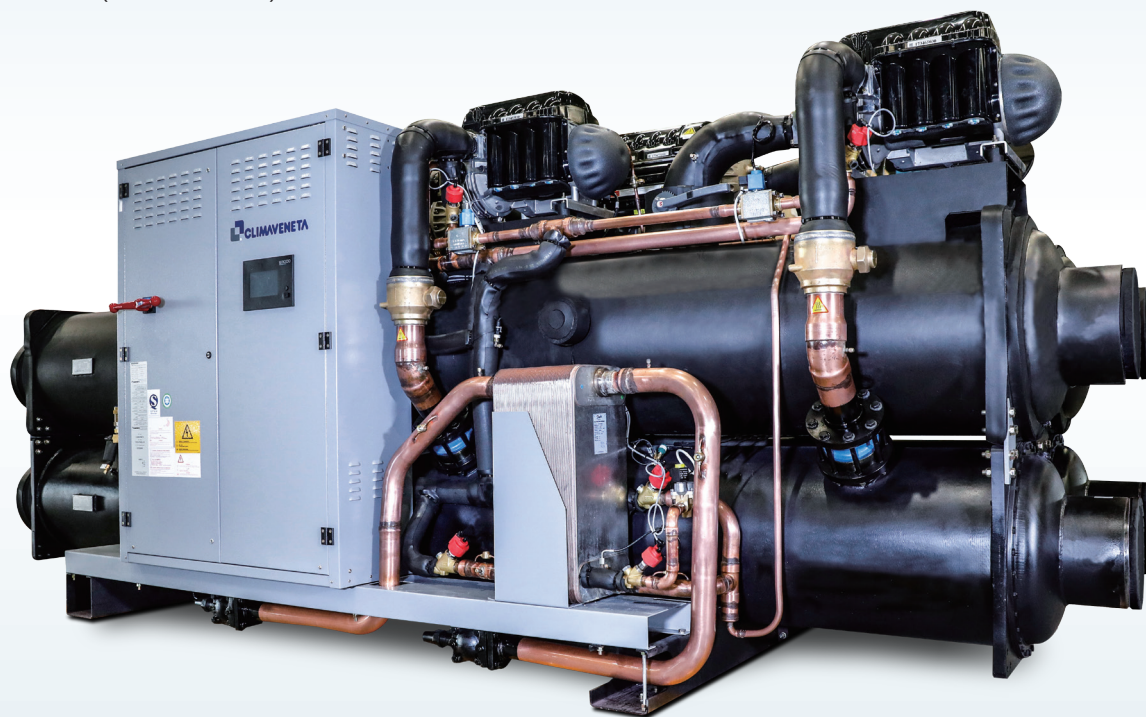


Sustainable Comfort

TECS-W/L-E® Series

Water-cooled Magnetic Levitation Variable Frequency Centrifugal Chiller

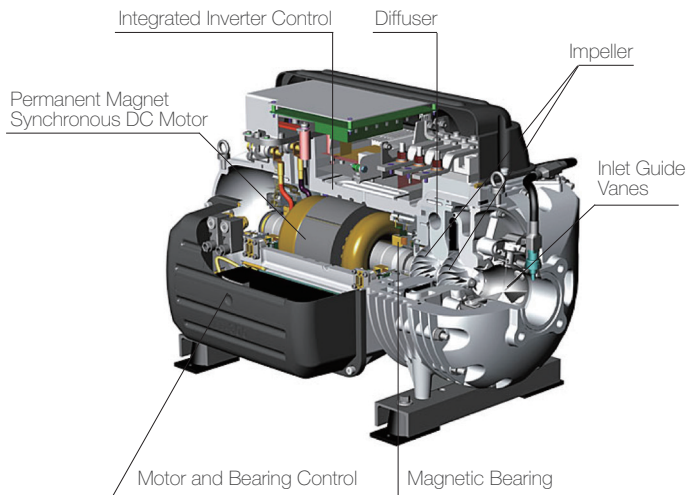
TECS-W/L-E Series
280-4220kW (80-1200RT)



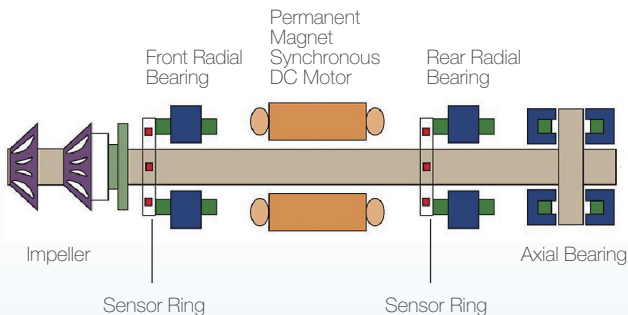
Water-cooled Magnetic Levitation Variable Frequency Centrifugal Chiller

Features and Benefits

Magnetic Levitation Oil-free Centrifugal Compressor



- Inverter driven high-efficiency magnetic levitation oil-free compressor: the compressor is designed with aerodynamic optimized two-stage centrifugal and magnetic levitation technology, high performance pulse width modulator (PWM), automatic regulation of rotation speed, which promise optimal operation and high-efficiency under both full load and part load operation.



- A significant improvement (15%) in the heat exchange can be achieved by magnetic levitation technology without oil lubrication system, contact friction and the thermal resistance caused by oil film. The reliability of unit is remarkably improved in the meanwhile and makes service convenient.
- With build-in inverter, which enables variable motor speed of compressor under part load condition, the units are able to operate effectively and with lower power consumption. Soft start-up function makes the starting current of unit low to 2A, therefore to reduce impulse on power network and decrease thermal stress of motor stator.

- Liquid refrigerant spray cooling promises stable operation of motor.
- The rotor and impeller of compressor are suspended in the magnetic field when operation. The sensor ring under the bearing keep sending real-time data to the bearing control system and adjust the position of shaft immediately to maintain its optimal running condition.
- The compressor operates without any oil, allowing its stable and low-noise operation. Furthermore, the whole system of the unit is greatly simplified because of eliminating oil system, which remarkably saves the cost of operation and maintenance.

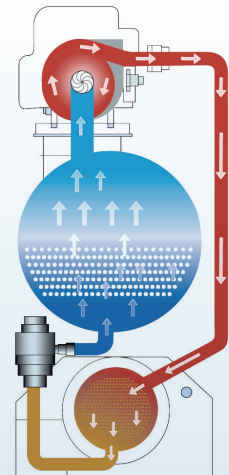
Super-low Noise and Vibration

- High speed of compressor running, while with no mechanical contact of bearing, enables super-low noise and vibration of compressor under both part load and full load.



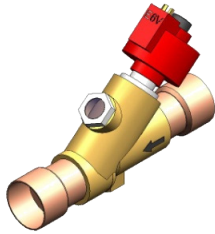
High-efficiency Flooded Type Evaporator and Condenser

- The threaded tube facilitates the formation of gasification core, which therefore greatly enhances heat exchange efficiency of tube outside surface.
- The tube of condenser with thread benefits the dropwise condensation of refrigerant, which increases tube external efficiency. Moreover, the thread inside the tube of both evaporator and condenser enhances the disturbance and turbulence of water.
- Single circuit design for multiple compressors system improves unit part load efficiency.



Electronic Expansion Valve (EXV)

- The electronic valve is adopted to grant the ideal operation of the evaporator in all conditions.
- The fast processing of the acquired data allows a quick, fluctuation-free regulation, and therefore a highly accurate adjustment to the swings of load and ambient conditions.



Energy Conservation and Environment Protection

- Environment friendly refrigerant of HFC134a is adopted with ODP value 0.
- Optimized refrigerant system for better energy saving, lower CO₂ emission and higher operation efficiency.

Stability and Reliability

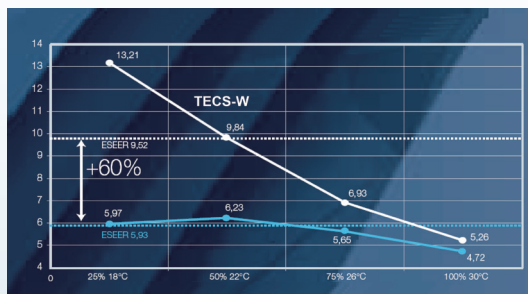
- In the case of power outage, the motor becomes a generator which feeds power to the various controls and bearing actuators then until the rotor de-levitates onto the touch-down bearings.
- The design, manufacturing and test of the unit are strictly complied with AHRI, EN, UNI, JIS and GB/T18430.1 standards.
- The protection level of enclosure conforms to GB4208-2008(China GB).
- The electric system is designed according to IEC60204-1/GB5226.1 and the system meets with EMC specification.
- Performance test of the unit shall be strictly conducted before ex-work to ensure operation stability.

Easy Installation

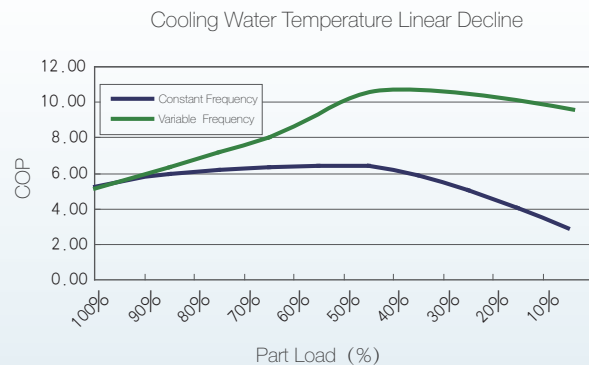
- Vertically arrangement of compressor, condenser and evaporator enables compact design of the unit and small footprint.
- Refrigerant charge, commissioning and test have been done before ex-factory.
- Water pipe connection and power supply are the only work need to do on site before operation.

Excellent Part Load Performance

TECS-W/L-E is brought in by Climaveneta with extremely outstanding performance in the chiller industry. With magnetic levitation compressor, variable frequency inverter control and oil free lubrication system, the unit has boosted with 60% of ESEER to compare with traditional chiller and less service cost.



In the transition period, the cooling water temperature decline results in additional energy saving of the unit.



Water-cooled Magnetic Levitation Variable Frequency Centrifugal Chiller

Integrated part load value (ESEER)

Increasingly closer attention is being paid towards the power consumption of air-conditioning equipments.

In air-conditioning systems, the chiller only works in full load for a few hours per year. For this reason, "season efficiency" is the truly determining consumption factor.

The valuation indices have been adopted that consider usage in part load conditions as IPLV in the United States and ESEER in Europe.

ESEER up to 9.58, and IPLV up to 10

ESEER (European Seasonal Energy Efficiency Ratio): $0.03 \times A + 0.33 \times B + 0.41 \times C + 0.23 \times D$

Evaporator leaving at 7 °C (constant), condenser water (inlet) at 30 °C (100% load—A), 26 °C (75% load—B), 22 °C (50% load—C), 18 °C (25% load—D).

IPLV (AHRI)

$IPLV = 0.01 \times A + 0.42 \times B + 0.45 \times C + 0.12 \times D$

Evaporator leaving at 6.7 °C (constant), condenser water (inlet) at 29.4 °C (100% load—A), 23.9 °C (75% load—B), 18.3 °C (50% load—C), 18.3 °C (25% load—D).

IPLV (China GB)

$IPLV = 0.023 \times A + 0.415 \times B + 0.461 \times C + 0.101 \times D$

Evaporator leaving at 7 °C (constant), condenser water (inlet) at 30 °C (100% load—A), 26 °C (75% load—B), 23 °C (50% load—C), 19 °C (25% load—D).

According GB19577-2015 Standard: TECS-W/L-E Whole Series

First Class

Energy Efficiency

Nomenclature

TECS-W 1051 L-E

High Efficiency

L: Water-cooled Chiller

Compressor Number

Unit Number

HFC-134a Magnetic Levitation Variable Frequency Centrifugal Chiller

TECS-W1051L-E

Means the water cooled high efficiency HFC-134a magnetic levitation variable frequency centrifugal chiller; unit number is 105; configured with 1 compressor.

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

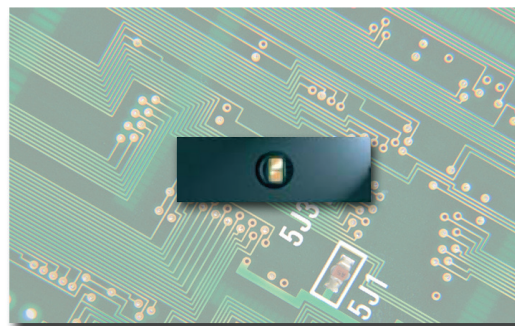
The advanced microcomputer intelligent control system of W3000 contains specially designed control algorithm of Climaveneta. It highlights the energy efficiency and reliability of the unit. The balanced running time of FIFO compressor prolongs the life of machine. The automatic adjustment of the output load makes the machine more energy saving. Combining with the load shedding system of the compressor, 25-100% stepless adjustment can be achieved and settings of the operating parameters can be adjusted, which is adaptable to different environments. The temperature and pressure protection using analog measurement can predict and prevent 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 provide MODBUS, LONWORKS, BACNET communication protocols with RS485 serial interface.

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 ability. By connecting to the Climaveneta remote service program, it can find potential failures before they occur and take proper preventive treatments.



Patented Black Box

Water-cooled Magnetic Levitation Variable Frequency Centrifugal Chiller

Technological Choices

Fast Restart

The management of fast restart allows to minimize downtime in case of power failure, through accelerating software selfdiagnose time, water pump start delay, pre-condensing time and compressor start time, meanwhile keeping all the necessary unit safety.

This option requires an external UPS power supply provided by customer.



Chilled Water Variable Flow Control

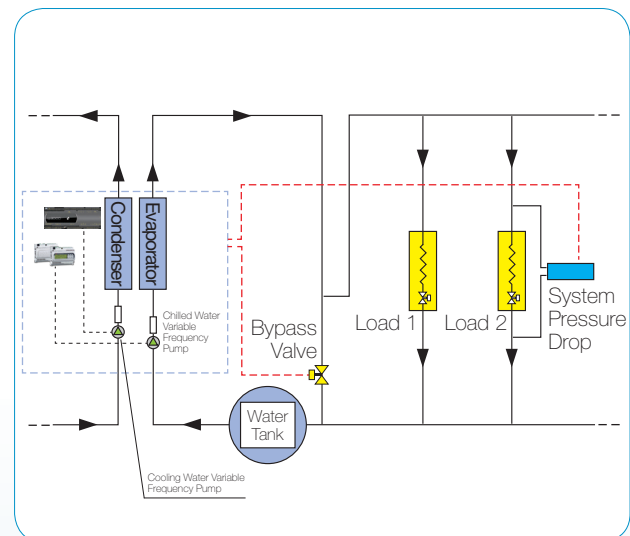
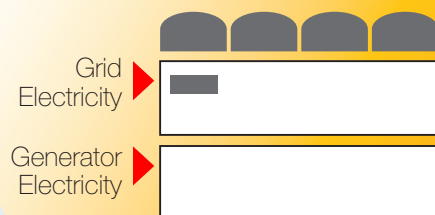
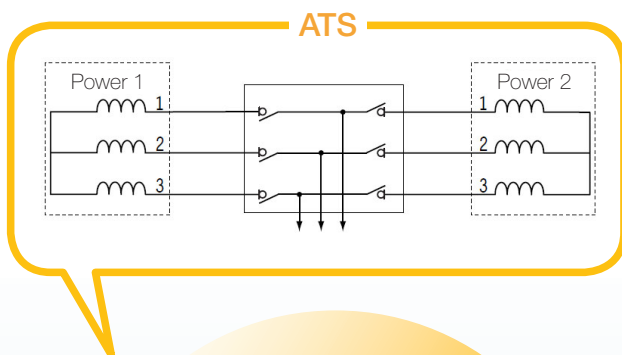


Extended module of variable flow control function enables chilled water variable frequency pump and pipe valve on-off control.

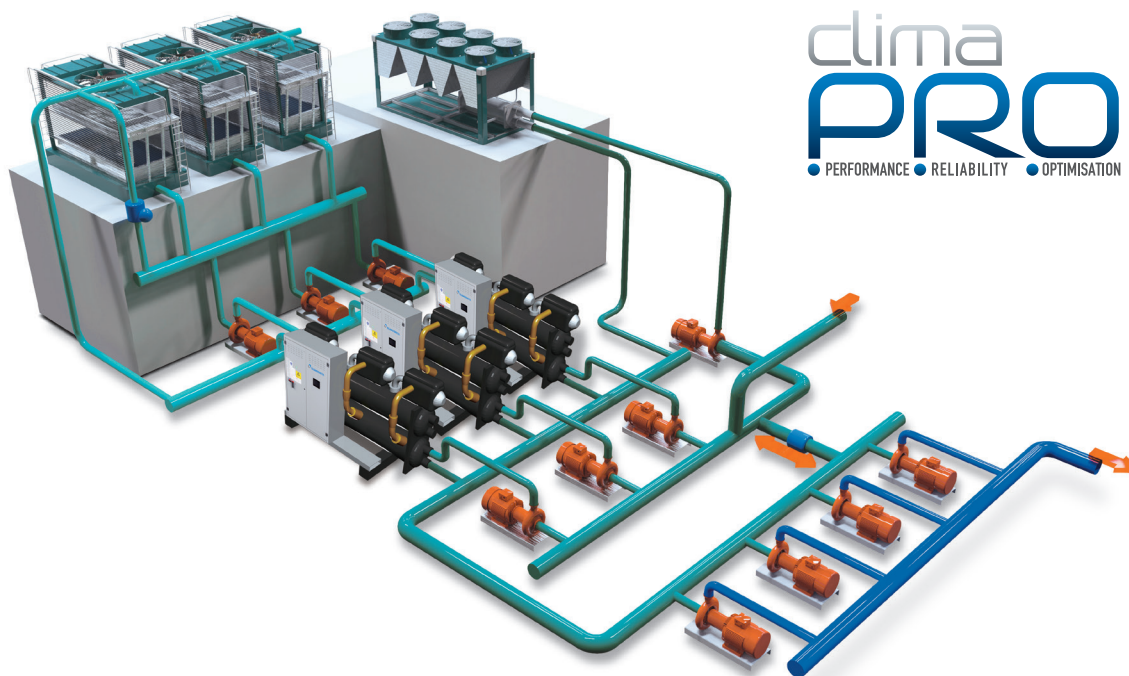
The control of chilled water side variable frequency pump, according to terminal side load, ensures lowest pump consumption.

Double Power Supply

This accessory entails the substitution of two separate power supply with ATS.



ClimaPRO Plant Room Optimization Group Control System (Option)



clima
PRO
● PERFORMANCE ● RELIABILITY ● OPTIMISATION

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 available on request Par. available by modifying a value of the configuration parameters

Water-cooled Magnetic Levitation Variable Frequency Centrifugal Chiller

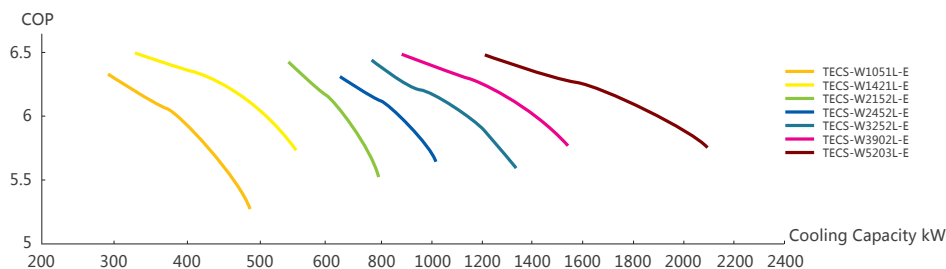
Technical Parameters

TECS-W/L-E		0801	1051	1401	1421	1801	2152	2452	3252	3902	3903	4503
Cooling Capacity	kW	281.0	422.0	493.0	546.8	703.0	880.0	1055.0	1231.0	1407.0	1583.0	1759.0
	RT	80	120	140	155	200	250	300	350	400	450	500
Power Input	kW	51.7	73.5	89.3	96.0	116.3	156.2	187.6	205.9	230.2	272.4	296.9
EER		5.43	5.74	5.52	5.70	6.05	5.63	5.62	5.98	6.11	5.81	5.92
IPLV		9.81	9.48	9.99	10.1	9.83	10.0	9.8	10.1	10.3	10.1	10.2
Chilled Water Flow	m ³ /h	44.0	66.1	77.1	85.6	110.0	137.7	165.1	192.7	220.2	247.7	275.3
Chilled Water Pressure Drop	kPa	35.4	39.9	33.1	40.7	51.4	46.3	66.6	39.0	37.4	47.4	41.0
Cooling Water Flow	m ³ /h	54.9	81.8	96.1	106.0	135.3	171.0	205.0	237.3	270.4	306.2	339.4
Cooling Water Pressure Drop	kPa	36.5	41.8	34.1	41.5	52.6	48.3	68.2	33.3	31.4	40.4	34.6
Microprocessor		W3000 Touch										
Compressor No.	n	1.	1	1	1	1	2	2	2	2	3	3
Refrigerant Circuit No.	n	1	1	1	1	1	1	1	1	1	1	1
Stepless Energy Regulation		20%-100%					15%-100%				10%-100%	
Operating Weight	kg	1835	1930	2115	2150	2385	3100	3112	4625	4785	5347	5760
Dimension												
Length	mm	2930	2930	2930	2930	2930	2990	2990	4450	4450	4440	4450
Width	mm	1210	1210	1210	1210	1400	1480	1480	1350	1350	1450	1360
Height	mm	1800	1800	1800	1800	1830	1980	1960	2050	2050	1990	2150

TECS-W/L-E		5203	5853	6304	6904	7504	8104	8905	9806	11006	12106
Cooling Capacity	kW	1935.0	2110.0	2286.0	2462.0	2638.0	2814.0	3165.0	3517.0	3869.0	4220.0
	RT	550	600	650	700	750	800	900	1000	1100	1200
Power Input	kW	318.6	347.6	381.1	405.1	429.3	454.9	516.1	583.2	629.8	679.9
EER		6.07	6.07	6.00	6.08	6.15	6.19	6.13	6.03	6.14	6.21
IPLV		10.3	10.2	10.5	10.6	10.7	10.8	10.50	10.50	10.50	10.6
Chilled Water Flow	m ³ /h	302.8	330.3	357.8	385.2	412.9	440.3	495.4	550.4	605.5	660.6
Chilled Water Pressure Drop	kPa	39.5	53.5	39.8	46.1	42.7	48.6	44.2	10.50	58.7	74.3
Cooling Water Flow	m ³ /h	371.9	405.7	440.3	473.4	140.7	539.6	607.7	676.8	742.7	809.3
Cooling Water Pressure Drop	kPa	33.3	47.8	48.6	56.1	51.4	58.4	44.3	55.0	60.7	78.7
Microprocessor		W3000 Touch									
Compressor No.	n	3	3	4	4	4	4	5	6	6	6
Refrigerant Circuit No.	n	1	1	2	2	2	2	2	2	2	2
Stepless Energy Regulation		10%-100%		8%-100%				6%-100%		5%-100%	
Operating Weight	kg	6080	6690	8770	8850	9310	9365	11570	11800	12520	13680
Dimension											
Length	mm	4450	5310	5000	5000	5000	5000	5060	5060	5060	5860
Width	mm	1360	1360	2200	2200	2200	2200	2425	2425	2425	2425
Height	mm	2150	2150	2150	2150	2150	2150	2140	2140	2140	2140

Remarks:

1. Standard Cooling Condition: Chilled water (in/out)=12.2/6.7°C; Condenser water (in/out)=29.4/34.6°C;
2. IPLV is measured according to AHRI Standard 550/590;
3. Standard water side pressure of evaporator and condenser is 1.0MPa. 1.6MPa or 2.0MPa is optional.



Each project has different application and demand: some require best full load efficiency, while others lowest initial investment, or an unrivaled part load performance. CLIMAVENETA provides optimized and tailored solution based on different cooling capacity and efficiency demand.

Electric Parameters

TECS-W/L-E				0801	1051	1401	1421	1801	2152	2452	3252	3902	3903	4503
Max Value	Compressor (Single)	n		1	1	1	1	1	2	2	2	2	3	3
		F.L.I	kW	80	105	105	105	124	105	105	105/124	124	105	105*2/124
		F.L.A	A	135	170	170	170	206	170	170	170/206	206	170	170*2/206
	Unit	F.L.I	kW	80	105	105	105	124	210	210	229	248	315	334
		F.L.A	A	135	170	170	170	206	340	340	376	412	510	546
Recommended Cable			mm ²	50	95	70	70	95	185	185	120*2	120*2	150*2	150*2

TECS-W/L-E				5203	5853	6304	6904	7504	8104	8905	9806	11006	12106
Max Value	Compressor (Single)	n		3	3	4	4	4	4	5	6	6	6
		F.L.I	kW	105/124*2	124	105*3/124	105*2/124*2	105/124*3	124	105*2/124*3	105*4/124*2	105*2/124*4	124
		F.L.A	A	170/206*2	206	170*3/206	170*2/206*2	170/206*3	206	170*2/206*3	170*4/206*2	170*2/206*4	206
	Unit	F.L.I	kW	353	372	439	458	477	496	582	668	706	744
		F.L.A	A	582	618	716	752	788	824	958	1092	1164	1236
Recommended Cable			mm ²	185*2	185*2	240*2	240*2	240*2	300*2/185*3	185*2	185*2	185*2	185*2

Note:

1. F.L.I Full load power input at max admissible condition

F.L.A Full load current ampere at max admissible condition

Supply power 380V-3Ph-50Hz(60Hz)

Range of voltage fluctuation: 10%

Range of voltage unbalance: 3%

The rated power and current are based on the rated working condition. The maximum data is the theoretical limit value. When making wiring and power distribution, the data in the table are as reference. The energy limit function shall be selected as option while the power supply is insufficient.

2. The wiring cables shall be single-pole and exposed laying type.

3. The cables in the table are chosen under the working temperature of 90°C and environment temperature of 30°C.

4. The cables size in use shall not be less than the value in the table.

Electric Specification

TECS-W/L-E Standard Configuration: Line Reactor

In order to reduce current harmonic distortion made by inverter and improve the imbalance of three phase power supply, line reactor is applied in the electric system. It can limit the voltage jump of power grid and the current shock when operation. By smoothing the pulse peak and voltage leakage caused when rectifier commutation, the disorder from grid can be prevented and in the meanwhile to cut down the impact of harmonic current on grid.

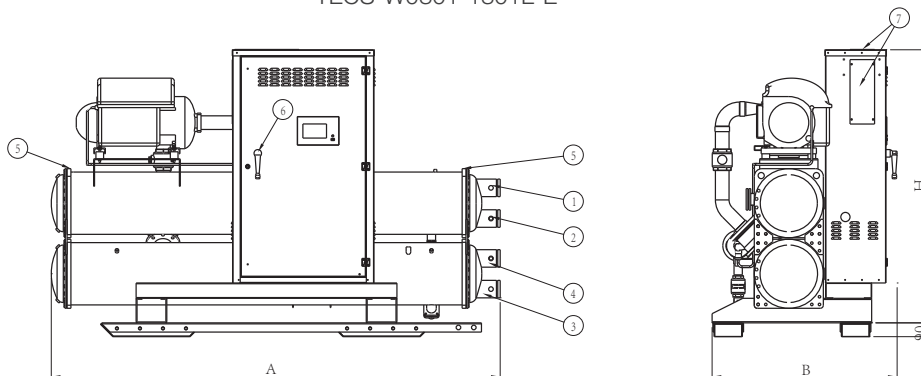
TECS-W/L-E Optional Configuration: Harmonic Filter

Harmonic filter is able to improve power transmission and usage efficiency, further reduce the electrical system of local parallel resonance or series resonance and noise, to assure the safety of electrical protection and automatic device.

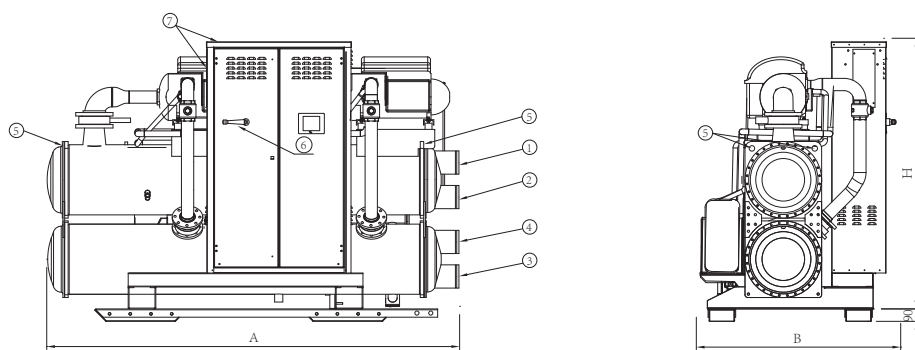
Water-cooled Magnetic Levitation Variable Frequency Centrifugal Chiller

Dimension Drawing

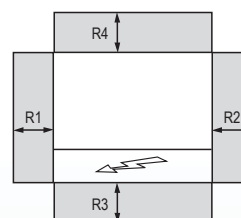
TECS-W0801-1801L-E



TECS-W2152-3902L-E



①Evaporator Inlet ③Condenser Inlet ⑤Lifting Points ⑦Power Inlet
②Evaporator Outlet ④Condenser Outlet ⑥Main Isolator
Please consult with Climaveneta office for detail drawing.



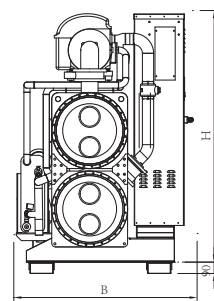
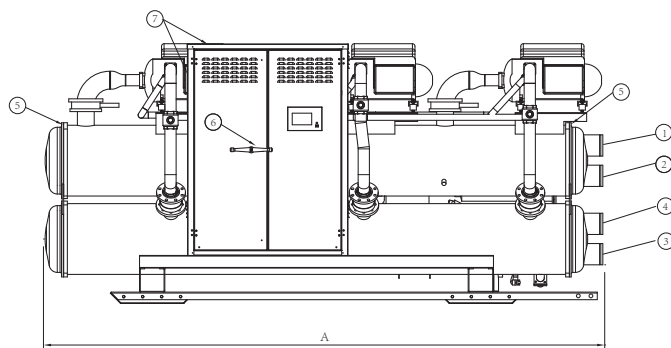
Minimum Clearance

Dimension and Weight

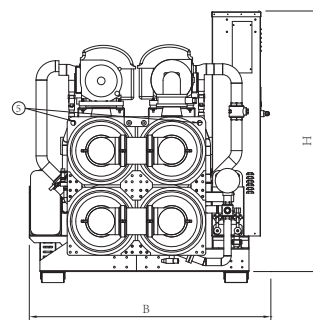
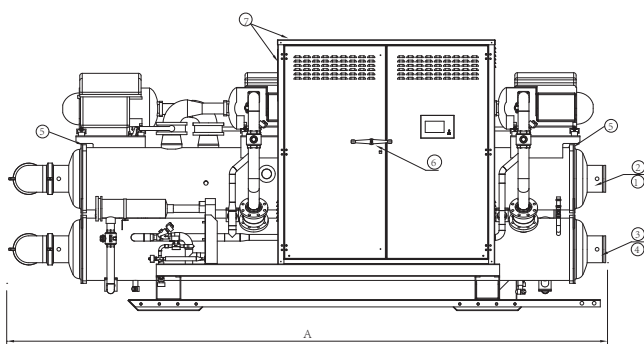
TECS-W/L-E	A	B	H	Lifting Weight	Pipe Size		Minimum Clearance			
	mm	mm	mm	kg	①/②	③/④	R1(mm)	R2(mm)	R3(mm)	R4(mm)
0801	2930	1210	1800	1735	3"	3"	2500	1000	900	500
1051	2930	1210	1800	1755	3"	3"	2500	1000	900	500
1401	2930	1210	1800	1985	4"	4"	2500	1000	900	500
1421	2930	1210	1800	2005	4"	4"	2500	1000	900	500
1801	2930	1400	1830	2150	5"	5"	2500	1000	900	500
2152	2990	1480	1980	2783	6"	6"	2500	1000	900	900
2452	2990	1480	1960	2860	6"	6"	2500	1000	900	900
3252	4450	1350	2050	3995	6"	6"	4000	1000	900	900
3902	4450	1350	2050	4050	6"	6"	4000	1000	900	900

Dimension Drawing

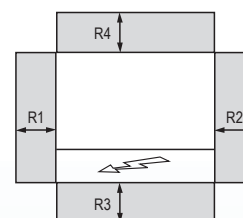
TECS-W3903 -5853L-E



TECS-W6304-8104L-E



①Evaporator Inlet ③Condenser Inlet ⑤Lifting Points ⑦Power Inlet
②Evaporator Outlet ④Condenser Outlet ⑥Main Isolator
Please consult with Climaveneta office for detail drawing.



Minimum Clearance

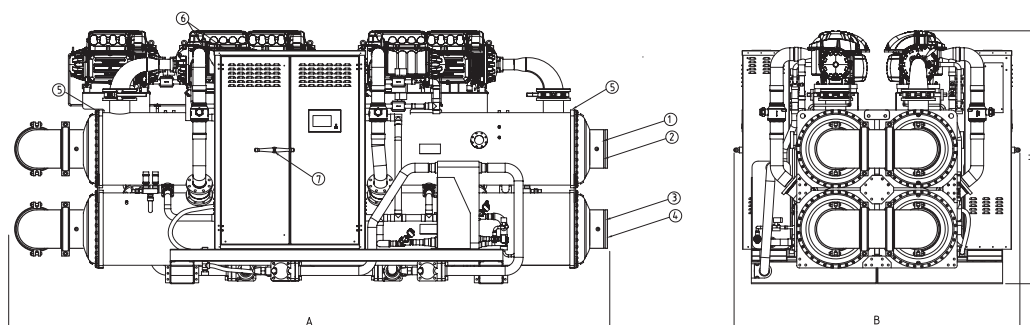
Dimension and Weight

TECS-W/L-E	A	B	H	Lifting Weight	Pipe Size		Minimum Clearance			
	mm	mm	mm	kg	①/②	③/④	R1(mm)	R2(mm)	R3(mm)	R4(mm)
3903	4440	1450	1990	4350	6"	6"	4000	1000	900	900
4503	4450	1360	2150	4845	8"	8"	4000	1000	900	900
5203	4450	1360	2150	4880	8"	8"	4000	1000	900	900
5853	5310	1360	2150	5390	8"	8"	4000	1000	900	900
6304	5000	2200	2150	7315	10"	10"	4000	1000	900	900
6904	5000	2200	2150	7370	10"	10"	4000	1000	900	900
7504	5000	2200	2150	7615	10"	10"	4000	1000	900	900
8104	5000	2200	2150	7670	10"	10"	4000	1000	900	900

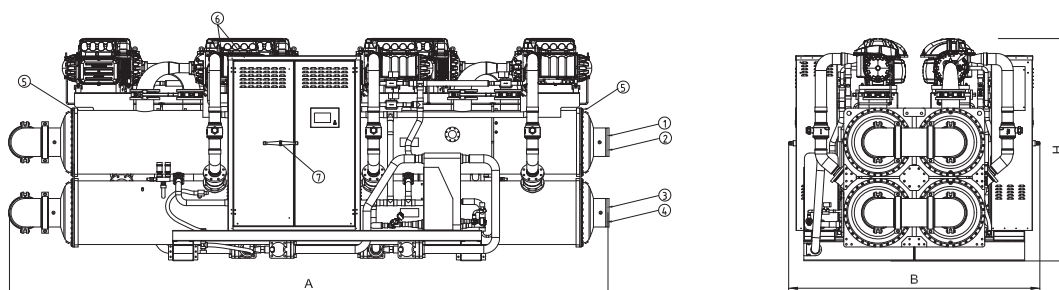
Water-cooled Magnetic Levitation Variable Frequency Centrifugal Chiller

Dimension Drawing

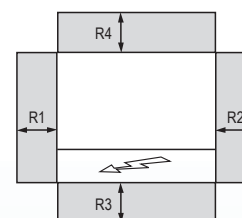
TECS-W8905L-E



TECS-W9806-12106L-E



①Evaporator Inlet ③Condenser Inlet ⑤Lifting Points ⑦Power Inlet
②Evaporator Outlet ④Condenser Outlet ⑥Main Isolator
Please consult with Climaveneta office for detail drawing.



Minimum Clearance

Dimension and Weight

TECS-W/L-E	A	B	H	Lifting Weight	Pipe Size		Minimum Clearance			
	mm	mm	mm	kg	①/②	③/④	R1(mm)	R2(mm)	R3(mm)	R4(mm)
8905	5060	2425	2140	9760	12"	12"	4000	1000	900	900
9806	5060	2425	2140	9990	12"	12"	4000	1000	900	900
11006	5060	2425	2140	10080	12"	12"	4000	1000	900	900
12106	5860	2425	2140	11080	12"	12"	4850	1000	900	900



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