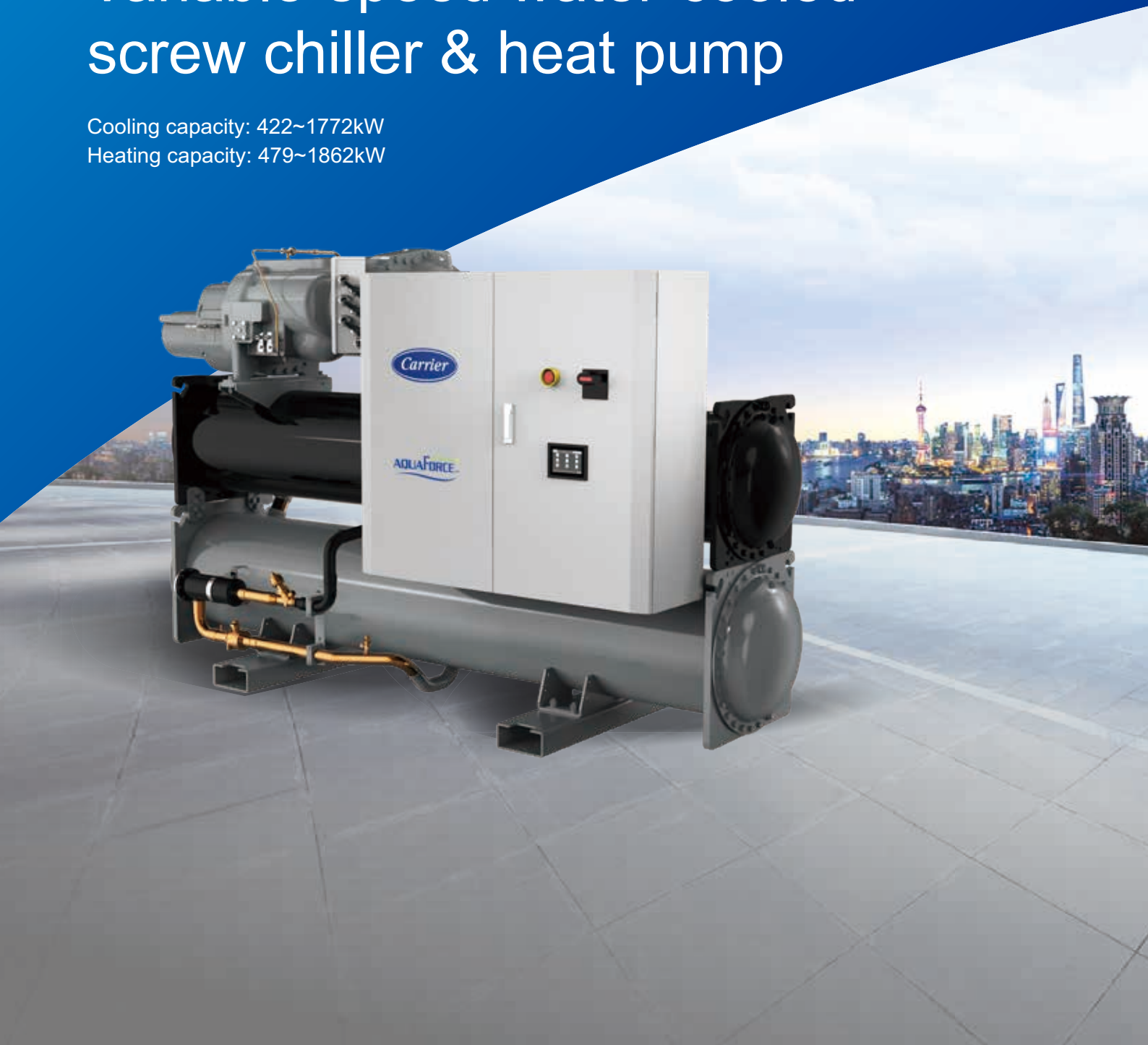
Carrier

greenspeed AQUAFORCE™

30XW-V
Variable-speed water-cooled screw chiller & heat pump

Cooling capacity: 422~1772kW
Heating capacity: 479~1862kW



In 1998, Time magazine named Dr. Carrier one of its 20 most influential builders and titans of the 20thcentury.

Carrier is a leading global provider of innovative HVAC, refrigeration, fire, security and building automation technologies. Supported by the iconic Carrier name, the company's portfolio includes industry-leading brands such as Carrier, Kidde, Edwards, LenelS2 and Automated Logic. Carrier's businesses enable modern life, delivering efficiency, safety, security, comfort, productivity and sustainability across a wide range of residential, commercial and industrial applications.

Nomenclature

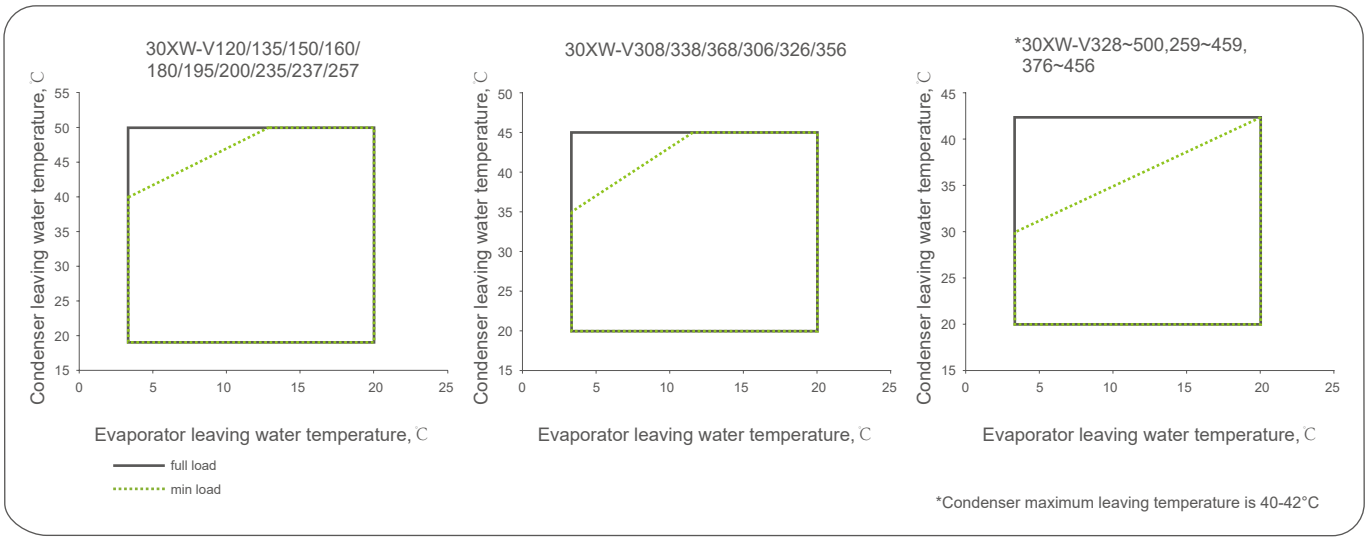
30 XW - V C 200 - PT001A

- PT001A: Option (Details on page 16)
- 200: Nominal cooling capacity (USRT)
- C: Refrigerant: default, R134a; C, R513A
- XW - V: Variable-speed water-cooled screw chiller
- 30: Carrier product code

Operating Range

Cooling		
Evaporator	Minimum	Maximum
Entering temperature at start-up	-	35℃
Leaving temperature during operation	3.3℃ *	20℃
Entering/leaving temperature difference at full load	2.8℃	11.1℃
Condenser	Minimum	Maximum
Entering temperature at start-up	13℃	-
Leaving temperature during operation	19℃	50℃ **
Entering/leaving temperature difference at full load	2.8℃	11.1℃

Note:
1.* If the leaving water temperature is below 3.3℃, a frost protection solution must be used.
2. ** The maximum leaving temperature is different for different model, please refer below operation envelop and ECAT report for details.
3. During storage and transport of the unit the minimum and maximum permissible temperatures are -20℃ and 58℃. These temperatures should be taken into consideration for transport by container.



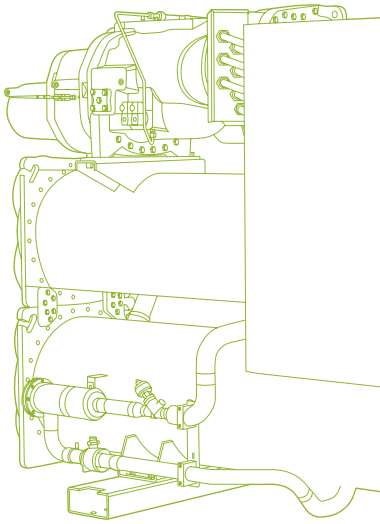
*Condenser maximum leaving temperature is 40-42°C

All data over 200Tons (50Hz) and all data (60Hz) in this catalogue is rated in accordance with AHRI Standard 550/590 and 551/591as represented in the Packaged Chiller Builder Selection Program (E-Cat)

General Features

The AquaForce 30XW-V variable speed screw chillers are the premium solution for industrial and commercial applications where installers, consultants and building owners require maximum quality and optimal performances, especially at part load.They are designed to meet current and future requirements in terms of energy efficiency, versatility and compactness.

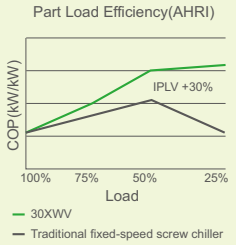
- The 30XW-V use the most reliable technologies available today:
  - · Exclusive inverter-driven screw compressors, an evolution of the proven traditional Carrier twin-rotor screw compressor design.
  - · Advanced Carrier® SmartVu™ controller.
  - · Extremely efficient mechanically cleanable flooded evaporators.
  - · Environmental stewardship refrigerant R134a and R513A.
- The 30XW-V range is split into two versions:
  - · 30XW-V for air conditioning and refrigeration applications.
  - · 30XW-V-PT150D/G for hot water and heating applications.
- As standard, the unit can provide an evaporator leaving water temperature down to 3.3℃ , and when operating as a heat pump, it can deliver up to 50℃ on the condenser side with option of 150D.
- Low temperature, allowing the 30XW-V to operate with an evaporator leaving glycol temperature down to -6°C with option of 005.

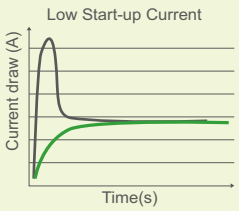


High Energy Efficiency

The 30XW-V was designed for high performance both at full load and at part load. Exceptional IPLV/ NPLV* values set new benchmarks for low energy consumption.

- Inverter-driven twin-rotor screw compressors allow precise capacity matching of building load changes and significantly reduce unit power input, especially at part-load.
- Flooded multi-pipe evaporator and condenser for increased heat exchange efficiency.
- Electronic expansion device permits operation at a lower condensing pressure and improved utilization of the evaporator heat exchange surface.
- Inverter-driven motors ensure negligible start-up current, optimised electrical performance.





Notes: *IPLV(Integrated Part-Load Value), a single number of part-load efficiency, it's rated at 100%, 75%, 50%, and 25% load relative to the full-load rating net refrigerating capacity at the standard rating AHRI conditions. Condenser EWT is 29.4℃ ,23.9℃ ,18.3℃ ,18.3℃ , respectively. Evaporator LWT is kept constant 6.7℃ .

NPLV(Non-Standard Part-Load Value), a single number of part-load efficiency referenced to conditions other than IPLV conditions. At 100% load, the condenser EWT is user-defined, at 75% load, condenser EWT is vary linearly from the selected EWT at 100% load to 18.3℃ at 50% load, and fixed at 18.3℃ for 50% to 0% load. Evaporator LWT at each load is user-defined too.

Variable-frequency for green building design

The air conditioning system uses about 40% of the annual building energy consumption. Selection of the right air conditioning unit is one the main aspects to consider when designing a green building.

- Buildings with a variable load throughout the year 30XW-V units offer the solution to this important challenge.
- High efficiency Integrated inverter with automatic energy optimization function, optimise energy savings due to quicker commissioning and better system efficiency.
- The low total harmonic current distortion rate (THDI) options ensure that the VFD can not exceed IEEE-519 standard, for distortion at the points of commom coupling, the evaluation of the compatibility level of harmonic interference on the public low-voltage power distribution system can be done using technical report IEC61000-3-4.
- With the primary pump variable flow system, variable speed chiller and water pump unit synchronous control, to meet the energy saving demands.

Environmental Care

- Stewardship refrigerant
  - · R134a refrigerant with zero ODP (ozone depletion potential) and R513A with low GWP (global warming potential) offering to reduce carbon emissions.
- Leak-tight refrigerant circuit
  - · Reduction of leaks as no capillary tubes and flare connections are used.
  - · Verification of pressure transducers and temperature sensors without transferring refrigerant charge.
  - · Discharge line shut-off valve and liquid line service valve for simplified maintenance.

High Reliability

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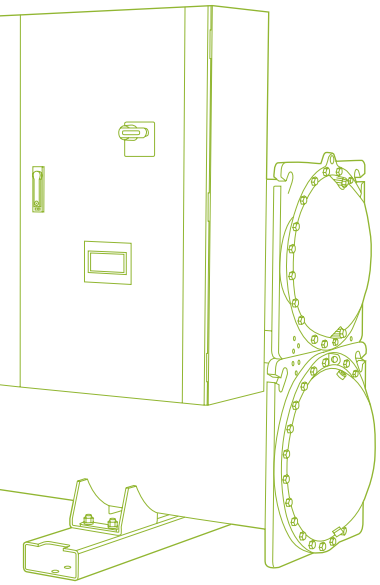


- Inverter-driven screw compressors
  - · Industrial-type screw compressors with oversized bearings and motor cooled by suction gas.
  - · The inverter is optimized for each compressor motor to ensure reliable operation and easy maintenance.
  - · All compressor components are easily accessible on site minimizing down-time.
- Evaporator
  - · Electronic paddle-free flow switch. Auto-setting according to cooler size and fluid type.
- High protection degree electric cabinet
  - · Good waterproof and dustproof function.
  - · Ensure chiller can still run stable and reliable under a variety of bad working conditions.
- Auto-adaptive control
  - · Control algorithm prevents excessive compressor cycling.
  - · Automatic compressor unloading in case of abnormally high condensing pressure or discharge temperature.
- Exceptional endurance tests
  - · Partnerships with specialized laboratories and use of limit simulation tools (finite element
  - · calculation) for the design of critical components.
  - · Transport simulation test in the laboratory on a vibrating table and then on an endurance circuit.

Easy and fast installation

- Compact design
  - · The 30XW-V units are designed to offer compact dimensions for easy installation.
  - · With a width of approximately 1.2 m, the units can pass through standard door openings and only require minimum floor space in the plant room.
- Simplified electrical connections
  - · Main circuit breaker with high trip capacity.
  - · Transformer supply to the integrated control circuit (400/24 V).
- Simplified water connections
  - · Victaulic connections on the evaporator and condenser.
  - · Practical reference marks for entering and leaving water connections.
  - · Possibility to reverse the heat exchanger water inlet and outlet at the factory.
  - · Possibility to modify the number of heat exchanger passes.
- Fast commissioning
  - · Systematic factory operation test before shipment.
  - · Quick-test function for step-by-step verification of the instruments, expansion devices and compressors.

Carrier® SmartVu™ Control System - Intelligent Colored Touch Screen

- 30XW-V chiller employs Carrier's most advanced Carrier® SmartVu™ controller that delivers distinct capabilities of controlling and detecting the chiller operations.
- Equipped with high-resolution colorful 7 inch touch screen (10 inch as optional), Carrier® SmartVu™ controller offers more user-friendly interface with intuitive graphical operational data in real time, adapts precisely the chiller capacity to building load and provides comprehensive protection.

Reliable Start - up and Operation

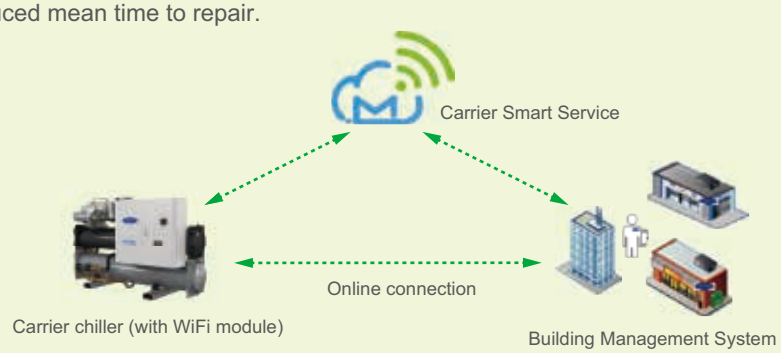
- Carrier® SmartVu™ controller offers password protection to avoid any unauthorized operation.
- When chiller starts, the controller will activate pre-start process to check parameters such as pressure, temperature, motor status, water flow etc.
- In addition to the function of detecting the main operational parameters, trending function provide the visual dynamic parameter curves. The intelligent and dynamic algorithm ensures optimal, effective and reliable chiller operation.
- The control system provides following comprehensive protection, which guarantees steady chiller operation:
  - Overcurrent.
  - Discharge temperature overheat.
  - Motor temperature overheat.
  - Evaporator and condenser anti-freeze.
  - Low discharge superheat.

Effective Failure Diagnostic

- Carrier® SmartVu™ control system has more than 100 failure diagnostic function. Users can easily access chiller operation parameters via touch screen. If control system detects failure the alarm will be initiated and related code will be recorded in alarm menu. The alarm records, up to 50, can be automatically saved by control system. Carrier service technician can read and delete alarm records by Carrier service/PCDCT tools.
- The control system can automatically send out email alarm to customer or service technician.

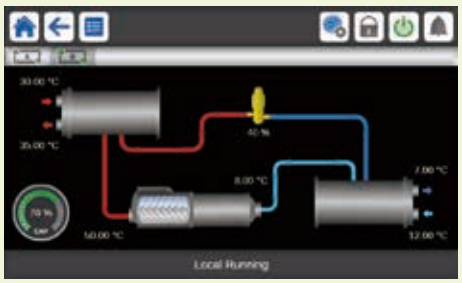
Intelligent Online Connection and Control

- Carrier® SmartVu™ control panel supports CCN, BACnet IP/MSTP, Modbus TCP/IP and Modubs RTU protocols, with which chiller can seamlessly connect with the Building Automation System or the i-Vu™/WebCTRL control network. Moreover, LonWorks, J-Bus are also supported with optional gateway.
- An industrial Internet intelligent protocol module housed in electrical cabinet has the function of conversion and transmission of data and can connect the field chiller controllers through the wireless network. Chiller operational data can be transmitted to the remote server (Smart Service by Carrier) via wireless network, 4G, etc., so as to detect chiller data and fault alarm.
- Carrier Smart Service (optional) based on “Big Data Processing” provides value added customer service such as online data management and analysis, daily and key performance reports, prognostics and preventative maintenance and graphic data trend. The enhanced data management and analysis will help achieve continuous optimization of the chiller and system operation.
- Carrier Smart Service changes how equipment is serviced and maintained. Carrier service technicians now utilize mobile devices with remote access to put real-time chiller data and service history in the palm of their hands. With advance notification of problems, technicians arrive at the jobsite more informed, which leads to faster problem resolution and reduced mean time to repair.



Main Page

- Control system main page operation and primary parameters detected:
  - Main page button
  - Menu page button
  - Log in/Language button
  - Start-up/Stop page button
  - Alarm menu button
  - Setting point
  - Chiller load percentage
  - Condensing water pump status
  - Chilled water pump status
  - Condenser water inlet/outlet temperature
  - Evaporator water inlet/outlet temperature



- Customer can easily read following primary information of chiller, components status and access to other interfaces from this page:
  - Temperature/Pressure page
  - Input/Output parameter page
  - Water system parameter page
  - Operation time
  - Mode

Carrier products and green building certification

Introduction

Energy usage and costs combined with increasing concerns to reduce CO_2 emissions are among the most important environmental challenges in today's world. New and existing buildings are one area where energy efficiency and the conservation of natural resources is a high priority.

Green building design

Design teams increasingly focus on designing "green buildings" to address today's energy efficiency and environmental sustainability needs. A green building is a building that is environmentally sustainable and has been designed, constructed and is operated to minimise the total impact of the environment.

The underlying principles of this approach: the resulting building will be economical to operate, offer increased comfort and create a healthier environment for the people who live and work there, increasing productivity.

The main strategies* adopted to achieve a green building design include:

- Sustainable Sites (SS)
- Water Efficiency (WE)
- Energy & Atmosphere (EA)
- Materials & Resources (MR)
- Indoor Environmental Quality (IEQ)
- Innovation in Design (ID)

Green building certification

A number of green building certification programs exist in the market and offer third-party assessment of green building measures for a wide variety of building types. Some examples of existing programs include:

- LEED (Leadership in Energy & Environmental Design)
- BREEAM
- ESTIDAMA PEARL
- NABERS (National Australian Built Environment Rating System)

HVAC products and systems

Carrier HVAC products are built to high energy efficiency and indoor air quality standards. They assist building designers and owners by offering high-performance heating, ventilation, and air conditioning (HVAC) systems and products with reduced energy consumption and enhanced indoor air quality for the occupants, contributing to optimised green building performance.

Each certification program may address and prioritise different green building design strategies according to local and regional needs and legislation. The following example looks at how Carrier's new 30XW-V range helps customers involved in LEED building certification.

* Source USGBC: LEED

Example: 30XW-V and LEED® certification

The LEED® (Leadership in Energy and Environmental Design) green building certification programme is a pre-eminent programme to rate the design, construction and operation of green buildings with points assigned in seven credit categories:

- Sustainable Sites (SS)
- Water Efficiency (WE)
- Energy & Atmosphere (EA)
- Materials & Resources (MR)
- Indoor Environmental Quality (IEQ)
- Innovation in Design (ID)
- Regional Priority (RP)

There are a number of different LEED® products. Whilst the strategies and categories assessed remain the same, the point distribution varies to address different building types and application needs, for example according to New Construction, Schools, Core & Shell, Retail and Healthcare. All programmes now use the same point scale.

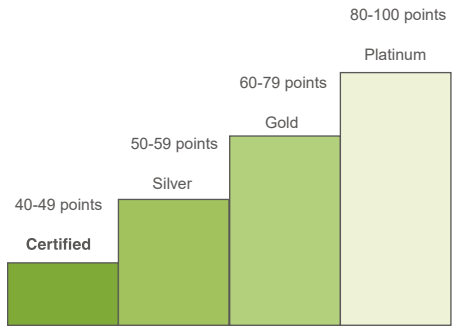
The majority of credits in LEED® rating systems are performance-based and achieving them is dependent on the impacts to the overall building.

The contribution any product or system may make to the points achieved depends on how it impacts the entire building and its operations.

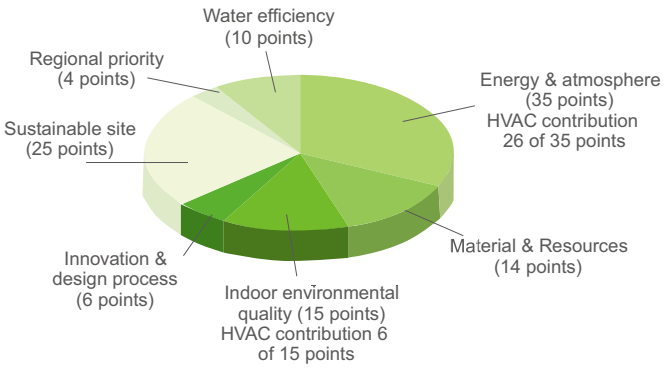
Whilst the LEED® green building certification programme does not certify products or services, the selection of products or service programmes is critical to obtaining LEED® certification for a registered project because the right products or service programmes can help meet the goals of green construction and ongoing operation and maintenance.

The choice of heating, ventilating and air conditioning (HVAC) products in particular can have a significant impact on LEED® certification, as the HVAC system directly impacts two categories that together influence 40% of the available points.

110 possible LEED points



Overview of LEED for new construction and major renovations



The new 30XW-V units from Carrier can assist building owners to earn LEED® points in the Energy & Atmosphere (EA) credit category and help address the following prerequisites and credit requirements:

EA prerequisite 2: Minimum Energy Performance

The 30XW-V could match the energy-efficiency requirements of ASHRAE 90.1-2016; therefore it complies with the prerequisite standard.

EA prerequisite 3: Fundamental Refrigerant Management

The 30XW-V does not use chlorofluorocarbon (CFC) refrigerants satisfying the prerequisite statement

EA credit 1; Optimise energy performance (1 to 19 points)

One component for this credit requires the energy cost reduction of the proposed building compared to ASHRAE 90.1-2016 minimum tables and beyond the performance level required to meet EA prerequisite 2.

The 30XW-V is designed for efficient part-load performance and therefore satisfies this LEED® credit. In addition, the Carrier HAP (Hourly Analysis Program) can be used in the energy analysis component of this credit. The HAP program can run analysis programs that comply with the modeling requirements for this credit and produce reports that are easily transferable to LEED® templates.

EA credit 4: Enhanced refrigerant management (2 points)

With this credit, LEED® awards systems that minimise the Ozone Depletion Potential (ODP) and Global Warming Potential (GWP) of the system.

The 30XW-V uses a reduced R134a charge and therefore contributes toward satisfying this credit under LEED®.

NOTE: This section describes the prerequisites and credit requirements in LEED® for New Construction and is directly related to the 30XW-V. Other prerequisites and credit requirements are not directly and purely related to the air-conditioning unit itself, but more to the control of the complete HVAC system. i-Vu™, Carrier's open control system, has features that can be valuable for:

- EA prerequisite 1: Fundamental commissioning of energy management systems
- EA credit 3: Enhanced commissioning (2 points)
- EA credit 5: Measurements and verification (3 points)

NOTE: Products are not reviewed or certified under LEED®. LEED® credit requirements cover the performance of materials in aggregate, not the performance of individual products or brands. For more information on LEED®, visit: www.usgbc.org.

Performance data

Model			30XW-V-PT001A											
			120	135	150	160	180	195	200	237	235	257	259	279
Capacity		kW	422.0	474.8	522.3	566.1	640.3	714.1	823.3	823.2	904.3	903.9	893.8	981.8
		USRT	120	135	149	161	182	203	234	234	257	257	254	279
Full load COP@AHRI		kW/kW	5.511	5.511	5.501	5.668	5.628	5.809	5.516	5.635	5.529	5.636	6.501	6.513
IPLV@AHRI		kW/kW	8.928	9.083	9.460	9.607	9.773	9.830	9.679	9.750	9.606	9.646	10.29	10.57
Evaporator	Flow rate	L/s	18.13	20.39	22.43	24.31	27.50	30.67	35.36	35.36	38.84	38.82	38.39	42.17
	Water Pressure drop	kPa	25.3	32.5	38.5	41.6	47.6	37.9	37.6	34.8	42.8	42.0	31.0	38.0
	Water connection	DN	125	125	125	150	150	200	200	200	200	200	200	200
Condenser	Flow rate	L/s	22.99	25.86	28.45	30.72	34.77	38.61	44.85	44.71	49.25	49.01	47.59	52.27
	Water Pressure drop	kPa	34.3	45.8	54.0	69.5	83.1	47.5	60.9	56.8	68.1	66.1	30.0	36.0
	Water connection	DN	125	125	125	150	150	200	200	200	200	200	200	200
Compressor			Inverter-driven screw type											
		No.	1	1	1	1	1	1	1	1	1	1	1	1
Capacity control range			30%-100%	25%-100%		20%-100%								
Motor	Power	V-Ph-Hz	400-3-50/380-3-60											
	Input power	kW	76.57	86.15	94.95	99.88	113.8	122.9	149.3	146.1	163.6	160.4	137.5	150.7
Refrigerant Charge			HFC-134a											
	Circuit A	kg	100	100	100	135	135	180	180	180	180	180	340	340
	Circuit B	kg	-	-	-	-	-	-	-	-	-	-	-	-
Shipping weight*		kg	3098	3111	3187	3333	3356	4308	4361	4361	4367	4367	6652	6652
Operation weight		kg	2832	2845	2921	3181	3204	4312	4365	4365	4371	4371	6748	6748
Dimension	Length	mm	2761	2761	2761	3056	3056	3301	3301	3301	3301	3301	3824	3824
	Width	mm	1189	1189	1189	1122	1122	1221	1239	1239	1239	1239	1689	1689
	Height	mm	1694	1694	1694	1743	1743	1949	1949	1949	1949	1949	2497	2497

Operation condition : Evaporator chilled water outlet temperature 6.67℃ , chilled water inlet temperature 12.22℃ , fouling factor=0.0176m^2K/kW
Condenser cooling water inlet water temperature 29.44℃ , cooling water outlet temperature 34.61℃ , fouling factor=0.044m^2K/kW.
Above are recommended models. Carrier can offer more models and computer selections at required conditions. For details, please contact Carrier local agencies.
* The shipment weight is only base unit and wooden crating, excluding refrigerant and water inside.

Performance data

Model			30XW-V-PT001A											
			308	309	328	329	338	368	358	359	378	379	408	409
Capacity		kW	1074	1077	1146	1159	1188	1231	1252	1248	1336	1343	1435	1413
		USRT	305	306	326	330	338	350	356	355	380	382	408	402
Full load COP@AHRI		kW/kW	5.972	6.602	6.260	6.471	5.933	5.934	6.307	6.472	6.312	6.452	6.199	6.503
IPLV@AHRI		kW/kW	10.06	10.72	9.606	10.74	10.02	10.10	9.825	10.65	9.968	10.57	10.10	10.64
Evaporator	Flow rate	L/s	46.13	46.27	49.22	49.77	51.04	52.88	53.76	53.62	57.39	57.66	61.61	60.71
	Water Pressure drop	kPa	68.0	38.0	42.7	44.0	65.1	68.9	41.8	58.0	52.8	63.0	44.7	43.1
	Water connection	DN	150	200	200	200	200	200	200	200	200	200	200	200
Condenser	Flow rate	L/s	57.86	57.25	61.06	61.75	64.08	66.38	66.60	66.53	71.12	71.10	76.50	74.79
	Water Pressure drop	kPa	56.5	35.9	46.3	42.0	76.8	81.1	39.3	54.0	45.4	52.9	51.9	62.9
	Water connection	DN	200	200	200	200	200	200	200	200	200	200	200	200
Compressor			Inverter-driven screw type											
		No.	1	1	1	1	1	1	1	1	1	1	1	1
Capacity control range			20%-100%											
Motor	Power	V-Ph-Hz	400-3-50/380-3-60											
	Input power	kW	179.8	163.2	183.1	179.1	200.3	207.4	198.4	192.9	211.7	208.1	231.4	217.4
Refrigerant Charge			HFC-134a											
	Circuit A	kg	330	356	380	356	340	340	380	400	400	450	400	480
	Circuit B	kg	-	-	-	-	-	-	-	-	-	-	-	-
Shipping weight*		kg	6369	6862	7808	6862	6570	6570	8045	7067	8395	8564	8506	8817
Operation weight		kg	6539	7031	7924	7031	6798	6798	8238	7275	8624	8837	8783	9202
Dimension	Length	mm	4166	3824	4107	3824	4164	4166	4124	4124	4515	4524	4515	4524
	Width	mm	1398	1689	1514	1689	1424	1424	1530	1687	1530	1745	1530	1745
	Height	mm	2321	2497	2563	2497	2388	2403	2614	2497	2614	2632	2614	2632

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Performance data

Model			30XW-V-PT001A											
			428	429	458	459	500	306	326	356	376	406	426	456
Capacity		kW	1494	1501	1611	1591	1772	1065	1150	1244	1320	1406	1496	1583
		USRT	425	427	458	452	504	303	327	354	375	400	425	450
Full load COP@AHRI		kW/kW	6.226	6.470	6.305	6.501	5.953	5.360	5.416	5.410	5.463	5.626	5.636	5.638
IPLV@AHRI		kW/kW	10.00	10.74	10.09	10.92	10.19	9.468	9.682	9.664	9.480	9.495	9.409	9.547
Evaporator	Flow rate	L/s	64.18	64.45	69.20	68.33	76.10	45.74	49.38	53.43	56.68	60.40	64.23	67.99
	Water Pressure drop	kPa	47.8	48.2	49.7	54.0	64.9	36.4	42.3	31.3	34.4	39.5	45.4	50.8
	Water connection	DN	200	200	200	200	200	200	200	200	200	200	200	200
Condenser	Flow rate	L/s	79.64	79.45	85.70	84.18	94.93	58.26	62.79	67.98	71.59	75.95	80.77	85.48
	Water Pressure drop	kPa	55.4	60.9	66.7	69.0	80.0	43.4	38.3	38.6	46.5	52.7	49.4	54.8
	Water connection	DN	200	200	200	200	200	200	200	200	200	200	200	200
Compressor			Inverter-driven screw type											
		No.	1	1	1	1	1	1	1	1	1	1	1	1
Capacity control range			20%-100%											
Motor	Power	V-Ph-Hz	400-3-50/380-3-60											
	Input power	kW	240.0	231.9	255.5	244.7	297.7	198.7	212.3	229.9	241.6	249.9	265.4	280.8
Refrigerant Charge			HFC-134a											
	Circuit A	kg	400	480	430	500	430	265	295	310	280	280	280	280
	Circuit B	kg	-	-	-	-	-	-	-	-	-	-	-	-
Shipping weight*		kg	8506	8817	8609	8921	8609	5646	6151	6285	7466	7608	7761	7761
Operation weight		kg	8783	9202	8816	9327	8816	5554	6166	6392	7505	7647	7825	7825
Dimension	Length	mm	4515	4524	4515	4524	4515	4042	4088	4088	4107	4107	4107	4107
	Width	mm	1530	1745	1530	1745	1530	1398	1399	1399	1514	1514	1514	1514
	Height	mm	2614	2632	2614	2632	2614	2142	2251	2251	2563	2563	2563	2563

Operation condition : Evaporator chilled water outlet temperature 6.67℃ , chilled water inlet temperature 12.22℃ , fouling factor=0.0176m^2K/kW
Condenser cooling water inlet water temperature 29.44℃ , cooling water outlet temperature 34.61℃ , fouling factor=0.044m^2K/kW.
Above are recommended models. Carrier can offer more models and computer selections at required conditions. For details, please contact Carrier local agencies.
* The shipment weight is only base unit and wooden crating, excluding refrigerant and water inside.

Performance data, 30XW-V Heating units (Option)

Model			30XW-V-PT001A/150D(150G)													
			120	135	150	160	180	195	200	237	235	257	259	279	308	309
Cooling																
Cooling Capacity		kW	431.4	489.5	571.1	607.6	686.2	779.7	905.0	878.8	991.2	978.3	979.3	1073	1183	1174
Input power		kW	62.2	70.2	76.9	82.3	93.1	101.6	125.2	118.8	134.4	130.2	113.6	125.3	142.1	136.3
Evaporator	Flow rate	L/s	20.61	23.39	27.29	29.03	32.79	37.25	43.24	41.99	47.36	46.74	46.79	51.28	56.51	56.11
	Water Pressure drop	kPa	32.3	42.6	56.8	55.1	63.0	59.1	59.7	51.6	67.5	64.3	45.8	55.8	102.0	55.5
Condenser	Flow rate	L/s	12.33	13.94	16.18	17.28	19.45	22.20	25.84	25.09	28.23	27.92	28.01	30.65	33.82	33.46
	Water Pressure drop	kPa	15.0	16.0	20.7	23.4	27.6	17.7	22.7	20.2	25.2	24.2	15.0	15.0	21.9	15.0
Heating																
Heating Capacity		kW	478.6	539.4	593.6	636.2	722.5	799.3	934.8	936.6	1038	1034	998.0	1097	1226	1201
Input power		kW	102.1	113.8	124.0	133.3	147.4	158.3	189.8	192.8	213.0	203.5	178.0	193.9	238.3	209.0
Condenser	Flow rate	L/s	20.61	23.39	27.29	29.03	32.79	37.25	43.24	41.99	47.36	46.74	46.79	51.28	56.51	56.11
	Water Pressure drop	kPa	26.6	36.0	47.4	53.4	67.9	41.4	54.7	51.8	64.8	63.3	28.3	33.6	52.6	33.4
Evaporator	Flow rate	L/s	12.33	13.94	16.18	17.28	19.45	22.20	25.84	25.09	28.23	27.92	28.01	30.65	33.82	33.46
	Water Pressure drop	kPa	15.0	15.1	20.2	22.2	26.8	17.6	18.4	17.2	22.5	22.0	16.9	20.4	37.1	20.3
Condenser water connection		DN	125	125	125	150	150	200	200	200	200	200	200	200	150	200
Evaporator water connection		DN	125	125	125	150	150	200	200	200	200	200	200	200	200	200
Compressor			Inverter-driven screw type													
		No.	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Capacity control range			30%-100%	25%-100%		20%-100%										
Power		V-Ph-Hz	400-3-50 / 380-3-60													
Refrigerant Charge			HFC-134a													
	Circuit A	kg	100	100	100	135	135	180	180	180	180	180	340	340	330	356
	Circuit B	kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Shipping weight(with refrigerant)		kg	3198	3211	3287	3468	3491	4488	4541	4541	4547	4547	6992	6992	6699	7218
Shipping weight*			3098	3111	3187	3333	3356	4308	4361	4361	4367	4367	6652	6652	6369	6862
Operation weight		kg	2832	2845	2921	3181	3204	4312	4365	4365	4371	4371	6748	6748	6539	7031
Dimension	Length	mm	2761	2761	2761	3056	3056	3301	3301	3301	3301	3301	3824	3824	4166	3824
	Width	mm	1189	1189	1189	1122	1122	1221	1239	1239	1239	1239	1689	1689	1398	1689
	Height	mm	1694	1694	1694	1743	1743	1949	1949	1949	1949	1949	2497	2497	2321	2497

1. Cooling condition: Evaporator entering/leaving water temperature -/7℃, water flow rate is 0.172m^3/(h.kW); Condenser entering/leaving water temperature 18/-℃,water flow rate is 0.103m^3/(h.kW)
2. Heating conditions: Evaporator entering/leaving water temperature 15/-℃, water flow is equal to condenser water flow under cooling coniditon; Condenser entering/leaving water temperature -/45℃,water flow is equal to evaporator water flow under cooling coniditon.
3. Evaporator fouling factor=0.018m^2K/kW,Condenser fouling factor=0.044m^2K/kW.
4. 30XW-V120~237/379~459 maximun heating temperature is 50℃, other models maximum heating temperature is 45℃.
5. Above are recommended models. Carrier can offer more models and computer selections at required conditions. For details, please contact Carrier local agencies.
6. * The shipment weight is only base unit and wooden crating, excluding refrigerant and water inside.

Performance data, 30XW-V Heating units (Option)

Model			30XW-V-PT001A/150D(150G)													
			328	329	338	368	358	359	378	379	408	409	428	429	458	459
Cooling																
Cooling Capacity		kW	1258	1262	1299	1347	1372	1360	1457	1462	1565	1486	1626	1578	1687	1674
Input power		kW	150.4	150.6	159.8	165.9	163.8	163.0	176.7	165.7	193.6	167.6	200.3	179.8	208.8	192.0
Evaporator	Flow rate	L/s	60.10	60.29	62.08	64.33	65.56	64.96	69.60	69.84	74.79	71.00	77.68	75.39	80.60	79.97
	Water Pressure drop	kPa	63.6	64.1	96.1	102.0	62.7	84.5	78.3	91.7	65.5	57.3	69.7	64.1	67.9	71.9
Condenser	Flow rate	L/s	35.96	35.91	37.12	38.46	39.08	38.70	41.58	41.87	44.60	42.53	46.31	45.14	47.84	47.77
	Water Pressure drop	kPa	17.6	15.1	29.3	31.0	15.0	19.5	17.3	21.1	19.6	23.5	20.8	22.7	23.2	25.7
Heating																
Heating Capacity		kW	1288	1296	1354	1404	1408	1398	1503	1494	1621	1627	1618	1731	1862	1824
Input power		kW	240.9	227.5	264.4	272.8	258.9	243.6	275.0	272.2	299.4	288.2	292.1	305.9	335.4	319.6
Condenser	Flow rate	L/s	60.10	60.29	62.08	64.33	65.56	64.96	69.60	69.84	74.79	71.00	77.68	75.39	80.60	79.97
	Water Pressure drop	kPa	43.5	39.0	69.8	74.6	37.7	51.0	43.6	52.5	50.0	54.1	53.7	53.8	57.6	58.3
Evaporator	Flow rate	L/s	35.96	35.91	37.12	38.46	39.08	38.70	41.58	41.87	44.60	42.53	46.31	45.14	47.84	47.77
	Water Pressure drop	kPa	23.0	23.7	34.6	37.1	22.7	31.8	28.6	35.8	24.9	22.2	26.8	25.5	24.1	27.3
Condenser water connection		DN	200	200	200	200	200	200	200	200	200	200	200	200	200	200
Evaporator water connection		DN	200	200	200	200	200	200	200	200	200	200	200	200	200	200
Compressor			Inverter-driven screw type													
		No.	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Capacity control range			20%-100%													
Power		V-Ph-Hz	400-3-50 / 380-3-60													
Refrigerant Charge			HFC-134a													
	Circuit A	kg	380	356	340	340	380	400	400	450	400	480	400	480	430	500
	Circuit B	kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Shipping weight(with refrigerant)		kg	8188	7218	6910	6910	8425	7467	8795	9014	8906	9297	8906	9297	9039	9421
Shipping weight*			7808	6862	6570	6570	8045	7067	8395	8564	8506	8817	8506	8817	8609	8921
Operation weight		kg	7924	7031	6798	6798	8238	7275	8624	8837	8783	9202	8783	9202	8816	9327
Dimension	Length	mm	4107	3824	4164	4166	4124	4124	4515	4524	4515	4524	4515	4524	4515	4524
	Width	mm	1514	1689	1424	1424	1530	1687	1530	1745	1530	1745	1530	1745	1530	1745
	Height	mm	2563	2497	2388	2403	2614	2497	2614	2632	2614	2632	2614	2632	2614	2632

1. Cooling condition: Evaporator entering/leaving water temperature -/7℃, water flow rate is 0.172m^3/(h.kW); Condenser entering/leaving water temperature 18/-℃,water flow rate is 0.103m^3/(h.kW)
2. Heating conditions: Evaporator entering/leaving water temperature 15/-℃, water flow is equal to condenser water flow under cooling coniditon; Condenser entering/leaving water temperature -/45℃,water flow is equal to evaporator water flow under cooling coniditon.
3. Evaporator fouling factor=0.018m^2K/kW,Condenser fouling factor=0.044m^2K/kW.
4. 30XW-V120~237/379~459 maximun heating temperature is 50℃, other models maximum heating temperature is 45℃.
5. Above are recommended models. Carrier can offer more models and computer selections at required conditions. For details, please contact Carrier local agencies.
6. * The shipment weight is only base unit and wooden crating, excluding refrigerant and water inside.

Electrical parameters (400V-3Ph-50Hz)

Models 30XW-V-PT001A	Power Factor	Power Factor	Cosine phi	Total Harmonic Distortion (current)††	Maximum start-up current **	Maximum power input†	Nominal current draw *	Maximum current draw (Un) †	Maximum current draw (Un -10%) †
	At nominal capacity*	At maximum capacity†		%	A	kW	A	A	A
120	0.91	0.92	>0.98	35	<184	117	122	184	203
135	0.91	0.92	>0.98	35	<206	132	137	206	227
150	0.91	0.92	>0.98	35	<222	141	154	222	244
160	0.91	0.92	>0.98	35	<245	155	159	245	270
180	0.91	0.92	>0.98	35	<300	193	182	300	330
195	0.91	0.92	>0.98	35	<300	193	195	300	330
200	0.91	0.92	>0.98	35	<346	222	238	346	380
237	0.91	0.92	>0.98	35	<340	217	231	340	372
235	0.91	0.92	>0.98	35	<383	246	261	383	421
257	0.91	0.92	>0.98	35	<374	238	254	374	412
259	0.93	0.94	>0.98	35	<256	167	212	256	274
279	0.93	0.94	>0.98	35	<282	183	233	282	300
308	0.92	0.93	>0.98	35	<387	249	286	387	426
309	0.93	0.94	>0.98	35	<309	201	256	309	329
328	0.93	0.94	>0.98	35	<360	234	282	360	379
329	0.93	0.94	>0.98	35	<332	216	275	332	348
338	0.92	0.93	>0.98	35	<465	300	322	465	512
368	0.92	0.93	>0.98	35	<465	300	336	465	512
358	0.93	0.94	>0.98	35	<394	257	310	394	415
359	0.93	0.94	>0.98	35	<360	235	298	360	377
378	0.93	0.94	>0.98	35	<409	267	329	409	431
379	0.93	0.94	>0.98	35	<371	241	320	371	398
408	0.93	0.94	>0.98	35	<423	275	354	423	445
409	0.93	0.94	>0.98	35	<412	268	341	412	439
428	0.93	0.94	>0.98	35	<424	276	369	424	446
429	0.93	0.94	>0.98	35	<437	285	362	437	458
458	0.93	0.94	>0.98	35	<523	341	397	523	551
459	0.93	0.94	>0.98	35	<464	302	384	464	486
500	0.93	0.94	>0.98	35	<529	344	473	529	556
306	0.92	0.93	>0.98	35	<387	249	312	387	426
326	0.92	0.93	>0.98	35	<465	300	336	465	512
356	0.92	0.93	>0.98	35	<465	300	361	465	512
376	0.93	0.94	>0.98	35	<503	327	372	503	529
406	0.93	0.94	>0.98	35	<519	338	397	519	546
426	0.93	0.94	>0.98	35	<530	345	422	530	558
456	0.93	0.94	>0.98	35	<532	346	447	532	560

*Values obtained at operating condition: evaporator temperature entry/leave water = 12.2℃ /6.7℃ , condenser temperature entry/leave water = 29.4℃ /34.6℃ .
**Instantaneous start -up current.
†Values obtained at operation with maximum unit power input.
††The THDI may vary,based on the short circuit current/max current draw ratio of the system transformer.

Electrical parameters (380V-3Ph-60Hz)

Models 30XW-V-PT001A	Power Factor	Power Factor	Cosine phi	Total Harmonic Distortion (current)††	Maximum start-up current **	Maximum power input†	Nominal current draw *	Maximum current draw (Un) †	Maximum current draw (Un -10%) †
	At nominal capacity*	At maximum capacity†		%	A	kW	A	A	A
120	0.91	0.92	>0.98	35	<194	117	128	194	213
135	0.91	0.92	>0.98	35	<217	131	144	217	239
150	0.91	0.92	>0.98	35	<233	141	161	233	256
160	0.91	0.92	>0.98	35	<257	155	167	257	270
180	0.91	0.92	>0.98	35	<315	193	191	315	330
195	0.91	0.92	>0.98	35	<315	193	205	315	330
200	0.91	0.92	>0.98	35	<363	222	251	363	380
237	0.91	0.92	>0.98	35	<358	217	243	358	372
235	0.91	0.92	>0.98	35	<402	246	275	402	421
257	0.91	0.92	>0.98	35	<393	238	267	393	412
259	0.93	0.94	>0.98	35	<270	167	224	270	274
279	0.93	0.94	>0.98	35	<296	183	246	296	300
308	0.92	0.93	>0.98	35	<406	249	302	406	447
309	0.93	0.94	>0.98	35	<325	201	269	325	329
328	0.93	0.94	>0.98	35	<379	234	297	379	379
329	0.93	0.94	>0.98	35	<349	216	290	349	349
338	0.92	0.93	>0.98	35	<488	299	340	488	537
368	0.92	0.93	>0.98	35	<488	299	355	488	537
358	0.93	0.94	>0.98	35	<415	257	327	415	415
359	0.93	0.94	>0.98	35	<379	235	314	379	379
378	0.93	0.94	>0.98	35	<431	267	346	431	431
379	0.93	0.94	>0.98	35	<390	241	337	390	398
408	0.93	0.94	>0.98	35	<445	275	372	445	445
409	0.93	0.94	>0.98	35	<433	268	359	433	439
428	0.93	0.94	>0.98	35	<446	276	389	446	446
429	0.93	0.94	>0.98	35	<460	285	381	460	460
458	0.93	0.94	>0.98	35	<551	341	418	551	551
459	0.93	0.94	>0.98	35	<488	302	405	488	488
500	0.93	0.94	>0.98	35	<556	344	498	556	556
306	0.92	0.93	>0.98	35	<406	249	330	406	447
326	0.92	0.93	>0.98	35	<488	299	355	488	537
356	0.92	0.93	>0.98	35	<488	299	383	488	537
376	0.93	0.94	>0.98	35	<529	327	392	529	529
406	0.93	0.94	>0.98	35	<546	338	418	546	546
426	0.93	0.94	>0.98	35	<558	345	444	558	558
456	0.93	0.94	>0.98	35	<560	346	471	560	560

*Values obtained at operating condition: evaporator temperature entry/leave water = 12.2℃ /6.7℃ , condenser temperature entry/leave water = 29.4℃ /34.6℃ .
**Instantaneous start -up current.
†Values obtained at operation with maximum unit power input.

Options & accessories

Options	NO	Description	Advantages	Use
Integrated VFD	001A	The inverter is packaged in electrical box	To bettert protect the inverter	30XW-V120~500
Medium Brine	005	Brine application down to -6°C leaving fluid temperature	Covers specific application such as ice storage and industrial processes	30XW-V120~500
Evaporator & Condenser water pressue 1.6MPa	104	Reinforced evaporator & condenser for extension of the maximum water-side service pressure to 1.6MPa	Covers applications with a high water column(high buildings)	30XW-V120~500
Evaporator & Condenser water pressue 2.1MPa	104A16	Reinforced evaporator & condenser for extension of the maximum water-side service pressure to 2.1MPa	Covers applications with a high water column(high buildings)	30XW-V120~500
Evaporator with reversed water connection	107E	Evaporator with reversed water inlet/outlet	Simplification of the water piping	30XW-V120~500
Condenser with reversed water connection	107C	Condenser with reversed water inlet/outlet	Simplification of the water piping	30XW-V120~500
CCN to J bus gateway	148B	Two way protocol converter board between CCN and J-Bus for easy connection to BMS. Consist of: - Electronic board mounted in the unit electrical cabinet - Automatic configuration at start up	Easy connection by communication bus to a building management system	30XW-V120~500
CCN to Lon work gateway	148D	Two way protocol converter board between CCN and Lon walk for easy connection to BMS. Consist of: - Electronic board mounted in the unit electrical cabinet - Automatic configuration at start up	Easy connection by communication bus to a building management system	30XW-V120~500
Heat pump（Max condenser leaving temp 50°C)	150D	Heat pump control logic to control condenser LWT * Condenser insulation * Heat pump Control logic	Allows heating applications with max condenser leaving temp 50°C	30XW-V120~237, 379/409/429/459
Heat pump（Max condenser leaving temp 45°C)	150G	Heat pump control logic to control condenser LWT * Condenser insulation * Heat pump Control logic	Allows heating applications with max condenser leaving temp 50°C	30XW-V308-458,259~359,306~406 (except 30XW-V379/409/429/426/456)
Cooling chiller condenser maxium leaving temperature 50°C	150E	Increase condenser LWT to 50°C	Allows application with high condensing temperature	30XW-V379/409/429/459
Cooling chiller condenser maxium leaving temperature 45°C	150F	Increase condenser LWT to 45°C	Allows application with high condensing temperature	30XW-V328~458,259~359, 376-406
Condenser water valve control (0-10V signal)	152	Output signal (0-10V) to control the condenser water inlet valve Consist of: - One 8DO+4AI/2AO Board - Connector for 3 way valve Note: Power supply for water valve is not included	Used for applications with cold water at the condenser inlet (well water). In this case the valve controls the water entering temperature to maintain an acceptable condensing pressure	30XW-V120~500
Energy management module	156	Remote control module. Additional contacts for an extension of the unit control functions (without communication bus) Consist of: - Electrinoc board mounted in the unit electrical cabniet	Easy connection by wired connection to a building management system	30XW-V120~500
Touch screen display	158B	10 inch touch screen display	Easy operation	30XW-V120~500
Evaporator flanged connections	314E	Victaulic to Flange water connections	Easy installation	30XW-V120~500
Condenser flanged connections	314C	Victaulic to Flange water connections	Easy installation	30XW-V120~500
Australia code	312A	Meets Australia government pressure vessel code AS 1210 and AS 4343	Meets Australia government pressure vessel code AS 1210 and AS 4343	30XW-V120~500
ASME Heat Exchanger	842	Meets ASME standard pressure vessel code	Meets ASME standard pressure vessel code	30XW-V**9
Low noise	257	Provide 2 to 4 dBA sound attenuation vs std to meet low noise application * Innovative lagging used	Lower operating sound levels	30XW-V120~237,500 & 30XW-V**9
EMC Classification according to IEC 61800-3-class C2	282	Frequency variator with RFI filter class C2	Reduces the risk of electromagnetic interference, if the unit is installed in a residential environment	30XW-V120~500
Nitrogen charge	320	Unit nitrogen factory charged.	Less weight. No refrigerant charged	30XW-V120~500
Discharge shut off valve	321	Allows referigerant to be stored inside the chiller during servicing	Reducing refrigerant loss and eliminating time-consuming transfer procedures	30XW-V120~500
Master/Slave	058	Optimal controller could manage two units, one unit is Master and the other is slave	Master/slave control to optimize performance of two units in one plant	30XW-V120~500
Hot gas Bypass	866	Hot gas bypass mininum load down to 10%	Extend capacity operating range to match mininum load requirement	30XW-V120~500
5% Total Harmonic Current Distortion	324A	Unit mounted active filter with lower 5 %THD offering	Reduce Harmonic,cleaning power source	30XW-V**9
5% Total Harmonic Current Distortion	325A	Free standing active filter with lower 5 %THD offering	Reduce Harmonic,cleaning power source	30XW-V120~500,except 30XW-V**9
25% Total Harmonic Current Distortion	323C	Free standing line reactor with lower 25% THD offering	Reduce Harmonic,cleaning power source	30XW-V120~500,except 30XW-V**9
Ball cleaning machine (with waterbox)	903	To clean the chiller heat exchanger tube	Easy to automatic clean the tube	30XW-V**9

Notes: 1. Australia code PT312A and ASME heat exchanger PT842 are not compatible with PT104/PT104A16.
2.Condenser water valve control option is not include 3 way valve and power supply for water valve.
3.Free standing harmonic filter cabinet and line reactor box (IP44) are not mounted on the chiller and need to be shipped seprately, please contact Carrier local agencies for details.

Part load performances

With the rapid increase in energy costs and the care about environmental impacts of electricity production, power consumption of air conditioning equipment has become an important topic. The energy efficiency of a liquid chiller at full load is rarely representative of the actual performance of the units, as on average a chiller works less than 5% of the time at full load.

IPLV (in accordance with AHRI 550/590)

The IPLV (integrated part load value) allows evaluation of the average energy efficiency based on four operating conditions defined by the AHRI. The IPLV is the average weighted value of the energy efficiency ratios (EER) at different operating conditions, weighted by the operating time.

IPLV (integrated part load value)

Load %	Condenser entering water temperature(℃)	Energy efficiency	Operating time(%)
100	29.4	EER_1	1
75	23.9	EER_2	42
50	18.3	EER_3	45
25	18.3	EER_4	12
IPLV = EER1 x 1% + EER2 x 42% + EER3 x 45% + EER4 x 12%			

The heat load of a building depends on many factors, such as the outside air temperature, the exposure to the sun and its occupation. Consequently it is preferable to use the average energy efficiency, calculated at several operating points that are representative for the unit utilisation.

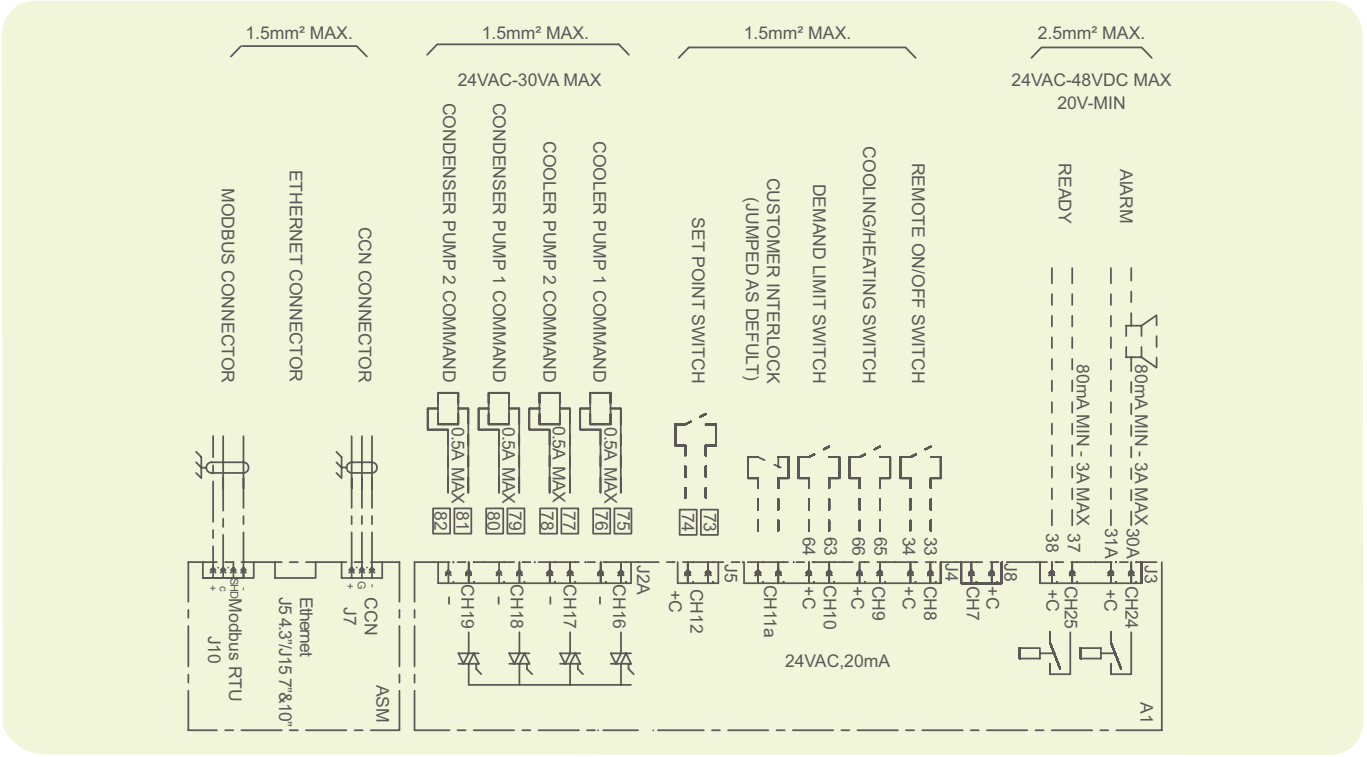
ESEER(in accordance with EUROVENT)

The ESEER (European seasonal energy efficiency ratio) permits evaluation of the average energy efficiency at part load, based on four operating conditions defined by Eurovent. The ESEER is the average value of energy efficiency ratios (EER) at different operating conditions, weighted by the operating time.

ESEER(European seasonal energy efficiency ratio)

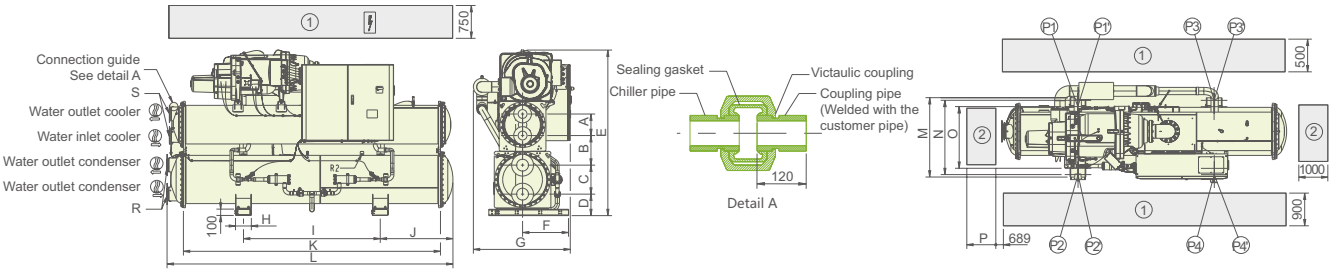
Load %	Condenser entering water temperature(℃)	Energy efficiency	Operating time(%)
100	30	EER_1	3
75	26	EER_2	33
50	22	EER_3	41
25	18	EER_4	23
ESEER = EER1 x 3% + EER2 x 33% + EER3 x 41% + EER4 x 23%			

Wiring Diagram



Dimension Drawing

30XW-V120~500-PT001A



Note: Above chiller condenser and evaporator are 2 passes design

Dimension (mm)

30XW-V-PT001A	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	S	R
120	272	251	320	189	1694	494	1189	250	1256	721	2456	2761	970	920	770	2660	DN125	DN125
135	272	251	320	189	1694	494	1189	250	1256	721	2456	2761	970	920	770	2660	DN125	DN125
150	272	251	320	189	1694	494	1189	250	1256	721	2456	2761	970	920	770	2660	DN125	DN125
160	242	299	304	222	1743	539	1122	250	1200	889	2756	3056	1008	958	808	3020	DN150	DN150
180	242	299	304	222	1743	539	1122	250	1200	889	2756	3056	1008	958	808	3020	DN150	DN150
195	290	333	340	230	1949	599	1221	220	1600	823	2956	3301	1135	1085	935	3220	DN200	DN200
200/237	290	333	340	230	1949	599	1239	220	1600	823	2956	3301	1135	1085	935	3220	DN200	DN200
235/257	290	333	340	230	1949	599	1239	220	1600	823	2956	3301	1135	1085	935	3220	DN200	DN200
259	340	467	458	339	2497	938	1689	250	2300	731	3360	3824	1258	1178	978	3620	DN200	DN200
279	340	467	458	339	2497	938	1689	250	2300	731	3360	3824	1258	1178	978	3620	DN200	DN200
309	340	467	458	339	2497	938	1689	250	2300	731	3360	3824	1258	1178	978	3620	DN200	DN200
328	340	491	360	363	2563	725	1514	250	2300	868	3660	4107	1258	1178	978	3924	DN200	DN200
329	340	467	458	339	2497	938	1689	250	2300	731	3360	3824	1258	1178	978	3620	DN200	DN200
358	340	467	458	339	2614	725	1530	250	2300	881	3660	4124	1258	1178	978	3924	DN200	DN200
359	340	467	458	339	2497	938	1687	250	2300	881	3660	4124	1258	1178	978	3920	DN200	DN200
378	340	467	458	339	2614	725	1530	250	2160	1148	4060	4515	1258	1178	978	4324	DN200	DN200
379	340	467	458	339	2632	968	1745	250	2160	1153	4060	4524	1258	1178	978	4320	DN200	DN200
408	340	467	458	339	2614	725	1530	250	2160	1148	4060	4515	1258	1178	978	4324	DN200	DN200
409	340	467	458	339	2632	968	1745	250	2160	1153	4060	4524	1258	1178	978	4320	DN200	DN200
428	340	467	458	339	2614	725	1530	250	2160	1148	4060	4515	1258	1178	978	4324	DN200	DN200
429	340	467	458	339	2632	968	1745	250	2160	1153	4060	4524	1258	1178	978	4320	DN200	DN200
458	340	467	458	339	2614	725	1530	250	2160	1148	4060	4515	1258	1178	978	4324	DN200	DN200
459	340	467	458	339	2632	969	1745	250	2160	1153	4060	4524	1258	1178	978	4320	DN200	DN200
500	340	467	458	339	2614	725	1530	250	2160	1148	4060	4515	1258	1178	978	4324	DN200	DN200
306	340	389	340	322	2142	698	1398	250	2160	912	3656	4042	1231	1151	951	3924	DN200	DN200
326	340	435	360	363	2251	725	1399	250	2160	933	3660	4088	1258	1178	978	3924	DN200	DN200
356	340	435	360	363	2251	725	1399	250	2160	933	3660	4088	1258	1178	978	3924	DN200	DN200
376	340	491	360	363	2563	725	1514	250	2300	868	3660	4107	1258	1178	978	3924	DN200	DN200
406	340	491	360	363	2563	725	1514	250	2300	868	3660	4107	1258	1178	978	3924	DN200	DN200
426	340	491	360	363	2563	725	1514	250	2300	868	3660	4107	1258	1178	978	3924	DN200	DN200
456	340	491	360	363	2563	725	1514	250	2300	868	3660	4107	1258	1178	1078	3924	DN200	DN200

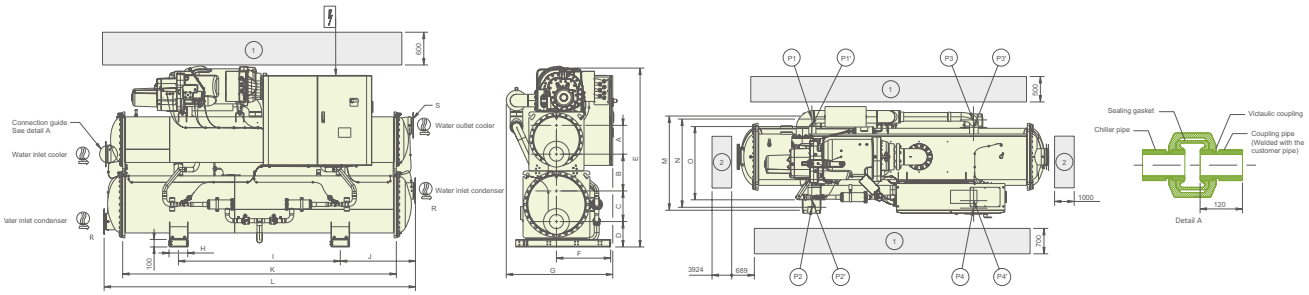
Note:
1.Tolerances on nozzle locations and overall dimensions are ±25mm.
2. ① Required clearances for maintenance, ② Recommended space for tube removal
3. Pi and Pi' are two group of bolts to fix the chiller, either group can be selected.
4. The water pipe connector is the Victaulic coupling,the Victaulic and the pipe are supplied with the chiller, the pipe length is 120mm.

Dimension Drawing

Weight distribution (kg)

30XW-V-PT001A	P1	P2	P3	P4	P1"	P2"	P3"	P4"	PT
120	852	1024	434	522	836	1040	426	530	2832
135	847	1018	445	535	830	1034	437	544	2845
150	778	979	515	648	759	999	502	661	2921
160	958	950	639	634	959	950	639	633	3181
180	965	957	643	638	966	956	644	638	3204
195	1348	1606	620	739	1327	1627	610	748	4312
200/237	1364	1626	627	748	1343	1647	618	757	4365
235/257	1366	1628	628	749	1345	1649	618	758	4371
259	1916	1678	1681	1473	1940	1653	1702	1453	6748
279	1916	1678	1681	1473	1940	1653	1702	1453	6748
309	1993	1745	1755	1538	2018	1720	1777	1516	7031
328	2587	2384	1536	1416	2608	2364	1549	1404	7924
329	1993	1745	1755	1538	2018	1720	1777	1516	7031
358	2682	2472	1605	1479	2704	2451	1618	1466	8238
359	1974	1723	1910	1668	2000	1697	1935	1643	7275
378	2811	2591	1677	1545	2834	2568	1690	1532	8624
379	2982	2647	1699	1509	3016	2613	1718	1490	8837
408	2864	2622	1722	1576	2888	2597	1737	1561	8783
409	3150	2740	1770	1542	3129	2698	1793	1519	9202
428	2864	2622	1722	1576	2888	2597	1737	1561	8783
429	3150	2740	1770	1542	3129	2698	1793	1519	9202
458	2976	2771	1589	1480	2997	2750	1600	1469	8816
459	3199	2763	1804	1561	3243	2719	1829	1563	9327
500	2976	2771	1589	1480	2997	2750	1600	1469	8816
306	1933	1844	909	868	1942	1835	914	863	5554
326	2196	2003	1029	938	2216	1984	1038	929	6166
356	2276	2077	1066	973	2297	2056	1076	963	6392
376	2588	2362	1336	1219	2612	2338	1348	1207	7505
406	2588	2362	1336	1219	2612	2338	1348	1207	7505
426	2642	2502	1317	1247	2656	2488	1324	1240	7707
456	2642	2502	1317	1247	2656	2488	1324	1240	7707

30XW-V308/338/368-PT001A



Note: Above chiller condenser and evaporator are 3 passes design

Dimension (mm)

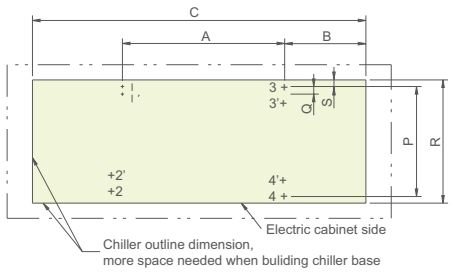
30XW-V-PT001A	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	S	R
30XW-V308	339	460	409	339	2321	725	1398	250	2165	1005	3660	4166	1258	1178	978	DN150	DN200
30XW-V338	385	491	409	339	2388	725	1424	250	2165	1005	3660	4164	1258	1178	978	DN200	DN200
30XW-V368	392	491	409	339	2403	725	1424	250	2165	1005	3660	4166	1258	1178	978	DN200	DN200

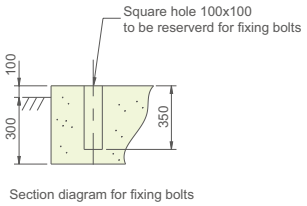
Weight distribution (kg)

30XW-V-PT001A	P1	P2	P3	P4	P1'	P2'	P3'	P4'	PT
30XW-V308	2260	2083	1143	1053	2278	2065	1152	1044	6539
30XW-V338	2373	2136	1205	1084	2397	2112	1217	1072	6798
30XW-V368	2376	2139	1201	1081	2401	2115	1214	1069	6798

Note:
1.Tolerances on nozzle locations and overall dimensions are ±25mm.
2. ① Required clearances for maintenance, ② Recommended space for tube removal
3. Pi and Pi' are two group of bolts to fix the chiller, either group can be selected.
4. The water pipe connector is the Victaulic coupling,the Victaulic and the pipe are supplied with the chiller, the pipe length is 120mm.

Basement Drawing



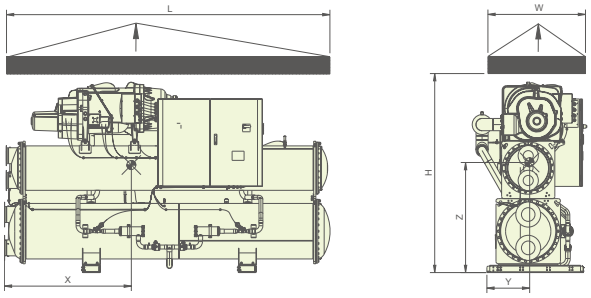


Section diagram for fixing bolts

30XW-V-PT001A	A(mm)	B(mm)	C(mm)	P(mm)	Q(mm)	R(mm)	S(mm)
120	1256	721	2761	920	75	1189	25
135	1256	702	2740	920	75	1189	25
150	1256	702	2740	920	75	1189	25
160	1200	889	3056	958	75	1122	25
180	1200	889	3056	958	75	1122	25
195	1600	823	3301	1085	75	1221	25
200/237	1600	823	3301	1085	75	1239	25
235/257	1600	823	3301	1085	75	1239	25
259	2300	731	3824	1258	100	1689	218
279	2300	731	3824	1258	100	1689	218
308	2165	1005	4166	1178	100	1398	180
309	2300	731	3824	1258	100	1689	218
328	2300	868	4107	1178	100	1514	268
329	2300	731	3824	1258	100	1689	218
338	2165	1005	4164	1178	100	1424	167
368	2165	1005	4166	1178	100	1424	167
358	2300	881	4124	1178	100	1530	284
359	2300	881	4124	1258	100	1687	216
378	2160	1148	4515	1178	100	1530	284
379	2160	1153	4524	1258	100	1745	244
408	2160	1148	4515	1178	100	1530	284
409	2160	1153	4524	1258	100	1745	244
428	2160	1148	4515	1178	100	1530	284
429	2160	1153	4524	1258	100	1745	244
458	2160	1148	4515	1178	100	1530	284
459	2160	1153	4524	1258	100	1745	244
500	2160	1148	4515	1178	100	1530	284
306	2160	912	4042	1151	100	1398	198
326	2160	933	4088	1178	100	1399	181
356	2160	933	4088	1178	100	1399	181
376	2300	868	4107	1178	100	1514	267
406	2300	868	4107	1178	100	1514	267
426	2300	868	4107	1178	100	1514	267
456	2300	868	4107	1178	100	1514	267

Notes:
1.4 bolts used to fix chiller, bolt size M20×300.
2.User can select 1, 2, 3, 4 or 1', 2', 3', 4' as a group to fix bolts.

Dimension Drawing



Dimension Drawing

30XW-V-PT001A	X(mm)	Y(mm)	Z(mm)	L(mm)Min	W(mm)Min	H(mm)Min
120	1468	534	905	3500	1500	2000
135	1296	534	901	3500	1500	2000
150	1296	534	901	3500	1500	2000
160	1447	502	930	2700	1200	2000
180	1447	502	930	2700	1200	2000
195	1382	615	1045	2900	1400	2500
200/237	1382	615	1045	2900	1400	2500
235/257	1382	615	1045	3600	1400	2500
259	1868	590	1260	3300	1700	2700
279	1868	590	1260	3300	1700	2700
308	1723	605	1198	3600	1400	2500
309	1870	590	1253	3300	1700	2700
328	1796	605	1438	3600	1600	2800
329	1870	590	1253	3300	1700	2700
338	1723	598	1209	3600	1600	2700
368	1723	598	1209	3600	1600	2700
358	1804	605	1448	3600	1600	2800
359	2074	589	1239	3600	1700	2700
378	2014	605	1422	4000	1600	2800
379	1996	594	1377	4000	1800	2900
408	2018	603	1423	4000	1600	2800
409	1989	588	1391	4000	1800	2900
428	2018	603	1423	4000	1600	2800
429	1989	588	1391	4000	1800	2900
458	1959	608	1553	4000	1600	2800
459	1991	586	1386	4000	1800	2900
500	1959	608	1553	4000	1600	2800
306	1661	602	1142	3600	1400	2500
326	1684	602	1149	3600	1600	2500
356	1684	602	1149	3600	1600	2500
376	1722	602	1612	3600	1600	2800
406	1722	602	1612	3600	1600	2800
426	1704	613	1599	3600	1600	2800
456	1704	613	1599	3600	1600	2800

Notes:1.Each spider bar must with stand unit weight.
2.Gravity center must be aligned with lifting bar.
3.Loading by lifting lug of condenser is prohibitted.

Water flow rate range (L/s)

30XW-V-PT001A	Evaporator		Condenser	
	Volume(min)*	Volume(max)***	Volume(min)**	Volume(max)***
120	6.0	35.6	3.9	40.0
135	6.0	35.6	3.9	40.0
150	6.0	35.6	3.9	40.0
160	8.4	50.7	5.1	51.1
180	8.4	50.7	5.1	51.1
195	9.6	69.2	7.6	78.7
200/237	11.4	68.7	7.8	67.9
235/257	11.4	68.7	7.8	67.9
259	14.4	87.1	11.4	115.5
279	14.4	87.1	11.4	115.5
308	11.4	63.4	8.8	89.7
309	16.4	93.7	12.7	129.1
328	15.1	92.4	10.9	110
329	16.4	93.7	12.7	129.1
338	12.7	74.8	8.8	89.7
368	12.7	74.8	8.8	89.7
358	15.9	97.0	12.7	129.1
359	16.4	93.7	12.7	129.1
378	15.9	97.0	12.7	129.1
379	16.4	93.7	12.5	126.6
408	18.9	114.9	12.7	129.1
409	20.8	126	12.5	126.6
428	18.9	114.9	12.7	129.1
429	20.8	126	12.5	126.6
458	18.9	114.9	12.7	129.1
459	20.8	126	12.5	126.6
500	18.9	114.9	12.7	129.1
306	12.7	74.8	8.8	87.1
326	12.7	74.8	10.6	107.7
356	17.4	91.2	11.5	116.6
376	16.4	96.3	11.0	111.5
406	16.4	96.3	11.0	111.5
426	16.4	96.3	12.0	121.7
456	16.4	96.3	12.0	121.7

Notes: * Based on flow velocity:0.5m/s
** Based on flow velocity:0.3m/s
*** Based on flow velocity:3.05m/s

Recommendations on heat exchange fluids

Filters are required to be installed in water entering side, and water quality analysis periodically implement.
Water quality should be maintained within the limits indicated in below table.

Water Characteristics	Quality Limitation
NH_3	<2 ppm
NH^{4+}	<2 ppm
Cl_2	<1 ppm
Cl-	< 300 ppm
H_2S*	<0.05 ppm
$SO4^{2-}$	< 70 ppm
CO_2†	<5 ppm
Fe^{2+}/Fe^{3+}	<0.2 ppm
O_2	< 5 ppm

Water Characteristics	Quality Limitation
NO3	<100 ppm
Si	< 0.1 ppm
Al	<0.2 ppm
Mn	<0.1 ppm
Hardness	71.2<…<151.3mg/l CaCO3
Resistance	>3000ohm.cm
Conductivity	200<…<600μS/cm
Ph	7.5<…<9

Guide Specifications

General description

Factory assembled single piece variable speed water-cooled liquid chiller. Contained within the unit shall be all factory wiring, piping, controls, refrigerant charge (R134a/R513A), refrigeration circuits set, screw compressors, variable frequency drive, electronic expan sionvalves and equipment required prior to field start-up.

Size Range:
120 to 504Tons (422 to 1772 kW) Nominal
Carrier Model Number:
30XW-V xxx
30XW-VC xxx

Part 1 — General

1.01 SYSTEM DESCRIPTION

Microprocessor controlled Variable speed water-cooled liquid chiller utilizing screw compressor, variable frequency drive and electronic expansion valves.

1.02 QUALITY ASSURANCE

- Chiller performance shall be rated in accordance with the latest edition of AHRI Standard 550/590 (I-P), AHRI Standard 551/591 (SI) and GB/T 18430.1.
- Cooler and condenser refrigerant side shall include nameplate certifying compliance with NB/T 47012, pressure vessels for refriger ant equipment.
- Chiller shall be designed and constructed to TSG 21-2016 requirements.
- The chiller and the unit-mounted VFD shall be factory wired and tested together to verify proper operation prior to shipment.
- Unit shall be designed, manufactured and tested in a facility with a quality management system certified ISO 9001 and environmental management system ISO 14001.

1.03 DELIVERY, STORAGE, AND HANDLING

- Unit shall be capable of withstanding 58°C storage without damage, failure, refrigerant loss, or safety risks.
- Unit shall be stored and handled in accordance with manufacturer's instructions.
- Unit shall be shipped with all refrigerant piping and control wiring factory installed.
- Unit shall be shipped with wooden or thermoplastic and wooden base package.
- Unit shall be shipped with firmly attached labels that indicate name of manufacturer, chiller model number, chiller serial number, and refrigerant used.

Part 2 — Products

2.01 Compressor (s):

- 06T/06W semi-hermetic twin-screw compressors with internal relief valve and check valve to avoid reverse rotation on shut down. Each compressor is equipped with discharge shut-off valve (optional).
- Compressor capacity control is ensured by successive use of speed variation (using a variable frequency drive) and swept volume variation at the screws (ensured by the slide valve), capable of reducing compressor capacity down to 20% of full load. Compressor shall start in unloaded condition.
- Induction motor or permanent magnet synchronous motor shall be cooled by suction gas and protected by internal winding tempera ture sensors. Compressor bearings shall be designed for minimum 73000 hours at maximum operating conditions. Lubrication oil system shall include pre-filter and external filter capable of filtration to 5 microns.

2.02 Evaporator & condenser:

- Unit shall be equipped with a single cooler and condenser.
- Cooler and condenser shall be manufactured, tested and stamped in accordance with the NB/T 47012 or ASME Pressure vessel code VIII.
- The maximum refrigerant-side working pressure will be 1600kPa, and the maximum waterside pressure will be 1000kPa (1600kPa, 2068kPa as options).
- The cooler and condenser shall be mechanically cleanable, shell-and-tube type with removable heads. Cooler shell shall be insulated with 19mm (38mm as optional) closed-cell foam and factory fitted.
- Tubing shall be copper, high-efficiency type, with integral internal and external enhancement unless otherwise noted. Tubes shall be nominal 19.0mm OD or 25.4mm OD with nominal wall thickness of 0.635mm measured at the root of the fin at the enhanced areas.
- The cooler and condenser shall have a drain and vent in each head.
- The cooler and condenser tubesheet shall be aluminum coating on water side for better anti-corrosion effect.
- Two reseating type pressure relief valves shall be installed on each cooler and condenser.
- The cooler shall incorporate an active refrigerant level control system to ensure optimum heat transfer performance under all load conditions.
- Cooler and condenser shall have water inlet & outlet connection with victaulic couplings to avoid vibrations transmission and accept small misalignment (water connection kit on demand).

Guide Specifications

- Cooler shall be fitted with electronic auto setting water flow switch. Paddle switches or differential pressure switches shall not be ac ceptable.

2.03 Refrigeration Components:

- Refrigerant circuit components shall include, compressor, oil separator, high and low side pressure relief devices, compressor discharge shutoff valves (optional), refrigerant liquid sub assembly line, filter driers, moisture indicating sight glasses, long stroke electronic expansion device, and complete operating charge of both refrigerant and compressor oil.
- To facilitate service and maintenance and avoid refrigerant charge transfers, it must be possible to isolate the following components and systems independently: filter driers, oil filters.

2.04 Carrier® SmartVu™ colorful screen user interface:

This Carrier® SmartVu™ colorful screen user interface allow customer to select menu or action by pressing directly on the screen. It is recommended to use a pen for the navigation via the touch screen. It prevents screen maintenance and allows more precision during the selections.

2.05 Variable frequency drive:

- 30XW-V/30XW-V Heating units are equipped with a frequency variator that permits compressor capacity adjustment by varying the motor speed in the chiller frequency range. The compressor drive uses power supply waveform generation with variable frequency and voltage, generated by pulse width modulation (PWM).
- Compressor start-up and stopping and the frequency setting for the operating range is only by RS485 communication protocol via the Carrier controller. One of the other frequency variator functions is to ensure the unit safety stop function using wired pressure switches at the digital drive inputs.

2.06 Controls:

Unit controls shall include the following minimum components:

- Microprocessor with non-volatile memory, picture guided unit/operator interface, the LOCAL/OFF/REMOTE/CCN selector and a display with multiple language capability.
- Pressure sensors shall be installed to measure suction, discharge and oil pressure.
- Thermostats shall be installed to measure cooler entering and leaving temperatures (on cooler and condenser side).

Unit controls shall include the following functions:

- EXV control, based on throttling optimizes evaporator charging, ensuring condenser superheat and sub-cooling.
- Capacity control based on leaving chilled fluid temperature with return fluid temperature sensors.
- Limit the chilled fluid temperature pull-down rate at start-up to an adjustable range of 0.1℃ to 1.1℃ per minute to prevent excessive demand spikes at start-up.
- Enable reset of leaving chilled water temperature according to the return water temperature or by means of a 0-10V signal.
- Provide a dual set point for the leaving chilled water temperature activated by a remote contact closure signal or by the built in time clock.
- Enable a 2-level demand limit control (between 0 and 100%) or a maximum current drawn limit activated by a remote contact closure or by the built in time clock.
- Control evaporator water pump and the condenser pump.
- Allow two time scheduling programs to enable unit start-up control, demand limit and set-point changes.
- Enable lead lag control of two chillers running in series or parallel.

2.07 Diagnostics:

Display module shall be capable of displaying set points, system status including temperatures, pressures, current for each compressor, run time and percent loading.

The control system shall allow a quick test of all machine elements to verify the correct operation of every switch before the chiller is started.

2.08 Safeties:

Unit shall be equipped with all necessary components, and in conjunction with the control system shall provide the unit with protection against the following:

- Reverse rotation.
- Low chilled water temperature.
- Low oil pressure (per compressor).
- Current imbalance.
- Compressor thermal overload
- Automatic compressor unloading in case of excessive condensing temperature
- High pressure.
- Electrical overload.

- Loss of phase.
- Variable speed drive failure

Control shall provide separate general event (minor incident) and alarm (circuit down) remote indication.

2.09 Operating Characteristics:

- Unit shall be capable of starting with 13℃ entering water temperature to the condenser.
- Unit shall be capable of starting with 35℃ entering water temperature to the evaporator.

2.10 Electrical Characteristics:

- Unit shall operate on 3-phase power supply (400V-3-50Hz/380V-3-60Hz) without neutral.
- Control voltage shall be supplied by a factory-installed transformer.
- Unit shall be supplied with factory-installed main circuit breaker.
- Unit shall have a factory installed variable frequency drive as standard to well control the electrical inrush current below maximum operation current.

2.11 Option Features:

The 30XW(V) comes standard with the “Carrier Chiller Digital Services” interface (see Control manual). Carrier Chiller Digital Service, is Carrier’s use of wireless technology to connect the chiller to the cloud and transmit some of the parameters in the unit controller, such as temperature, pressure, running time, load, voltage, current, alarm information, etc. To achieve real-time understanding of the operating status of the chiller unit, recording and analysis of operating parameters, alarm reception and diagnosis and other basic functions. More value-added functions can also be provided according to customer needs.

Carrier chiller digital services, including digital warranty services and cloud housekeeping services. Users can request to connect or disconnect the Carrier Chiller Digital Service at any time according to their needs. Please contact your local Carrier sales or after-sales service department for more information.

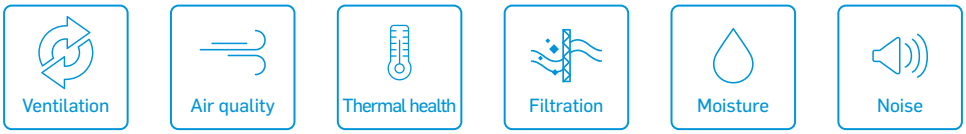
2.12 Electrical Characteristics:

- Energy Management Module:
  A factory or field installed module shall provide the following energy management abilities: 4 to 20 mA signals for leaving fluid tem perature reset, cooling set point reset or demand limit control; 2-point demand limit control (from 20 to 100%) activated by a remote-contact closure; and discrete input for “Ice Done” indication for ice storage system interface.
- LON Translator Control:
  Unit shall be supplied with factory or field-installed interface between the Chiller and a Local Operating Network (LON, i.e., Lon Works FT-10A ANSI/EIA-709.1).
- Medium Temperature Brine:
  Unit shall be factory modified to start and operate at leaving chilled fluid temperatures below 3.3℃ . Chiller shall be equipped with condenser water flow switch.
- Marine Waterboxes:
  Marine waterboxes shall provide water piping connections extending from the side of the waterbox (as opposed to extending from the end of the waterbox).This option also includes a removable bolt on waterbox cover allowing access to the heat exchanger tubes without breaking the existing field piping. This option is available for both the evaporator and condenser.
- Heat machine:
  Heat machine condensers shall include factory-installed thermal insulation on the condenser, condenser flow switch and leaving water temperature sensor. Heat machine units require field-installed thermal insulation on waterbox heads because of high tempera ture.
- Coolclean cleaning machine:
  Coolclean cleaning machine shall provide cleaning ball. The option also includes the PLC for operating the equipment.
- Unit mounted Active Harmonic Filter(THDi ≤5%):
  This option provides a unit-mounted active harmonic filter which is parallelly connected to the chiller power box, dynamically com pensate harmonics with varying amplitude and frequency and varying reactive power with leading or lagging phase, in order to miti gate the harmonics of 30XW-V.
- Free Standing Active Harmonic Filter(THDi ≤5%):
  This option provides a free-standing active harmonic filter which is parallelly connected to the chiller power box, dynamically compensate harmonics with varying amplitude and frequency and varying reactive power with leading or lagging phase, in order to mitigate the harmonics of 30XW-V.
- PT323C: Line reactor filter cabinet(THiD =25%):
  Protect VFD from current spikes. Mitigate the harmonics of unit to about 25% THiD.

HEALTHY**BUILDINGS**

As the inventors of modern air conditioning and a world leader in HVAC, refrigeration, and fire and security, solutions, Carrier has a legacy of creating safe and comfortable buildings. Our Healthy Buildings Program builds on that legacy through in-depth expertise and a holistic suite of healthy building technologies and services .to address the immediate pandemic concerns and long into the future.

6 of 9 foundations of healthy building are related closely to air conditioning system.



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MacNaughton P, Allen J, Satish U, Laurent J, Flanigan S, Vallarino J, Coull B, Spengler. 2016. The Impact of Working in a Green Certified Building on Cognitive Function and Health. Building and Environment DOI: 10.1016/j.buildenv.2016.11.041

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