HiRef

CATALOGUE

CHILLERS AND HEAT PUMPS

AIR/WATER

Liquid chillers

	APPLICATION	VERSIONS	REFRIGERANT	RANGE	
 **PCC**	**AIR-CONDENSED CHILLERS FOR INDUSTRIAL PROCESSES** INDUSTRIAL		R-410A R-454B	6-141* (kW)	PAGE 7
 **TSE**	**CHILLERS WITH REMOTE CONDENSER WITH SCROLL COMPRESSORS** DATA CENTER SERVICES	ME	R-410A R-454B	43-433* (kW)	PAGE 8
 **CDA**	**CHILLERS WITH NATURAL REFRIGERANT R744 (CO_2) AIR COOLED AND WITH MODULATING COMPRESSORS - COOLING ONLY VERSION** DATA CENTER INDUSTRIAL SERVICES		R-744	96-492* (kW)	PAGE 9
 **CDA-F**	**CHILLERS WITH NATURAL REFRIGERANT R744 (CO_2) AIR COOLED AND WITH MODULATING COMPRESSORS - FREE-COOLING VERSION** DATA CENTER INDUSTRIAL SERVICES		R-744	96-492* (kW)	PAGE 10
 **TVA**	**REFRIGERATORI CONDENSATI AD ARIA CON COMPRESSORI A VITE AD INVERTER** DATA CENTER INDUSTRIAL SERVICES		R-134a R-1234ze R-513A R515B	297-1367* (kW)	PAGE 11
 **TTX**	**AIR CONDENSED CHILLERS WITH OIL-FREE CENTRIFUGAL COMPRESSORS** DATA CENTER INDUSTRIAL SERVICES		R-134a R-1234ze	281-1057* (kW)	PAGE 12
 **HCB**	**REFRIGERATORI CONDENSATI AD ARIA CON COMPRESSORI A VITE AD INVERTER IN VERSIONE SOLO FREDDO** DATA CENTER INDUSTRIAL SERVICES		R-134a R-1234ze R-513A R515B	370-1199* (kW)	PAGE 13
 **HCB-F**	**AIR CONDENSED CHILLERS WITH INVERTER DRIVEN SCREW COMPRESSORS - FREE-COOLING VERSION** DATA CENTER INDUSTRIAL SERVICES		R-134a R-1234ze R-513A R515B	300-1199* (kW)	PAGE 14

AIR/WATER

Reversible heat pumps

	APPLICATION	VERSIONS	REFRIGERANT	RANGE	
 **HPS**	**REVERSIBLE AND MULTI-PURPOSE AIR CONDENSED HEAT PUMPS FOR LOW OUTDOOR TEMPERATURES** INDUSTRIAL SERVICES		R-410A	36-202** (kW)	PAGE 16
 **HWC**	**AIR CONDENSED CHILLERS AND HEAT PUMPS WITH SCROLL COMPRESSORS FOR INDOOR INSTALLATIONS** INDUSTRIAL SERVICES		R-410A	58-202* (kW)	PAGE 17
 **TSS**	**CLASS A CHILLERS AND HEAT PUMPS AIR CONDENSED WITH SCROLL COMPRESSORS** DATA CENTER INDUSTRIAL SERVICES		R-410A R-454B	120-265* (kW)	PAGE 18
 **TAS**	**AIR CONDENSED CHILLERS AND HEAT PUMPS WITH SCROLL COMPRESSORS** DATA CENTER INDUSTRIAL SERVICES		R-410A R-454B	60-261* (kW)	PAGE 19
 **MHA**	**AIR CONDENSED CHILLERS AND HEAT PUMPS WITH SCROLL BLDC INVERTER COMPRESSORS** DATA CENTER INDUSTRIAL SERVICES		R-410A R-454B	30-288* (kW)	PAGE 20
 **TPS**	**AIR CONDENSED CHILLERS AND HEAT PUMPS WITH SCROLL COMPRESSORS** DATA CENTER INDUSTRIAL SERVICES		R-410A R-454B	43-445* (kW)	PAGE 21

* User side: In/Out water T 16/10 °C, source side: outdoor air 35 °C (air/water), In/Out water T 30/35 °C (water/water)
** User side: In/Out water T 40/45 °C, source side: outdoor air 7 °C
*** User side: In/Out water T 70/80 °C, source side: In/Out water T 45/40 °C
**** 200 m³/h corresponding to 1.4 MW with ΔT = 6 K

Cooling Only | Heating Only | Reversible Heat Pump | Free-Cooling | Motoevaporating | Polyvalent for 2-pipe system | Polyvalent for 4-pipe system

AIR/WATER

Reversible heat pumps

TSL

APPLICATION: DATA CENTER, INDUSTRIAL, SERVICES
VERSIONS: Cooling Only, Heating Only, Reversible Heat Pump
REFRIGERANT: R-410A, R-454B
RANGE: 277-1004* (kW)

CLASS A CHILLERS AND HEAT PUMPS AIR CONDENSED WITH SCROLL COMPRESSORS

PAGE 22

TAL

APPLICATION: DATA CENTER, INDUSTRIAL, SERVICES
VERSIONS: Cooling Only, Heating Only, Reversible Heat Pump
REFRIGERANT: R-410A, R-454B
RANGE: 283-1166* (kW)

CLASS A CHILLERS AND HEAT PUMPS AIR CONDENSED WITH SCROLL COMPRESSORS

PAGE 23

TPL

APPLICATION: DATA CENTER, INDUSTRIAL, SERVICES
VERSIONS: Cooling Only, Heating Only, Reversible Heat Pump
REFRIGERANT: R-410A, R-454B
RANGE: 365-1199* kW

AIR CONDENSED CHILLERS AND HEAT PUMPS WITH SCROLL COMPRESSORS

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AIR/WATER

Multipurpose

MPS

APPLICATION: INDUSTRIAL, SERVICES
VERSIONS: 2-pipe, 4-pipe
REFRIGERANT: R-410A
RANGE: 39-248** (kW)

REVERSIBLE AND MULTI-PURPOSE AIR CONDENSED HEAT PUMPS FOR LOW OUTDOOR TEMPERATURES

PAGE 26

MPA

APPLICATION: DATA CENTER, INDUSTRIAL, SERVICES
VERSIONS: 2-pipe, 4-pipe
REFRIGERANT: R-410A, R-454B
RANGE: 59-325* (kW)

MULTIPURPOSE CLASS A AIR CONDENSED HEAT PUMPS WITH SCROLL COMPRESSORS

PAGE 27

MSL

APPLICATION: DATA CENTER, INDUSTRIAL, SERVICES
VERSIONS: 4-pipe
REFRIGERANT: R-410A, R-454B
RANGE: 279-1425* (kW)

MULTI-PURPOSE CLASS A HEAT PUMPS AIR CONDENSED WITH SCROLL COMPRESSORS

PAGE 28

MLA

APPLICATION: DATA CENTER, INDUSTRIAL, SERVICES
VERSIONS: 2-pipe, 4-pipe
REFRIGERANT: R-410A, R-454B
RANGE: 286-1431* (kW)

MULTIPURPOSE CLASS A AIR CONDENSED HEAT PUMPS WITH SCROLL COMPRESSORS

PAGE 29

HWP

APPLICATION: INDUSTRIAL, SERVICES
VERSIONS: 2-pipe, 4-pipe
REFRIGERANT: R-410A
RANGE: 55-231* (kW)

AIR CONDENSED CHILLERS AND HEAT PUMPS WITH SCROLL COMPRESSORS FOR INDOOR INSTALLATIONS

PAGE 30

Technical data are subject to change without notice.
Do not use these data in the design stage.

* User side: In/Out water T 16/10 °C, source side: outdoor air 35 °C (air/water), In/Out water T 30/35 °C (water/water)
** User side: In/Out water T 40/45 °C, source side: outdoor air 7 °C
*** User side: In/Out water T 70/80 °C, source side: In/Out water T 45/40 °C
**** 200 m³/h corresponding to 1.4 MW with ΔT = 6 K

Cooling Only | Heating Only | Reversible Heat Pump | Free-Cooling | Motoevaporating | Polyvalent for 2-pipe system | Polyvalent for 4-pipe system

WATER/WATER

Liquid chillers

XTW

APPLICATION: DATA CENTER, INDUSTRIAL, SERVICES
VERSIONS: ❄
REFRIGERANT: R-134a, R-1234ze, R515B
RANGE: 221-916* (kW)

WATER-CONDENSED CHILLERS WITH OIL-FREE CENTRIFUGAL COMPRESSORS

PAGE 32

XVA

APPLICATION: DATA CENTER, INDUSTRIAL, SERVICES
VERSIONS: ❄ ☼
REFRIGERANT: R-134a, R-1234ze, R-513A, R515B
RANGE: 445-1588* (kW)

WATER CONDENSED CHILLERS AND HEAT PUMPS WITH INVERTER DRIVEN SCREW COMPRESSORS

PAGE 33

Split version with remote condenser available

Reversible heat pumps

XSA

APPLICATION: DATA CENTER, INDUSTRIAL, SERVICES
VERSIONS: ❄ ☼ ❄
REFRIGERANT: R-410A, R-454B
RANGE: 54-535* (kW)

WATER CONDENSED CHILLERS AND HEAT PUMPS WITH SCROLL COMPRESSORS

PAGE 35

RSW

APPLICATION: DATA CENTER, INDUSTRIAL, SERVICES
VERSIONS: ❄ ☼ ❄
REFRIGERANT: R-410A, R-454B
RANGE: 329-867* (kW)

MULTIPURPOSE WATER-CONDENSED HEAT PUMPS WITH SCROLL COMPRESSORS

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XSB

APPLICATION: DATA CENTER, INDUSTRIAL, SERVICES
VERSIONS: ❄ ☼ ❄
REFRIGERANT: R-410A, R-454B
RANGE: 40-838* (kW)

WATER CONDENSED CHILLERS AND HEAT PUMPS WITH SCROLL COMPRESSORS

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WATER/WATER

Multipurpose

KSW P

APPLICATION: INDUSTRIAL, SERVICES
VERSIONS: 2 4
REFRIGERANT: R-134a
RANGE: 10-151* (kW)

MULTI-PURPOSE WATER COOLED HEAT PUMPS FOR HIGH TEMPERATURES, USER SIDE AND SOURCE SIDE

PAGE 39

MSW

APPLICATION: INDUSTRIAL, SERVICES
VERSIONS: 2 4
REFRIGERANT: R-410A, R-454B
RANGE: 42-549* (kW)

MULTIPURPOSE WATER-CONDENSED HEAT PUMPS WITH SCROLL COMPRESSORS

PAGE 40

PSW

APPLICATION: DATA CENTER, INDUSTRIAL, SERVICES
VERSIONS: 4
REFRIGERANT: R-410A, R-454B
RANGE: 294-867* (kW)

MULTIPURPOSE WATER-CONDENSED HEAT PUMPS WITH SCROLL COMPRESSORS

PAGE 41

Heating only heat pumps

KSW

APPLICATION: INDUSTRIAL, SERVICES
VERSIONS: ☼
REFRIGERANT: R-134a
RANGE: 38-590*** (kW)

WATER/WATER HEAT PUMPS FOR HIGH EVAPORATION AND CONDENSATION TEMPERATURES

PAGE 43

KVW

APPLICATION: INDUSTRIAL
VERSIONS: ☼
REFRIGERANT: R-1234ze, R515B
RANGE: 535-2208* (kW)

HIGH TEMPERATURE HEAT PUMPS WITH TWO-STAGE COMPRESSORS

PAGE 44

Hydraulic modules

PLM

APPLICATION: DATA CENTER, INDUSTRIAL, SERVICES
VERSIONS: 2 4 ☼ ▨
REFRIGERANT: -
RANGE: -

POLYMORPH HYDRONIC MODULES FOR WATER/WATER CHILLERS SYSTEMS

PAGE 46

Heating Only | Cooling Only | Reversible Heat Pump | Free-Cooling | Motoevaporating | Polyvalent for 2-pipe system | Polyvalent for 4-pipe system

Technical data are subject to change without notice.
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** User side: In/Out water T 40/45 °C, source side: outdoor air 7 °C
*** User side: In/Out water T 70/80 °C, source side: In/Out water T 45/40 °C
**** 200 m³/h corresponding to 1.4 MW with ΔT = 6 K

TECNOLOGIES

ADVISORS IN THE FIELD OF ADVANCED TECHNOLOGIES AND CUSTOMIZED SOLUTIONS FOR IT AND INDUSTRIAL COOLING

At HiRef, we love a challenge and constantly try to exceed limits and standards.

Our Research & Development hub is the innovative core of the company: here, we study new ideas and test innovative approaches to the development and application of technologies - so that they are at **the forefront of economic sustainability for data centres, for telecommunications and for the commercial and services sector, without ever compromising on environment-friendliness**.

In synergy with our in-house electrical, mechanical and software design department, we design full-custom air conditioning systems, which are customizable and adaptable to even the most critical environments, to be able to respond to any specific needs.

We are guided by **high quality engineering and the constant optimization of system efficiency, to mitigate its environmental impact**.

We are the acknowledged first adopters and flexible implementers of new technologies.

At HiRef, customer relations and tailor-made design are key to our success.

AIR/WATER AND WATER/WATER CHILLERS TOP PERFORMANCE IN ALL CONDITIONS

HiRef's air/water and water/ water liquid chillers meet the heating power requirements in the industrial, commercial, services and Data Centre sectors.

Designed for top performance, they can operate in Free-Cooling mode when outdoor conditions allow it, rationalising the use of the plant's electricity with lower operating costs and reduced environmental impact. Our painstakingly executed designs ensure correct sizing according to the specific requests of our customers, so that **each unit can be perfectly integrated into an existing system (retro-fitting) or installed in new systems, without wasting any power**.

Free-Cooling

The Free-Cooling technology allows the unit to supply the required cooling capacity without any need for the compressors to be running. **The resulting advantages in terms of lower seasonal power absorption can reach 30%.**

High efficiency

The combined choice and weighted sizing of high-tech internal components **allows the units to operate at high levels of efficiency**.

Shell and tube heat exchanger

Some chiller and heat pump product ranges are supplied with a shell and tube exchanger. The high reliability and operating stability of this type of heat exchanger makes it particularly suitable for industrial and high-tech applications. **The generously sized volumes typical of shell and tube exchangers ensure stable unit operation and make the exchanger less sensitive to thermal stress**.
Where present, the dual-pass exchanger configuration allows both cooling and heat pump operation to be optimised.
According to the range considered, it is possible to have either **dry expansion tube exchangers or flooded shell and tube exchangers with spray technology**.

A2L Ready - Low environmental impact refrigerants

Some ranges of liquid chillers, in addition to safety class A1 refrigerants R410A and R134a, can also be supplied with class A2L (slightly flammable) refrigerants with low environmental impact R454B and R1234ze. HiRef makes these product ranges available also in the "A2L Ready" version: **filled with a safety class A1 refrigerant, they are factory-ready and equipped with all the necessary safety sensors to allow, if the customer requests it, fast switching to A2L at a later stage.**

Fast Restart and dedicated microprocessor control

With the FAST Restart option the unit is equipped with separate dedicated low voltage (24 V) or 230 V power supply for microprocessor control separately from the main users' power supply. In this way, the control can be powered by a source external to the UPS or by a small source internal to the UPS (optional), **to ensure power supply continuity for the unit's microprocessor**.
With the FAST restart option the unit can reach 100% cooling capacity in maximum 120 s after power is restored, **ensuring maximised system cooling availability in a short time**.

Fans

In units with an air source, the fan is a key component for trouble-free operation in all operating conditions and at the same time - for unit energy absorption calculations. A**n efficient fan and motor play a significant role in reducing consumption**. All the fans used in the Hiref units are built according to the most innovative technologies; this is true both for versions with traditional motors and for versions with EC motors, **actively contributing to energy saving**.

Adiabatic Cooling

A set of panels equipped with a system of nozzles, located upstream of the finned pack heat exchangers, humidifies the incoming air, decreasing its temperature. **Consequently, an increase in the efficiency of the thermodynamic cycle and in the cooling capacity is obtained**.

Control and supervision

All the units are equipped with **proprietary software** modelled on the specific features of the range, to meet customer needs whatever the application requirements.
An optional feature is also available to connect several independent units together and control them as if they were a single machine, with freely selectable logics for switching individual units on or off. This **ensures maximum efficiency and, at the same time, maximum reliability within the plant**.
Each unit integrates perfectly with the most popular supervision systems available commercially.

Plate heat exchanger

The plate heat exchanger is characterised by high power density values: its geometry makes an efficient heat exchange possible, combined with minimal footprint.
The use of this type of exchanger on some chiller and heat pump ranges **allows for compact footprint units, with optimised internal spaces**.
The applied cross-channel technology also makes it possible to **operate efficiently even at partial loads**, without any impact on pressure drops at user end and therefore keeping pumping costs at reasonable levels.

Inverter driven compressors

Compressors with inverter electronics are able to vary their rotation speed and therefore provide variable cooling and heating capacity based on the actual system demand. Compressors with inverters are therefore suitable for applications with highly variable power demand over time and/ or with reduced thermal inertia. **The possibility of modulating down to low RPMs allows units with inverter compressors to also reach higher seasonal efficiencies compared to units with scroll compressors only**.

Super low noise set-up

When low noise levels are required, it is possible to choose between two unit soundproofing configurations: the Low noise version and the higher-performance **Super Low noise** version. The latter, designed with panelling around not just the compressors but also the entire refrigeration circuit and hydraulic components (pumps, valves, etc.), **reduces any noise caused by valves, pipes and pumps**.
Combined with reduced ventilation speed, the Super Low Noise version **allows the lowest noise levels on the market to be achieved**.

A2L GAS UPGRADE KIT

FOR AIR CONDITIONING UNITS

HiRef, in compliance with the European "**F-Gas**" regulation which imposes gradual but increasingly stringent restrictions to the use of fluorinated greenhouse gases (79% reduction of tonnes of equivalent CO_2 by 2030) **encourages the development and use of new A2L ultra-low environmental impact refrigerants**, promoting a new approach that aims to speed up the transition to an increasingly widespread adoption of a more environmentally friendly refrigerant class at global level.

The HiRef ranges of chillers and heat pumps can be ordered with class A2L refrigerant or alternatively, they can be supplied with a safety class A1 refrigerant. To expand its offer, **HiRef makes these product ranges available also in "A2L Ready" versions**.

WHAT IS AN A2L READY UNIT?

The unit, pre-filled with an A1 safety class refrigerant, is already preconfigured and equipped to allow, if the customer requires it, quick switching to another refrigerant at a later stage. Purchasing an A2L Ready version machine rather than an R454B factory-filled version is particularly advantageous for customers who, for various reasons, need to urgently replace their units or install new ones: **an A2L Ready unit can be installed without having to apply for plant viability or CPI (fire prevention) certificates, as it is supplied with class A1 refrigerant**. Another strong point of the A2L Ready range by HiRef consists in offering customers better guarantees in terms of return on their investment: the A2L Ready units are futureoriented.

Compressors and components

Compressors and components are specially designed and created to **work with A2L fluids**.

Pressure switch and fan of the compressor compartment and of the power control panel compartment

A ventilation system and a pressure switch are installed in the control panel compartment, to ensure **constant overpressure conditions thanks to air intake from outside the machine**.

Refrigerant leak sensor

A refrigerant leak sensor is installed inside each dependent section of the control panel and inside each separate compartment that contains one or more compressors **to detect any gas leaks**.

Alarm control and management systems

A centralised control system constantly monitors the values detected by the sensors and pressure switches.
Deviations from the safety levels are signalled as warnings if they fall within a first safety threshold (low alarm level).
If the second safety threshold is also exceeded, the alarm is classified as "severe" and t**he control system sends a shutdown command to the components of the refrigeration circuit**.

Safety

Safety ASHRAE A2L class refrigerants are mildly flammable. This peculiarity requires certain precautions in terms of sensors and components in the air conditioning unit, **to prevent - through adequate designing - the risk of igniting fires**.

HiRef

AIR/WATER

Liquid chillers

PCC is the HiRef range of air condensed liquid chillers designed for process applications that require **precision temperature control of the chilled water delivered to the system**. The PCC units use Scroll type compressors and braze welded plate evaporators; the hydraulic circuit can be equipped with an open or closed circuit tank, it can be supplemented with high head pumps and with a by-pass valve to meet the requirements of several industrial applications.

- Refrigerant R410A
- Electronically controlled expansion valve supplied as standard
- Up to 5 bar pump set
- Dual day/night noise emission set-point
- Optional EC electronic switching fans
- Programmable on-board microprocessor control with dedicated software
- Equipment for production of water and glycol mixtures available

Maximum efficiency at partial loads

Multi-Scroll solutions, electronically controlled expansion valves, generously-sized plate heat exchangers, software-managed integrated control of fans and circulation pumps: these key characteristics make the PCC range suitable for numerous industrial applications that require **precise control of delivered power and chilled water temperature.**

Solution designed for process applications

The PCC range also allows for the installation, directly on-board the machine, of dual impeller pumps, the special configuration of which ensures the achievement of the **highest heads to meet a broad range of process requirements.** Pumping modules with pressures up to 5 bar are available.

Accurate regulation of the outlet temperature

For applications where accurate control of the cooling capacity delivered is required, the use of a water bypass valve **ensures fine adjustment of the temperature of the chilled liquid flowing out of the unit.**

Perfect adaptability to any type of process

A water tank can be installed inside all units of the PCC range. The tanks come in two configurations:

- **with an open circuit** that allows for continuous topping up of water to make up for losses in the utility circuit.
- **with a traditional closed circuit** with expansion tank and safety valve.

Easy installation and maintenance

The choice and layout of components make for a constructively straightforward unit, **with installation and maintenance tasks made easier.**

PCC		005	010	015	020	025	030	035	040	045	050	055	062	072	082	092	102	120	140	160	180	210
User water values 12/7°C, 35°C outside air, 40% U.R.																						
Cooling capacity	kW	5.6	8.8	13	14.6	18.8	22	26	28.9	31.9	35.9	39.1	43.1	48.9	56.2	63.7	74.3	81.6	101.1	111.9	125.2	141.3
Total absorbed power	kW	1.8	2.6	4.1	4.8	6.4	6.8	8	9.1	10.3	12.1	13.9	13.2	15.9	18.1	20.8	23.7	27	32.6	37.2	42.2	48.6
EER		3.12	3.37	3.14	3.04	2.95	3.24	3.25	3.16	3.09	2.96	2.81	3.28	3.08	3.11	3.07	3.14	3.02	3.1	3	2.96	2.91
SEPR		5.03	5.71	5.51	5.6	5.05	5.84	6	5.89	5.56	5.37	5.05	6.95	6.59	5.57	6.35	6.27	6.04	5.39	5.29	5.12	5.01
ESEER		3.16	3.55	3.49	3.44	3.28	3.64	3.68	3.6	3.47	3.37	3.2	4.78	4.59	4.37	4.36	4.32	4.26	3.67	3.68	3.68	3.71
Sound power	dB(A)	67	69	74	73	73	75	76	76	76	77	80	74	75	83	77	78	82	79	80	80	81
Sound power [Low noise]	dB(A)	64	66	71	70	70	72	73	73	73	74	77	71	72	80	74	75	79	76	77	77	78
Dimensions [LxDxH]	mm	966 x795 x542	1500x1370x650				1661x1468x914						2090x1730x1170				2440 x1730 x1170		3530x1730x1140			

Also available with 60 Hz power supply

DATA CENTER SERVICES

TSE

CHILLERS WITH REMOTE CONDENSER WITH SCROLL COMPRESSORS

43.1–433.2 kW

MULTI-PROTOCOL COMMUNICATION INTERFACE
PLATE HEAT EXCHANGER
SCROLL COMPRESSORS
CORROSION RESISTANT MATERIAL
A2L READY
LOW GWP REFRIGERANT

TSE is the HiRef range of liquid chillers with remote condenser and Scroll compressors. These motoevaporating units are available with different refrigerating set-ups (Efficiency Packs), numerous power ratings and two different noise emission set-ups, making them **particularly versatile for a number of system engineering applications**. Sizing, the choice of individual components and control of auxiliary units (circulation pumps, remote condenser fans) all aim to **reduce energy consumption and increase energy savings throughout the system**.

The configurations available for the refrigeration circuit are:

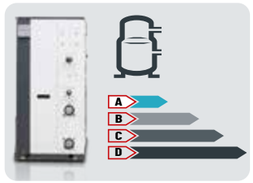
EFFICIENCY PACK 1: Dual compressor on dual circuit for high system redundancy. For units from 48 to 177 kW.

EFFICIENCY PACK 2: Dual compressor (tandem) on single circuit for greater efficiency at partial loads. For units from 48 to 177 kW.

EFFICIENCY PACK 4: Four compressors (dual tandem) on dual circuit, for a redundant system that is also efficient with low loads. For units from 146 to 481 kW.

Sizes above 481 kW are always of the dual refrigerating circuit type with five or six Scroll compressors.

- Refrigerant R410A: Available on request with R454B
- Electronically controlled expansion valve supplied as standard
- Optional Vic-Taulic hydraulic couplings
- Remote condenser fan management for air flow modulation
- Remote pump control according to constant T or constant ΔT logic
- Partial heat recovery (desuperheater) (optional)
- Oil recovery kit for refrigeration lines up to 50 m long



Maximum efficiency at partial loads

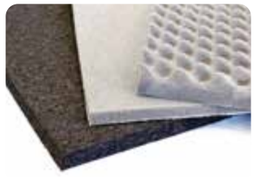
The TSE range features a multi-Scroll solution also on single circuits, electronically controlled expansion valves and the option of managing the circulation pumps and remote condenser fans via onboard software: all these features help **achieve high standards of energy efficiency, particularly at partial loads.**

Reduced footprint

The carefully arranged component layout, together with compact plate heat exchangers and the Scroll compressors, gives the machine a **compact configuration and makes it adaptable to any installation area.** Sizes with **EFFICIENCY PACK 1 and 2** also have a width compatible with that of most commercially available doors, **making transport and installation easier.**

Efficiency and reliability in line with system requirements

The main strength of the TSE range is given by **its numerous configurations available for the refrigeration circuit,** which, depending on the size of the machine and system construction requirements (redundancy and/or efficiency at reduced load), can be available in the form of different **EFFICIENCY PACKS.** The management of the oil return through integrated software logic also helps **to increase the reliability of the compressors** - and consequently - of the unit.



Attention to detail and to low noise requirements

Scroll compressors, which are the main noise source in the unit, are fitted on rubber feet; these dampen vibration and therefore **attenuate the noise transmitted to the various system parts.** On request, the compressor enclosure can be lined with special sound absorbing material and the compressors can be enclosed in special insulating sheaths **to reduce airborne noise emission.**

TSE		041 CS	042 CS	051 CS	052 CS	061 CS	062 CS	071 CS	072 CS	081 CS	082 CS	091 CS	092 CS
User water values 12/7°C, condensing temperature 50°C													
Cooling capacity	kW	43.1	43.1	50.5	50.3	57.9	57.9	65.2	65.1	75.3	75.4	84.5	84.3
Total absorbed power	kW	13.2	13.2	15.5	15.5	17.5	17.5	19.5	19.5	22.4	22.4	25.2	25.2
EER		3.26	3.25	3.25	3.24	3.32	3.32	3.34	3.33	3.37	3.37	3.35	3.34
Sound power	dB(A)	76	76	78	78	78	78	79	79	79	79	81	81
Sound power [Low noise]	dB(A)	72	72	74	74	74	74	75	75	75	75	77	77
Weight	kg	372	362	432	422	442	432	452	442	472	462	512	492
Dimensions [LxDxH]	mm	1174x1594x772											

TSE		111 CS	112 CS	131 CS	132 CS	141 CS	142 CS	144 CS	161 CS	162 CS	164 CS	181 CS	182 CS
User water values 12/7°C, condensing temperature 50°C													
Cooling capacity	kW	100.2	100.1	114.4	114.1	127.3	127.3	131.2	139.7	139.4	149.8	175.1	175.1
Total absorbed power	kW	29.8	29.8	34.6	34.6	37.8	37.8	39	41.2	41.2	44.8	53.1	53.1
EER		3.36	3.36	3.31	3.3	3.37	3.37	3.37	3.39	3.39	3.34	3.3	3.3
Sound power	dB(A)	84	84	85	85	85	85	82	85	85	82	90	90
Sound power [Low noise]	dB(A)	80	80	81	81	81	81	78	81	81	78	86	86
Weight	kg	563	553	573	563	633	618	723	673	653	743	713	693
Dimensions [LxDxH]	mm	1644x1594x772						2374 x1854 x877	1644x1594x772		2374 x1854 x877	1644x1594x772	

TSE		184 CS	204 CS	214 CS	244 CS	284 CS	314 CS	344 CS	374 CS	424 CS	484 CS
User water values 12/7°C, condensing temperature 50°C											
Cooling capacity	kW	169.8	185.3	199.2	228	249.6	272	303.1	338.8	384.4	433.2
Total absorbed power	kW	50.4	55	59.7	68.8	75.5	82.2	94	105.7	118.9	132.1
EER		3.37	3.37	3.33	3.31	3.31	3.31	3.23	3.21	3.23	3.28
Sound power	dB(A)	84	85	86	88	88	88	91	93	94	95
Sound power [Low noise]	dB(A)	80	81	82	84	84	84	87	89	90	91
Weight	kg	853	873	923	983	1093	1253	1293	1333	1413	1520
Dimensions [LxDxH]	mm	2374x1854x877									

Also available with 60 Hz power supply

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CDA

CHILLERS WITH NATURAL REFRIGERANT R744 (CO_2) AIR COOLED AND WITH MODULATING COMPRESSORS - COOLING ONLY VERSION

96-492 kW

- REFRIGERANT R744 (CO_2)
- ADIABATIC COOLING
- MULTI-PROTOCOL COMMUNICATION INTERFACE
- PISTON COMPRESSORS
- CLASS A
- FAST RESTART
- CORROSION RESISTANT MATERIAL

CDA is the new range of water chillers designed by HiRef for applications that require **energy efficiency and environment-friendliness**. Low environmental impact is guaranteed by the use of CO_2 as a refrigerant fluid (R744) which is characterised by a unit GWP (Global Warming Potential) value equal to 1. High efficiency/footprint ratios are achieved thanks to the use of inverter-driven compressors and finned pack exchangers with a large exchange surface installed in a "V" configuration. The adiabatic saturation technology also allows **the highest efficiency rates to be reached both at partial and at nominal loads**, thanks to the lower temperature of the air entering the coils.

- EC fans as standard (as AC option)
- Aisi 316L stainless steel refrigeration circuit
- Low pressure side PS: 85 bar

Higher efficiency potential

Ejector technology (available as an option) makes it possible to flood the evaporator and **increase the unit's performance by 8%.**

Natural refrigerant

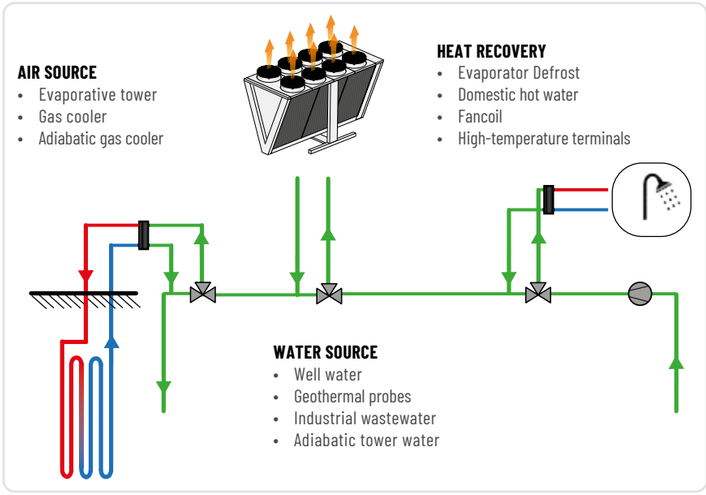
The refrigerant R744 is a natural gas, largely available in nature and without limitations of use. In addition, it is inert, non-toxic and, more importantly, non-flammable, all of which contributes **to reducing costs and the difficulties associated with installing the systems safely.** This refrigerant can be widely used in the field of commercial refrigeration; among other things, it offers good thermodynamic performance due to its inherently favourable chemical and physical properties.

Modular and efficient

The configuration with very deep modular 'V' coils provides an extensive heat exchange surface area and therefore **excellent thermal efficiency levels in relation to the unit footprint.** Another special feature is the material of the coil tubes (alloy of copper and steel) which ensures mechanical **strength to high pressures (up to 130 bar) and heat transfer coefficients greater than those of stainless steel-only tubes**. By connecting in parallel each CDA unit via special kits (on request) a modular configuration can be obtained capable of meeting high cooling capacity requirements and guaranteeing **high redundancy,** with full system management via the on-board electronics.

Maximum efficiency at partial loads

The choice of adopting a single refrigerant circuit configuration with an inverter-driven compressor, the use of EC electronic switching fans (supplied as standard) and management of the variable flow rate through circulation pumps: **these main features maximize the efficiency of the CDA range at partial loads.**



Very high temperature and multi-source heat recovery

CO_2 in the transcritical system allows several exchangers to be placed in series on the dissipation side. A typical configuration includes:

- **a partial or total heat recovery exchanger** that recovers the dissipated heat and produces instantaneous hot water at very high temperatures (over 90°C), without altering the operation of the unit. A typical application is the production of instantaneous hot water;
- **an exchanger with air dissipation,** preferably of the adiabatic type;
- **an exchanger with dissipation in water using well water or geothermal probes,** to further cool the CO_2 and guarantee greater efficiency and cooling performance during the most critical periods of operation.

The compressors and pumping kit are housed in a box lined internally with soundproofing material.

Adiabatic saturation system

The adiabatic saturation system consists of a set of humidification panels placed in front of the finned pack heat exchangers and equipped with a system of nozzles that evenly wet the coils. The air flowing through these panels causes partial evaporation of the contained water and cools down as a result. This ensures **higher efficiency of the thermodynamic cycle and increased refrigeration capacity.**

CDA		095CS	190CS	285CS
User water values 12/7°C, 35°C outside air, 40% U.R.				
Cooling capacity	kW	96	192	288
Total absorbed power	kW	29	58	87
EER		3.33	3.33	3.33
User water values 12/7°C, 10/80°C source water side				
Cooling capacity	kW	131	262	393
Thermal power	kW	164	328	492
Total absorbed power	kW	33.5	67	100.5
Total COP		8.81	8.81	8.81
Sound power	dB(A)	86	89	91
Dimensions [LxHxD]	mm	2255x2655x1600	2255x2655x3200	2255x2655x4800

Also available with 60 Hz power supply

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CDA-F

CHILLERS WITH NATURAL REFRIGERANT R744 (CO_2) AIR COOLED AND WITH MODULATING COMPRESSORS - FREE-COOLING VERSION

96-492 kW

- REFRIGERANT R744(CO_2)
- MULTI-PROTOCOL COMMUNICATION INTERFACE
- PISTON COMPRESSORS
- CLASS A
- FAST RESTART
- CORROSION RESISTANT MATERIAL

CDA is the new range of water chillers designed by HiRef for applications that require **energy efficiency and environment-friendliness**. Low environmental impact is guaranteed by the use of CO_2 as a refrigerant fluid (R744) which is characterised by a unit GWP (Global Warming Potential) value equal to 1. High efficiency/footprint ratios are achieved thanks to the use of inverter-driven compressors and finned pack exchangers with a large exchange surface installed in a "V" configuration.

- EC fans as standard (as AC option)
- Available in versions: Liquid chiller and Free-Cooling chiller (Free-Cooling version not available with adiabatic saturation system).
- Aisi 316L stainless steel refrigeration circuit
- Low pressure side PS: 85 bar

Higher efficiency potential

Ejector technology (available as an option) makes it possible to flood the evaporator and **increase the unit's performance by 8%.**

Natural refrigerant

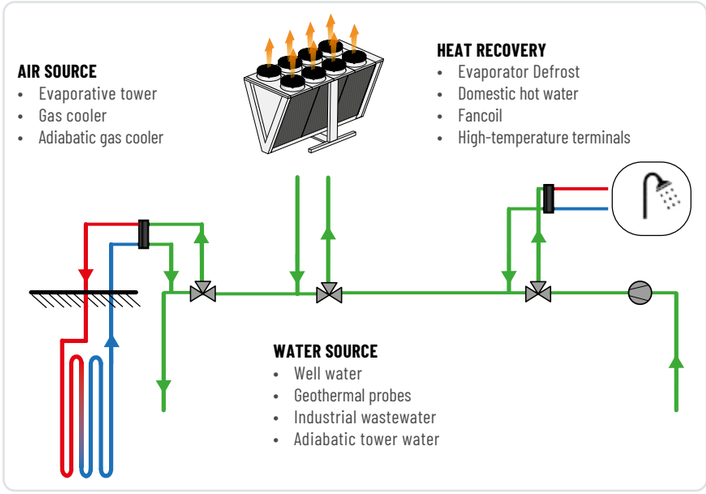
The refrigerant R744 is a natural gas, largely available in nature and without limitations of use. In addition, it is inert, non-toxic and, more importantly, non-flammable, all of which contributes **to reducing costs and the difficulties associated with installing the systems safely.** This refrigerant can be widely used in the field of commercial refrigeration; among other things, it offers good thermodynamic performance due to its inherently favourable chemical and physical properties.

Modular and efficient

The configuration with very deep modular 'V' coils provides an extensive heat exchange surface area and therefore **excellent thermal efficiency levels in relation to the unit footprint.** Another special feature is the material of the coil tubes (alloy of copper and steel) which ensures mechanical **strength to high pressures (up to 130 bar) and heat transfer coefficients greater than those of stainless steel-only tubes**. By connecting in parallel each CDA unit via special kits (on request) a modular configuration can be obtained capable of meeting high cooling capacity requirements and guaranteeing **high redundancy,** with full system management via the on-board electronics.

Maximum efficiency at partial loads

The choice of adopting a single refrigerant circuit configuration with an inverter-driven compressor, the use of EC electronic switching fans (supplied as standard) and management of the variable flow rate through circulation pumps: **these main features maximize the efficiency of the CDA range at partial loads.**



Very high temperature and multi-source heat recovery

CO_2 in the transcritical system allows several exchangers to be placed in series on the dissipation side. A typical configuration includes:

- **a partial or total heat recovery exchanger** that recovers the dissipated heat and produces instantaneous hot water at very high temperatures (over 90°C), without altering the operation of the unit. A typical application is the production of instantaneous hot water;
- **an exchanger with air dissipation,** preferably of the adiabatic type;
- **an exchanger with dissipation in water using well water or geothermal probes,** to further cool the CO_2 and guarantee greater efficiency and cooling performance during the most critical periods of operation.

The compressors and pumping kit are housed in a box lined internally with soundproofing material.

CDA-F		095CS	190CS	285CS
User water values 12/7°C, 35°C outside air, 40% U.R.				
Cooling capacity	kW	96	192	288
Total absorbed power	kW	29	58	87
EER		3.33	3.33	3.33
User water values 12/7°C, 10/80°C source water side				
Cooling capacity	kW	131	262	393
Thermal power	kW	164	328	492
Total absorbed power	kW	33.5	67	100.5
Total COP		8.81	8.81	8.81
Sound power	dB(A)	86	89	91
Dimensions [LxHxD]	mm	2255x2655x1600	2255x2655x3200	2255x2655x4800

Also available with 60 Hz power supply

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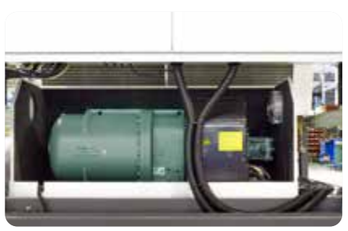
TVA

AIR CONDENSED CHILLERS WITH INVERTER DRIVEN SCREW COMPRESSORS

285.9-1367.1 kW

TVA sets a new standard for air cooled chillers, designed to ensure that processes are both energy-efficient and environment-friendly. Low environmental impact has been achieved by using **new HFO refrigerants** with low Global Warming Potential (GWP), while **higher efficiency/footprint ratios** are reached thanks to the special V-configuration of the heat exchange coils and their sizing, **the largest among the chillers currently available on the market**. The Free-Cooling version - where heat exchange surface areas are double the market average - **ensure outstanding performance**. The high thermodynamic efficiency, low Total Equivalent Warming Impact (TEWI) is combined with a special focus on maintainability and **easy accessibility of the compressors contained in the removable HiRail** module which reduces noise emissions.

- Refrigerant R1234ze and R515B
- Also available with R134a refrigerant and on request with R513A
- Capacity modulation: with slide valve or with inverters on both compressors or on one compressor only
- EC Fans
- Electronically controlled expansion valve
- HiNode Supervision
- Monitoring and limitation of the maximum absorbed power

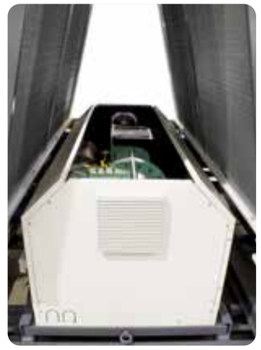


Inverter screw compressors

Inverter equipped with screw compressors combine the possibility of moving large volumes of refrigerant with **the guarantee of constant power modulation and high energy efficiency even at partial loads.**

New refrigerant R1234ze

TVA air condensed chillers use **the new HFO refrigerant with low GWP** (GWPR1234ze=6) as part of a wider Green Technology approach. (Also available in version with R134a refrigerant and on request with R513A.)

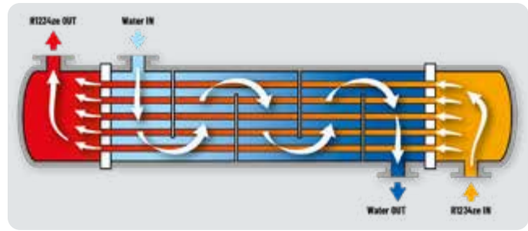


Low noise and accessibility: HI-RAIL

The compressor hoods **dramatically reduce noise** thanks to the use of special soundabsorbing materials. On request, sliding rails allow them **to be removed effortlessly, making all maintenance tasks much easier**. The compressors can also be removed by hooking from above and lifting with a crane.

Modular and efficient

The configuration with very deep 'V' modular coils provides **an extensive heat exchange surface area and therefore excellent thermal efficiency in relation to the unit footprint.** The Free-Cooling version features heat exchangers sized in such a way as to allow a Total Free-Cooling Temperature (TFT) of 10°C.



New concept of heat exchange

Single pass shell and tube evaporators provide **excellent levels of thermodynamic efficiency** thanks to full heat exchange counter-flow.

TVA		0311F	0331F	0361F	0381F	0421F	0451F	0481F	0531F	0581F	0621F	0661F	0721F	0801F	0831F	0901F	0971F	1041F	1101F	1161F
Raffreddamento/Free-Cooling: Temperatura acqua utenza 12/7°C 20% glicole etilenico, aria esterna 35°C, 40% U.R.																				
Cooling capacity	kW	285.9	296.7	329.9	362.4	394.2	420.3	438.8	478.4	513	579	596.9	660.7	719.1	749.1	790.8	847.2	929.2	979.7	1059.1
Total absorbed power	kW	90.2	92.9	98.2	105.9	113.1	121.5	126.7	131.3	146.3	165.4	171.6	193.4	200.7	216.8	233.9	248.7	273.6	298.7	315.5
EER		3.17	3.19	3.36	3.42	3.49	3.46	3.46	3.64	3.51	3.5	3.48	3.42	3.58	3.46	3.38	3.41	3.4	3.28	3.36
Sound power	dB(A)	92	92	93	93	94	94	94	95	96	97	97	98	99	99	99	99	99	100	100
Dimensions [LxDxH]	mm	5404 x2650 x2255		6655 x2650 x2255		7906x2650x2255			9722 x2650 x2255		11100x2650x2255			12854x2650x2255			13355x2650x2255			

TVA		0311F	0331F	0361F	0381F	0421F	0451F	0481F	0531F	0581F	0621F	0661F	0721F	0801F	0831F	0901F	0971F	1041F	1101F	1161F
Raffreddamento/Free-Cooling: Temperatura acqua utenza 12/7°C, glicole etilenico 20%																				
Total Free-Cooling temperature	°C	1.1	1	1.8	1.4	2	1.8	1.5	1.9	1.7	1.8	1.7	1.2	1.4	1.2	0.9	1.2	0.7	0.3	-1.3
Sound power	dB(A)	92	92	93	93	94	94	94	95	96	97	97	98	99	99	99	99	99	100	100
Dimensions [LxDxH]	mm	5404 x2650 x2255		6655 x2650 x2255		7906x2650x2255			9722 x2650 x2255		11100x2650x2255			12854x2650x2255			13355x2650x2255			

TVA		0381C	0401C	0451C	0481C	0531C	0581C	0621C	0661C	0721C	0801C	0831C	0901C	0971C	1041C	1101C	1161C	1231C	1291C	1351C	1421C
User water values 12/7°C, 35°C outside air, 40% U.R.																					
Cooling capacity	kW	354.5	386	423.1	464.1	500.3	520	568.3	609.4	699.7	751.7	802.4	865.5	877	958.3	1007	1065.1	1121.2	1178.4	1247.6	1367.1
Total absorbed power	kW	112.3	123.4	132.9	146.9	156.1	165.7	180.4	190.8	224.1	238.1	251.1	277.9	280.7	306.3	319.5	333.9	351	375.4	388.2	417.5
EER		3.16	3.13	3.18	3.16	3.21	3.14	3.15	3.19	3.12	3.16	3.2	3.11	3.12	3.13	3.15	3.19	3.19	3.14	3.21	3.27
SEER		4.43	4.43	4.53	4.57	4.53	4.52	4.5	4.62	4.51	4.5	4.65	4.57	4.44	4.52	4.59	4.64	4.66	4.65	4.54	4.92
SEPR		5.4	5.45	5.52	5.91	5.9	5.83	5.52	5.99	5.54	5.59	6.05	6.04	5.67	5.64	5.81	6.02	5.75	5.75	5.96	6.46
ESEER		4.11	4.14	4.22	4.28	4.26	4.24	4.19	4.35	4.18	4.18	4.36	4.27	4.14	4.23	4.31	4.34	4.33	4.31	4.26	4.5
Sound power	dB(A)	92	92	95	96	97	96	96	100	99	99	102	101	99	99	102	104	100	100	103	105
Dimensions [LxDxH]	mm	5404x2650x2255				6655x2650x2255				7906x2650x2255				9722x2650x2255				11100 x2650 x2255		12854 x2650 x2255	

Dati dichiarati con utilizzo di refrigerante R134a | Disponibile anche in alimentazione 60 Hz

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TTX

AIR CONDENSED CHILLERS WITH OIL-FREE CENTRIFUGAL COMPRESSORS

281–1057 kW

MULTI-PROTOCOL COMMUNICATION INTERFACE

OIL-FREE CENTRIFUGAL COMPRESSORS

SPRAY FLOODED SHELL AND TUBE

FAST RESTART

AXIAL FANS

CORROSION RESISTANT MATERIAL

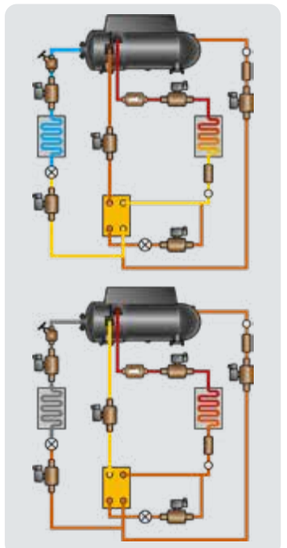
CLASS A

SUPER LOW NOYSE

LOW GWP REFRIGERANT

The TTX range is **the most innovative and efficient** solution for air-condensed liquid chillers. The use of the oil-free centrifugal compressor in combination with new small-sized flooded exchangers (minimised water and refrigerant approach and reduction of refrigerant charge compared to traditional flooded heat exchangers) allows **top efficiency values to be achieved**, especially at partial loads. TTX range chillers can be used with **the new HFO R1234ze refrigerant** characterised by a **very low environmental impact**, minimising the TEWI of the entire system.

- Refrigerant R134a
- Available in versions: Liquid chiller and Free-Cooling chiller (Free-Cooling version not available with adiabatic saturation system).
- Energy efficiency class A
- Optional EC electronic switching fans
- Refrigerant leak sensor
- Water connections with Vic-Taulic quick couplings
- Dual day/night noise emission set-point



Top-class thermodynamic performance!

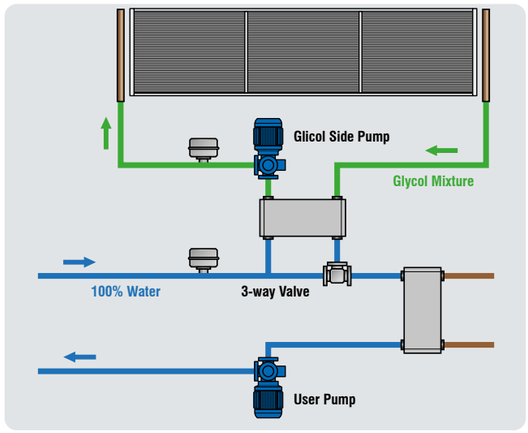
An effective combination of "oil-free" centrifugal compressor and flooded exchangers allows maximisation of thermal exchange efficiency; this is largely due to the absence of oil in the circuit and the reduced approach temperature between water and refrigerant (1K) as a result of no overheating in the evaporator. Cycle efficiency is enhanced by the centrifugal compressor, which provides **ultra-high efficiency at partial loads,** and by the economiser, which ensures **intermediate regenerative exchange in the circuit.**

Acoustic comfort

Two different soundproofing systems are available: the most suitable one will depend on the importance of noise containment in the overall plant layout. Adopted technical solutions include fan speed control and compartmentalisation of compressors and pumping kits in a box internally lined with soundproofing material.

New refrigerant R1234ze

On request, TTX air condensed chillers can use **the new HFO refrigerant with low GWP** (GWPR1234ze=6), part of a wider Green Technology approach. (The standard version is with R134a).



Glycol-Free kit

The Free-Cooling versions can be selected with the "Glycol- Free" kit (on board the unit) to confine the water-antifreeze mix inside the finned coils. This solution **maximises heat exchange efficiency at the evaporator** with the exclusive use of pure water; it also **dramatically reduces pumping costs.**

Maximum efficiency at partial loads

The adoption of oil-free centrifugal compressors, electronically controlled expansion valves, flooded heat exchangers, fan modulation and variable flow rate controlled with circulation pumps are all **key features that make the TTX range particularly efficient at partial loads.**

TTX		280CS	380CS	410CS	531CS	561CS	631CS	761CS	813CS	911CS	821CS	943CS	1064CS
User water values 12/7°C, 35°C outside air, 40% U.R.													
Cooling capacity	kW	281	380	414	529	562	661	759	809	909	829	943	1057
Total absorbed power	kW	90	121	130	169	180	211	242	259	263	260	300	339
EER		3.12	3.14	3.19	3.12	3.12	3.14	3.14	3.12	3.46	3.19	3.15	3.12
Dimensions [LxDxH]	mm	3065 x2652 x2256	4065 x2652 x2256	5065x2652x2256		6130 x2652 x2256	7130 x2650 x2256	8130x2650x2256		9130 x2650 x2256	10120x2650x2256		

Also available with 60 Hz power supply

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HCB

AIR CONDENSED CHILLERS WITH INVERTER DRIVEN SCREW COMPRESSORS COOLING ONLY VERSION

369.7–1199.4 kW

MULTI-PROTOCOL COMMUNICATION INTERFACE
SCREW COMPRESSORS
FAST RESTART
AXIAL FANS
CORROSION RESISTANT MATERIAL
CLASS A
INVERTER DRIVEN COMPRESSORS
ADIABATIC COOLING
LOW GWP REFRIGERANT
SPRAY FLOODED SHELL AND TUBE

HCB ChillBatic sets a new standard for air cooled chillers, designed to ensure that processes are both energy-efficient and environment-friendly. Low environmental impact has been achieved by using **new HFO refrigerants** with low GWP (Global Warming Potential), while **higher efficiency/footprint ratios** are reached thanks to the special V-configuration of the heat exchange coils and their sizing, the largest among the chillers currently available on the market. The adiabatic cooling technology also produces **the highest efficiency rates both at partial and at nominal loads**, thanks to the lower temperature of the air entering the coils. The high thermodynamic efficiency low Total Equivalent Warming Impact (TEWI) is combined with a special focus on maintainability and **easy accessibility of the compressors contained in the removable HiRail module** which reduces noise emissions.

New refrigerant R1234ze

HCB range air condensed chillers use the **new HFO refrigerant with low GWP** (GWPR1234ze=6) as part of a wider Green Technology approach. (Also available in a version with R134a refrigerant).

Inverter screw compressors

Inverter equipped with screw compressors combine the possibility of moving large volumes of refrigerant with **the guarantee of constant power modulation and high energy efficiency even at partial loads.**

- Refrigerant R1234ze and R515B
- Also available with R134a refrigerant
- Also available in Low-Noise silenced set-up with internal compartment lined with sound-absorbing material
- Capacity modulation: with slide valve or with inverters on both compressors or on one compressor only
- EC Fans
- Electronically controlled expansion valve
- HiNode Supervision
- Monitoring and limitation of the maximum absorbed power

Modular and efficient

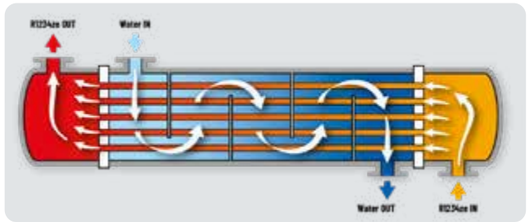
The configuration with very deep 'V' modular coils **provides an extensive heat exchange surface area and therefore excellent thermal efficiency in relation to the unit footprint.**

Low noise and accessibility: HI-RAIL

The compressor hoods **dramatically reduce noise** thanks to the use of special sound-absorbing materials. On request, sliding rails allow them to be removed effortlessly, **making all maintenance tasks much easier.** The compressors can also be removed by hooking from above and lifting with a crane.

Adiabatic humidification system

Adiabatic humidification consists of a series of humidification panels placed before the dissipation coils and kept uniformly humidified. With this system, hot air passes through the humidified panels, comes into contact with the contained water and transforms it into water vapour: the outgoing air is therefore cooler and passes through the dissipation coils at a lower temperature, **increasing the efficiency of the thermodynamic cycle and the cooling capacity.** Considering average climatic conditions, the energy saving on an annual basis is more than **35%** compared to a conventional chiller with the same footprint.



New concept of heat exchange: spray flooded shell and tube heat exchanger

A spray flooded shell and tube construction guarantees **effectiveness and efficiency** thanks to the minimal approach temperature between refrigerant and water. It requires about **30% less refrigerant charge** compared to traditional flooded shell and tube configurations: a solution that **benefits the environment** and results in **costs savings**, in terms of both CapEx and OpEx.

HCB		0381C	0401C	0421C	0451C	0481C	0531C	0581C	0621C	0661C	0721C	0801C	0831C	0901C	0971C	1041C	1101C	1161C	1231C
User water values 12/7°C, 35°C outside air, 40% U.R.																			
Cooling capacity	kW	369.7	398.5	417.3	442.2	477.9	519.2	565.1	614.8	652.2	705.6	773.6	815.5	880.5	938.5	1019.2	1067.7	1123.6	1199.4
Total absorbed power	kW	98.5	107.4	114.7	120.4	129.7	137.8	152.1	164.7	177.3	193.6	205.8	221	238	251.9	272.1	288.8	306	327.3
EER		3.75	3.71	3.64	3.67	3.68	3.77	3.72	3.73	3.68	3.65	3.76	3.69	3.7	3.73	3.75	3.7	3.67	3.66
Consumo d'acqua	l	2868	2868	2868	2812	2812	3824	3749	3749	3749	4780	4687	4687	5737	5624	5624	5624	6693	6561
Sound power	dB(A)	93	93	93	96	97	97	96	97	97	97	98	98	98	98	99	99	100	100
Sound power [Low noise]	dB(A)	88	88	88	91	92	92	91	92	92	92	93	93	93	93	94	94	95	95
Dimensions [LxHxD]	mm	5755x2652x2256					7405x2650x2256				8855x2650x2256			10700x2652x2256				13000 x2652 x2256	

Also available with 60 Hz power supply

DATA CENTER | INDUSTRIAL | SERVICES

HCB-F

AIR CONDENSED CHILLERS WITH INVERTER DRIVEN SCREW COMPRESSORS - FREE-COOLING VERSION

299.8–1199.4 kW

- MULTI-PROTOCOL COMMUNICATION INTERFACE
- SCREW COMPRESSORS
- FAST RESTART
- AXIAL FANS
- CORROSION RESISTANT MATERIAL
- CLASS A
- INVERTER DRIVEN COMPRESSORS
- LOW GWP REFRIGERANT
- SPRAY FLOODED SHELL AND TUBE

HCB ChillBatic sets a new standard for air cooled chillers, designed to ensure that processes are both energy-efficient and environment-friendly. Low environmental impact has been achieved by using **new HFO refrigerants** with low GWP (Global Warming Potential), while **higher efficiency/footprint ratios** are reached thanks to the special V-configuration of the heat exchange coils and their sizing, the largest among the chillers currently available on the market. The Free-Cooling version - where heat exchange surface areas are double the market average - ensure outstanding performance. The high thermodynamic efficiency low Total Equivalent Warming Impact (TEWI) is combined with a special focus on maintainability and **easy accessibility of the compressors contained in the removable HiRail module** which reduces noise emissions.

New refrigerant R1234ze

HCB range air condensed chillers use the **new HFO refrigerant with low GWP** (GWPR1234ze=6) as part of a wider Green Technology approach. (Also available in a version with R134a refrigerant).

Inverter screw compressors

Inverter equipped with screw compressors combine the possibility of moving large volumes of refrigerant with **the guarantee of constant power modulation and high energy efficiency even at partial loads.**

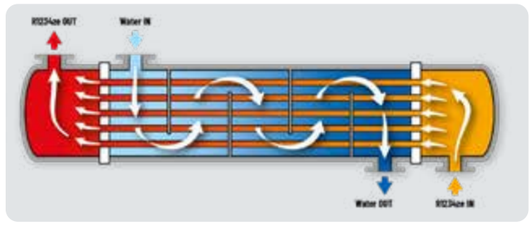
- Refrigerant R1234ze and R515B
- Also available with R134a refrigerant
- Also available in Low-Noise silenced set-up with internal compartment lined with sound-absorbing material
- Capacity modulation: with slide valve or with inverters on both compressors or on one compressor only
- EC Fans
- Electronically controlled expansion valve
- HiNode Supervision
- Monitoring and limitation of the maximum absorbed power

Modular and efficient

The configuration with very deep 'V' modular coils **provides an extensive heat exchange surface area and therefore excellent thermal efficiency in relation to the unit footprint.** The Free-Cooling version features heat exchangers sized in such a way as to allow a Total Free- Cooling Temperature (TFT) of 10°C (Data Center conditions with chilled water to 19/25 °C).

Low noise and accessibility: HI-RAIL

The compressor hoods **dramatically reduce noise** thanks to the use of special sound-absorbing materials. On request, sliding rails allow them to be removed effortlessly, **making all maintenance tasks much easier.** The compressors can also be removed by hooking from above and lifting with a crane.



New concept of heat exchange: spray flooded shell and tube heat exchanger

A spray flooded shell and tube construction guarantees **effectiveness and efficiency** thanks to the minimal approach temperature between refrigerant and water. It requires about **30% less refrigerant charge** compared to traditional flooded shell and tube configurations: a solution that **benefits the environment** and results in **costs savings**, in terms of both CapEx and OpEx.

HCB-F		0311F	0331F	0361F	0381F	0421F	0451F	0481F	0531F	0581F	0621F	0661F	0721F
User water temperature 12/7°C 20% ethylene glycol, outside air 35°C, 40% R.H.													
Cooling capacity	kW	299.8	316	342	362.1	402	423.7	445.4	478.7	517.8	553.6	589.1	654.1
Total absorbed power	kW	78.7	84.2	91	97.6	106.6	112.9	119.2	127.8	135.8	146	160.5	172.8
EER		3.81	3.75	3.76	3.71	3.77	3.75	3.74	3.75	3.81	3.79	3.67	3.79
Consumo d'acqua	l	2666	2666	3554	3554	4443	4443	4443	5332	5332	6220	6220	6220
Sound power	dB(A)	93	93	94	94	95	95	95	97	98	98	98	98
Sound power [Low noise]	dB(A)	88	88	89	89	90	90	90	92	93	93	93	93

Also available with 60 Hz power supply

HCB-F		0311F	0331F	0361F	0381F	0421F	0451F	0481F	0531F	0581F	0621F	0661F	0721F
Utility water temperature 12/7°C, ethylene glycol 20%													
Total Free-Cooling temperature	°C	-0.8	-1.1	0	-0.3	0.3	0.1	-0.2	0.4	0	0.4	0.1	0.4
Sound power	dB(A)	93	93	94	94	95	95	95	97	98	98	98	98
Sound power [Low noise]	dB(A)	88	88	89	89	90	90	90	92	93	93	93	93

Also available with 60 Hz power supply

HCB-F		0381C	0401C	0421C	0451C	0481C	0531C	0581C	0621C	0661C	0721C	0801C	0831C	0901C	0971C	1041C	1101C	1161C	1231C
User water values 12/7°C, 35°C outside air, 40% U.R.																			
Cooling capacity	kW	369.7	398.5	417.3	442.2	477.9	519.2	565.1	614.8	652.2	705.6	773.6	815.5	880.5	938.5	1019.2	1067.7	1123.6	1199.4
Total absorbed power	kW	98.5	107.4	114.7	120.4	129.7	137.8	152.1	164.7	177.3	193.6	205.8	221	238	251.9	272.1	288.8	306	327.3
EER		3.75	3.71	3.64	3.67	3.68	3.77	3.72	3.73	3.68	3.65	3.76	3.69	3.7	3.73	3.75	3.7	3.67	3.66
Consumo d'acqua	l	2868	2868	2868	2812	2812	3824	3749	3749	3749	4780	4687	4687	5737	5624	5624	5624	6693	6561
Sound power	dB(A)	93	93	93	96	97	97	96	97	97	97	98	98	98	98	99	99	100	100
Sound power [Low noise]	dB(A)	88	88	88	91	92	92	91	92	92	92	93	93	93	93	94	94	95	95
Dimensions [LxHxD]	mm	5755x2652x2256					7405x2650x2256				8855x2650x2256			10700x2652x2256				13000 x2652 x2256	

Also available with 60 Hz power supply

HiRef

AIR/WATER

Reversible heat pumps

INDUSTRIAL SERVICES

HPS / MPS

REVERSIBLE AND MULTI-PURPOSE AIR CONDENSED HEAT PUMPS FOR LOW OUTDOOR TEMPERATURES

36.3-202.2 kW

MULTI-PROTOCOL COMMUNICATION INTERFACE

EVI SCROLL COMPRESSORS

AXIAL FANS

CORROSION RESISTANT MATERIAL

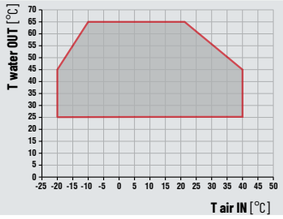
PLATE HEAT EXCHANGER

HPS/MPS is the HiRef range of air-to-water multipurpose reversible heat pumps designed for operation in very cold climates. **The use of compressors with EVI steam injection technology allows the production of hot water up to 65 °C and operation with outdoor temperatures down to -20 °C**. This is combined with special **focus on Low Noise** (the "Low-Noise" silenced version is supplied as standard) and the use of different refrigeration circuit architectures to meet the needs of many different system applications.

- Refrigerant R410A
- EVI compressors with steam injection
- Electronically controlled expansion valve
- "Cold" start Smart Kit
- Hydrophilic coated coils with wider fin pitch
- Defrost ice disposal chutes with heating elements
- Optional EC electronic switching fans
- Available in multipurpose version for 2 and 4 pipe systems

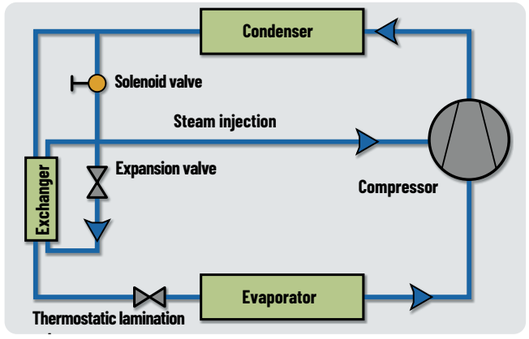
Efficiency and reliability in line with system requirements

The available refrigerating circuit configurations have been designed to ensure, also simultaneously, **redundancy and efficiency at partial loads.** More specifically, the units - depending on the size of the machine and on specific plant engineering requirements - consist of two compressors on two circuits **for high system redundancy** or four compressors (double tandem) on two circuits **for a system that is simultaneously redundant and efficient at partial loads.**



Production of hot water up to 65 °C

The units of the HPS/MPS range are capable of **producing water at 65°C**, as well as operating with outdoor air temperatures down **to -20°C.**



Units optimised for climates with T down to -20°C

The Scroll compressors of the HPS/MPS range use **steam injection technology:** a light flow of refrigerant in a medium-pressure vapour state is "injected" into the coils in the compression chamber. This system allows for both **an increase in the cooling** (and therefore, also the heating) **capacity and efficiency and, above all, an extension of the operating range of the heat pump;** this makes of the HPS/MPS range the ideal solution in case of extremely low outdoor temperatures.

Extra low noise

All units in the HPS/MPS range are, as standard, **"Low Noise"**, which means fan speed is controlled, anti-vibration piping is used on the refrigeration circuit, and the compressors and pumping kit are compartmentalised in a box lined with soundproofing material. **All this ensures minimum noise emissions throughout the system.**

Smart Defrost System

A factor that heavily weighs on the costs of managing the entire plant is finned pack evaporator defrosting during wintertime operation. The (patented) Smart Defrost System by HiRef is able to identify a decline in the exchanger performance caused by the formation of ice and to **minimise the duration of the defrosting process.** The use of coils treated with hydrophilic surface coating **speeds up the defrosting process** so that melting of just the first, thin ice layer on the fins is only required for cleaning.

HPS		041HL	051HL	071HL	081HL	101HL	134HL	164HL	204HL
User water values 12/7°C, 35°C outside air, 40% U.R.									
Cooling capacity	kW	36.3	45.5	61.8	68.9	79.2	121.5	136.9	175.2
Total absorbed power	kW	12	15	19.7	23.3	25.4	40.2	48.9	62.5
EER		3.03	3.03	3.14	2.96	3.12	3.02	2.8	2.8
User water values 40/45°C, 7°C outside air, 89% U.R.									
Thermal power	kW	43.6	53.9	72.5	81.6	92.2	140.3	158	202.2
Total absorbed power	kW	13	15.7	21.2	24.4	26.8	41.1	48.6	61.5
COP		3.34	3.42	3.41	3.35	3.44	3.41	3.25	3.29
SCOP		2.83	2.96	2.91	2.9	2.91	3.2	2.85	3.05
Sound power	dB(A)	79	78	80	81	81	80	82	82
Dimensions [LxDxH]	mm	2440x1735x1183		2792x1735x1183		3540x1679x1183	3538x1884x1653		3538x2284x1653

Also available with 60 Hz power supply

MPS		041PL	051PL	071PL	081PL	101PL	134PL	164PL	204PL
User water values 12/7°C, 35°C outside air, 40% U.R.									
Cooling capacity	kW	39.5	49.1	66.7	73.9	86	131	148.8	188.1
Total absorbed power	kW	12	15.1	19.6	23.4	25.5	40.1	49	62.5
EER		3.29	3.24	3.41	3.16	3.37	3.27	3.03	3.01
Utility water temperature 12/7°C, Recovery water temperature 40/45°C									
Cooling capacity	kW	38.5	47.8	64.9	72	83.7	127.3	144.4	182.2
Thermal power	kW	51.135	63.6	85.8	96.89	110.4	170.3	196.46	248.3
Total absorbed power	kW	13.3	16.7	22	26.2	28.2	45.3	54.8	69.6
Total COP		6.74	6.67	6.85	6.45	6.89	6.57	6.22	6.19
User water values 40/45°C, 7°C outside air, 89% U.R.									
Thermal power	kW	43.6	53.9	72.5	81.6	92.2	140.3	158	202.2
Total absorbed power	kW	13	15.7	21.2	24.4	26.8	41.1	48.6	61.5
COP		3.34	3.42	3.41	3.35	3.44	3.41	3.25	3.29
SCOP		2.83	2.96	2.91	2.9	2.91	3.2	2.85	3.05
Sound power	dB(A)	79	78	80	81	81	80	82	82
Dimensions [LxDxH]	mm	2440x1735x1183		2792x1735x1183		3540x1679x1183	3538x1884x1653		3538x2284x1653

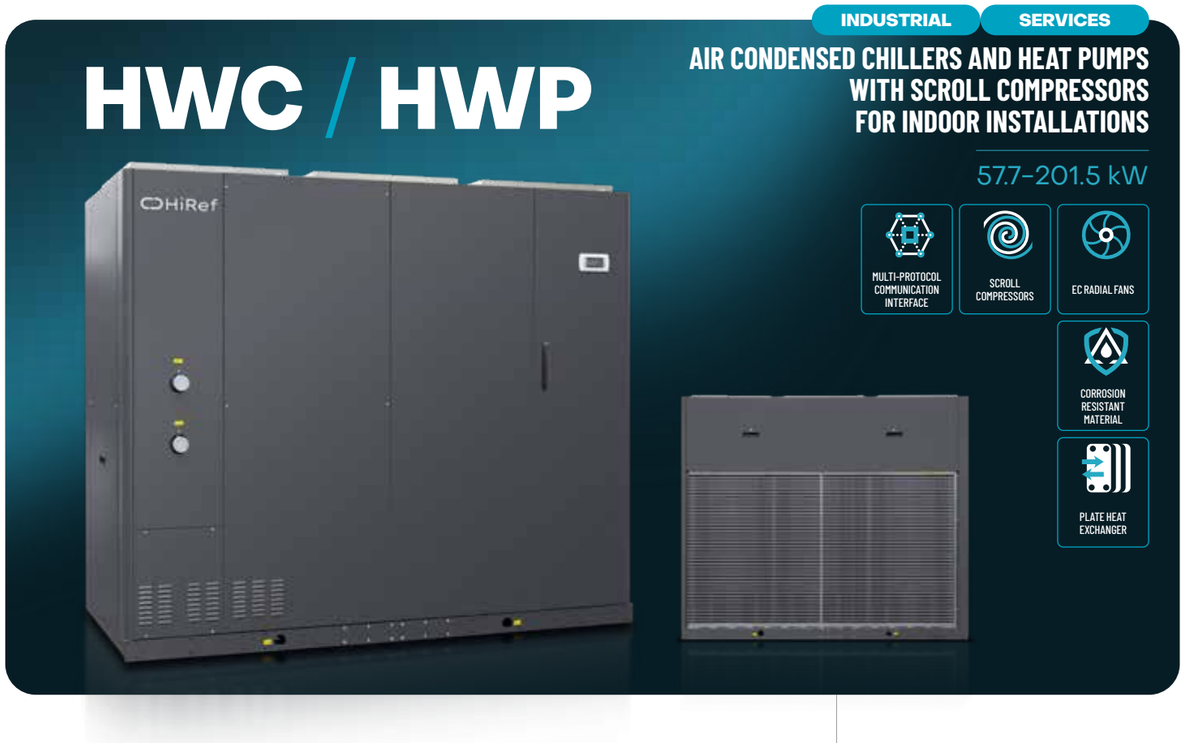
Also available with 60 Hz power supply

INDUSTRIAL SERVICES

HWC / HWP

AIR CONDENSED CHILLERS AND HEAT PUMPS WITH SCROLL COMPRESSORS FOR INDOOR INSTALLATIONS

57.7–201.5 kW



HWC/HWP is the HiRef range of air-condensed liquid chillers with Scroll compressors for indoor installations. Four different versions (chiller, Free-Cooling chiller, reversible heat pump and multipurpose) the several available power output rates and compact frame make these units **highly versatile and suited to a wide range of system layouts**. The sizing and selection of individual components have focused on **containing energy consumption, aiming to optimise energy savings not just for individual chillers but for the entire system**. The unit is suitable for installation in equipment rooms and **can be ducted at both suction and delivery ends**. The maximum working head available is 250 Pa.

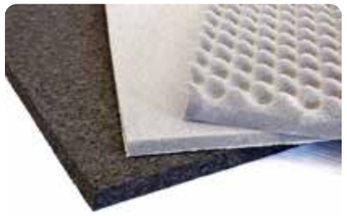
The configurations available for the refrigeration circuit are:

EFFICIENCY PACK 1: Dual compressor and dual circuit unit, for a system with greater redundancy (only for Free-Cooling versions).

EFFICIENCY PACK 2: Dual compressor (tandem) on single circuit for greater efficiency at partial loads.

EFFICIENCY PACK 4: Four compressors (dual tandem) on dual circuit, for a redundant system that is efficient with low loads.

- 2 different soundproofing set-ups available: Standard and Low Noise
- Electric control panel with IP55 protection rating
- Radial EC motor fans
- Electronic expansion valve
- Easy accessibility thanks to the optimisation of the internal space
- Programmable microprocessor control with proprietary software
- Available with single or double pumping kit in timed rotation
- Maintenance kit available
- Compliance with ERP regulations



Attention to detail and to low noise requirements

Scroll compressors, which are the main noise source in the unit, are fitted on rubber feet; **these dampen vibration and therefore attenuate the noise transmitted to the various system parts.** On request, the compressor compartment can be lined with special sound absorbing material and the compressors encased in special insulating hoods **to reduce airborne noise emissions.**

All accessories on-board the machine

The special component layout, together with compact plate heat exchangers and Scroll compressors, ensures on one hand **easier access to carry out maintenance procedures** and on the other hand, **sufficient internal space available for fitting a wide range of accessories and hydraulic options.** The hydraulic circuit may include a dual shut-off pump, flow switch, tank, expansion tank and safety valve.

Maximum efficiency at partial loads

The adoption of a multi-Scroll solution, the use of electronically controlled expansion valves and plate heat exchangers and modulation of the compressors are all key features **that make the HWC/HWP range particularly efficient at partial loads.**

HWC		052CS	062CS	072CS	082CS	092CS	102CS	112CS	132CS	142CS	162CS	182CS	204CS
User water values 12/7°C, 35°C outside air, 40% U.R.													
Cooling capacity	kW	57.7	62	71	78.7	94.5	106.8	119.8	128.2	142	155.5	183	201.5
Total absorbed power	kW	18.5	23	25	28.7	33.8	39.6	42.6	47.1	55.2	63.8	68.5	82.2
EER		3.12	2.69	2.84	2.74	2.8	2.7	2.82	2.72	2.57	2.44	2.67	2.45
SEPR		5.29	5.26	5.32	5.33	5.27	5.22	5.42	5.3	5.11	5.05	5.24	5.15
Sound power	dB(A)	82	82	82	83	85	86	86	86	89	90	92	89
Dimensions [LxDxH]	mm	2000x1100x2020				2400x1100x2020		3090x1100x2020				4090x1100x2104	

Calculated with 20% glycol. Free-Cooling versions always have a refrigerating configuration consisting of one compressor per circuit or a dual tandem arrangement on two circuits | Features referred to the standard set-up. If not available, these features are referred to the Low Noise or Super Low Noise set-ups | Also available with 60 Hz power supply | Data declared with use of R410A refrigerant

HWP		052PS	062PS	072PS	082PS	092PS	102PS	112PS	132PS	142PS	162PS	182PS	204PS
User water values 12/7°C, 35°C outside air, 40% U.R.													
Cooling capacity	kW	55.1	61.2	71	78.7	94.5	106	119.6	127.9	141.6	152.3	181.1	201.5
Total absorbed power	kW	19.9	23.1	25	28.7	33.8	39.7	42.5	47.1	55.1	63.6	68.4	82.2
EER		2.77	2.65	2.84	2.74	2.8	2.67	2.81	2.71	2.57	2.4	2.65	2.45
User water values 40/45°C, 7°C outside air, 89% U.R.													
Thermal power	kW	58	64.6	76.6	85.5	102.3	115.2	131.2	141.8	159.1	175.1	203.1	230.8
Total absorbed power	kW	21	23.9	26.6	29.3	36.3	41.1	44	48	53.2	59.7	68.4	77.8
COP		2.76	2.71	2.88	2.92	2.82	2.8	2.98	2.96	2.99	2.93	2.97	2.97
SCOP		3.2	3.23	3.27	3.37	3.22	3.23	3.42	3.46	3.46	3.5	3.4	3.44
Sound power	dB(A)	82	82	82	83	85	86	86	86	89	90	92	89
Dimensions [LxDxH]	mm	2000x1100x2020				2400x1100x2020		3090x1100x2020				4090x1100x2104	

Data declared with use of R410A refrigerant | Calculated with 20% glycol. Free-Cooling versions always have a refrigerating configuration consisting of one compressor per circuit or a dual tandem arrangement on two circuits | Features referred to the standard set-up. If not available, these features are referred to the Low Noise or Super Low Noise set-ups | Also available with 60 Hz power supply

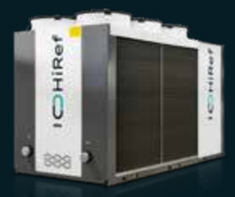
DATA CENTER | INDUSTRIAL | SERVICES

TSS

CLASS A CHILLERS AND HEAT PUMPS AIR CONDENSED WITH SCROLL COMPRESSORS

120.3-265.2 kW

MULTI-PROTOCOL COMMUNICATION INTERFACE
SCROLL COMPRESSORS
AXIAL FANS
CORROSION RESISTANT MATERIAL
A2L READY
LOW GWP REFRIGERANT
CLASS A
SHELL AND TUBE HEAT EXCHANGER



The new TSS range chillers and heat pumps are air/water units in energy class A for both cooling and heating, available for use with R410A refrigerant or, in the "A2L" version, with low environmental impact R454B refrigerant. The TSS range is designed **to manage the conditioning of industrial plants and thermal loads in technological applications, where 24/7 reliability in all working conditions, one of the assets of these units, is a critically important requirement**. The TSS range uses latest-generation Scroll compressors, shell and tube water heat exchangers optimised for use with **high pressure refrigerants** (R410A/R454B) and axial fans suitable for outdoor installation.

- 3 different soundproofing setups available: Standard, Low Noise and Super Low Noise
- Electric control panel with IP55 protection rating
- High power density units in both chiller and heat pump modes
- Radial EC motor fans (optional)
- Electrically controlled expansion valve
- Easy accessibility thanks to the optimisation of the internal space
- Programmable microprocessor control with proprietary software
- Compliance with ERP regulations

The **TSS** units can be supplied both with the standard R410A refrigerant, in class A1 (non-flammable), and with the new generation R454B refrigerant, in class A2L (mildly flammable) or in the A2L-ready configuration.

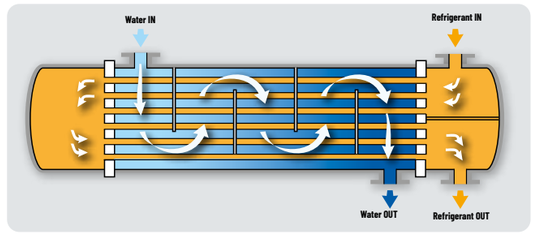
DETAILS AT **Page 5**

Acoustic comfort

Two different soundproofing systems are available: the most suitable one will depend on the importance of noise containment in the overall plant layout. Adopted technical solutions include fan speed control and compartmentalisation of compressors and pumping kits in a box internally lined with soundproofing material.

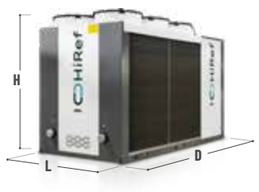
Maximised energy efficiency

The units of the TSS range belong to the **energy efficiency class A,** both in the chilling only version and in the heat pump version. This is thanks to a careful selection of internal components, which also includes the adoption of **innovative high efficiency Scroll compressors with direct start, permanent magnet motor technology.** The high modulation range guaranteed by the multi-Scroll technology allows cooling/heating requirements **to be met at any time, minimising energy waste and increasing seasonal efficiency.**



Reliability: shell and tube

The use of shell and tube heat exchangers with exchange water flow on the shell side implies **a lower risk of blocking the flow** due to exchanger clogging compared to units with plate heat exchangers. This is thanks to **the larger throughsections,** the exchanged power being the same. Additionally, the dual-pass heat exchanger **ensures high heat exchange efficiency** both in "chiller" and in "heat pump" modes, with lower consumption figures for the user.



TSS		114	124	144	164	194	214	244
VERSIONE CS - User water values 12/7°C, 35°C outside air, 40% U.R.								
Cooling capacity	kW	120.3	130.2	152.4	164.9	190.2	225.7	251.4
Total absorbed power	kW	34	36.2	43.6	47.5	56	71.1	80
EER		3.54	3.59	3.5	3.47	3.4	3.17	3.14
SEER		4.95	4.83	4.86	4.98	4.97	4.9	4.78
SEPR		5.66	5.7	5.7	5.82	5.86	5.7	5.74
VERSIONE HS - User water values 40/45°C, 7°C outside air, 89% U.R.								
Thermal power	kW	123.9	130.8	149.9	163.1	186.9	227.5	265.2
Total absorbed power	kW	34.1	36.2	42.5	46.8	53.4	65.1	75.4
COP		3.63	3.61	3.53	3.49	3.5	3.49	3.52
SCOP		3.95	3.85	3.86	3.93	4.05	4.18	4.24
Sound power	dB(A)	83	84	86	86	87	88	89
Sound power [Low noise]	dB(A)	80	81	83	83	84	85	86
Sound power [Super Low noise]	dB(A)	78	80	82	82	84	84	85
Dimensions [LxDxH]	mm	3540x1735x1183	3540x1846x1653			3540x2330x1653		4206x2330x1653

Also available with 60 Hz power supply | Data declared with use of R410A refrigerant

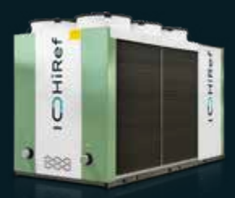
DATA CENTER | INDUSTRIAL | SERVICES

TAS

AIR CONDENSED CHILLERS AND HEAT PUMPS WITH SCROLL COMPRESSORS

60.3-260.5 kW

MULTI-PROTOCOL COMMUNICATION INTERFACE
SCROLL COMPRESSORS
AXIAL FANS
CORROSION RESISTANT MATERIAL
A2L READY
LOW GWP REFRIGERANT
PLATE HEAT EXCHANGER
CLASS A



TAS is the HiRef range of air-condensed liquid chillers and heat pumps with Scroll compressors. Three different versions (chiller, Free-Cooling chiller and reversible heat pump) and the several available power output rates make these units **highly versatile and suited to a wide range of system set-ups**. The sizing and selection of individual components have focused on containing energy consumption, aiming to optimise energy savings not just for individual chillers but for the entire system. The unit is suitable for being installed in environments where **noise abatement is fundamentally important, thanks to the possibility of choosing from as many as three soundproofing set-ups**.

The configurations available for the refrigeration circuit are:

EFFICIENCY PACK 1: Dual compressor dual circuit unit for higher redundancy systems.

EFFICIENCY PACK 2: Dual compressor (tandem) on single circuit for greater efficiency at partial loads.

EFFICIENCY PACK 4: Four compressors (dual tandem) on dual circuit, for a redundant system that is efficient with low loads.

- 3 different soundproofing setups available: Standard, Low Noise and Super Low Noise
- Radial EC motor fans (optional)
- Electrically controlled expansion valve
- Easy accessibility thanks to the optimisation of the internal space
- Programmable microprocessor control with proprietary software
- Available with variable flow pumping kit
- Maintenance kit available
- Compliance with ERP regulations

The **TAS** units can be supplied both with the standard R410A refrigerant, in class A1 (non-flammable), and with the new generation R454B refrigerant, in class A2L (mildly flammable) or in the A2L-ready configuration.

DETAILS AT **Page 5**

Plate heat exchangers

The TAS range uses brazewelded plate exchangers with asymmetrical channels, suitable for the use of high and medium pressure refrigerant gases. The configuration with asymmetrical channels allows **high exchange efficiencies** to be reached while maintaining pressure drops low on the water side - **reducing pumping costs** at both full and partial load.

Acoustic comfort

Three different soundproofing setups are available: the most suitable one will depend on the importance of noise containment in the overall plant layout. Adopted technical solutions include fan speed control, the use of anti-vibration devices on the refrigerating circuit, compartmentalisation of compressors and pumping kits in a box internally lined with soundproofing material.

All accessories on-board the machine

The special component layout, together with compact plate heat exchangers and Scroll compressors, allows users on the one hand to make **the most of large sized condensing sections** and on the other hand, to have sufficient Free-Cooling internal space available for fitting **a wide range of accessories and hydraulic options.** The hydraulic circuit may include a dual shut-off pump, flow switch, tank, expansion tank and safety valve.

Maximum efficiency at partial loads

The adoption of the multi-Scroll solution, the use of electronically controlled expansion valves, selection of plate heat exchangers, fan modulation and variable flow rate controlled with circulation pumps are all key features that make the **TAS range particularly efficient at partial loads.**

TAS		061FS	071FS	081FS	101FS	114FS	124FS	144FS	164FS	194FS	214FS	244FS
User water temperature 12/7°C 20% ethylene glycol, outside air 35°C, 40% R.H.												
Cooling capacity	kW	60.4	74.3	87.1	100.8	116.4	124.5	146.8	159.3	184.6	218.6	246.1
Total absorbed power	kW	17	21.5	25.9	30	34.1	36.6	44.3	48.3	56.7	72.1	81.3
EER		3.55	3.45	3.36	3.36	3.42	3.4	3.31	3.3	3.26	3.03	3.03
Total Free-Cooling temperature	°C	-1.5	-3.2	-5.3	-4.9	-6.5	-4.8	-6.5	-8.1	-5.8	-8.2	-6.5
Sound power	dB(A)	81	83	83	86	83	84	86	86	87	88	89
Sound power [Low noise]	dB(A)	78	80	80	83	80	81	83	83	84	85	86
Dimensions [LxDxH]	mm	2792x1735x1183			3540x1735x1183		3540x1846x1653			3540x2330x1653		4206 x2330 x1653

TAS		062CS	072CS	082CS	102CS	114CS	124CS	144CS	164CS	194CS	214CS	244CS
User water values 12/7°C, 35°C outside air, 40% U.R.												
Cooling capacity	kW	61.5	75.5	88.5	102.8	118.2	127	149.6	162.5	187.7	222.6	250.4
Total absorbed power	kW	16.9	21.4	25.6	29.6	33.8	35.9	43.3	47.2	55.9	71	80
EER		3.63	3.53	3.45	3.47	3.5	3.54	3.46	3.44	3.36	3.14	3.13
SEER		4.68	4.82	4.94	4.71	4.87	4.76	4.79	4.91	4.9	4.81	4.76
SEPR		5.33	5.49	5.73	5.45	5.59	5.61	5.65	5.76	5.77	5.61	5.69
Sound power	dB(A)	81	83	83	86	83	84	86	86	87	88	89
Sound power [Low noise]	dB(A)	78	80	80	83	80	81	83	83	84	85	86
Dimensions [LxDxH]	mm	2792x1735x1183			3540x1735x1183		3540x1846x1653			3540x2330x1653		4206 x2330 x1653

TAS		062HS	072HS	082HS	102HS	114HS	124HS	144HS	164HS	194HS	214HS	244HS
User water values 40/45°C, 7°C outside air, 89% U.R.												
Thermal power	kW	60.3	74.2	85.5	100.7	121.3	127.6	147	159.6	183.2	223.4	260.5
Total absorbed power	kW	18.8	22.7	26.6	31.3	36.4	39.6	45.2	49.8	57.2	69.8	81.5
COP		3.21	3.27	3.21	3.22	3.33	3.23	3.25	3.21	3.2	3.2	3.2
SCOP		3.45	3.83	3.81	3.74	3.7	3.59	3.61	3.67	3.77	3.9	3.93
Sound power	dB(A)	81	83	83	86	83	84	86	86	87	88	89
Sound power [Low noise]	dB(A)	78	80	80	83	80	81	83	83	84	85	86
Dimensions [LxDxH]	mm	2792x1735x1183			3340 x1735 x1183	3540 x1735 x1183	3540x1846x1653			3540x2330x1653		4206 x2330 x1653

Also available with 60 Hz power supply | Features referred to the standars set-up. If not available, these features are referred to the Low Noise or Super Low Noise set-ups | Data declared with use of R410A refrigerant

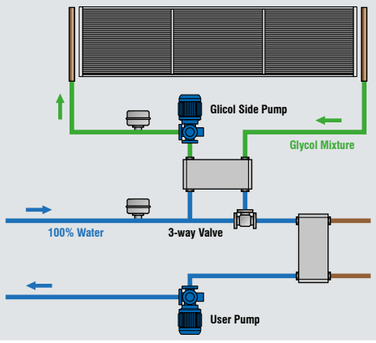
DATA CENTER | INDUSTRIAL | SERVICES

MHA

AIR CONDENSED CHILLERS AND HEAT PUMPS WITH SCROLL BLDC INVERTER COMPRESSORS

30.2-287.6 kW

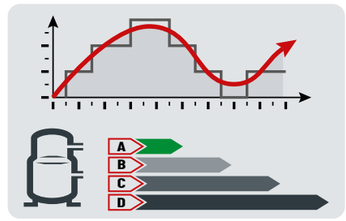
MHA is the HiRef range of air condensed liquid chillers and heat pumps that uses a combination of Scroll ON/OFF compressors and modulating BLDC (Brushless DC-inverter) compressors. **Thanks to timely control of the supplied refrigerating power, based on the achievement of maximum system delivery or energy efficiency, the running costs of the system are minimised**. The excellent configurability of the range in terms of refrigerating circuit, noise levels and available power ratings, together with the numerous accessories and options, make MHA chillers **highly versatile and suitable for a wide range of system applications**.



Glycol-Free kit

The Free-Cooling versions can be selected with the **"Glycol-Free" kit** (on board the unit) to confine the water-antifreeze mix inside the finned coils. This solution **maximises heat exchange efficiency** at the evaporator with the exclusive use of pure water; it also **dramatically reduces pumping costs.**

- Refrigerant R410A
- Available in version: Liquid chiller, Free-Cooling chiller and reversible heat pump
- Variable flow management up to 25% of the nominal flow rate
- Electronically controlled expansion valve supplied as standard
- Quick water connections
- Programmable microprocessor control with dedicated software
- Optional electronic flow switch



Dual management of the delivered power

The control software integrated on the MHA range allows management of the cooling capacity, delivered by the Scroll ON/OFF compressors combined with BLDC modulating compressors, according to a dual logic:

- **Maximum power:** the compressors are driven by the inverters at maximum frequency to quickly reach set-point conditions.
- **Maximum efficiency:** the software calculates the point of highest machine efficiency to minimise running costs. This function is particularly effective in the Free-Cooling versions.

Efficiency and reliability in line with system requirements

Users can select, according to unit size and specific plant engineering requirements, refrigerating circuits with different set-ups:
EFFICIENCY PACK 1: Dual compressor on dual circuit for high system redundancy.
EFFICIENCY PACK 2: Dual compressor (tandem) on single circuit for greater efficiency at partial loads.
EFFICIENCY PACK 3: Three compressors (trio) on single circuit for higher efficiency at partial loads.
EFFICIENCY PACK 4: Four compressors (dual tandem) on dual circuit, for a redundant system that is also efficient with low loads.

Attention to detail and to low noise requirements

Depending on how important noise containment is in the overall plant layout, a standard version or a **Low Noise version** can be chosen. Adopted technical solutions include fan speed control, the use of anti-vibration devices on the refrigerating circuit, compartmentalisation of compressors and pumping kits in a box internally lined with soundproofing material (**the new HI-BOX by HiRef**).

Maximum efficiency at partial loads

The high precision of the hot-wire flow switch (up to 1/10 of the nominal flow rate), combined with pump modulation via the control software, **allows an ideal combination of machine delivery and water flow rate in the primary circuit.** This **optimises the water flow** required at each operating point and **reduces the power absorbed by the hydraulic module,** preventing the risk of ice formation in the evaporator.

Advantages of modulation

DC-inverter compressors are frequency modulated: from an electrical viewpoint, **this significantly reduces inrush current.**

MHA		030	035	061	062	081	082	101	102	104	121	122	124	141	142	144	171	172	174	204	244	294
Utility water temperature 12/7°C, ethylene glycol 20%																						
Total Free-Cooling temperature	°C	1.6	-1.1	2.2	-	0.6	-	-0.3	-	-0.8	0.6	-	0.5	1.2	-	0.6	0.4	-	-0.4	-0.1	0.1	-1.2
User water values 12/7°C, 35°C outside air, 40% U.R.																						
Cooling capacity	kW	30.2	40.3	57.8	57.7	75.7	76.4	98.2	98.9	102.4	124.9	127.3	126.6	146.1	147.4	155.7	156.3	156.7	170.4	200.9	252.8	278.6
Total absorbed power	kW	11.3	14.9	18.9	18.8	24.4	24.4	34.2	34.1	37.5	44	43.2	43.4	48.6	48.4	52.3	52.3	52.2	58.7	72.7	86.9	99.4
EER		2.68	2.7	3.07	3.07	3.1	3.13	2.87	2.9	2.73	2.84	2.95	2.91	3.01	3.04	2.98	2.99	3	2.9	2.76	2.91	2.8
SEER		4.5	4.57	4.39	5.17	4.43	5.23	4.18	4.88	4.48	4.28	5.19	4.71	4.27	5.03	4.5	4.19	4.95	4.44	4.55	4.68	4.62
SEPR		5.08	5	6.14	6.08	6.31	6.39	5.62	5.58	5.31	5.7	5.79	5.61	5.9	5.97	5.27	5.75	5.86	5.3	5.35	5.69	5.69
ESEER		4.16	4.19	4.01	4.41	3.77	4.4	3.9	4.46	4.34	4.48	4.69	4.43	4.4	4.64	4.16	3.88	4.55	4.24	4.32	4.43	4.56
Weight	kg	418	424	600	600	789	789	789	789	789	1085	1085	1085	1390	1390	1390	1430	1430	1470	1620	1943	1985
User water values 40/45°C, 7°C outside air, 89% U.R.																						
Thermal power	kW	31.7	42.2	-	57.5	-	75.9	-	100.8	106.8	-	133.6	133.5	-	149.8	159	-	160.5	178.1	210.1	257	287.6
Total absorbed power	kW	11.7	15.7	-	19.9	-	26	-	35	38.1	-	45.1	45.7	-	51.8	55.5	-	55.6	61.4	74	89.4	100.4
COP		2.72	2.71	-	2.9	-	2.94	-	2.9	2.83	-	3	2.95	-	2.92	2.89	-	2.92	2.93	2.87	2.9	2.89
Total COP		2.7	2.69	-	2.88	-	2.92	-	2.88	2.8	-	2.96	2.92	-	2.89	2.86	-	2.89	2.9	2.84	2.88	2.86
SCOP		3.28	3.32	-	3.2	-	3.21	-	3.34	3.32	-	3.36	3.22	-	3.22	3.21	-	3.2	3.2	3.36	3.27	3.31
Weight	kg	423	430	-	600	-	789	-	789	789	-	1085	1085	-	1390	1390	-	1430	1495	1655	1980	2025
Sound power	dB(A)	87	92	87	87	88	88	90	90	90	94	94	88	94	94	90	94	94	90	94	94	94
Sound power [Low noise]	dB(A)	85	90	83	83	86	84	86	86	86	90	90	84	90	90	86	90	90	86	90	90	90
Dimensions [LxDxH]	mm	1661 x1468 x914		2440 x1735 x1185		2972x1735x1185					3540x1735x1185			3540x1847x1653						3540 x2247 x1653	4206 x2247 x1653	

Also available with 60 Hz power supply | Free-Cooling version not available for this Efficiency Pack

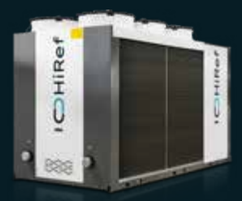
DATA CENTER | INDUSTRIAL | SERVICES

TPS

AIR CONDENSED CHILLERS AND HEAT PUMPS WITH SCROLL COMPRESSORS

43.2-444.7 kW

MULTI-PROTOCOL COMMUNICATION INTERFACE
SCROLL COMPRESSORS
AXIAL FANS
CORROSION RESISTANT MATERIAL
A2L READY
LOW GWP REFRIGERANT
PLATE HEAT EXCHANGER



TPS is the HiRef range of air-condensed liquid chillers and heat pumps with Scroll compressors. Three different versions (chiller, Free-Cooling chiller and reversible heat pump) and the several available power output rates make these units **highly versatile and suited to a wide range of system set-ups**. The sizing and selection of individual components have focused **on containing energy consumption, aiming to optimise energy savings not just for individual chillers but for the entire system**. The unit is suitable for being installed in environments where **noise abatement is fundamentally important**, thanks to the possibility of choosing from as many as **three soundproofing set-ups**.

The configurations available for the refrigeration circuit are:

EFFICIENCY PACK 1: Dual compressor dual circuit unit for higher redundancy systems.

EFFICIENCY PACK 2: Dual compressor (tandem) on single circuit for greater efficiency at partial loads.

EFFICIENCY PACK 4: Four compressors (dual tandem) on dual circuit, for a redundant system that is efficient with low loads.

- 3 different soundproofing setups available: Standard, Low Noise and Super Low Noise
- Electric control panel with IP55 protection rating
- Radial EC motor fans (optional)
- Electronic expansion valve
- Easy accessibility thanks to the optimisation of the internal space
- Programmable microprocessor control with proprietary software
- Available with variable flow pumping kit
- Maintenance kit available
- Compliance with ERP regulations

The **TPS** units can be supplied both with the standard R410A refrigerant, in class A1 (non-flammable), and with the new generation R454B refrigerant, in class A2L (mildly flammable) or in the A2L-ready configuration.

DETAILS AT **Page 5**

Acoustic comfort

Three different soundproofing set-ups are available: the most suitable one will depend on the importance of noise containment in the overall plant layout. Adopted technical solutions include fan speed control, the use of anti-vibration devices on the refrigerating circuit, compartmentalisation of compressors and pumping kits in a box internally lined with soundproofing material.

All accessories on-board the machine

The special component layout, together with compact plate heat exchangers and Scroll compressors, allows users on the one hand to make **the most of large sized condensing sections** and on the other hand, to have sufficient Free- Cooling internal space available for fitting **a wide range of accessories and hydraulic options.** The hydraulic circuit may include a dual shut-off pump, flow switch, tank, expansion tank and safety valve.

Maximum efficiency at partial loads

The adoption of the multi-Scroll solution, the use of electronically controlled expansion valves, selection of plate heat exchangers, fan modulation and variable flow rate controlled with circulation pumps are all key features that make **the TPS range particularly efficient at partial loads.**

TPS		042	052	062	072	082	092	102	122	124	142	144	162	164
Cold user In water temperature 12°C, ehylene glycol 20%														
Total Free-Cooling temperature	°C	-2.1	-3.2	-2.2	-3.4	-4.4	-2.9	-2.3	-	-4	-	-3.5	-	-6.7
Weight	kg	671	675	900	910	980	1105	1115	-	1475	-	1490	-	1640
User water values 12/7°C, 35°C outside air, 40% U.R.														
Cooling capacity	kW	43.2	54.4	63.1	70.9	78.5	94.4	105.6	122.4	125.3	133.7	141.4	160.5	156.2
Total absorbed power	kW	13.1	18.3	20.7	24.3	28.1	32.6	38.5	40.8	42.1	43.9	48.3	59.2	55.9
EER		3.31	2.98	3.05	2.91	2.79	2.9	2.74	3	2.98	3.04	2.93	2.71	2.79
SEER		4.98	4.9	4.63	4.58	4.52	4.35	4.39	4.54	4.53	4.71	4.61	4.34	4.54
SEPR		5.69	5.72	5.3	5.38	5.38	5.31	5.22	5.35	5.32	5.41	5.38	5.13	5.38
ESEER		4.48	4.42	4.15	4.15	4.27	4.11	4.13	4.29	4.25	4.44	4.33	4.12	4.28
Weight	kg	525	525	540	570	650	730	730	1010	1050	1055	1070	1085	1220
User water values 40/45°C, 7°C outside air, 89% U.R.														
Thermal power	kW	50.7	57.1	64.2	72.6	80.8	96	108.7	124	126.9	142.4	151.8	175.8	169.6
Total absorbed power	kW	16.8	19.1	22.3	25.1	28.3	33.8	38.6	42.8	44	46.9	51.2	58.7	56.8
COP		3.02	2.99	2.87	2.89	2.86	2.85	2.82	2.9	2.89	3.03	2.97	3	2.99
SCOP		3.99	3.99	3.66	3.73	3.71	3.58	3.66	3.68	3.54	3.69	3.58	3.68	3.68
Weight	kg	545	545	585	585	675	755	760	1050	1090	1100	1120	1155	1270
Sound power	dB(A)	73	74	75	75	79	82	83	-	82	86	83	87	85
Dimensions [LxDxH]	mm	2090x1740x1180					2640x1740x1180		3340 x1740 x1180	3540 x1740 x1180	3340 x1740 x1180	3540 x1740 x1180	3340 x1740 x1180	3540 x1740 x1180

TPS		174	192	194	212	214	242	244	272	274	294	324	364	394
Cold user In water temperature 12°C, ehylene glycol 20%														
Total Free-Cooling temperature	°C	-	-5	-5.5	-6.8	-7	-8	-8.2	-7	-7.1	-7.7	-8.3	-11	-10.5
Weight	kg	-	1720	1750	1740	1760	1870	1870	2285	2285	2317	2352	2402	3580
User water values 12/7°C, 35°C outside air, 40% U.R.														
Cooling capacity	kW	166.2	189.1	188.4	207.6	211.2	230.1	232	267.2	266	293.2	317.5	352	397.6
Total absorbed power	kW	54.2	65.4	65.4	73.9	77.5	82.8	85.2	90.3	89.5	104.9	120.5	136.9	153.8
EER		3.06	2.89	2.88	2.81	2.72	2.78	2.72	2.96	2.97	2.79	2.63	2.57	2.59
SEER		4.62	4.31	4.28	4.37	4.32	4.27	4.31	4.61	4.6	4.25	4.23	4.15	4.28
SEPR		5.43	5.18	5.32	5.13	5.19	5.32	5.4	5.42	5.51	5.29	5.1	5.21	5.22
ESEER		4.36	4.17	4.05	4.17	4.07	4.07	4.1	4.13	4.14	4.03	4.01	3.95	4.06
Weight	kg	1440	1430	1460	1430	1470	1620	1620	1943	1943	1975	2010	2060	3090
User water values 40/45°C, 7°C outside air, 89% U.R.														
Thermal power	kW	172.8	199.6	199.3	220.4	226.2	243.7	247.4	275.7	278	311	342.1	395.8	444.7
Total absorbed power	kW	59	68.9	69.5	75.4	79.1	82.8	85.5	91.4	93	105.7	118.5	132.7	147.5
COP		2.93	2.9	2.87	2.92	2.86	2.94	2.89	3.02	2.99	2.94	2.89	2.98	3.01
SCOP		3.32	3.49	3.41	3.55	3.49	3.66	3.62	3.66	3.54	3.5	3.54	3.62	3.56
Weight	kg	1495	1485	1515	1485	1530	1690	1690	2015	2015	2050	2101	2191	3190
Sound power	dB(A)	86	92	87	92	89	94	89	89	94	93	95	94	97
Dimensions [LxDxH]	mm	3540x1847x1653					3540x2247x1653		4200x2330x1653				4296 x2330 x1653	5350 x2330 x1653

Also available with 60 Hz power supply | Calculated with 20% glycol. The Free-Cooling versions always feature a refrigeration configuration consisting of one compressor per circuit or dual tandem on two circuits | Features referred to the standard set-up. If not available, they refer to the Low Noise or Quiet set-up | Data declared with use of R410A refrigerant

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TSL

CLASS A CHILLERS AND HEAT PUMPS AIR CONDENSED WITH SCROLL COMPRESSORS

276.9–1003.8 kW

MULTI-PROTOCOL COMMUNICATION INTERFACE

FAST RESTART

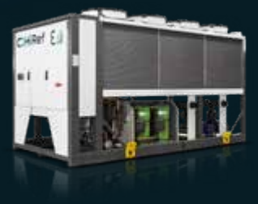
CORROSION RESISTANT MATERIAL

CLASS A

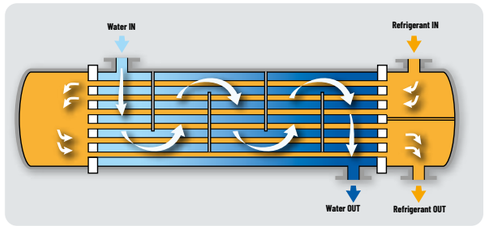
LOW GWP REFRIGERANT

SCROLL COMPRESSORS

SHELL AND TUBE HEAT EXCHANGER



The new TSL range chillers and heat pumps are air/water units in energy class A for both cooling and heating, available for use with R410A refrigerant or, in the "A2L" version, with low environmental impact R454B refrigerant. The TSL range is designed to manage the **conditioning of industrial plants and thermal loads in technological applications, where 24/7 reliability in all working conditions, one of the assets of these units, is a critically important requirement**. The TSL range uses latest generation Scroll compressors, shell and tube water heat exchangers optimised for use with high pressure refrigerants (R410A/R454B) and axial fans suitable for outdoor installation.



Reliability: shell and tube

The use of shell and tube heat exchangers with exchange water flow on the shell side implies **a lower risk of blocking the flow** due to exchanger clogging compared to units with plate heat exchangers. This is thanks to the **larger throughsections,** the exchanged power being the same. Additionally, the dual-pass heat exchanger **ensures high heat exchange efficiency** both in "chiller" and in "heat pump" modes, **with lower consumption figures for the user.**

- 3 different soundproofing setups available: Standard, Low Noise and Super Low Noise
- Electric control panel with IP55 protection rating
- High power density units in both chiller and heat pump modes
- Radial EC motor fans (optional)
- Electronic expansion valve
- Easy accessibility thanks to the optimisation of the internal space
- Programmable microprocessor control with proprietary software
- Compliance with ERP regulations

The **TSL** units can be supplied both with the standard R410A refrigerant, in class A1 (non-flammable), and with the new generation R454B refrigerant, in class A2L (mildly flammable) or in the A2L-ready configuration.

DETAILS AT **Page 5**

Easy maintenance

To carry out maintenance of the condensing coil manifolds and refrigeration circuit components, which are located behind the electrical panel, the TSL range is supplied as standard with the Hi-Rail sliding guide. This allows **the control panel to be easily removed,** resulting in **extra space for unscheduled maintenance,** without impacting the footprint required for normal operation of the unit.

Maximised energy efficiency

The units of the TSL range belong to the energy **efficiency class A,** both in the chilling only version and in the heat pump version. This is thanks to a careful selection of internal components, which also includes the adoption **of innovative high efficiency Scroll compressors with direct start, permanent magnet motor technology.** The high modulation range guaranteed by the multi-Scroll technology allows cooling/heating requirements to be met at any time, **minimising energy waste and increasing seasonal efficiency.**

TSL		294FS	324FS	374FS	404FS	454FS	496FS	556FS	596FS	636FS	676FS	748FS	808FS	868FS	900FS
User water temperature 12/7°C 20% ethylene glycol, outside air 35°C, 40% R.H.															
Cooling capacity	kW	276.9	319.4	354.2	383.2	422.9	478.9	545.6	585.7	608.1	648.6	725.3	791.8	848.6	910.9
Total absorbed power	kW	89.7	105.8	118.3	129.2	150.4	155.8	179.4	195.8	205.4	221.1	235.4	258.1	270.8	299.7
EER		3.09	3.02	2.99	2.97	2.81	3.07	3.04	2.99	2.96	2.93	3.08	3.07	3.13	3.04
Sound power	dB(A)	89	90	90	90	92	91	92	91	93	93	93	93	94	94
Sound power [Low noise]	dB(A)	86	87	87	87	89	87	89	88	90	90	90	90	91	91
Dimensions [LxDxH]	mm	3865x2652x2256		4865x2652x2256			5860x2652x2256			6860x2652x2256		7865x2652x2256		8865x2652x2256	

TSL		294FS	324FS	374FS	404FS	454FS	496FS	556FS	596FS	636FS	676FS	748FS	808FS	868FS	900FS
Utility water temperature 12/7°C, ethylene glycol 20%															
Total Free-Cooling temperature	°C	-8.7	-10.4	-6.4	-7.3	-8.6	-6.2	-8.1	-9.2	-6.7	-7.7	-6.8	-8.1	-7.1	-8
Sound power	dB(A)	89	90	90	90	92	91	92	91	93	93	93	93	94	94
Sound power [Low noise]	dB(A)	86	87	87	87	89	87	89	88	90	90	90	90	91	91
Dimensions [LxDxH]	mm	3865x2652x2256		4865x2652x2256			5860x2652x2256			6860x2652x2256		7865x2652x2256		8865x2652x2256	

TSL		294CS	324CS	374CS	404CS	454CS	496CS	556CS	596CS	636CS	676CS	748CS	808CS	868CS	900CS
User water values 12/7°C, 35°C outside air, 40% U.R.															
Cooling capacity	kW	281.5	326.1	364.2	396.6	436.1	485.9	549.9	598.9	617.1	658.3	734.3	794.1	861.2	923.2
Total absorbed power	kW	88.7	104.2	117	127.6	148.6	153.7	176.9	193	202.7	218	232.5	254.7	267.6	295.7
EER		3.18	3.13	3.11	3.11	2.93	3.16	3.11	3.1	3.04	3.02	3.16	3.12	3.22	3.12
SEER		4.9	4.99	4.82	4.87	5.03	5.02	5.09	5.18	5.06	5.14	4.77	4.81	4.88	4.84
SEPR		5.46	5.62	5.38	5.49	5.74	5.56	5.64	5.79	5.67	5.75	5.53	5.58	5.65	5.71
ESEER		4.63	4.76	4.56	4.6	4.75	4.66	4.78	4.85	4.72	4.82	4.63	4.58	4.72	4.45
Sound power	dB(A)	89	90	90	90	92	91	92	91	93	93	93	93	94	94
Sound power [Low noise]	dB(A)	86	87	87	87	89	87	89	88	90	90	90	90	91	91
Dimensions [LxDxH]	mm	3520x2652x2256		4520x2652x2256			5520x2652x2256			6520x2652x2256		7520x2652x2256		8520x2652x2256	

TSL		294HS	324HS	374HS	404HS	454HS	496HS	556HS	596HS	636HS	676HS	748HS	808HS	868HS	900HS
User water values 40/45°C, 7°C outside air, 89% U.R.															
Thermal power	kW	291.9	337	390.9	412.9	448.8	504.5	566	603.9	656.7	683.9	776.9	841	883.1	1003.8
Total absorbed power	kW	89.1	102.3	119.2	126	143.4	153.6	173.3	184.1	200.6	213.5	231.3	250.5	267.9	295.1
SEER		-	-	-	-	-	-	-	5.19	5.1	5.2	4.63	4.69	4.73	4.63
COP		3.27	3.29	3.28	3.28	3.13	3.28	3.27	3.28	3.27	3.2	3.36	3.36	3.3	3.4
SCOP		4.01	4.17	4.1	4.1	4.24	3.82	3.99	-	-	-	-	-	-	-
Sound power	dB(A)	89	90	90	90	92	91	92	91	93	93	93	93	94	95
Sound power [Low noise]	dB(A)	86	87	87	87	89	87	88	87	89	89	90	89	90	91
Dimensions [LxDxH]	mm	3520x2652x2256		4520x2652x2256			5520x2652x2256			6520x2652x2256		9085x2652x2256			11085 x2652 x2256

20% Ethylene glycol | Also available with 60 Hz power supply | Data declared with use of R410A refrigerant

DATA CENTER | INDUSTRIAL | SERVICES

TAL

CLASS A CHILLERS AND HEAT PUMPS AIR CONDENSED WITH SCROLL COMPRESSORS

283.2–1165.9 kW

- MULTI-PROTOCOL COMMUNICATION INTERFACE
- SCROLL COMPRESSORS
- AXIAL FANS
- CORROSION RESISTANT MATERIAL
- A2L READY
- LOW GWP REFRIGERANT
- PLATE HEAT EXCHANGER
- CLASS A

The new TAL range chillers and heat pumps are air/water units in energy class A for both cooling and heating, available for use with R410A refrigerant or, in the "A2L" version, with low environmental impact R454B refrigerant. The TAL range is designed to manage the **conditioning of industrial plants and thermal loads in technological applications, where 24/7 reliability in all working conditions, one of the assets of these units, is a critically important requirement**. The TAL range uses latest generation Scroll compressors, braze-welded plate exchangers optimised for use with high pressure refrigerants (R410A/R454B) and axial fans suitable for outdoor installation.

- 3 different soundproofing setups available: Standard, Low Noise and Super Low Noise
- Electric control panel with IP55 protection rating
- High power density units in both chiller and heat pump modes
- Radial EC motor fans (optional)
- Electronic expansion valve
- Easy accessibility thanks to the optimisation of the internal space
- Programmable microprocessor control with proprietary software
- Compliance with ERP regulations

The **TAL** units can be supplied both with the standard R410A refrigerant, in class A1 (non-flammable), and with the new generation R454B refrigerant, in class A2L (mildly flammable) or in the A2L-ready configuration.

DETAILS AT **Page 5**

Easy maintenance

To carry out maintenance of the condensing coil manifolds and refrigeration circuit components, which are located behind the electrical panel, the TAL range is supplied as standard with the Hi-Rail sliding guide. This allows **the control panel to be easily removed,** resulting in extra space for unscheduled maintenance, **without impacting the footprint required for normal operation of the unit.**

Plate heat exchangers

The TAL range uses braze-welded plate exchangers with asymmetrical channels, suitable for the use of high and medium pressure refrigerant gases. The configuration with asymmetrical channels **allows high exchange efficiencies to be reachedwhile maintaining pressure drops low** on the water side - **reducing pumping costs** at both full and partial load.

Maximised energy efficiency

The units of the TAL range fall within the **energy efficiency class A,** in both the chilling only version and the heat pump version. This is thanks to a careful selection of internal components, which also includes the adoption of **innovative high efficiency Scroll compressors with direct start, permanent magnet motor technology.** The high modulation range guaranteed by the multi-Scroll technology allows cooling/heating requirements to be met at any time, **minimising energy waste and increasing seasonal efficiency.**

TAL		294FS	324FS	374FS	404FS	454FS	496FS	556FS	596FS	636FS	676FS	748FS	808FS	868FS	900FS	1072FS
User water temperature 12/7°C 20% ethylene glycol, outside air 35°C, 40% R.H.																
Cooling capacity	kW	283.2	316.9	366.2	392.9	433.7	476.3	532.1	580.3	621.3	642.9	738.9	781.8	831.4	900.4	1064.6
Total absorbed power	kW	87.3	102.9	115.1	126	147.4	152.7	176.6	193.6	201.1	216.6	229.7	251.8	264.5	293.2	352.7
EER		3.24	3.08	3.18	3.12	2.94	3.12	3.01	3	3.09	2.97	3.22	3.11	3.14	3.07	3.02
Sound power	dB(A)	89	90	90	90	92	91	92	91	93	93	93	93	94	94	95
Sound power [Low noise]	dB(A)	86	87	87	87	89	87	89	88	90	90	90	90	91	91	92
Dimensions [LxDxH]	mm	3865x2652x2256		4865x2652x2256			5860x2652x2256			6860x2652x2256		7865x2652x2256		8865x2652x2256		11270 x2652 x2256

TAL		294FS	324FS	374FS	404FS	454FS	496FS	556FS	596FS	636FS	676FS	748FS	808FS	868FS	900FS	1072FS
Utility water temperature 12/7°C, ethylene glycol 20%																
Total Free-Cooling temperature	°C	-8.9	-8.4	-4.6	-5.4	-7	-4.4	-6.1	-7.6	-5.3	-5.8	-5.3	-6.2	-4.6	-6.1	-6.1
Sound power	dB(A)	89	90	90	90	92	91	92	91	93	93	93	93	94	94	95
Sound power [Low noise]	dB(A)	86	87	87	87	89	87	89	88	90	90	90	90	91	91	92
Dimensions [LxDxH]	mm	3865x2652x2256		4865x2652x2256			5860x2652x2256			6860x2652x2256		7865x2652x2256		8865x2652x2256		11270 x2652 x2256

TAL		294CS	324CS	374CS	404CS	454CS	496CS	556CS	596CS	636CS	676CS	748CS	808CS	868CS	900CS	1072CS
User water values 12/7°C, 35°C outside air, 40% U.R.																
Cooling capacity	kW	286.1	319.8	370.1	397.8	450	482.7	539.7	588.7	629.9	662.1	746.6	791.3	841.2	911.8	1079.7
Total absorbed power	kW	86.2	101.9	114	124.4	145.3	150.3	173.7	190.5	198	213.2	226.8	248.1	261.1	289.2	347.2
EER		3.32	3.14	3.25	3.2	3.1	3.21	3.11	3.09	3.18	3.1	3.29	3.19	3.22	3.15	3.11
SEER		5.18	4.96	5.08	5.05	4.96	5.25	5.22	5.32	5.3	5.18	5.08	5.01	4.97	4.98	5.12
SEPR		5.67	5.65	5.61	5.62	5.6	5.68	5.69	5.78	5.7	5.61	5.75	5.7	5.62	5.76	5.72
Sound power	dB(A)	89	90	90	90	92	91	92	91	93	93	93	93	94	94	95
Sound power [Low noise]	dB(A)	86	87	87	87	89	87	89	88	90	90	90	90	91	91	92
Dimensions [LxDxH]	mm	3520x2652x2256		4520x2652x2256			5520x2652x2256			6520x2652x2256		7520x2652x2256		8520x2652x2256		11085 x2652 x2256

TAL		294HS	324HS	374HS	404HS	454HS	496HS	556HS	596HS	636HS	676HS	748HS	808HS	868HS	900HS	1072HS
User water values 40/45°C, 7°C outside air, 89% U.R.																
Thermal power	kW	292.2	334.3	395.6	421.7	474.9	513.9	573.4	625.2	674.4	706.6	769.6	829.5	884.4	960.3	1165.9
Total absorbed power	kW	90.6	104.1	119.6	128.2	146.5	159.8	178.5	194.5	209.5	219.5	236.4	256.3	274.5	298.2	362.4
SEER		-	-	-	-	-	-	-	5.31	5.19	5.25	4.99	4.94	4.84	4.98	5.16
COP		3.22	3.21	3.31	3.29	3.24	3.22	3.21	3.21	3.22	3.22	3.26	3.24	3.22	3.22	3.22
SCOP		4.16	4.27	4.12	4.13	4.21	3.98	4.11	-	-	-	-	-	-	-	-
Sound power	dB(A)	89	90	90	90	92	91	92	91	93	93	93	93	94	95	96
Sound power [Low noise]	dB(A)	86	87	87	87	89	87	88	87	89	89	90	89	90	91	92
Dimensions [LxDxH]	mm	3520x2652x2256		4520x2652x2256			5520x2652x2256			6520x2652x2256		9085x2652x2256			11085 x2652 x2256	12930 x2652 x2256

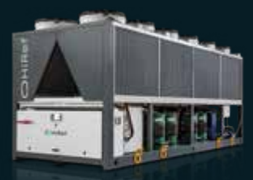
20% Ethylene glycol | Also available with 60 Hz power supply | Data declared with use of R410A refrigerant

DATA CENTER | INDUSTRIAL | SERVICES

TPL

AIR CONDENSED CHILLERS AND HEAT PUMPS WITH SCROLL COMPRESSORS

365.3–1199.3 kW



- MULTI-PROTOCOL COMMUNICATION INTERFACE
- SCROLL COMPRESSORS
- AXIAL FANS
- CORROSION RESISTANT MATERIAL
- A2L READY
- LOW GWP REFRIGERANT
- PLATE HEAT EXCHANGER

The new TPL range chillers and heat pumps are high power density air/water units available for use with R410A refrigerant or, in the "A2L" version, with low environmental impact R454B refrigerant. The TPL range is designed to manage **the conditioning of industrial plants and thermal loads in technological applications, where 24/7 reliability in all working conditions, one of the assets of these units, is a critically important requirement**. The TPL range uses latest generation Scroll compressors, braze-welded plate exchangers optimised for use with high pressure refrigerants (R410A/R454B) and axial fans suitable for outdoor installation.

- 3 different soundproofing setups available: Standard, Low Noise and Super Low Noise
- Electric control panel with IP55 protection rating
- High power density units in both chiller and heat pump modes
- Radial EC motor fans (optional)
- Electronic expansion valve
- Easy accessibility thanks to the optimisation of the internal space
- Programmable microprocessor control with proprietary software
- Compliance with ERP regulations

The **TPL** units can be supplied both with the standard R410A refrigerant, in class A1 (non-flammable), and with the new generation R454B refrigerant, in class A2L (mildly flammable) or in the A2L-ready configuration.

DETAILS AT **Page 5**

Plate heat exchangers

The TPL range uses braze-welded plate exchangers with asymmetrical channels, suitable for the use of high and medium pressure refrigerant gases. The configuration with asymmetrical channels allows **high exchange efficiencies to be reached while maintaining pressure drops low** on the water side - **reducing pumping costs** at both full and partial load.

Maximum efficiency at partial loads

The adoption of the multi-Scroll solution, the use of electronically controlled expansion valves, selection of plate heat exchangers, fan modulation and variable flow rate controlled with circulation pumps are all key features that make the **TPL range particularly efficient at partial loads.**

TPL		374F	414F	456F	486F	536F	616F	658F	748F	818F	900F	942F	1072F
User water temperature 12/7°C 20% ethylene glycol, outside air 35°C, 40% R.H.													
Cooling capacity	kW	365.3	421	451.4	507.5	556.6	613.7	683.1	752.4	824.9	940.1	1042.4	1097.7
Total absorbed power	kW	132.7	146.5	163.1	190.6	193.4	224.7	253.7	264.7	309.1	327.1	371.3	404.3
COP		2.75	2.87	2.77	2.66	2.88	2.73	2.69	2.84	2.67	2.87	2.81	2.72
Sound power	dB(A)	90	92	91	92	91	93	93	93	95	93	95	94
Sound power [Low noise]	dB(A)	87	89	89	90	89	91	91	90	92	91	93	92
Dimensions [LxDxH]	mm	3415 x2652 x2256	4415x2652x2256			5415 x2652 x2256	5415x2650x2256		6415x2650x2256		7415x2650x2256		8415 x2650 x2256

TPL		374F	414F	456F	486F	536F	616F	658F	748F	818F	900F	942F	1072F
Utility water temperature 12/7°C, ethylene glycol 20%													
Total Free-Cooling temperature	°C	-10.3	-6.6	-7.8	-9.8	-6.8	-8.3	-10.3	-8.5	-10.1	-9.4	-11.3	-9.4
Sound power	dB(A)	90	92	91	92	91	93	93	93	95	93	95	94
Sound power [Low noise]	dB(A)	87	89	89	90	89	91	91	90	92	91	93	92
Dimensions [LxDxH]	mm	3415 x2652 x2256	4415x2652x2256			5415 x2652 x2256	5415x2650x2256		6415x2650x2256		7415x2650x2256		8415 x2650 x2256

TPL		374C	414C	456C	486C	536C	616C	658C	748C	818C	900C	942C	1072C
User water values 12/7°C, 35°C outside air, 40% U.R.													
Cooling capacity	kW	369.7	426	457.6	515.3	565.2	622	694.9	764.2	837.9	957.7	1062	1112.9
Total absorbed power	kW	131.2	144.9	161.1	187.9	190.2	221.1	249.8	261	305	320.9	364.8	398.5
EER		2.82	2.94	2.84	2.74	2.97	2.81	2.78	2.93	2.75	2.98	2.91	2.79
SEER		4.81	4.87	4.95	4.96	5.14	5.02	4.71	4.85	4.71	4.96	5.09	5.05
SEPR		5.66	5.69	5.75	5.67	5.87	5.7	5.71	5.9	5.73	6.01	5.95	6
Sound power	dB(A)	90	92	91	92	91	93	93	93	95	93	95	94
Sound power [Low noise]	dB(A)	87	89	89	90	89	91	91	90	92	91	93	92
Dimensions [LxDxH]	mm	3065 x2652 x2256	4065x2652x2256			5065 x2652 x2256	5065 x2650 x2256	5060 x2650 x2256	6060x2650x2256		7060x2650x2256		8060 x2650 x2256

TPL		374H	414H	456H	486H	536H	616H	658H	748H	818H	900H	942H	1072H
User water values 40/45°C, 7°C outside air, 89% U.R.													
Thermal power	kW	391.8	476.4	511.6	578.4	601	679.4	734.6	769.2	855.8	997.6	1114.5	1199.3
Total absorbed power	kW	130.8	150.6	161.7	181.8	199.6	226.1	236	254.3	286.2	322.5	358.4	394.1
SEER		-	-	-	-	5.14	5.02	4.71	4.81	4.67	4.71	4.85	5.13
COP		3	3.16	3.16	3.18	3.01	3	3.11	3.02	2.99	3.09	3.11	3.04
SCOP		4.03	4.06	3.98	4.05	-	-	-	-	-	-	-	-
Sound power	dB(A)	90	92	91	92	91	93	93	93	95	94	95	94
Sound power [Low noise]	dB(A)	87	89	89	90	89	91	91	90	92	91	93	92
Dimensions [LxDxH]	mm	3065 x2652 x2256	4065x2652x2256			5065 x2652 x2256	5065 x2650 x2256	5060 x2650 x2256	6635x2650x2256		8635x2650x2256		10635 x2650 x2256

20% Ethylene glycol | Also available with 60 Hz power supply | Data declared with use of R410A refrigerant

HiRef

AIR/WATER

Multipurpose

INDUSTRIAL SERVICES

HPS / MPS

REVERSIBLE AND MULTI-PURPOSE AIR CONDENSED HEAT PUMPS FOR LOW OUTDOOR TEMPERATURES

36.3-202.2 kW

MULTI-PROTOCOL COMMUNICATION INTERFACE

EVI SCROLL COMPRESSORS

AXIAL FANS

CORROSION RESISTANT MATERIAL

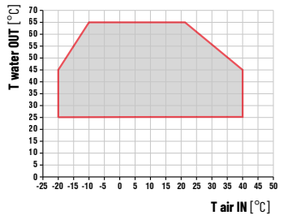
PLATE HEAT EXCHANGER

HPS/MPS is the HiRef range of air-to-water multipurpose reversible heat pumps designed for operation in very cold climates. **The use of compressors with EVI steam injection technology allows the production of hot water up to 65 °C and operation with outdoor temperatures down to -20 °C**. This is combined with special **focus on Low Noise** (the "Low-Noise" silenced version is supplied as standard) and the use of different refrigeration circuit architectures to meet the needs of many different system applications.

- Refrigerant R410A
- EVI compressors with steam injection
- Electronically controlled expansion valve
- "Cold" start Smart Kit
- Hydrophilic coated coils with wider fin pitch
- Defrost ice disposal chutes with heating elements
- Optional EC electronic switching fans
- Available in multipurpose version for 2 and 4 pipe systems

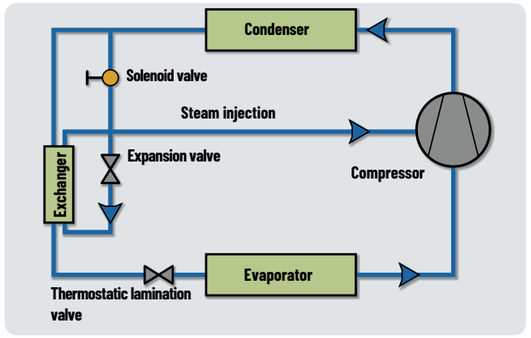
Efficiency and reliability in line with system requirements

The available refrigerating circuit configurations have been designed to ensure, also simultaneously, **redundancy and efficiency at partial loads.** More specifically, the units - depending on the size of the machine and on specific plant engineering requirements - consist of two compressors on two circuits **for high system redundancy** or four compressors (double tandem) on two circuits **for a system that is simultaneously redundant and efficient at partial loads.**



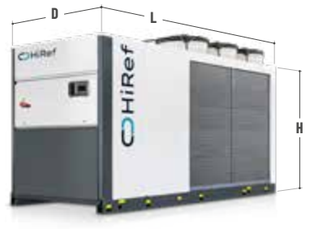
Production of hot water up to 65 °C

The units of the HPS/MPS range are capable of **producing water at 65°C**, as well as operating with outdoor air temperatures down **to -20°C.**



Units optimised for climates with T down to -20°C

The Scroll compressors of the HPS/MPS range use **steam injection technology:** a light flow of refrigerant in a medium-pressure vapour state is "injected" into the coils in the compression chamber. This system allows for both **an increase in the cooling** (and therefore, also the heating) **capacity and efficiency and, above all, an extension of the operating range of the heat pump;** this makes of the HPS/MPS range the ideal solution in case of extremely low outdoor temperatures.



Extra low noise

All units in the HPS/MPS range are, as standard, **"Low Noise"**, which means fan speed is controlled, anti-vibration piping is used on the refrigeration circuit, and the compressors and pumping kit are compartmentalised in a box lined with soundproofing material. **All this ensures minimum noise emissions throughout the system.**

Smart Defrost System

A factor that heavily weighs on the costs of managing the entire plant is finned pack evaporator defrosting during wintertime operation. The (patented) Smart Defrost System by HiRef is able to identify a decline in the exchanger performance caused by the formation of ice and to **minimise the duration of the defrosting process.** The use of coils treated with hydrophilic surface coating **speeds up the defrosting process** so that melting of just the first, thin ice layer on the fins is only required for cleaning.

HPS		041HL	051HL	071HL	081HL	101HL	134HL	164HL	204HL
User water values 12/7°C, 35°C outside air, 40% U.R.									
Cooling capacity	kW	36.3	45.5	61.8	68.9	79.2	121.5	136.9	175.2
Total absorbed power	kW	12	15	19.7	23.3	25.4	40.2	48.9	62.5
EER		3.03	3.03	3.14	2.96	3.12	3.02	2.8	2.8
User water values 40/45°C, 7°C outside air, 89% U.R.									
Thermal power	kW	43.6	53.9	72.5	81.6	92.2	140.3	158	202.2
Total absorbed power	kW	13	15.7	21.2	24.4	26.8	41.1	48.6	61.5
COP		3.34	3.42	3.41	3.35	3.44	3.41	3.25	3.29
SCOP		2.83	2.96	2.91	2.9	2.91	3.2	2.85	3.05
Sound power	dB(A)	79	78	80	81	81	80	82	82
Dimensions [LxDxH]	mm	2440x1735x1183		2792x1735x1183		3540x1679x1183	3538x1884x1653		3538x2284x1653

Also available with 60 Hz power supply

MPS		041PL	051PL	071PL	081PL	101PL	134PL	164PL	204PL
User water values 12/7°C, 35°C outside air, 40% U.R.									
Cooling capacity	kW	39.5	49.1	66.7	73.9	86	131	148.8	188.1
Total absorbed power	kW	12	15.1	19.6	23.4	25.5	40.1	49	62.5
EER		3.29	3.24	3.41	3.16	3.37	3.27	3.03	3.01
Utility water temperature 12/7°C, Recovery water temperature 40/45°C									
Cooling capacity	kW	38.5	47.8	64.9	72	83.7	127.3	144.4	182.2
Thermal power	kW	51.135	63.6	85.8	96.89	110.4	170.3	196.46	248.3
Total absorbed power	kW	13.3	16.7	22	26.2	28.2	45.3	54.8	69.6
Total COP		6.74	6.67	6.85	6.45	6.89	6.57	6.22	6.19
User water values 40/45°C, 7°C outside air, 89% U.R.									
Thermal power	kW	43.6	53.9	72.5	81.6	92.2	140.3	158	202.2
Total absorbed power	kW	13	15.7	21.2	24.4	26.8	41.1	48.6	61.5
COP		3.34	3.42	3.41	3.35	3.44	3.41	3.25	3.29
SCOP		2.83	2.96	2.91	2.9	2.91	3.2	2.85	3.05
Sound power	dB(A)	79	78	80	81	81	80	82	82
Dimensions [LxDxH]	mm	2440x1735x1183		2792x1735x1183		3540x1679x1183	3538x1884x1653		3538x2284x1653

Also available with 60 Hz power supply

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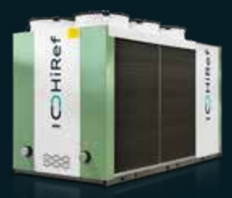
MPA

MULTIPURPOSE CLASS A AIR CONDENSED HEAT PUMPS WITH SCROLL COMPRESSORS

59.1-324.7 kW



MULTI-PROTOCOL COMMUNICATION INTERFACE

AXIAL FANS

CORROSION RESISTANT MATERIAL

A2L READY

LOW GWP REFRIGERANT

SCROLL COMPRESSORS

CLASS A

FAST RESTART

PLATE HEAT EXCHANGER

The new MPA class A multipurpose units are air/water units in energy class A for both cooling and heating, available for use with R410A refrigerant or, in the "A2L" version, with low environmental impact R454B refrigerant. The MPA range is designed to manage **the conditioning of industrial plants and thermal loads in technological applications, where 24/7 reliability in all working conditions, one of the assets of these units, is a critically important requirement**. The MPA range uses latest generation Scroll compressors, braze-welded plate exchanger optimised for use with high pressure refrigerants (R410A/R454B) and axial fans suitable for outdoor installation.

- 3 different soundproofing setups available: Standard, Low Noise and Super Low Noise
- Available versions: multi-purpose for 2-pipe system (M) and multi-purpose for 4-pipe system (P)
- High power density units in both chiller and heat pump modes
- Radial EC motor fans (optional)
- Electronic expansion valve
- Easy accessibility thanks to the optimisation of the internal space
- Programmable microprocessor control with proprietary software
- Compliance with ERP regulations

The **MPA** units can be supplied both with the standard R410A refrigerant, in class A1 (non-flammable), and with the new generation R454B refrigerant, in class A2L (mildly flammable) or in the A2L-ready configuration.

DETAILS AT **Page 5**

Plate heat exchangers

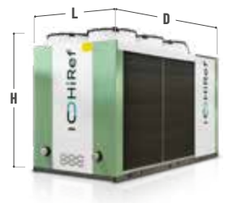
The MPA range uses braze-welded plate exchangers with asymmetrical channels, suitable for the use of high and medium pressure refrigerant gases. The configuration with asymmetrical channels allows **high heat exchange efficiencies to be reached while maintaining low pressure drops** on the water side - which results **in reduced pumping costs** at both full and partial load.

Maximised energy efficiency

The units of the MPA range fall within the **energy efficiency class A,** both in cooling and in heating mode. This is thanks to **a careful selection of internal components**, which also includes the adoption of **innovative high efficiency Scroll compressors with direct start, permanent magnet motor technology.** The high modulation range guaranteed by the multi-Scroll technology allows cooling/heating requirements to be met at any time, **minimising energy waste and increasing seasonal efficiency.** The high degree of partial load operation (**up to 11%** of the rated power), combined with water flow rate modulation (**up to 20%** of the nominal flow) allows **operating costs and system maintenance costs to be reduced.**

Smart defrosting

A factor that heavily weighs on the costs of managing the entire plant is finned coil defrosting during wintertime operation. The special management of the defrosting cycle of MPAunits **minimises the time to completion and ensures that defrosting is only performed when strictly necessary,guaranteeing greater heating efficiency.** The presence of two completely independent thermodynamic circuits ensures **uninterrupted operation** also during the defrosting phase, **with practically no thermal discomfort for the user.**



MPA		061PS	071PS	081PS	101PS	114PS	124PS	144PS	164PS	194PS	214PS	244PS
User water values 12/7°C, 35°C outside air, 40% U.R.												
Cooling capacity	kW	61.2	75.3	88.3	102.4	118.2	127	149.6	162.5	187.7	222.6	250.4
Total absorbed power	kW	16.9	21.4	25.6	29.7	33.8	35.9	43.3	47.2	55.9	71	80
EER		3.62	3.53	3.44	3.45	3.5	3.54	3.46	3.44	3.36	3.14	3.13
SEER		4.7	4.55	4.52	4.66	5.14	5.06	5.05	5.15	5.15	5	4.96
SEPR		5.99	5.93	5.99	5.83	6.03	6.07	6.01	6.1	6.18	5.92	6.09
ESEER		4.5	4.37	4.34	4.47	4.88	4.79	4.78	4.86	4.88	4.72	4.67
Utility water temperature 12/7°C, Recovery water temperature 40/45°C												
Cooling capacity	kW	59.1	74.5	89.2	101.2	116.9	124.2	150	162.5	191	227.2	258
Thermal power	kW	73.9	93	111	126.9	146.5	155.2	186.8	203.1	238.5	286.3	324.7
Total absorbed power	kW	15.6	19.5	23.1	27.2	31.5	32.8	39	43	50.6	62.9	71.1
Total COP		8.54	8.58	8.68	8.38	8.37	8.51	8.64	8.5	8.49	8.16	8.2
User water values 40/45°C, 7°C outside air, 89% U.R.												
Thermal power	kW	61.5	75.5	87.2	102.5	123.9	130.4	149.9	163	186.9	227.6	265.1
Total absorbed power	kW	17.5	21.1	24.8	29.2	33.8	36.7	42.1	46.3	53.2	64.8	75.3
COP		3.51	3.57	3.51	3.51	3.67	3.55	3.56	3.52	3.51	3.51	3.52
SCOP		4	4.27	4.19	4.33	4.26	4.16	4.19	4.22	4.37	4.41	4.51
Sound power	dB(A)	81	83	83	86	83	84	86	86	87	88	89
Sound power [Low noise]	dB(A)	76	78	78	81	78	80	82	82	84	84	85
Dimensions [LxDxH]	mm	2792x1735x1183			3540x1735x1183		3540x1846x1653			3540x2330x1653		4206 x2330 x1653

Also available with 60 Hz power supply | Cold user In water temperature 12°C | Cold user Out water temperature 7°C | Hot user In water temperature 40°C | Hot user Out water temperature 45°C

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MSL

MULTI-PURPOSE CLASS A HEAT PUMPS AIR CONDENSED WITH SCROLL COMPRESSORS

279.4-1425.3 kW

MULTI-PROTOCOL COMMUNICATION INTERFACE

AXIAL FANS

CORROSION RESISTANT MATERIAL

A2L READY

LOW GWP REFRIGERANT

SHELL AND TUBE HEAT EXCHANGER

SCROLL COMPRESSORS

CLASS A

FAST RESTART

The new MSL range multipurpose units are air/water units in energy class A for both cooling and heating, available for use with R410A refrigerant or, in the "A2L" version, with low environmental impact R454B refrigerant. The MSL range is designed to manage **the conditioning of industrial plants and thermal loads in technological applications, where 24/7 reliability in all working conditions, one of the assets of these units, is a critically important requirement**. The MSL range uses latest generation Scroll compressors, shell and tube water heat exchangers optimised for use with **high pressure refrigerants (R410A/R454B)** and axial fans suitable for outdoor installation.

- 3 different soundproofing setups available: Standard, Low Noise and Super Low Noise
- Electric control panel with IP55 protection rating
- High power density units in both chiller and heat pump modes
- Radial EC motor fans (optional)
- Electronic expansion valve
- Easy accessibility thanks to the optimisation of the internal space
- Programmable microprocessor control with proprietary software
- Compliance with ERP regulations

Configurability of hydraulic connections

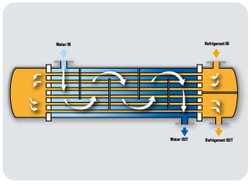
To facilitate installation, especially when replacing existing units, the MSL range is available **with different configurations of hydraulic connections.**
They can be both on the right or left side, two on the right and two on the left side, or all on the back of the unit.

The **MSL** units can be supplied both with the standard R410A refrigerant, in class A1 (non-flammable), and with the new generation R454B refrigerant, in class A2L (mildly flammable) or in the A2L-ready configuration.

DETAILS AT **Page 5**

Maximised energy efficiency

The units of the MSL range fall within the **energy efficiency class A,** both in cooling and in heating mode. This is thanks to a **careful selection of internal components,** which also includes the adoption of innovative high efficiency Scroll compressors with direct start, permanent magnet motor technology. The high modulation range guaranteed by the multi-Scroll technology allows cooling/heating requirements to be met at any time, **minimising energy waste and increasing seasonal efficiency.** The high degree of partial load operation (**up to 11%** of the rated power), combined with water flow rate modulation (**up to 20%** of the nominal flow) **allows operating costs and system maintenance costs to be reduced.**



Reliability: shell and tube

The use of shell and tube heat exchangers with exchange water flow on the shell side implies **a lower risk of blocking the flow due to exchanger clogging compared to units with plate heat exchangers.** This is thanks to the larger throughsections, the exchanged power being the same. Additionally, the dual-pass heat exchanger **ensures high heat exchange efficiency** both in "chiller" and in "heat pump" modes, with **lower consumption figures for the user and easier transport and installation.**

Smart defrosting

A factor that heavily weighs on the costs of managing the entire plant is finned coil defrosting during wintertime operation. The special management of the defrosting cycle of MSL units **minimises the time to completion and ensures that defrosting is only performed when strictly necessary, guaranteeing greater heating efficiency.** The presence of two completely independent thermodynamic circuits ensures **uninterrupted operation** also during the defrosting phase, **with practically no thermal discomfort for the user.**

Easy maintenance

To carry out maintenance of the condensing coil manifolds and refrigeration circuit components, which are located behind the electrical panel, the MSL range is supplied as standard with the Hi-Rail sliding guide. This allows **the control panel to be easily removed,** resulting in **extra space for unscheduled maintenance, without impacting the footprint** required for normal operation of the unit.

MSL		294PS	324PS	374PS	404PS	454PS	496PS	556PS	596PS	636PS	676PS	748PS	808PS	868PS	900PS	1072PS
User water values 12/7°C, 35°C outside air, 40% U.R.																
Cooling capacity	kW	281.5	326.1	364.2	395.9	434.5	486.1	550	598.1	639.8	669.8	737.5	798.8	831.9	917.3	1146
Total absorbed power	kW	88.7	104.2	117	127.1	148	152.7	175.5	193	202.7	218.1	234.4	255.8	275.7	291	343.9
EER		3.18	3.13	3.11	3.12	2.94	3.18	3.13	3.1	3.16	3.07	3.15	3.12	3.02	3.15	3.33
SEER		4.91	4.9	4.82	4.88	4.77	5.01	5.12	5.19	5.08	5.08	4.91	4.96	4.83	4.98	4.76
SCOP		4.09	4.15	4.03	4.16	4.15	3.94	3.98	4.03	3.95	3.95	4.1	4.26	4.16	4.05	3.48
Utility water temperature 12/7°C, Recovery water temperature 40/45°C																
Cooling capacity	kW	279.4	317.3	354.4	390	435.9	484.3	542.5	592	618.2	663.7	742	791.7	857.1	906	1129.4
Thermal power	kW	355.2	405.6	455.5	497.5	560.8	614.9	691.6	752.1	790.9	849	937.6	1004.1	1087.9	1156.4	1425.3
Total absorbed power	kW	81.5	95.4	109.8	115.1	134.1	139.4	159.6	172.2	186	200.2	212	230.8	248.6	270.3	319.5
SEER		4.91	4.9	4.82	4.88	4.77	5.01	5.12	5.19	5.08	5.08	4.91	4.96	4.83	4.98	4.76
Total COP		7.79	7.58	7.38	7.71	7.43	7.89	7.73	7.8	7.58	7.56	7.92	7.78	7.82	7.63	8
SCOP		4.09	4.15	4.03	4.16	4.15	3.94	3.98	4.03	3.95	3.95	4.1	4.26	4.16	4.05	3.48
User water values 40/45°C, 7°C outside air, 89% U.R.																
Thermal power	kW	296.9	332.8	383.4	417.8	458.8	512.2	563.8	606.5	656.3	683.2	756.3	840.3	863.4	977.7	1183.2
Total absorbed power	kW	89.2	102.3	119.1	126	143.5	152.8	172.1	184.3	200.6	213.7	231.2	250.5	267.7	294.8	349.4
SEER		4.91	4.9	4.82	4.88	4.77	5.01	5.12	5.19	5.08	5.08	4.91	4.96	4.83	4.98	4.76
COP		3.33	3.25	3.22	3.32	3.2	3.35	3.28	3.29	3.27	3.2	3.27	3.35	3.22	3.32	3.39
SCOP		4.09	4.15	4.03	4.16	4.15	3.94	3.98	4.03	3.95	3.95	4.1	4.26	4.16	4.05	3.48
Sound power	dB(A)	96	89	90	90	90	92	91	92	91	93	93	93	93	94	95
Sound power [Low noise]	dB(A)	92	86	87	87	87	89	87	88	87	89	89	90	89	90	91
Sound power [Super Low noise]	dB(A)	90	84	85	85	85	87	85	86	85	87	87	88	87	88	89
Dimensions [LxDxH]	mm	12930 x2680 x2256	3520x2680x2256		4520x2680x2256			5520x2680x2256			6520x2680x2256		9085x2680x2256			11085 x2680 x2256

Hot user Out water temperature 45°C | Cold user In water temperature 12°C | Cold user Out water temperature 7°C | Hot user In water temperature 40°C

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MLA

MULTIPURPOSE CLASS A AIR CONDENSED HEAT PUMPS WITH SCROLL COMPRESSORS

286.2-1430.6 kW

MULTI-PROTOCOL COMMUNICATION INTERFACE
AXIAL FANS
CORROSION RESISTANT MATERIAL
A2L READY
LOW GWP REFRIGERANT
SCROLL COMPRESSORS
CLASS A
FAST RESTART
PLATE HEAT EXCHANGER

The air-water MLA range multipurpose units are air/water units in energy class A for both cooling and heating, available for use with R410A refrigerant or, in the "A2L" version, with low environmental impact R454B refrigerant. The MLA range is designed to manage **the conditioning of industrial plants and thermal loads in technological applications, where 24/7 reliability in all working conditions, one of the assets of these units, is a critically important requirement**. The MLA range uses latest generation Scroll compressors, braze-welded plate exchanger optimised for use with high pressure refrigerants (R410A/R454B) and axial fans suitable for outdoor installation.

- 3 different soundproofing setups available: Standard, Low Noise and Super Low Noise
- High power density units in both chiller and heat pump modes
- Radial EC motor fans (optional)
- Electronic expansion valve
- Easy accessibility thanks to the optimisation of the internal space
- Programmable microprocessor control with proprietary software
- Compliance with ERP regulations

The **MLA** units can be supplied both with the standard R410A refrigerant, in class A1 (non-flammable), and with the new generation R454B refrigerant, in class A2L (mildly flammable) or in the A2L-ready configuration.

DETAILS AT **Page 5**

Plate heat exchangers

The MLA range uses braze-welded plate exchangers with asymmetrical channels, suitable for the use of high and medium pressure refrigerant gases. The configuration with asymmetrical channels **allows high heat exchange efficiencies to be reached while maintaining low pressure drops** on the water side - which results in **reduced pumping costs at both full and partial load.**

Maximised energy efficiency

The units of the MLA range fall within the energy efficiency class A, both in cooling and in heating mode. This is thanks to a careful selection of internal components, which also includes the adoption of **innovative high efficiency Scroll compressors with direct start,permanent magnet motor technology.** The high modulation range guaranteed by the multi-Scroll technology allows cooling/heating requirements to be met at any time, **minimising energy waste and increasing seasonal efficiency.** The high degree of partial load operation (**up to 11%** of the rated power), combined with water flow rate modulation (**up to 20%** of the nominal flow) allows **operating costs and system maintenance costs to be reduced.**

Easy maintenance

To carry out maintenance of the condensing coil manifolds and refrigeration circuit components, which are located behind the electrical panel, the MLA range is supplied as standard with the Hi-Rail sliding guide. This allows **the control panel to be easily removed,** resulting in **extra space for unscheduled maintenance,without impacting the footprint** required for normal operation of the unit.

MLA		294PS	324PS	374PS	404PS	454PS	496PS	556PS	596PS	636PS	676PS	748PS	808PS	868PS	900PS	1072PS
User water values 12/7°C, 35°C outside air, 40% U.R.																
Cooling capacity	kW	288.8	322.9	374.8	401.8	448.1	487.3	545.7	593.8	617.9	663.4	756.8	804	840.4	942.3	1125
Total absorbed power	kW	86.6	102.1	114	125	144.6	150.8	173.8	191.4	198.6	214.2	228.5	249.7	270.6	283.8	335.1
EER		3.34	3.16	3.29	3.21	3.1	3.23	3.14	3.1	3.11	3.1	3.31	3.22	3.11	3.32	3.36
SEER		4.93	4.73	4.83	4.82	4.89	5.01	5.09	5.15	4.95	5.08	4.75	4.72	4.61	4.91	5
SCOP		4.01	3.96	4.07	4.2	4.26	3.93	4.13	4.01	3.93	4.01	3.83	4	3.93	3.81	3.8
Utility water temperature 12/7°C, Recovery water temperature 40/45°C																
Cooling capacity	kW	286.2	324.4	371	403.3	451	479.8	546.8	582.8	607.7	651.6	755.5	807	866.7	931.7	1126.8
Thermal power	kW	362.7	413.5	471.6	511.6	576.2	614.4	699.1	748.6	786.4	843.3	954.1	1023	1099.7	1181.8	1430.6
Total absorbed power	kW	81.4	95.1	107.5	115.7	134.3	144.6	164	178.9	193.1	207.8	212	230.9	249.5	267.8	327.5
SEER		4.93	4.73	4.83	4.82	4.89	5.01	5.09	5.15	4.95	5.08	4.75	4.72	4.61	4.91	5
Total COP		7.97	7.76	7.84	7.9	7.65	7.57	7.6	7.44	7.22	7.19	8.06	7.93	7.88	7.89	7.81
SCOP		4.01	3.96	4.07	4.2	4.26	3.93	4.13	4.01	3.93	4.01	3.83	4	3.93	3.81	3.8
User water values 40/45°C, 7°C outside air, 89% U.R.																
Thermal power	kW	292.4	323.5	406	441.2	481.8	505.4	556.7	597	653.1	694.4	777.7	861.8	886	975.8	1177.4
Total absorbed power	kW	86.5	99.6	114.6	122.6	140.2	153	170.8	185.9	202.3	216	225.9	245.1	262.4	285.2	347.5
SEER		4.93	4.73	4.83	4.82	4.89	5.01	5.09	5.15	4.95	5.08	4.75	4.72	4.61	4.91	5
COP		3.38	3.25	3.54	3.6	3.44	3.3	3.26	3.21	3.23	3.21	3.44	3.52	3.38	3.42	3.39
SCOP		4.01	3.96	4.07	4.2	4.26	3.93	4.13	4.01	3.93	4.01	3.83	4	3.93	3.81	3.8
Sound power	dB(A)	89	90	90	90	92	91	92	91	93	93	93	93	94	95	96
Sound power [Low noise]	dB(A)	86	87	87	87	89	87	88	87	89	89	90	89	90	91	92
Sound power [Super Low noise]	dB(A)	84	85	85	85	87	85	86	85	87	87	88	87	88	89	90
Dimensions [LxDxH]	mm	3520x2680x2256			4520x2680x2256			5520x2680x2256			6520x2680x2256		9085x2680x2256		11085 x2680 x2256	12930 x2680 x2256

Also available with 60 Hz power supply | Cold user In water temperature 12°C | Cold user Out water temperature 7°C | Hot user In water temperature 40°C | Hot user Out water temperature 45°C

INDUSTRIAL SERVICES

HWC / HWP

AIR CONDENSED CHILLERS AND HEAT PUMPS WITH SCROLL COMPRESSORS FOR INDOOR INSTALLATIONS

57.7-201.5 kW

MULTI-PROTOCOL COMMUNICATION INTERFACE | SCROLL COMPRESSORS | EC RADIAL FANS | CORROSION RESISTANT MATERIAL | PLATE HEAT EXCHANGER

HWC/HWP is the HiRef range of air-condensed liquid chillers with Scroll compressors for indoor installations. Four different versions (chiller, Free-Cooling chiller, reversible heat pump and multipurpose) the several available power output rates and compact frame make these units **highly versatile and suited to a wide range of system layouts**. The sizing and selection of individual components have focused on **containing energy consumption, aiming to optimise energy savings not just for individual chillers but for the entire system**. The unit is suitable for installation in equipment rooms and **can be ducted at both suction and delivery ends**. The maximum working head available is 250 Pa.

The configurations available for the refrigeration circuit are:

EFFICIENCY PACK 1: Dual compressor and dual circuit unit, for a system with greater redundancy (only for Free-Cooling versions).

EFFICIENCY PACK 2: Dual compressor (tandem) on single circuit for greater efficiency at partial loads.

EFFICIENCY PACK 4: Four compressors (dual tandem) on dual circuit, for a redundant system that is efficient with low loads.

- 2 different soundproofing set-ups available: Standard and Low Noise
- Electric control panel with IP55 protection rating
- Radial EC motor fans
- Electronic expansion valve
- Easy accessibility thanks to the optimisation of the internal space
- Programmable microprocessor control with proprietary software
- Available with single or double pumping kit in timed rotation
- Maintenance kit available
- Compliance with ERP regulations

Attention to detail and to low noise requirements

Scroll compressors, which are the main noise source in the unit, are fitted on rubber feet; **these dampen vibration and therefore attenuate the noise transmitted to the various system parts.** On request, the compressor compartment can be lined with special sound absorbing material and the compressors encased in special insulating hoods **to reduce airborne noise emissions.**

All accessories on-board the machine

The special component layout, together with compact plate heat exchangers and Scroll compressors, ensures on one hand **easier access to carry out maintenance procedures** and on the other hand, **sufficient internal space available for fitting a wide range of accessories and hydraulic options.** The hydraulic circuit may include a dual shut-off pump, flow switch, tank, expansion tank and safety valve.

Maximum efficiency at partial loads

The adoption of a multi-Scroll solution, the use of electronically controlled expansion valves and plate heat exchangers and modulation of the compressors are all key features **that make the HWC/HWP range particularly efficient at partial loads.**

HWC		052CS	062CS	072CS	082CS	092CS	102CS	112CS	132CS	142CS	162CS	182CS	204CS
User water values 12/7°C, 35°C outside air, 40% U.R.													
Cooling capacity	kW	57.7	62	71	78.7	94.5	106.8	119.8	128.2	142	155.5	183	201.5
Total absorbed power	kW	18.5	23	25	28.7	33.8	39.6	42.6	47.1	55.2	63.8	68.5	82.2
EER		3.12	2.69	2.84	2.74	2.8	2.7	2.82	2.72	2.57	2.44	2.67	2.45
SEPR		5.29	5.26	5.32	5.33	5.27	5.22	5.42	5.3	5.11	5.05	5.24	5.15
Sound power	dB(A)	82	82	82	83	85	86	86	86	89	90	92	89
Dimensions [LxDxH]	mm	2000x1100x2020				2400x1100x2020			3090x1100x2020			4090x1100x2104	

Calculated with 20% glycol. Free-Cooling versions always have a refrigerating configuration consisting of one compressor per circuit or a dual tandem arrangement on two circuits | Features referred to the standard set-up. If not available, these features are referred to the Low Noise or Super Low Noise set-ups | Also available with 60 Hz power supply | Data declared with use of R410A refrigerant

HWP		052PS	062PS	072PS	082PS	092PS	102PS	112PS	132PS	142PS	162PS	182PS	204PS
User water values 12/7°C, 35°C outside air, 40% U.R.													
Cooling capacity	kW	55.1	61.2	71	78.7	94.5	106	119.6	127.9	141.6	152.3	181.1	201.5
Total absorbed power	kW	19.9	23.1	25	28.7	33.8	39.7	42.5	47.1	55.1	63.6	68.4	82.2
EER		2.77	2.65	2.84	2.74	2.8	2.67	2.81	2.71	2.57	2.4	2.65	2.45
User water values 40/45°C, 7°C outside air, 89% U.R.													
Thermal power	kW	58	64.6	76.6	85.5	102.3	115.2	131.2	141.8	159.1	175.1	203.1	230.8
Total absorbed power	kW	21	23.9	26.6	29.3	36.3	41.1	44	48	53.2	59.7	68.4	77.8
COP		2.76	2.71	2.88	2.92	2.82	2.8	2.98	2.96	2.99	2.93	2.97	2.97
SCOP		3.2	3.23	3.27	3.37	3.22	3.23	3.42	3.46	3.46	3.5	3.4	3.44
Sound power	dB(A)	82	82	82	83	85	86	86	86	89	90	92	89
Dimensions [LxDxH]	mm	2000x1100x2020				2400x1100x2020			3090x1100x2020			4090x1100x2104	

Data declared with use of R410A refrigerant | Calculated with 20% glycol. Free-Cooling versions always have a refrigerating configuration consisting of one compressor per circuit or a dual tandem arrangement on two circuits | Features referred to the standard set-up. If not available, these features are referred to the Low Noise or Super Low Noise set-ups | Also available with 60 Hz power supply

HiRef

WATER/WATER

Liquid chillers

DATA CENTER | INDUSTRIAL | SERVICES

XTW
Bicircuito

WATER-CONDENSED CHILLERS WITH OIL-FREE CENTRIFUGAL COMPRESSORS

221–916 kW

- MULTI-PROTOCOL COMMUNICATION INTERFACE
- OIL-FREE CENTRIFUGAL COMPRESSORS
- SPRAY FLOODED SHELL AND TUBE
- FAST RESTART
- CORROSION RESISTANT MATERIAL
- CLASS A
- SUPER LOW NOYSE
- LOW GWP REFRIGERANT

XTW offers the most innovative, efficient water condensed chiller solution. A meticulous choice of components and equipment layout has led to **a solution with numerous advantages as regards both energy performance and noise emissions**. The special component layout lets users maximise **the advantages provided by the oil-free centrifugal compressor** (maximum heat exchange efficiency, ultra-high efficiency at partial loads, reduced inrush current) and **the compact flooded exchangers** (minimal approach temperature between water and refrigerant, lower load compared to traditional flooded units). The larger sizes have a double refrigerant circuit configuration **and high system efficiency and redundancy**.

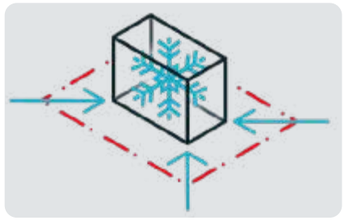
New refrigerant R1234ze

XTW range water condensed chillers use **the new HFO refrigerant with low GWP** (GWPR1234ze=6) as part of a wider Green Technology approach. (Also available with R134a refrigerant.)

Top-class thermodynamic performance!

An effective combination of "oil-free" centrifugal compressor and flooded exchangers **allows maximisation of thermal exchange efficiency;** this is largely due to the absence of oil in the circuit and the reduced approach temperature between water and refrigerant (1K) as a result of no overheating in the evaporator. Cycle efficiency is enhanced by the centrifugal compressor, **which features ultra-high efficiency at partial loads,** and by the economiser, which **ensures intermediate regenerative exchange in the circuit.**

- Refrigerant R1234ze and R515B
- Also available with R134a refrigerant
- Refrigerant leak sensor
- Fast restart technology
- Water connections with Vic-Taulic quick couplings
- Modulation and supervision managed by the software
- Low noise set-up with compressor insulation
- Ductable electrical panel (separate electrical panel ventilation)



Reduced footprint

Careful assessment of component layout and sizing **allows the system footprint to be reduced,** freeing up more space within the facility and during handling operations.

"Silent" layout

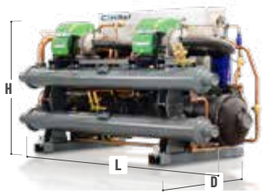
The piping layout is designed and sized to ensure low noise emissions under all working conditions and **mitigate Coriolis force acceleration.** The use of high performance sound absorbing material in the **Low Noise configuration** results in a further **reduction of the compressor noise emissions.**

Two-level evaporation

The evaporator with spray technology and single pass on the water side **guarantees up to 5% more efficiency than traditional shell and tube versions,** thanks to the permanently countercurrent heat exchange on two separate evaporation levels - and with a **smaller refrigerant charge than a standard flooded shell and tube model.**

24 hour operation

The configuration with dual refrigerant circuit and dual centrifugal compressor with permanent magnets **guarantees high operational reliability,** making the XTW range particularly suitable **for installation in Data Centers or wherever high-value, continuous cycle industrial processes are carried out.**



XTW		220CS	300CS	370CS	440CS	461CS	641CS	761CS	921CS
User water values 12/7°C, 30/35°C source water side									
Cooling capacity	kW	221	305	368	436	461	644	784	916
Total absorbed power	kW	38.1	51.6	62.3	72.5	74.5	100.7	123.4	142.4
EER		5.79	5.91	5.9	6.01	6.18	6.39	6.35	6.43
SEER		10.18	9.05	9.83	8.98	9.61	9.66	9.76	9.73
SEPR		11.31	11.15	12.54	11.79	11.33	12.47	12.74	12.4
ESEER		7.99	7.87	8.27	7.97	8.52	8.79	8.77	8.86
Sound power	dB(A)	86	89	89	89	89	92	92	92
Dimensions [LxDxH]	mm	2310x2040x1080		2700x1900x1500			4800x1900x1500		4800x2000x1500

Also available with 60 Hz power supply

DATA CENTER | INDUSTRIAL | SERVICES

XVA

WATER CONDENSED CHILLERS AND HEAT PUMPS WITH INVERTER DRIVEN SCREW COMPRESSORS

444.6–1587.7 kW

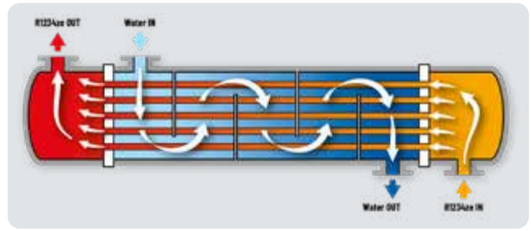
- MULTI-PROTOCOL COMMUNICATION INTERFACE
- SCREW COMPRESSORS
- SHELL AND TUBE HEAT EXCHANGER
- FAST RESTART
- CORROSION RESISTANT MATERIAL
- CLASS A
- LOW GWP REFRIGERANT

XVA is HiRef's range of water-cooled chillers with screw compressors and shell and tube heat exchangers. Use of the new R1234ze refrigerant, **with ultra-low GWP** (Global Warming Potential), and **achievement of high energy efficiency levels**, especially at partial loads, **ensures the system has a low TEWI** (Total Equivalent Warming Impact). The broad capacity range offered and the availability of different versions caters to a wide variety of needs. It's possible to choose operation in **chiller-only mode with evaporative tower or Dry Cooler** and **operation in heat pump mode** for high or low temperatures.

- Refrigerant R1234ze and R515B
- Also available with R515B refrigerant on request
- Available in version with Eurovent A (XVA) energy efficiency class
- Available in versions: chilling only (with well water or evaporative tower), chilling only (with Dry Cooler), heating only heat pump and heating only heat pumps for high temperatures
- Electronic expansion valve
- Monitoring and limitation of the maximum absorbed power
- Available with screw compressors driven by inverters
- Thermal insulation hoods on the compressors for the high temperature heat pump versions (optional)

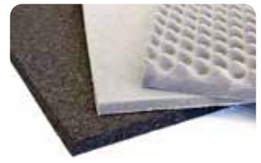
Power and flexibility

Screw compressor allows **high cooling capacities** to be achieved with load modulation via the special slide valve. On request, a version with inverter either on one or on both compressors is available, **for finer adjustment of cooling capacity and obvious advantages in terms of energy efficiency.**



New concept of heat exchange

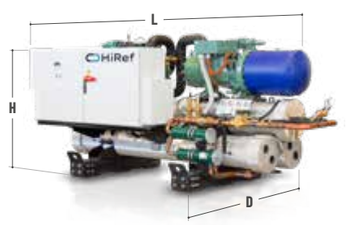
Single pass shell and tube evaporators provide **excellent levels of thermodynamic efficiency** thanks to full heat exchange counter-flow.



Low Noise set-up

The screw compressors, the only source of noise on the machine, can be placed in a dedicated enclosure lined with sound-absorbing material **that reduces the overall noise emission.**

Suitable for coupling to Polymorph HiRef modules



XVA		521D	621D	691D	811D	901D	1071D	1201D	1321D	1531D	1641D	491D	541D	601D	681D	801D
User water values 12/7°C, 30/35°C source water side																
Cooling capacity	kW	523.6	625.2	700.6	819.1	1010.3	1065.9	1212.4	1320	1491.6	1587.7	488.5	563.7	648.5	729.4	871
Total absorbed power	kW	102.8	120.1	137.5	160.7	208.7	208.4	237	253.5	285.1	297.5	90.4	101.5	119.3	135.1	158.2
EER		5.09	5.21	5.09	5.1	4.84	5.12	5.12	5.21	5.23	5.34	5.41	5.56	5.44	5.4	5.51
SEER		6.92	6.95	6.9	6.84	6.89	6.9	6.8	7.61	7.98	8.24	7.63	7.52	7.52	7.56	7.54
SEPR		8	8.2	8.05	8.08	8.1	8.11	8.08	8.83	9.44	9.66	8.15	8.01	8	8	8
ESEER		6.27	6.37	6.27	6.33	6.42	6.31	6.29	6.72	7	7.17	6.99	6.9	6.89	6.92	6.9
Sound power	dB(A)	92	95	96	97	98	99	100	101	102	103	95	97	97	98	99
Dimensions [LxDxH]	mm	4250x2050x1500				4800x2250x1500		5200x2250x1900			5400 x2250 x2050	4250x2050x1500			4800x2250x1500	

XVA		921D	1141D	1281D	451D	551D	641D	701D	821D	911D	1061D	1221D	1291D	1431D	1501D
User water values 12/7°C, 30/35°C source water side															
Cooling capacity	kW	953.7	1113.8	1289.1	444.6	542.3	618.2	709	811.6	903.4	1096.5	1215	1260	1419.9	1493.9
Total absorbed power	kW	177.9	190.5	220.2	80.8	97.8	115.8	133.2	154.4	170.3	205.6	230.1	248.2	279.4	291.5
EER		5.36	5.85	5.85	5.5	5.55	5.34	5.32	5.26	5.3	5.33	5.28	5.08	5.08	5.12
SEER		7.52	7.88	7.94	7.63	7	6.79	6.93	6.94	6.94	7.03	6.99	7.23	7.52	7.55
SEPR		8.16	8.03	8.01	8.15	8	8	8.06	8.04	8.04	8.12	8.05	8.13	8.55	8.55
ESEER		6.93	7.1	7.13	6.99	6.43	6.38	6.4	6.55	6.56	6.46	6.52	6.5	6.61	6.65
Sound power	dB(A)	100	102	103	95	92	95	96	97	98	99	100	101	102	103
Dimensions [LxDxH]	mm	5200x2250x1900		5200 x2250 x2050	4250x2050x1500					4800x2250x1500		5200x2250x1900			5400 x2250 x2050

HiRef

WATER/WATER

Reversible heat pumps

DATA CENTER | INDUSTRIAL | SERVICES

XSA

WATER CONDENSED CHILLERS AND HEAT PUMPS WITH SCROLL COMPRESSORS

54.3–534.6 kW

MULTI-PROTOCOL COMMUNICATION INTERFACE

SCROLL COMPRESSORS

CORROSION RESISTANT MATERIAL

A2L READY

LOW GWP REFRIGERANT

PLATE HEAT EXCHANGER

CLASS A

The XSA range consists of a wide range of units available in cooling only (D), heating only (W) and reversible heat pump (H) versions. The many refrigerating configuration options, together with specific construction choices, make XSA units suitable for a wide range of plant engineering requirements: **redundancy**, **efficiency at partial loads**, **compactness to make the most of limited space in technical enclosures**, **low noise levels**, **auxiliary unit control** and **easy installation**. The units of the XSA range **feature high nominal efficiency**, including at seasonal and partial loads, which makes them **the best choice** among small and medium-power water-condensed units.

Available versions:

D cooling only unit, suitable for combined use with Dry Cooler

W heating only unit

H reversible heat pump

Maximised energy efficiency

The units of the XSA range all feature **high energy efficiency ratings up to class A,** both in cooling and in heating mode. This is thanks to **a careful selection of internal components,** which also includes the adoption of **innovative high efficiency Scroll compressors with direct start, permanent magnet motor technology.** The high modulation range guaranteed by the multi-Scroll technology allows cooling/heating requirements to be met at any time, **minimising energy waste and increasing seasonal efficiency.** The high degree of partial load operation (**up to 11%** of the rated power), combined with water flow rate modulation (**up to 20%** of the nominal flow) allows **operating costs and system maintenance costs to be reduced.**

- Electronically controlled expansion valve supplied as standard
- Optional Vic-Taulic hydraulic couplings
- Available in Standard and Low Noise versions
- Programmable electronic control as part of standard equipment
- Smart management of several units in parallel
- Suitable for coupling to Polymorph module (PLM)
- Compliance with ERP regulations

Plate heat exchangers

The XSA range uses braze-welded plate exchangers with asymmetrical channels, suitable for the use of high and medium pressure refrigerant gases. The configuration with asymmetrical channels **allows high exchange efficiencies to be reached while maintaining pressure drops low** on the water side - **reducing pumping costs** at both full and partial load.

More space in the heating unit

The possibility of installing the pumping units directly on the machine **avoids having to install external hydronic modules with the resulting coupling costs.** This, together with the adoption of compact plate heat exchangers directly facing the right side panel of the unit, guarantees **maximised unit compactness to make the most of the available space in the thermal power plant.**

Integrated hydronic module

XSA units are available with **integrated hydronic module** (optional), which includes user side and/or source side circulation pumps.

The **XSA** units can be supplied both with the standard R410A refrigerant, in class A1 (non-flammable), and with the new generation R454B refrigerant, in class A2L (mildly flammable) or in the A2L-ready configuration.

DETAILS AT **Page 5**

XSA		061H	062H	071H	072H	081H	082H	091H	092H	111H	112H	131H	132H	141H	142H	144H	161H
User water values 12/7°C, 40/45°C source water side																	
Cooling capacity	kW	54.3	54.4	60.9	61	68.7	68.8	80.5	80.6	93.1	93.3	104.9	105.1	119.3	119.3	92.5	132.6
Total absorbed power	kW	15.4	15.4	17.2	17.2	19.2	19.2	23.3	23.2	26.9	26.8	31	30.9	35	35	25.3	39.6
EER		3.52	3.54	3.53	3.55	3.58	3.58	3.46	3.47	3.46	3.47	3.38	3.4	3.4	3.41	3.66	3.35
User water values 40/45°C, 12/7°C source water side																	
Thermal power	kW	69.3	69.4	77.7	77.7	87.5	87.5	103.1	103.2	119.3	119.4	135.1	135.2	153.4	153.4	117.1	171.1
Total absorbed power	kW	15.4	15.4	17.2	17.2	19.2	19.2	23.3	23.2	26.9	26.8	31	30.9	35.1	35	25.3	39.6
COP		4.49	4.51	4.51	4.52	4.55	4.56	4.43	4.45	4.43	4.45	4.35	4.37	4.37	4.38	4.63	4.32
SCOP		4.9	5.04	4.91	5.07	4.95	5.07	4.85	5.01	4.78	4.86	4.74	4.89	4.75	4.88	5.24	4.75
Sound power	dB(A)	77	77	78	78	81	81	81	81	81	81	82	82	83	83	81	85
Sound power [Low noise]	dB(A)	74	74	75	75	78	78	78	78	78	78	79	79	80	80	78	82
Dimensions [LxDxH]	mm	1174x1930x772								1644x1930x772						2374 x1990 x877	1644 x1930 x772

XSA		162H	164H	181H	182H	184H	204H	214H	243H	244H	283H	284H	314H	344H	374H	424H	484H
User water values 12/7°C, 40/45°C source water side																	
Cooling capacity	kW	132.7	136.9	174.4	174.6	162	173.7	185.5	199.3	210.2	259.1	236.7	261.3	302.3	343.4	371.6	407.1
Total absorbed power	kW	39.5	39	51.6	51.6	46.2	50.3	54.5	59.1	62.1	79.1	71.3	81.1	93.5	105.8	113.8	132
EER		3.36	3.51	3.38	3.39	3.51	3.45	3.4	3.37	3.38	3.28	3.32	3.22	3.23	3.24	3.26	3.08
User water values 40/45°C, 12/7°C source water side																	
Thermal power	kW	171.2	174.8	224.6	224.7	206.9	222.7	238.3	256.8	270.4	335.4	305.6	339.8	392.9	445.9	481.7	534.6
Total absorbed power	kW	39.6	39	51.7	51.6	46.2	50.4	54.5	59.2	62.1	79.1	71.3	81.1	93.5	105.9	113.9	132
COP		4.33	4.48	4.35	4.36	4.48	4.42	4.37	4.34	4.35	4.24	4.29	4.19	4.2	4.21	4.23	4.05
SCOP		4.9	5.18	4.78	4.94	5.18	5.09	5	5.03	5.03	4.98	4.99	4.98	4.97	5.02	5.02	4.84
Sound power	dB(A)	85	84	87	87	84	84	84	86	85	88	86	88	89	90	89	91
Sound power [Low noise]	dB(A)	82	81	84	84	81	81	81	83	82	85	83	85	86	87	86	88
Dimensions [LxDxH]	mm	1644 x1930 x772	2374 x1990 x877	1644x1930x772		2374x1990x877											

DATA CENTER | INDUSTRIAL | SERVICES

PSW / RSW

MULTIPURPOSE WATER-CONDENSED HEAT PUMPS WITH SCROLL COMPRESSORS

293.7–866.6 kW

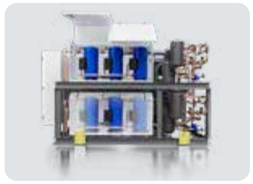
- MULTI-PROTOCOL COMMUNICATION INTERFACE
- SCROLL COMPRESSORS
- A2L READY
- LOW GWP REFRIGERANT
- SHELL AND TUBE HEAT EXCHANGER
- CLASS A

PSW/RSW multifunction units are used to produce hot and cold water, **both independently and simultaneously**, to meet the cooling and heating needs of both industrial and commercial applications. PSW units are ideally suitable for **use in 4-pipe systems**. All units are available with two refrigerant circuits and shell and tube exchangers, for a high level of unit reliability. The arrangement of the components allows **easy access during maintenance**, while the hydraulic connections all on the same side allow for **easy installation** and reduced installation space requirements.

- Electronically controlled expansion valve supplied as standard
- Optional Vic-Taulic hydraulic couplings
- Available in Standard and Low Noise versions
- Programmable electronic control as part of standard equipment
- Smart management of several units in parallel
- Easy access to components for routine maintenance
- Compliance with ERP regulations
- Available in multipurpose version for 4 pipe systems

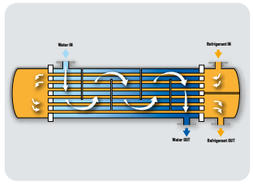
The **PSW / RSW** units can be supplied both with the standard R410A refrigerant, in class A1 (non-flammable), and with the new generation R454B refrigerant, in class A2L (mildly flammable) or in the A2L-ready configuration.

DETAILS AT **Page 5**



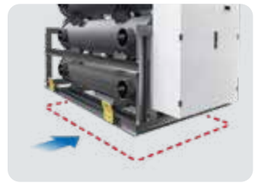
Maximum efficiency at partial loads

Accurate selection of the components allows **high efficiency to be obtained at partial loads;** this is thanks above all to the use of Scroll compressors and to the use of electronically controlled electric expansion valves (one for each circuit), **optimised to track refrigerant load trends in all conditions of use.** The shell and tube heat exchanger also ensures low water/refrigerant approach temperatures during operation, **all to the advantage of heat exchange efficiency.**



Reliability: shell and tube

The use of shell and tube exchangers with water flow on the shell side implies **a lower risk of blocking the flow due to exchanger clogging** - compared to units with plate heat exchangers. This is ascribable to larger throughsections - the exchanged power being the same. Additionally, the dual-pass heat exchanger ensures **high heat exchange efficiency** both in "chiller" and in "heat pump" modes, **with lower consumption figures for the user.**



Reduced footprint

The PSW/RSW series has a **compact layout** thanks to the optimised arrangement of the compressors and heat exchangers. **The power density reaches very high values, exceeding 100kW/m².** The lower weight compared to units with screw compressors **facilitates installation and maintenance operations.**

Low noise levels

Thanks to the Scroll compressors used, the PSW/RSW units feature lower noise levels than other compressor technologies used for similar applications. Also, thanks to the use of multi-Scroll technology, at partial loads unnecessary compressors are turned off which results in **a further noise reduction.** For extra soundproofing, the **Low Noise version** is available with soundproofed sheet metal enclosures to compartmentalise the compressors.

PSW		324P	374P	444P	484P	506P	566P	646P	706P
Utility water temperature 12/7°C, Recovery water temperature 40/45°C									
Cooling capacity	kW	293.7	334	398.6	412	442.4	500.6	579	676.2
Thermal power	kW	370.8	423.9	503.6	521.4	558.1	635.7	730.2	866.6
Total absorbed power	kW	77.1	89.9	105.1	109.4	115.7	135.1	151.2	190.3
Total COP		8.62	8.43	8.59	8.53	8.65	8.41	8.66	8.11
User water values 12/7°C, 30/35°C source water side									
Cooling capacity	kW	329.3	374.4	445.6	459.9	498.4	561.4	648.7	692
Total absorbed power	kW	61.9	72.1	84	87.2	92.9	108.3	121.1	130.9
EER		5.32	5.2	5.31	5.27	5.34	5.18	5.36	5.29
User water values 12/7°C, 40/45°C source water side									
Cooling capacity	kW	329.3	374.4	445.6	459.9	498.4	561.4	648.7	692
Total absorbed power	kW	61.9	72.1	84	87.2	92.9	108.3	121.1	130.9
EER		5.32	5.2	5.31	5.27	5.34	5.18	5.36	5.29
User water values 40/45°C, 12/7°C source water side									
Thermal power	kW	370.8	423.9	503.6	521.4	558.1	635.7	730.2	866.6
Total absorbed power	kW	77.1	89.9	105.1	109.4	115.7	135.1	151.2	190.3
COP		4.81	4.72	4.79	4.77	4.82	4.71	4.83	4.55
Sound power	dB(A)	89	89	90	90	91	91	91	90
Sound power [Low noise]	dB(A)	85	85	86	86	87	87	87	86
Dimensions [LxDxH]	mm	3500X2100X1800							

RSW		324H	374H	444H	484H	506H	566H	646H	706H
User water values 12/7°C, 30/35°C source water side									
Cooling capacity	kW	329.3	374.4	445.6	459.9	498.4	561.4	648.7	692
Total absorbed power	kW	61.9	72.1	84	87.2	92.9	108.3	121.1	130.9
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User water values 40/45°C, 12/7°C source water side									
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Total absorbed power	kW	77.1	89.9	105.1	109.4	115.7	135.1	151.2	190.3
COP		4.81	4.72	4.79	4.77	4.82	4.71	4.83	4.55
Sound power	dB(A)	89	89	90	90	91	91	91	90
Sound power [Low noise]	dB(A)	85	85	86	86	87	87	87	86
Dimensions [LxDxH]	mm	3500X2100X1800							

DATA CENTER | INDUSTRIAL | SERVICES

XSB

WATER CONDENSED CHILLERS AND HEAT PUMPS WITH SCROLL COMPRESSORS

39.8–838.3 kW

MULTI-PROTOCOL COMMUNICATION INTERFACE

SCROLL COMPRESSORS

CORROSION RESISTANT MATERIAL

LOW GWP REFRIGERANT

PLATE HEAT EXCHANGER

XSB is HiRef's range of water-condensed chillers and heat pumps with multi-scroll compressors. The many refrigerating configuration options, together with specific construction choices, make the ample choice of XSB units **suitable for a wide range of plant engineering requirements: redundancy, efficiency at partial loads, compactness to make the most of limited space in technical enclosures, low noise levels, auxiliary unit control, and easy installation**.

The configurations available for the refrigeration circuit are:

EFFICIENCY PACK 1: Dual compressor on dual circuit for high system redundancy.

EFFICIENCY PACK 2: Dual compressor (tandem) on single circuit for greater efficiency at partial loads.

EFFICIENCY PACK 3: 3 compressors on single circuit for greater efficiency at partial loads.

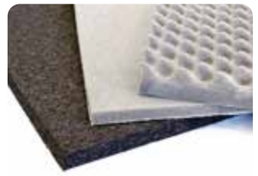
EFFICIENCY PACK 4: 4 compressors (dual tandem) on dual circuit, for a redundant system that is efficient with low loads.

Two refrigerating circuits with five or six Scroll compressors for capacities above 560 kW.

- Available with R454B or R410A refrigerant
- Can be used with Polymorph hydronic modules by HiRef
- Versions: cooling only chiller with well/mains water source, cooling only chiller with Dry Cooler water source/ evaporative tower, reversible heat pump and heating only heat pump
- Electronically controlled expansion valve supplied as standard
- Easy connection with Victaulic type couplings
- Partial heat recovery (desuperheater) (optional)
- Possibility for the software to natively manage the application of two 3-way valves to use the Free-Cooling option offered by the geothermal source

Maximum efficiency at partial loads

The XSB range adopts a multi-Scroll solution also on single circuits, electronically controlled expansion valves, plate heat exchangers and the option to control the (external) circulation pumps **via dedicated software:** all these characteristics allow **high energy efficiency to be achieved at partial loads.**



Attention to detail and low noise operation

Scroll compressors, which are the main noise source in the unit, are fitted on rubber feet; these **dampen vibration and therefore attenuate the noise transmitted to the various system parts.** On request, the compressor compartment can be lined with special sound absorbing material and the compressors encased in special insulating hoods **to reduce airborne noise emissions.**

More space in the heating unit

The adoption of compact plate heat exchangers facing the unit right side panel **maximise the use of the available internal space thanks to reduced unit footprint.**

Efficiency and reliability in line with system requirements

The main strength of the XSB range is the number of available configurations of the refrigeration circuit, which depending on the machine size and special system requirements (redundancy and/or efficiency at reduced loads) can include:
EFFICIENCY PACK 1: from 92 to 196 kW.
EFFICIENCY PACK 2: from 53 to 200 kW.
EFFICIENCY PACK 3: from 268 to 301 kW.
EFFICIENCY PACK 4: from 160 to 560 kW.
2 refrigeration circuits with 5 or 6 Scroll compressors: over 560 kW.

XSB		041H	042H	051H	052H	061H	062H	071H	072H	081H	082H	091H	092H	111H	112H	131H	132H	141H	142H	144H	161H
User water values 12/7°C, 40/45°C source water side																					
Cooling capacity	kW	39.8	40	45.8	46	53.3	53.5	59.5	59.8	69.7	69.7	77.1	77.4	92.7	93.1	104.8	104.9	117.7	118	121	128.9
Total absorbed power	kW	14.2	14.2	16.8	16.8	18.7	18.7	21	21.1	23.8	23.9	27.3	27.3	31.8	31.8	37.3	37.3	40.5	40.5	41.7	44.1
EER		2.81	2.82	2.72	2.73	2.86	2.86	2.83	2.83	2.92	2.92	2.83	2.84	2.91	2.93	2.81	2.81	2.9	2.91	2.9	2.92
User water values 40/45°C, 12/7°C source water side																					
Thermal power	kW	53.5	53.7	62.1	62.3	71.4	71.6	79.9	80.1	92.8	92.8	103.4	103.8	123.5	123.9	140.7	140.9	156.8	157	161.2	171.5
Total absorbed power	kW	14.2	14.2	16.8	16.9	18.7	18.7	21.1	21.1	23.9	23.9	27.3	27.3	31.8	31.8	37.3	37.4	40.5	40.5	41.7	44.2
COP		3.78	3.79	3.69	3.69	3.82	3.83	3.79	3.8	3.89	3.89	3.79	3.8	3.88	3.89	3.77	3.77	3.87	3.88	3.86	3.88
SCOP		5.35	5.82	5.17	5.65	5.42	5.9	5.31	5.79	5.53	5.99	5.4	5.88	5.48	5.82	5.36	5.82	5.47	5.91	6.11	5.53
Sound power	dB(A)	76	76	78	78	78	78	79	79	79	79	81	81	83	83	85	85	85	85	82	85
Sound power [Low noise]	dB(A)	72	72	74	74	74	74	75	75	75	75	77	77	79	79	81	81	81	81	78	81
Dimensions [LxDxH]	mm	1174x1930x772												1644x1930x772						2374 x1990 x877	1644 x1930 x772

XSB		162H	164H	181H	182H	184H	204H	214H	243H	244H	283H	284H	314H	344H	374H	424H	484H	535H	576H	636H	706H
User water values 12/7°C, 40/45°C source water side																					
Cooling capacity	kW	129	137.5	164	164.3	158.4	170.5	186.4	203.1	224	248.4	240.2	259.9	294.2	328.9	376.3	423.5	471.7	523.6	552.6	626.7
Total absorbed power	kW	44.1	48.4	56.3	56.4	53.5	58.9	63.5	64.7	71.7	83.9	79.7	87.6	100	112.3	125.9	139.8	159.1	175.5	190.2	211.5
EER		2.92	2.84	2.91	2.91	2.96	2.89	2.94	3.14	3.12	2.96	3.01	2.97	2.94	2.93	2.99	3.03	2.96	2.98	2.91	2.96
User water values 40/45°C, 12/7°C source water side																					
Thermal power	kW	171.5	184.1	218.2	218.6	210.1	227.3	247.6	265.4	293.4	329.4	317.3	344.3	390.6	437	497.5	558	624.3	691.8	734.6	838.3
Total absorbed power	kW	44.2	48.4	56.3	56.3	53.6	59	63.5	64.7	71.7	83.9	79.8	87.6	100	112.3	126	139.8	159.2	175.6	190.3	216.5
COP		3.88	3.8	3.88	3.88	3.92	3.85	3.9	4.1	4.09	3.93	3.98	3.93	3.9	3.89	3.95	3.99	3.92	3.94	3.86	3.87
SCOP		5.98	6.09	5.43	5.84	6.26	6.1	6.11	6.4	6.39	6.1	6.37	6.33	6.08	6.12	6.17	6.24	6.21	3.94	3.86	3.87
Sound power	dB(A)	85	82	90	90	84	85	86	87	88	92	88	88	91	93	94	95	91	91	90	93
Sound power [Low noise]	dB(A)	81	78	86	86	80	81	82	83	84	88	84	84	87	89	90	91	87	87	86	89
Dimensions [LxDxH]	mm	1644 x1930 x772	2374 x1990 x877	1644 x1930 x772		2374x1990x877												3820x2040x1085			

Performance figures refer to units with R410A refrigerant. Data subject to change without notice.

HiRef

WATER/WATER

Multipurpose

INDUSTRIAL SERVICES

KSW P

MULTI-PURPOSE WATER COOLED HEAT PUMPS FOR HIGH TEMPERATURES, USER SIDE AND SOURCE SIDE

10-150.7 kW

MULTI-PROTOCOL COMMUNICATION INTERFACE

SCROLL COMPRESSORS

CORROSION RESISTANT MATERIAL

PLATE HEAT EXCHANGER

The multi-purpose KSW P units are Water/Water heat pumps used for production of domestic hot water, designed for both services and industrial applications. They ensure **production of hot water up to 80°C**, **without using an electric** (element) **or gas booster**. The main feature of the KSW P range is being able to manage, on the heat source side, **very different thermal levels**: these heat pumps can use groundwater, usually available at 10-15°C, or water from thermal waste up to 45°C. The versions available for 2-pipe or 4-pipe systems and the number of refrigeration configurations provided, ranging from **single-circuit solutions** with single or tandem compressors up to **two-circuit solutions** with tandem compressors, allow the **best redundancy and maximum efficiency to be achieved, even simultaneously, at partial loads**.

- Refrigerant R134a
- Electronically controlled expansion valve supplied as standard
- Vic-Taulic hydraulic couplings
- Optional energy meter integrated via Modbus, for metering the energy absorbed by the machine
- External pump control according to constant T or constant ΔT logic

More space in the heating unit

A KSW P unit can be used **to produce domestic hot water, heating and cooling water from a single machine.** This optimises the use of space in the heat station, avoiding the need to install cascade-connected units and additional hydronic modules that would reduce the space available for the installation of other equipment.

Operation safety

In KSW P units water up to 80°C can be produced **to avoid having to run antilegionella cycles** or, in the event that the water is stored at a lower temperature, to be able to run them more efficiently than via a boiler or an electrical heater.

Multi-purpose: Total Recovery

All sizes of the KSW P series can be coupled to both 2 and 4-pipe systems. In the former case system-side production of **hot or cold water and the simultaneous total recoveryside production of hot water is ensured**; in the latter case the **simultaneous production of hot and cold water for heating and cooling is ensured**.

Recupero totale

Riscaldamento

Raffreddamento

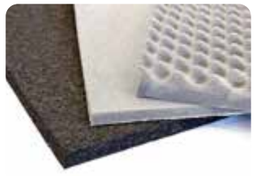
Efficiency and reliability in line with system requirements

The available refrigerating circuit configurations have been designed to ensure, also simultaneously, redundancy and efficiency at partial loads. In particular, depending on the size of the machine and any special plant requirements, the units may include:

- **single circuit solutions with single compressor;**
- **single circuit solutions with compressors in a tandem arrangement,** for high system efficiency;
- **dual circuit solutions with one compressor per circuit,** for high system redundancy;
- **dual circuit solutions with four compressors (in a dual tandem arrangement) on two circuits,** for a system that is both redundant and efficient at partial loads.

Maximum efficiency at partial loads

The KSW P range uses Scroll compressors, electronically controlled expansion valves for each circuit and plate heat exchangers: all these features ensure high efficiencies at partial loads and accurate tracking of cooling load trends in all conditions of use.



Attention to detail and low noise operation

Scroll compressors, which are the main noise source in the unit, are fitted on rubber feet; these dampen vibration and therefore **attenuate the noise transmitted to the various system parts.** On request, the compressor compartment can be lined with special sound absorbing material and the compressors encased in special insulating hoods **to reduce airborne noise emissions.**

KSW P		040P	050P	060P	081P	082P	091P	092P	101P	102P	121P	122P	151P	152P	171P	172P	174P	201P
Utility water temperature 12/7°C, Recovery water temperature 60/70°C																		
Cooling capacity	kW	10	13.1	16	10	20	11.2	22.4	13.1	26.2	16	32	20.5	40.9	20.5	47.9	22.4	27.5
Thermal power	kW	16.5	21.6	26.7	16.5	33.1	18.5	37	21.6	43.2	26.7	53.4	33.5	67	33.5	78.1	37	44.6
Total absorbed power	kW	6.9	8.9	11.3	6.8	13.7	7.7	15.3	8.9	17.9	11.3	22.5	13.7	27.5	13.7	31.8	15.3	18
Total COP		3.87	3.88	3.79	3.88	3.87	3.88	3.88	3.89	3.88	3.8	3.79	3.93	3.93	3.93	3.96	3.88	4
Sound power	dB(A)	74	74	78	77	77	77	77	77	77	81	81	84	84	85	85	80	86
Sound power [Low noise]	dB(A)	70	70	74	73	73	73	73	73	73	77	77	80	80	79	79	74	80
Dimensions [LxDxH]	mm	804x1462x607			1174x1594x772										1644x1594x772		2374 x1854 x877	1644 x1594 x772
User water values 12/7°C, 40/45°C source water side																		
Cooling capacity	kW	15.9	20.7	25.5	16.5	32.8	18.5	36.4	21.6	41.8	26.4	52.4	31.3	61	31.3	70.5	36.9	41.2
Total absorbed power	kW	4.2	5.5	6.9	4	8.2	4.5	9.2	5.3	10.8	6.6	13.5	8.3	17	8.3	19.3	9	10.5
EER		3.83	3.79	3.73	4.09	4.01	4.1	3.96	4.1	3.87	3.98	3.89	3.75	3.59	3.75	3.65	4.09	3.91
Sound power	dB(A)	74	74	78	77	77	77	77	77	77	81	81	84	84	85	85	80	86
Sound power [Low noise]	dB(A)	70	70	74	73	73	73	73	73	73	77	77	80	80	79	79	74	80
Dimensions [LxDxH]	mm	1174x1594x772			1644 x1594 x772	1174 x1594 x772	1644 x1594 x772	1174 x1594 x772	1644 x1594 x772	1174 x1594 x772	1644 x1594 x772	1174 x1594 x772	1644 x1594 x772	1174 x1594 x772	2374 x1854 x877	1644 x1594 x772	3130 x1854 x877	2374 x1854 x877
User water values 60/70°C, 15/10°C source water side																		
Thermal power	kW	18.5	24.2	29.9	18.5	37	20.7	41.4	24.2	48.3	29.8	59.7	37	74	37	86	41.3	49
Total absorbed power	kW	6.9	9	11.3	6.9	13.7	7.7	15.3	8.9	17.9	11.3	22.6	13.7	27.4	13.7	31.6	15.3	17.9
COP		2.69	2.7	2.64	2.7	2.69	2.7	2.7	2.7	2.7	2.65	2.65	2.71	2.7	2.71	2.72	2.7	2.74
SCOP		4.18	4.2	4.17	4.91	4.92	4.89	4.94	4.84	4.95	4.86	4.87	4.52	4.59	4.62	4.65	5.15	4.67

KSW P		202P	204P	221P	222P	241P	242P	244P	301P	302P	304P	344P	404P	444P	484P	554P	604P
Utility water temperature 12/7°C, Recovery water temperature 60/70°C																	
Cooling capacity	kW	54.9	26.2	27.5	61.4	34	68	32	42.2	84.5	40.9	40.9	54.9	54.9	68	84.5	84.5
Thermal power	kW	89.1	43.2	44.6	100.1	55.5	111.1	53.4	68.6	137.2	67	67	89.1	89.1	111	137.2	137.2
Total absorbed power	kW	36.1	17.9	18	40.7	22.7	45.4	22.5	27.7	55.5	27.4	27.4	36	36	45.4	55.5	55.5
Total COP		3.99	3.89	4	3.97	3.95	3.95	3.8	4	3.99	3.93	3.93	4	4	3.95	4	4
Sound power	dB(A)	86	80	87	87	88	88	84	90	90	87	88	89	90	91	92	93
Sound power [Low noise]	dB(A)	80	74	81	81	82	82	78	82	82	79	80	81	82	83	84	85
Dimensions [LxDxH]	mm	1644 x1594 x772	2374 x1854 x877	1644x1594x772				2374 x1854 x877	1644x1594x772		2374x1854x877						
User water values 12/7°C, 40/45°C source water side																	
Cooling capacity	kW	78.9	43.2	41.2	87	51	99.3	52.8	63.4	120.1	62.6	62.6	82.4	82.4	102	126.8	126.8
Total absorbed power	kW	21.7	10.5	10.5	24.8	13.2	27.1	13.3	16.2	33.7	16.7	16.7	21.1	21	26.5	32.4	32.4
EER		3.63	4.1	3.91	3.51	3.85	3.66	3.98	3.91	3.57	3.75	3.75	3.91	3.92	3.85	3.91	3.91
Sound power	dB(A)	86	80	87	87	88	88	84	90	90	87	88	89	90	91	92	93
Sound power [Low noise]	dB(A)	80	74	81	81	82	82	78	82	82	79	80	81	82	83	84	85
Dimensions [LxDxH]	mm	1644 x1594 x772	3130 x1854 x877	2374 x1854 x877	1644 x1594 x772	2374 x1854 x877	1644 x1594 x772	3130 x1854 x877	2374 x1854 x877	1644 x1594 x772	3130x1854x877						
User water values 60/70°C, 15/10°C source water side																	
Thermal power	kW	97.9	48.3	49	109.2	61	122	59.7	75.3	149.9	74	74	97.9	97.9	122	150.7	150.7
Total absorbed power	kW	35.8	17.9	17.9	40.6	22.5	45	22.5	27.5	55.2	27.4	27.4	35.8	35.8	45	55	55
COP		2.74	2.7	2.74	2.69	2.71	2.71	2.65	2.74	2.72	2.71	2.71	2.74	2.74	2.71	2.74	2.74
SCOP		4.84	5.14	4.68	4.84	4.72	4.82	5.05	4.65	4.85	4.74	4.84	4.98	5	4.93	4.98	5.01

Also available with 60 Hz power supply | Hot user IN water temperature 40°C | Hot user OUT water temperature 45°C | Cold user IN water temperature 16°C | Cold user OUT water temperature 10°C

INDUSTRIAL SERVICES

MSW

MULTIPURPOSE WATER-CONDENSED HEAT PUMPS WITH SCROLL COMPRESSORS

42.3-549.2 kW

- MULTI-PROTOCOL COMMUNICATION INTERFACE
- SCROLL COMPRESSORS
- CORROSION RESISTANT MATERIAL
- A2L READY
- LOW GWP REFRIGERANT
- PLATE HEAT EXCHANGER

MSW units are multi-purpose water-cooled heat pumps with Scroll compressors, designed for both services and industrial uses. They guarantee **extensive configurability, in terms of both accessories and refrigeration circuit**. All sizes of the MSW series can be coupled to both 2 and 4-pipe systems. In the former case production is guaranteed on the hot or cold water primary system side with simultaneous production of hot water on the total recovery side, in the latter case the simultaneous production of hot and cold water is guaranteed for heating and cooling. The numerous cooling configurations available, which offer **single-circuit** and **two-circuit solutions with compressors in a tandem arrangement**, ensure **maximum efficiency even at partial loads and optimised redundancy**. The MSW range is designed to efficiently meet any requirement.

Operation modes with 2-pipe system:
cooling mode, heating mode, domestic water mode and cooling + domestic water.

Operation modes with 4-pipe system:
cooling mode, heating mode and cooling + heating.

More space in the heating unit

The possibility of installing the pumping units directly on the machine **avoids having to install external hydronic modules** with the resulting coupling costs. This, together with the adoption of compact plate heat exchangers directly facing the right side panel of the unit, guarantees **maximised unit compactness** to make the most of the available space in the thermal power plant.

- Refrigerant R410A
- Electronically controlled expansion valve supplied as standard
- Optional Vic-Taulic hydraulic couplings
- Available versions: multi-purpose for 2-pipe system (M) and multi-purpose for 4-pipe system (P)

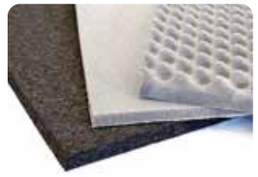
Maximum efficiency at partial loads

Accurate selection of the components allows **high efficiency to be obtained at partial loads;** this is thanks above all to the use of Scroll compressors and to the use of electronically controlled electric expansion valves (one for each circuit), **optimised to track refrigerant load trends in all conditions of use.** The plate heat exchanger also ensures low water/refrigerant approaches during operation, **all to the advantage of heat exchange efficiency.**

Excellent configurability of the refrigeration section

One of the main strengths of the MSW range is the excellent configurability of the refrigeration circuit structure, which depending on the required size and special requirements can consist of:

- **a dual compressor (tandem) on a single circuit** for greater efficiency at partial loads;
- **four compressors (dual tandem) on dual circuit,** for a redundant system that is also efficient with low loads.



Attention to detail and low noise operation

The Scroll compressors, which are the main source of noise from the machine, can be mounted on a rubber support that **dampens vibrations,** wrapped in special insulating sheaths and placed in a dedicated compartment lined with sound-absorbing material. The machine noise emission and vibrations are thus **considerably reduced at all operating points.**

Integrated hydronic module

On request, and up to a cooling capacity of 180 kW, a version with integrated **hydronic module is available,** which includes circulation pumps on the user side and/or on the source side.

MSW		042P	052P	062P	072P	082P	092P	112P	132P	142P	144P	162P
Utility water temperature 12/7°C, Recovery water temperature 40/45°C												
Cooling capacity	kW	42.3	49	56.7	63.5	73.9	82.4	98.7	111.6	125.2	128.2	137
Thermal power	kW	54.8	63.8	73.2	82	94.8	106.3	126.6	144.1	160.5	164.7	175.4
Total absorbed power	kW	13.2	15.7	17.6	19.7	22.3	25.5	29.8	34.8	37.8	39.1	41.2
Total COP		7.33	7.16	7.38	7.38	7.56	7.4	7.57	7.34	7.55	7.5	7.58
User water values 12/7°C, 40/45°C source water side												
Cooling capacity	kW	42.3	49	56.7	63.5	73.9	82.4	98.7	111.6	125.2	128.2	137
Total absorbed power	kW	13.2	15.7	17.5	19.7	22.3	25.5	29.7	34.8	37.8	39.1	41.2
EER		3.2	3.12	3.24	3.22	3.31	3.24	3.32	3.21	3.31	3.28	3.33
ESEER		5.34	5.14	5.46	5.31	5.57	5.43	5.39	5.39	5.46	5.77	5.55
User water values 12/7°C, 15/10°C source water side												
Thermal power	kW	59.6	69.4	79.5	89.1	103.2	115.3	137.4	156.8	174.3	179.4	190.5
Total absorbed power	kW	13.4	16	17.7	20.1	22.6	25.7	30.1	35.3	38.3	39.6	41.8
COP		4.46	4.34	4.5	4.44	4.57	4.48	4.56	4.44	4.56	4.54	4.56
SCOP		4.59	4.52	4.67	4.65	4.77	4.71	4.66	4.69	4.75	4.91	4.81
Sound power	dB(A)	76	78	78	79	79	81	83	85	85	82	85
Sound power [Low noise]	dB(A)	72	74	74	75	75	77	79	81	81	78	81
Dimensions [LxDxH]	mm	1174x1594x772						1644x1594x772			2374 x1854 x877	1644 x1594 x772

MSW		164P	182P	184P	204P	214P	244P	284P	314P	344P	374P	424P
Utility water temperature 12/7°C, Recovery water temperature 40/45°C												
Cooling capacity	kW	146.1	174	167.9	181.2	197.8	234	255.5	277	313.4	350.3	399.2
Thermal power	kW	188.2	223.3	214.6	232.4	253	297	324.9	352.8	400.1	447.7	506.1
Total absorbed power	kW	45.1	52.8	50	55	59.3	67.1	74.1	81.3	93	104.5	114.9
Total COP		7.42	7.52	7.65	7.51	7.6	7.91	7.83	7.75	7.67	7.63	7.88
User water values 12/7°C, 40/45°C source water side												
Cooling capacity	kW	146.1	174	167.9	181.2	197.8	234	255.5	277	313.4	350.3	399.2
Total absorbed power	kW	45.1	52.8	50.1	55	59.3	67.1	74.1	81.2	93	104.5	114.8
EER		3.24	3.3	3.35	3.29	3.33	3.49	3.45	3.41	3.37	3.35	3.48
ESEER		5.75	5.41	5.96	5.86	5.75	6.15	6.03	6	5.69	5.77	5.89
User water values 12/7°C, 15/10°C source water side												
Thermal power	kW	204.4	242.4	233.7	252.8	274.7	322.2	352.2	382.4	433.7	485	549.2
Total absorbed power	kW	45.5	53.6	50.4	55.6	60	67.7	74.8	82	94	106	115.9
COP		4.49	4.52	4.64	4.55	4.58	4.76	4.71	4.66	4.61	4.58	4.74
SCOP		4.89	4.75	5.01	4.89	4.9	5.05	5.1	5.08	4.94	4.97	5.14
Sound power	dB(A)	82	90	84	85	86	88	88	88	91	93	89
Sound power [Low noise]	dB(A)	78	86	80	81	82	84	84	84	87	89	85
Dimensions [LxDxH]	mm	2374 x1854 x877	1644 x1594 x772	2374 x1854 x877	3130x1854x877							

Also available with 60 Hz power supply

DATA CENTER | INDUSTRIAL | SERVICES

PSW / RSW

MULTIPURPOSE WATER-CONDENSED HEAT PUMPS WITH SCROLL COMPRESSORS

293.7–866.6 kW

MULTI-PROTOCOL COMMUNICATION INTERFACE

SCROLL COMPRESSORS

A2L READY

LOW GWP REFRIGERANT

SHELL AND TUBE HEAT EXCHANGER

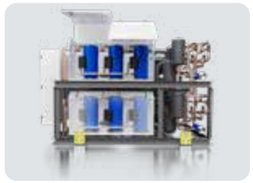
CLASS A

PSW/RSW multifunction units are used to produce hot and cold water, **both independently and simultaneously**, to meet the cooling and heating needs of both industrial and commercial applications. PSW units are ideally suitable for **use in 4-pipe systems**. All units are available with two refrigerant circuits and shell and tube exchangers, for a high level of unit reliability. The arrangement of the components allows **easy access during maintenance**, while the hydraulic connections all on the same side allow for **easy installation** and reduced installation space requirements.

- Electronically controlled expansion valve supplied as standard
- Optional Vic-Taulic hydraulic couplings
- Available in Standard and Low Noise versions
- Programmable electronic control as part of standard equipment
- Smart management of several units in parallel
- Easy access to components for routine maintenance
- Compliance with ERP regulations
- Available in multipurpose version for 4 pipe systems

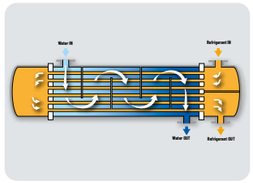
The **PSW / RSW** units can be supplied both with the standard R410A refrigerant, in class A1 (non-flammable), and with the new generation R454B refrigerant, in class A2L (mildly flammable) or in the A2L-ready configuration.

DETAILS AT **Page 5**



Maximum efficiency at partial loads

Accurate selection of the components allows **high efficiency to be obtained at partial loads;** this is thanks above all to the use of Scroll compressors and to the use of electronically controlled electric expansion valves (one for each circuit), **optimised to track refrigerant load trends in all conditions of use.** The shell and tube heat exchanger also ensures low water/refrigerant approach temperatures during operation, **all to the advantage of heat exchange efficiency.**



Reliability: shell and tube

The use of shell and tube exchangers with water flow on the shell side implies **a lower risk of blocking the flow due to exchanger clogging** - compared to units with plate heat exchangers. This is ascribable to larger throughsections - the exchanged power being the same. Additionally, the dual-pass heat exchanger ensures **high heat exchange efficiency** both in "chiller" and in "heat pump" modes, **with lower consumption figures for the user.**

Reduced footprint

The PSW/RSW series has a **compact layout** thanks to the optimised arrangement of the compressors and heat exchangers. **The power density reaches very high values, exceeding 100kW/m².** The lower weight compared to units with screw compressors **facilitates installation and maintenance operations.**

Low noise levels

Thanks to the Scroll compressors used, the PSW/RSW units feature lower noise levels than other compressor technologies used for similar applications. Also, thanks to the use of multi-Scroll technology, at partial loads unnecessary compressors are turned off which results in **a further noise reduction.** For extra soundproofing, the **Low Noise version** is available with soundproofed sheet metal enclosures to compartmentalise the compressors.

PSW		324P	374P	444P	484P	506P	566P	646P	706P
Utility water temperature 12/7°C, Recovery water temperature 40/45°C									
Cooling capacity	kW	293.7	334	398.6	412	442.4	500.6	579	676.2
Thermal power	kW	370.8	423.9	503.6	521.4	558.1	635.7	730.2	866.6
Total absorbed power	kW	77.1	89.9	105.1	109.4	115.7	135.1	151.2	190.3
Total COP		8.62	8.43	8.59	8.53	8.65	8.41	8.66	8.11
User water values 12/7°C, 30/35°C source water side									
Cooling capacity	kW	329.3	374.4	445.6	459.9	498.4	561.4	648.7	692
Total absorbed power	kW	61.9	72.1	84	87.2	92.9	108.3	121.1	130.9
EER		5.32	5.2	5.31	5.27	5.34	5.18	5.36	5.29
User water values 12/7°C, 40/45°C source water side									
Cooling capacity	kW	329.3	374.4	445.6	459.9	498.4	561.4	648.7	692
Total absorbed power	kW	61.9	72.1	84	87.2	92.9	108.3	121.1	130.9
EER		5.32	5.2	5.31	5.27	5.34	5.18	5.36	5.29
User water values 40/45°C, 12/7°C source water side									
Thermal power	kW	370.8	423.9	503.6	521.4	558.1	635.7	730.2	866.6
Total absorbed power	kW	77.1	89.9	105.1	109.4	115.7	135.1	151.2	190.3
COP		4.81	4.72	4.79	4.77	4.82	4.71	4.83	4.55
Sound power	dB(A)	89	89	90	90	91	91	91	90
Sound power [Low noise]	dB(A)	85	85	86	86	87	87	87	86
Dimensions [LxDxH]	mm	3500X2100X1800							

RSW		324H	374H	444H	484H	506H	566H	646H	706H
User water values 12/7°C, 30/35°C source water side									
Cooling capacity	kW	329.3	374.4	445.6	459.9	498.4	561.4	648.7	692
Total absorbed power	kW	61.9	72.1	84	87.2	92.9	108.3	121.1	130.9
EER		5.32	5.2	5.31	5.27	5.34	5.18	5.36	5.29
User water values 12/7°C, 40/45°C source water side									
Cooling capacity	kW	329.3	374.4	445.6	459.9	498.4	561.4	648.7	692
Total absorbed power	kW	61.9	72.1	84	87.2	92.9	108.3	121.1	130.9
EER		5.32	5.2	5.31	5.27	5.34	5.18	5.36	5.29
User water values 40/45°C, 12/7°C source water side									
Thermal power	kW	370.8	423.9	503.6	521.4	558.1	635.7	730.2	866.6
Total absorbed power	kW	77.1	89.9	105.1	109.4	115.7	135.1	151.2	190.3
COP		4.81	4.72	4.79	4.77	4.82	4.71	4.83	4.55
Sound power	dB(A)	89	89	90	90	91	91	91	90
Sound power [Low noise]	dB(A)	85	85	86	86	87	87	87	86
Dimensions [LxDxH]	mm	3500X2100X1800							

HiRef

WATER/WATER

Heating only heat pumps

INDUSTRIAL SERVICES

KSW

WATER/WATER HEAT PUMPS FOR HIGH EVAPORATION AND CONDENSATION TEMPERATURES

38-589.7 kW

MULTI-PROTOCOL COMMUNICATION INTERFACE | SCROLL COMPRESSORS | CORROSION RESISTANT MATERIAL | PLATE HEAT EXCHANGER

HiRef's range of KSW Water/Water heat pumps is designed for all applications where the cold source is at medium temperatures and at the same time, very hot water is required at the condenser - up to 80°C. This particular feature makes KSW units the **ideal solution in the event of medium heat** (up to 45°C) waste heat, which can be used to produce water at higher temperatures in both residential and industrial applications, e.g. district heating systems. All this while **ensuring partial load efficiency, redundancy, compact footprint in utility rooms, low noise levels, auxiliary system management and easy installation**.

- Refrigerant R134a
- Electronically controlled expansion valve supplied as standard
- Optional Vic-Taulic hydraulic couplings
- Optional integrated energy meter via Modbus, for metering the energy absorbed by the machine
- Remote pump control according to constant T or constant ΔT logic

Ideal design for medium temperature heat sources

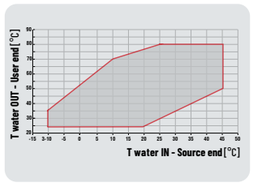
Thanks to the special features of the KSW range, heat sources at temperatures **between 30° and 45°C** (and therefore, unsuitable for direct use) are used by heat pumps **to produce hotter water.** This is true for industrial heat waste, which can be reused to produce, for example, district heating. Similarly, in residential applications, KSW heat pumps can, for example, use in **wintertime fan coil loop water as a heat source** to produce water to feed to high temperature terminals, produce hot water or run anti-legionella cycles.

More space in the heating unit

The adoption of compact plate heat exchangers facing the unit right side panel **maximise the use of the available internal space thanks to reduced unit footprint.**

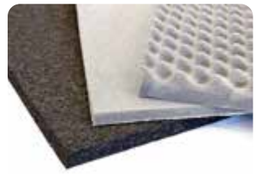
Maximum efficiency at partial loads

The KSW range adopts a multi-Scroll solution also on single circuits, electronically controlled expansion valves, plate heat exchangers and the option to control the (external) circulation pumps **via dedicated software:** all these characteristics allow **high energy efficiency to be achieved at partial loads.**



Optimised units for high temperature water production (80°C)

The KSW range units can produce water **up to 80°C** even when associated with a source of medium-temperature water (up to 45°C). This is thanks to **an accurate sizing of the heat exchangers and to the use of Scroll compressors** specially developed for high evaporation and condensation temperatures.

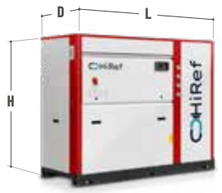


Attention to detail and low noise operation

Scroll compressors, which are the main noise source in the unit, are fitted on rubber feet; **these dampen vibration and therefore attenuate the noise transmitted to the various system parts.** On request, the compressor compartment can be lined with special sound absorbing material and the compressors encased in special insulating hoods **to reduce airborne noise emissions.**

Efficiency and reliability in line with system requirements

The available refrigerating circuit configurations have been designed to ensure, also simultaneously, **redundancy and efficiency at partial loads.** More specifically, the units - depending on the size of the machine and on specific plant engineering requirements - consist of two compressors on two circuits **for high system redundancy** or four compressors (double tandem) on two circuits for a system that is **simultaneously redundant and efficient at partial loads.**



KSW		040K	050K	060K	081K	082K	091K	092K	101K	102K	121K	122K	151K	152K	171K	172K	174K	201K
User water values 70/80°C, 45/40°C source water side																		
Thermal power	kW	38	49.5	61.1	75.6	75.8	83.9	84.1	97.1	97.3	121.3	121.5	148.8	149.3	171	171.3	166.4	191.2
Total absorbed power	kW	8.5	11.2	14.1	16.9	16.9	19	19	22.4	22.3	27.9	27.8	35	35	40.2	40.1	38.3	45.2
COP		4.45	4.41	4.33	4.47	4.49	4.41	4.44	4.34	4.35	4.35	4.37	4.25	4.26	4.26	4.27	4.35	4.23
SCOP		4.18	4.2	4.17	4.91	4.92	4.89	4.94	4.84	4.95	4.86	4.87	4.52	4.59	4.62	4.65	5.15	4.67
Sound power	dB(A)	74	74	78	77	77	77	77	77	77	81	81	84	84	85	85	80	86
Sound power [Low noise]	dB(A)	70	70	74	73	73	73	73	73	73	77	77	80	80	79	79	74	80
Dimensions [LxDxH]	mm	804x1462x607			1174x1594x772										1644x1594x772		2374 x1854 x877	1644 x1594 x772

KSW		202K	204K	221K	222K	241K	242K	244K	301K	302K	304K	344K	404K	444K	484K	554K	604K
User water values 70/80°C, 45/40°C source water side																	
Thermal power	kW	191.3	192	211.4	211.8	240.9	241.7	239.5	291.5	292.3	296.1	339.5	380.5	431.7	474.7	537.1	589.7
Total absorbed power	kW	45.2	45.1	51.4	51.3	56.5	56.4	56.3	69.9	69.9	70.4	80.6	91.2	102.3	114.5	126.3	139.8
COP		4.24	4.25	4.12	4.13	4.26	4.28	4.26	4.17	4.18	4.2	4.21	4.17	4.22	4.14	4.25	4.22
SCOP		4.84	5.14	4.68	4.84	4.72	4.82	5.05	4.65	4.85	4.74	4.84	4.98	5	4.93	4.98	5.01
Sound power	dB(A)	86	80	87	87	88	88	84	90	90	87	88	89	90	91	92	93
Sound power [Low noise]	dB(A)	80	74	81	81	82	82	78	82	82	79	80	81	82	83	84	85
Dimensions [LxDxH]	mm	1644 x1594 x772	2374 x1854 x877	1644x1594x772				2374 x1854 x877	1644x1594x772		2374x1854x877						

Also available with 60 Hz power supply

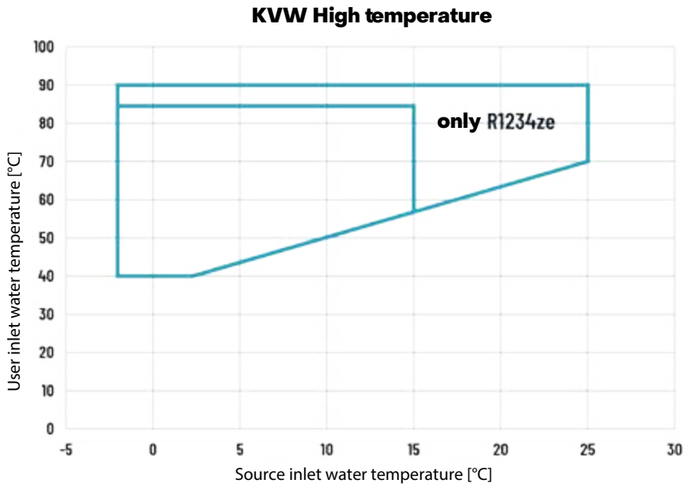
INDUSTRIAL

KVW

HIGH TEMPERATURE HEAT PUMPS WITH TWO-STAGE COMPRESSORS

535-2208 kW

KVW is HiRef's range of water-condensed high-temperature heat pumps with **two-stage screw compressors**, **spray flooded shell and tube evaporator** and **shell and tube condenser**. The units are available with traditional refrigerant R134a or R1234ze, with a **very low GWP** (Global Warming Potential) value. The range covers the thermal power range from 400 to 2000kW* and reaches COP values of 2.2 producing water at +90°C (with R1234ze) from a source at -2°C. The KVW **extra high temperature heat pump series is ideally suitable for low-medium temperature heat recovery to produce hot water for district heating networks or industrial processes**.



- Refrigerant R1234ze and R515B
- Also available with R515B refrigerant on request
- Available in version: heating only heat pumps for high temperatures and chiller with total high temperature recovery.
- Monitoring and limitation of the maximum absorbed power
- Available with screw compressors driven by inverters
- Thermal insulation hoods on the compressors for the high temperature heat pump versions (optional)
- Modulation and supervision managed by the software
- Available in a single-circuit version with a single compressor and a dual-circuit version with two compressors
- External inverter for compressor modulation from 50% to 100%

Power and flexibility

Screw compressor allows achievement of **high cooling capacities** with load modulation via the special slide valve, **with obvious advantages in terms of energy efficiency.**

Two-level evaporation

The unit is equipped with a flooded evaporator with spray technology and double water-side passage. With this technology, **the refrigerant charge is reduced by 30% compared to a standard flooded bundle.**

Standard touch screen display

The KVW series comes with a **touch screen display and customized software and screens as standard.** On request, total web monitoring can be integrated through an Ethernet card

Production of hot water up to 90°C

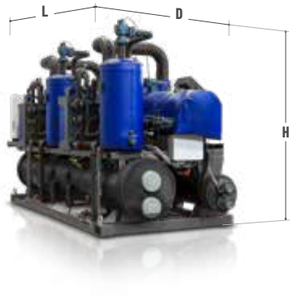
The units of the KVW range **can produce water at a temperature of 90°C even from a very cold source.** Thanks to this feature, the heat pumps can be integrated into the **district heating circuits** even in replacement of traditional heat generators.

Optimised installation space

The unit is available in both standard and 'mirrored' layout versions. When ordered together, the two versions **can be placed adjacent to each other on the long side** in order to occupy **as little space as possible in the heating plant and facilitate maintenance operations.**

Economiser, power and flexibility

The integration of the refrigeration circuit with the economiser allows **the heat output of the heat pump and also the efficiency (COP) to be increased.**



KVW		500K	1001K	2001K
User water temperature 65/85°C, Source water temperature 4/1°C 20% ethylene glycol				
Thermal power	kW	535	1104	2208
Total absorbed power	kW	227.6	460	920
Sound power	dB(A)	96	99	102
Dimensions [LxDxH]	mm	3045X2574X1800	5180X2574X1800	5180X2574X3600

The 2000kW unit includes two 1000kW modules.

HiRef

WATER/WATER

Multipurpose

DATA CENTER | INDUSTRIAL | SERVICES

PLM

POLYMORPH HYDRONIC MODULES FOR WATER/WATER CHILLERS SYSTEMS

MULTI-PROTOCOL COMMUNICATION INTERFACE

PLATE HEAT EXCHANGER

HiRef Polymorph modules provide a **solution that "converts" a water-condensed chiller into a more advanced system**. The water management system is the "master" element of the heating system. Thanks to **a hydronic circuit specially designed for the application, and built-in software to control the different operating modes**, any water-to-water chiller (even of a different brand) can also be used as: a reversible heat pump, a chiller with total recovery, a multipurpose heat pump for 2-pipe systems, a multipurpose heat pump for 4-pipe systems or an air conditioning system with Free-Cooling.

- The PLM module, unlike traditional pumping modules, acts as the "master" unit managing the system, which can be made up of one or more chillers in parallel
- Built-in software for managing the different modes and interfacing with the chiller
- Compatibility with any chiller, even if already present in the system
- VicTaulic type quick water couplings
- Suitable for any chiller size
- Also available in Low-Noise silenced set-up with internal compartment lined with sound-absorbing material
- Standard high efficiency pumps

PLM - POLYMORPH M

2T multi-purpose heat pump

The Polymorph PLM-M module is able to turn a water-condensed chilling-only chiller into **a multipurpose heat pump (with total condensation heat recovery)** suitable for installation in a "twopipe" system. Its possible functions are:

- production of chilled water only;
- hot water production only set-point #1 (e.g. heating);
- hot water production only set-point #2 (e.g. DHW);
- production of chilled water and hot water at the same time set-point #2.

PLM - POLYMORPH P

4T multi-purpose heat pump

The Polymorph PLM-P module is suitable for **all the so-called "four-pipe" systems** where hot and cold water must be produced at the same time. The water/water chiller combined with PLM-P allows the following functions:

- production of chilled water only;
- production of hot water only;
- production of chilled water and hot water at the same time.

PLM - POLYMORPH F

Free-Cooling system

A Dry Cooler water-condensed water chiller can be combined with a Polymorph PLM-F module to convert the system **into a Free-Cooling system.** Outdoor air, if sufficiently cold, is used as a source of cooling capacity **allowing considerable savings of electricity.** Below the TFT (Total Free-Cooling Temperature) the compressors are switched off and the cooling demand is completely **covered with the only consumption being from auxiliaries** (fans and circulators).

PLM - POLYMORPH H

Reversible heat pump

The Polymorph PLM-H module allows **a reversible heat pump to be obtained** for the production of chilled water or hot water when connected to a chilling-only water-water chiller.

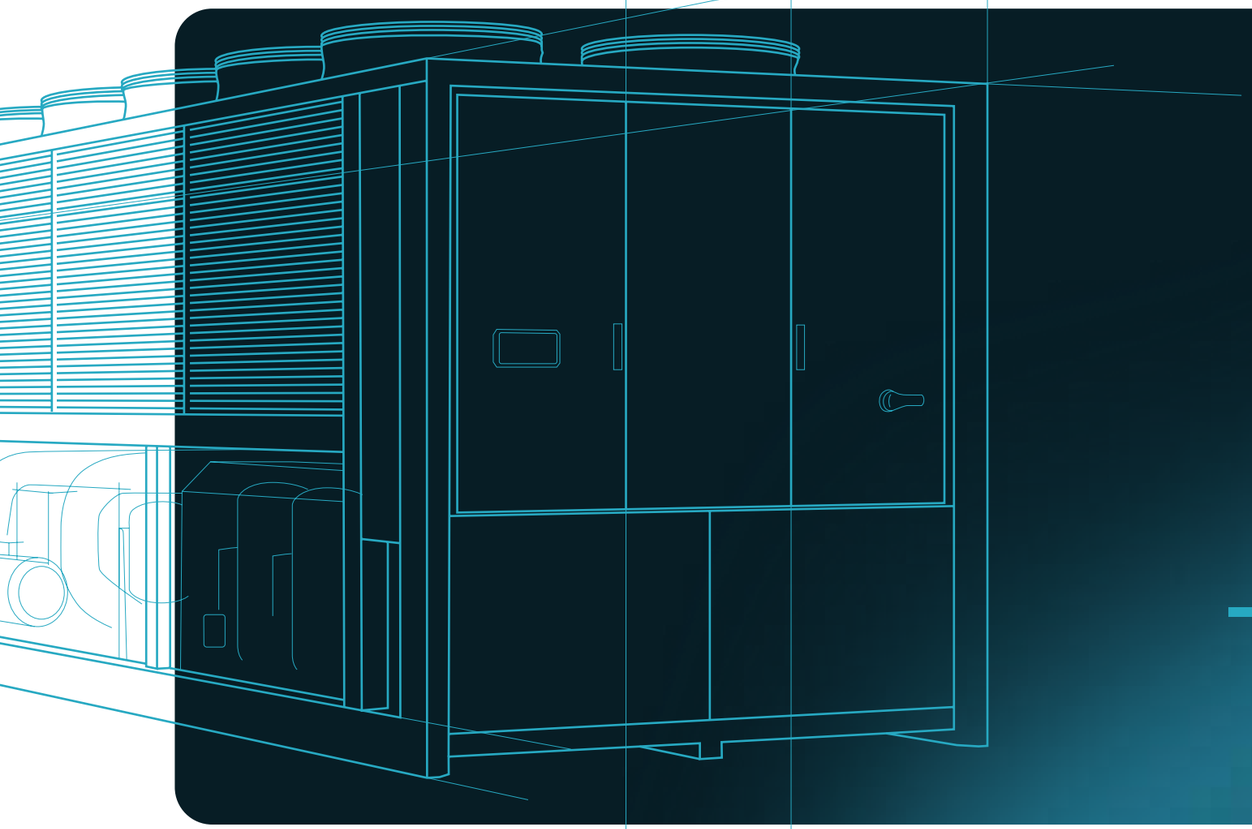
PLM - POLYMORPH R

Chiller with total recovery

The Polymorph PLM-R module, in combination with a water-water chiller, **recovers 100% of the condensation heat** avoiding dissipation to the outside heat source and making heat available for different purposes.

PLM		FRAME 1	FRAME 2	FRAME 3	FRAME 4
Dimensions [LxDxH]	mm	1174x1590x772	1644x1590x772	2374x1850x877	3130x1850x877

Also available with 60 Hz power supply



CATALOGUE

CHILLERS AND HEAT PUMPS

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