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MSL

HiRef

Innovators above
the standards

SERVICES

DATA CENTER

INDUSTRY



Multi-purpose class A heat pumps

MSL

air condensed with scroll compressors

Range: 279.4-1425.3 kW

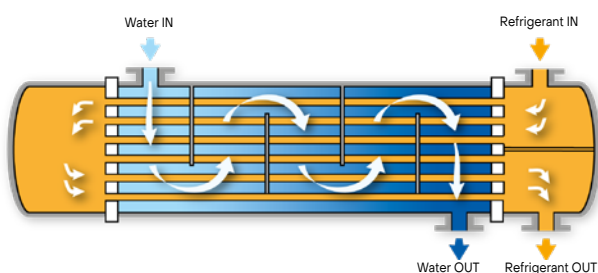


The new MSL range multipurpose units are air/water units in energy class A for both cooling and heating, available for use with R410A refrigerant or, in the “A2L” version, with low environmental impact R454B refrigerant. The MSL range is designed to manage the conditioning of industrial plants and thermal 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.

Main advantages

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 multiscroll 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

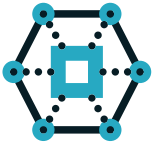
A factor that heavily weighs on the costs of managing the entire plant is finned coil defrosting during wintertime operation. The special management of the defrosting cycle of MSL units minimises the time to completion and ensures that defrosting is only performed when strictly necessary, guaranteeing 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.

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.



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.



Class A

Internal high-tech components suitably chosen and sized allow the units to operate with outstanding levels of efficiency.



Fast restart

The fast restart function (on request) allows the unit to restart quickly after a mains power outage. This optional feature is available with dual power to minimise restart times.



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 (CO₂) whose baseline value is equal to 1. This parameter is used to determine the amount in kilograms of CO₂ 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, CO₂, allows the environmental impact of air conditioning systems to be significantly reduced.



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.



Shell and tube heat exchanger

Some chiller and heat pump product ranges are equipped with a shell and tube exchanger. These heat exchangers are ideally suitable for units to be installed in high-tech industrial sites, thanks to their high reliability and operating stability. Their large volumes also make them less sensitive to thermal stress and capable of ensuring unit operation stability. Finally, the dual-pass exchanger configuration allows both cooling and heat pump operation to be optimised. According to the range chosen, it is possible to have either dry expansion tube exchangers or flooded shell and tube exchangers with spray technology.

Available versions



**POLYVALENT FOR
4-PIPE SYSTEM**

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
- Class A 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

Technical table

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 POWER INPUT	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 POWER INPUT	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
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
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
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 POWER INPUT	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
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
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
SOUND POWER LEVEL	dB	89		90		92	91	92	91		93		94	95	96	
SOUND POWER LEVEL LOW NOISE	dB	86		87		89	87	88	87		89	90	89	90	91	92
SOUND POWER LEVEL SUPER LOW NOISE	dB	84		85		87	85	86	85		87	88	87	88	89	90
DIMENSIONS [LxHxD]	mm		3520 x2680 x2256		4520x2680x2256			5520x2680x2256			6520 x2680 x2256		9085x2680x2256		11085 x2680 x2256	12930 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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