Air-cooled Oil-free Centrifugal Chiller

229~1324kW

CLIMAVENETA

WHEN STRIVING FOR HIGHEST EFFICIENCY

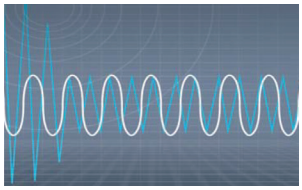
Today's office buildings, hotels, large shopping and leisure complexes, all the most prestigious projects require leading edge solutions to meet extremely demanding challenges:

PRECISE ATTENTION TO COMFORT AND NOISE EMISSIONS

To guarantee ideal temperature, humidity and air quality go together with the need to reduce noise emissions and vibrations. This is a decisive aspect in order to ensure adequate comfort, as well as to comply with noise emission regulations.

VERY STRICT ENERGY EFFICIENCY AND SUSTAINABILITY REQUIREMENTS

Reduced initial investment and running costs, compliance with increasingly strict energy consumption and environmental impact regulations, are becoming more and more crucial factors not only for real estate valuation, but also in deciding if the project should proceed.



INFRASTRUCTURE AND TECHNICAL SPACE OPTIMIZATION

The real estate value, especially with expensive, prestigious investment in urban environments may be determined also by the quality of the electrical system installed. Hence, choices that do not overload electrical infrastructure are more and more desirable.

TECS2 IS THE MOST ADVANCED SOLUTION

Resulting from the recognised prestige of Climaveneta brand products utilising magnetic levitation technology, TECS2 air and water source chillers are the most efficient and reliable solution available in the market today.

ESEER 5.87 for TECS2 with all the advantages in terms of reliability and technical support, due to Climaveneta's unbeatable know-how of this technology, for a truly ideal answer to the challenge of the most demanding applications:

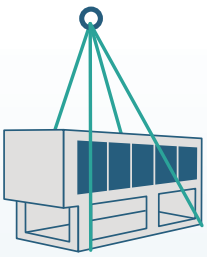
UNBEATABLE EFFICIENCY AT PART LOAD

E.S.E.E.R.
5.87

At partial load, TECS2 units are far more efficient than traditional scroll/screw units, with ESEER values up to 60% higher.

Running cost savings are evident and consistent, especially when all year round operation is required.

SIMPLIFIED LOGISTICS



Turbocor compressors feature an extremely advantageous capacity / weight ratio. The considerable weight reduction allows simplified site operations.

EXTREMELY SILENT OPERATION

Thanks to the adoption of the centrifugal compressor with magnetic levitation, and, in air source units, of fans with reduced noise emission, TECS2 sound power and pressure are the lowest on the market, without peaks in any of the sound frequency spectrum.

Vibrations are dramatically reduced as well, with considerable advantages in terms of transmission to the building.

LOW IN RUSH CURRENT

A further benefit is the very low inrush current, obtained thanks to the characteristics of the compressor and to the "inverter" starting. This is a crucial factor, as it allows a more favourable selection of the protection devices to be placed on the power supply between transformer and unit.

SoftSTART

TECNOLOGICAL CHOICES

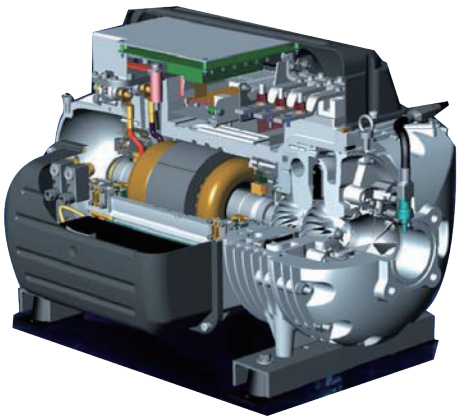
Efficiency, silent operation and reliability. But also compact dimensions and reduced weight. These are the main features that make TECS units the best result of Climaveneta's know-how. Advantages that result from technological choices, involving each aspect of these units.

CENTRIFUGAL COMPRESSOR WITH MAGNETIC LEVITATION

This is a miniaturized, highly innovative compressor, with magnetic levitation device and digital control of the rotor's speed. The efficiencies achieved are far superior to those with traditional volumetric compressors.

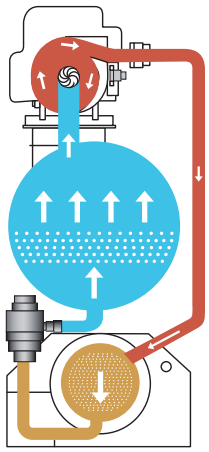
Inverter controls with inlet guide vanes extend the compressor's operational limit: building requirements are precisely met, even at very low conditions.

A solution that, besides the reduction of weight and dimensions with respect to traditional compressors, permits the compressor to operate completely without oil allowing an improvement of its performance, through the heat exchange process. Vibrations are virtually eliminated together with possible jolts due to inrush current in the start up phase: the unit's wear is minimized.



FLOODED EVAPORATOR

The technology of flooded evaporator, further enhanced the absence of oil in the refrigerant circuits, realises a substantial increase of cooling capacity and an optimization in the compressor's operational mode. The unit's overall efficiency further increases thanks to:

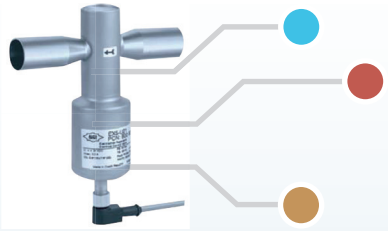


Compression ratio reduction thanks to a smaller approach Theoretic absence of refrigerant superheat at the compressor's suction stage Minimization of refrigerant pressure drop on the evaporator's shell side Optimization of the exchange surfaces, also at part loads, thanks to the complete control of the refrigerant level in all operating conditions. To comply with the security requirements of the "F-gas Regulation" (CE 842//2006), factory calibrated leak detection systems are available upon request.

ELECTRONIC VALVE

The electronic valve is adopted to grant the ideal operation of the evaporator in all conditions. In the air cooled unit the control is made with a precise measurement of the subcooling in the condenser coil.

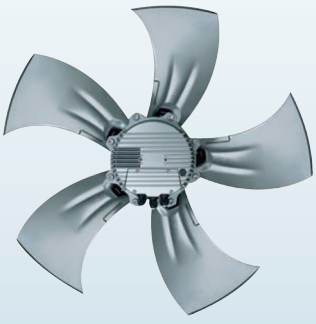
The fast processing of the acquired data allow a quick, fluctuation-free regulation, and therefore a highly accurate adjustment to the swings of load and ambient conditions.

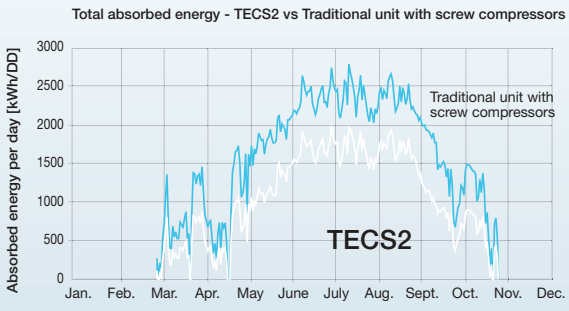


EC FANS

On TECS2 units, the technology of EC electronic switching fans is introduced, as standard on SL-CA-E versions and optional on the other models.

The superior energy efficiency of the DC brushless motor further improves the chiller's performance, that reaches the highest ESEER level in the market. More advantages are low inrush current and the ability to continuously modulate the rotational speed with an immediate gain in both silence and energy consumption.





Nomenclature

TECS2 SL-CA-E 0512

- 0512 — Compressor Number
- E — Unit Number
- CA — Super High Efficiency
- SL — High Efficiency
- TECS2 — Super Low Noise
- Compressor Number — HFC-134a Magnetic Levitation Variable Frequency Centrifugal Chiller

TECS2 0512-SL-CA Means the air cooled high efficiency HFC-134a oil free variable frequency centrifugal chiller; unit number is 0512; configured with 2 compressors.

Advanced W3000 Touch Control System

The brand-new W3000 touch control system features friendly user interface, excellent control, strong expansion ability and compatibility.

Color LCD Display

The touch screen is embedded in the unit for convenient operation and well protection. The automatic control by the computer realizes unattended operation.

TFT LCD touch screen can display data and parameter adjustment in various languages and menus. According to the tradition of Climaveneta, the status and parameters of the compressor are visually displayed individually to make sure the operating status clear at a glance.

W3000 Touch Control System

Unit Control and Operation Management

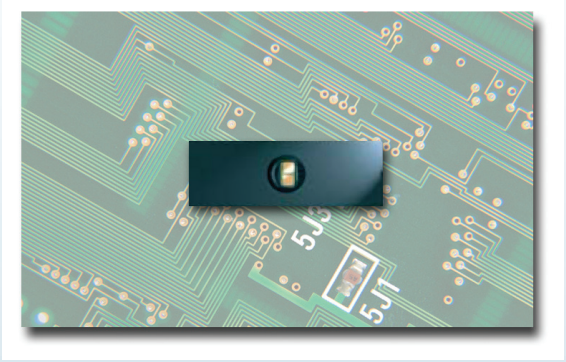
The advanced microcomputer intelligent control system of W3000 contains specially designed control algorithm of Climaveneta. It highlights the energy efficiency and reliability of the unit. The balanced running time of FIFO compressor prolongs the life of machine. The automatic adjustment of the output load makes the machine more energy saving. Combining with the load shedding system of the compressor can achieve 25-100% stepless adjustment. The adjustments and settings of the operating parameters can adapt to different environments. The temperature and pressure protection using analog measurement can predict and prevent of failure and increase reliability. Various expansion accessories are available, such as remote and group control.

Network Communication and Building Management Control

The chiller supports BMS connection and can connect to common BMS systems such as MODBUS, LONWORKS, BACNET and so on.

Fault Protection, Alarm and Analysis Capabilities

The microcomputer intelligent controller contains perfect functions of fault protection, alarm, recording and analysis. It has protection functions of high/low pressure switch, lack of phase, reverse phase, overload, overcurrent, overheat, exhaust temperature, water flow, frost and so on. The controller also achieves fault recording and alarm display. The unique “Black Box” fault recording and analyzing system can record 400 failures and more than 200 field data before each failure. It can diagnose and remove faults rapidly to improve the technical support effect. By connecting to the Climaveneta remote service program, it can find potential failures before they occur and take proper preventive treatments.

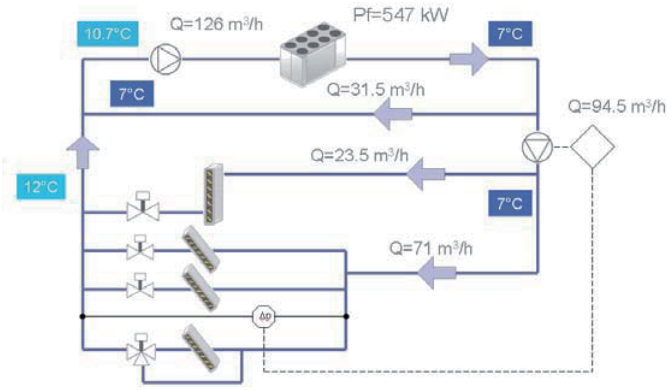


Patented Black Box

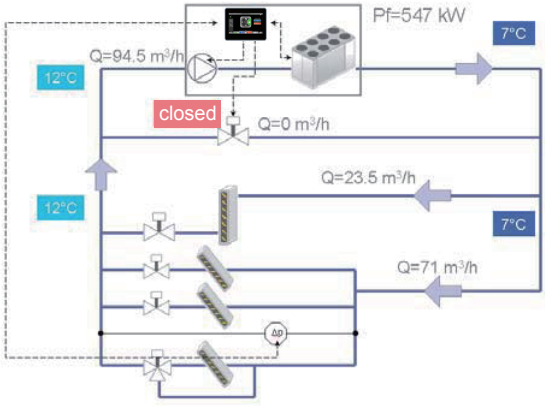
VARIABLE FLOW HYDRONIC GROUP (optional)

75% cooling capacity

Traditional plant

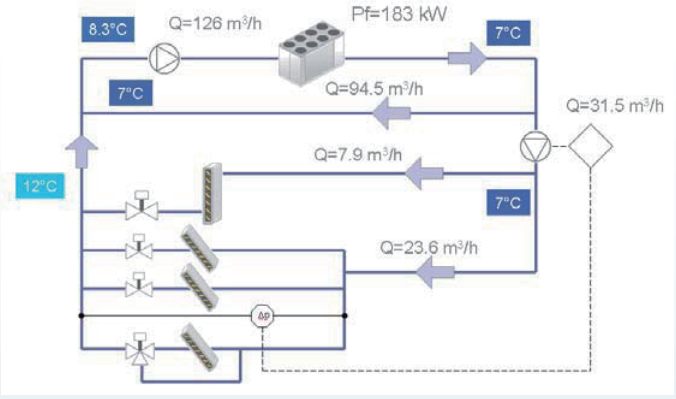


"Smart" plant

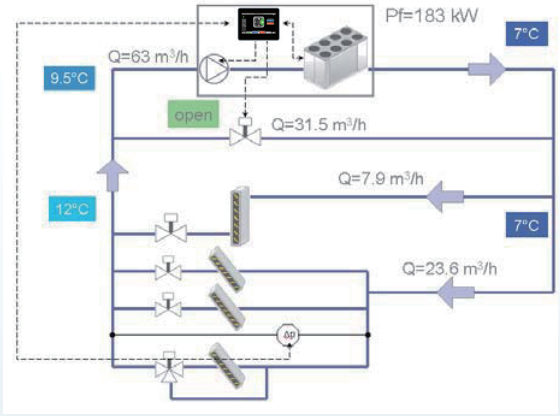


25% cooling capacity

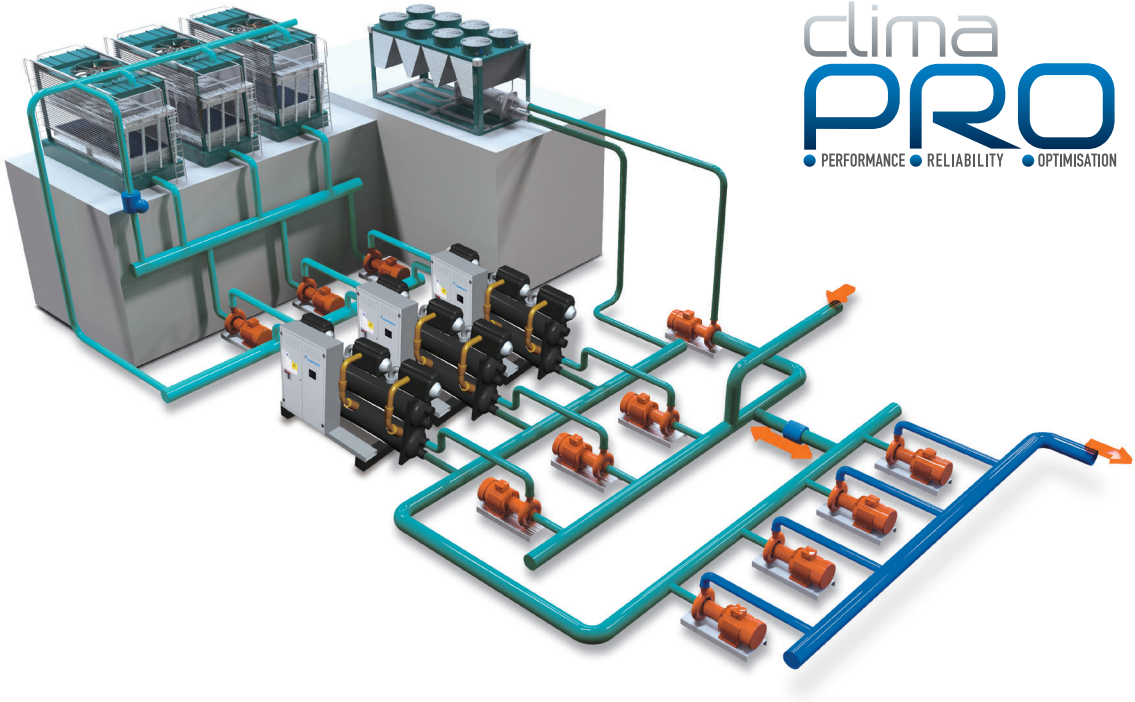
Traditional plant



"Smart" plant



ClimaPRO Plant Room Optimization Group Control System (Option)



Microprocessor Control Features

Microprocessor	W3000	Microprocessor	W3000
Remote on/off with external volt-free contact	√	Energy limit function	OPT
Multi-language menu	√	Manual control	√
Phase sequence relay	√	ModBus communication protocol	OPT
Cumulative fault alarm	√	BACnet communication protocol	OPT
Alarms code function	√	LonWorks communication protocol	OPT
"BLACK BOX" alarm events record	√	Pump control	OPT
Self-test when power on	√	Backup pump control	OPT
Daily/weekly programming control	Par.	Water temp. regulation by external signal (4-20mA)	OPT
Evaporator inlet/outlet water temp. display	√	Remote relay control	OPT
Compressor/unit alarms display	√	Local/remote network monitor (FWS)	OPT
General unit alarms display	√	Remote secondary temp. control	OPT
Entering water temp. ratio control	√	Set-point regulation from external signal (0-5V)	OPT
Start/stop operating timer	Par.	Compressor run-timer, time balance & FIFO	√
Double set-point timer	Par.	Compressor start scheduling	√
"Pump-Down" when stopped	√		

√ Standard OPT avaiable on request Par. available by modifying a value of the configuraton paramenters

TECS2 / SL-CA		0211	0251	0351	0452	0512	0552	0652	0712	0853	0913	1013	1054	1154
Power supply	V/Ph/Hz	400/3/50												
COOLING ONLY (GROSS VALUE)														
Cooling capacity (1)	kW	233	258	346	442	509	574	650	742	848	903	977	1065	1183
Total power input (1)	kW	70.5	81.1	110	138	161	174	208	225	269	286	310	336	374
EER (1)	kW/kW	3.30	3.18	3.13	3.20	3.16	3.30	3.13	3.30	3.15	3.15	3.15	3.17	3.17
ESEER (1)	kW/kW	4.77	4.87	4.72	5.07	5.17	5.09	5.04	5.16	5.12	5.13	5.09	5.06	5.14
EXCHANGERS														
HEAT EXCHANGER USER SIDE IN REFRIGERATION														
Water flow (1)	l/s	11.13	12.33	16.53	21.15	24.32	27.43	31.07	35.49	40.56	43.20	46.74	50.93	56.59
Pressure drop (1)	kPa	36.4	27.4	28.5	27.6	27.7	35.2	21.1	27.6	31.8	36.0	29.7	35.3	37.3
REFRIGERANT CIRCUIT														
Compressors nr.	N°	1	1	1	2	2	2	2	2	3	3	3	4	4
No. Circuits	N°	1	1	1	1	1	1	1	1	2	2	2	2	2
Refrigerant chargekg		100	100	120	210	180	210	240	280	340	430	490	480	520
NOISE LEVEL														
Sound Pressure (2)	dB(A)	56	56	58	58	58	59	59	59	60	60	60	61	61
Sound power level in cooling (3)(4)dB(A)		88	88	90	90	90	91	92	92	93	93	93	94	94
SIZE AND WEIGHT														
Length (5)	mm	3100	3100	4000	4900	4900	5800	7000	7000	8500	9700	10600	11200	11500
Width (5)	mm	2260	2260	2260	2260	2260	2260	2260	2260	2260	2260	2260	2260	2260
Height (5)	mm	2430	2430	2430	2430	2430	2430	2430	2430	2430	2430	2430	2430	2430
Operating weight (5)	kg	2320	2370	3050	4000	4240	4530	5800	6150	6940	7370	8150	8700	9020

Notes:
1.Plant (side) cooling exchanger water (in/out) 12°C/7°C; Source (side) heat exchanger air (in) 35°C.
2.Average sound pressure level at 10m distance, unit in a free field on a reflective surface;non-binding value calculated from the sound power level.
3.Sound power on the basis of measurements made in compliance with ISO 9614.
4.Sound power level in cooling, outdoors.
5.Unit in standard configuration/execution, without optional accessories.

TECS2 / SL-CA-E		0211	0251	0351	0452	0512	0552	0652	0712	0853	0913	1013	1054	1154
Power supply	V/Ph/Hz	400/3/50												
COOLING ONLY (GROSS VALUE)														
Cooling capacity (1)	kW	229	285	385	455	527	590	703	796	902	969	1086	1177	1324
Total power input (1)	kW	67.1	81.3	113	134	154	168	204	233	263	279	317	336	383
EER (1)	kW/kW	3.41	3.50	3.40	3.41	3.41	3.50	3.45	3.41	3.43	3.48	3.42	3.50	3.46
ESEER (1)	kW/kW	5.29	5.52	5.43	5.79	5.71	5.64	5.77	5.77	5.62	5.79	5.71	5.87	5.75
EXCHANGERS														
HEAT EXCHANGER USER SIDE IN REFRIGERATION														
Water flow (1)	l/s	10.93	13.62	18.39	21.76	25.19	28.21	33.61	38.05	43.14	46.35	51.91	56.30	63.34
Pressure drop (1)	kPa	35.2	33.5	35.2	29.2	29.7	37.2	24.7	31.7	35.9	41.5	36.7	43.1	46.8
REFRIGERANT CIRCUIT														
Compressors nr.	N°	1	1	1	2	2	2	2	2	3	3	3	4	4
No. Circuits	N°	1	1	1	1	1	1	1	1	2	2	2	2	2
Refrigerant chargekg		100	100	130	220	220	240	270	310	410	450	520	500	580
NOISE LEVEL														
Sound Pressure (2)	dB(A)	56	56	58	58	58	59	59	59	60	60	60	61	62
Sound power level in cooling (3)(4)dB(A)		88	88	90	90	90	91	92	92	93	93	93	94	95
SIZE AND WEIGHT														
Length (5)	mm	3100	3100	4000	4900	4900	5800	7000	7900	8500	9700	10600	10600	12400
Width (5)	mm	2260	2260	2260	2260	2260	2260	2260	2260	2260	2260	2260	2260	2260
Height (5)	mm	2430	2430	2430	2430	2430	2430	2430	2430	2430	2430	2430	2430	2430
Operating weight (5)	kg	2270	2350	3130	4070	4230	4570	6040	6450	7020	7610	8510	8510	9720

Notes:
1.Plant (side) cooling exchanger water (in/out) 12°C/7°C; Source (side) heat exchanger air (in) 35°C.
2.Average sound pressure level at 10m distance, unit in a free field on a reflective surface; non-binding value calculated from the sound power level.
3.Sound power on the basis of measurements made in compliance with ISO 9614.
4.Sound power level in cooling, outdoors.
5.Unit in standard configuration/execution, without optional accessories.

ELECTRICAL DATA

TECS2 /SL-CA

Maximum values									
Size	n	Compressor			Fan motors (1)		Total unit (1) (2)		
		F.L.I.[kW]	F.L.A.[A]	L.R.A.[A]	F.L.I.[kW]	F.L.A.[A]	F.L.I.[kW]	F.L.A.[A]	S.A.[A]
0211	1	85	135	145	2	3.09	97	158	-
0251	1	85	135	145	2	3.09	97	158	-
0351	1	130	210	231	2	3.09	146	241	-
0452	2	85	135	145	2	3.09	189	309	-
0512	2	85	135	145	2	3.09	189	309	-
0552	2	85	135	145	2	3.09	193	317	-
0652	2	130	210	231	2	3.09	287	475	-
0712	2	130	210	231	2	3.09	287	475	-
0853	3	2x85+1x130	2x135+1x210	2x145+1x231	2	3.09	335	550	-
0913	3	1x85+2x130	1x135+2x210	1x145+2x231	2	3.09	384	633	-
1013	3	130	210	231	2	3.09	433	716	-
1054	4	85	135	145	2	3.09	387	633	-
1154	4	2x85+2x130	2x135+2x210	2x145+2x231	2	3.09	477	784	-

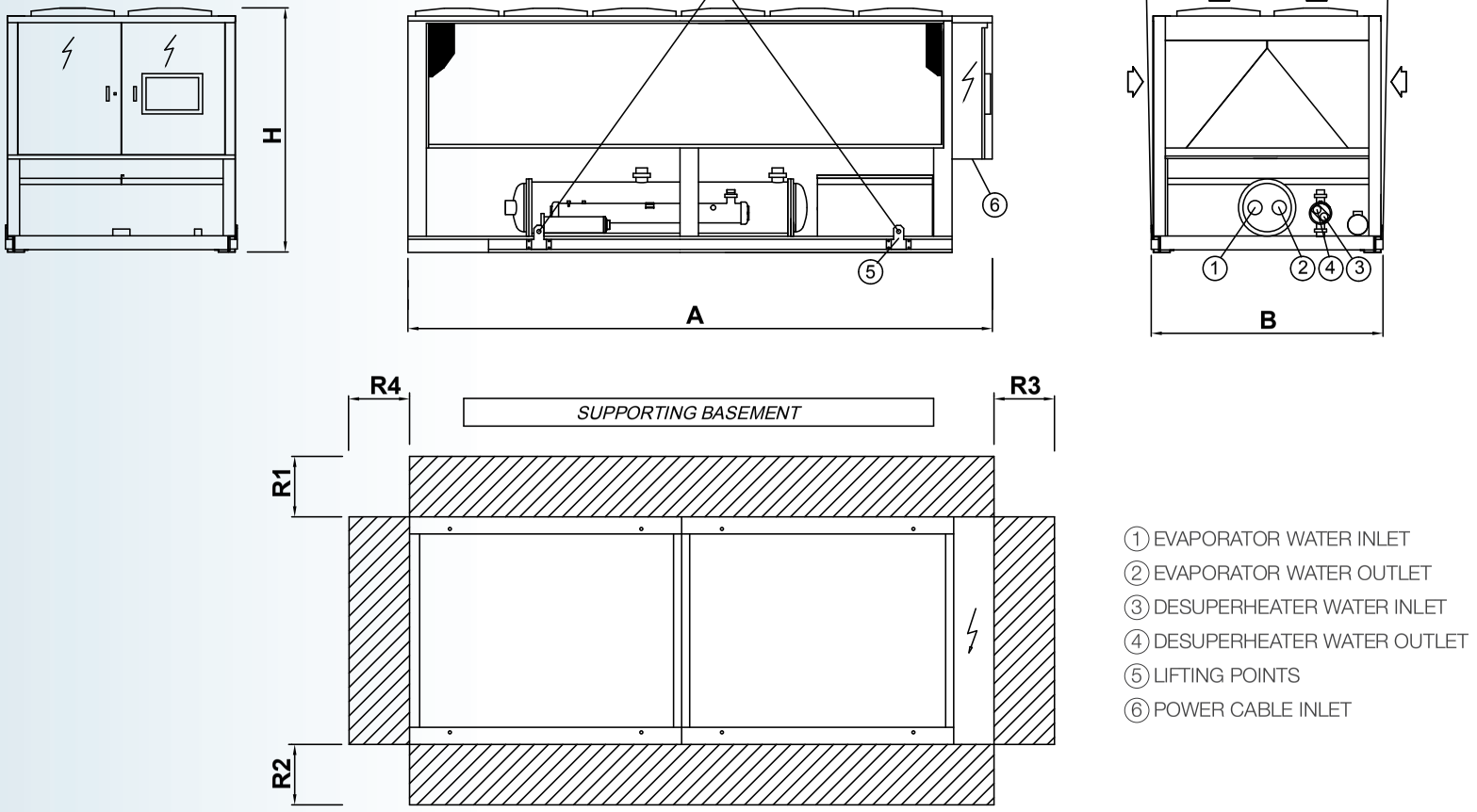
TECS2 /SL-CA-E

Maximum values									
Size	n	Compressor			Fan motors (1)		Total unit (1) (2)		
		F.L.I.[kW]	F.L.A.[A]	L.R.A.[A]	F.L.I.[kW]	F.L.A.[A]	F.L.I.[kW]	F.L.A.[A]	S.A.[A]
0211	1	85	135	145	2	3.01	97	154	-
0251	1	85	135	145	2	3.01	97	154	-
0351	1	130	210	231	2	3.01	146	235	-
0452	2	85	135	145	2	3.01	190	301	-
0512	2	85	135	145	2	3.01	190	301	-
0552	2	85	135	145	2	3.01	194	307	-
0652	2	130	210	231	2	3.01	288	463	-
0712	2	130	210	231	2	3.01	292	470	-
0853	3	2x85+1x130	2x135+1x210	2x145+1x231	2	3.01	336	536	-
0913	3	1x85+2x130	1x135+2x210	1x145+2x231	2	3.01	384	617	-
1013	3	130	210	231	2	3.01	433	698	-
1054	4	85	135	145	2	3.01	387	614	-
1154	4	2x85+2x130	2x135+2x210	2x145+2x231	2	3.01	481	771	-

F.L.I. Full load power input at max admissible condition
F.L.A. Full load current at max admissible condition
L.R.A. Locked rotor amperes for single compressor
S.A. Starting current

Power supply: 400/3/50
Voltage tolerance: 10%
Maximum voltage unbalance: 3%%

(1) Values calculated referring to the version with the maximum number of fans working at the max absorbed current
(2) Safety values to be considered when cabling the unit for power supply and line-protections



1 EVAPORATOR WATER INLET
2 EVAPORATOR WATER OUTLET
3 DESUPERHEATER WATER INLET
4 DESUPERHEATER WATER OUTLET
5 LIFTING POINTS
6 POWER CABLE INLET

REMARKS:
For installation purposes, please refer to the documentation sent after the purchase-contract.
This technical data should be considered as indicative.
CLIMAVENETA may modify them at any moment.

DIMENSIONAL DRAWINGS

SIZE	DIMENSIONS AND WEIGHTS				CLEARANCES (see following page)				PLANT SIDE HEAT EXCHANGER		USER SIDE HEAT RECOVERY EXCHANGER	
	A [mm]	B [mm]	H [mm]	PESO [kg]	R1 [mm]	R2 [mm]	R3 [mm]	R4 [mm]	in/out		n/out	
									Type	Ø	Type	Ø
0211 / SL-CA	3100	2260	2430	2320	2000	2000	1800	1500	VICTAULIC	4"	-	-
0251 / SL-CA	3100	2260	2430	2370	2000	2000	1800	1500	VICTAULIC	4"	-	-
0351 / SL-CA	4000	2260	2430	3050	2000	2000	1800	1500	VICTAULIC	4"	-	-
0452 / SL-CA	4900	2260	2430	4000	2000	2000	1800	1500	VICTAULIC	5"	-	-
0512 / SL-CA	4900	2260	2430	4240	2000	2000	1800	1500	VICTAULIC	5"	-	-
0552 / SL-CA	5800	2260	2430	4530	2000	2000	1800	1500	VICTAULIC	5"	-	-
0652 / SL-CA	7000	2260	2430	5800	2000	2000	1800	1500	VICTAULIC	6"	-	-
0712 / SL-CA	7000	2260	2430	6150	2000	2000	1800	1500	VICTAULIC	6"	-	-
0853 / SL-CA	8500	2260	2430	6940	2000	2000	1800	1500	VICTAULIC	8"	-	-
0913 / SL-CA	9700	2260	2430	7370	2000	2000	1800	1500	VICTAULIC	8"	-	-
1013 / SL-CA	10600	2260	2430	8150	2000	2000	1800	1500	VICTAULIC	8"	-	-
1054 / SL-CA	11200	2260	2430	8700	2000	2000	1800	1500	VICTAULIC	8"	-	-
1154 / SL-CA	11500	2260	2430	9020	2000	2000	1800	1500	VICTAULIC	8"	-	-
0211 / SL-CA-E	3100	2260	2430	2270	2000	2000	1800	1500	VICTAULIC	4"	-	-
0251 / SL-CA-E	3100	2260	2430	2350	2000	2000	1800	1500	VICTAULIC	4"	-	-
0351 / SL-CA-E	4000	2260	2430	3130	2000	2000	1800	1500	VICTAULIC	4"	-	-
0452 / SL-CA-E	4900	2260	2430	4070	2000	2000	1800	1500	VICTAULIC	5"	-	-
0512 / SL-CA-E	4900	2260	2430	4230	2000	2000	1800	1500	VICTAULIC	5"	-	-
0552 / SL-CA-E	5800	2260	2430	4570	2000	2000	1800	1500	VICTAULIC	5"	-	-
0652 / SL-CA-E	7000	2260	2430	6040	2000	2000	1800	1500	VICTAULIC	6"	-	-
0712 / SL-CA-E	7900	2260	2430	6450	2000	2000	1800	1500	VICTAULIC	6"	-	-
0853 / SL-CA-E	8500	2260	2430	7020	2000	2000	1800	1500	VICTAULIC	8"	-	-
0913 / SL-CA-E	9700	2260	2430	7610	2000	2000	1800	1500	VICTAULIC	8"	-	-
1013 / SL-CA-E	10600	2260	2430	8510	2000	2000	1800	1500	VICTAULIC	8"	-	-
1054 / SL-CA-E	11200	2260	2430	8660	2000	2000	1800	1500	VICTAULIC	8"	-	-
1154 / SL-CA-E	12400	2260	2430	9720	2000	2000	1800	1500	VICTAULIC	8"	-	-

Global Headquarter
Mitsubishi Electric Hydronics & IT Cooling Systems S.p.A.
36061 BASSANO DEL GRAPPA (VICENZA) ITALIA - VIA SARSON 57/C
TEL: +39 / 0424 509 500 (r.a.) FAX: +39 / 0424 509 509
E-mail: https://www.melcohit.com

Asia Pacific Headquarter
Climaveneta Chat Union Refrigeration Equipment (Shanghai) CO., LTD
NO. 88 BAIYUN ROAD XINGHUO DEVELOPING ZONE, SHANGHAI, CHINA
TEL: +86-21-57505566 FAX: +86-21-57505797
E-mail: http://www.climaveneta.com.cn

Hongkong Branch
ROOM 2003, CCT TELECOM BUILDING, 11 WO SHING STREET, FOTAN, SHATIN, N.T., HONGKONG
TEL: +852-26871755 FAX: +85-2-26873078
E-mail: http://www.climaveneta.com

Vietnam Branch
6TH FLOOR, ROOM 6.6B, ETOWN2, 364 CONG HOA STREET, WARD 13, TAN BINH DISTRICT, HOCHIMINH CITY
TEL: +848 6262 9966 FAX: +848 6262 9977
E-mail: http://www.climaveneta.com

Malaysia Branch
A-4-3, GARDEN SHOPPE ONE CITY, JALAN USJ 25/1, 47650 SUBANG JAYA, SELANGOR DARUL EHSAN
TEL: +603 8081 8558 FAX: +603 8081 9558
E-mail: http://www.climaveneta.com

Myanmar Branch
ROOM 501, 5TH FLOOR, SALOMON BUSINESS CENTER, NO 244/A, U WISARA ROAD, BAHAN TOWNSHIP, YANGON
Tel: +951535098 Ext: 501
E-mail: http://www.climaveneta.com

B114 CCU/01-01-2019-EN-SH