Carrier

Air-Cooled Liquid Chillers

PRO-DIALOG PLUS

AQUASNAP JUNIOR

Carrier is participating in the Eurovent Certification Programme. Products are as listed in the Eurovent Directory of Certified Products.

Puron

(Size 005-013)

HFC-407C

(Size 015)

Quality Management System Approval

30RA 005-015

Nominal cooling capacity 5-15 kW

This new generation of liquid chillers features the latest technological innovations, incorporating scroll compressors and operating on the ozone-friendly refrigerant HFC-410A (sizes 005-013) or HFC-407C (size 015).

The 30RA chillers from Carrier have an integrated hydronic module, with pump and expansion tank, limiting the installation to simple operations like connection of the power supply and the water supply and return piping.

An electronic, microprocessor-based auto-adaptive control system ensures intelligent control of the compressor start-up sequence, permitting operation at low system water volumes.

Features

- Refrigerants R-410A (a blend of R-32 and R-125) and R-407C (a blend of R-32, R-125 and R-134a) ensure superior performances to those achieved with R-22 and offer an economical solution to environmental protection problems. They have no effect on the ozone layer and can be used as a replacement for R-22 in air conditioning applications with small and medium capacities.
- The components of these units are specifically designed for R-410A or R-407C refrigerant, and all units have been submitted to the necessary laboratory tests to ensure perfect operation.
- The unit incorporates one or two two-speed axial fans with horizontal air discharge. The advanced design allows exceptionally low-noise operation. At part load conditions or at low outdoor temperatures the fan speed is automatically reduced by 50%, for even quieter operation. The control system also permits programming operation at reduced speed for a preset time period.
- The compact dimensions and reduced weight of these units facilitate installation, even in very restricted spaces.
- The use of galvanised steel panels guarantees increased resistance to atmospheric conditions. These components have exceeded the stringent salt-spray corrosion resistance tests according to ASTM 117, with over 500 hours exposure to aggressive environments.
- The panels are removable for improved service and easier access to the internal components.
- The condenser coils are made of copper tubes, mechanically expanded into aluminium fins, with an increased heat exchange surface.
- The refrigerant-to-water heat exchangers are plate heat exchangers, ensuring optimum heat transfer at reduced dimensions. The plates are made of welded stainless steel. This heat exchanger type requires less refrigerant than traditional heat exchangers of the same capacity.
- Scroll compressors run very quietly and vibration-free. They are known for their durability and reliability. The motors are fully cooled by suction gas and permit up to

12 starts per hour. These compressors are especially designed for operation with R-410A or R-407C.

- The hydronic components are factory-installed. This eliminates the need to install the components on site.

  The hydronic kit includes:
  - a flow switch
  - an expansion tank
  - a three-speed circulating pump
  - a manual purge valve
  - a water drain valve
  - a safety valve (installed in sizes 005-013; provided for field installation in size 015)
  - a single-speed water pump (30RA 015 only)

PRO-DIALOG Plus control system

PRO-DIALOG Plus is an advanced numeric control system that combines complex intelligence with great operating simplicity. PRO-DIALOG Plus constantly monitors all machine parameters and safety devices, and precisely manages the operation of compressor and fans for optimum energy efficiency. It also controls the operation of the water pump.

A powerful control system

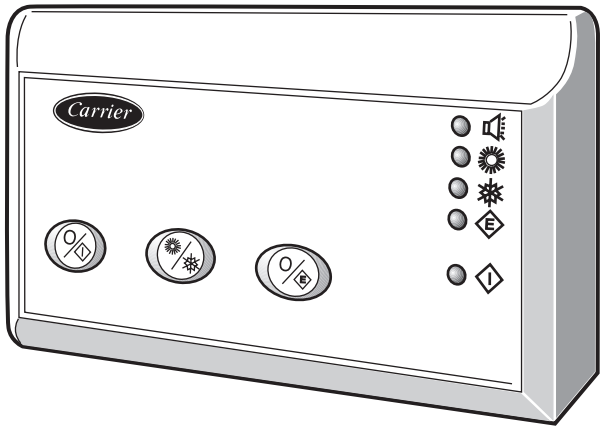
- The PID control algorithm with permanent compensation for the difference between entering and leaving water temperature, anticipates load variations, and ensures intelligent leaving water temperature control.
- Dual set point: two different supply water temperature set points can be manually programmed or selected, according to the thermal load expected during the course of the day in the zones to be air conditioned. This always ensures maximum comfort at minimum energy consumption.
- PRO-DIALOG Plus control is auto-adaptive for improved chiller protection. Compressor cycling is automatically adapted to the characteristics of the application according to the inertia of the water loop and prevents dangerous compressor short cycling.
- The integrated CCN Clock Board offers additional unit functions:
  - CCN protocol interface for complete connectivity and compatibility with the Carrier CCN network
  - Real-time clock

  With this board installed and using a CCN tool (for example the accessory Service Interface tool) new and more advanced functions are available:
  Time scheduling of the unit with up to eight sequences, cascade operation of two units, remote control and programming of the fan operating time at low speed.

Remote control system

The remote control system, wired to the unit located outside, permits easy user control of the principal unit functions: start/stop control, selection of the desired temperature at reduced energy consumption, general alarm display.

The remote control was designed for indoor use in residential and/or commercial applications.



Remote control

Accessories

	Accessory
Remote control	x
Service interface	x
Mechanical water filter	x

Physical data

30RA		005	007†	009	011	013	015
Nominal cooling capacity*	kW	5.2	6.7/6.5	7.6	9.7	11.2	14.7
Operating weight	kg	71	73	85	108	118	135
Refrigerant type		R-410A	R-410A	R-410A	R-410A	R-410A	R-407C
Compressor		One scroll compressor					
Evaporator		One plate heat exchanger					
Net water volume	l	0.66	0.85	0.94	1.22	1.22	1.50
Max. water-side operating pressure	kPa	300	300	300	300	300	400****
Hydraulic circuit							
Pump		One three-speed pump (sizes 005-013) or single-speed pump (size 015)					
Available pressure**	kPa	44	35/36	49	53	54	150
Water inlet/outlet connections	in	1	1	1	1	1	1
Expansion tank volume	l	1	1	2	2	2	2
Fans		One or two propeller fans					
Number of fans/diameter	mm	1/370	1/370	1/370	2/370	2/370	2/370
No. of blades		4	4	4	4	4	4
Fan speed	r/s	14	18.2	17.2	17.2	17.2	17.2
Sound pressure level***	dB(A)	36	40	41	42	44	50
Sound power level	dB(A)	64	68	69	70	72	78

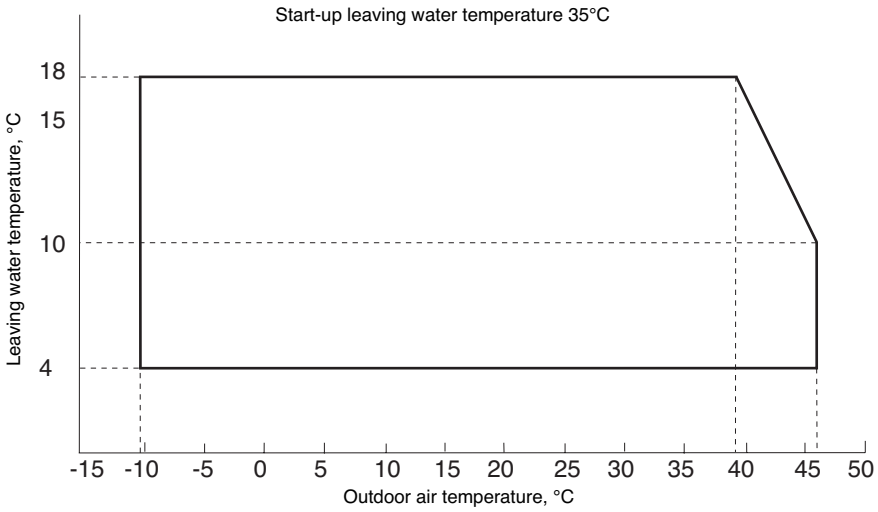
* Based on Eurovent conditions: evaporator entering/leaving water temperature 12°C/7°C, condenser entering air temperature of 35°C.
** At nominal flow and high pump speed
*** Sound pressure is measured at 10 m distance.
**** The safety valve is not installed on size 015; please ensure that it is installed on-site in the hydronic circuit.
† The first value is for single-phase units, the second value is for three-phase units.

Electrical data

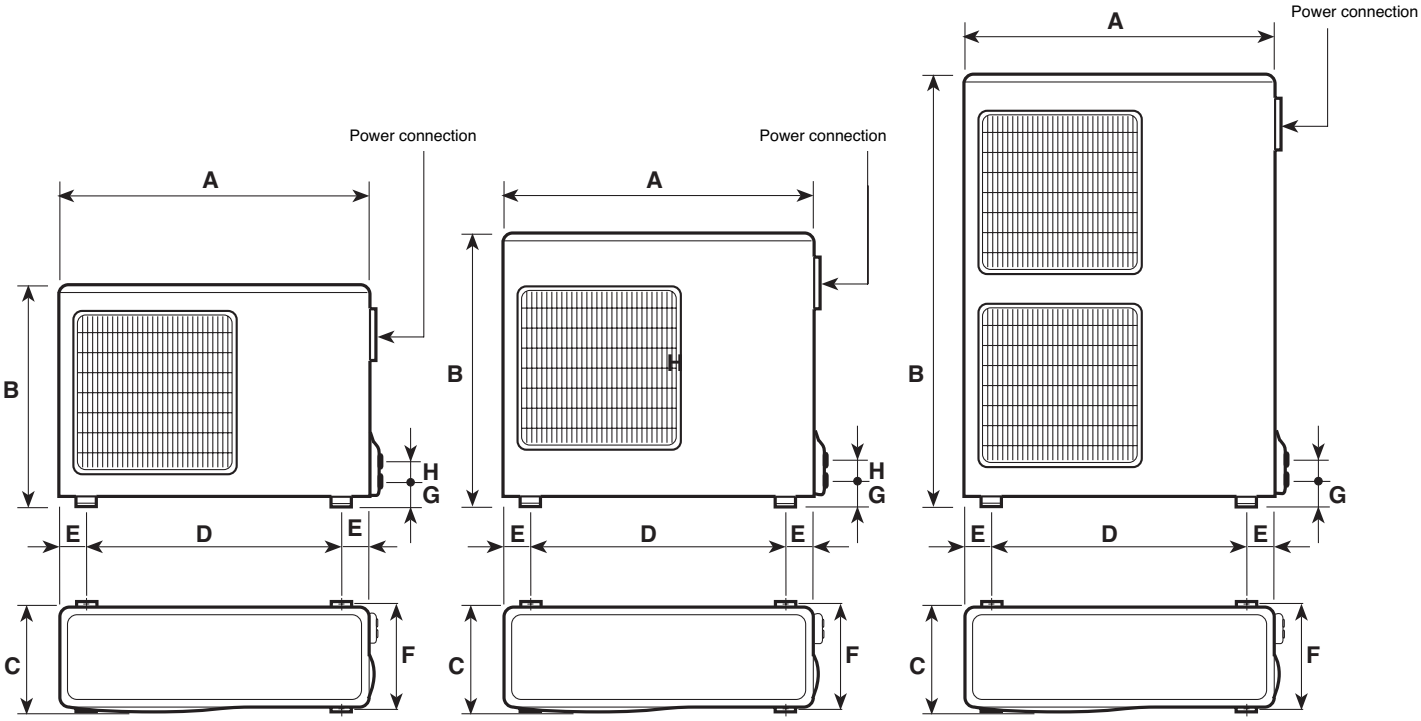
30RA		005	007	007	009	011	011	013	015
Power supply	V-ph-Hz	230-1-50	230-1-50	400-3-50	400-3-50	230-1-50	400-3-50	400-3-50	400-3-50
Voltage range	V	198-264	198-264	342-462	342-462	198-264	342-462	342-462	342-462
Nominal power input*	kW	2.07	2.78	2.70	3.05	3.22	3.22	4.57	6.60
Maximum power input**	kW	2.90	3.80	3.60	4.30	4.30	4.40	6.30	8.00
Locked rotor current	A	58	82	35	40	97	48	64	75.5
Max. starting current with soft starter	A	-	-	-	-	-	-	-	45
Full load current	A	15	18	7.5	8	21.5	8.5	11.5	14.5
Water circulating pump (230-1-50)									
Current drawn	A	0.30	0.30	0.30	0.50	0.90	0.90	0.97	1.10
Fan motor (230-1-50)									
Current drawn	A	0.50	0.94	0.94	0.90	1.80	1.80	1.80	1.64
Compressor crankcase heater (230-1-50)									
Current drawn	A	0.11	0.11	0.11	0.11	0.11	0.11	0.11	-

* At standard Eurovent conditions
** Maximum unit power input at maximum operating conditions and worst power supply voltage

Operating limits

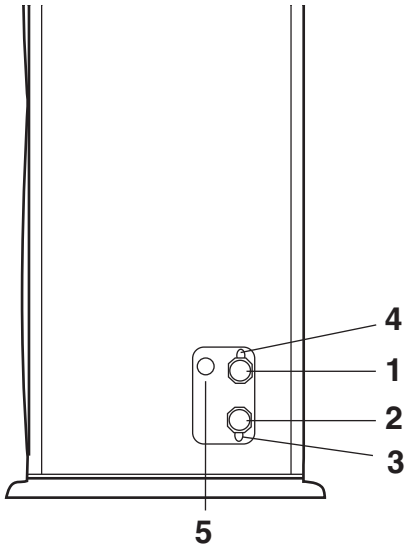


Dimensions



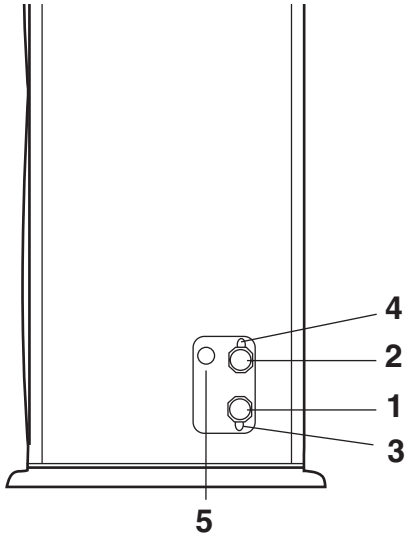
30RA		005	007	009	011	013	015
A	mm	800	800	800	800	800	800
B	mm	590	590	803	1264	1264	1264
C	mm	300	300	300	300	300	300
D	mm	508	508	508	508	508	508
E	mm	146	146	146	146	146	146
F	mm	330	330	330	330	330	330
G	mm	97	97	97	97	97	97
H	mm	157	157	157	157	157	157

Water connections



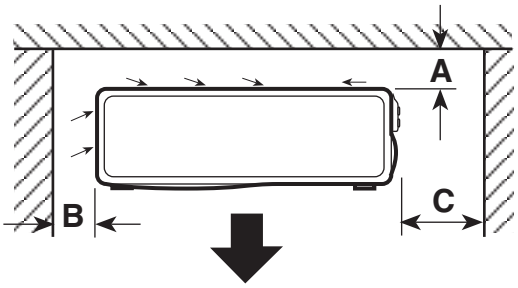
30RA 005-013

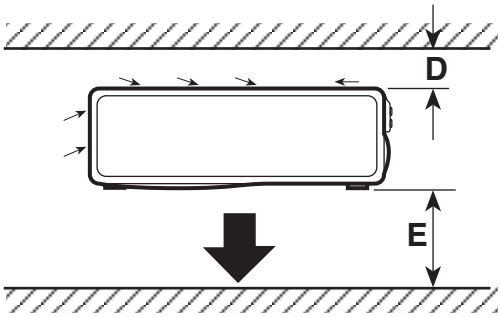
1 Water inlet, unit ø 1" gas female
2 Water outlet, unit ø 1" gas female
3 Drain
4 Purge
5 Drain safety valve ø 1/2" gas female

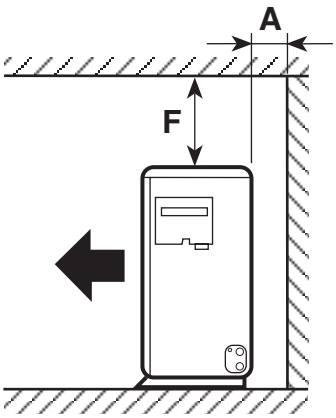


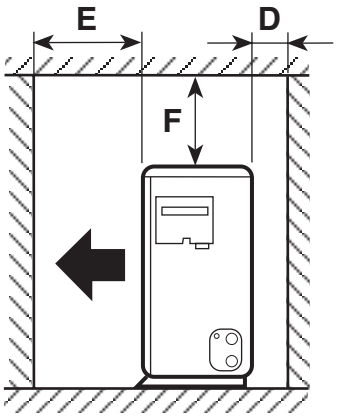
30RA 015

Clearances









30RA		005-007	009-015
A	mm	100	100
B	mm	250	250
C	mm	500	500
D	mm	50	100
E	mm	470	670
F	mm	400	400

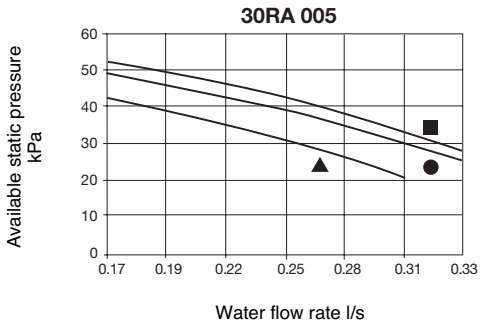
System water flow rate/volume

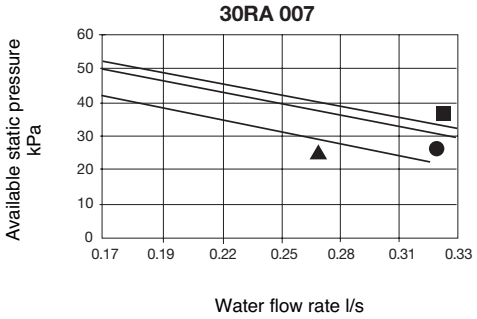
30RA		005	007	009	011	013	015
Nominal water flow rate	l/s	0.25	0.31	0.37	0.46	0.54	0.70
System water volume	l						
Minimum		17	22	27	32	41	53
Maximum		50	50	100	100	100	85

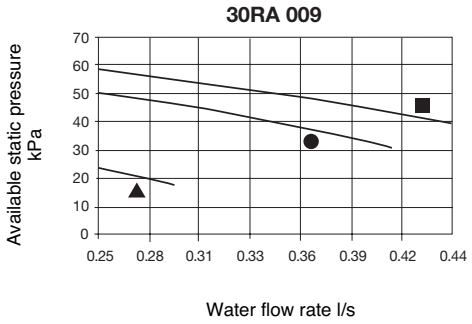
Sound power levels (dB)

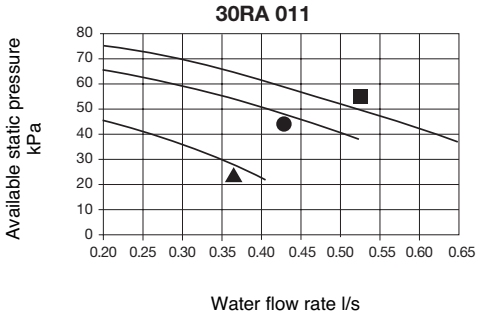
30RA	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	dB(A)
005	69	64	64	59	52	45	39	64
007	72	67	66	63	58	53	47	68
009	71	71	67	63	60	54	48	69
011	71	70	68	66	61	56	50	70
013	72	71	71	66	62	57	52	72
015	72.5	71	68	68.5	62.5	58	52	78

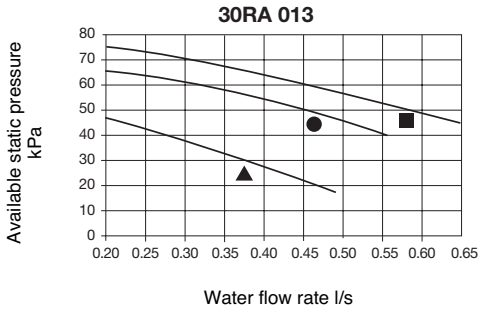
Total pressure available

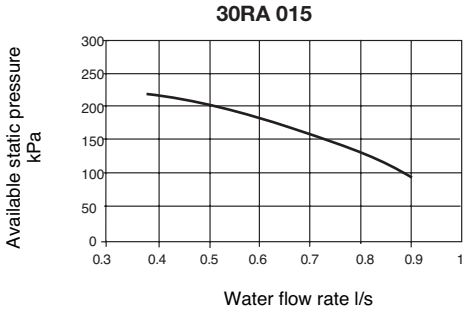












Legend:
■ III high speed
● II medium speed
▲ I low speed
Water temperature 20°C

Cooling capacities

30RA **Condenser entering air temperature, °C**

	LWT	25						30						35						40						45					
		CAP	COMP	UNIT	COOL		PRES	CAP	COMP	UNIT	COOL		PRES	CAP	COMP	UNIT	COOL		PRES	CAP	COMP	UNIT	COOL		PRES	CAP	COMP	UNIT	COOL		PRES
	°C	kW	kW	kW	l/s	kPa	kPa	kW	kW	kW	l/s	kPa	kPa	kW	kW	kW	l/s	kPa	kPa	kW	kW	kW	l/s	kPa	kPa	kW	kW	kW	l/s	kPa	kPa
005	5	5.02	1.52	1.64	0.24	14	45	4.98	1.71	1.83	0.24	14	45	4.81	1.9	2.02	0.23	13	47	4.48	2.09	2.22	0.21	11	50	4.01	2.29	2.42	0.19	9	53
007-7		6.89	2.07	2.29	0.33	11	33	6.54	2.31	2.53	0.31	10	37	6.2	2.56	2.78	0.3	9	38	5.88	2.81	3.03	0.28	7	42	5.57	3.07	3.29	0.27	7	44
007-9		6.72	1.99	2.19	0.32	10	35	6.37	2.23	2.44	0.3	9	38	6.03	2.48	2.69	0.29	8	40	5.71	2.74	2.94	0.27	7	44	5.41	3	3.21	0.26	6	45
009		8.01	2.25	2.45	0.38	26	46	7.71	2.53	2.73	0.37	25	47	7.27	2.83	3.03	0.35	23	49	6.72	3.14	3.34	0.32	19	52	6.03	3.46	3.66	0.29	16	54
011		9.73	2.24	2.58	0.46	20	52	9.59	2.54	2.89	0.46	19	53	9.24	2.86	3.2	0.44	18	55	8.68	3.18	3.52	0.41	16	58	7.91	3.51	3.86	0.38	14	60
013		12	3.43	3.76	0.57	28	50	11.4	3.8	4.13	0.54	26	53	10.8	4.21	4.53	0.51	22	57	10.1	4.64	4.97	0.48	18	62	9.39	5.1	5.43	0.45	16	65
015		15.7	5.28	5.5	0.74	25	137	15	5.79	6.01	0.7	23	146	14.2	6.34	6.56	0.66	20	156	13.3	6.93	7.15	0.62	18	165	12.3	7.56	7.78	0.57	16	176
005	6	5.16	1.54	1.66	0.25	15	44	5.14	1.73	1.85	0.24	15	44	4.98	1.92	2.04	0.24	14	45	4.67	2.12	2.24	0.22	12	49	4.21	2.31	2.44	0.2	10	52
007-7		7.11	2.09	2.31	0.34	12	31	6.76	2.32	2.54	0.32	10	35	6.42	2.56	2.78	0.31	10	37	6.11	2.81	3.03	0.29	8	40	5.8	3.06	3.28	0.28	7	42
007-9		6.94	2.01	2.21	0.33	11	33	6.59	2.25	2.45	0.31	10	37	6.26	2.49	2.69	0.3	9	38	5.94	2.74	2.94	0.28	7	42	5.64	2.99	3.2	0.27	7	44
009		8.12	2.26	2.46	0.39	28	45	7.85	2.54	2.74	0.37	25	47	7.45	2.84	3.04	0.35	24	48	6.93	3.15	3.35	0.33	21	51	6.29	3.48	3.68	0.3	17	54
011		9.79	2.24	2.58	0.47	20	52	9.72	2.55	2.89	0.46	19	53	9.44	2.87	3.21	0.45	19	54	8.96	3.2	3.54	0.43	17	56	8.26	3.54	3.88	0.39	14	59
013		12.2	3.45	3.78	0.58	29	49	11.7	3.82	4.15	0.55	27	52	11	4.22	4.55	0.52	24	56	10.3	4.65	4.98	0.49	19	61	9.58	5.11	5.44	0.45	17	64
015		16	5.31	5.53	0.75	26	134	15.3	5.82	6.03	0.71	23	143	14.4	6.36	6.58	0.68	21	152	13.5	6.95	7.17	0.63	19	163	12.5	7.57	7.8	0.59	16	173
005	7	5.3	1.56	1.68	0.25	15	44	5.3	1.75	1.87	0.25	15	44	5.15	1.94	2.07	0.24	15	44	4.85	2.14	2.26	0.23	13	47	4.42	2.33	2.46	0.21	11	50
007-7		7.33	2.11	2.33	0.35	13	29	6.98	2.34	2.56	0.33	11	33	6.65	2.57	2.79	0.32	10	35	6.33	2.81	3.03	0.3	9	38	6.03	3.05	3.27	0.29	8	40
007-9		7.16	2.03	2.24	0.34	12	31	6.81	2.26	2.46	0.32	11	33	6.48	2.49	2.7	0.31	10	37	6.17	2.74	2.94	0.29	8	40	5.87	2.98	3.19	0.28	7	42
009		8.22	2.27	2.46	0.39	28	45	7.99	2.55	2.75	0.38	26	46	7.63	2.85	3.05	0.36	24	48	7.15	3.16	3.36	0.34	22	50	6.54	3.49	3.69	0.31	18	53
011		9.85	2.23	2.57	0.47	20	52	9.85	2.55	2.89	0.47	20	52	9.65	2.88	3.22	0.46	19	53	9.23	3.22	3.56	0.44	18	55	8.61	3.56	3.91	0.41	16	58
013		12.5	3.46	3.8	0.59	32	46	11.9	3.84	4.17	0.56	28	50	11.2	4.24	4.57	0.53	25	54	10.5	4.67	5	0.5	20	60	9.77	5.13	5.46	0.46	17	63
015		16.3	5.33	5.56	0.77	27	130	15.5	5.84	6.06	0.73	24	139	14.7	6.38	6.6	0.69	22	149	13.8	6.97	7.19	0.64	19	160	12.8	7.59	7.81	0.6	17	171
005	8	5.44	1.58	1.7	0.26	17	42	5.45	1.77	1.89	0.26	17	42	5.32	1.97	2.09	0.25	15	44	5.04	2.16	2.28	0.24	14	45	4.62	2.36	2.48	0.22	12	49
007-7		7.55	2.13	2.35	0.36	14	27	7.21	2.35	2.57	0.34	12	31	6.88	2.57	2.79	0.33	11	33	6.56	2.8	3.02	0.31	10	37	6.26	3.04	3.26	0.3	9	38
007-9		7.38	2.05	2.26	0.35	13	29	7.04	2.27	2.48	0.34	12	31	6.71	2.5	2.7	0.32	10	35	6.4	2.73	2.94	0.3	10	37	6.1	2.97	3.17	0.29	8	40
009		8.32	2.27	2.47	0.4	29	44	8.13	2.56	2.76	0.39	28	45	7.81	2.86	3.06	0.37	25	47	7.36	3.18	3.38	0.35	23	49	6.79	3.51	3.71	0.32	19	52
011		9.92	2.22	2.57	0.47	20	52	9.99	2.55	2.9	0.47	21	51	9.85	2.89	3.23	0.47	20	52	9.51	3.24	3.58	0.45	19	54	8.96	3.59	3.93	0.43	17	56
013		12.7	3.48	3.82	0.6	33	44	12.1	3.85	4.19	0.58	29	49	11.4	4.25	4.58	0.54	26	53	10.7	4.69	5.01	0.51	21	58	9.95	5.15	5.47	0.47	17	63
015		16.6	5.36	5.59	0.78	28	126	15.8	5.86	6.09	0.74	25	136	15	6.41	6.62	0.7	23	146	14	6.99	7.21	0.66	20	157	13	7.61	7.83	0.61	17	168
005	9	5.58	1.6	1.73	0.27	18	40	5.61	1.79	1.92	0.27	18	40	5.49	1.99	2.11	0.26	17	42	5.23	2.18	2.3	0.25	15	44	4.82	2.38	2.5	0.23	13	47
007-7		7.77	2.15	2.38	0.37	15	24	7.43	2.36	2.58	0.35	13	29	7.1	2.58	2.8	0.34	12	31	6.79	2.8	3.02	0.32	10	35	6.5	3.03	3.25	0.31	10	37
007-9		7.6	2.07	2.28	0.36	14	27	7.26	2.28	2.49	0.35	13	29	6.93	2.5	2.71	0.33	11	33	6.62	2.73	2.93	0.32	10	35	6.33	2.96	3.16	0.3	9	38
009		8.43	2.28	2.47	0.4	29	44	8.27	2.57	2.76	0.39	29	44	7.99	2.87	3.07	0.38	26	46	7.58	3.19	3.39	0.36	24	48	7.05	3.53	3.72	0.34	22	50
011		9.98	2.22	2.56	0.47	21	51	10.1	2.56	2.9	0.48	21	51	10.1	2.9	3.24	0.48	21	51	9.78	3.25	3.6	0.46	20	52	9.31	3.62	3.96	0.44	19	54
013		12.9	3.5	3.83	0.62	35	43	12.3	3.87	4.2	0.59	31	47	11.7	4.27	4.6	0.55	27	52	10.9	4.7	5.03	0.52	22	57	10.1	5.16	5.49	0.48	18	62
015		16.9	5.39	5.62	0.79	29	122	16.1	5.89	6.11	0.76	26	132	15.3	6.43	6.65	0.71	23	143	14.3	7.01	7.23	0.67	21	154	13.3	7.63	7.85	0.62	18	166
005	10	5.72	1.62	1.75	0.27	18	40	5.76	1.82	1.94	0.27	20	38	5.66	2.01	2.13	0.27	18	40	5.42	2.2	2.32	0.26	17	42	5.02	2.4	2.52	0.24	14	45
007-7		7.99	2.17	2.4	0.38	16	22	7.65	2.37	2.6	0.36	14	27	7.33	2.58	2.81	0.35	13	29	7.02	2.8	3.02	0.33	11	33	6.73	3.02	3.24	0.32	10	35
007-9		7.82	2.09	2.3	0.37	15	24	7.48	2.3	2.51	0.36	14	27	7.16	2.51	2.72	0.34	12	31	6.85	2.73	2.93	0.33	11	33	6.56	2.95	3.15	0.31	10	37
009		8.53	2.28	2.48	0.41	30	43	8.41	2.58	2.77	0.4	29	44	8.17	2.88	3.08	0.39	28	45	7.8	3.2	3.4	0.37	25	47	7.3	3.54	3.74	0.35	23	49
011		10	2.21	2.56	0.48	21	51	10.3	2.56	2.9	0.49	22	50	10.3	2.91	3.25	0.49	22	50	10.1	3.27	3.62	0.48	21	51	9.66	3.64	3.99	0.46	19	53
013		13.2	3.51	3.85	0.63	36	41	12.6	3.89	4.22	0.6	32	46	11.9	4.29	4.62	0.56	28	50	11.1	4.72	5.05	0.53	24	56	10.3	5.18	5.5	0.49	19	61
015		17.2	5.41	5.65	0.81	30	118	16.4	5.91	6.14	0.77	27	128	15.5	6.45	6.67	0.73	24	139	14.6	7.03	7.25	0.68	21	151	13.5	7.65	7.87	0.63	19	163

Legend:

LWT	Leaving water temperature
CAP kW	Net cooling capacity = gross cooling capacity plus the capacity corresponding to the available pressure (flow x pressure/0.3).
Comp kW	Compressor power input
Unit kW	Unit power input (compressors, fans, control circuit and pumps) minus the capacity corresponding to the available pressure (flow x pressure/0.3).
Cool l/s	Evaporator water flow rate
Cool kPa	Evaporator and hydronic module pressure drop
Pres kPa	Available pressure at the unit outlet (unit with single-pump hydronic module)

Capacity based on standard EUROVENT conditions

The published performances are in accordance with EUROVENT tolerances:
- 5% for heating and cooling capacities
+ 5% for power input
+15% for the pressure drop

Full load correction factors for Eurovent laboratory test:

Net cooling capacity	1.000
Energy efficiency ratio	1.000
Evaporator pressure drop	1.000

Application data:

Refrigerant: R-410A (sizes 005-013), R-407C (size 015)
Evaporator temperature rise: 5 K
Evaporator fluid: chilled water
Fouling factor: 0.000044 m^2 K/W

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Manufacturer reserves the right to change any product specifications without notice.

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