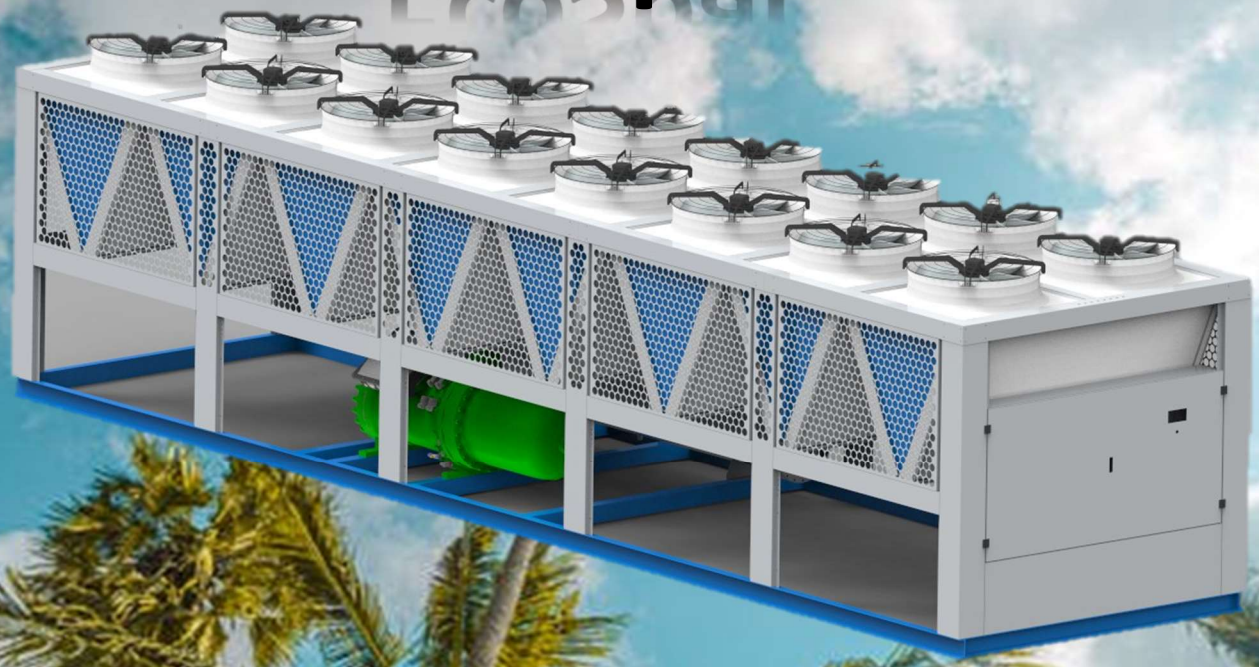
SIRE

CHILLERS

Air cooled screw

EcoSpar



The **EcoSpar** for life!

Why EcoSpar series?

because we produce a chiller that has a condenser **delta t** that nobody uses in the chillers market.

Because we can guarantee that this chiller withstands desert temperatures.

because we can start the equipment at high water temperatures, ambiguous ambient temperatures

because our electrical components are always below temperature, ambient when it is high

because our compressors have a response in high temperature conditions, which is difficult to verify in equipment of this kind.

because their durability is huge, above the expectations of our customers

because we have customers in many countries who have opted for our quality over price

because SIRE is thinking about its customers and the most important thing was to guarantee the longevity of the equipment, which is definitely related to the construction of an equipment, the analysis of its application, the application area, the external conditions, the environmental aggressiveness. , material strength and fatigue,

SIRE has scrupulously selected for its WecoSpar groups the best that the new cold technology can give you.

Durability, endurance, thermal efficiency, energy efficiency

are key points in the construction of our equipmentessentially SIRE thinks, in the reduction of energy consumption, durability of its equipments, and longevity of its equipments.

Reliability

Low energy consumption

Longevity

Durabiliday

R134a R513A

Warrant

EcoSpar	122B	144B	180B	240B	260B	310B	360B
cooling capacity KW	122	144	179	238	264	310	366
cooling capacity Tr	35	41	51	68	75	88	104
power absorbed kW	36.8	44.1	53.5	70.5	72.7	90.6	103.6
EER	3.32	3.27	3.35	3.38	3.63	3.42	3.53
ESEER	4.59	4.39	4.79	3.57	4.94	4.87	4.99
Efficiency Class (factory)	B	B	B	B	B	B	B
Sound Standard	89	89	91	91	92	87	88
modo eco	Y	N	N	Y	y	Y	Y
compressor							
compressors nº	1	2	2	2	2	2	2
model	7553.5	6553.35	6563.4	7553.5	6593.63	7573.7	7583.8
power absorbed kW	34.5	41.8	51.2	68.2	70.4	86	99
Current A	52.9	87.3	91,8	117,6	124.6	172	170
evaporator							
evaporator nº	1	1	1	1	1	1	1
evaporator flow m3/h	21	25	31	41	45	53.5	63
evaporator Kpa loss charge	28	54	54	30	46	55	62
evaporator nº of passes	2	2	2	2	2	2	2
fouling factor ff m2*K/KW	0.000043	0.000043	0.000043	0.000043	0.000043	0.000043	0.000043
condensers							
nº	2	2	4	4	6	6	6
facial air flow m3/h	4.6	4.6	4.6	4.6	4.6	4.6	5.1
fans quantity	2	2	4	4	4	6	6
fans diameter / mm	800	800	800	800	800	800	800
Rpm	925	925	925	925	925	925	925
current A	1.85	1.85	1.85	1.85	1.85	1.85	1.85
Power absorbed	1.15	1.15	1.15	1.15	1.15	1.15	1.15
operation limits							
Maxi. ambient temp. ºC	55	55	55	55	55	55	55
Min ambient temp. ºC	-20	-20	-20	-20	-20	-20	-20
sound level 10 meters	79	78	81	81	81	81	80
Power and current Max.							
Power absorbed kW	52	68	82	104	112	156	176
current A	79	77.8	122	158	216	248	288
Power factor	*80*	*0.88*	*0.88*	*0.88*	*0.88*	*0.88*	*0.88*
Switch size A	100	100	125	200	250	250	250
Rating kA short circuit	35	35	35	35	35	35	35
Chillers Data							
water connections inch	3	3	4	4	4	5	5
Weight kg	1312	1477	1912	2101	2890	3570	3770
Width mm	2300	2300	2300	2300	2300	2300	2300
Depth mm	1260	1260	2380	2380	3500	3500	3500
Height mm	2295	2295	2295	2295	2295	2295	2295
refrigerant gas kg R134A	18 x 2	22 x 2	24 x 2	27 x 2	31 x 2	44 x2	47 x 2
optional R513A							
air operation limits ºC	+47	+47	+47	+47	+47	+47	+47

Evaporator Water temperature 12ºC/º7C air +35ºC according EN 145111- 2013

Range of application: Water -15ºC at + 25ºC

air +45ºC

we reserve the right to modify or alter design or any equipment without prior notice

EcoSpar	410B	450B	500B	550B	620B	650B	720B
cooling capacity KW	408	462	500	561	626	662	726
cooling capacity Tr	116	131	144.4	160	178	188	197
power absorbed kW	119	131	144	160	172	191	209
EER	3.44	3.52	3.48	3.51	3.64	3.47	3.47
ESEER	4.69	4.73	3.88	5.27	5.45	5.34	5.11
Efficiency Class (factory)	B	B	B	B	B	B	B
Sound Standard	88	89	91	92	87	92	89
modo eco	Y	Y	N	Y	Y	Y	y
compressor							
compressors nº	2	2	2	2	2	2	2
model	858380	856390	85110125	85110125	85125140	85140140	95140160
power absorbed kW	109.4	122.2	132.2	148.5	158.2	177	193
Current A	173	199.2	230	253	286	301	323
evaporator							
evaporator nº	1	1	1	1	1	1	1
evaporator flow m3/h	71	80	86	97	108	114	125
evaporator Kpa loss charge	51	46	67	85	52	52	52
evaporator nº of passes	2	2	2	2	2	2	2
fouling factor ff m2*K/KW	0.000043	0.000043	0.000043	0.000043	0.000043	0.000043	0.000043
condensers							
nº	8	8	10	10	12	12	14
facial air flow m3/h	5.1	5.1	5.1	5.6	5.6	5.6	5.6
fans quantity	8	8	10	10	12	12	14
fans diameter / mm	800	800	800	800	800	800	800
Rpm	940	940	940	940	940	940	940
current A	1.85	1.85	1.85	1.85	1.85	1.85	1.85
Power absorbed	1.15	1.15	1.15	1.15	1.15	1.15	1.15
operation limits							
Maxi. ambient temp. ºC	55	55	55	55	55	55	55
Min ambient temp. ºC	-20	-20	-20	-20	-20	-20	-20
sound level 10 meters	82	82	82	81	82	82	82
Power and current Max.							
Power absorbed kW	176	192	242	230	251	262	286
current A	288	310	398	378	437	428	494
Power factor	*0.88*	*0.88*	*0.88*	*0.88*	*0.88*	*0.88*	*0.88*
Switch size A	400	250	250	400	400	400	400
Rating kA short circuit	35	35	35	35	35	35	35
Chillers Data							
Water connections	5	5	6	6	6	6	6
Weight kg	4050	4460	4940	5037	5402	5560	5789
Width mm	2300	2300	2300	2300	2300	2300	2300
Depth mm	4620	4620	5740	5740	6860	6860	7980
Height mm	2295	2295	2295	2295	2295	2295	2295
refrigerant gas kg R134A	99 x 2	107 x 2	110 x 2	110 x 2	118 x 2	120 x2	123 x 2
optional R513A							
air operation limits ºC	+47	+47	+47	+47	+47	+47	+47

Evaporator Water temperature 12ºC/º7C air +35ºC according EN 145111- 2013

Range of application: Water -15ºC at + 25ºC

air +45ºC

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EcoSpar	730B	790B	850B	910B	970B	1030B	1100B
cooling capacity KW	735	791	848	910	972	1034	1114
cooling capacity Tr	208	225	220	258	276	290	316
power absorbed kW	214.3	229.4	261.8	263.7	278.7	297	337
EER	3.43	3.45	3.24	3.45	3.49	3.48	3.31
ESEER	5.27	4.64	5.18	5.24	5.31	5.44	4.83
Efficiency Class (factory)	B	B	B	C	C	B	B
Sound Standard	88	89	86	89	84	81	87
modo eco	**N**	**N**	**Y**	**N**	**N**	**N**	**N**
compressor							
compressors nº	2	2	2	2	2	2	2
model	5160.18	9573180	180.21	9583210	210.24	9593240	280.28
power absorbed kW	198.2	211	243.4	243	258	274	314
Current A	327	338	360	410	434	458	462
evaporator							
evaporator nº	1	1	1	1	1	1	1
evaporator flow m3/h	127	136	146	156.5	168	178	192
evaporator Kpa loss charge	62	48	68	91	91	91	76
evaporator nº of passes	2	2	2	2	2	2	2
fouling factor ff m2*K/KW	0,000045	0.000043	0.000043	0.000043	0.000043	0.000043	0.000043
condensers							
nº	14	16	16	18	18	20	20
facial air flow m3/s	5.6	5.6	5.6	5.6	5.6	5.6	5.6
fans quantity	14	16	16	18	18	20	20
fans diameter / mm	800	800	800	800	800	800	800
Rpm	940	940	940	940	940	940	940
current A	1.85	1.85	1.85	1.85	1.85	1.85	1.85
Power absorbed	1.15	1.15	1.15	1.15	1.15	1.15	1.15
operation limits							
Maxi. ambient temp. ºC	55	55	55	55	55	55	55
Min ambient temp. ºC	-20	-20	-20	-20	-20	-20	-10
sound level 10 meters	81	83	83	81	81	83	84
Power and current Max.							
Power absorbed kW	330	350	330	408	426	444	508
current A	590	620	590	640	680	720	826
Power factor	*0.88*	*0.88*	*0.88*	*0.88*	*0.88*	*0.88*	0.88
Switch size A	400	400	630	630	630	630	630
Rating kA short circuit	35	35	35	35	35	35	35
Chillers Data							
water connections	6	6	8	8	8	8	8
Weight kg	5804	6220	7205	7883	7970	8265	8349
Width mm	2300	2300	2300	2300	2300	2300	2300
Depth mm	7980	8890	9910	10220	10220	11240	11240
Height mm	2295	2295	2295	2295	2295	2295	2295
refrigerant gas kg R134A	129 x 2	138 x 2	139 x 2	145 x 2	147 x 2	153 x 2	155 x 2
optional R513A							
air operation limits ºC	+47	+47	+47	+47	+47	+47	+47

Evaporator Water temperature 12ºC/º7C air +35ºC according EN 145111- 2013

Range of application: Water -15ºC at + 25ºC

air +45ºC

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EcoSpar	1250B	1350B	1460B	1580B	1700B	1800B	1920B
cooling capacity KW	1252	1361	1468	1584	1700	1820	1924
cooling capacity Tr	344	390	418	450	483	520	547
power absorbed kW	316	388.6	428.6	449.9	482.5	486	577.8
EER	3.96	3.50	3.43	3.52	3.49	3.75	3.62
ESEER	5.55	5.76	5	5.81	5.07	5.17	5.77
Efficiency Class (factory)	B	B	C	B	B	B	B
Sound Standard	85	88	89	89	91	89	97
modo eco	Y	Y	N	N	Y	N	N
compressor							
compressors nº	2	2	4	4	4	4	4
model	103.28	113320	210210F	9573180	180.21	210210	210810
power absorbed kW	293	361	401	420	452	486	492
Current A	566	568	711	684	752	820	897
evaporator							
evaporator nº	1	1	2	2	2	2	2
evaporator flow m3 /h	216	234	255	272	293	313	331
evaporator Kpa loss charge	80	88	2 x 68	71	77	68	69
evaporator nº of passes	2	2	2	1 + 1	1 + 1	1 + 1	1 + 1
fouling factor ff m2*K/KW	0.000043	0.000043	0,000043	0.000043	0.000043	0.00043	0.00043
condensers							
nº	22	22	24	24	26	26	28
facial air flow m3/s	5.8	5.8	5.8	5.8	5.8	5.8	5.8
fans quantity	22	22	24	24	26	26	28
fans diameter / mm	800	800	800	800	800	800	800
Rpm	1020	1020	1020	1020	1020	1020	1020
current A	1.85	1.85	1.85	1.85	1.85	1.85	1.85
Power absorbed	1.15	1.15	1.15	1.15	1.15	1.15	1.15
operation limits							
Maxi. ambient temp. ºC	55	55	55	55	55	55	55
Min ambient temp. ºC	-10	-10	-10	-10	-10	-10	-10
sound level 10 meters	83	86	89	89	88	88	89
Power and current Max.							
Power absorbed kW	508	602	984	800	758	816	816
current A	826	1020	1480	1332	1260	1280	1424
Power factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Switch size A	630	1250	1500	1500	1500	1500	1500
Rating kA short circuit	35	35	35	35	35	35	35
Chillers Data							
water connections	8	10	10	10	10	12	12
Weight kg	9765	9893	10560	11340	11768	12540	13960
Width mm	2300	2300	2300	2300	2300	2300	2300
Depth mm	11120	12131	12131	13151	13151	14171	14171
Height mm	2295	2295	2295	2295	2295	2295	2295
refrigerant gas kg R134A	187 x 2	205 x 2	212x4	131x4	241 x 4	252 x 4	272 x4
optional R513A							
air operation limits ºC	+47	+47	+47	+47	+47	+47	+47

Evaporator Water temperature 12ºC/º7C air +35ºC according EN 145111- 2013

Range of application: Water -15ºC at + 25ºC

air +45ºC

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TECHNICAL DESCRIPTION

Thank you very much for choosing SIRE
Sire produces high energy efficiency chiller, alias this is one of the fundamental points of our construction, there is a huge concern in the construction of our air condensers reducing its Dt as much as possible in order to reduce the discharge temperatures in its compressors
the use of inverters in both fans and compressors, bring exceptional energy efficiency with enormous results in their efficiency, from the standard chiller to the high efficiency chiller (the latter full inverter)
points to consider in your EcoSpar: interface system, Modbus and BACnet and interaction at a distance screen of lines or touch visualization of high and low pressures on the monitor avoiding pressure gauges that cause leakage of material wear intuitive menus with monitoring of the behavior time equipment in general, pressures, consumption, phases, overheating, undercooling, expansion valve control with constant monitoring, speed control for ventilation and compressors, when using inverters control of water pumps
air temperature readings, and water Condensers, with a shorter Delta t, thus reducing discharge pressures and drastically reducing the consumption of the air condenser protection device, in terms of aluminum and aluminum covers whenever necessary, very careful and low sound system
compressor enclosure whenever necessary variable speed for ERp21 fans
Variable speed whenever requested for compressor adiabatic system whenever necessary
ventilation collars with noise reduction pipe insulation
Gaz refrigerant according to EU F gas standards, with low GWP, and low refrigerant charge
use of gases such as R134a, R513A, 1234ze
drastic reduction in leakage potential, by using piping without welds, whenever possible using microchannel vibration eliminators to avoid any pipe degradation and leakage the chillers are tested in the factory, with close supervision and certification concepts in course by certified bodies, from construction to consumption and refrigerating power working operation of standard chillers, this is guaranteed between + 25ºC and -10ºC in water and - 10ºC in air and + 47ºC in air for special chillers for Middle East or desert, between ºC at + 55ºC in the air. Any other situation can be revised and changed at the factory depending on the customer's wishes and whenever possible. Chillers are also designed using shell and tube evaporators in semi-flooded or flooded regime. In the EcoSpar and WecoSpar class, the evaporator is shell and tube In the Spar class the heat exchanger is made of stainless steel and copper-plated plates. Compressors are carefully chosen at SIRE, due to their consumption and durability and efficiency.

TEC

Housing

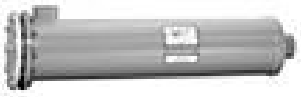
The structure base of the chiller is made in UPN steel with 160mm x 6mm thickness

The unit housing shall consist of a frame construction of galvanized our **stainless steel**, profiles at least 1,5mm thick assembled with bolts and cast stainless steel, our galvanized corner joints. The outer panels shall be galvanized our stainless steel and internally noise insulated in the compressors department (when demanded).

Frame panels shall be finished in stainless steel or dry powder epoxy resin paint, our stainless steel to provide an additional weather-proof protection.

Filter-drier

Consisting of a blend of highly effective desiccants. The quality features built into it assure years of service on any refrigeration system.



Air to Water

The Unit is equipped
With at least two or four
Compressors and two or four
Independent refrigerant
circuits. Starting delay shall assure that the compressors do not start simultaneously in order to reduce the starting current.
For Units with total compressor

Water to refrigerant heat exchanger

It shall be of high efficiency and
externally well insulated.
Shell and tube evaporator
Brazed stainless steel plate heat
Exchangers shall be used up to a total compressor absorbed power of 25 kW and shell and tube type in larger Units.

Air to refrigerant heat exchanger (condensers) Large condensers

It shall be manufactured from seamless copper tubes and aluminium fins with properly formed surface for high heat transfer efficiency. Copper tubes
shall be mechanically expanded into the aluminium fins accomplishing a good contact thus maximum heat transfer. **Adiabatic** system is also providing with more than +48C on air. The chillers with +50C they add a tropical condenseur.

The new microchannel condenser is also providing, by demand in this model. However, we advise the use of this condenser only in clean places or far away from the sea area, with a clean ambient.

Expansion control device

Electronic expansion valves are also used.

Refrigerant pressure gauges

Glycerine type pressure gauges shall be used for measuring the suction and discharge pressure of each refrigerant circuit; our electronic advices are used also, to provide reading pression points

Housing

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Frame panels shall be finished in stainless steel or dry powder epoxy resin paint, our stainless steel to provide an additional weather-proof protection

Electrical panel
The package includes an electrical panel in a water proof enclosure, mounted inside the Unit. It shall contain:
-Compressor and fan motors contactors;
-Auto-fuse for the control circuit, magnetic break circuits in every compressor;
-Low- and high-pressure switches; pression transducers
-Phase asymmetry and under-voltage relay;
-Selection for summer or winter operations (in heat pumps);
-Terminals for external electric heater (in heat pumps);
-Indicating lamps for crankcase heater;
-Indicating lamps for phase asymmetry and under voltage;

Microprocessor based controller
The package includes microprocessor-based controller, which should provide the following functions:
-Temperature control (heating, cooling);
-Freeze-up protection;
-Compressor starting delay;
-Operation of the fans and of the water pump;
-Selection of the compressor starting order;
-Protection against high and low refrigerant pressure as well as low flow (connection with relevant switches);
-
The electric panel board, contain; contactors, phase asymmetries and under voltage relay, (in some models) thermal protections, fuses, control circuit breakers, INT relays, switch breaker, and the microprocessor our PLC controller. The electrical panel is in a water proof enclosure system. MICROPROCESSADOR
SIRE has as control equipment, one of the most advanced types of Microprocessor (several).

This equipment in the series is based on some of the following items:

The controller, checking all the parameters, control systems, and functions of the unit, and protects whenever it is necessary.

The same where necessary provides all the functions of alarm that you are against it, the figures are usually visible on their monitors. The programming system provides sophisticated means, for some of the functions described below:

System P + I or P
Control of adjustable temperature…
Several step points…
Control of water pumps…
Delays to the start of compressors (part. wending) conform capacity…
Starting in empty…
Control of capacity…
Selection of variable start of compressors…
Protection against high and low pressure, oil, ice, etc.…
Display for reading codes, errors, failures…
remote controls when requested

Modbus system is possible
All kind of diagnostic codes
Monitoring of fazes control
External monitorization
And yet for some more advanced microprocessors, various types of connections including modems and other external systems (options)
all this facility depending for the kind of chiller selected.
SIRE provide to our costumer the possibility of cooperation to building all kind of chiller situation by client design and by their demand

SIRE Chiller capacity control

The system is prepared to give different work conditions in the chiller

1

Stepped capacity control with control at inlet
All compressors and the relevant capacity control steps will be proportionally positioned in the band. Increasing temperature values will cause the control steps to be
subsequently input. Each step will be input according to the set delay times. The compressors will be started at the first entered capacity control stage. If special management of the first capacity control stage was selected, control will be effected according to the description in the dedicated section. In any event, the times for the capacity controls will be applied as described.

2

Stepped capacity control with control at outlet

A description of stepped capacity control of 4 compressors with four capacity control steps each:

Activation of compressors

if the water temperature measured by the probe located at the evaporator outlet exceeds the threshold of Control Set-point + Control Band the number of power stages will be increased - the power stages were input according to the set parameter known as "delay between power-up of different devices

3

Continuous capacity control

A maximum number of four compressors are managed, with continuous capacity control. The compressor's capacity is controlled by two relay outputs, which, when suitably controlled, enable compressor power to be increased or reduced, varying the capacity of the compression chamber. Compressor power is controlled by sending impulses to the outputs of the capacity control relays. These impulses command the compressor to be charged or discharged. These impulses are at a constant frequency, settable, and of variable duration between two minimum and maximum limits, also settable. As there is no acquisition regarding the absolute position of the compressor 's capacity control valve, and, consequently, as no direct verification is possible of the power percentage input in the circuit, a time based control is run. With this control, when a set time threshold is reached, the compressor is considered fully charged/discharged and thus control of the capacity control impulses are suspended.

4

Inverter variable speed control, can be included in the compressor or outside of compressor

110 .. 1,156 m^3/h based on variable speed

Semi-hermetic compact with integrated frequency inverter CSV or outside module inverter

Chilled Water Pump Control — Unit controls provide an output to control the chilled water pump(s). One contact closure to the chiller is all that is required to initiate the chilled water system.

Series Chiller Arrangements

Another energy-saving strategy is to design the system around chillers arranged in series. The actual savings possible with such strategies depends on the application dynamics and should be researched by consulting your SIRE chiller. Systems Solutions Representative and applying the SIRE System analyzer program. It is possible to operate a pair
of chillers more efficiently in a series chiller arrangement than in a parallel arrangement. It is also possible to achieve higher entering-to-leaving chiller differentials, which may, in turn, provide the opportunity for lower chilled water design temperature, lower design flow, and resulting installation and operational cost savings. The SIRE screws compressor also has excellent capabilities for “lift,” which affords an opportunity for savings on the evaporator water loop.

Water to refrigerant heat exchanger

It is made for high efficiency and is externally well insulated.
In this series of chillers, Sire uses, shell and tube evaporators,

Fans

They have 3-phase (6-pole or 8-pole) motors with external rotor, closed type IP 54 (according to DIN 40050). The bearings of the motors are closed type, filled with special lubricant, thus requiring no maintenance and guaranteeing noiseless performance.
Fan the propellers are axial type, statically and dynamically balanced according to VDI 2060, with aerodynamically designed blades for quiet operation. The motor shall be protected against over current
by internal thermal contacts according to VDE 0730.
ERP 2021 norm

Very low noise speed

EC variable fan control speed With

Eco device System ECOSPAR
Increase more 15% of capacity in the chiller
Sire... chillers between 24 at 36 months of guarantee
The best guarantee in Market

Declare under our sole responsibility that the product ranges

DTD.

to which this declaration relates is in conformity with the following standards or other normative document(s).

EN directive for pression equipment's PED 2014/68/UE

EN 60529 (2000) Degrees of protection provided by enclosures (IP code)

EN 60335-2-40 (2006) Household and similar electrical appliances, Part 2-40

EN 61000-6-2 (2006) Electromagnetic compatibility (EMC), Part 6-2

EN 61000-6-3 (2007) Electromagnetic compatibility (EMC), Part 6-3

ISO 12100-2 (2004) Safety of machinery, Part 2.

EN 14511-1,2,3,4 (2008) Air conditioners, liquid chilling packages and heat pumps with electrically driven compressors for space

Machinery 2006/42/EC

Electromagnetic compatibility 2004/108/EC

Low voltage 2006/95/EC

ECODESIGN

company certification by

Selection software SIRE