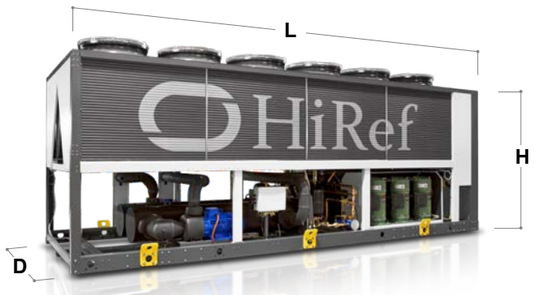
MSL

MULTI-PURPOSE CLASS A HEAT PUMPS

AIR CONDENSED
WITH SCROLL COMPRESSORS



MSL P		284	324	374	404	434	464	506	556	606
		COOLING - Water conditions: user side 12/7°C; outside air temp. 35°C								
Cooling capacity (UNI 14511)	kW	280.2	327.6	368.8	386.9	427.0	449.3	499.7	555.3	610.9
Total absorbed power (UNI 14511)	kW	90.5	102.9	119.3	128.4	131.7	140.5	154.0	175.2	188.5
EER (UNI 14511)		3.10	3.18	3.09	3.01	3.24	3.20	3.25	3.17	3.24
ESEER		4.32	4.37	4.27	4.27	4.42	4.40	4.43	4.41	4.33
		HEATING - Water conditions: user side 40/45°C; outside air temp. 7°C								
Heating capacity (UNI 14511)	kW	304.0	356.7	401.6	424.6	469.2	498.3	546.2	612.0	659.5
Total absorbed power (UNI 14511)	kW	92.6	104.4	121.8	131.1	142.4	151.0	163.6	183.7	200.9
COP (UNI 14511)		3.28	3.42	3.30	3.24	3.29	3.30	3.34	3.33	3.28
SCOP		3.70	3.93	3.68	3.72	3.74	3.71	3.73	3.70	3.43
ERP efficiency	%	145	154	144	146	147	145	146	145	134
ERP Efficiency Class		A+ / L.T. HP	A++ / L.T. HP	A+ / L.T. HP						
		COOLING AND HEATING - Water conditions *								
Cooling capacity (UNI 14511)*	kW	286.4	334.6	376.2	398.3	424.4	448.6	495.6	559.4	606.4
Heating capacity (UNI 14511)*	kW	364.2	424.3	479.3	508.0	539.2	572.3	633.5	712.7	770.6
Total absorbed power (UNI 14511)*		79.0	91.4	104.5	111.6	118.0	126.2	138.8	156.1	167.0
Total COP (UNI 14511)*		8.23	8.30	8.19	8.12	8.17	8.09	8.14	8.15	8.24
Sound power level Lw (standard unit)	db(A)	89	90	91	91	91	92	92	92	92
Sound power level Lw (low noise unit)	db(A)	61	62	63	63	63	64	64	64	64
Dimensions [L x D x H]	mm	3465x2258 x2652	4465x2258x2652			5465x2258x2652		6465x2258x2652		8950x2258 x2652

MSL P		676	748	778	808	858	908	1072
		COOLING - Water conditions: user side 12/7°C; outside air temp. 35°C						
Cooling capacity (UNI 14511)	kW	678.6	752.9	803.9	824.2	872.2	929.8	1133.0
Total absorbed power (UNI 14511)	kW	214.7	233.6	235.2	243.5	260.6	278.3	344.8
EER (UNI 14511)		3.16	3.22	3.42	3.39	3.35	3.34	3.29
ESEER		4.36	4.37	4.44	4.45	4.43	4.43	4.53
		HEATING - Water conditions: user side 40/45°C; outside air temp. 7°C						
Heating capacity (UNI 14511)	kW	746.3	805.4	854.1	880.4	938.2	996.8	1223.5
Total absorbed power (UNI 14511)	kW	225.4	247.3	263.8	273.4	289.9	301.7	374.5
COP (UNI 14511)		3.31	3.26	3.24	3.22	3.24	3.30	3.27
SCOP		3.59	3.50	3.35	3.37	3.45	3.55	3.60
ERP efficiency	%	141	137	131	132	135	139	141
ERP Efficiency Class		A+ / L.T. HP						
		COOLING AND HEATING - Water conditions *						
Cooling capacity (UNI 14511)*	kW	208.3	231.1	256.1	276.5	291.1	342.9	369.7
Heating capacity (UNI 14511)*	kW	278.7	308.4	338zzzz.7	367.7	392.5	451.4	485.5
Total absorbed power (UNI 14511)*		71.0	77.9	83.8	92.4	102.3	110.1	117.6
Total COP (UNI 14511)*		6.86	6.93	7.09	6.97	6.68	7.21	7.27
Sound power level Lw (standard unit)	db(A)	94	94	94	94	94	95	95
Sound power level Lw (low noise unit)	db(A)	87	87	87	87	87	88	88
Dimensions [L x D x H]	mm	3538x1653x2330		4206x1653x2330			3065x2250x2650	

*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

Also available with 60 Hz power supply

HIREF S.p.A.
Viale Spagna, 31/33
35020 Tribano (PD) Italy
Tel. +39 049 9588511
Fax +39 049 9588522
e-mail: info@hiref.it
www.hiref.it

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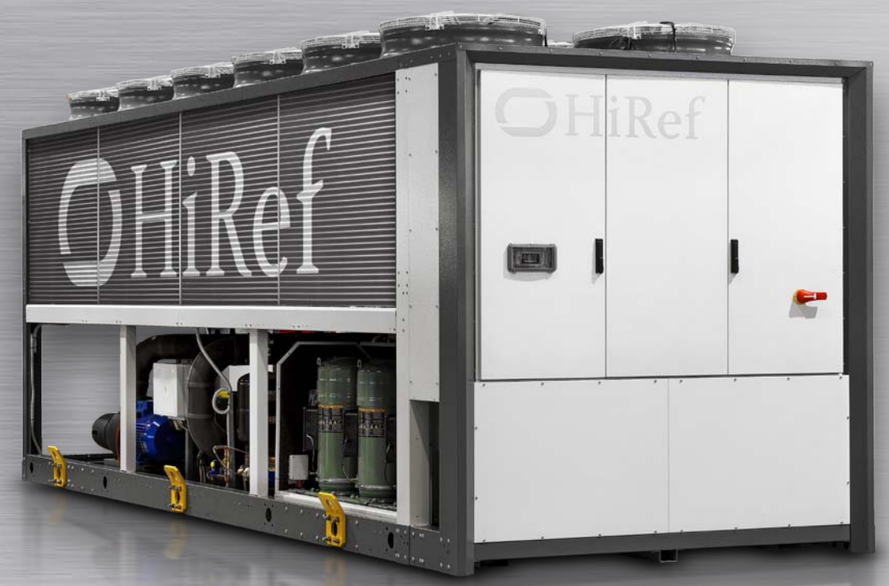
ITALIAN COOLING SOLUTIONS

HiRef

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

A2L READY
R 454B



308 - 1200 kW

MSL

MULTI-PURPOSE CLASS A HEAT PUMPS

AIR CONDENSED WITH SCROLL COMPRESSORS

R410A

GWP = 2088 (AR4)

R454B

GWP = 466 (AR4)

AVAILABLE WITH TRADITIONAL R410A REFRIGERANT

AVAILABLE IN A2L READY VERSION

Supplied with R410A, the unit is configured and equipped with all the safety devices necessary for use with a mildly flammable refrigerant (class ASHRAE A2L). This allows the old generation refrigerant to be subsequently replaced with the new class A2L, low environmental impact R454B (**GWP -78%**), so as to be able to manage system adjustment to the F-GAS Directive on the use of high GWP substances within the required timeframe.

AVAILABLE WITH R454B REFRIGERANT CHARGE (A2L)

HiRef, in compliance with the European "F-Gas" standard which applies gradual but increasingly stringent restrictions to the use of HFC refrigerant gases (79% reduction of tonnes of equivalent CO2 by 2030) encourages the development and use of new ultra-**low GWP** refrigerants, more environment friendly than traditional gases. At HiRef, we care about sustainability and we believe that this class of refrigerants is the solution that best preserves long-term investments as a perfect combination of value, safety (they are only slightly flammable) and eco-compatibility.

SYSTEM SAFETY PRECAUTIONS AND MEASURES

A2L class refrigerants are slightly flammable and therefore require certain precautions in the air conditioning system to avoid the risk of igniting fires by preventing, through an adequate design, leaks of refrigerant which could evolve into possible fire risks. The main safety measures suggested by HiRef include the installation of a refrigerant presence sensor and a ventilation kit, controlled by an alarm detection and management system.

REFRIGERANT PRESENCE SENSOR

A sensor is installed inside each independent 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 SYSTEM

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 the control system sends a shutdown command to the components of the refrigeration circuit.

VENTILATION SYSTEM

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

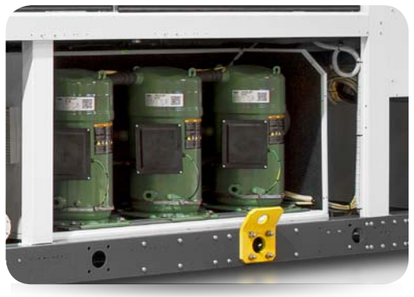
The new **MSL** range chillers and heat pumps are air/water units in energy class A for both cooling and heating, available for use with R410A refrigerant or, in the "A2L" version, with low environmental impact R454B refrigerant. The MSL range is designed to manage the conditioning of industrial plants 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, tube bundle water heat exchangers optimised for use with high pressure refrigerants (R410A/R454B) and axial fans suitable for outdoor installation.

RELIABILITY: TUBE BUNDLE

The use of tube bundle 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 through-sections, the exchanged power being the same. Additionally, the dual-pass heat exchanger allows high heat exchange efficiency both in "chiller" and in "heat pump" modes, resulting in lower consumption for the user.

MAXIMUM 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 thus 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 **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.

- 3 Different soundproofing set-ups 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
- Optional EC motor fans
- Electrically controlled expansion valve
- Easy accessibility thanks to the optimization of the internal space
- Programmable microprocessor control with proprietary software
- Compliance with ERP regulations