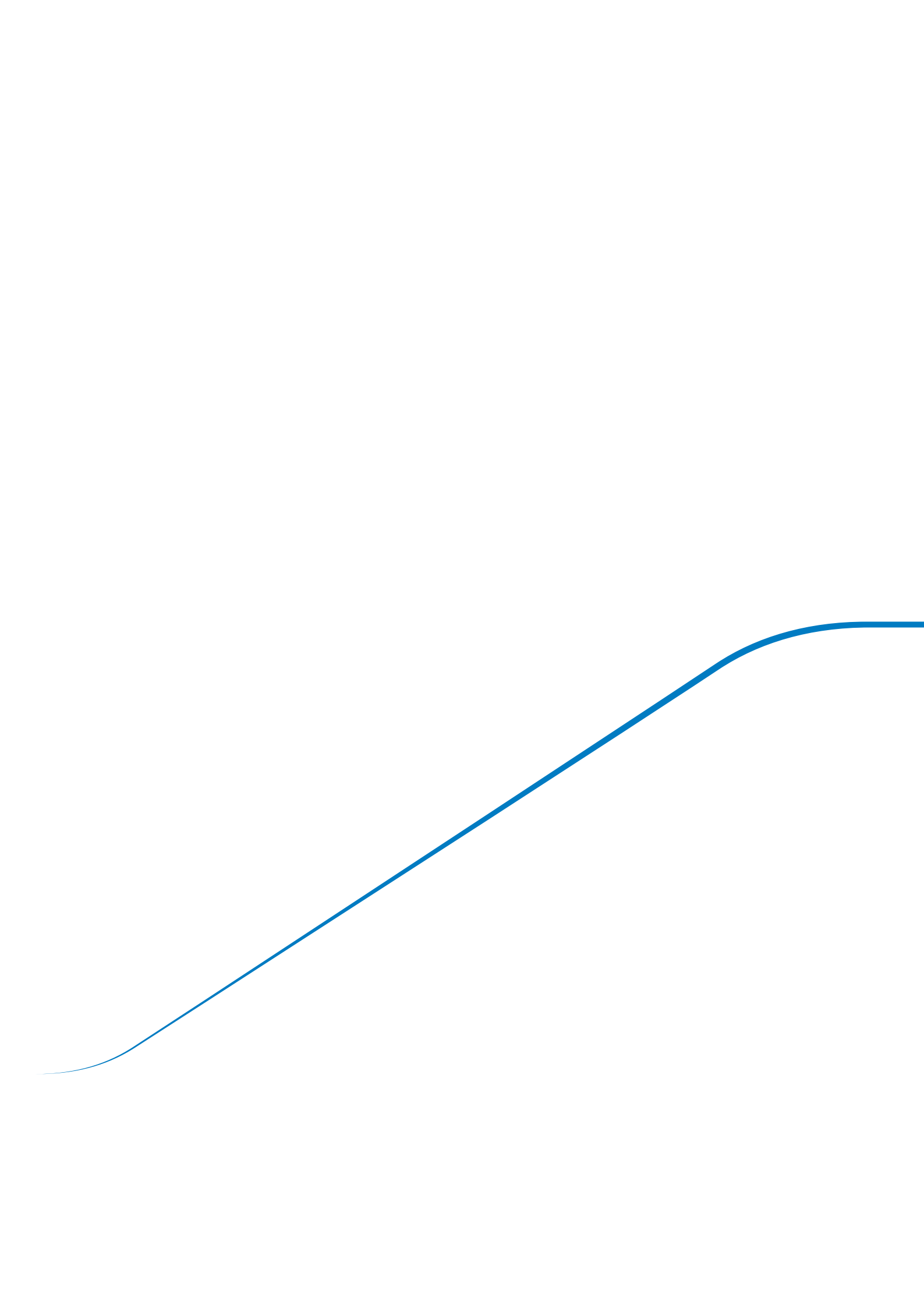
SMC

Expertise – Passion – Automation

Give yourself peace of mind

Circulating fluid temperature controller thermo-chiller

Quick overview



Thermo-chiller
Give yourself peace of mind with SMC thermo-chillers

Heat generation in industrial processes

Several industries, such as machine tooling, the printing industry and packaging, involve processes that include heat generating devices. Failure to properly control these can have serious consequences, including high rejection rates, poor product quality and lack of overall process reliability.

The use of a thermo-chiller makes it possible to **maintain the temperature of those heat generating devices within strict limits**. This proper temperature control increases the productivity, maximizes the machine performance, and improves the quality, reliability and service life of the equipment.

Give yourself peace of mind with SMC thermo-chillers

The use of an SMC thermo-chiller will give you not only reliability and precision but also overall peace of mind. The HRS Series accurately monitors and controls the cooling system, so you can worry about something else.

- Get a **smart solution that will give you proactive control**. Anticipate any changes via the remote control and manage anomalies and incidents in the cooling system
- **Improve the performance and reliability of your machine** thanks to a superior temperature stability
- **Ensure yourself worldwide support**. We have sales offices in 83 countries.
- **Streamline your suppliers** and profit from product order unification. Our portfolio consists of 12,000 basic models and over 700,000 variations.

Whatever your cooling needs, we've got a solution for you endorsed by our experience

Back in 1978 we launched our first cooling solution, a chiller for X-Ray analysers. Our evolution since then has been considerable, together with the progression in our customers' demands. At present, we have a portfolio of 8 different families of cooling solutions, including standard, basic and high-level chillers.

More importantly, over 40 years of experience at your disposal to help you find the solution that fits your needs and sorts your temperature problems out.

General specifications

Main features

Temperature stability: ±0.1, ±0.5, ±1.0 or ±2.0 °C.
(Depends on series and size)

Heating function available even with no heater:
(Not for HRSE)
- Circulating fluid can be heated by using the exhaust heat (hot gas) from the compressor circuit
- Ideal for start-up in the mornings and cool environments
- Temperature stability even in wintertime.

Cooling methods:
air/water-cooled refrigeration. (HRSE and HRSH300 only air-cooled refrigeration)

Cooling capacity: from 1.1 to 28 KW.
Heating capacity: from 0.58 to 7.5 kW.

Outdoor installation, splashproof type – IPX4, for large type models.

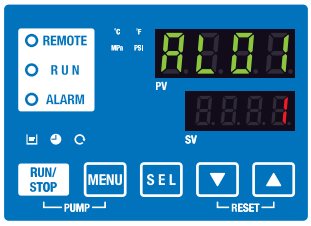
Optional facilities and accessories that ease the maintenance and provide better machine controllability (depends on series, type and size):
- DI filter set
- Piping conversion fitting
- Electric conductivity control set
- By-pass piping set
- Particle filter set
- Replacement type dustproof filter set
- Anti-quake bracket
- Caster adjuster foot-kit
- Snow protection hood
- Front access to electrical components
- Optional fluid fill port in the upper tank
- Easy check of the circulating fluid
- Tool-less inspection and cleaning of air-cooled condenser
- Concentration meter
- Analogue gateway unit
- Filter for circulating fluid fill port
- Relief valve set.

For dimensions and other details refer to the general catalogue of each series in www.smc.eu

Compact and lightweight – reduced machine dimensions.

Low-noise design – as low as 57 dB(A). (Depends on series and size).

Self-diagnosis and large digital display with extensive alarm monitoring and convenient functions that allow to detect abnormalities quickly before any real damage occurs.

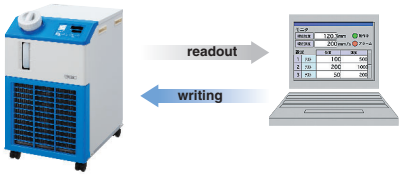


Display of **up to 42 alarm codes**, such as:
- Low level in tank
- Circulating fluid return temperature sensor failure
- Pump maintenance
- Power stoppage.

Convenient functions, such as:
- Timer operation function
- Power failure auto-restart function
- Anti-freezing operation function
- Key-lock function
- Function to output a signal for completion of preparation.

Dual frequency compatibility – 50/60 Hz – in a wide range of power supplies available as standard.

Serial communication – RS232-C and RS-485 – and contact I/Os



Writing
- Run/stop
- Circulating fluid temperature setting

Readout
- Circulating fluid present temperature
- Circulating fluid discharge pressure
- Status information
- Alarm occurrence information

Relevant process variables – such as pressure, flow and temperature – can be recorded, thus guaranteeing an **Industry 4.0 oriented thermo-chiller**.

Reduced power consumption with a triple inverter. (only HRSH series)
The triple inverter individually controls the compressor motor, the fan and the pump, thus optimizing control of the number of motor rotations depending on the load.

The inverter pump has a power reducing effect since there is no need of using, for different piping conditions, any bypass valve for adjustments.

Thermo-chiller portfolio

	Cooling (heating) capacity [kW] [1) 2)]	Cooling method	Temperature stability [°C]	Set temperature range [°C]
Standard thermo-chiller, HRS Series				
HRS012/018/024/030/040/050/060 	HRS012: 1.1 (0.53) HRS018: 1.7 (0.53) HRS024: 2.1 (0.53) HRS030: 2.6 (0.6) HRS040: 3.8 (0.9) HRS050: 4.7 (1.1) HRS060: 4.9 (1.0)	Air/water-cooled refrigeration	±0.1	5 to 40
HRS090 	HRS090: 8.0 (1.7)		±0.5	5 to 35
HRS100/150 	HRS100: 9.0 (1.7) HRS150: 13.0 (2.5)		±1.0	
Basic thermo-chiller, HRSE Series				
HRSE012/018/024 	HRSE012: 1.0 (-) HRSE018: 1.4 (-) HRSE024: 1.9 (-)	Air-cooled refrigeration	±2.0	10 to 30
High-level thermo-chiller, HRSH Series				
HRSH090 	HRSH090: 9.5 (2.5)	Air/water-cooled refrigeration [3)]	±0.1	5 to 40
HRSH100/150 **HRSH200/250/300** 	HRSH100: 10.5 (2.5) HRSH150: 15.7 (3.0) HRSH200: 20.5 (5.5) HRSH250: 25.0 (7.5) HSRH300: 28.0 (7.5)			5 to 35
Thermo-chiller/Rack mount type, HRR Series				
HRR012/018/024/030 	HRR012: 1.0 (0.45) HRR018: 1.6 (0.45) HRR024: 2.0 (0.55) HRR030: 2.5 (0.55)	Air/water-cooled refrigeration	±0.1	10 to 35

1) Values for 50 Hz, air-cooled refrigeration
2) Values for ambient temperature: 25 °C, circulating fluid temperature: 20 °C, circulating fluid: tap water
3) HRSH300 only air-cooled refrigeration.

For dimensions and other details refer to the general catalogue of each series in www.smc.eu

Ambient temperature range [°C]	Environment	Pump capacity [l/min] [2)]	Applicable fluid
5 to 40	Indoor use	34	Clear water, Ethylene glycol aqueous solution
5 to 45		55	
-5 to 45 (air-cooled models) 2 to 45 (water-cooled models)	Outdoor installation IPX4		Clear water, Deionized water, Ethylene glycol aqueous solution
5 to 40	Indoor use	15 (option T: 25)	Clear water, Ethylene glycol aqueous solution
5 to 45	Indoor use	60	Clear water, Deionized water, Ethylene glycol aqueous solution
-20 to 45 (air-cooled models) 2 to 45 (water-cooled models)	Outdoor installation IPX4	180	
5 to 40	Indoor use	7 (with high pressure pump: 14)	Clear water, Ethylene glycol aqueous solution

Other circulating fluid temperature controllers

Peltier-type chiller, thermo-con

HEC Series

High-precision temperature control by using peltier elements

- Cooling/heating capacity: from 140/600 W to 1.2/2.2 kW
- Temperature stability: ± 0.01 to ±0.03 °C
- Set temperature range: 10 to 60 °C
- Refrigerant-free
- For environments with no cooling equipment
- Compact and low-vibration design
- Suitable for the manufacture of semiconductors, medical, pharmaceutical or special laser equipment.

Thermo-con, rack mount type

HECR Series

Peltier type chiller mounted in 19 inch rack

- Cooling/heating capacity: from 200/600 W to 1.2/2.0 KW.
- Temperature stability: ± 0.01 to 0.03 °C
- Set temperature range: 10 to 60 °C
- Refrigerant-free
- Easy start-up in 3 steps
- 14 alarm codes
- Low noise level: 55 dB or less
- Suitable for the manufacture of semiconductors, medical, pharmaceutical or special laser equipment.

Standard, options, accessories

	HRS	HRS090	HRS100/150	HRSE	HRSH090	HRSH	HRR
Heating function	●	●	●		●	●	●
Air-cooled condenser fan	●	●	●	●	●	●	●
PID control	●	●	●		●	●	●
Compressor ON/OFF				●			
Self-diagnosis	●	●	●	●	●	●	●
RS-232C	●	●	●		●	●	●
RS-485	●	●	●		●	●	●
Contact I/Os	●	●	●		●	●	●
Connector for external switch	●	●	●		●	●	●
Earth leakage breaker	◆	◆	◆		●	●	
Fluid fill port	●	●	◆	●	●	◆	●
Automatic water fluid fill function	◆	◆	●		◆	●	
Applicable to DI water piping	◆	◆			◆		◆
High-pressure pump	◆	●	●	◆	●	●	◆
High ambient temp. (up to 45 °C)	◆	●	●		●	●	
DI filter set	★						◆
Piping conversion fitting	◆/★	◆/★	◆/★		◆/★	◆/★	◆
Electric conductivity control set		★	★		★	★	◆
Electric conductivity sensor set	★						◆
By-pass piping set	★	★	★	★	★	★	●
Dustproof filter set	★			★			●
Particle filter set	★	★	★	★	★	★	●
Anti-quake bracket	★			★			★
Caster adjuster-foot kit	●	●	◆/★	●	●	◆/★	
Snow protection hood			★			★	
Analogue gateway unit	★						
Filter for circulating fluid fill port	★	★			★		
Relief valve set			★				
Power supply cable	★			●			
Drain pan set	★						●
Connector cover	★						
Separately installed power transformer	★						

● Standard
◆ Option
★ Accessory

For dimensions and other details refer to the general catalogue of each series in www.smc.eu

Thermo-chillers portfolio

Standard type

Air/water cooled refrigeration
HRS Series

Improve the performance & reliability of your machine

- Temperature stability (depends on size): ±0.1, ±0.5, ±1.0 °C
- Control method: PID control
- Self-diagnosis: 35 alarms (41 for HRS090, 42 for HRS100/150).

Part number [3]	Cooling method	Maximum cooling (heating) capacity (50/60 Hz) [kW] [2]	Power supply	Set temperature range [°C]	Temperature stability [°C]	Tank capacity [L]	Dimensions [mm]	Weight [kg]	Noise level (50 Hz) [dB(A)] [2]
HRS012-AF-20 ●	Air-cooled refrigeration	1.1/1.3 (0.53/0.65)	Single-phase 200-230 VAC (50/60 Hz)	5 to 40	±0.1	Approx. 5	W377 x D500 x H615	43	60
HRS012-AF-20-T ●									
HRS012-AF-20-MT ●									
HRS018-AF-20 ●		1.7/1.9 (0.53/0.65)							
HRS018-AF-20-T ●									
HRS018-AF-20-MT ●									
HRS024-AF-20 ●		2.1/2.4 (0.53/0.65)							
HRS024-AF-20-T ●									
HRS024-AF-20-MT ●									
HRS030-AF-20 ●		2.6/3.2 (0.6/0.64)					W377 x D500 x H660	47	62
HRS040-AF-20		3.8/4.2 (0.9/1.1)					W377 x D592 x H676	53	64
HRS040-WF-20		3.8/4.2 (0.7/1.0)							
HRS050-AF-20 ●		4.7/5.1 (1.1/1.4)					W377 x D592 x H976	69	65
HRS060-AF-20 ●		4.9/5.9 (1.0/1.3)						73	66
HRS090-AF-40 ●		8.0/9.0 (1.7/2.2)	3-phase 380-415 VAC (50/60 Hz)	5 to 35	±0.5	18	W377 x D970 x H1080	136	75
HRS100-AF-40 ●		9.0/9.5 (1.7/2.2)			±1.0		W616 x D954 x H1434	171	70
HRS150-AF-40 ●		13.0/14.5 (2.5/3.0)						177	72
HRS012-WF-20 ●	Water-cooled refrigeration	1.1/1.3 (0.53/0.65)	Single-phase 200-230 VAC (50/60 Hz)	5 to 40	±0.1	Approx. 5	W377 x D500 x H615	43	60
HRS018-WF-20 ●		1.7/1.9 (0.53/0.65)							
HRS024-WF-20 ●		2.1/2.4 (0.53/0.65)							
HRS030-WF-20		2.6/3.2 (0.4/0.6)					W377 x D500 x H660	46	62
HRS050-WF-20 ●		4.7/5.1 (1.0/1.3)					W377 x D592 x H976	67	65
HRS060-WF-20		4.9/5.9 (1.0/1.3)							66

● Stocked items.
1) Pipe thread type: G.
2) Values for ambient temperature: 25 °C, circulating fluid temperature: 20 °C, circulating fluid: tap water.
3) HRS□-□-T: high pressure pump mounted; HRS□-□-MT: high pressure pump mounted and applicable to deionized water piping.

Basic type

Air cooled refrigeration
HRSE Series

Cool down your costs

- Temperature stability: ±2.0 °C
- Control method: compressor ON/OFF
- Self-diagnosis: 12 alarms.

Part number	Cooling method	Maximum cooling capacity (50/60 Hz) [kW] 2)	Power supply	Set temperature range [°C]	Temperature stability [°C]	Tank capacity [L]	Dimensions [mm]	Weight [kg]	Noise level (50 Hz) [dB(A)] 2)
HRSE012-A-23 ●	Air-cooled refrigeration	1.0/1.2	Single-phase 230 VAC (56/60 Hz)	10 to 30	±2.0	Approx. 5	W377 x D435 x H615	35	57
HRSE018-A-23 ●		1.4/1.6							
HRSE024-A-23 ●		1.9/2.2							

● Stocked items.
1) Pipe thread type: Rc.
2) Values for ambient temperature: 25 °C, circulating fluid temperature: 20 °C, circulating fluid: tap water.

High-level type

Air/water cooled refrigeration
HRSH Series

Triple savings at the right temperature

- Temperature stability: ±0.1 °C
- Control method: PID control
- Self-diagnosis: 42 alarms (44 for HRSH090).

Part number	Cooling method	Maximum cooling (heating) capacity [kW] 2)	Power supply	Set temperature range [°C]	Temperature stability [°C]	Tank capacity [L]	Dimensions [mm]	Weight [kg]	Noise level (50 Hz) [dB(A)] 2)
HRSH090-AF-40 ●	Air-cooled refrigeration	9.5 (2.5)	3-phase 380-415 VAC (56/60 Hz)	5 to 40	±0.1	18	W377 x D970 x H1080	130	66
HRSH100-AF-40 ●		10.5 (2.5)		5 to 35		25	W715 x D954 x H1420	180	68
HRSH150-AF-40 ●		15.7 (3.0)				42		215	
HRSH200-AF-40 ●		20.5 (5.5)							
HRSH250-AF-40 ●		25.0 (7.5)				60	W850 x D1035 x H1720	280	
HRSH300-AF-40		28.0 (7.5)							

● Stocked items.
1) Pipe thread type: Rc.
2) Values for ambient temperature: 25 °C, circulating fluid temperature: 20 °C, circulating fluid: tap water.

Rack mount type

Air/water cooled refrigeration
HRR Series

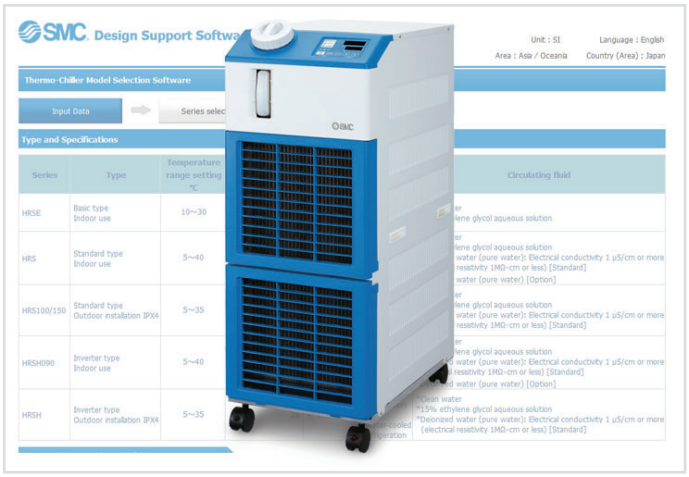
Simplify your temperature control

- Temperature stability: ±0.1 °C
- Control method: PID control
- Self-diagnosis: 23 alarms.

Part number	Cooling method	Maximum cooling capacity (50/60 Hz) [kW] 2)	Power supply	Set temperature range [°C]	Temperature stability [°C]	Tank capacity [L]	Dimensions [mm]	Weight [kg]	Noise level (50 Hz) [dB(A)] 2)
HRR012-AF-20	Air-cooled refrigeration	1.0/1.2 (0.45/0.50)	Single-phase 200-230 VAC (50/60 Hz)	5 to 40	±0.1	Approx. 4	W483 x D661 x H310	40	59
HRR018-AF-20		1.6/1.8 (0.45/0.50)							
HRR024-AF-20		2.0/2.4 (0.55/0.70)					W483 x D686 x H399	46	61
HRR030-AF-20		2.5/3.0 (0.55/0.70)							
HRR012-WF-20	Water-cooled refrigeration	1.0/1.2 (0.45/0.50)					W483 x D624 x H310	41	59
HRR018-WF-20		1.6/1.8 (0.45/0.50)							
HRR024-WF-20		2.0/2.4 (0.55/0.70)					W483 x D624 x H399	45	61
HRR030-WF-20		2.5/3.0 (0.55/0.70)							

1) Pipe thread type: G.
2) Values for ambient temperature: 25 °C, circulating fluid temperature: 20 °C, circulating fluid: tap water.

Model selection software

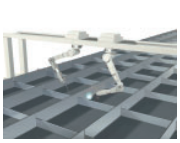


Try our thermo-chiller online selector. You can use this to choose the best thermo-chiller for your application, in **3 simple steps**, so you **guarantee efficiency** and great performance.

Visit www.smc.eu now.

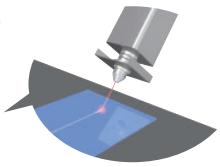
Applications

Arc welding machine
Cooling of welding torches and power sources

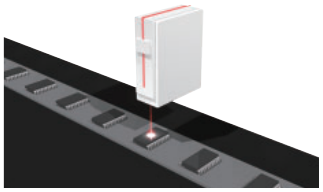


Resistant welding machine (spot welding)
Cooling of the welding head electrodes, transformers and transistors (thyristors)

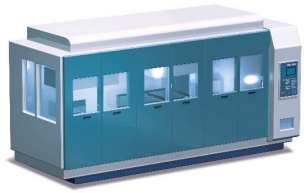
Laser applications
Cooling of the laser oscillation part and power source, needing a very precise temperature control
- Laser welding machine



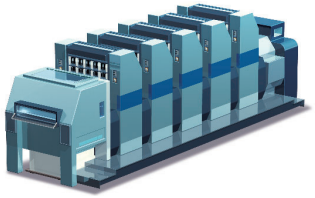
- Laser maker



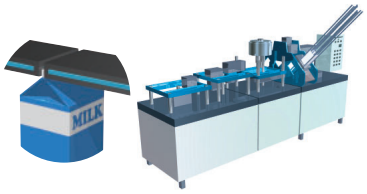
Cleaning machine
Temperature control of cleaning solution



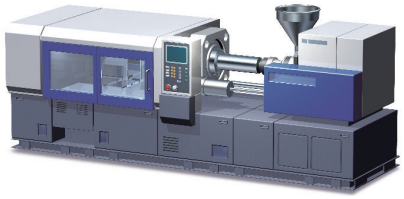
Printing machine
Temperature control of the ink roller, UV lamps



Packaging line
Sealing of film and paper package

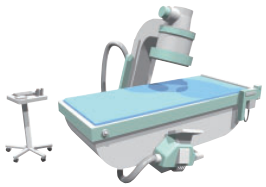


Injection moulding

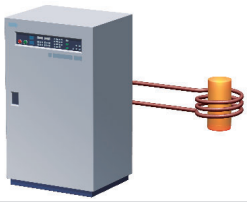


Electronic microscope
Temperature control of the electron-beam irradiated part

X-ray digital instrument – Medical Industry
Temperature control of x-ray tube and X-ray light sensing parts. The temperature stability enables to obtain clear pictures without fluctuation of digital signals



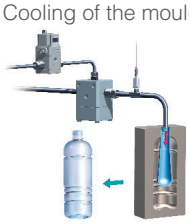
High frequency induction heating equipment
Cooling of the heating coils, high frequency current transformers and around inverters



UV curing device

For dimensions and other details refer to the general catalogue of each series in www.smc.eu

PET industry
Cooling of the moulds and oven

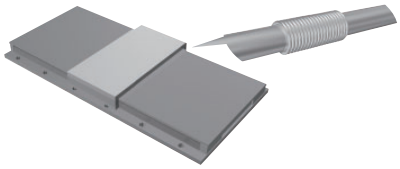


Shrink fit machine
Cooling of workpieces

Concentrating equipment
Temperature control of concentrating fluid

Ultra sonic wave inspection machine
Temperature control of ultra sonic wave laser part

Linear motor
Temperature control of moving coil

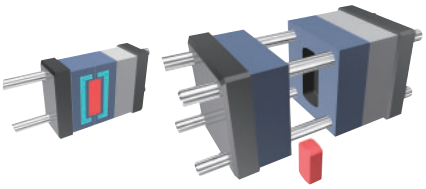


Ozone applications
By using of water refrigeration it is possible to multiply by 5 the quantity of ozone generated

Atomising device (food, cosmetics)
Temperature control of samples and devices

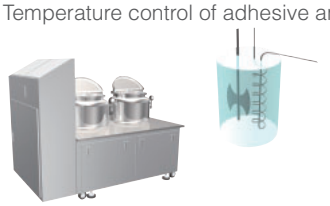
Gas cylinder cabinet
Temperature control inside the cabinet

Mould cooling

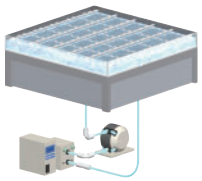


Reagent cooling equipment
Temperature control of the reagents

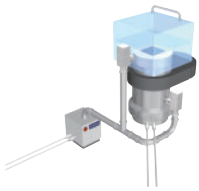
Temperature control of adhesive and paint material



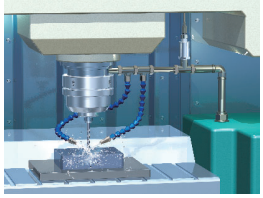
Cleaning machine (hydrocarbon-based)



Cooling of vacuum pump



Machine tool (Spindle)



Accessories

Description		Series/models	Part number
DI filter set, stainless steel type		HRS012/018/024/030/040/050/060	**HRS-DP001**
DI filter set, resin type			**HRS-DP002**
Electric conductivity control set Refer to the Operation Manual for details about the models		HRS090 HRSH090	**HRS-DI007**
		HRS100/150	**HRS-DI010**
		HRSH100/150/200/250/300	**HRS-DI006**
Electrical resistance sensor set Refer to the Operation Manual for details about the models		HRS012/018/024/030/040/050/060	**HRS-DI001** **HRS-DI005**
		HRS012/018/024/030/040	**HRS-DI003** **HRS-DI004**
Replacement type dustproof filter set		HRS012/018/024 HRSE	**HRS-FL001**
Bypass piping set		HRS012/018/024/030 HRSE	**HRS-BP001**
		HRS040/050/060	**HRS-BP004**
		HRS090 HRSH	**HRS-BP005**
		HRS100/150	**HRS-BP007**
Particle filter set, for circulating fluid outlet, with handle, L=125 mm	Element (5 µm nominal filtration)	HRS012/018/024/030/040/050/060 HRSE	**HRS-PF001-W005-H**
	Element (75 µm nominal filtration)		**HRS-PF001-W075-H**
Particle filter set, for circulating fluid outlet, with handle, L=250 mm	Element (5 µm nominal filtration)	HRS050/060	**HRS-PF002-W005-H**
	Element (75 µm nominal filtration)		**HRS-PF002-W075-H**
Particle filter set, for circulating fluid return port, with handle, L=125 mm	Element (5 µm nominal filtration)	HRS012/018/024/030/040/050/060	**HRS-PF003-W005-H**
	Element (75 µm nominal filtration)		**HRS-PF003-W075-H**
Particle filter set, for circulating fluid return port, with handle, L=250 mm	Element (5 µm nominal filtration)	HRS050/060	**HRS-PF004-W005-H**
	Element (75 µm nominal filtration)		**HRS-PF004-W075-H**
Particle filter set, with handle		HRS090 HRSH090	**HRS-PF005-H**
Anti-quake bracket		HRS012/018/024/030	**HRS-TK001**
		HRS040/050/060	**HRS-TK002**
		HRSE	**HRS-TK003**
Caster adjuster-foot kit		HRS100/150-A	**HRS-KS003**
		HRS100/150-W HRSH100/150/200-A HRSH100/150/200/250-W	**HRS-KS002**
		HRS250/300-A	**HRS-KS001**
Snow protection hood		HRS100/150	**HRS-BK005**
		HRSH100/150/200	**HRS-BK004**
		HRSH250/300	**HRS-BK003**
Filter for circulating fluid fill port		HRS012/018/024/030/040/050/060 HRS090 HRSH090	**HRS-PF007**
Relief valve set		HRS100/150	**HRS-BP008**
Particle filter element		HRR012/018/024/030	**EJ202S-005X11**
DI filter replacement		HRR012/018/024/030	**HRR-DF001**

Note) If more detailed information is required please check SMC´s online Digital Catalogue or contact your nearest SMC sales office

Related products

Digital flow switch for water
PF3W Series

Digital flow switch for deionized water and chemical fluids
PF2D Series

3-screen display high-precision digital pressure switch
ISE20C Series

Pressure sensor controller
PSE300AC Series

Multi channel pressure sensor controller
PSE200 Series

Quick change filter
FQ1 Series

S coupler, stainless steel 304
KKA Series

Stainless steel 316 insert fittings
KFG2 Series

Stainless steel 316 one-touch fittings
KQG2 Series

Electromagnetic type digital flow switch
LFE Series

4-channel flow monitor
PF2□200 Series

3-screen display high-precision digital pressure switch
ISE7□G Series

Pressure sensor for general fluids
PSE570 Series

Pressure sensor controller
PSE300 Series

S coupler
KK Series

Metal one-touch fittings
KQB2 Series

Fluoropolymer fittings
LQ Series

Nylon tubing – T Series
Polyurethane tubing – TU Series
FEP tubing – TH Series
Modified PTFE tubing – TD Series
PFA tubing – TLM Series
Super PFA tubing – TL Series

Expertise – Passion – Automation

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