



United Technologies

PRODUCT SELECTION DATA



- 30WG optimized for cooling
- 61WG optimized for heating
 - Compact design
- Plug and play approach
 - High efficiency

Water-Cooled and Condenserless Liquid Chillers
Water-Sourced Heat Pumps

61WG/30WG/30WGA



CARRIER participates in the ECP programme for LCP/HP
Check ongoing validity of certificate:
www.eurovent-certification.com 
www.certiflash.com

AQUASNAP
Heating

AQUASNAP

Physical data, 30WGA units

30WGA				020	025	030	035	040	045	050	060	070	080	090	
Standard unit	C1	Nominal capacity	kW	22.6	27.0	29.5	34.7	39.2	43.7	53.7	59.8	69.2	78.3	87.8	
Full load performances*	C1	EER	kW/kW	3.75	3.84	3.87	3.93	3.94	3.90	3.82	3.85	3.86	3.91	3.88	
	C2	Nominal capacity	kW	32.1	38.1	41.9	48.9	55.2	63.1	75.9	83.9	98.1	110.5	124.6	
	C2	EER	kW/kW	5.51	5.36	5.44	5.51	5.44	5.53	5.36	5.37	5.45	5.42	5.42	
	C1	Gross nominal capacity	kW	22.7	27.1	29.6	34.8	39.4	43.8	53.8	59.9	69.4	78.4	88.0	
Full load performances**	C1	Gross EER	kW/kW	3.80	3.91	3.94	4.00	4.02	3.98	3.86	3.89	3.91	3.95	3.93	
	C2	Gross nominal capacity	kW	32.2	38.3	42.1	49.2	55.5	63.5	76.2	84.1	98.4	110.9	125.0	
	C2	Gross EER	kW/kW	5.67	5.52	5.62	5.69	5.63	5.72	5.47	5.48	5.58	5.55	5.54	
Operating weight⁽¹⁾			kg	164	171	171	177	180	185	321	324	332	339	354	
Operating weight with option 258 ⁽¹⁾			kg	171	178	178	184	187	192	334	337	345	352	367	
Sound levels⁽²⁾															
Sound power level			dB(A)	67.0	68.5	69.0	69.3	70.0	70.1	71.5	72.0	72.0	73.0	73.4	
Sound power level, option 257			dB(A)	65.0	65.8	65.8	66.6	68.4	68.4	68.4	68.6	69.0	69.0	69.9	
Sound power level, option 258			dB(A)	61.2	62.4	63.4	63.2	64.4	63.9	66.2	66.1	66.1	67.3	67.2	
Sound power level, option 257 + 258			dB(A)	60.4	61.8	62.3	62.4	63.7	62.9	64.9	64.8	65.1	66.0	66.0	
Dimensions, standard unit⁽³⁾															
Width		mm		600	600	600	600	600	600	880	880	880	880	880	
Length		mm		1044	1044	1044	1044	1044	1044	1474	1474	1474	1474	1474	
Height		mm		901	901	901	901	901	901	901	901	901	901	901	
Compressors					Hermetic scroll 48.3 r/s										
Circuit A				1	1	1	1	1	1	2	2	2	2	2	
Circuit B				-	-	-	-	-	-	-	-	-	-	-	
Number of capacity stages				1	1	1	1	1	1	2	2	2	2	2	
Minimum capacity		%		100	100	100	100	100	100	50	50	50	50	50	
Refrigerant					R410A										
Capacity control					Pro-Dialog+										
Evaporator					Direct-expansion plate heat exchanger										
Water volume		l		3.3	3.6	3.6	4.2	4.6	5.0	8.4	9.2	9.6	10.4	12.5	
Water connections					Victaulic										
Inlet/outlet		in		1.5	1.5	1.5	1.5	1.5	1.5	2	2	2	2	2	
Max. water-side operating pressure without hydronic module		kPa		1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	
Refrigerant connections															
Discharge line diameter		in		7/8	7/8	7/8	7/8	7/8	7/8	1-1/8	1-1/8	1-1/8	1-1/8	1-1/8	
Liquid line diameter		in		5/8	5/8	5/8	5/8	5/8	5/8	7/8	7/8	7/8	7/8	7/8	
Chassis paint colour					Colour code: RAL7035										

* In accordance with standard EN14511-3:2013. Refrigerant piping equivalent length (without drier and valves) = 3 m.

** Not in accordance with standard EN14511-3:2013. These performances do not take into account the correction for the proportional heating capacity and power input generated by the water pump to overcome the internal pressure drop in the heat exchanger. Refrigerant piping equivalent length (without drier and valves) = 3 m

C1 Cooling mode conditions: evaporator entering/leaving water temperature 12 °C/7 °C, saturated condensing temperature 45 °C, subcooling 5 K, evaporator fouling factor 0 m² K/W.

C2 Cooling mode conditions: evaporator entering/leaving water temperature 23 °C/18 °C, saturated condensing temperature 45 °C, subcooling 5 K, evaporator fouling factor 0 m² K/W.

⁽¹⁾ Weight shown is a guideline only. Please refer to the unit nameplate

⁽²⁾ In dB ref=10-12 W, (A) weighting. Declared dual number noise emission values in accordance with ISO 4871 (with an associated uncertainty of +/-3dB(A)). Measured in accordance with ISO 9614-1 and certified by Eurovent.

⁽³⁾ The dimensions shown are for the standard unit. For other unit types please refer to the dimensional drawings.

Electrical data notes and operating conditions:

- 61WG/30WG/30WGA units have a single power connection point, located immediately upstream of the main disconnect switch.
- The control box includes the following standard features:
 - a main disconnect switch,
 - the starter and motor protection devices for each compressor and the pumps
 - the control devices
- Field connections: All connections to the system and the electrical installations must be in full accordance with all applicable local codes.
- The Carrier 61WG/30WG/30WGA units are designed and built to ensure conformance with these codes. The recommendations of European standard EN 60204-1 (machine safety - electrical machine components - part 1: general regulations - corresponds to IEC 60204-1) are specifically taken into account, when designing the electrical unit equipment.

Notes:

- Generally the recommendations of IEC 60364 are accepted as compliance with the requirements of the installation directives. Conformance with EN 60204-1 is the best means of ensuring compliance with the Machines Directive § 1.5.1.
 - Annex B of EN 60204-1 describes the electrical characteristics used for the operation of the machines.
- The operating conditions for the units are specified below:

Environment* - Environment as classified in EN 60721 (equivalent to CEI60721):

 - Indoor installation,
 - ambient temperature range: +5 °C for the temperature minimum to +40 °C, class 4K4H,
 - humidity range (non-condensing)*:
 - 50% relative humidity at 40 °C
 - 90% relative humidity at 20 °C
 - altitude: ≤ 2000 m (see note for table 4.7 in the IOM)
 - indoor installation*

- presence of water: class AD2 (possibility of water droplets)
 - presence of hard solids, class 4S2 (no significant dust present)
 - presence of corrosive and polluting substances, class 4C2 (negligible)
 - vibration and shock, class AG2, AH2
 - competence of personnel, class BA4* (trained personnel - IEC 60364)
- Power supply frequency variation: ± 2 Hz.
 - The neutral (N) conductor must not be connected directly to the unit (if necessary use a transformer).
 - Over-current protection of the power supply conductors is not provided with the unit.
 - The factory-installed disconnect switch(es)/circuit breaker(s) is (are) of a type suitable for power interruption in accordance with EN 60947.
 - The units are designed for simplified connection on TN(s) networks (IEC 60364). For IT networks provide a local earth and consult competent local organisations to complete the electrical installation. Units delivered with speed drive (option 116V and 270V) are not compatible with IT network.
 - Derived currents: If protection by monitoring of derived currents is necessary to ensure the safety of the installation, the control of the cut-out value must take the presence of leak currents into consideration that result from the use of frequency converters in the unit. A value of at least 150 mA is recommended to control differential protection devices.

NOTE: If particular aspects of an actual installation do not conform to the conditions described above, or if there are other conditions which should be considered, always contact your local Carrier representative.

* The protection level of the control boxes required to conform to this class is IPX1B (according to reference document IEC 60529). All 61WG/30WG/30WGA units fulfil this protection condition. Units equipped with front casing panel meet class IP23. If the casing panel has been removed, access to energised components is protected to level IPXXB.

30WGA without hydronic module		020	025	030	035	040	045	050	060	070	080	090
Power circuit												
Nominal voltage	V-ph-Hz	400-3-50										
Voltage range	V	360-440										
Control circuit supply												
24 V, via internal transformer												
Maximum start-up current draw (Un)*												
Standard unit	A	98	142	142	147	158	197	161	163	172	185	228
Unit with electronic starter option	A	53.9	78.1	78.1	80.9	86.9	108.4	96.8	97.9	104.1	112.3	137.4
Unit power factor at maximum capacity**												
0.83 0.82 0.84 0.83 0.82 0.84 0.82 0.82 0.82 0.83 0.82 0.84												
Maximum operating power input**												
kW 9.7 11.4 12.8 14.7 16.6 18.7 22.8 25.6 29.4 33.2 37.4												
Nominal unit operating current draw***												
A 11.4 13.8 14.7 16.5 18.1 21.2 27.6 29.4 33.0 36.2 42.4												
Maximum operating current draw (Un)****												
A 14.7 17.7 19.3 21.7 24.1 27.5 35.4 38.7 43.5 48.1 55.0												
Maximum operating current draw (Un-10%) †												
A 16.2 19.5 21.3 23.9 26.5 30.3 39.0 42.6 47.8 53.0 60.6												
Customer-side unit power reserve												
Customer reserve at the 24 V control power circuit												
Short-circuit stability and protection												
See table below "Short-circuit stability current"												

- * Maximum instantaneous start-up current at operating limit values (maximum operating current of the smallest compressor(s) + locked rotor current or limited start-up current of the largest compressor).
** Maximum power input at the unit operating limits.
*** Values obtained at the following conditions: evaporator entering/leaving water temperature 12 °C/7 °C, condenser entering/leaving water temperature 45 °C.
**** Maximum unit operating current at maximum unit power input and 400 V.
† Maximum unit operating current at maximum unit power input and 360 V.

Short-circuit stability current (TN system*) - standard unit (with main disconnect switch)

61WG/30WG/30WGA		020	025	030	035	040	045	050	060	070	080	090
Value with non-specified upstream protection												
Short-term current at 1 s - I _{cw} - kA rms	3	3	3	3	3	3	3	3	3	3	3	3
Admissible peak current - I _{pk} - kA pk	6	6	6	6	6	6	6	6	6	6	6	6
Maximum value with upstream protection (by circuit breaker)												
Conditional short-circuit current I _{cc} - kA rms	40	40	40	40	40	40	40	40	40	40	40	40
Schneider circuit breaker - Compact series	NSX 100N											
Reference number**	LV429795											

- * Earthing system type
** If another current limitation protection system is used, its time-current and thermal constraint (I²t) trip characteristics must be at least equivalent to those of the recommended Schneider circuit breaker. Contact your nearest Carrier office.
The short-circuit stability current values above are in accordance with the TN system.

30WG		110	120	140	150	170	190
Value with non-specified upstream protection							
Short-term current at 1 s - I _{cw} - kA rms		5,5	5,5	5,5	5,5	5,5	5,5
Admissible peak current - I _{pk} - kA pk		20	20	20	20	20	20
Maximum value with upstream protection (by circuit breaker)							
Conditional short-circuit current I _{cc} - kA rms		154	154	154	154	154	154
Schneider circuit breaker - Compact series		NSX 100N					
Reference number**		LV429795					

- * Earthing system type
** If another current limitation protection system is used, its time-current and thermal constraint (I²t) trip characteristics must be at least equivalent to those of the recommended Schneider circuit breaker. Contact your nearest Carrier office.
The short-circuit stability current values above are in accordance with the TN system.

Water flow rates

Standard 61WG

61WG	Evaporator water flow rate, l/s					
	Minimum*		Minimum**	Maximum***		Maximum****
	Low pressure	High pressure		Low pressure	High pressure	
020	1.0	0.9	0.5	3.1	3.6	3.8
025	1.0	1.0	0.5	3.3	3.8	4.1
030	1.0	1.0	0.5	3.3	3.8	4.1
035	1.1	1.1	0.6	3.6	4.2	4.7
040	1.2	1.1	0.6	3.8	4.4	5.0
045	1.2	1.1	0.8	4.0	4.6	5.4
050	1.6	1.4	0.8	5.4	7.8	9.2
060	1.5	1.6	1.0	6.1	8.0	9.9
070	1.6	1.5	1.1	6.2	8.1	10.3
080	1.6	1.5	1.3	6.3	8.3	10.9
090	2.0	1.6	1.5	7.8	8.7	12.5

- * Units with hydronic module
Flow rate for a maximum permitted temperature difference at the minimum leaving water temperature
- ** Units without hydronic module
Flow rate for a maximum permitted temperature difference at the minimum leaving water temperature
- *** Units with hydronic module
Maximum flow rate for an available pressure of 20 kPa (unit with low-pressure hydronic module) or 50 kPa (unit with high-pressure hydronic module)
- **** Units without hydronic module
Maximum flow rate for a pressure drop of 100 kPa in the plate heat exchanger.

61WG	Condenser water flow rate, l/s			
	Minimum*	Maximum**		Maximum***
		Low pressure	High pressure	
020	0.3	3.1	3.5	3.8
025	0.3	3.3	3.8	4.1
030	0.3	3.3	3.8	4.1
035	0.4	3.5	4.1	4.7
040	0.4	3.7	4.3	5.0
045	0.4	3.9	4.5	5.4
050	0.4	4.8	6.8	7.0
060	0.5	5.5	7.0	7.5
070	0.5	5.6	7.2	7.8
080	0.6	5.8	7.4	8.2
090	0.6	7.2	7.9	9.3

- * Units with or without hydronic module
Minimum flow rate for a water temperature difference of 18 K-
Note: Operation permitted up to a value of 20 K.
- ** Units with hydronic module
Maximum flow rate for an available pressure of 20 kPa (unit with low-pressure hydronic module) or 50 kPa (unit with high-pressure hydronic module)
- *** Units without hydronic module
Maximum flow rate for a pressure drop of 100 kPa in the plate heat exchanger

61WG with option 272

61WG	Minimum evaporator glycol solution flow rate - option 272*, l/s		
	Minimum**	Minimum***	
		Low pressure	High pressure
020	0.5	0.5	0.5
025	0.5	0.5	0.5
030	0.5	0.5	0.5
035	0.6	0.6	0.6
040	0.6	0.6	0.6
045	0.8	0.8	0.8
050	2.0	1.9	0.8
060	1.9	1.9	1.0
070	1.9	1.9	1.1
080	1.9	2.0	1.3
090	2.2	2.0	1.5

- * Option 272: Condenser side high-temperature water production, evaporator side with glycol solution,
- ** Units with hydronic module
Minimum flow rate for a maximum permitted temperature difference at the minimum leaving water temperature
- *** Units without hydronic module
Minimum flow rate for a maximum permitted temperature difference at the minimum leaving water temperature

Standard 30WG/30WGA

30WG 30WGA	Evaporator water flow rate, l/s					
	Minimum*		Minimum**	Maximum***		Maximum†
	Low pressure	High pressure		Low pressure	High pressure	
020	1.0	0.9	0.5	3.1	3.6	3.8
025	1.0	1.0	0.5	3.3	3.8	4.1
030	1.0	1.0	0.5	3.3	3.8	4.1
035	1.1	1.1	0.6	3.6	4.2	4.7
040	1.1	1.1	0.6	3.8	4.4	5
045	1.2	1.1	0.8	4.0	4.6	5.4
050	1.6	1.4	0.8	5.4	7.8	9.2
060	1.5	1.6	1.0	6.1	8.0	9.9
070	1.6	1.5	1.1	6.2	8.1	10.3
080	1.6	1.5	1.3	6.3	8.3	10.9
090	2.0	1.6	1.5	7.8	8.7	12.5
110	2	1,25	0,8	7,5	11,8	14,4
120	2	1,25	0,9	7,6	12,5	16,7
140	2	1,25	1	8,6	12,8	18,3
150	2	1,25	0,8	8,6	12,5	16,1
170	2	1,25	0,9	13,6	13,1	18,3
190	2	1,25	1	14,0	13,3	20,3

- * Units with hydronic module
Flow rate for a maximum permitted temperature difference at the minimum leaving water temperature
- ** Units without hydronic module
Flow rate for a maximum permitted temperature difference at the minimum leaving water temperature
- *** Units with hydronic module
Maximum flow rate for an available pressure of 20 kPa (unit with low-pressure hydronic module) or 50 kPa (unit with high-pressure hydronic module)
- † Units without hydronic module
Maximum flow rate for a pressure drop of 100 kPa in the plate heat exchanger.

30WG	Condenser water flow rate, l/s			
	Minimum*	Maximum**		Maximum***
		Low pressure	High pressure	
020	0.3	3.1	3.5	3.8
025	0.3	3.3	3.8	4.1
030	0.3	3.3	3.8	4.1
035	0.4	3.5	4.1	4.7
040	0.4	3.7	4.3	5.0
045	0.4	3.9	4.5	5.4
050	0.4	4.8	6.8	7.0
060	0.5	5.5	7.0	7.5
070	0.5	5.6	7.2	7.8
080	0.6	5.8	7.4	8.2
090	0.6	7.2	7.9	9.3
110	0,5	11,4	11,7	13,1
120	0,5	12,5	12,4	15,0
140	0,6	13,2	12,9	16,7
150	0,5	12,6	13,8	16,4
170	0,5	13,6	14,4	18,9
190	0,6	14,0	14,7	20,6

- * Units with or without hydronic module
Minimum flow rate for a water temperature difference of 18 K-
Note: Operation permitted up to a value of 20 K.
- ** Units with hydronic module
Maximum flow rate for an available pressure of 20 kPa (unit with low-pressure hydronic module) or 50 kPa (unit with high-pressure hydronic module)
- *** Units without hydronic module
Maximum flow rate for a pressure drop of 100 kPa in the plate heat exchanger

30WG with option 6

30WG	Minimum evaporator glycol solution flow rate - option 6*, l/s		
	Minimum**	Minimum***	
		Low pressure	High pressure
020	1.4	1.3	0.5
025	1.5	1.3	0.5
030	1.5	1.3	0.5
035	1.6	1.5	0.6
040	1.7	1.5	0.6
045	1.8	1.5	0.8
050	2.5	2.2	0.8
060	2.2	2.3	1.0
070	2.2	2.4	1.1
080	2.3	2.4	1.3
090	2.5	2.5	1.5
110	2	1,4	1,5
120	2	1,4	1,5
140	2	1,4	1,5
150	2	1,4	1,5
170	2	1,4	1,5
190	2	1,4	1,5

- * Option 6: Glycol solution production, very low temperature
- ** Units with hydronic module
Minimum flow rate for a maximum permitted temperature difference at the minimum leaving water temperature
- *** Units without hydronic module
Minimum flow rate for a maximum permitted temperature difference at the minimum leaving water temperature

Variable water flow system (VWF)

Variable water flow is a hydronic control function package that permits control of the water flow rate.

The VWF not only ensures control at full load, a specific Carrier algorithm linked to an electronic frequency converter also continuously modulates the flow rate to minimise pump consumption at full load as well as part load.

The hydronic module includes pressure transducers that permit intelligent measurement of the water flow rate and real-time display on the Pro-Dialog+ interface. All adjustments can be made directly on the interface, speeding up start-up and maintenance.

As VWF acts directly on the pump, the system no longer requires the control valve at the unit outlet. However, for applications with two-way valves a bypass system must be kept to guarantee the minimum flow rate.

Operating logic

■ Full-load setpoint

The flow rate control at full load uses the Pro-Dialog+ & TouchPilot Junior interface, reducing the pump speed. This first control saves energy that would normally be dissipated in the control valve. For example, if the pressure supplied by the pump is reduced by 20% the power consumption of the pump is reduced by the same ratio, compared to a traditional installation.

■ Operating mode at part load

Pro-Dialog+ & TouchPilot Junior includes two part-load operating modes:

- Constant outlet pressure control
- Constant delta T control.

1 – Constant unit outlet pressure control

The control continuously acts on the pump speed to ensure a constant outlet pressure.

This solution is suitable for installations with two-way valves. When these close, the water speed will accelerate in the system branches that are still open. For a fixed-speed pump this results in an unnecessary increase of the pressure at the pump outlet.

The outlet pressure control mode ensures that each circuit branch always has a uniform supply, without unnecessary energy waste.

In industrial processes such as plastic injection moulding, this solution ensures that each terminal unit has the correct pressure supply.

2 – Constant delta T control

The VWF algorithm maintains a constant delta T no matter what the unit load, reducing the flow rate to the minimum.

This solution can be used for systems with two-way or three-way valves and achieves higher energy savings than the “Constant unit outlet pressure control” mode. It is suitable for the majority of comfort applications.

Guide specification, 61WG/30WG/30WGA

Quality assurance

- The water-sourced units shall be designed for indoor installation in a plant room.
- The water-sourced units shall use ozone-friendly refrigerant R410A and include scroll compressors.
- The design and manufacturing site of the units shall be certified in accordance with the quality management system ISO 9001.
- The development test site of the units shall be certified to the quality management system ISO 17025.
- The design and manufacturing site of the units shall be certified in accordance with the environmental management system ISO 14001.
- The published performances for the units shall be Eurovent-certified and all units are factory-tested before shipment.
- The units shall meet the following product quality standards: 2014/35/UE, 2014/30/UE, 2014/68/UE, 2011/65/UE "RoHS 2", 2012/19/EU "WEEE", 2008/28/EC "Ecodesign", EN14511.

61WG product features

- The hot-water production unit shall have a heating capacity of ____ kW, a maximum power input of ____ kW and a COP of ____ kW/kW.
- The evaporator leaving water temperature shall be ____ °C with a temperature difference of ____ K and a condenser leaving water temperature of ____ °C with a temperature difference of ____ K.
- The hot-water production unit shall be able to produce hot water up to 65 °C and cold water to class ____ in accordance with Eurovent.
- The hot-water production unit shall have weather compensation control, controlling a needle valve and permitting hot-water production at a second setpoint of ____ °C, controlled by a clock.
- It shall control a supplementary 4-stage electric heater and be able to manage a relief boiler (heat pump stopped).
- A second circulation pump shall be controlled by the hot-water production unit.

30WG product features

- The chilled-water production unit shall have a cooling capacity of ____ kW, a maximum power input of ____ kW and an ESEER of ____ kW/kW.
- The evaporator leaving water temperature shall be ____ °C with a temperature difference of ____ K and a condenser leaving water temperature of ____ °C with a temperature difference of ____ K.
- The chilled-water production unit shall be able to produce hot water up to 60 °C and class ____ heating in accordance with Eurovent.
- The chilled-water production unit shall be connected by communication bus to a drycooler.

30WGA product features

- The refrigerant circuit of the condenserless unit shall include a check valve on the discharge line piping, a solenoid valve on the liquid line piping and a nitrogen holding charge.
- The unit shall be capable of delivering cooling capacity with a saturated condensing temperature of up to 62 °C.
- The chiller shall be connected to a remote condenser via communication bus.
- Fan control on the remote condenser shall be possible via a digital output (up to 8 steps possible) or via an analogue 0-10 V output signal for variable-speed fans.
- Fan operation shall be controlled remotely based on the outside temperature and the saturated refrigerant discharge temperature

Common 61WG/30WG/30WGA unit features

- The unit shall have water connections at the top/back and a footprint size of ____ m².
- The hydronic kit, located in the upper unit section shall include all required hydronic components including an expansion tank of ____ litres.
- The circulation pumps have fixed speed/variable water flow with a minimum frequency of 25 Hz. The evaporator water pressure drop shall be ____ kPa and the condenser water pressure drop shall be ____ kPa.
- All hydronic and refrigerant circuit components of the unit shall be compatible with a condenser leaving water temperature of 65 °C.
- The unit shall be stackable in pairs, controlled in master/slave configuration for a total capacity of ____ kW (sizes 020 to 090).
- The unit shall operate with 400 V-3 ph-50 Hz (400 V ± 10%) without neutral and it shall only have one connection point.
- The main control panel shall be protected by a glass panel and shall only be opened with a special tool.
- The unit control circuit voltage shall be 24 V maximum, supplied by a factory-installed transformer. The compressor shall offer quick keyed electrical connection.
- The unit shall include numerical control, with the possibility of remote control. It shall ensure the control of the compressors, evaporator and condenser water pumps and the fans (drycooler).
- The numerical control shall include a patented auto-adaptive Carrier algorithm that controls the operation of the compressors and permanently adjusts to the application characteristics including the water loop inertia.
- Dangerous compressor cycles are reduced to six per hour.
- The control menus shall permit direct access to all unit data including the history of possible faults.