

# tecs

Chillers, air- and water cooled, featuring centrifugal compressors with magnetic levitation, from 220 to 1200 kW



Unbeatable part-load efficiency



Low inrush current



Extremely silent operation



Simplified logistics



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## TECS: high technology applied to air conditioning

ESEER 9,27 for TECS-HF, water-cooled unit. This would be enough to summarize the innovating potential of these products, which now include also the new air-cooled TECS-F series.

But TECS products, besides their unbeatable part-load efficiency, are also synonymous of extremely low inrush current values, exceptional quietness and unprecedented simplification of logistics and commissioning.

### Unbeatable part-load efficiency

Chillers operate for most of the time at part load. Therefore the “seasonal efficiency” (ESEER) is the factor actually influencing the energy consumption. In order to obtain the highest part-load energy efficiency, Climaveneta has developed the new TECS chillers.

At part loads, TECS units are extraordinarily more efficient than traditional screw compressor units.

Consequently the ESEER values are higher by 45% for TECS-HF units.

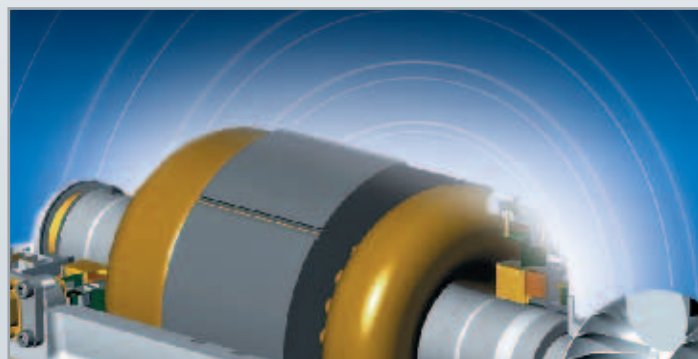
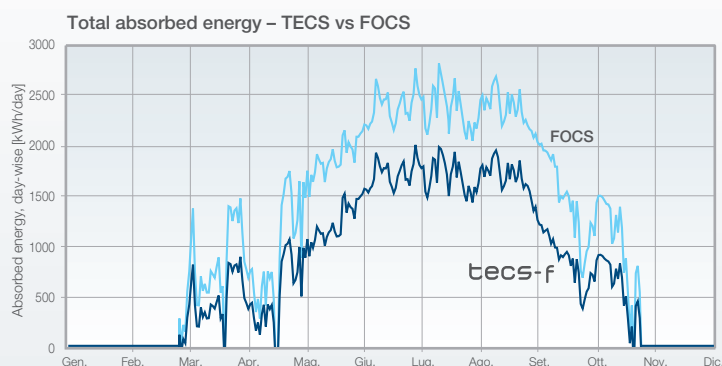
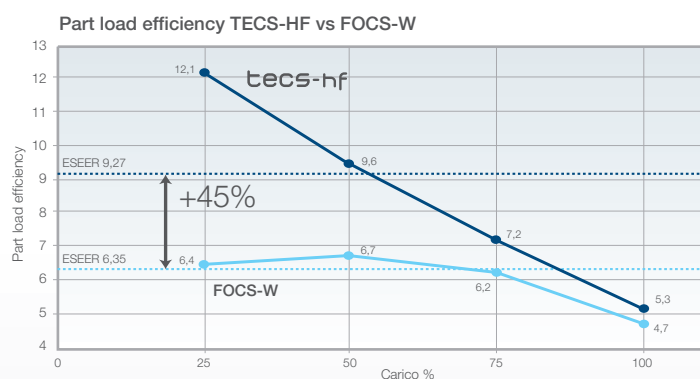
Also for the TECS-F units remarkable energy benefits are achieved, throughout their whole operation time. The operational cost savings are substantial and real, especially with continuous, year-round operation.

### Low inrush current

One further element of differentiation is the low inrush current value, a result of the compressor’s “soft start” switching.

This unique feature of the TECS units allows a more favourable selection of the protection devices to be placed on the power supply between transformer and unit.

Furthermore, due to the reduced electrical consumption, the sizing of transformer and power supply cabling is more compact. These aspects bring further savings in terms of electrical equipment costs and associated space requirements.



## Application opportunities

The distinctive features in terms of efficiency, modularity, compactness, silentness of the TECS series make these units the ideal solution for all applications featuring mostly part-load operation, with high attention to acoustic emissions, and to requirements regarding the ease of installation and uncompromised reliability.



### Extremely silent operation

TECS chillers are characterized by the best acoustic performance available on the market:

**Extremely low sound pressure- and power levels** with respect to traditional units, thanks to the centrifugal compressor of new generation adopted on these units.

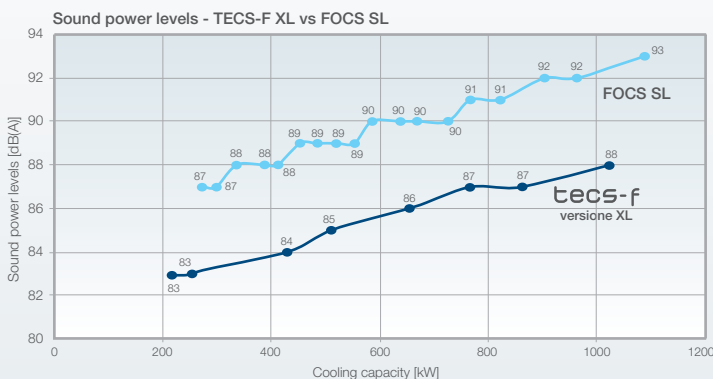
**Sound spectrum without tonal components** therefore not affected by peaks at the most critical frequencies.

**Absence of vibrations** with consequent benefits in terms of mechanical stress transmitted along the pipework and towards the footprint surfaces, besides the higher durability of unit's circuitry.

Furthermore TECS-F units are available in two versions, reflecting in their names the excellent positioning with respect to other chillers; in such way the series can comply also with the most stringent requirements about acoustic emissions

**Version SL**, super-silenced

**Version XL**, with extremely reduced acoustic emission, with sound power levels down to 83dB(A).



### Simplified logistics

The handling and the space required by the units has important implications, about on-site commissioning operations and costs.

The on-site operations are simplified, in both cases of indoor installation within equipment rooms (TECS-HF) and of roof-top installation with related lifting (TECS-F).

Besides the installation operations, the reduction of the space to be assigned within the equipment rooms represents a significant capital cost saving.





## Technological choices

Efficiency, quietness, reliability. But also compact dimensions and weight reduction. These are the main features, making the TECS units the quintessence of Climaveneta's know-how and expertise.

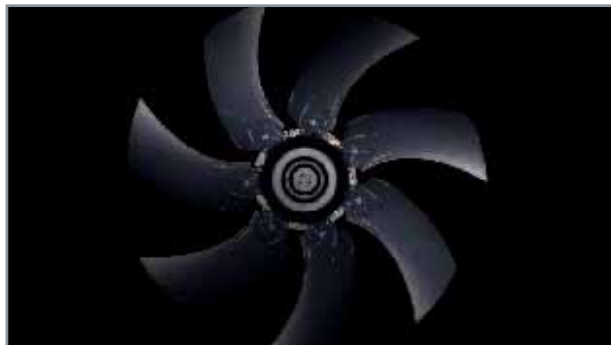
Advantages resulting from precise technological choices, permeating each aspect of these units.



### Centrifugal compressor with magnetic levitation

This is a miniaturized, highly innovative compressor, with magnetic levitation device and digital control of the rotor's speed. A solution which, besides the reduction of weight and dimensions with respect to traditional compressors, improves the performance of the heat exchangers and virtually eliminates vibration in any operating condition, plus very low inrush currents at the start-up and minimized mechanical wear.

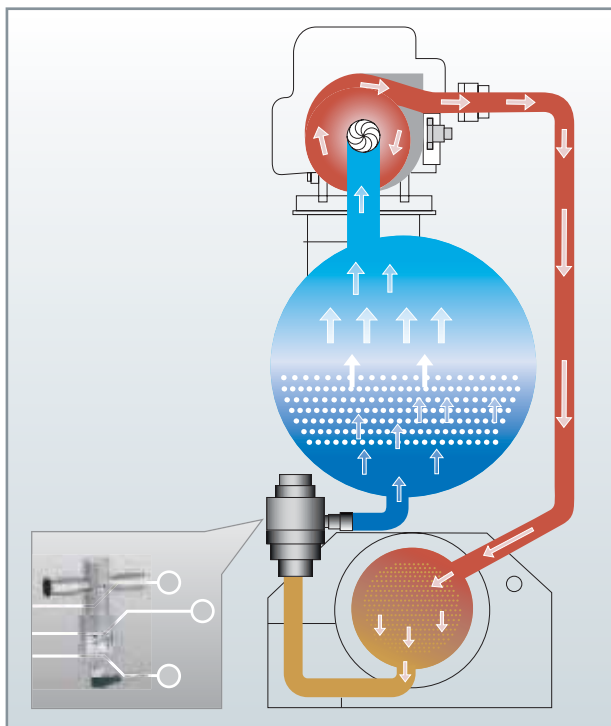
The extended range of modulation enhances the efficiency features in all conditions.



### EC Fans

On TECS-F units, the technology of EC electronic switching fans is introduced, as standard on -E versions and optional on the other models. The superior energy efficiency, coupled with the low inrush current, further improves performance and reliability, with associated conspicuous operational cost savings.

A choice that helps to distinguish the TECS-F from all other water chillers on the marketplace.



### Flooded evaporator

The technology of the flooded evaporator, together with the absence of lubricant oil, realises a substantial increase of cooling capacity and efficiency thanks to:

- Smaller approach, between evaporation- and water outlet temperatures (2°C instead of 4-6°C for a traditional evaporator).
- Minimum superheating of the refrigerant (2-3°C instead of 5-8°C for a traditional evaporator).
- Minimum pressure drop on the shell's side.
- Optimization of the exchange surfaces, also at part loads, thanks to the complete control of the refrigerant level in all operating conditions.

### Electronic valve

The electronic valve is adopted to grant the correct operating conditions for the evaporator, with a sophisticated detection of the refrigerant level. 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.



## Evolved control

The high level performance of TECS units is made possible chiefly by the regulation devices adopted on this series. The units are provided with the W3000 large controller.

Optional devices are featured, as Manager3000 for the centralized regulation of multiple units, and the FWS3000 supervisory system.



### W3000 large: complete regulation

The controller features the most advanced functions and regulation, developed by Climaveneta based on the experience gained with specific units and system solutions. The keyboard offers a generous size and the complete visualization of the operation status. Commands and LCD display permit an easy and safe access to the settings. The diagnostics enables the complete management of the alarms, with the "black box" e historical alarm log functions to improve the ability to assess the operation of the unit. Programming by time belts of operation mode and set-point are also featured.

Temperature regulation is based on the continuous modulation of the capacity, according to the return- and supply water temperatures, by means of proportional- and integral algorithms.



### Centralized controller Manager3000

Device regulates a group of units in a centralized way, always ensuring:

- Optimum co-ordination of the working times and cooling capacity provided.
- Superior reliability thanks to the reduced number of switch-on phases and to the balancing strategy among units.
- Achievement of the best energy efficiency thanks to specific logic for the pumping groups and to the prioritization of the units with higher efficiency.



### FWS3000 Field Web Server

The units can be connected via serial line to the innovative supervisory system, Climaveneta FWS (Field Web Server), besides to main BMS systems available. This allows the real-time monitoring of the units, the setting of their main operation parameters and the alarm management.



### Remote control and historical alarm log

The unit controller can dialogue with the Climaveneta Service software: it is possible to perform pre-emptive and corrective measures offering therefore a superior and more effective service, thanks also to the ability to operate at both local- and remote levels.

Furthermore the "black box" function (see above) records the operation variables detected before each alarm event, while the historical alarm log records up to 200 events: all this for optimum diagnostics and maintenance of the unit.



## Complete range

The TECS range is organized in a wide array of models and versions in order to provide solutions to any application- and plant requirement, offering the fullest reliability, flexibility and project approach.



### Models

**TECS-F**  
Chiller, air cooled.

**TECS-HF**  
Chiller, water cooled.

### Configurations

**TECS-HF/D**  
With partial heat recovery via desuperheater.



### TECS-F versions

All sizes of the TECS-F units, air cooled, are available in two different versions to satisfy even the most stringent requirements about the acoustic emission:

**SL**, super-silenced version.

**XL**, version with extremely reduced acoustic emission.

**SL-E, XL-E**: versions corresponding to the previous ones featuring high energy efficiency, achieved through wider exchange surfaces and the EC fans.



### Options

Among the main options, to be mentioned are the different interface serial boards, for ModBus, Bacnet and Echelon LonTalk protocols. In such way the supervision is easily implemented, via both the resources' integration into a BMS and the Climaveneta devices (FWS3000). By serial interface, it is also possible to co-ordinate regulation of multiple units in parallel, in the same system (Manager3000).

The remote keyboard features access from one point to one or more units, up to 10, enabling the visualization of status and variables plus the complete setting. Further options to be highlighted:

#### TECS-F

- Integrated pumping group, with 4-pole pumps and different options for the system head values. This simplifies the installation and commissioning of the system; the characteristics of silentness and available head values are consistent with the qualifying points of this project.
- EC fans with electronic switching, "brushless" type (standard on SL-E, XL-E).

#### TECS-HF

- Noise reduction via integral sound-proof enclosure. Provides an 8db(A) reduction of the sound power levels, strengthening further one of the main features of this series.
- Pre-arrangement for the mode reversal (heat pump), water side. This availability represents a real innovation in our sector and allows the user to benefit from the high energy efficiency throughout the year.



# General technical data

TECS-F		Version	0201	0301	0402	0502	0703	0803	0904	1004	0201-E	0402-E	0703-E	0904-E
No compressors		SL / XL	1	1	2	2	3	3	4	4	1	2	3	4
No of circuits		SL / XL	1	1	1	1	2	2	2	2	1	1	2	2
Cooling capacity (1)	kW	SL	222	256	434	508	659	769	869	1018	225	447	675	895
		XL	218	255	430	511	655	766	862	1024	224	449	673	899
Total absorbed power (1)	kW	SL	70	83	145	167	215	246	291	335	70	140	206	280
		XL	71	82	144	162	213	244	288	324	69	135	203	269
EER (1)		SL	3,19	3,08	2,99	3,04	3,07	3,12	2,99	3,04	3,22	3,20	3,27	3,20
		XL	3,06	3,10	2,99	3,16	3,08	3,14	2,99	3,16	3,27	3,33	3,31	3,34
ESEER		SL	5,01	5,01	5,01	5,11	5,04	5,11	5,01	5,12	5,70	5,76	5,71	5,76
		XL	5,02	5,16	5,14	5,18	5,19	5,2	5,12	5,19	5,85	5,91	5,87	5,91
Cooling capacity (2)	kW	SL	226	275	444	546	673	826	890	1094	229	456	686	912
		XL	223	274	442	549	670	823	885	1100	228	457	685	915
Sound power level (3)	dB(A)	SL	88	88	90	90	92	92	93	93	88	90	92	93
		XL	83	83	84	85	86	87	87	88	83	85	87	88
Maximum outdoor air temperature	°C	SL / XL	42	42	42	42	42	42	42	42	42	42	42	42

Dimensions														
A	mm	SL	3100	3100	4900	4900	7600	7600	9400	9400	3100	4900	7600	9400
		XL	3100	3100	4900	5800	7600	8500	9400	11200	3100	5800	8500	11200
B	mm	SL / XL	2260	2260	2260	2260	2260	2260	2260	2260	2260	2260	2260	
H	mm	SL / XL	2430	2430	2430	2430	2430	2430	2430	2430	2430	2430	2430	

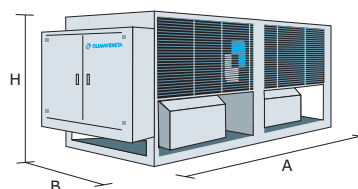
TECS-HF		1AI	1AN	1AS	2AI	2AN	2AS	3AI	3AN	3AS	4AI	4AN	4AS
No compressors		1	1	1	2	2	2	3	3	3	4	4	4
No of circuits		1	1	1	1	1	1	1	1	1	1	1	1
Cooling capacity (4)	kW	224	269	314	449	539	627	673	809	941	898	1079	1256
Total absorbed power (4)	kW	42	53	67	84	106	135	126	159	203	168	212	270
EER		5,32	5,08	4,64	5,33	5,08	4,64	5,34	5,09	4,64	5,35	5,09	4,65
ESEER		9,27	9,11	8,90	9,20	9,03	8,82	9,13	8,96	8,70	9,14	8,97	8,72
Sound power level (3)	dB(A)	91	93	94	93	95	96	94	96	97	95	97	98

Dimensions													
A	mm		2975	2975	2975	3000	3000	3000	4510	4510	4510	4500	4500
B	mm		940	940	940	1115	1115	1115	1285	1285	1285	1420	1420
H	mm		1730	1730	1730	1980	1980	1980	1940	1940	1940	2070	2070
Weight	kg		1360	1360	1360	2480	2480	2480	3620	3620	3620	5010	5010

## Data refer to:

- (1) Evaporator water temperature (in/out) = 12°C / 7°C  
External air temperature = 35°C
- (2) Evaporator water temperature (in/out) = 12°C / 7°C  
External air temperature = 32°C
- (3) Sound power data according to ISO 3744 and Eurovent 8/1. This certification is based on Sound Power measured in dB(A). This is therefore the only certified sound datum.
- (4) Evaporator water temperature (in/out) = 12°C / 7°C  
External air temperature = 30°C / 35°C

TECS-F 0201-1004



TECS-HF 1AI-4AS

