

# HiRef

Innovators above  
the standards

SERVICES

DATA CENTER

INDUSTRY



## Chillers and heat pumps air condensed

# TPS

with scroll compressors

Range: 43.2-444.7 kW



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.

## Main advantages

### Is the unit working?

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 multiscroll 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.



## Technological components



### Multi-protocol communication interface

HiRef units can be integrated with the customer's external supervision Building Management System (BMS), using the most popular communication protocols, including Modbus RTU, Modbus/IP, BacNet, LonWorks, SNMP.



### Scroll compressors

Scroll compressors include a mobile scroll, driven by the motor, which completes orbital revolutions and a fixed scroll that is coupled to it. The orbital motion creates a series of gas pockets that move from one scroll to the other. When moving closer to the centre of the scroll, where exhaust takes place, the gas is compressed to smaller and smaller volumes until the desired delivery pressure is reached. Scroll technology improves volumetric efficiency and flow continuity, reduces noise and leakage and eliminates harmful volumes and downtime.



### Axial fans

In axial fans air moves in a parallel direction to the rotation axis and allows large air flows to be processed. Thanks to their low head compared to radial fans, they are used on remote condensers and on components with free outlet into the atmosphere, where there are no high pressure drops due, for example, to ducting.



### Corrosion resistant material

The HiRef outdoor units are protected by a metal structure resistant to corrosion and weathering. They are also made of galvanised steel sheet, with epoxy-polyester powder coating, oven-polymerised at 180°C, to offer a C3 degree of protection. On request, it is possible to order specific paint finishing treatments or a metalwork structure built entirely in stainless steel, to obtain a higher degree of protection from high impact adverse weather events.



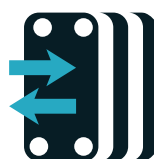
### A2L Ready

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 sub-ranges available also in the "A2L Ready" version, filled with a safety class A1 refrigerant, factory-ready and equipped with all the necessary safety sensors to allow, if the customer requests it, fast refrigerant switching at a later stage.



### Low GWP refrigerant

The Global Warming Potential (GWP) index is a numerical indicator that identifies the environmental impact of a substance. It measures the extent to which a gas contributes to the greenhouse effect, in relation to carbon dioxide (CO<sub>2</sub>) whose baseline value is equal to 1. This parameter is used to determine the amount in kilograms of CO<sub>2</sub> corresponding to the environmental impact of the release of a refrigerant gas into the atmosphere. The use of low GWP refrigerants, such as R513A, R454B, R1234ze, CO<sub>2</sub>, allows the environmental impact of air conditioning systems to be significantly reduced.



### Plate heat exchanger

Brazed plate heat exchangers ensure efficient heat transfer with minimised footprint, eliminate the need for thick frame plates and seals, and ensure high thermal power density. They have a long life cycle, are maintenance-free and withstand both high temperatures and extremely high pressures. This type of exchanger is used in a wide range of applications including cooling, heating, evaporation and condensation.

## Available versions



COOLING ONLY



FREE-COOLING



REVERSIBLE HEAT PUMP

## Types of system



AIR/WATER



## Additional benefits

- 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

# Technical table

TPS	042	052	062	072	082	092	102	122	124	142	144	162	164	174	192	194	212	214	242	244	272	274	294	324	364	394	
<b>COLD USER IN WATER TEMPERATURE 12°C, EHYLENE GLYCOL 20%</b>																											
<b>FULL FREE-COOLING TEMPERATURE</b>	°C	-2.1	-3.2	-2.2	-3.4	-4.4	-2.9	-2.3	-	-4	-	-3.5	-	-6.7	-	-5	-5.5	-6.8	-7	-8	-8.2	-7	-7.1	-7.7	-8.3	-11	-10.5
<b>PESO</b>	kg	671	675	900	910	980	1105	1115	-	1475	-	1490	-	1640	-	1720	1750	1740	1760	1870	1870	2285	2285	2317	2352	2402	3580
<b>SOUND POWER LEVEL</b>	dB	73	74	75	79	82	83	-	81	-	81	-	79	-	88	83	89	85	91	86	91	86	90	92	90	92	
<b>DIMENSIONS [LxHxD]</b>	mm	2090x1740x1180					2640 x1740 x1180	3340 x1740 x1180	3540 x1740 x1180	3340 x1740 x1180	3540 x1740 x1180	3340 x1740 x1180	3540 x1740 x1180	3540x1847x1653					3540 x2247 x1653	4200x2330x1653				4296 x2330 x1653	5350 x2330 x1653		
<b>USER WATER VALUES 12/7°C, 35°C OUTSIDE AIR, 40% U.R.</b>																											
<b>COOLING CAPACITY</b>	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	166.2	189.1	188.4	207.6	211.2	230.1	232	267.2	266	293.2	317.5	352	397.6
<b>TOTAL POWER INPUT</b>	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	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
<b>EER</b>	-	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	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
<b>SEPR</b>	-	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	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
<b>SEER</b>	-	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	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
<b>ESEER</b>	-	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	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
<b>PESO</b>	kg	525	525	540	570	650	730	730	1010	1050	1055	1070	1085	1220	1440	1430	1460	1430	1470	1620	1620	1943	1943	1975	2010	2060	3090
<b>SOUND POWER LEVEL</b>	dB	72	73	79	80	82	85	86	82	86	83	87	85	86	92	87	92	89	94	89	94	93	95	94	97		
<b>DIMENSIONS [LxHxD]</b>	mm	2090x1740x1180					2640 x1740 x1180	3340 x1740 x1180	3540 x1740 x1180	3340 x1740 x1180	3540 x1740 x1180	3340 x1740 x1180	3540 x1740 x1180	3540x1847x1653					3540 x2247 x1653	4200x2330x1653				4296 x2330 x1653	5350 x2330 x1653		
<b>USER WATER VALUES 40/45°C, 7°C OUTSIDE AIR, 89% U.R.</b>																											
<b>THERMAL POWER</b>	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	172.8	199.6	199.3	220.4	226.2	243.7	247.4	275.7	278	311	342.1	395.8	444.7
<b>TOTAL POWER INPUT</b>	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	59	68.9	69.5	75.4	79.1	82.8	85.5	91.4	93	105.7	118.5	132.7	147.5
<b>COP</b>	-	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	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
<b>SEER</b>	-	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	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
<b>PESO</b>	kg	545	545	585	585	675	755	760	1050	1090	1100	1120	1155	1270	1495	1485	1515	1485	1530	1690	1690	2015	2015	2050	2101	2191	3190
<b>SOUND POWER LEVEL</b>	dB	72	73	79	80	82	85	86	82	86	83	87	85	86	92	87	92	89	94	89	94	93	95	94	97		
<b>DIMENSIONS [LxHxD]</b>	mm	2090x1740x1180					2640 x1740 x1180	3340 x1740 x1180	3540 x1740 x1180	3340 x1740 x1180	3540 x1740 x1180	3340 x1740 x1180	3540 x1740 x1180	3540x1847x1653					3540 x2247 x1653	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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