Carrier

Water-Cooled/Condenserless Liquid Chillers with Integrated Hydronic Module

PRO-DIALOG PLUS

AQUASNAP™

HFC-407C

Quality Management System Approval

30RW/30RWA

Nominal cooling capacity 20-310 kW

- The new generation of 30RW/30RWA Aquasnap liquid chillers features the latest technological innovations: scroll compressors, digital auto-adaptive Pro-Dialog control and ozone-friendly refrigerant HFC-407C. Aquasnap can be supplied with hydronic evaporator and condenser modules as standard, limiting the installation to simple operations such as the entering and leaving water piping connection. An auto-adaptive control algorithm intelligently controls condenser water pump speed and the operation of the glycol cooler fans (30RW) or of the air-cooled condenser fans (30RWA) to ensure reliable and economical operation under any climate conditions.

"Plug and Play" installation

- Integrated hydronic modules: they minimise site installation complexity and reduce the required space for the chiller installation.

Evaporator hydronic module
This consists of a removable screen filter, single or twin-head water pump, expansion tank, water flow switch, safety valve, pressure gauge, and purge valve. A control valve permits adjustment of the flow rate to the water system characteristics. All components are isolated to prevent condensation.

Condenser hydronic module
This consists of a removable screen filter, single or twin-head (from size 060 upwards) variable-speed water pump, expansion tank, safety valve, pressure gauge, and purge valve. The variable-speed pump controls the chiller condensing pressure and makes the installation of a three-way mixing valve on the condenser water circuit unnecessary.

- Fan control: Pro-Dialog also controls the fans of the glycol cooler or remote air-cooled condenser. There are two methods: up to 8 stages maximum with balancing of fan operation times (30RW/RWA), or continuous speed variation (30RWA).
- Quick electrical connections: Aquasnap is equipped with a general disconnect switch and a 24 V control circuit supply transformer as standard. A single power supply entry (three-phase without neutral) supplies the chiller.

Economical operation

- The condensing pressure is optimised by a patented auto-adaptive algorithm. At part load or moderate outside temperature an algorithm intelligently controls the condenser water pump speed and the operation of the glycol cooler (30RW) or the condenser (30RWA) fans to maintain the condensing pressure at its lowest possible value. The standard 30RW chiller can operate down to -20°C outside temperature.

- The variable-speed condenser water pump automatically adjusts the water flow rate to maintain the ideal condensing conditions. At part load the power consumption of the pump is significantly reduced. A further advantage: as the three-way valve on the condenser circuit is not required, the hydronic circuit pressure drops are lower and the condenser water pump uses less energy.
- High-performance welded evaporator and condenser plate heat exchangers. With their counter-flow technology the heat exchangers maximise the thermodynamic properties of refrigerant HFC-407C. They are sized for very low water pressure drops. From size 30RW 160 upwards the evaporator and the condenser have two interlaced refrigerant circuits.

Finds space anywhere

- The Aquasnap chiller saves space, as it does not require additional space for the water pumps - everything is built into the unit. A further advantage: as routine unit maintenance operations are carried out via the front or side panels, the chiller can be installed against a wall.
- No plant room required. With its aesthetically pleasing casing design and the water connections at the top (30RW 020-150) the Aquasnap chiller can be installed in a place that is open to the public (garage, basement etc.), if local regulations permit.
- Low-noise operation. Aquasnap is equipped with quiet, vibration-free scroll compressors. These are well known for their durability and reliability, and they require no maintenance.

Reliability

- Refrigerant HFC-407C has no effect on the ozone layer, and is the replacement for R-22 in air conditioning applications with small and medium capacities. It has been extensively tested by Carrier for several years and offers the same reliability and even slightly superior performances to those of R-22.
- The refrigerant circuit is designed to be completely leak-proof. All pipes and the refrigeration components are welded, the capillaries, a source of leaks in the past, have been replaced. Pressure sensors, mounted directly on the pipes, take the place of the pressure switches. From size 30RW 160 upwards, two independent refrigerant circuits ensure partial cooling capacity in all circumstances.

PRO-DIALOG Plus control

- PRO-DIALOG Plus is an advanced numeric control system that combines intelligence with great operating simplicity. It controls the operation of compressors, evaporator and condenser water pumps and fans (glycol cooler or condenser).

Energy demand optimisation

- A patented auto-adaptive control algorithm optimises the condensing pressure at part load to reduce the compressor load, ensuring a perfect supply of the evaporator with liquid refrigerant. The algorithm controls the operation of the variable-speed condenser water pump and of the fans (glycol cooler or condenser).
- PRO-DIALOG Plus automatically resets the chilled-water temperature set point based on the outside air temperature or the return water temperature. The control can also operate on a second set point (example: unoccupied mode).

Total chiller protection

- A patented auto-adaptive algorithm controls the compressor operation and permanently adapts to the system characteristics (water loop inertia). Dangerous compressor cycling is prevented. The chiller can operate safely with a low water volume, and this frequently makes a buffer tank unnecessary (see minimum water volume later in this document).
- PRO-DIALOG permanently analyses the compressor suction and discharge pressures and temperatures. When an abnormal situation is detected, the control reacts e.g. by unloading one refrigerant circuit. As a result the compressors always operate in their ideal temperature range and many chiller fault shut-downs can be prevented.

Easy-to-use system

- The PRO-DIALOG operator interface is clear and user-friendly: LEDs and two numeric displays offer an immediate check of all unit operating data.
- By pushing the buttons conveniently positioned on a synoptic chiller diagram you have an immediate display of the following parameters: temperatures, pressures, set point, compressor run times etc.
- 10 menus offer direct access to all machine data, including a history of possible faults, for rapid and complete chiller fault diagnosis.

Easy remote control

- PRO-DIALOG Plus allows remote control and monitoring of the chiller through a wired connection: start/stop, cooling/heat reclaim mode selection, power demand limit or dual set point and customer safety lock. The system permits remote signalling of any possible anomaly for each refrigerant circuit.
- The optional “CCN Clock Board” offers other control possibilities. Three independent time schedules permit definition of:
  - chiller start/stop
  - operation at the second chilled-water set-point (e.g. unoccupied mode)
  - operation with a reduced number of fans (e.g. during the night).

  This option also permits parallel operation of two units and remote control via communication bus (RS 485 serial port).

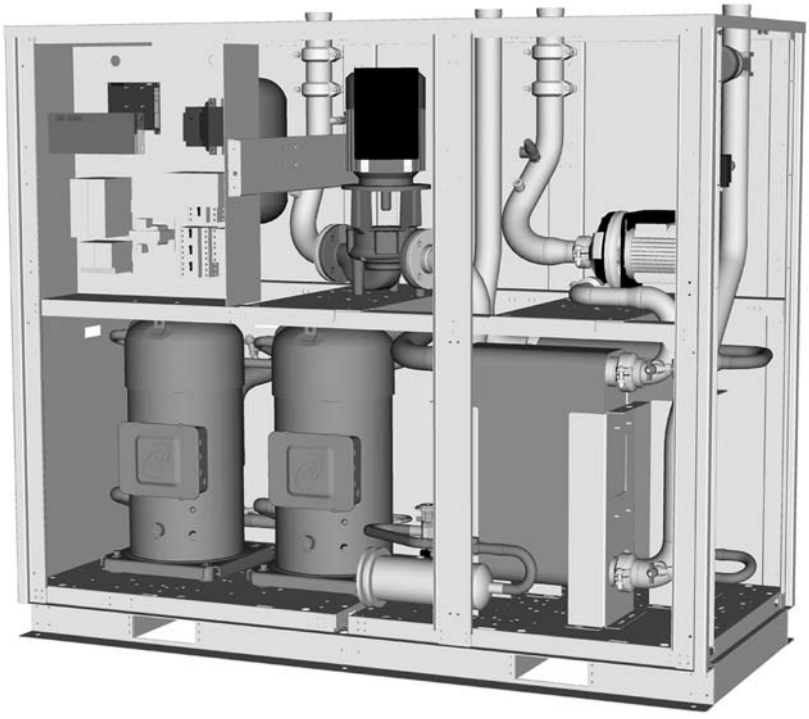
PRO-DIALOG Plus operator interface

Options and accessories

	Option	Accessory
Chiller without condenser 30RWA	X	
Heat pump (hot or cold water control)	X	
Low leaving water temperature down to -10°C (30RW)	X	
Electronic starter for reduced start-up current	X	
CCN Clock Board RS485 communications and time schedule board	X	X
Communications board for the AQUASMART “hydronic solution” system	X	
Evaporator hydronic module with single pump	X	
Evaporator hydronic module with twin-head pump (sizes 060-300)	X	
Condenser hydronic module with variable-speed single pump	X	
Condenser hydronic module with variable-speed twin-head pump (sizes 060-300)	X	

The glycol coolers or air-cooled condensers of the Carrier 09 series are supplied ready for installation with a control box. A simple communication bus connects the liquid chiller to the heat rejection unit. As all control components are installed and tested in the factory, installation and start-up of the chiller and its associated glycol cooler are simplified.

Glycol cooler 09



Chiller 30RW

Physical data

30RW/RWA		020	025	030	040	045	060	070	080	090	110	120	135	150	160	185	210	245	275	300
Nominal cooling capacity 30RW*	kW	20.2	25.9	29.9	39.7	45.3	56	70	80	91	108	123	139	149	162	183	216	247	284	310
Nominal cooling capacity 30RWA**	kW	19	24.4	28.2	37.8	43.5	54	67	76	87	102	117	134	143	148	170	198	226	264	291
Operating weight																				
30RW without hydronic module	kg	316	335	338	367	387	683	713	755	781	864	937	956	977	1079	1144	1357	1471	1421	1491
30RWA without hydronic module	kg	325	339	339	361	375	627	648	682	703	777	840	849	859	953	1000	1318	1318	1361	1371
Extra weight																				
Evaporator with single-pump hydronic kit	kg	25	25	25	27	27	14	14	14	14	15	15	15	15	75	75	75	75	60	63
Condenser with single-pump hydronic kit	kg	35	35	35	37	37	20	20	20	20	80	80	80	80	80	80	95	95	97	101
Evaporator with twin-head pump hydronic kit	kg	-	-	-	-	-	104	104	104	104	130	130	130	130	130	130	188	188	-	-
Condenser with twin-head pump hydronic kit	kg	-	-	-	-	-	114	114	114	114	140	140	140	140	140	140	198	198	-	-
Casing, if hydronic option is used	kg	-	-	-	-	-	-	-	-	-	-	-	-	-	170	170	170	170	-	-
Refrigerant 30RW***		R-407C																		
Circuit A	kg	3.2	3.3	3.3	4.2	6.2	7.5	9.6	11	12.4	14	16.4	18.5	19.3	15	17	19	19	24	24
Circuit B	kg	-	-	-	-	-	-	-	-	-	-	-	-	-	15	17	19	19	24	24
Compressors 30RW/30RWA		Hermetic scroll, 48.3 r/s																		
Circuit A		1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Circuit B		-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	2	2	2
Number of capacity steps		1	1	1	1	1	2	2	2	2	2	2	2	2	4	4	4	4	4	4
Minimum capacity	%	100	100	100	100	100	46	43	50	50	42	50	46	50	25	25	21	25	23	25
Control		PRO-DIALOG Plus																		
Condensers (30RW)		Welded plate heat exchangers																		
Water volume	l	2	2.91	2.91	3.8	4.8	6.1	7.8	9	9.7	12.2	13.7	15.8	17.9	26.5	26.5	34.9	34.9	46.6	46.6
Max. water-side operating pressure, without hydronic module	kPa	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
Max. water-side operating pressure, with hydronic module	kPa	400	400	400	400	400	400	400	400	400	400	400	400	400	400	400	400	400	400	400
Condenser hydronic module (30RW)																				
Condenser pump		Single or twin-head composite centrifugal pump, as per option used, variable speed by frequency converter (48.3 r/s)																		
Expansion tank volume, condenser loop	l	8	8	8	8	8	12	12	12	25	25	25	25	25	35	35	35	50	50	50
Evaporator (30RW/30RWA)		Welded direct-expansion plate heat exchanger																		
Water volume	l	2	2.91	2.91	3.8	4.8	6.1	7.8	9	9.7	12.2	13.7	15.8	17.9	26.5	26.5	34.9	34.9	46.6	46.6
Max. water-side operating pressure, without hydronic module	kPa	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
Max. water-side operating pressure, with hydronic module	kPa	400	400	400	400	400	400	400	400	400	400	400	400	400	400	400	400	400	400	400
Evaporator hydronic module (30RW/30RWA)																				
Evaporator pump		Single or twin-head composite centrifugal pump, as per option used (48.3 r/s)																		
Expansion tank volume, evaporator loop	l	8	8	8	8	8	12	12	12	25	25	25	25	25	35	35	35	50	50	50
Water connections (30RW/30RWA)		Victaulic† (30RW 020-045 without hydronic module: threaded gas connections)																		
Standard field connection diameter, Victaulic	inch	2	2	2	2	2	2	2	2	2	3 OD	3 OD	3 OD	3 OD	3	3	3	3	3	3
Welded field connection diameter	mm	60.3	60.3	60.3	60.3	60.3	60.3	60.3	60.3	60.3	76.1	76.1	76.1	76.1	88.9	88.9	88.9	88.9	88.9	88.9
Field refrigerant connections (30RWA)		Welded copper tube																		
Outside discharge piping diameter	inch																			
Circuit A		7/8	7/8	7/8	7/8	1-1/8	1-1/8	1-1/8	1-1/8	1-3/8	1-3/8	1-3/8	1-3/8	1-3/8	1-1/8	1-3/8	1-3/8	1-3/8	1-3/8	1-3/8
Circuit B		-	-	-	-	-	-	-	-	-	-	-	-	-	1-1/8	1-3/8	1-3/8	1-3/8	1-3/8	1-3/8
Outside liquid refrigerant return piping diameter	inch																			
Circuit A		7/8	7/8	7/8	7/8	7/8	7/8	7/8	7/8	7/8	1-1/8	1-1/8	1-1/8	1-1/8	7/8	7/8	7/8	1-1/8	1-1/8	1-1/8
Circuit B		-	-	-	-	-	-	-	-	-	-	-	-	-	7/8	7/8	7/8	1-1/8	1-1/8	1-1/8

* Standard EUROVENT conditions: evaporator entering/leaving water temperature = 12°C/7°C, condenser entering/leaving water temperature = 30°C/35°C.
** Standard EUROVENT conditions: evaporator entering/leaving water temperature = 12°C/7°C, saturated bubble point condensing temperature = 45°C, subcooling = 5 K.
*** The RWA units only have a nitrogen holding charge
† With tubular sleeve, supplied with the unit, consisting of a Victaulic connection at one end and a plain section at the other end.

Electrical data

30RW/RWA (without hydronic module)		020	025	030	040	045	060	070	080	090	110	120	135	150	160	185	210	245	275	300
Power circuit																				
Nominal power supply	V-ph-Hz	400-3-50																		
Voltage range	V	360-440																		
Control circuit supply		The control circuit is supplied via the unit-mounted transformer																		
Maximum unit power input 30RW/RWA*	kW	8.1	10.3	12.0	15.8	18.0	22.3	27.8	31.6	36.1	42.4	48.8	54.0	59.1	63.2	72.2	84.9	97.6	107.9	118.2
Nominal unit current draw 30RW**	A	9.9	12.6	14.6	17.9	21.1	27.2	32.5	35.8	42.1	48.1	54.0	61.0	68.0	71.7	84.2	96.1	108.0	122.0	136.0
Nominal unit current draw 30RWA***	A	10.4	13.3	15.5	19.1	22.4	28.8	34.5	38.1	44.8	51.4	58.0	64.7	71.4	76.3	89.6	102.8	116.0	129.4	142.8
Maximum unit current draw 30RW/RWA†	A	13.7	17.6	20.5	25.9	30.2	38.0	46.3	51.8	60.5	69.2	78.0	99.9	96.0	120.1	120.9	138.5	156.0	174.0	192.0
Maximum start-up current (standard unit without electronic starter) 30RW/30RWA††	A	86.0	130.0	130.0	135.0	155.0	147.6	155.5	160.9	185.2	245.2	254.0	309.0	318.0	212.6	245.7	314.5	332.0	396.0	414.0
Maximum start-up current (electronic-starter option) 30RW/30RWA‡	A	51.6	78.0	78.0	81.0	93.0	95.6	101.5	106.9	123.2	159.2	168.0	201.0	210.0	158.6	183.7	228.5	246.0	288.0	306.0
Three-phase short-circuit holding current 30RW/RWA	kA	7.5	7.5	7.5	7.5	7.5	10	10	10	10	10	10	10	10	18	18	18	18	18	18

* Power input of the compressor(s) at maximum unit operating conditions: entering/leaving evaporator water temperature = 15°C/10°C, maximum condensing temperature of 65°C, and 400 V nominal voltage.
** Nominal unit current draw at standard conditions: evaporator entering/leaving water temperature 12°C/7°C, condenser entering/leaving water temperature 30°C/35°C. The current values are given at 400 V nominal voltage.
*** Nominal unit current draw at standard conditions: evaporator entering/leaving water temperature 12°C/7°C, saturated condensing temperature (dew point) 45°C, subcooling 5 K The current values are given at 400 V nominal voltage.
† Maximum unit operating current at maximum unit power input and 400 V.
†† Maximum instantaneous starting current at 400 V nominal voltage and with compressor in across-the-line start (maximum operating current of the smallest compressor(s) + locked rotor current of the largest compressor).
‡ Maximum instantaneous starting current at 400 V nominal voltage and with compressor with electronic starter (maximum operating current of the smallest compressor(s) + reduced start-up current of the largest compressor).

Evaporator hydronic module

30RW/RWA		020	025	030	040	045	060	070	080	090	110	120	135	150	160	185	210	245	275	300
Single pump																				
Shaft power rating	kW	0.75	0.75	0.75	0.75	0.75	1.5	1.5	1.5	1.5	1.85	1.85	1.85	1.85	4	4	4	4	4	4
Power input*	kW	1.0	1.0	1.0	1.0	1.0	2.1	2.1	2.1	2.1	2.5	2.5	2.5	2.5	5	5	5	5	5	5
Maximum current draw**	A	1.9	1.9	1.9	1.9	1.9	3.9	3.9	3.9	3.9	4.6	4.6	4.6	4.6	8.3	8.3	8.3	8.3	8.3	8.3
Dual pump																				
Shaft power rating	kW	-	-	-	-	-	2.2	2.2	2.2	2.2	4	4	4	4	4	4	5.5	5.5	5.5	5.5
Power input	kW	-	-	-	-	-	2.8	2.8	2.8	2.8	5.3	5.3	5.3	5.3	5.3	5.3	6.8	6.8	6.8	6.8
Maximum current draw	A	-	-	-	-	-	4.7	4.7	4.7	4.7	8.7	8.7	8.7	8.7	8.7	8.7	11.6	11.6	11.6	11.6

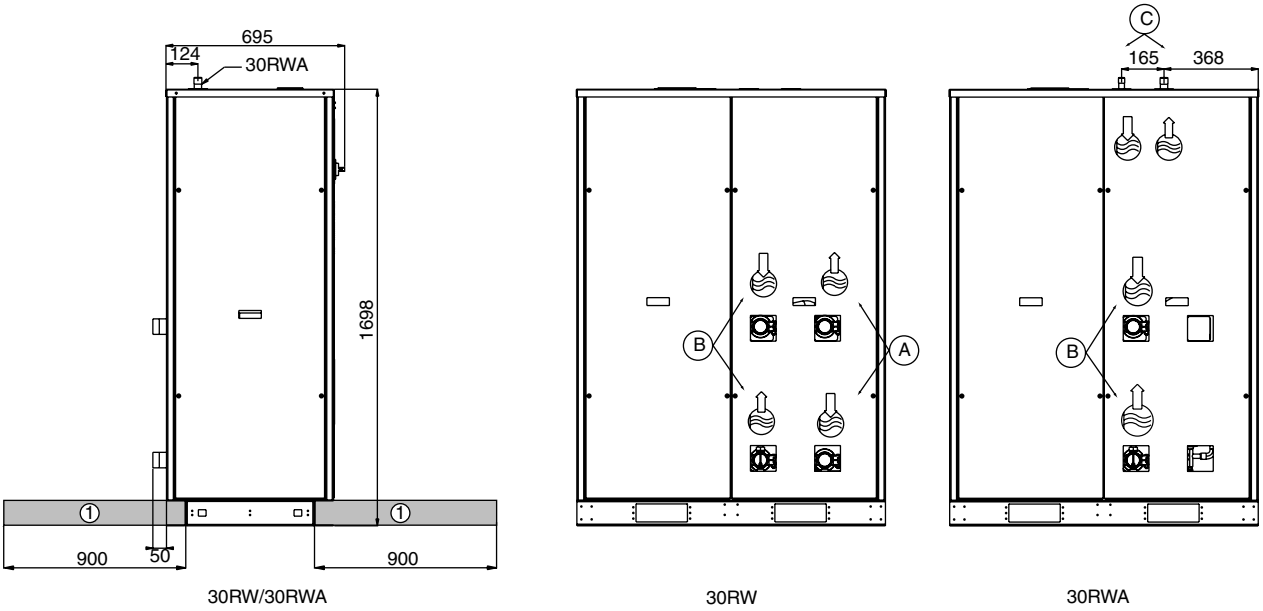
Condenser hydronic module

30RW/RWA		020	025	030	040	045	060	070	080	090	110	120	135	150	160	185	210	245	275	300
Variable-speed single pump																				
Shaft power rating	kW	1.85	1.85	1.85	1.85	1.85	1.85	1.85	1.85	1.85	4	4	4	4	4	4	5.5	5.5	5.5	5.5
Power input***	kW	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	5	5	5	5	5	5	6.7	6.7	6.7	6.7
Maximum current draw†	A	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	8.3	8.3	8.3	8.3	8.3	8.3	11.5	11.5	11.5	11.5
Pompe double à vitesse variable																				
Shaft power rating	kW	-	-	-	-	-	2.2	2.2	2.2	2.2	4	4	4	4	4	4	5.5	5.5	5.5	5.5
Power input	kW	-	-	-	-	-	2.8	2.8	2.8	2.8	5.3	5.3	5.3	5.3	5.3	5.3	6.8	6.8	6.8	6.8
Maximum current draw	A	-	-	-	-	-	4.7	4.7	4.7	4.7	8.7	8.7	8.7	8.7	8.7	8.7	11.6	11.6	11.6	11.6

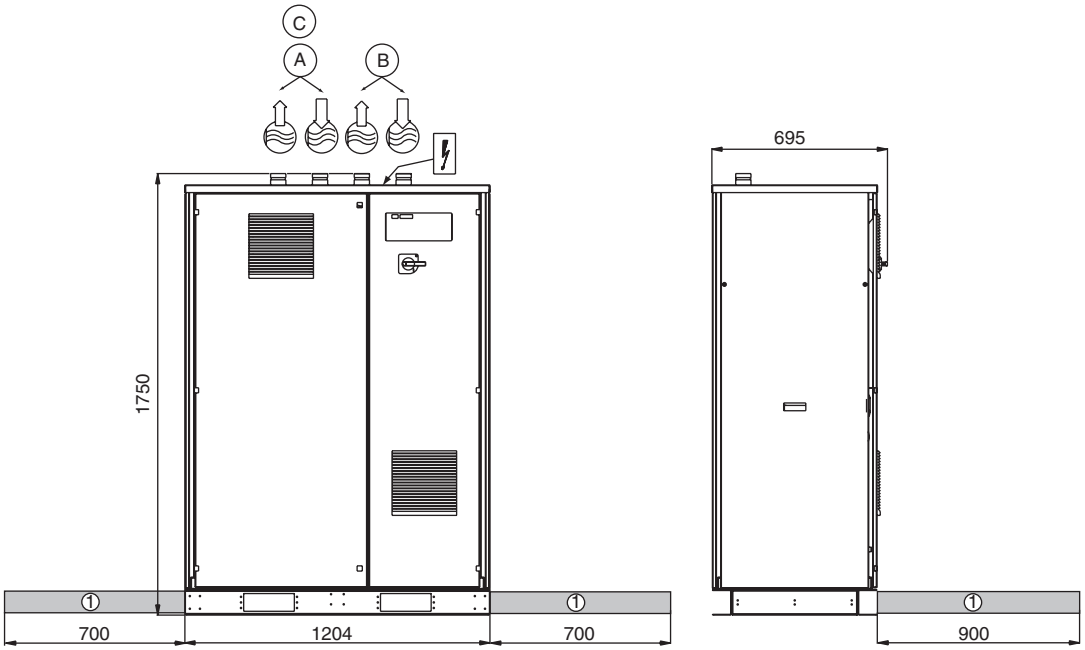
Notes:
- The water pump power input values given are for guidance only.
- 30RW units have an evaporator and a condenser pump.
- 30RWA only have an evaporator pump.
- To obtain the maximum unit power input for a unit with hydronic kit add the evaporator (*) and condenser pump (***) power input to the maximum power input of the unit without hydronic module, given in the top table.
- To obtain the maximum unit current draw for a unit with hydronic kit add the evaporator (**) and condenser pump current (†) draw to the maximum current draw of the unit without hydronic module, given in the top table.

Dimensions/clearances

30RW/30RWA 020-045 - unit without hydronic module (standard)



30RW/30RWA 020-045 - unit with hydronic module (option) and/or unit with option 116E (Victaulic water connection at the top)



	30RW 020-030	30RW 040-045
A	1-1/4" gas	2" gas
B	1-1/4" gas	2" gas

Legend

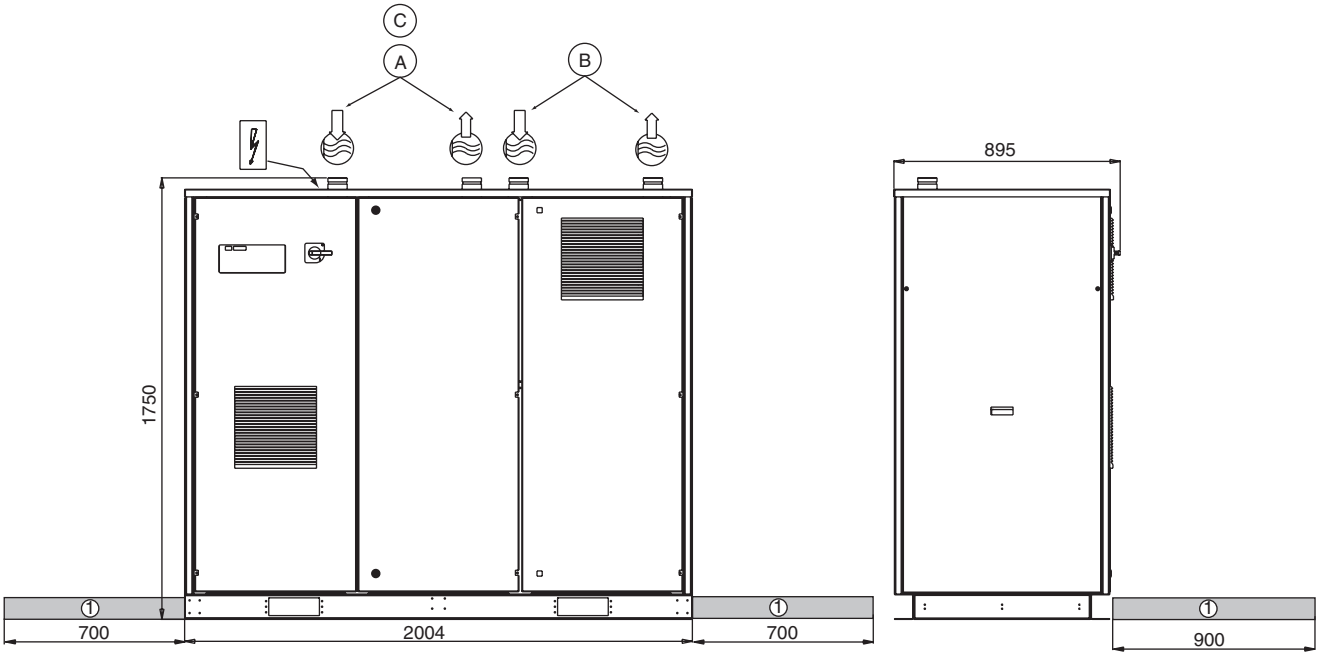
All dimensions are given in mm.

- Water inlet
- Water outlet
- A Condenser (water inlet/outlet for 30RW unit)
- B Evaporator
- C Refrigerant inlet/outlet (30RWA units only)
- ① Required clearances for maintenance
- Power supply

NOTE: Drawings are not contractually binding. Before designing an installation, consult the certified dimensional drawings, available on request.

Dimensions/clearances

30RW/30RWA 060-150 - unit with or without hydronic module



Legend

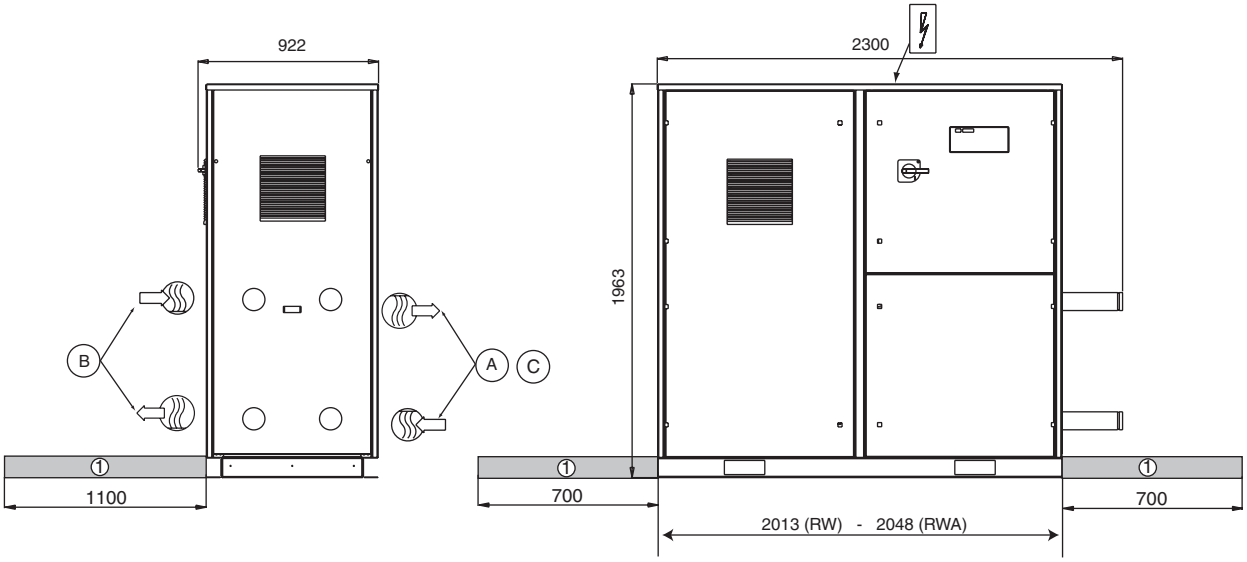
All dimensions are given in mm.

- Water inlet
- Water outlet
- A Condenser (water inlet/outlet for 30RW unit)
- B Evaporator
- C Refrigerant inlet/outlet (30RWA units only)
- 1 Required clearances for maintenance
- Power supply

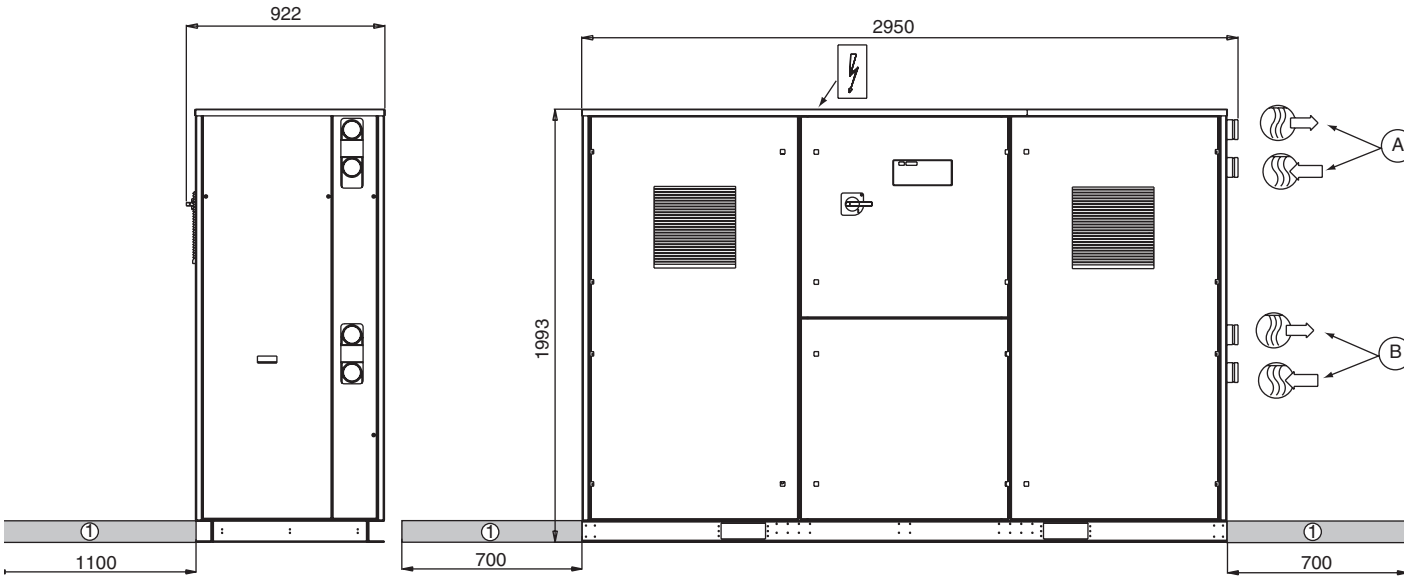
NOTE: Drawings are not contractually binding. Before designing an installation, consult the certified dimensional drawings, available on request.

Dimensions/clearances

30RW/30RWA 160-300 - unit without hydronic module (standard)



30RW/30RWA 160-300 - unit with hydronic module (option)



Legend

All dimensions are given in mm.

- Water inlet
- Water outlet
- A Condenser (water inlet/outlet for 30RW unit)
- B Evaporator
- C Refrigerant inlet/outlet (30RWA units only)
- (1) Required clearances for maintenance
- Power supply

NOTE: Drawings are not contractually binding. Before designing an installation, consult the certified dimensional drawings, available on request.

Cooling capacities 30RW

30RW	LWT °C	Condenser entering water temperature °C																													
		30								35								40								45					
		CAP	COMP	COOL	COOL	COOL PRES	COND	COND	COND PRES	CAP	COMP	COOL	COOL	COOL PRES	COND	COND	COND PRES	CAP	COMP	COOL	COOL	COOL PRES	COND	COND	COND PRES	CAP	COMP	COOL	COOL	COOL PRES	COND	COND	COND PRES
		kW	kW	l/s	kPa	kPa	l/s	kPa	kPa	kW	kW	l/s	kPa	kPa	l/s	kPa	kPa	kW	kW	l/s	kPa	kPa	l/s	kPa	kPa	kW	kW	l/s	kPa	kPa	l/s	kPa	kPa
020	5	18.8	4.99	0.9	34	137	1.13	50	188	17.6	5.59	0.84	30	142	1.11	48	190	16.4	6.25	0.78	26	146	1.08	46	192	15	7	0.72	23	150	1.05	44	195
025		24.2	6.25	1.16	18	149	1.45	26	206	22.7	7.03	1.08	16	153	1.41	25	208	21.1	7.92	1.01	14	156	1.38	24	209	19.4	8.92	0.93	12	159	1.34	23	211
030		27.9	7.25	1.33	23	141	1.67	34	193	26.2	8.18	1.25	20	145	1.63	32	195	24.3	9.23	1.16	18	149	1.59	31	198	22.4	10.4	1.07	15	153	1.55	29	200
040		37	9.69	1.77	23	147	2.22	36	204	34.8	10.9	1.66	21	151	2.17	35	206	32.6	12.3	1.56	18	154	2.12	33	208	30.2	13.9	1.44	15	158	2.08	32	209
045		42.2	11.4	2.02	19	148	2.54	30	207	39.6	12.8	1.89	17	152	2.48	29	209	36.7	14.3	1.76	14	156	2.42	27	211	33.7	16.1	1.61	12	160	2.35	26	213
060		52	14	2.49	18	189	3.13	29	201	48.8	15.7	2.33	16	193	3.06	27	203	45.3	17.8	2.16	14	196	2.98	26	205	41.4	20	1.98	12	199	2.9	25	208
070		65	17.1	3.13	19	182	3.91	29	186	62	19.2	2.94	16	187	3.82	28	190	57	21.7	2.74	14	191	3.74	26	192	53	24.5	2.53	12	195	3.65	25	195
080		74	19.4	3.55	22	173	4.45	33	170	70	21.9	3.35	20	178	4.35	32	173	66	24.6	3.13	17	184	4.26	31	177	61	27.8	2.91	15	189	4.18	30	180
090		84	22.7	4.03	25	161	5.08	39	148	79	25.5	3.78	22	169	4.95	37	153	73	28.7	3.51	19	176	4.82	35	159	67	32.2	3.22	16	183	4.69	33	164
110		101	26.1	4.8	23	186	6	36	209	95	29.2	4.52	21	193	5.86	34	211	88	32.7	4.22	18	200	5.71	33	213	82	36.6	3.9	16	207	5.58	31	215
120		114	30.7	5.47	25	171	6.87	39	200	108	34.2	5.14	22	181	6.71	37	203	101	38.2	4.81	20	189	6.55	35	206	93	42.7	4.46	17	198	6.41	34	208
135		130	34.1	6.22	25	154	7.78	38	193	123	38.1	5.87	22	165	7.61	37	196	115	42.5	5.5	20	176	7.44	35	199	107	47.4	5.1	17	187	7.26	34	202
150		139	37.4	6.66	23	145	8.37	36	190	132	41.8	6.3	21	157	8.21	35	193	124	46.7	5.9	18	169	8.03	33	196	115	52	5.48	16	180	7.85	32	199
160		151	35.6	7.23	24	212	8.84	34	186	143	40	6.84	21	218	8.65	33	190	135	45	6.43	19	223	8.47	32	193	126	51	6	17	228	8.3	30	196
185		171	42.7	8.15	26	202	10.1	39	166	161	47.9	7.68	23	209	9.85	37	171	150	54	7.17	21	216	9.61	35	176	138	60	6.61	18	223	9.36	34	181
210		201	49.4	9.6	18	209	11.8	27	208	190	55	9.06	16	216	11.6	26	210	178	62	8.5	15	222	11.3	25	213	165	69	7.89	13	228	11	24	216
245		230	57	11	23	189	13.6	35	188	217	64	10.4	21	198	13.3	33	192	204	71	9.74	19	207	13	32	196	190	79	9.07	16	215	12.7	31	199
275		265	65	12.6	20	171	15.6	30	177	251	72	12	18	182	15.3	29	181	236	81	11.3	16	193	14.9	27	185	220	90	10.5	14	204	14.6	26	189
300		290	71	13.8	24	149	17.1	36	157	275	80	13.2	21	162	16.8	34	161	259	89	12.4	19	176	16.4	33	166	242	99	11.6	17	189	16	32	171
020	6	19.5	5	0.93	36	135	1.17	53	184	18.3	5.59	0.87	32	139	1.14	50	187	17	6.26	0.81	28	144	1.11	48	190	15.6	7.01	0.75	25	148	1.07	45	193
025		25.1	6.26	1.2	19	147	1.49	27	203	23.5	7.04	1.12	17	151	1.45	26	206	21.9	7.92	1.05	15	154	1.42	25	207	20.1	8.93	0.96	13	158	1.38	24	209
030		28.9	7.25	1.38	24	138	1.72	36	190	27.1	8.18	1.3	22	142	1.68	34	192	25.2	9.23	1.21	19	147	1.63	32	195	23.2	10.4	1.11	16	152	1.59	31	198
040		38.3	9.7	1.83	25	145	2.28	38	201	36.1	10.9	1.72	22	149	2.23	37	203	33.8	12.3	1.61	19	153	2.18	35	205	31.3	13.9	1.5	17	156	2.14	34	207
045		43.7	11.4	2.09	20	146	2.62	32	204	41	12.8	1.96	18	150	2.55	30	207	38.1	14.4	1.82	15	154	2.48	29	209	34.9	16.1	1.67	13	158	2.41	27	212
060		54	14	2.58	20	187	3.22	30	197	51	15.7	2.42	17	191	3.14	29	200	46.9	17.8	2.24	15	195	3.06	27	203	43	20	2.05	12	198	2.97	26	206
070		68	17.1	3.24	20	180	4.02	31	182	64	19.3	3.04	18	184	3.93	29	186	59	21.7	2.84	15	189	3.84	28	189	55	24.5	2.62	13	193	3.75	27	192
080		77	19.5	3.68	23	169	4.57	35	165	73	21.9	3.47	21	175	4.47	34	169	68	24.7	3.24	18	181	4.37	32	173	63	27.8	3.01	16	186	4.28	31	176
090		87	22.8	4.18	27	156	5.22	41	141	82	25.6	3.92	24	165	5.09	39	147	76	28.7	3.64	21	173	4.95	37	153	70	32.3	3.34	17	181	4.81	35	159
110		104	26.2	4.98	25	181	6.18	38	205	98	29.3	4.69	22	189	6.02	36	208	92	32.8	4.38	20	197	5.87	34	211	85	36.7	4.05	17	204	5.72	33	213
120		119	30.8	5.66	27	166	7.07	41	197	112	34.3	5.33	24	175	6.9	39	200	104	38.3	4.98	21	185	6.73	37	203	97	42.9	4.62	18	194	6.58	36	205
135		135	34.3	6.44	27	147	8	41	189	127	38.2	6.08	24	159	7.82	39	192	119	42.7	5.69	21	171	7.64	37	195	111	47.6	5.29	18	182	7.46	35	199
150		144	37.6	6.89	25	137	8.61	38	185	136	42	6.52	22	149	8.44	36	188	128	46.9	6.11	20	162	8.25	35	192	119	52	5.67	17	175	8.05	33	195
160		157	35.6	7.48	25	209	9.1	36	181	148	40	7.08	23	214	8.9	35	185	139	45.1	6.66	20	220	8.71	33	189	130	51	6.22	18	225	8.52	32	192
185		177	42.8	8.44	28	197	10.4	41	160	166	48	7.95	25	205	10.1	39	165	155	54	7.43	22	212	9.87	37	171	143	61	6.85	19	220	9.6	35	176
210		208	49.5	9.94	19	204	12.2	28	204	197	55	9.39	18	212	11.9	27	207	184	62	8.81	16	219	11.6	26	210	171	69	8.19	14	225	11.3	25	213
245		238	57	11.4	25	183	14	37	183	225	64	10.8	23	193	13.6	35	187	211	71	10.1	20	202	13.3	34	191	197	79	9.41	18	211	13	32	195
275		274	65	13.1	21	163	16	32	171	260	73	12.4	19	175	15.7	30	175	244	81	11.7	17	187	15.3	29	180	228	90	10.9	15	199	15	28	184
300		300	71	14.3	25	139	17.6	38	150	285	80	13.6	23	154	17.2	36	155	268	89	12.8	20	168	16.9	35	160	250	99	12	18	183	16.5	33	165
020	7	20.2	5	0.96	38	132	1.2	55	181	19	5.6	0.91	35	136	1.17	53	184	17.6	6.27	0.84	30	142	1.14	50	187	16.2	7.02	0.77	26	147	1.1	47	191
025		25.9	6.26	1.24	20	145	1.53	29	201	24.4	7.04	1.17	18	149	1.49	27	203	22.7	7.93	1.08	16	153	1.45	26	206	20.9	8.93	1	13	156	1.41	25	208
030		29.9	7.25	1.43	26	135	1.77	37	186	28.1	8.18	1.34	23	140	1.72	36	190	26.1	9.23	1.25	20	145	1.68	34	192	24	10.4	1.15	17	150	1.63	32	195
040		39.7	9.72	1.9	27	142	2.35	41	198	37.4	10.9	1.79	24	146	2.29	39	201	35	12.3	1.67	21	151	2.24	37	203	32.5	13.9	1.55	18	155	2.19	35	205
045		45.3	11.4	2.16	22	143	2.69	34	202	42.5	12.8	2.03	19	148	2.62	32	204	39.5	14.4	1.88	17	152	2.55	30	207	36.2	16.2	1.73	14	157	2.47	28	210
060		56	14	2.67	21	185	3.31	32	194	52	15.7	2.5	18	189	3.23	31	197	48.6	17.8	2.32	16	193	3.14	29	200	44.6	20	2.13	13	197	3.05	27	203
070		70	17.1	3.35	21	177	4.14	32	178	66	19.3	3.15	19	182	4.04	31	182	62	21.7	2.94	16	187	3.94	29	185	57	24.5	2.72	14	191	3.84	28	189
080		80	19.5	3.81	25	165	4.71	37	159	75	21.9	3.59	22	172	4.6	36	164	70	24.7	3.36	20	178	4.49	34	168	65	27.8	3.12	17	184	4.39	33	172
090		91	22.8	4.32	28	152	5.37	43	135	85	25.6	4.06	25	160	5.23	41	141	79	28.8	3.77	22	169	5.09	39	147	72	32.3	3.46	19	178	4.94	37	154
110		108	26.3	5.15	27	176	6.36	40	202	102	29.4	4.85	24	185	6.2	38	205	95	32.9	4.53	21	193	6.04	36	208	88	36.8	4.2	18	201	5.88	34	211
120		123	30.9	5.87	29	159	7.28	43	193	116	34.5	5.52	26	170	7.1	41	196	108	38.5	5.17	23	180	6.92	39	199	100	43	4.79	20	190	6.76	37	202
135		139	34.4	6.66	29	139	8.23	43	184	132	38.4	6.29	26	152	8.04	41	188	123	42.8	5.9	23	164	7.85	39	192	115	47.8	5.47	20	177	7.65	37	195
150		149	37.7	7.13	26	128	8.85	40	180	141	42.2	6.75	24	142	8.67	38	184	132	47	6.33	21	156	8.47	37	188	123	52	5.88	18	169	8.26	35	192
160		162	35.7	7.75	27	205	9.37	38	176	154	40.1	7.34	24	211	9.16	36	180	144	45.1	6.9	22	217	8.95	35	184	135	51	6.44	19	223	8.75	33	188
185		183	42.8	8.74	30	192	10.7	43	154	172	48.1	8.24	27	200	10.4	41	159	161	54	7.69	23	209	10.1	39	165	149	61	7.1	20	217	9.86	37	171
210		216	49.6	10.3	21	199	12.6	30	200	204	55	9.73	19	207	12.2	29	203	191	62	9.13	17	215	11.9	27	207	178	69	8.49	15	222	11.6	26	210
245		247	58	11.8	27	176	14.4	39	178	233	64	11.1	24	187	14	37	183	219	71	10.5	21	197	13.7	35	187	204	80	9.76	19	207	13.4	34	191
275		284	65	13.6	23	155	16.5	33	165	269	73	12.8	21	168	16.2	32	170	253	81	12.1	18	181	15.8	31	175	236	91	11.3	16	193	15.4	29	179
300		310	72	14.8	27	129	18.1	40	143	295	80	14.1	25	144	17.7	38	148	278	90	13.3	22	160	17.3	37	153	259	100	12.4	19	176	16.9	35	159

Cooling capacities 30RW (cont.)

30RW	LWT °C	Condenser leaving water temperature °C							
		30							
		CAP	COMP	COOL	COOL	COOL PRES	COND	COND	COND PRES
		kW	kW	l/s	kPa	kPa	l/s	kPa	kPa
020	8	20.9	5.01	1	41	129	1.24	58	177
025		26.9	6.26	1.28	21	143	1.58	30	198
030		30.9	7.25	1.48	27	132	1.82	39	183
040		41.1	9.73	1.96	29	139	2.41	43	195
045		46.8	11.4	2.24	23	140	2.77	36	199
060		58	14	2.76	23	183	3.41	34	191
070		73	17.1	3.47	23	173	4.26	34	173
080		83	19.5	3.94	27	161	4.84	39	154
090		94	22.8	4.48	30	146	5.52	45	128
110		112	26.4	5.33	29	171	6.54	42	199
120		127	31.1	6.07	31	152	7.49	45	188
135		144	34.5	6.89	30	131	8.47	45	179
150		154	37.9	7.37	28	119	9.1	42	175
160		168	35.8	8.02	28	200	9.64	40	171
185		189	42.9	9.04	32	187	11	45	147
210		223	49.8	10.7	22	194	12.9	32	196
245		255	58	12.2	29	169	14.8	41	172
275		293	66	14	24	146	17	35	158
300		321	72	15.3	29	118	18.6	42	135
020	10	22.4	5.01	1.07	46	123	1.31	64	170
025		28.8	6.26	1.37	24	139	1.67	34	193
030		33.1	7.24	1.58	31	126	1.92	43	176
040		43.9	9.76	2.1	33	133	2.55	48	189
045		50	11.4	2.39	27	134	2.92	40	193
060		62	14	2.96	26	177	3.6	38	183
070		78	17.1	3.71	26	166	4.5	38	164
080		88	19.6	4.22	30	152	5.12	44	141
090		100	22.9	4.79	35	135	5.84	50	112
110		119	26.5	5.71	33	159	6.92	47	191
120		136	31.3	6.51	35	137	7.93	51	179
135		154	34.8	7.37	35	113	8.96	50	169
150		165	38.2	7.88	32	99	9.63	47	164
160		180	35.9	8.58	32	191	10.2	44	159
185		202	43	9.67	36	175	11.6	50	132
210		239	50	11.4	25	182	13.7	35	187
245		274	58	13.1	32	152	15.7	46	160
275		314	66	15	28	125	18	39	144
300		343	73	16.4	33	94	19.7	47	117

30RW	LWT °C	35							
		CAP	COMP	COOL	COOL	COOL PRES	COND	COND	COND PRES
		kW	kW	l/s	kPa	kPa	l/s	kPa	kPa
020	8	19.6	5.61	0.94	37	134	1.2	55	181
025		25.3	7.04	1.21	19	147	1.54	29	201
030		29.1	8.17	1.39	24	138	1.77	37	186
040		38.7	10.9	1.85	26	144	2.36	41	198
045		44	12.8	2.1	21	145	2.69	34	202
060		54	15.7	2.59	20	187	3.32	32	194
070		68	19.3	3.26	20	179	4.15	33	178
080		78	21.9	3.72	24	168	4.72	37	159
090		88	25.6	4.2	27	156	5.37	43	135
110		105	29.4	5.02	26	180	6.37	40	202
120		120	34.6	5.72	27	164	7.3	43	192
135		136	38.5	6.51	27	145	8.27	43	183
150		146	42.4	6.98	25	134	8.91	40	179
160		159	40.2	7.59	26	207	9.42	38	175
185		178	48.1	8.53	28	195	10.7	43	153
210		211	56	10.1	20	202	12.6	30	200
245		241	64	11.5	26	180	14.5	39	177
275		278	73	13.3	22	160	16.6	34	163
300		305	81	14.6	26	135	18.2	40	140
020	10	21.1	5.62	1.01	41	128	1.27	61	174
025		27.1	7.04	1.29	21	143	1.62	32	196
030		31.2	8.17	1.49	28	132	1.87	41	180
040		41.4	11	1.98	29	138	2.49	46	192
045		47.1	12.9	2.25	24	140	2.84	37	196
060		58	15.7	2.78	23	182	3.5	36	187
070		73	19.3	3.5	23	172	4.38	36	168
080		83	22	3.98	27	160	4.99	42	147
090		94	25.7	4.5	31	145	5.67	47	120
110		113	29.6	5.38	29	169	6.73	45	195
120		128	34.8	6.13	31	150	7.72	48	184
135		146	38.8	6.97	31	128	8.74	48	174
150		156	42.7	7.47	29	115	9.41	45	169
160		170	40.3	8.13	29	199	9.96	42	164
185		191	48.3	9.13	32	185	11.3	48	139
210		226	56	10.8	23	192	13.3	34	191
245		259	65	12.4	29	166	15.3	43	166
275		298	74	14.2	25	142	17.6	38	150
300		326	81	15.6	30	112	19.3	45	124

30RW	LWT °C	40							
		CAP	COMP	COOL	COOL	COOL PRES	COND	COND	COND PRES
		kW	kW	l/s	kPa	kPa	l/s	kPa	kPa
020	8	18.3	6.28	0.87	32	139	1.17	53	184
025		23.5	7.93	1.12	17	151	1.49	27	203
030		27.1	9.23	1.29	21	143	1.72	36	190
040		36.2	12.3	1.73	22	149	2.3	39	200
045		40.9	14.4	1.95	18	150	2.62	32	204
060		50	17.8	2.41	17	191	3.22	30	197
070		64	21.7	3.05	18	184	4.04	31	182
080		73	24.7	3.48	21	175	4.61	36	163
090		82	28.8	3.9	23	165	5.22	41	141
110		98	32.9	4.7	22	189	6.2	38	205
120		112	38.6	5.35	24	175	7.11	41	196
135		128	43	6.1	24	158	8.06	41	188
150		137	47.2	6.55	22	148	8.7	39	183
160		150	45.2	7.15	23	214	9.2	37	180
185		167	54	7.97	25	204	10.4	41	159
210		198	62	9.45	18	211	12.3	29	203
245		227	72	10.8	23	191	14.1	37	182
275		262	82	12.5	19	174	16.2	32	169
300		287	90	13.7	23	151	17.8	39	146
020	10	19.6	6.3	0.94	37	134	1.23	58	178
025		25.2	7.93	1.21	19	147	1.58	30	198
030		29	9.22	1.39	24	138	1.82	39	183
040		38.8	12.4	1.85	26	144	2.43	44	195
045		43.8	14.4	2.09	20	146	2.76	35	199
060		54	17.7	2.58	20	187	3.4	34	191
070		68	21.8	3.27	20	179	4.26	34	173
080		78	24.8	3.73	24	168	4.86	40	153
090		88	28.9	4.18	27	156	5.5	45	129
110		105	33.1	5.03	26	180	6.55	42	199
120		120	38.9	5.74	28	163	7.51	46	188
135		137	43.3	6.53	28	144	8.51	46	178
150		147	47.6	7.01	26	133	9.18	43	174
160		160	45.3	7.66	26	206	9.71	41	169
185		179	54	8.53	28	195	11	45	147
210		212	62	10.1	20	202	13	32	195
245		243	72	11.6	26	179	14.9	41	171
275		280	82	13.4	22	158	17.1	36	156
300		307	91	14.7	27	132	18.8	43	131

30RW	LWT °C	45							
		CAP	COMP	COOL	COOL	COOL PRES	COND	COND	COND PRES
		kW	kW	l/s	kPa	kPa	l/s	kPa	kPa
020	8	16.8	7.04	0.8	28	145	1.13	50	188
025		21.7	8.94	1.03	14	155	1.45	26	206
030		24.9	10.4	1.19	18	148	1.67	34	193
040		33.7	13.9	1.61	19	153	2.25	37	203
045		37.5	16.2	1.79	15	155	2.54	30	207
060		46.2	20	2.21	14	195	3.13	29	201
070		59	24.5	2.82	15	189	3.94	29	185
080		68	27.9	3.23	18	181	4.51	34	167
090		75	32.4	3.58	20	174	5.06	38	148
110		91	36.9	4.35	19	197	6.03	36	208
120		104	43.2	4.97	21	185	6.94	39	199
135		119	48	5.67	21	171	7.86	39	191
150		127	53	6.08	19	163	8.48	37	188
160		140	51	6.67	20	220	8.99	35	184
185		154	61	7.36	22	213	10.1	39	166
210		184	70	8.79	16	219	12	27	207
245		212	80	10.1	20	202	13.7	36	186
275		244	91	11.7	17	187	15.8	31	174
300		268	100	12.8	20	168	17.4	37	153
020	10	18.1	7.06	0.86	31	140	1.19	54	182
025		23.3	8.94	1.11	16	152	1.53	29	201
030		26.8	10.4	1.28	21	143	1.76	37	187
040		36.1	13.9	1.72	22	149	2.37	42	197
045		40.2	16.2	1.92	17	151	2.67	33	202
060		49.6	20	2.37	17	192	3.29	32	195
070		63	24.6	3.02	17	185	4.15	33	178
080		73	27.9	3.47	21	175	4.74	38	158
090		80	32.5	3.84	23	167	5.33	42	136
110		98	37.1	4.66	22	190	6.36	40	202
120		112	43.5	5.33	24	175	7.32	44	192
135		127	48.3	6.07	24	159	8.28	43	183
150		136	53	6.52	22	149	8.93	41	179
160		150	51	7.16	23	213	9.47	39	174
185		165	61	7.89	25	206	10.7	43	154
210		197	70	9.43	18	211	12.6	30	199
245		227	80	10.9	23	191	14.5	39	177
275		262	92	12.5	19	174	16.7	34	163
300		287	101	13.7	23	152	18.3	41	139

Legend:
LWT - Leaving water temperature °C
CAP kW - Cooling capacity
COMP kW - Compressor power input
COOL l/s - Evaporator water flow rate
COOL kPa - Evaporator water pressure drop
COOL PRES kPa - Available pressure at the unit evaporator outlet (unit with hydronic module)
COND l/s - Condenser water flow rate
COND kPa - Condenser water pressure drop
COND PRES kPa - Available pressure at the unit condenser outlet (unit with hydronic module)

Note: For the water pump power input (30RW with hydronic module) please refer to the electrical data table.

Application data:
Standard units
Refrigerant: R-407C
Condenser and evaporator entering/leaving water temperature difference: 5 K
Evaporator fluid: Chilled water
Fouling factor: 0.44 x 10^{-4} (m^2K)/W

Technical description

Guide specifications

Liquid chillers
Nominal cooling capacity range: 20 to 310 kW
Carrier model:
30RW water-cooled
30RWA condenserless

Part 1 - General

System description

- Water-cooled (30RW) or condenserless (30RWA) liquid chiller for indoor installation, equipped with scroll compressors, auto-adaptive microprocessor control and operating with HFC-407C refrigerant which has no effect on the ozone layer.

Quality assurance

- 30RW units comply with requirements of European directives:
  - machinery directive 98/37/CE, modified,
  - low voltage directive 73/23/EEC, modified,
  - electromagnetic compatibility directive 89/336/EEC, modified and with the applicable recommendations of European standards:
  - machine safety, electrical equipment in machines, general regulations: EN 60204-1,
  - radiated electromagnetic emissions: EN 50081-1,
  - conducted electromagnetic emissions: EN 50081-2,
  - electromagnetic immunity EN 50082-2. 30RW and 30RWA units have been designed and tested in a facility with a quality assurance system certified ISO 9001.
  - 30RW and 30RWA units have been assembled in a facility with an environment management system certified ISO 14001. All units undergo a run test before shipment (electrical test only for 30RWA units).

Part 2 - Product equipment

Compressors

- Hermetic scroll compressor with only three moving parts, 2-pole electric motor, cooled by suction gas. Overload protection through an internal thermostat. Polyolester synthetic oil charge, and oil level sight glass.

Evaporator

- Stainless steel plate heat exchanger with welded copper connections. From size 30RW 160 upwards the evaporator has two interlaced independent refrigerant circuits. Closed-cell thermal foam insulation.

Condenser (30RW only)

- Stainless steel plate heat exchanger with welded copper connections. From size 30RW 160 upwards the condenser has two interlaced independent refrigerant circuits.

Refrigerant circuit

- Each circuit includes: one or two compressors, liquid line valve, moisture sight glass, filter drier, thermostatic expansion device, high and low pressure transducers, manually reset high pressure switch, high and low-pressure safety valve (except sizes 30RW 020-045) and HFC-407C refrigerant charge. The main components of the refrigerant circuit are welded.

  Note: On 30RWA units the refrigerant circuit also includes a check valve on the discharge piping, a solenoid valve on the liquid piping, refrigerant piping and a nitrogen holding charge.

Control and power circuit control box

- The control box is accessible via a hinged door. It includes a main disconnect switch, fuses and circuit breakers, compressor and evaporator water pump contactors, thermal relays, low-voltage control circuit transformer (24 V control circuit) and the Pro-Dialog control system. The whole unit is supplied via a single power connection point (three-phase supply without neutral).
- Extraction fans protecting the electrical components against overheating.

Chassis/cabinet

- Chassis and cabinet made of galvanised sheet steel. Painted in oven-baked polyester powder paint in light grey colour (RAL 7035). Removable side and rear panels. Front access via hinged doors.

Evaporator hydronic module

- Integrated hydronic module, including: removable screen filter, expansion tank, single monocell centrifugal water pump (dual water pump optional from sizes 30RW 060 upwards) - three-phase motor with internal thermal protection, water flow switch, safety valve set to 4 bar, flow control valve, pressure gauge and purge valves. Internal piping made of galvanised steel. Thermal piping and water pump insulation to prevent condensation. Victaulic water connections at the top (30RW 020-150) or on the right-hand side (30RW 160-300) with welded connection sleeve.

  Note: Units without hydronic module (standard): water flow switch installed as standard and water piping protected against condensation. 30RW 020-045 threaded gas water connections at the rear of the unit.

Condenser hydronic module

- Integrated hydronic module, including: removable screen filter, expansion tank, single monocell centrifugal water pump (dual water pump optional from sizes 30RW 060 upwards) - three-phase motor with integrated frequency converter, safety valve set to 4 bar, pressure gauge and purge valves. Internal piping made of galvanised steel with thermal insulation. Victaulic water connections at the top (30RW 020-150) or on the right-hand side (30RW 160-300) with welded connection sleeve.

  Note: Units without hydronic module (standard). 30RW 020-045 threaded gas water connections at the rear of the unit.

Carrier Pro-Dialog Plus control system

Pro-Dialog Plus ensures the following functions:

Control

- Entering or leaving chilled or hot water (heat pump option) temperature control by PID loop with compressor run time and start-up equalising. The system permanently adjusts the system inertia and ensures complete protection against excessive compressor cycling.
- Head pressure control by auto-adaptive algorithm:
  - Control of the frequency converter, integrated into the condenser water pump
  - Activating a maximum of 8 fan stages with operating time equalising or fan speed control (with Carrier glycol cooler or air-cooled condenser)
  - Fan rotation speed control (with Carrier air-cooled condenser)
- Evaporator and condenser water pump control (optional dual pump with automatic change-over in case of a fault from size 30RW 060 upwards).
- Control at the second set point (example: unoccupied room).
- Leaving water temperature reset, based on the air temperature (with Carrier glycol cooler or air-cooled condenser) or the difference between entering/leaving water temperature.

Safety

- The system checks the evolution of the parameters (temperatures, pressures etc.), and responds to maintain the compressor within the operating range. If despite this one parameter exceeds its limit, an alert message is generated or the unit is shut down. The following faults cause the refrigerant circuit or the unit to be shut down:
  - Low suction pressure
  - High discharge pressure
  - Low suction temperature
  - Compressor, water pump overload
  - Reverse compressor rotation
  - Temperature sensor and pressure transducer fault
  - Board and loss of communication fault
  - Customer safety device tripping
  - Water heat exchanger anti-freeze protection
  - More than 50 alert or fault codes to facilitate fault detection.

Operator interface

Includes status or fault LEDs, two numerical displays, a refrigerant system synoptic diagram and a command keyboard.

- Immediate display of parameters: entering/leaving chilled water temperature, compressor suction/discharge pressures and temperatures, set point, run times and number of compressor start-ups.
- Diagnosis and complete parameter set by selection of one of the following ten menus: information, temperatures, pressures, set points, input values, test, configuration, alarms, alarm history and run times.

Remote chiller management

- Volt-free contact inputs permit:
  - Start/stop control
  - Selection of cooling or heat reclaim mode (override mode at high condensing temperature)
  - Integration of a customer safety device
  - Operation at the second set point* (example: room unoccupied)
  - Maximum demand limit* (three limit levels from size 30RW 160 upwards)

  * One or the other for 30RWA 020-160

- Outputs are available for:
  - Start-up of a boiler
  - Signalling of a general fault condition for each circuit.

  Note: For units without hydronic module (standard) a 0-10 V output is available to control a three-way valve or a variable-speed condenser water pump.

- The optional/accessory CCN Clock Board permits:
  - Control in master/slave configuration of two chillers operating in parallel
  - Programming of operating time schedules (up to 8 periods per week)
  - Programming of operating time schedules for the second set point (up to 8 periods per week)
  - Definition of an operating time period with a reduced number of fans (for example during the night)
  - Definition of an operating time period with demand limitation
  - Integration of the chiller into a building monitoring system (BMS): serial port RS 485.

Electrical data notes:

- 30RW and 30RWA 020-300 units have a single power connection point.
- The control box includes the following standard features:
  - 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 30RW and 30RWA 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.

1. The operating environment for the 30RW and 30RWA chillers is specified below:
- Environment* - Environment as classified in IEC 60364 § 3:
  - ambient temperature range: +5°C to +40°C, class AA4
  - humidity range (non-condensing)*:
    50% relative humidity at 40°C
    90% relative humidity at 20°C
  - altitude: ≥ 2000 m
  - indoor installation*
  - presence of water: class AD2* (possibility of water droplets)
  - presence of hard solids, class AE2* (no significant dust present)
  - presence of corrosive and polluting substances, class AF1 (negligible)
  - vibration and shock, class AG2, AH2
  - competence of personnel, class BA4* (trained personnel - IEC 60364)
2. Power supply frequency variation: ± 2 Hz.
3. The neutral (N) conductor must not be connected directly to the unit (if necessary use a transformer).
4. Over-current protection of the power supply conductors is not provided with the unit.
5. The factory-installed disconnect switch(es)/circuit breaker(s) is (are) of a type suitable for power interruption in accordance with EN 60947.
6. The units are designed for connection to TN networks (IEC 60364). For IT networks the earth connection must not be at the network earth. Provide a local earth, consult competent local organisations to complete the electrical installation.

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 IP21B (according to reference document IEC 60529). All 30RW and 30RWA units with correctly installed casing panels fulfil this protection condition.