accessory the water outlet temperature can be regulated on the condenser side instead of on the evaporator side. (Fig. 3)

### Cooling only models



RCME-40WH1 RCME-50WH1  
RCME-60WH1 RCME-70WH1

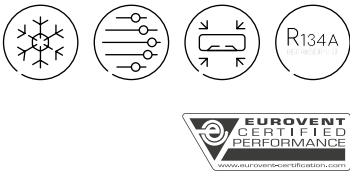


Samurai L - RCME-WH1 - Cooling only

			RCME-40WH1	RCME-50WH1	RCME-60WH1	RCME-70WH1
Capacity	Cooling (nominal)	kW	140	180	220	250
	Heating (nominal)	kW	159.9	205.9	252.9	287.1
EER			5.00	4.96	4.85	4.87
COP			4.79	4.76	4.67	4.69
SEER			5.14	5.46	5.51	5.52
SEPR <sub>MT</sub>			4.88	4.85	4.89	4.90
SEPR <sub>HT</sub>			7.58	7.51	7.57	7.59
SCOP <sub>LT</sub>			5.90	5.86	5.75	5.78
SCOP <sub>MT</sub>			4.42	4.39	4.32	4.33
Sound power		dB(A)	88	89	90	91
Sound pressure at 10 m		dB(A)	60	61	62	63
IP Rating			IP2X	IP2X	IP2X	IP2X
No. and type of compressor/ no. of circuits			1 - Semi-hermetic twin-screw/ 1	1 - Semi-hermetic twin-screw/ 1	1 - Semi-hermetic twin-screw/ 1	1 - Semi-hermetic twin-screw/ 1
Refrigerant			R134A	R134A	R134A	R134A
Refrigerant charge		kg	19	20	24	29
Capacity control		%	25-100	25-100	25-100	25-100
Water flow	Cooling (Min/Nom/Max)	m³/h	15.1-24.1-52.3	19.4-31.0-67.3	23.7-37.8-82.3	26.9-43.0-83.8
Condensation water flow	(nom-max)	m³/h	28.9-62.8	37.2-80.9	45.6-83.8	51.8-83.8
Water pipe connection	Size and type	inches	2.1/2" Victaulic			
	Quantity		1 x Inlet, 1 x Outlet			
Minimum system water volume		m3	0.51	0.65	0.80	0.90
Water temperatures of the condenser	Cooling	°C	22 to 50	22 to 50	22 to 50	22 to 50
	Heating (optional)	°C	35 to 60	35 to 60	35 to 60	35 to 60
Water production temperatures	Cooling - Standard	°C	5 to 15	5 to 15	5 to 15	5 to 15
	Cooling - Low option	°C	-10 to 5	-10 to 5	-10 to 5	-10 to 5
	Cooling - High option	°C	15 to 25	15 to 25	15 to 25	15 to 25
	Heating	°C	35 to 60	35 to 60	35 to 60	35 to 60
		°C	3N~400V 50Hz	3N~400V 50Hz	3N~400V 50Hz	3N~400V 50Hz
Power supply		°C	3N~400V 50Hz	3N~400V 50Hz	3N~400V 50Hz	3N~400V 50Hz
Consumption	Cooling (nominal)	kW	28.0	36.3	45.4	51.3
	Heating (nominal)	kW	33.4	43.3	54.1	61.2
Current (maximum cooling /startup)		A	66.2/ 179	84.6/ 240	105/ 240	118/ 240
Current (optional maximum heating/ startup)		A	76.4/ 179	96.2/ 240	119/ 240	135/ 240
Dimensions (H x W x D)		mm	1,681x806x1,271	1,681x806x1,271	1,681x806x1,271	1,681x806x1,271
Weight		kg	860.0	950.0	1,040.0	1,075.0

Options and accessories:

See pages 328-329



# Samurai L remote condenser cooling only

Twin screw compressor, continuous capacity regulation



## New compressor

The range incorporates a new twin-screw compressor with the latest advances in Hitachi screw-compressor technology and continuous capacity control from 25% to 100%. This modulation ensures the required charge at all times. (Fig. 1)

## Precise temperature control

The combination of the Hitachi "continuous capacity control compressor" and Hitachi's exclusive electronic controls allows precise control of the water outlet temperature, independently of the cooling load, which is especially important in industrial processes. (Fig. 2)

## Two operating modes

Two operating modes come as standard in the system:

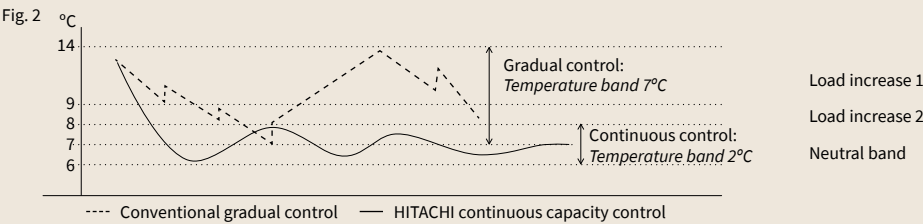
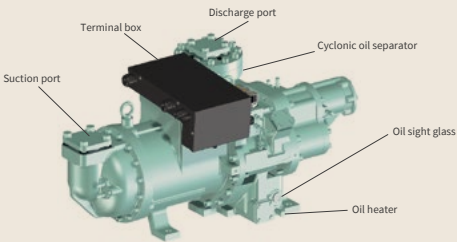
- Standard mode
- High-efficiency mode

## Less maintenance space

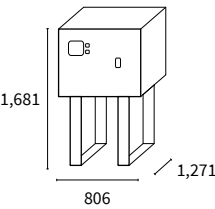
The compressor is in a lower position, making it easier to dismantle from the rear of the unit, which reduces the maintenance space needed.

## Choose the condenser to fit your needs

The unit is supplied without a condenser, so you can choose one that is best suited to the installation.



### Cooling only models



RCME-40CLH1  
RCME-50CLH1  
RCME-60CLH1

Samurai L RCME-CLH1

			RCME-40CLH1	RCME-50CLH1	RCME-60CLH1
Capacity	Cooling (nominal)	kW	135	175	215
EER			4.22	4.19	4.10
Sound power		dB(A)	88	89	90
Sound pressure at 10 m		dB(A)	60	61	62
IP Rating			IP2X	IP2X	IP2X
No. and type of compressor/ no. of circuits			1 - Semi-hermetic twin-screw/ 1	1 - Semi-hermetic twin-screw/ 1	1 - Semi-hermetic twin-screw/ 1
Refrigerant			R134A	R134A	R134A
Refrigerant charge		kg	please check	please check	please check
Refrigerant pipe diameter (outdoor)	Liquid-gas	inches	1 1/8-2 1/8	1 1/8-2 1/8	1 1/8-2 1/8
Capacity control		%	25-100	25-100	25-100
Exchanger type			Plate	Plate	Plate
Water flow	Cooling (Min/Nom/Max)	m³/h	14.5-23.2-50.5	18.8-30.1-65.4	23.1-37.0-80.4
Water pipe connection	Size and type	inches	2.1/2" Victaulic		
	Quantity		1 x Inlet, 1 x Outlet		
Minimum system water volume		m3	0.49	0.63	0.78
Condensation temperature		°C	30 to 60	30 to 60	30 to 60
Water production temperatures	Cooling - Standard	°C	5 to 15	5 to 15	5 to 15
	Cooling - Low option	°C	-5 to 5	-5 to 5	-5 to 5
	Cooling - High option	°C	15 to 25	15 to 25	15 to 25
Power supply			3N~400V 50Hz	3N~400V 50Hz	3N~400V 50Hz
Consumption	Cooling (nominal)	kW	32.0	41.8	52.4
Current (maximum-startup)		A	72.7-179	92.7-240	116-240
Dimensions (H x W x D)		mm	1,681x806x1,271	1,681x806x1,271	1,681x806x1,271
Weight		kg	765.0	835.0	900.0

\* The acoustic power levels refer to a distance of 10 meters measured in front of the unit.

Options and accessories:

See pages 328-329

# Options and accessories

## Samurai L options

		RCME- (60-90)AH2	RCME- (120-140)AH2	RHME- (60-90)AH2	RHME- (120-140)AH2	RCME-WH1	RCME-CLH1
Options of the unit	Condensation-unit protection grilles	•	•	•	•		
	Panels on the bottom of the unit	•	•	•	•		
	Low noise version	•	•	•	•	•	•
	Super Low noise version	•	•	•	•	•	•
	Extra super lownoise version	•	•	•	•		
	Corrosion protection on condenser units	•	•	•	•		
	Power Cable Routing (W)	•		•			
	Power Cable Routing (WO)	•		•			
	Power Cable Routing					•	•
	Wooden base	•		•		Standard	Standard
	Wooden box					•	•
	Wooden skid	•		•			
Options of the cooling circuit	Differential pressure flow switch	•	•	•	•	•	•
	Discharge valve	•	•	•	•	•	Standard
	Dual safety valve	•	•	•	•	•	•
	Suction safety valve					•	•
	Suction valve	•	•			•	•
	Partial heat recovery	•	•	•	•	inc for WH1	
Options hydraulic	Functionality with low temperature of water outlet (from 5°C to 0°C)	•	•	•	•	•	•
	Functionality with low temperature of water outlet (from -1°C to -5°C)	•	•	•	•	•	•
	Functionality with low temperature of water outlet (from -6°C to -10°C)	•	•	•	•	•	•
	Common water pipe		•		•		
	Std. pressure single pump kit	•	•	•	•		
	High pressure single pump kit	•	•	•	•		
	Std. pressure twin pump kit	•	•	•	•		
	High pressure twin pump kit	•	•	•	•		
	Stainless-steel water pipes	•	•	•	•	•	•
	Water pressure ports	•	•	•	•	•	•
Options of control	Safety cover on bottom of electrical enclosure	•	•	•	•		
	Heating Option					•	
	Extended working range of the water outlet temperature	•	•	•	•	•	•
	Thermomagnetic circuit breakers	•	•	•	•	•	•
	Energy meter	•	•	•	•	•	•
	Frost protection heater element in evaporator (Cooler heater)	•	•	•	•	•	•
	Language Pack (Alternative EU languages)	•	•	•	•	•	•
	Water PN(16Bar)	•	•	•	•	•	•



Samurai L accessories

Name	Code
Water Strainer 2 1/2", 5", 6"	CHL-WST-01/04/05
Modbus Interface	CHL-MBS-02
BACnet Interface	CHL-BAC-01
Anti-vibration spring system for CLH1 units	CHL-AVS-04
Common water pipe for two WH1 or CLH1 modules	CHL-CWP-05 for WH1: order two sets per module; for CLH1: order one set per module
Common water pipe for three WH1 or CLH1 modules	CHL-CWP-06 for WH1: order two sets per module; for CLH1: order one set per module
Anti-vibration spring system for WH1 units	CHL-AVS-05
Energy meter (200A)	CHL-PMM-04
Energy meter (400A)	CHL-PMM-05
Energy meter (1000A)	CHL-PMM-06
Common water pipe L-R for AH2 units up to 90 HP	CHL-CWP-07
Common water pipe -M- for AH2 units up to 90 HP	CHL-CWP-08
Anti-vibration spring system for 60 and 70 HP AH2 units	CHL-AVS-06
Anti-vibration spring system for 80 and 90 HP AH2 units	CHL-AVS-07
Anti-vibration spring system for 120 and 140 HP AH2 units	CHL-AVS-08
Certificate of origin	CO
Flow Switch	CHL-WFS-01
PN16 Water Flange (2 1/2")	CHL-FLA-01
Anti-vibration rubber mat	CHL-AVR-02



Modbus Interface  
CHL-MBS-02



BACnet Interface  
CHL-BAC-01



Energy meter  
CLH-PMM (04-05-06)



Selection software  
for our chillers

Notes:

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## Johnson Controls Hitachi Air Conditioning Conditioning Europe SAS

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