

*Sustainable Comfort*

## INVERTER SERIES

# WATER COOLED INVERTER CHILLER With SCREW COMPRESSOR

**r** HFC  
R-134a

B-134a  
R-134a



**FOCSWATER-INV**  
190-1634kW

**CLIMAVENETA**



# Contents

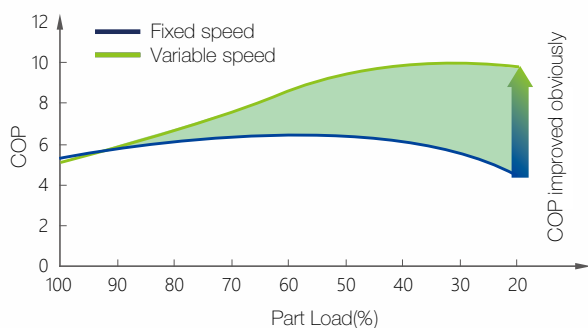
Product Overview .....	1
Product Features .....	1
Control System .....	3
Product Nomenclature .....	4
Operating Envelope .....	4
General Technical Data .....	5
Electrical Data .....	6
Dimension and Weight .....	7



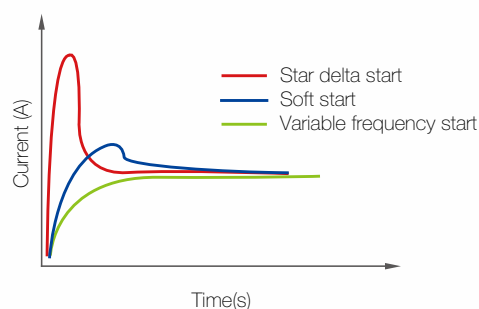
- Equipped with advanced inverter, cooperate with slide valve built-in compressor to present outstanding IPLV performance
- Variable frequency starting, FOCSWATER-INV starts at the minimum starting current, weak the impact on the grid

FOCSWATER-INV series, water cooled screw chiller, is newly developed with inverter. Using industrial semi-hermetic twin-screw compressor, HFC-134a refrigerant, high efficiency flooded evaporator, ensures high energy efficiency, high stability and long service life. FOCSWATER-INV series are widely used in industry, hotel, hospital, business and office hall.

### Outstanding IPLV Performance



### Smaller Starting Current



## Flooded evaporator and condenser

- Copper tube completely immersed in the boiling liquid refrigerant and therefore the unit performance and COP are enhanced obviously
- Super high efficiency copper tube are designed with patent technology. The external screw on the tube increases the evaporation of the refrigerant and is beneficial for the drop condensation, so it reduces the heat transfer temperature difference between tube internal surface and external surface effectively;
- In order to achieve perfect water perturbation and turbulent heat transfer, the internal surface of the copper tube is also special designed;
- Because of the chilled water flows inside the tube, it's quite easy to clean and maintenance.

## Screw Compressor

- Semi-hermetic twin screw compressors with special designed for HFC 134a, featuring in high efficiency compression and operation under full load and part load condition;
- Precisely manufactured twin rotor and aerospace-grade bear result in reliable performance, low noise and stable operation;
- Direct-drives motor and least moving part make whole the unit without other energy lost which also contribute to better operation efficiency;
- According to the actual operation condition, the system model can be adjusted by dedicated Microprocessor. And the slide valve fulfills the stepless control to enhance the efficiency under part load condition.



# INVERTER WATER COOLED CHILLER WITH SCREW COMPRESSOR

## High Stability

- The chiller is strictly designed, manufactured and tested based on international or national standard, such as AHRI, EN, UNI, JIS and GB/ T18430.1
- The built-in 3-stage oil separator and external 2-stage oil separator are dedicated for the best performance of gas-oil separation.
- The unique oil return kits are used to make sure the performance.
- Each unit is fully tested by strict process for best reliability and to meet customer's request.
- The protection level of unit external panel comply with GB4208-2008 standard.



## Electronic Expansion Valve

The electronic expansion valve is featured by its precise control, high sensitivity and well adaption to the part load condition. So CLIMAVENETA cooperate with world leader supplier for best performance both for full load and part load condition.



## Safety of Electrical Devices

- The electric system is designed based on IEC60204-1-2005/ GB5226.1-2008 standard. And the system comply with the EMC standard.
- The unit main power is inter locked with the bar breaker on the electric panel door. This special design aims to make sure the safety of the maintenance engineer.
- The electric component, such as the phase fault, phase unbalance, are all standard configuration for the chiller.

## Convenient Maintenance

- Full computer controlling, menu displaying, unit self-checking as well as the load adjusting and safety is completely controlled by the microprocessor. Daily operation is only to switch on the unit.
- Multi-circuit design are better for standby request of the system
- The unit is available for functions such as fault protection, memorizing and alarming. All faults are clearly displayed.
- Each circuit has the check valve and "Pump Down" function for easy repairing.

## Easy Installation

- Compact design for footprint area saving.
- The unit is oil and refrigerant charged before delivery, and it's completely factory tested under all range loading.
- The pressure difference type water flow switch is already installed on the chiller before delivery (we suggest to install water flow switch on piping).

## Environment Friendly

- Adopting HFC134a
- Optimized refrigerant system for better energy saving, lower CO<sub>2</sub> emission and higher operation efficiency.



## Senior control system

The chiller equipped with an advanced microprocessor control system, with a friendly human-machine interface, excellent adjustment ability, strong expansion function, tight and precise monitoring control, also strong compatibility. The microprocessor contains several optional accessories, also can be connected to Building Automation System via MODBUS Protocol.

### Friendly human-machine interface

The operation screen is embedded in the unit for easy operation and good protection. The automatic control by the computer realizes unattended operation.

The 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.



### 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 30-100% 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.

### Network communication and building management control

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

### FWS network server

Microcomputer intelligent controller can be equipped with FMS network server to monitor, set and adjust parameters and control the unit operation through LAN or Internet.

### 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.

### Remote group controller

#### Sequencer



- LCD Visual display
- Group control and management
- Centralized control unit ON/OFF
- Pump control
- Potocols as ModBus, LonWork, Bance are optional

#### Manager 3000(recommend)



- Touch-screen
- Group control and management
- Centralized control unit ON/OFF
- Pump control
- Potocols as ModBus, LonWork, Bance are optional

# INVERTER WATER COOLED CHILLER WITH SCREW COMPRESSOR

## Control functions

Microprocessor	W3000	Microprocessor	W3000
Remote ON/OFF dry contact	√	Energy limit	OPT
Multi-language menu	√	"Pump-down" when stopped	√
Phase sequency relay	√	ModBus communication protocol	OPT
Cumulative fault alarm	√	BACNET communication protocol	OPT
Fault code	√	Interface connection to LonWorks network	OPT
"BLACK BOX" function for alarm events	√	Pump management	OPT
Switch-on self-check	√	Spare pump management	OPT
Programming of daily/weekly program	Par.	External 4-20mA signal for water temp. setting	OPT
Evaporator inlet/outlet water temperature display	√	Remote relay control	OPT
Compressor/ circuit failure display	√	Local/Remote supervision through FWS	OPT
General unit alarms display	√	Double set-point by external contact	OPT
Water temperature proportional control	√	Set-point regulation from external signal(0-5v)	OPT
Regular programming operation	Par.	Compressor run-timer,time balance & FIFO	√
Regular double set point	Par.	Management of the compressor working hours	√

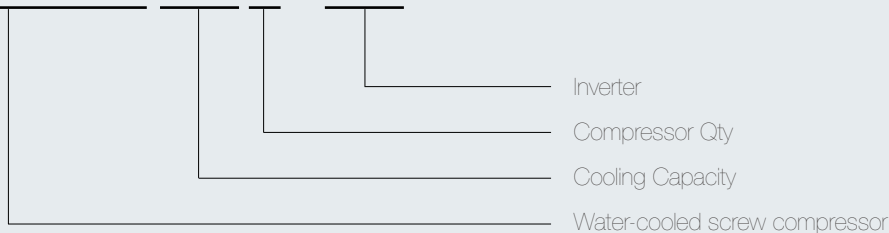
√ Standard

OPT available on request

Par. available by modifying a value of the configuraton paramenters

## Product Nomenclature

### FOCSWATER 300 2 - INV



### FOCSWATER3002-INV

The water cooled inverter chiller with screw compressor, cooling capacity at 300RT, featured by HFC 134a refrigerant, flooded evaporator

## Recommended Operation envelope

Cooling Condition	Water Inlet Temp ( °C )		Water Outlet Temp ( °C )	
	Min.	Max.	Min.	Max.
Chilled Water	-	23	5	15
Cooling Water	12*	-	26	48

#### Remark:

1. "\*" means the optional cooling water control is required, if the cooling water temperature is lower than the value;
2. For other operation condition which exceed the range above, please contact Climaveneta office for detail information.

## General Technical Data

FOCSWATER-INV		0551	0701	0851	0951	1101	1301	1651	2001	2501	2602	3002	3402	3852	4252	4652
Cooling Performance																
Cooling Cap.	kW	189.4	246.0	304.2	336.5	378.7	461.9	587.3	687.4	834.6	915.0	1047.0	1187.0	1349.0	1483.0	1634.0
Power Input	kW	35.5	45.8	56.5	61.7	70.2	84.9	105.7	123.3	150.3	163.3	185.4	209.0	236.7	262.8	292.6
EER		5.3	5.4	5.4	5.5	5.4	5.4	5.6	5.6	5.6	5.6	5.7	5.7	5.7	5.6	5.6
IPLV		8.40	8.44	8.50	8.44	8.46	8.44	8.55	8.60	8.39	8.63	8.57	8.62	8.66	8.49	8.43
Chilled Water Flow	m <sup>3</sup> /h	32.6	42.4	52.4	57.9	65.2	79.5	101.1	118.3	143.7	157.5	180.2	204.4	232.2	255.3	281.3
Chilled Water Pressure Drop	kPa	42.5	47.2	48.5	52.0	51.4	47.9	50.1	49.6	49.5	47.9	50.0	48.9	48.0	48.9	49.1
Cooling Water Flow	m <sup>3</sup> /h	38.6	50.1	61.9	68.3	77.0	93.8	118.9	139.1	169.0	185.1	211.5	239.7	272.1	299.6	330.7
Cooling Water Pressure Drop	kPa	57.6	55.6	55.5	58.4	56.3	55.4	54.7	55.7	54.6	51.0	52.3	53.4	50.4	52.1	51.4
Microprocessor		W3000														
Compressor No.	n	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2
Circuit No.	n	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Capacity Regulating		30-100% stepless										20-100% stepless				
HFC-R134a Charged	kg	65	70	75	80	85	117	126	132	160	210	250	280	300	320	340
Oil	kg	15	15	22	19	19	30	30	30	32	60	60	60	60	62	64
Lifting Weight	kg	1872	1915	2250	2287	2332	2934	3043	3275	3763	5720	5795	6376	6683	7107	7265
Operating Weight	kg	1937	2003	2353	2398	2458	3103	3250	3520	4083	6185	6315	6980	7350	7863	8077
Dimension																
Length	mm	2930	2930	2930	2930	2930	2950	2950	2960	3020	4470	4470	4470	4470	4600	4700
Width	mm	1195	1195	1195	1195	1195	1260	1260	1260	1290	1380	1380	1380	1380	1420	1420
Height	mm	1660	1660	1780	1780	1780	2000	2080	2050	2280	2230	2230	2230	2230	2400	2400

### Remarks:

1. Standard cooling condition: Evaporator water inlet/outlet temp. 12/7 °C, Condenser water inlet/outlet temp. 30/35 °C
2. IPLV data shown in the sheet @AHRI condition
3. Standard water side pressure of evaporator and condenser is 1.0MPa, 1.6MPa and 2.0MPa is optional
4. Special application, such as river, sea water, please contact Climaveneta office for detail

# INVERTER WATER COOLED CHILLER WITH SCREW COMPRESSOR

## Electrical Data

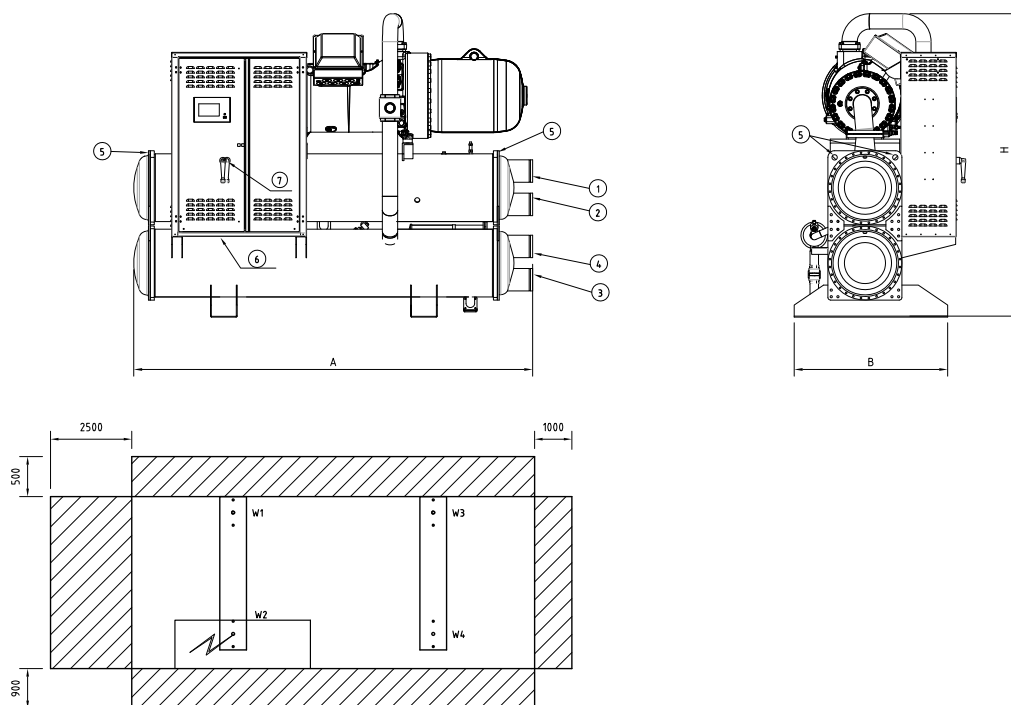
FOCSWATER-INV	n	Max.					
		Compressor(Single set)			Unit		
		F.L.I(kW)	F.L.A(A)	L.R.A(A)	F.L.I(kW)	F.L.A(A)	S.A(A)
0551	1	50.9	88.9	140.0	50.9	88.9	44.5
0701	1	66.3	114.9	202.0	66.3	114.9	57.5
0851	1	80.9	136.6	258.0	80.9	136.6	68.3
0951	1	89.0	154.6	315.0	89.0	154.6	77.3
1101	1	101.3	176.9	378.0	101.3	176.9	88.5
1301	1	121.6	208.0	415.0	121.6	208.0	104.0
1651	1	154.9	260.0	506.0	154.9	260.0	130.0
2001	1	175.1	301.0	650.0	175.1	301.0	150.5
2501	1	216.0	369.0	845.0	216.0	369.0	184.5
2602	2	121.6	208.0	415.0	243.2	416.0	498.2
3002	2	137.7	235.0	479.0	275.4	470.0	573.0
3402	2	154.9	260.0	506.0	309.8	520.0	610.0
3852	2	175.1	301.0	650.0	350.2	602.0	770.4
4252	2	175.1/216.0	301.0/369.0	650.0/845.0	391.1	670.0	965.4
4652	2	216.0	369.0	845.0	432.0	738.0	992.6

### Remarks:

1. Electrical power input: 380-3ph-50Hz; Maximum voltage unbalance: 3%
2. Safety allowance should be considered when cabling the unit for power supply and line-protections
3. F.L.I. Max. Power Input L.R.A. Locked Rotor Current F.L.A. Max. Running Current S.A. Starting Current

## Dimension and Weight

FOCSWATER0551 ~ 2501



Model	Dimension			Weight P./W.(Kg)	Connection	
	A(mm)	B(mm)	H(mm)		①/②	③/④
0551	2930	1195	1660	1872	3"	3"
0701	2930	1195	1660	1915	3"	3"
0851	2930	1195	1780	2250	3"	3"
0951	2930	1195	1780	2287	3"	3"
1101	2930	1195	1780	2332	3"	3"
1301	2950	1260	2000	2934	4"	4"
1651	2950	1260	2080	3043	4"	4"
2001	2960	1260	2050	3275	5"	5"
2501	3020	1290	2280	3763	6"	6"

### Remarks:

- ①Evaporator water inlet      ③Condensers water inlet      ⑤Lift points      ⑦Main isolator
- ②Evaporator water outlet      ④Condensers water outlet      ⑥Power inlet

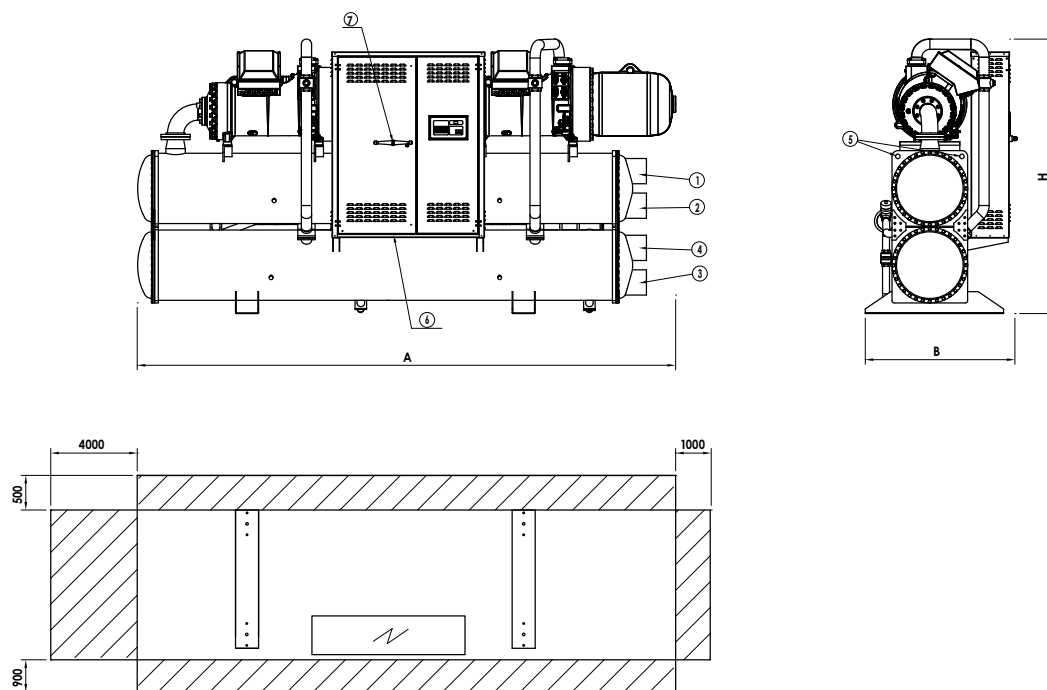
2.Shadows are the maintenance clearance and pipe connection area.( If pipe connection direction need to be exchanged to the opposite side, please consult local Climaveneta office);

3.Please contact Climaveneta office for detail drawings.

# INVERTER WATER COOLED CHILLER WITH SCREW COMPRESSOR

## Dimension and Weight

FOCSWATER2602 ~ 4652



Model	Dimension			Weight P./W.(Kg)	Connection	
	A(mm)	B(mm)	H(mm)		①/②	③/④
2602	4470	1380	2230	5720	6"	6"
3002	4470	1380	2230	5795	6"	6"
3402	4470	1380	2230	6376	6"	6"
3852	4470	1380	2230	6683	6"	6"
4252	4600	1420	2400	7107	8"	8"
4652	4700	1420	2400	7265	8"	8"

### Remarks:

- 1.①Evaporator water inlet    ③Condensers water inlet    ⑤Lift points    ⑦Main isolator  
 ②Evaporator water outlet    ④Condensers water outlet    ⑥Power inlet

2.Shadows are the maintenance clearance and pipe connection area.( If pipe connection direction need to be exchanged to the opposite side, please consult local Climaveneta office);

3.Please contact Climaveneta office for detail drawings.





**Climaveneta Italy:**

36061 BASSANO DEL GRAPPA (VICENZA) ITALIA - VIA SARSON 57/c  
TEL. +39 / 0424 509 500 (r.a.) - TELEFAX +39 / 0424 509 509  
E-mail: info@climaveneta.com <http://www.climaveneta.com>

**Climaveneta China:**

No.88 Baiyun Road Xinghuo Developing Zone ,Shanghai,China Post Code:201419  
TEL: +86-21-57505566 FAX: +86-21-57505797  
E-mail: info@climaveneta.com.cn <http://www.climaveneta.com.cn>

**Climaveneta Hongkong:**

Room 2003,CCT Telecom Building, 11 Wo Shing Street,Fotan,Shatin,N.T.,Hongkong  
TEL: +852-26871755 FAX: +85-2-26873078  
E-mail: info@climaveneta.com.cn <http://www.climaveneta.com>

**Climaveneta Vietnam:**

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: info@climaveneta.com.cn <http://www.climaveneta.com>