ECOi-W SW-N EVO C

ECOi-W SW-N EVO C 660

P-SWVN0660CA-E

Panasonic

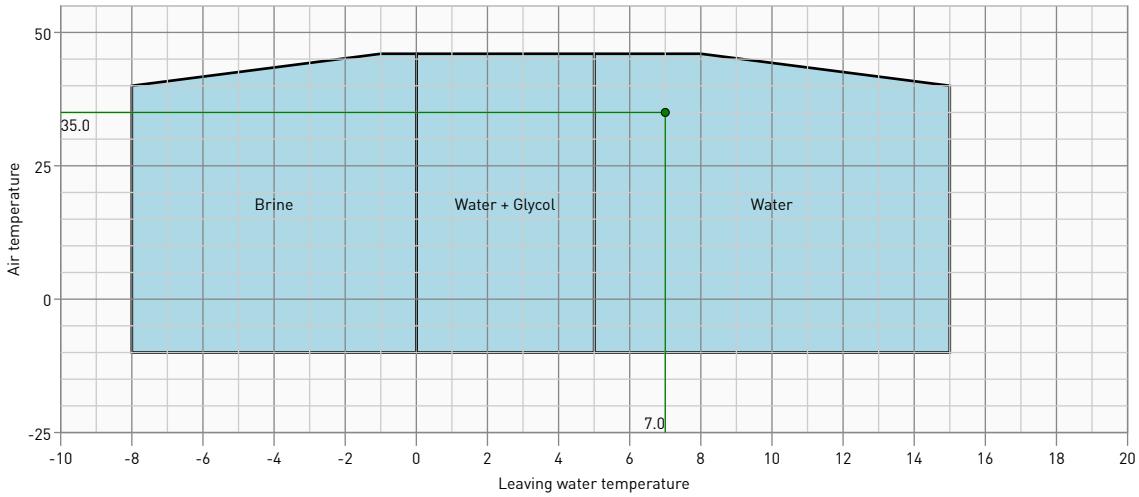
heating & cooling solutions

Configuration

Parameter	Value
Size	660
Acoustic options	Standard
Version	Standard
Fan type	EC
Pump	Without pump
Refrigerant	R513A
Recovery option	No
EcoDesign compliant (european market)	Erp

Calculation

Cooling



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Unit	ECOi-W SW-N EVO C 660
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Operating conditions	Value	
External air temperature	35,0	°C
Entering water temperature	12,0	°C
Leaving water temperature	7,00	°C
Fluid	Water	
Altitude	0	m
Fouling factor	0,000	

Performance	Value	
Capacity	644	kW
Power input	206	kW
Full load efficiency (EER)	3,12	
Energy efficiency class (SEER)*	A	
nsc/nsh*	183	
Seasonal efficiency (SEER)*	4,66	

* *SEER : According to commission regulation (EU) N° 2016/2281*

General data	Value	
Power supply (V/Ph/Hz)	400V/3/50Hz	
Capacity steps (%)	STEP: 50/75/100 - INVERTER: continuous starting from 30%	
Startup current	616	A
Maximum running current	489	A
Maximum input power	297	kW
Number of refrigerating circuits	2	
Refrigerant	R513A	
Indicative refrigerant charge for the unit	130,00	kg

Compressor	Value	
Number of compressors	2	
Compressor type	1 STEP SCREW + 1 INVERTER SCREW	
Compressor startup type	SD	

Plant side heat exchanger	Value	
Number of exchangers	1	
Exchanger type	Shell and Tube	
Total fluid flow rate*	112268	l/h
Minimum fluid flow rate	69346	l/h
Minimum fluid volume (Comfort)	4830	L
Pressure drop	31,3	kPa

* *The plant side exchanger water-flow rate is equal to the standard rating water flow rate*

Water connections	Value
Water connection type	Victaulic
Water connection inlet diameter	8
Water connection outlet diameter	8

Fan	Value	
Number of fans	14	
Fan type	Axial Fans	
Fan speed	15	Hz
Maximum absorbed power per fan	1,50	kW
Total air flow	321840	m³/h

Condenser	Value
Number of condensers	14
Condenser type	Microchannel coil

Sound level	Value	
Sound power level	99,7	dB(A)
Distance from sound source	10,0	m
Sound pressure level*	67,0	dB(A)

* *Sound pressure levels refer to ISO Standards 3744 with parallelepiped shape*

Hz	125	250	500	1k	2k	4k
dB	98	95	97	96	91	83

All the data are including options

Options

101 - MBS - Modbus protocol kit for BMS (RS485) (Option)

It allows the integration of the unit with BMS with Modbus protocol through RS485 port

104 - MBS/IP - Modbus protocol kit for BMS (ETHERNET) (Option)

It allows the integration of the unit with BMS with Modbus protocol through Ethernet port

111 - BLD - Back light display (Option)

User Display panel mounted. Suggested for outdoor installation

121 - FSC - Fan Speed controlled by Condensing Pressure in cool mode or by Air Temp in heat mode (Option)

Electronic speed controllers are designed to control the speed of fan motors in Air Cooled Chiller and Heat pump. Fan Speed controlled by Condensing Pressure in cool mode or by Air Temp in heat mode. Using variable fan speed controllers offers following benefits in commercial refrigeration or air-conditioning applications High Efficiency, Low Noise level, Low air temperature in cool mode and High air temperature in heat mode.

123 - DSP - Double set point (Option)

Can manage two different applications (set point) selected by remote dry contact Circuit 1 and Circuit 2. On/Off or Part Load by remote Dry contact.

124 - PHC - Sequence phases control (Option)

Relay detecting wrong unit cabling (phase loss or phase rotation)

126 - 3PH - Power supply without neutral (Option)

Additional transformer mounted in electrical board to avoid the use of neutral

127 - EEV - Electronic expansion valves (Option)

It allows to have high precision on superheat control

130 - SD - Compressor' Star Delta Start (Option)

Start-up mode of screw compressor to reduce LRA

133 - Compressor envelop control (Option)

Integrated logic to protect compressor operation

141 - CLK - Set point timer/Clock card (Option)

To schedule 4 different interval time with different active water T setpoint

142 - DL - Data logger (Option)

Record continuously the essential thermodynamic operating parameters, during the last hours. This facilitates debug and service activity on field

201 - R513A - Refrigerant R513A (Option)

250 - PED Approval (Option)

PED Approval

305 - SC - Stepless control (Option)

It allows to follow continuously capacity load modifications without having sensitive variation on water temperature. Thanks to the control logic this effect can be obtained even combining a multi step fixed screw compressor with an inverter driven compressor.

400 - EEH - Antifreeze electric heater (Option)

Antifreeze electric heater to protect evaporator from freezing.It's managed by a water temperature probe

410 - S&T - Shell & Tube evaporator (Option)

Shell & Tube evaporator

500 - MCHX - Micro Channel Heat Exchanger (Option)

Microchannel coils

601 - CB - Compressor box (Option)

Box to protect compressor from external environment and reduce sound emissions

912 - Left hand water connection (Option)

Left hand water connection

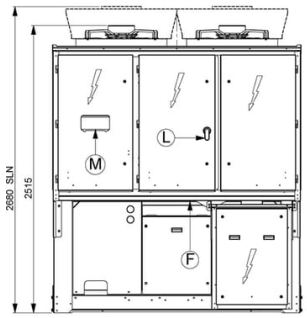
1100 - crane lifting kit (Option)

Kit for crane lifting

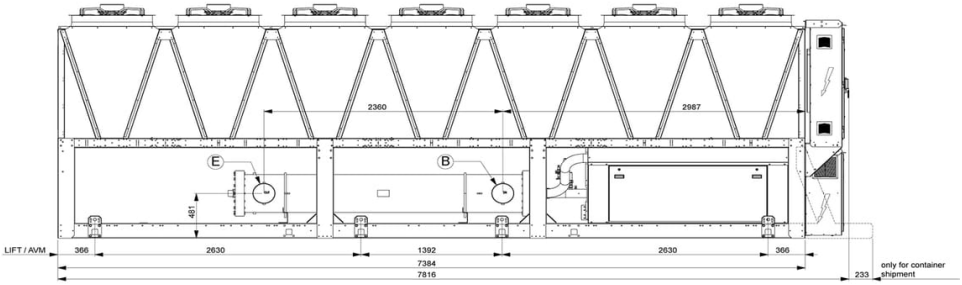
Dimensions & weight

Dimensions

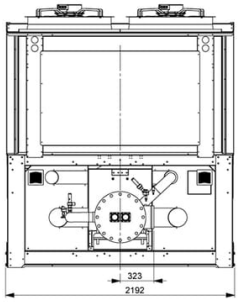
Front view



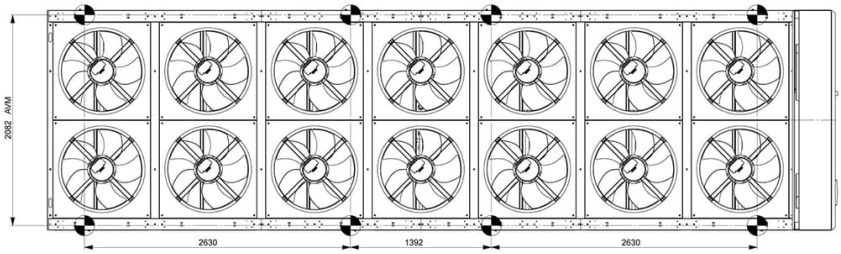
Side view



Back view



Top view



B	Water inlet 8” Victaulic
E	Water outlet 8” Victaulic
F	Electrical power supply
L	Main switch
M	Control keypad / Display

Hydraulic option	Water in	Water out
STD	B	E

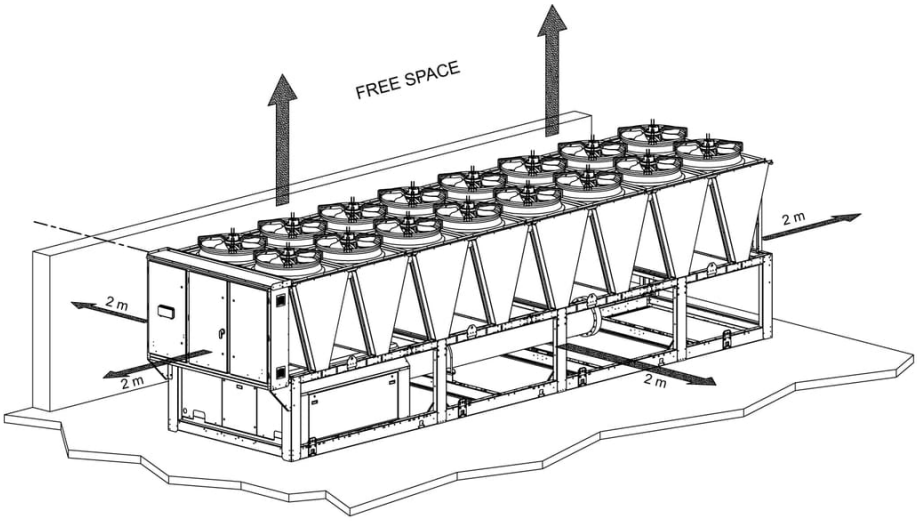
Dimensions	Value (mm)
Length	7816
Width	2192
Height	2510

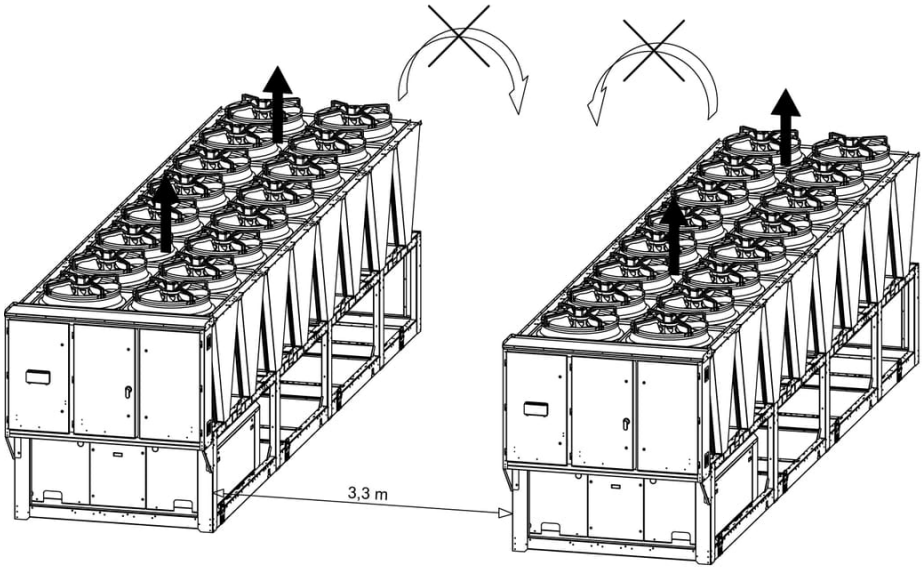
Weight

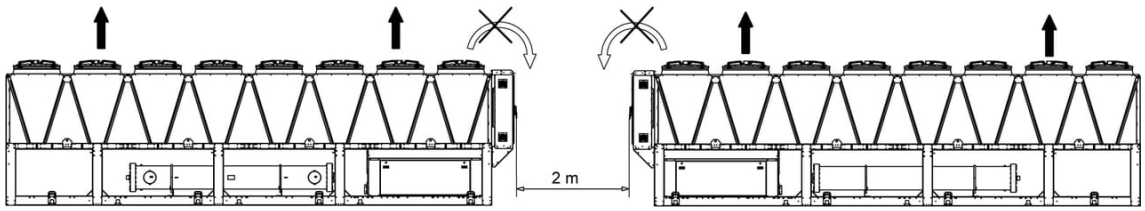
Part	Weight (kg)
Operating weight	5620.0
Shipping weight	5392.0

Space Requirements

Space Requirements (mm)







Pictures and drawings of Dimensions and Hydraulic/Electrical Connection tabs are only illustrative. They can differ from the visual shape of the selected product variant.

General

The new range has been designed and optimized to operate with R513A refrigerant. Each unit consists of two independent refrigerant circuits with a hybrid combination of one inverter driven variable speed screw compressor and one fixed speed screw compressor. Pure counter-flow shell and tube direct expansion evaporator is equipped with double refrigerant circuit and common hydraulic circuit. The modular condensing section is made with long life aluminium alloy micro-channel coils, and a new optimized fan deck. All the units are equipped with electronic expansion valves, one for each circuit. The units are available in 12 sizes, with a nominal capacity range from 360 to 1240 kW.

Version

Standard acoustic version. The units are equipped with electronically commutated (EC) fan motors, providing quiet acoustic performances and stepless speed control, and a metallic compressors box further reducing the noise emission.

Cabinet and structure

The cabinet is made of heavy gauge galvanized steel. All galvanized steel components are individually painted by a special painting process before the assembly of the unit. This painting system performs a homogeneous protection to the corrosion. The painting is a polyester powder based type. The units are suitable for outdoor installation, directly on the building roof or at the ground level. All parts of the structure are totally fastened with stainless steel bolts and rivets.

Refrigerant circuits

All the units are composed of two independent and separate refrigerant circuits. Each refrigerant circuit is equipped with discharge line shut-off valves, filter-drier with solid core, sight glass and electronic expansion valve. Some units are equipped with economizer circuit (ECO) to improve cooling capacity and efficiency. The functional diagram of each circuit is shown in the section "Refrigerantflow diagram".

Semi-hermetic screw compressors

The compressors installed in the units are semi-hermetic screw type. The leading compressor is variable speed controlled, integrating frequency inverter, sensors for protection and monitoring and solenoid valves (Vi control and frequency inverter cooling) in a pre-wired package. The inverter driven compressor, in hybrid combination with a step control type screw compressor, perform a continuous capacity control and offer precision in load management and set-point regulation and enhanced seasonal performances. All compressors are fitted with an electronic control systemensuring the following functions:Protection against high temperature and excessive load;Correct direction of rotation;Phase monitoring.Besides the aforementioned functions, inverter drivencompressor is also equipped as standard of the following additional features:Frequency inverter cooling (solenoid valve, expansionvalve, regulator);Low / High pressure transducer;Oil level switch;Vi slider control for efficiency optimization.Depending on unit size, step type compressors are suppliedwith Part-Winding or Star-Delta starting system. Start-Delta starting system is available as option for unit havingPart-Winding starting system as standard. Also soft starteris available on request for step type compressors in orderto reduce the global value of inrush current.

Evaporator

Evaporator is of a new generation shell and tube, of pure counter flow type heat exchanger. It is insulated with a 19 mm thick closed cell polyethylene foam material and is fit¬ted with an electric heater on the external surface to prevent the unit from freezing at a low temperature (downto -18 °C) when the unit is off. Water connections of heat exchanger are of Victaulic type supplied with coupling stub pipe to be welded.

Condenser coils

The condenser coils are of microchannel type, made of 100% aluminium (fins, tubes and headers) with the exception of pipe couplings which are in copper. Anti-corrosion protection treatment is available as option.

Condenser fans

For each size, all versions keep the same number of fans. Large diameter, direct drive axial type fans with electronic brushless type motors are used in all available versions. A dedicated version of electronic brushless type with more powerful motor is used on HT and HPF versions, in order to generate higher air flow rate (HT) or additional static pressure up to 120 Pa (HPF). Fans are equipped with externally mounted nozzle profile housing generating low sound levels. In super low noise versions (S) an additional air diffuser is mounted on top of each fan motor to further reduce sound power level without compromising unit performances. Thanks to electronic brushless technology, fan speed controlfunction is standard included for all the available ranges, allowing the units to operate in cooling mode at negative ambient temperatures.

Electrical board

The electrical board is located in a metal case arranged outside the unit. The metal case has an IP54 protection rating and is complete with grilles for natural air ventilation.

Electronic control

The units are supplied with the new microprocessor-based electronic control and management system ensuring the following functions: Management of the operation of compressors:Power on/offAnti-cycle managementUnloading for high pressure or high compressor pressure ratio (integrated inside the curves of compressoroperating limits).Chilled water temperature regulation (control option oninlet water temperature RWT (P+I type) or outlet watertemperature LWT (neutral band type) of the evaporator.Control of superheating on suction line. Evaporator antifreeze protection.Management of high and low pressure alarms.Management of the compressors on the two circuits. Management of the electronic expansion valves bymeans of EEV controller.Management of external interlocks.Management of the remote control:Unit power on/offSummary alarm signalsRemote signalling, by free contacts:Voltage presence.Compressors in operation.Circuit alarm unit.Management of the on board hydro kit (fixed / variablespeed pumps).Management of the heat recovery mode by means ofinlet water temperature sensor at the heat recovery condenser.The unit controller can also clearly show all control parametersof the machine on the liquid crystal display, such as:Display of superheating value.Display of the temperature at the evaporator inlet andoutlet.Display of the ambient air temperature.Display of the circuit 1 and circuit 2 discharge pressureand suction pressure.

Control and safety devices

Each unit is fitted with the following devices:Safety:Power disconnect switch with an emergency stop function.Safety valve on the discharge line (HP side) set to 22 bar.Safety valve on the suction line (LP side) set to 14.5 bar.HP switches (double on each circuit) set to 19.7 bar,manual reset to be reinitialized from control board.LP switches (one for each circuit) set to 0.5 bar, manualreset to be reinitialized from control board. Antifreeze temperature sensor (set to +4°C) on theevaporator.Discharge gas temperature protection, on the dischargeline of each compressor. Control:HP and LP transducers.Evaporator water inlet temperature sensor.Evaporator water outlet temperature sensor (with an antifreeze function).Suction temperature sensor for EEV control.Ambient air temperature sensor.Heat recovery condenser temperature sensor.

Conformity with standards

The following applies to all the sizes and versions of units:Machine Directive: 2006/42/EC.Low Voltage Directive: 2006/95/EC.Electromagnetic Compatibility Directive: 2014/30/EU.Pressure Equipment Directive: 2014/68/EU.