



United Technologies

PRO-DIALOG



## PRODUCT SELECTION DATA

- Quality design and construction
  - Very compact dimensions for easy installation
- Two independent refrigerant circuits
  - Specific options for marine and process applications
  - Simple to service

Water-Cooled Screw-Compressor Liquid Chillers

# 30HXC



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# 30HXC

## Nominal cooling capacity 286-1302 kW

The 30HXC units are water-cooled chillers, designed from the ground up to meet the needs of today and tomorrow:

- ozone-friendly HFC-134a refrigerant
- screw compressors
- fits through a standard door with no disassembly required
- mechanically cleanable evaporators and condensers

All units are equipped with Pro-Dialog Plus control to optimise the efficiency of the refrigerant circuit.

### Features

- Quality design and construction make the 30HXC unit the preferred choice.
- Non-controlled, ozone-friendly HFC-134a refrigerant.
- HCF-134a is a proven, non-toxic, non-flammable refrigerant.
- Medium-pressure refrigerant HFC-134a minimises stress on the compressors and ensures their long operating life.
- The 30HXC units are equipped with screw compressors for extremely quiet operation and low-vibration levels.
- The 30HXC units exceed the efficiency level of average industry standards for both full- and part-load operation, saving on operating costs, through lower electrical costs.
- Part of the 30HXC product range is available equipped with the very low temperature option that permits evaporator leaving water temperatures down to  $-10^{\circ}\text{C}$  with ethylene glycol or down to  $-7^{\circ}\text{C}$  with propylene glycol.
- The 30HXC control is fully automatic. The leaving water temperature is continuously monitored to detect load and flow changes. This combination provides the most precise temperature control available.
- Two independent refrigerant circuits - the second one takes over automatically, when the first one malfunctions, maintaining partial cooling under all circumstances.
- Easy installation - the 30HXC chillers are supplied with a full refrigerant charge, and conveniently located power supply and water inlet and outlet connections.
- Auto-diagnostics - quick display of the machine status.
- Multiple compressor concept for optimised part-load efficiency and minimised starting current.
- Series star/delta starter, limiting the start-up current on 30HXC 080-190 units.
- All units are also available as high condensing temperature and non-reversible heat pump versions (options 150 and 150A). Their application range is the same as for the standard units, on which they are based, but they also allow condenser leaving water temperatures of up to  $63^{\circ}\text{C}$ . Pro-Dialog control offers all the advantages of the standard units, plus control of the leaving condenser water temperature.

### Easy installation

- The 30HXC has a compact design that fits through a standard door opening and requires minimal indoor space. The 30HXC is supplied as a complete package for easy installation. There are no extra controls, timers, starters or other items to install.
- 30HXC units have a single power point and one main disconnect/isolator switch for sizes 30HXC 080 to 190, and one power point and one main disconnect/isolator switch per circuit for sizes 30HXC 200 to 375. The hydraulic connections are simple and facilitated by the use of Victaulic connections for the evaporator and condenser.

### Simple to service

- Mechanically-cleanable evaporator and condenser
- Twin-screw compressors which require minimum routine service or maintenance.
- Easily accessed suction and discharge pressure and temperature information via a display module.

### Pro-Dialog Plus control

Pro-Dialog Plus is an advanced numeric control system that combines intelligence with great operating simplicity.

### Pro-Dialog Plus ensures intelligent leaving water temperature control and optimises energy requirements.

- The PID control algorithm with permanent compensation for the difference between the heat exchanger entering and leaving temperature, anticipates load variations, guarantees leaving water temperature stability and prevents unnecessary compressor cycling.
- The long-stroke electronic expansion valves (EXV), together with refrigerant level control via heat exchange in the evaporator, allows a significant energy efficiency improvement at part load conditions, and faultless chiller operation in a wider temperature range.
- Adjustable ramp loading, according to the inertia of the application, avoids load increases that are too fast and too frequent, increasing unit life and limiting power consumption peaks.
- Several capacity loading possibilities ensure improved start-up at low outdoor air temperature, and permit use of one of the refrigerant circuits as a back-up circuit.

### Pro-Dialog Plus ensures preventive protection and enhances chiller reliability.

- Equalisation of compressor operating hours
- No capillary tubes or pressostats (except as safety device)
- Pro-Dialog Plus monitors all chiller safety parameters.
- The fault history function and the fault codes facilitate immediate location of faults and in certain cases the conditions causing the alarm. Prognostic and preventive maintenance functions (incorrect water loop, oil filter dirty etc.) permit anticipation of possible problems.

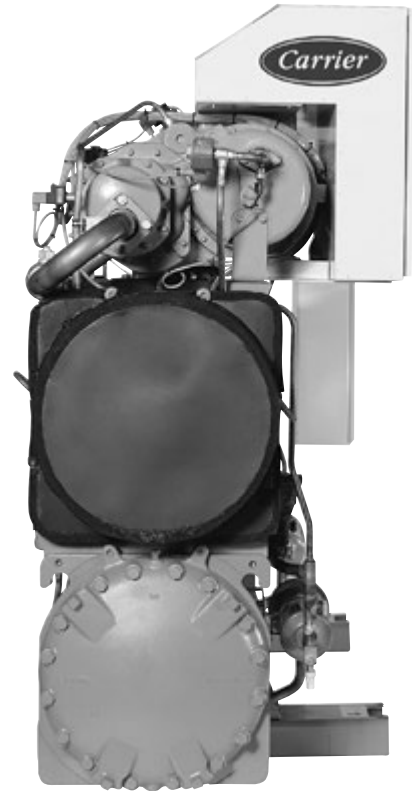
### Pro-Dialog Plus operator interface



### **Pro-Dialog Plus offers extended communications capabilities**

- Clear and easy-to-understand operator interface. The LEDs, numeric displays and touch keys are well-positioned on the schematic chiller diagram. The user immediately knows all operating parameters: pressures, temperatures, operating hours, etc.
- The extensive chiller remote control capabilities (wired connection) allow integration into building management systems (see Technical Description)
- RS485 series port for connection to the Carrier Comfort Network (CCN) or any other monitoring system (optional communications interface with open protocol allows transfer of almost 40 parameters).
- Parallel piloting of two units as standard, or of several units with Flotronic System Manager (FSM) and Chiller System Manager (CSM III) options.
- The control permits:
  - Control in master/slave configuration of two units 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 operating time period with demand limit.
  - Integration of the unit into a building management system (BMS): serial port RS 485.
- Control of the customer's water pump (dual pump with automatic change-over optional).
- Control at the second set point (example: room unoccupied).
- Set point reset as a function of the air temperature or the difference between entering and leaving water temperature.

**The 30HXC fits through a standard door opening, minimising installation cost.**



# Options

Options	N°	Description	Advantages	Use for 30HXC
Medium-temperature brine solution	5	Low temperature chilled water production from +5°C down to -6°C	Covers specific applications such as ice storage and industrial processes	080-375
Low-temperature brine solution	6	Low temperature glycol solution production down to -10 °C with ethylene glycol	Covers specific applications such as ice storage and industrial processes	090, 110, 130, 155, 175, 200, 230, 260, 310, 345*
IP44C electrical protection level	20	Control box tightness reinforced	Permits unit installation in more severe environments	080-375
Tropicalisation	22	Unit control box suitable for tropical climates	Reduced relative humidity in the control boxes for operation in tropical climates (warm and humid)	080-375
Soft Starter	25	Electronic starter on each compressor	Reduced start-up current	200-375
Cu/Ni condensers	33	Condenser tubes and tubes sheets in 90-10 Copper/Nickel alloy	Allows applications with sea water	080-375
Cu/Ni cond. + Sakaphen coated water boxes	34A	Condenser tubes and tubes sheets in 90-10 Copper/Nickel alloy and Sakaphen treatment inside water boxes	Allows applications with sea water, improved durability of water boxes	080-375
Unit supplied in two assembled parts	51	The unit is equipped with flanges that allow disassembly of the unit on site	Facilitates installation in plant rooms with limited access	080-375
460-3-60 power supply	60	Power supply of 460 V-3 ph-60 Hz	Permits unit connection to a power network with specific characteristics	080-375
380-3-60 power supply	61	Power supply of 380 V-3 ph-60 Hz	Permits unit connection to a power network with specific characteristics	080-375
Evap. single pump power/control circuit	84	Unit equipped with an electrical power and control circuit for one pump evaporator side	Quick and easy installation: the control of fixed speed pumps is embedded in the unit control	080-375
Evap. dual pumps power/control circuit	84D	Unit equipped with an electrical power and control circuit for two pumps evaporator side	Quick and easy installation: the control of fixed speed pumps is embedded in the unit control	080-375
Cond. single pump power/control circuit	84R	Unit equipped with an electrical power and control circuit for one pump condenser side	Quick and easy installation: the control of fixed speed pumps is embedded in the unit control	080-375
Compressor suction valve	92	Valve set for the compressor suction side to isolate it in the refrigerant circuit	Simplified service and maintenance	080-375
Evaporator with one pass less	100C	Evaporator with one pass on the water side. Evaporator inlet and outlet on opposite sides.	Easy to install, depending on site. Reduced pressure drops	080-375
Condenser with one pass less	102C	Condenser with one pass on the water side. Condenser inlet and outlet on opposite sides.	Easy to install, depending on site. Reduced pressure drops	080-375
21 bar evaporator	104	Reinforced evaporator for extension of the maximum water-side service pressure to 21 bar (standard 10 bar)	Covers applications with a high water column evaporator side (typically high buildings)	080-375
21 bar condenser	104A	Reinforced condenser for extension of the maximum water-side service pressure to 21 bar (standard 10 bar)	Covers applications with a high water column condenser side (typically high buildings)	080-375
Reversed evaporator water connections	107	Evaporator with reversed water inlet/outlet	Easy installation on sites with specific requirements	080-375
Reversed condenser water connections	107A	Condenser with reversed water inlet/outlet	Easy installation on sites with specific requirements	080-375
J-Bus gateway	148B	Two-directional communication board complying with JBus protocol	Connects the unit by communication bus to a building management system	080-375
BacNet gateway	148C	Two-directional communication board complying with BacNet protocol	Easy connection by communication bus to a building management system	080-375
Lon gateway	148D	Two-directional communication board complying with Lon Talk protocol	Connects the unit by communication bus to a building management system	080-375
High condensing temperature	150	Increased condenser leaving water temperature up to 63°C. Control of the leaving water temperature.	Allows applications with high condensing temperature (for heat reclaim or dry cooler applications)	080-375
High condensing temperature in non-reversible applications	150A	Operation in heat pump mode only with condenser leaving water temperature up to 63°C.	Allows applications with high condensing temperature (for heat reclaim or dry cooler applications)	080-375
Control for low cond. temperature	152	Output signal (0-10 V) to control the condenser water inlet valve	Simple installation: for applications with cold water at condenser inlet (ex. ground-source, groundwater-source, superficial water-source applications) the signal permits to control a 2 or 3-way valve to maintain condenser water temperature (and so condensing pressure) at acceptable values	080-375
RS 485 interface with open protocol	155	Additional RS 485 communication board	Communication via CCN protocol	080-375
Dual relief valves on 3-way valve	194	Three-way valve upstream of the relief valves on the evaporator and the oil separator	Valve replacement and inspection facilitated without refrigerant loss. Comforms to European standard EN378/BGVD4	080-190
Compliance with Swiss regulations	197	Additional tests on the water heat exchangers: supply (additional of PED documents) supplementary certificates and test certifications	Conformance with Swiss regulations	080-375
Compliance with Russian regulations	199	EAC certification	Conformance with Russian regulations	080-375
Welded evaporator connection kit	266	Victaulic piping connections with welded joints	Easy installation	080-375
Welded condenser water connection kit	267	Victaulic piping connections with welded joints	Easy installation	080-375
Flanged evaporator water connection kit	268	Victaulic piping connections with flanged joints	Easy installation	080-375
Flanged condenser water connection kit	269	Victaulic piping connections with flanged joints	Easy installation	080-375
230V electrical plug	284	230V AC power supply source provided with plug socket and transformer (180 VA, 0,8 Amps)	Permits connection of a laptop or an electrical device during unit commissioning or servicing	080-375

\* This option is not available with CE marking. For EU market, please use option 5

# Physical data

30HXC				080	090	100	110	120	130	140	155	175
<b>Cooling</b>												
<b>Standard unit</b>	C1	Nominal capacity	kW	287	312	349	375	413	450	510	542	599
Full load performances*	C1	EER	kW/kW	5.04	4.80	4.85	4.57	4.86	4.69	4.72	4.55	4.68
	C1	Eurovent class cooling	B	B	B	C	B	B	B	B	C	B
Full load performances**	C1	Gross nominal capacity	kW	288	314	350	376	414	452	512	545	602
	C1	Gross EER	kW/kW	5.24	4.98	5.07	4.82	5.11	4.97	4.97	4.78	4.89
Seasonal efficiency*	C1	ESEER	kW/kW	5.56	5.41	5.31	5.28	5.23	5.21	5.17	4.85	5.03
	C1	Gross ESEER	kW/kW	6.20	6.11	5.97	5.94	5.85	5.92	5.84	5.48	5.61
<b>Unit + option 150</b>	C1	Nominal capacity	kW	286	313	345	379	410	460	505	543	583
Full load performances*	C1	EER	kW/kW	4.47	4.35	4.37	4.36	4.46	4.34	4.28	4.11	4.08
Full load performances**	C1	Gross nominal capacity	kW	287	315	347	381	412	462	507	545	585
	C1	Gross EER	kW/kW	4.63	4.57	4.57	4.54	4.68	4.57	4.49	4.33	4.24
<b>Heating</b>												
<b>Unit + option 150</b>	H1	Nominal capacity	kW	326	358	393	434	468	529	582	633	682
Full load performances*	H1	COP	kW/kW	4.29	4.21	4.18	4.21	4.33	4.23	4.25	4.11	4.11
Full load performances**	H1	Gross nominal capacity	kW	325	357	392	432	466	527	580	630	680
	H1	Gross COP	kW/kW	4.51	4.46	4.45	4.45	4.61	4.50	4.50	4.34	4.33
<b>Sound levels - standard unit</b>												
Sound power level <sup>(1)</sup>			dB(A)	94	94	94	94	94	97	98	100	101
Sound pressure level at 1 m <sup>(2)</sup>			dB(A)	77	77	77	77	76	79	80	82	83
<b>Operating weight</b>			kg	2274	2279	2302	2343	2615	2617	2702	2712	3083
<b>Compressor size</b>				Semi-hermetic, twin-screw				The compressor size is identified by its nominal cooling capacity in tons of refrigeration (1 ton = 3.517 kW).				
Circuit A				39	46	46	56	56	66	80	80	80
Circuit B				39	39	46	46	56	56	80	66	80
<b>Refrigerant - standard unit <sup>(3)</sup></b>												
				R-134a								
Circuit A		kg		33	33	32	31	49	51	48	54	54
		teqCO <sub>2</sub>		47	47	46	44	70	73	69	77	77
Circuit B		kg		34	34	30	35	52	47	48	57	50
		teqCO <sub>2</sub>		49	49	43	50	74	67	69	82	72
<b>Oil - standard unit <sup>(4)</sup></b>												
				Polyolester oil CARRIER SPEC. PP 47-32								
Circuit A/B		l		17/17	17/17	17/17	17/17	17/17	17/17	17/17	17/17	17/17
<b>Capacity control</b>												
				PRO-DIALOG Plus control								
No. of control steps				6	6	6	6	6	6	6	6	6
Minimum step capacity		%		19	19	21	19	21	19	17	19	21
<b>Evaporator</b>												
				Shell and tube with internally finned copper tubes								
Net water volume		l		50	50	58	69	65	65	75	75	88
Water connections				Victaulic connections								
Inlet/outlet		in		4	4	4	5	5	5	5	5	5
Drain and vent (NPT)		in		3/8	3/8	3/8	3/8	3/8	3/8	3/8	3/8	3/8
Max. water-side operating pressure		kPa		1000	1000	1000	1000	1000	1000	1000	1000	1000
<b>Condenser</b>												
				Shell and tube with internally finned copper tubes								
Net water volume		l		48	48	48	48	78	78	90	90	108
Water connections				Victaulic connections								
Inlet/outlet		in		5	5	5	5	5	5	5	5	6
Drain and vent (NPT)		in		3/8	3/8	3/8	3/8	3/8	3/8	3/8	3/8	3/8
Max. water-side operating pressure		kPa		1000	1000	1000	1000	1000	1000	1000	1000	1000

\* In accordance with standard EN14511-3:2013  
 \*\* 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.  
 C1 Cooling mode conditions: evaporator-condenser entering/leaving water temperature 12°C/7°C, condenser entering/leaving water temperature 30°C/35°C, evaporator fouling factor = 0 m<sup>2</sup> K/W.  
 H1 Heating mode conditions: evaporator entering/leaving water temperature 10°C/7°C, condenser entering/leaving water temperature 40°C/45°C, evaporator fouling factor = 0 m<sup>2</sup> K/W.  
<sup>(1)</sup> 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.  
<sup>(2)</sup> In dB ref 20µPa, (A) weighting. Declared dual number noise emission values in accordance with ISO 4871 (with an associated uncertainty of +/-3dB(A)). For information, calculated from the sound power level Lw(A).  
<sup>(3)</sup> Values shown are a guideline only. Please refer to the unit nameplate  
<sup>(4)</sup> For options 150 and 150A the units are supplied with an additional charge of 3 litres per compressor.



Eurovent certified values

# Physical data

30HXC				190	200	230	260	285	310	345	375
<b>Cooling</b>											
<b>Standard unit</b>											
	C1	Nominal capacity	kW	652	701	814	899	986	1109	1207	1302
Full load performances*	C1	EER	kW/kW	4.72	4.74	4.73	4.45	4.76	4.76	4.55	4.65
	C1	Eurovent class cooling	B	B	B	C	B	B	B	C	B
Full load performances**	C1	Gross nominal capacity	kW	655	704	817	902	991	1113	1212	1308
	C1	Gross EER	kW/kW	4.96	4.96	4.92	4.65	5.01	4.97	4.77	4.90
Seasonal efficiency*	C1	ESEER	kW/kW	4.97	5.08	5.06	5.01	5.11	5.49	5.39	5.34
	C1	Gross ESEER	kW/kW	5.59	5.71	5.54	5.55	5.75	6.19	6.12	6.15
<b>Unit + option 150</b>											
	C1	Nominal capacity	kW	641	727	800	875	965	1087	1166	1285
Full load performances*	C1	EER	kW/kW	4.08	4.35	4.21	4.03	4.04	4.13	4.03	4.04
Full load performances**	C1	Gross nominal capacity	kW	644	730	803	878	970	1092	1170	1290
	C1	Gross EER	kW/kW	4.29	4.56	4.36	4.18	4.22	4.32	4.21	4.24
<b>Heating</b>											
<b>Unit + option 150</b>											
	H1	Nominal capacity	kW	773	834	927	1025	1171	1266	1369	1554
Full load performances*	H1	COP	kW/kW	4.18	4.23	4.19	4.07	4.11	4.12	4.09	4.13
Full load performances**	H1	Gross nominal capacity	kW	770	831	925	1022	1167	1261	1363	1546
	H1	Gross COP	kW/kW	4.40	4.52	4.40	4.28	4.34	4.35	4.31	4.37
<b>Sound levels - standard unit</b>											
Sound power level <sup>(1)</sup>			dB(A)	101	99	101	102	102	103	104	104
Sound pressure level at 1 m <sup>(2)</sup>			dB(A)	83	80	82	83	83	84	85	85
Operating weight			kg	3179	3873	4602	4656	4776	5477	5553	5721
<b>Compressor size</b>											
				The compressor size is identified by its nominal cooling capacity in tons of refrigeration (1 ton = 3.517 kW).							
Circuit A				80+	66/56	80/56	80/80	80+/80+	80/66	80/80	80+/80+
Circuit B				80+	66	80	80	80+	80/66	80/80	80+/80+
<b>Refrigerant - standard unit <sup>(3)</sup></b>											
Circuit A		kg		75	92	115	117	132	109	96	119
		teqCO <sub>2</sub>		100	132	164	167	189	156	137	170
Circuit B		kg		75	68	63	75	80	106	109	137
		teqCO <sub>2</sub>		100	97	90	107	114	152	156	196
<b>Oil - standard unit <sup>(4)</sup></b>											
				Polyolester oil CARRIER SPEC. PP 47-32							
Circuit A/B		l		17/17	30/17	30/17	30/17	30/17	34/34	34/34	34/34
<b>Capacity control</b>											
				PRO-DIALOG Plus control							
No. of control steps				6	8	8	8	8	10	10	10
Minimum step capacity		%		21	14	14	14	14	10	10	10
<b>Evaporator</b>											
				Shell and tube with internally finned copper tubes							
Net water volume		l		88	126	155	170	170	191	208	208
				Victaulic connections							
Inlet/outlet		in		5	6	6	6	6	8	8	8
Drain and vent (NPT)		in		3/8	3/8	3/8	3/8	3/8	3/8	3/8	3/8
Max. water-side operating pressure		kPa		1000	1000	1000	1000	1000	1000	1000	1000
<b>Condenser</b>											
				Shell and tube with internally finned copper tubes							
Net water volume		l		108	141	190	190	190	255	255	255
				Victaulic connections							
Inlet/outlet		in		6	6	8	8	8	8	8	8
Drain and vent (NPT)		in		3/8	3/8	3/8	3/8	3/8	3/8	3/8	3/8
Max. water-side operating pressure		kPa		1000	1000	1000	1000	1000	1000	1000	1000

\* In accordance with standard EN14511-3:2013

\*\* 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.

C1 Cooling mode conditions: evaporator-condenser entering/leaving water temperature 12°C/7°C, condenser entering/leaving water temperature 30°C/35°C, evaporator fouling factor = 0 m<sup>2</sup> K/W.

H1 Heating mode conditions: evaporator entering/leaving water temperature 10°C/7°C, condenser entering/leaving water temperature 40°C/45°C, evaporator fouling factor = 0 m<sup>2</sup> K/W.

<sup>(1)</sup> In dB ref=10-12 W, (A) weighting. Declared dualnumber 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.

<sup>(2)</sup> In dB ref 20µPa, (A) weighting. Declared dualnumber noise emission values in accordance with ISO 4871 (with an associated uncertainty of +/-3dB(A)). For information, calculated from the sound power level Lw(A).

<sup>(3)</sup> Values shown are a guideline only. Please refer to the unit nameplate

<sup>(4)</sup> For options 150 and 150A the units are supplied with an additional charge of 3 litres per compressor.



Eurovent certified values

# Electrical data

30HXC		080	090	100	110	120	130	140	155	175	190	200	230	260	285	310	345	375	
<b>Power circuit</b>																			
Nominal power supply (Un)*	V-ph-Hz	400-3-50																	
Voltage range	V	360-440																	
<b>Control circuit supply</b>		The control circuit is supplied via the factory-installed transformer																	
<b>Nominal power input*</b>	kW	53	62	67	76	80	89	102	112	121	129	140	164	192	195	221	250	263	
<b>Nominal current drawn*</b>	A	101	115	127	143	149	168	190	207	226	234	255	294	337	354	399	448	477	
<b>Max. power input**</b>	kW	87	97	108	119	131	144	161	175	192	212	223	257	288	318	350	384	424	
Circuit A	kW	-	-	-	-	-	-	-	-	-	-	144	161	192	212	175	192	212	
Circuit B	kW	-	-	-	-	-	-	-	-	-	-	79	96	96	106	175	192	212	
<b>Cosine phi, unit at full load</b>		0.88	0.88	0.88	0.88	0.89	0.88	0.88	0.89	0.89	0.89	0.88	0.89	0.89	0.89	0.89	0.89	0.89	
<b>Total harmonic distortion***</b>	%	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
<b>Max. current drawn (Un - 10%)*</b>	A	158	176	195	215	235	259	289	314	344	379	401	461	517	568	628	688	758	
Circuit A	A	-	-	-	-	-	-	-	-	-	-	259	289	344	379	314	344	379	
Circuit B	A	-	-	-	-	-	-	-	-	-	-	142	172	172	189	314	344	379	
<b>Max. current drawn (Un)***</b>	A	143	160	177	195	213	236	263	285	312	344	365	419	468	516	570	624	688	
Circuit A***	A	-	-	-	-	-	-	-	-	-	-	236	263	312	344	285	312	344	
Circuit B***	A	-	-	-	-	-	-	-	-	-	-	129	156	156	172	285	312	344	
<b>Max. starting current, std. unit (Un)****</b>	A	181	206	223	249	267	298	333	355	382	442	841	978	1027	1200	1129	1184	1373	
Circuit A****	A	-	-	-	-	-	-	-	-	-	-	712	822	871	1028	844	871	1028	
Circuit B****	A	-	-	-	-	-	-	-	-	-	-	605	715	715	856	844	871	1028	
<b>Max. starting current/max. current draw ratio, unit</b>		1.26	1.28	1.26	1.27	1.25	1.26	1.27	1.24	1.22	1.28	2.31	2.33	2.19	2.32	1.98	1.89	1.99	
Max. starting current/max. current draw ratio, circuit A		-	-	-	-	-	-	-	-	-	-	3.02	3.13	2.79	2.99	2.96	2.79	2.99	
Max. starting current/max. current draw ratio, circuit B		-	-	-	-	-	-	-	-	-	-	4.70	4.58	4.58	4.97	2.96	2.79	2.99	
<b>Max. starting current - reduced current start (Un)****</b>	A	std.	std.	std.	std.	std.	std.	std.	std.	std.	std.	std.	636	683	732	824	834	889	
Circuit A	A	std.	std.	std.	std.	std.	std.	std.	std.	std.	std.	std.	507	527	576	652	549	576	
Circuit B	A	std.	std.	std.	std.	std.	std.	std.	std.	std.	std.	std.	330	370	370	385	549	576	
<b>Max. starting current - red. current start/ max. current draw ratio, unit</b>		std.	std.	std.	std.	std.	std.	std.	std.	std.	std.	std.	1.74	1.63	1.56	1.60	1.46	1.42	
Circuit A		std.	std.	std.	std.	std.	std.	std.	std.	std.	std.	std.	2.15	2.00	1.84	1.89	1.93	1.84	
Circuit B		std.	std.	std.	std.	std.	std.	std.	std.	std.	std.	std.	2.56	2.37	2.37	2.24	1.93	1.84	
<b>Three-phase short circuit holding current</b>	kA	25	25	25	25	25	25	25	25	25	25	25	N/A	N/A	N/A	N/A	N/A	N/A	
Circuit A	kA	-	-	-	-	-	-	-	-	-	-	-	25	25	25	25	25	25	
Circuit B	kA	-	-	-	-	-	-	-	-	-	-	-	15	15	15	15	25	25	
<b>Customer standby capacity, unit or circuit B, for evaporator water pump connections†</b>	kW	8	8	8	11	11	11	15	15	15	15	15	18	18	30	30	30	30	

\* Standard Eurovent conditions: Evaporator entering/leaving water temperature 12°C and 7°C. Condenser entering/leaving water temperature 30°C/35°C.  
 \*\* Power input, compressor, at unit operating limits (evaporator water entering/leaving temperature = 15°C/10°C, condenser entering/leaving water temperature = 45°C/50°C) and a nominal voltage of 400 V (data given on the unit name plate).  
 \*\*\* Maximum unit operating current at maximum unit power input.  
 \*\*\*\* Maximum instantaneous starting current (maximum operating current of the smallest compressor(s) + locked rotor current or reduced starting current of the largest compressor)  
 † Current and power inputs not included in the values above.  
 N/A Not applicable.

## Notes, electrical data and operating conditions

- 30HXC 080-190 units have a single power connection point; 30HXC 200-375 units have two connection points.
- The control box includes the following standard features:
  - A main disconnect switch
  - Starter and protection devices for the compressor motor, fans and pump
  - Control devices
- **Field connections:**  
All connections to the system and the electrical installations must be in full accordance with all applicable codes.
- The Carrier 30HXC units are designed and built to ensure conformance with local codes. The recommendations of European standard EN 60204-1 (corresponds to IEC 60204-1) (machine safety - electrical machine components - part 1: general regulations) are specifically taken into account, when designing the electrical equipment.
- **Electrical reserves:**  
Circuit B has disconnect switches and branch sections, designed to supply the evaporator and condenser pump power input.
- Important:**
  - 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 and paragraph 1.5.1.
  - Annex B of EN 60204-1 describes the electrical characteristics used for the operation of the machines.

- The operating environment for the 30HXC units is specified below:
  1. Environment\* - Environment as classified in IEC 60364 paragraph 3:
    - indoor installation
    - ambient temperature range: +5°C to +40°C, class AA4\*
    - altitude: ≤ 2000 m
    - presence of hard solids, class AE2 (no significant dust present)
    - presence of corrosive and polluting substances, class AF1 (negligible)
  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. Overcurrent 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 (corresponds to IEC 60947-3).
  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 required to conform to this class is IP21B (according to reference document IEC 60529). All 30HXC units are protected to IP23C and fulfil this protection condition.

# 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 (Air Conditioning, Heating and Refrigeration Institute). 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, °C	Energy efficiency	Operating time, %
100	29.4	EER <sub>1</sub>	1
75	23.9	EER <sub>2</sub>	42
50	18.3	EER <sub>3</sub>	45
25	18.3	EER <sub>4</sub>	12

$$\text{IPLV} = \text{EER}_1 \times 1\% + \text{EER}_2 \times 42\% + \text{EER}_3 \times 45\% + \text{EER}_4 \times 12\%$$

Note: Constant leaving water temperature 6.67°C (44°F).

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, °C	Energy efficiency	Operating time, %
100	30	EER <sub>1</sub>	3
75	26	EER <sub>2</sub>	33
50	22	EER <sub>3</sub>	41
25	18	EER <sub>4</sub>	23

$$\text{ESEER} = \text{EER}_1 \times 3\% + \text{EER}_2 \times 33\% + \text{EER}_3 \times 41\% + \text{EER}_4 \times 23\%$$

Note: Constant leaving water temperature 7°C.

30HXC - standard unit	080	090	100	110	120	130	140	155	175	190	200	230	260	285	310	345	375	
ESEER	kW/kW	5.56	5.41	5.31	5.28	5.23	5.21	5.17	4.85	5.03	4.97	5.08	5.06	5.01	5.11	5.49	5.39	5.34

ESEER Calculations according to standard performances (in accordance with EN14511-3:2013) and certified by Eurovent.

# Sound spectrum

## 30HXC - standard unit and unit with high condensing temperatures (option 150\*)

	dB	Octave bands, Hz						Sound power levels
		125	250	500	1k	2k	4k	
080	dB	79	84	89	88	90	84	dB(A) 94
090	dB	79	84	89	88	90	84	dB(A) 94
100	dB	79	84	89	88	90	84	dB(A) 94
110	dB	79	84	89	88	90	84	dB(A) 94
120	dB	79	84	89	88	90	84	dB(A) 94
130	dB	79	84	96	92	90	84	dB(A) 97
140	dB	79	84	89	93	94	87	dB(A) 98
155	dB	79	84	96	93	94	91	dB(A) 100
175	dB	79	84	83	96	97	91	dB(A) 101
190	dB	79	84	83	96	97	91	dB(A) 101
200	dB	79	84	98	94	90	84	dB(A) 99
230	dB	79	84	89	96	97	91	dB(A) 101
260	dB	80	85	84	97	98	92	dB(A) 102
285	dB	80	85	84	97	98	92	dB(A) 102
310	dB	81	87	99	96	97	94	dB(A) 103
345	dB	82	87	86	99	100	94	dB(A) 104
375	dB	82	87	86	99	100	94	dB(A) 104

\* Option 150: unit with high condensing temperatures



# Operating limits, standard units

## Condenser water flow rates

30HXC	Minimum flow rate, l/s*		Maximum flow rate, l/s**
	Open loop	Closed loop	
080-110	2.3	7	28.2
120-130	3.1	9.3	37.1
140-155	3.7	11.1	44.5
175-190	4.3	13	51.9
200	4.9	14.8	59.2
230-285	6.7	20.1	80.4
310-375	8	24	95.9

\* Based on a velocity of 0.3 m/s in a closed loop and 0.9 m/s in an open loop.

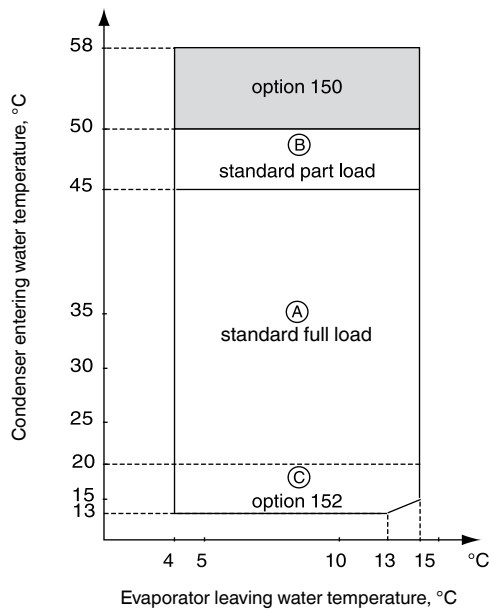
\*\* Based on a water velocity of 3.6 m/s.

## Evaporator water flow rates

30HXC	Minimum flow rate, l/s	Maximum flow rate, l/s*
080-090	5.2	20.8
100	6.5	25.9
110	7.4	29.6
120-130	8.3	33.4
140-155	9.4	37.8
175-190	11.5	45.9
200	14.1	56.3
230	16.3	65.2
260-285	18.3	73.4
310	20.9	83.7
345-375	23	91.9


\* The maximum flow rate corresponds to a pressure drop of 100 kPa.

# Operating range, standard units



### Notes:

- Evaporator and condenser  $\Delta T = 5 K$
  - For start-up at full load with a condenser water entering temperature below 20°C, a three-way valve must be used to maintain the correct condensing temperature.
  - Maximum condenser water leaving temperature 50°C (at full load).
  - For low evaporator leaving water temperatures <+4°C and >-6°C please order option 5.
- A Standard unit operating at full load.  
 B Standard unit operating at reduced load.  
 C Units operating with head pressure control with analogue water control valve.  
 For transient operating modes (start-up and part load) the unit can operate down to a condenser entering water temperature of 13°C.

 Additional operating range for high condensing temperature units and non-reversible heat pumps.

# Operating limits, units for very low temperature (option 6 - no CE marking)

## Evaporator water flow rate with 35% ethylene glycol

30HXC	Minimum flow rate, l/s*	Maximum flow rate, l/s**
090	8	15.7
110	10.6	21.3
130	12.4	25.1
155	14.5	28.1
175	15.6	33
200	20.5	38
230	21	39.7
260	24.1	48.3
310	29.6	62
345	30.2	63

\* Based on a Reynolds number of 4000.  
 \*\* Based on a water velocity of 3.6 m/s.

For very low temperature applications the amount of antifreeze solution added is critical for the unit operation. The following amounts are required:

Evaporator leaving water temperature, °C	Ethylene glycol, %	Propylene glycol, %
-6	25	27
-7	28	30
-8	30	NA
-9	33	NA
-10	35	NA

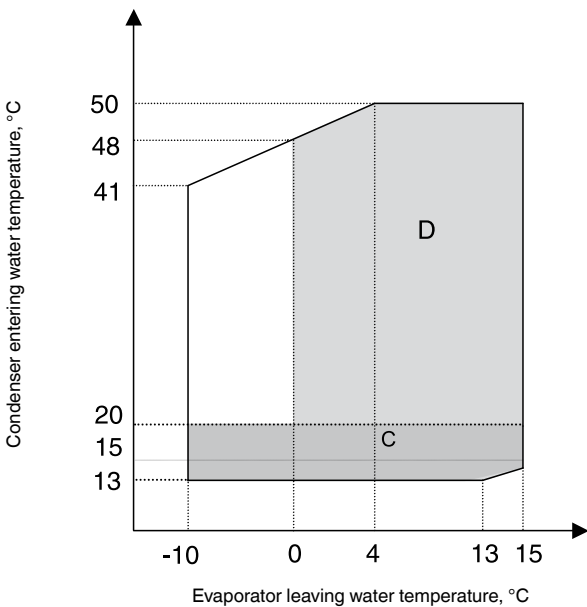
## Evaporator water flow rate with 30% propylene glycol

30HXC	Minimum flow rate, l/s*	Maximum flow rate, l/s**
090	11.1	15.7
110	14.2	21.3
130	16.7	25.1
155	19.1	28.1
175	21.1	33
200	25.1	38
230	27.4	39.7
260	32.3	48.3
310	40	62
345	40.6	63

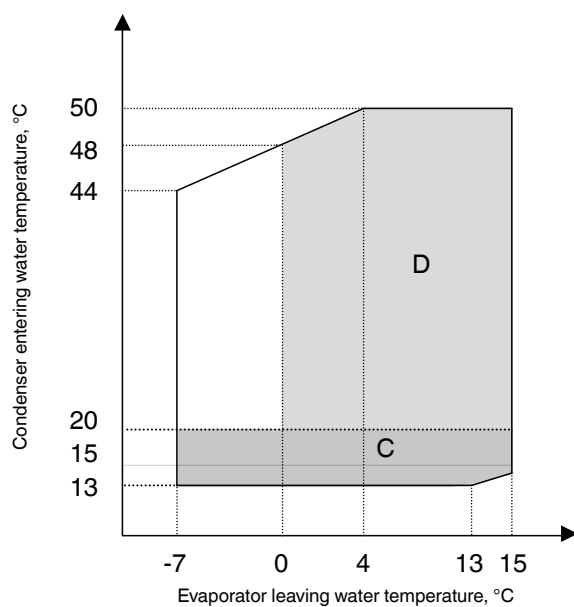
\* Based on a Reynolds number of 4000.  
 \*\* Based on a water velocity of 3.6 m/s.

# Operating range, units for very low temperature (option 6 - no CE marking)

## Operating range 35% ethylene glycol



## Operating range 30% propylene glycol



**Notes:**

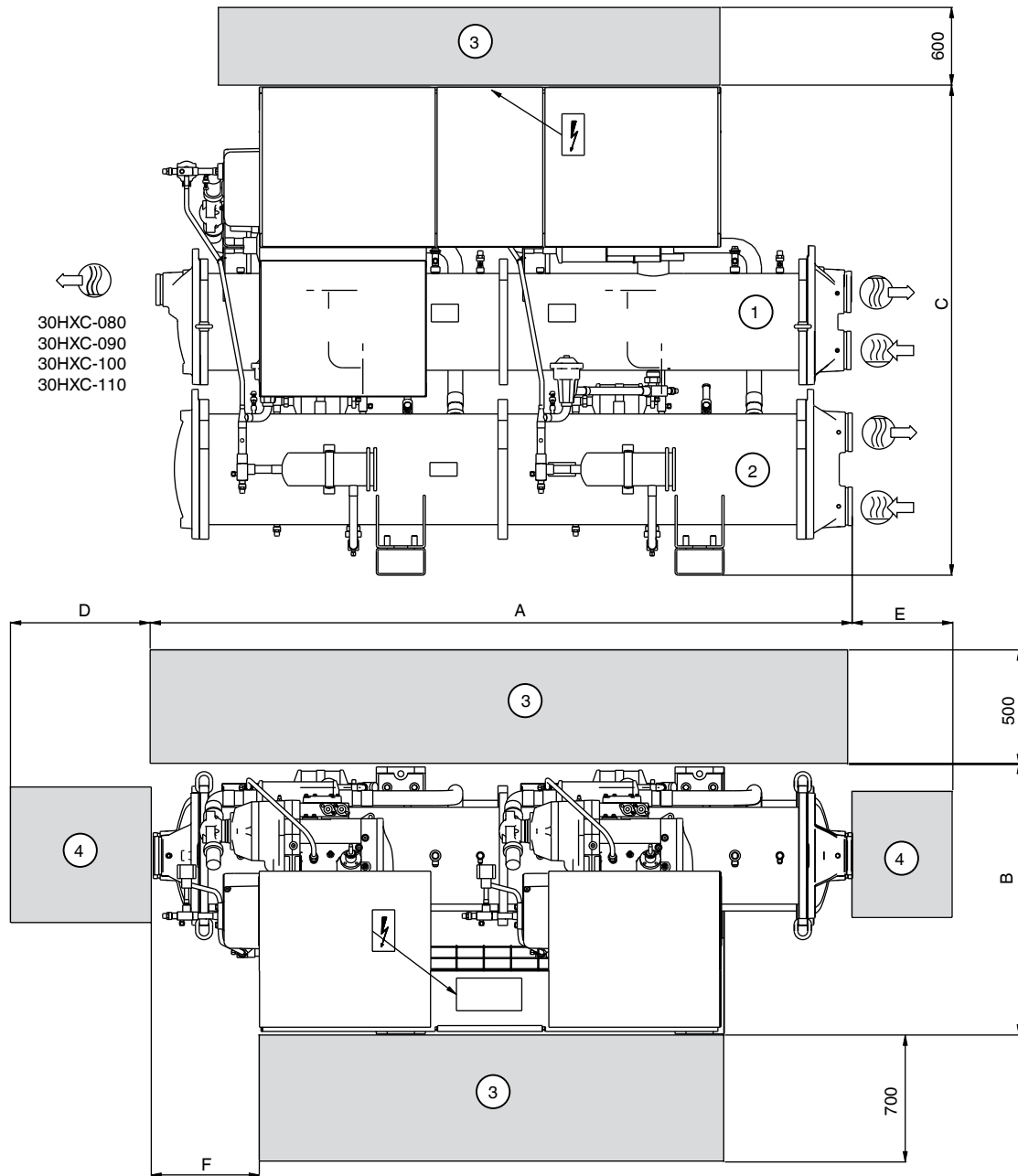
1. Evaporator  $\Delta T = 4\text{ K max.}$  - condenser  $\Delta T = 5\text{ K}$
2. Operating range applicable for full and reduced load.
3. At full load with a condenser water entering temperature below 20°C, a three-way valve must be used to maintain the correct condensing temperature.

**Legend**

- C Unit operating with condensing pressure control with an analogue water control valve. For transient operating modes (start-up and part load), the unit can operate down to a condenser entering water temperature of 13°C.
- D Operation permitted, but performance is not optimised.

# Dimensions/clearances

30HXC 080-190



## Legend

All dimensions are given in mm.

- ① Evaporator
- ② Condenser
- ③ Required clearances for maintenance
- ④ Recommended space for tube removal (clearances D and E can be either on the right or the left-hand side).

Water outlet

Water inlet

Power supply connection

## Notes:

Non-certified drawings.

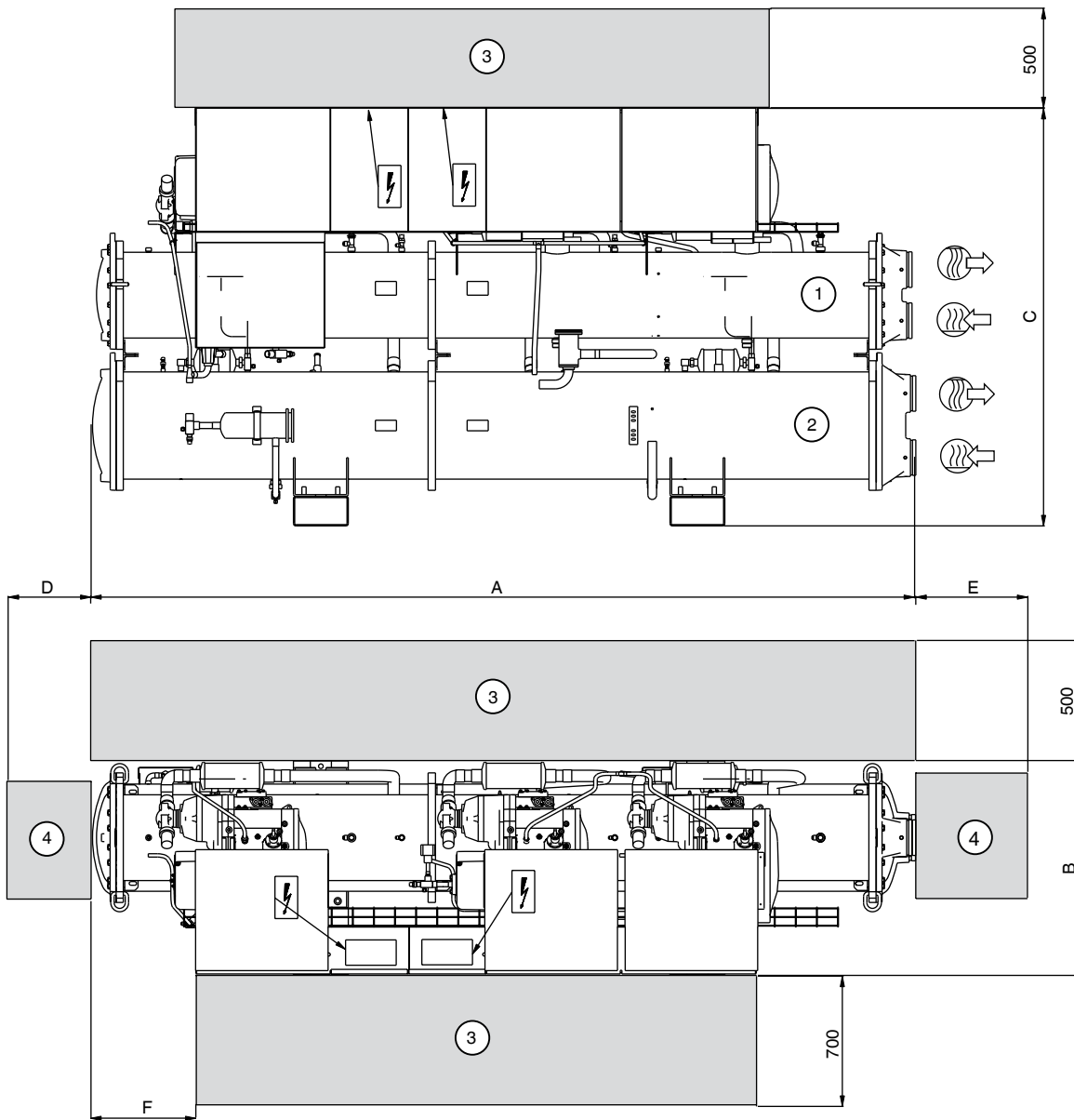
Refer to the certified dimensional drawings supplied with the unit or available on request, when designing an installation.

For the location of fixing points, weight distribution and coordinates of the centre of gravity refer to the certified dimensional drawings.

30HXC	A	B	C	D	E	F
<b>080-100</b>	2558	980	1800	2200	1000	385
<b>110</b>	2565	980	1850	2200	1000	385
<b>120-155</b>	3275	980	1816	2990	1000	689
<b>175-190</b>	3275	980	1940	2990	1000	689

# Dimensions/clearances

30HXC 200-375



### Legend

All dimensions are given in mm.

- ① Evaporator
- ② Condenser
- ③ Required clearances for maintenance
- ④ Recommended space for tube removal (clearances D and E can be either on the right or the left-hand side).
- ↗ Water outlet
- ↖ Water inlet
- ⚡ Power supply connection

### Notes:

Non-certified drawings.

Refer to the certified dimensional drawings supplied with the unit or available on request, when designing an installation.

For the location of fixing points, weight distribution and coordinates of the centre of gravity refer to the certified dimensional drawings.

30HXC	A	B	C	D	E	F
200	3903	1015	1980	3600	1000	489
230-285	3924	1015	2060	3600	1000	489
310-375	4533	1015	2112	4200	1000	503

# Cooling capacities in accordance with EN14511-3 : 2013

## 30HXC standard units

30HXC	LWT °C	Condenser entering water temperature, °C															
		25				30				35				40			
		Qc kW	EER kW/kW	q l/s	Δp kPa	Qc kW	EER kW/kW	q l/s	Δp kPa	Qc kW	EER kW/kW	q l/s	Δp kPa	Qc kW	EER kW/kW	q l/s	Δp kPa
080	5	281	5.51	13.5	54	267	4.77	12.8	49	252	4.06	12.1	44	237	3.43	11.3	39
090		305	5.17	14.7	63	291	4.55	14	58	275	3.87	13.2	52	258	3.23	12.4	46
100		341	5.25	16.4	58	324	4.56	15.6	53	307	3.89	14.7	47	289	3.28	13.9	42
110		366	5.01	17.5	50	349	4.36	16.7	45	331	3.72	15.9	41	312	3.12	14.9	37
120		402	5.29	19.3	45	384	4.63	18.4	41	364	3.91	17.5	37	344	3.31	16.5	33
130		439	5.16	21.1	51	419	4.46	20.1	47	398	3.79	19.1	42	376	3.16	18	38
140		497	5.12	23.8	50	475	4.48	22.8	45	450	3.81	21.6	41	425	3.22	20.4	37
155		528	4.93	25.3	55	504	4.27	24.2	51	479	3.66	23	46	452	3.07	21.7	41
175		583	5.03	28	54	556	4.38	26.7	49	528	3.77	25.3	44	499	3.18	23.9	40
190		628	5.06	30.2	60	612	4.50	29.3	57	593	3.93	28.5	54	573	3.37	27.5	51
200		683	5.17	32.7	55	651	4.46	31.3	51	618	3.77	29.7	46	584	3.16	28	41
230		793	5.12	38	53	756	4.45	36.3	48	717	3.81	34.4	43	676	3.20	32.4	39
260		875	4.81	42	54	835	4.20	40	49	792	3.60	38	44	746	3.02	35.8	39
285		952	5.15	45.7	61	925	4.53	44.4	58	897	3.95	43	54	865	3.41	41.5	51
310		1079	5.16	52	58	1030	4.48	49.4	53	978	3.81	46.9	48	923	3.19	44.2	43
345		1175	4.92	56	58	1121	4.28	54	53	1063	3.68	51	48	1002	3.10	48	43
375		1256	5.00	60	66	1221	4.42	59	62	1184	3.87	57	59	1143	3.32	55	55
080	7	301	5.79	14.5	62	287	5.04	13.8	57	271	4.30	13	51	255	3.64	12.2	45
090		328	5.47	15.7	73	312	4.80	15	66	296	4.11	14.2	60	279	3.49	13.4	53
100		366	5.55	17.6	66	349	4.85	16.7	60	331	4.14	15.9	54	311	3.49	14.9	49
110		393	5.31	18.9	57	375	4.57	18	52	356	3.96	17.1	47	336	3.33	16.1	42
120		432	5.61	20.7	51	413	4.86	19.8	47	392	4.17	18.8	43	371	3.50	17.8	38
130		471	5.48	22.6	58	450	4.69	21.6	54	428	4.00	20.6	49	405	3.38	19.4	44
140		534	5.39	25.6	57	510	4.72	24.5	52	485	4.08	23.3	47	459	3.45	22	42
155		567	5.25	27.2	63	542	4.55	26	58	516	3.91	24.8	53	488	3.28	23.4	47
175		627	5.36	30.1	62	599	4.68	28.7	56	570	4.01	27.3	51	538	3.41	25.8	46
190		669	5.31	32.1	68	652	4.72	31.3	65	632	4.13	30.3	61	611	3.57	29.3	57
200		733	5.47	35.2	63	701	4.74	33.6	58	666	4.01	32	53	630	3.37	30.2	47
230		853	5.43	40.9	60	814	4.73	39.1	55	773	4.07	37.1	50	730	3.43	35	45
260		941	5.11	45.2	62	899	4.45	43.1	56	853	3.83	40.9	51	806	3.24	38.6	46
285		1014	5.39	48.7	69	986	4.76	47.3	65	956	4.16	45.9	61	923	3.58	44.3	57
310		1160	5.50	56	66	1109	4.76	53	61	1054	4.07	51	55	996	3.42	47.8	50
345		1264	5.20	61	67	1207	4.55	58	61	1146	3.91	55	56	1083	3.31	52	50
375		1338	5.25	64	74	1302	4.65	63	71	1263	4.06	61	66	1220	3.51	59	62
080	10	332	6.15	16	75	317	5.47	15.2	68	301	4.70	14.4	62	283	3.99	13.6	55
090		361	5.92	17.4	88	344	5.13	16.6	80	327	4.42	15.7	72	309	3.77	14.8	65
100		403	5.93	19.4	80	385	5.20	18.5	73	366	4.46	17.6	66	345	3.79	16.6	59
110		434	5.64	20.8	69	414	4.93	19.9	63	393	4.23	18.9	57	371	3.60	17.8	51
120		476	5.95	22.9	62	456	5.24	21.9	57	434	4.47	20.8	52	411	3.81	19.7	47
130		519	5.83	24.9	70	497	5.07	23.9	65	473	4.34	22.7	59	449	3.68	21.5	53
140		589	5.83	28.3	69	564	5.08	27.1	63	537	4.40	25.8	58	509	3.74	24.4	52
155		626	5.64	30.1	77	599	4.91	28.8	70	571	4.23	27.4	64	542	3.59	26	58
175		692	5.77	33.3	75	663	5.06	31.8	69	631	4.38	30.3	62	598	3.71	28.7	56
190		731	5.67	35.1	81	712	5.05	34.2	77	691	4.43	33.2	73	668	3.84	32.1	68
200		810	5.91	38.9	77	775	5.13	37.2	70	738	4.37	35.4	64	699	3.68	33.5	58
230		942	5.85	45.2	73	901	5.12	43.2	67	857	4.42	41.1	61	812	3.74	38.9	55
260		1040	5.50	49.9	75	994	4.83	47.7	68	946	4.17	45.4	62	895	3.54	42.9	56
285		1107	5.74	53	81	1078	5.08	52	77	1045	4.45	50	73	1010	3.84	48.5	68
310		1282	5.94	62	80	1227	5.16	59	74	1168	4.44	56	67	1107	3.74	53	61
345		1397	5.61	67	81	1336	4.93	64	74	1271	4.27	61	68	1203	3.61	58	61
375		1462	5.58	70	88	1423	4.96	68	84	1381	4.36	66	79	1335	3.76	64	74
080	12	353	6.54	17	84	337	5.71	16.2	77	320	4.92	15.4	70	302	4.19	14.5	62
090		383	6.08	18.4	98	366	5.38	17.6	90	348	4.64	16.7	81	329	3.96	15.8	73
100		428	6.20	20.6	90	409	5.38	19.7	82	389	4.69	18.7	75	368	3.96	17.7	67
110		461	5.91	22.2	78	440	5.12	21.1	71	418	4.45	20.1	64	395	3.76	19	58
120		506	6.25	24.3	69	485	5.45	23.3	64	462	4.71	22.2	58	438	3.98	21	53
130		550	6.11	26.5	79	528	5.33	25.3	73	504	4.58	24.2	66	478	3.85	23	60
140		625	6.07	30	77	599	5.30	28.8	71	572	4.61	27.5	65	543	3.93	26	59
155		665	5.94	32	86	637	5.18	30.6	79	608	4.47	29.2	72	577	3.77	27.7	65
175		736	6.03	35.4	84	705	5.30	33.9	77	672	4.60	32.3	70	638	3.91	30.6	64
190		772	5.89	37.1	90	752	5.26	36.1	85	730	4.62	35.1	81	706	4.01	33.9	76
200		860	6.19	41.3	86	824	5.35	39.6	79	785	4.59	37.7	72	745	3.88	35.7	65
230		1002	6.15	48.1	82	959	5.39	46	75	913	4.63	43.8	69	866	3.95	41.6	62
260		1106	5.79	53	84	1058	5.06	51	77	1007	4.40	48.4	70	954	3.74	45.8	63
285		1169	5.93	56	90	1138	5.27	55	86	1104	4.64	53	81	1068	4.02	51	76
310		1363	6.22	65	90	1305	5.41	63	83	1244	4.68	60	76	1180	3.96	57	68
345		1485	5.87	71	91	1421	5.17	68	84	1354	4.47	65	76	1284	3.81	62	69
375		1545	5.81	74	98	1504	5.17	72	93	1459	4.53	70	88	1411	3.93	68	82

**Legend**  
LWT Leaving water temperature, °C  
Qc Cooling capacity, kW  
EER Energy efficiency ratio, kW/kW  
q Evaporator water flow rate, l/s  
Δp Evaporator pressure drop, kPa

**Application data**  
Standard units, refrigerant: R-134a  
Evaporator and condenser entering/leaving water temperature difference: 5 K  
Evaporator and condenser fluid: chilled water  
Fouling factor: 0 m<sup>2</sup> K/W

Performances in accordance with EN14511-3:2013.

# Cooling capacities

## 30HXC standard units

30HXC	LWT °C	Condenser entering water temperature, °C															
		25				30				35				40			
		Qc kW	EER kW/kW	q l/s	Δp kPa	Qc kW	EER kW/kW	q l/s	Δp kPa	Qc kW	EER kW/kW	q l/s	Δp kPa	Qc kW	EER kW/kW	q l/s	Δp kPa
080	5	282	5.73	13.5	54	268	4.96	12.8	49	253	4.22	12.1	44	237	3.49	11.3	39
090	5	307	5.48	14.7	63	292	4.71	14	58	276	4.00	13.2	52	259	3.32	12.4	46
100	5	342	5.52	16.4	58	326	4.72	15.6	53	308	4.05	14.7	47	290	3.37	13.9	42
110	5	367	5.24	17.5	50	350	4.55	16.7	45	332	3.86	15.9	41	313	3.23	14.9	37
120	5	404	5.61	19.3	45	385	4.81	18.4	41	366	4.07	17.5	37	345	3.38	16.5	33
130	5	441	5.44	21.1	51	421	4.68	20.1	47	400	3.92	19.1	42	377	3.25	18	38
140	5	499	5.42	23.8	50	476	4.67	22.8	45	452	3.96	21.6	41	426	3.33	20.4	37
155	5	530	5.25	25.3	55	506	4.48	24.2	51	481	3.82	23	46	454	3.17	21.7	41
175	5	585	5.27	28	54	559	4.58	26.7	49	530	3.90	25.3	44	500	3.27	23.9	40
190	5	631	5.35	30.2	60	614	4.69	29.3	57	595	4.08	28.5	54	575	3.48	27.5	51
200	5	685	5.44	32.7	55	654	4.64	31.3	51	621	3.91	29.7	46	585	3.23	28	41
230	5	796	5.34	38	53	759	4.60	36.3	48	720	3.91	34.4	43	678	3.28	32.4	39
260	5	879	5.02	42	54	838	4.34	40	49	794	3.69	38	44	749	3.11	35.8	39
285	5	956	5.40	45.7	61	929	4.72	44.4	58	900	4.11	43	54	868	3.50	41.5	51
310	5	1084	5.42	52	58	1034	4.66	49.4	53	981	3.94	46.9	48	925	3.28	44.2	43
345	5	1180	5.18	56	58	1125	4.46	54	53	1067	3.81	51	48	1005	3.19	48	43
375	5	1261	5.28	60	66	1227	4.65	59	62	1189	4.03	57	59	1147	3.44	55	55
080	7	303	6.10	14.5	62	288	5.24	13.8	57	273	4.48	13	51	256	3.76	12.2	45
090	7	329	5.77	15.7	73	314	4.98	15	66	297	4.24	14.2	60	280	3.59	13.4	53
100	7	368	5.84	17.6	66	350	5.07	16.7	60	332	4.31	15.9	54	313	3.60	14.9	49
110	7	395	5.56	18.9	57	376	4.82	18	52	357	4.10	17.1	47	337	3.44	16.1	42
120	7	434	5.95	20.7	51	414	5.11	19.8	47	394	4.33	18.8	43	372	3.61	17.8	38
130	7	473	5.77	22.6	58	452	4.97	21.6	54	430	4.17	20.6	49	407	3.51	19.4	44
140	7	536	5.76	25.6	57	512	4.97	24.5	52	487	4.23	23.3	47	460	3.57	22	42
155	7	570	5.59	27.2	63	545	4.78	26	58	518	4.08	24.8	53	490	3.40	23.4	47
175	7	630	5.63	30.1	62	602	4.89	28.7	56	572	4.18	27.3	51	540	3.51	25.8	46
190	7	673	5.66	32.1	68	655	4.96	31.3	65	635	4.32	30.3	61	614	3.70	29.3	57
200	7	737	5.80	35.2	63	704	4.96	33.6	58	669	4.18	32	53	632	3.47	30.2	47
230	7	856	5.71	40.9	60	817	4.92	39.1	55	776	4.19	37.1	50	733	3.52	35	45
260	7	945	5.37	45.2	62	902	4.65	43.1	56	857	3.97	40.9	51	809	3.33	38.6	46
285	7	1019	5.69	48.7	69	991	5.01	47.3	65	960	4.34	45.9	61	927	3.71	44.3	57
310	7	1166	5.80	56	66	1113	4.97	53	61	1058	4.23	51	55	1000	3.53	47.8	50
345	7	1269	5.52	61	67	1212	4.77	58	61	1151	4.08	55	56	1086	3.43	52	50
375	7	1345	5.58	64	74	1308	4.90	63	71	1268	4.27	61	66	1225	3.65	59	62
080	10	334	6.68	16	75	319	5.70	15.2	68	302	4.87	14.4	62	285	4.13	13.6	55
090	10	363	6.37	17.4	88	347	5.51	16.6	80	329	4.70	15.7	72	310	3.92	14.8	65
100	10	405	6.33	19.4	80	387	5.45	18.5	73	367	4.71	17.6	66	347	3.94	16.6	59
110	10	436	6.06	20.8	69	416	5.20	19.9	63	395	4.44	18.9	57	373	3.73	17.8	51
120	10	478	6.37	22.9	62	458	5.52	21.9	57	436	4.74	20.8	52	413	3.97	19.7	47
130	10	521	6.28	24.9	70	499	5.42	23.9	65	476	4.58	22.7	59	451	3.82	21.5	53
140	10	592	6.23	28.3	69	566	5.39	27.1	63	540	4.66	25.8	58	511	3.90	24.4	52
155	10	629	6.11	30.1	77	602	5.23	28.8	70	574	4.48	27.4	64	544	3.75	26	58
175	10	696	6.16	33.3	75	666	5.37	31.8	69	634	4.59	30.3	62	601	3.88	28.7	56
190	10	735	6.13	35.1	81	716	5.38	34.2	77	694	4.69	33.2	73	672	4.02	32.1	68
200	10	814	6.36	38.9	77	778	5.44	37.2	70	741	4.60	35.4	64	702	3.84	33.5	58
230	10	947	6.23	45.2	73	905	5.39	43.2	67	861	4.60	41.1	61	815	3.88	38.9	55
260	10	1045	5.87	49.9	75	999	5.07	47.7	68	950	4.36	45.4	62	899	3.67	42.9	56
285	10	1113	6.12	53	81	1083	5.39	52	77	1050	4.69	50	73	1015	4.01	48.5	68
310	10	1288	6.34	62	80	1232	5.48	59	74	1173	4.65	56	67	1111	3.90	53	61
345	10	1404	6.03	67	81	1342	5.22	64	74	1277	4.48	61	68	1208	3.78	58	61
375	10	1470	6.02	70	88	1431	5.30	68	84	1388	4.61	66	79	1341	3.96	64	74
080	12	355	6.96	17	84	339	6.05	16.2	77	322	5.19	15.4	70	303	4.39	14.5	62
090	12	386	6.66	18.4	98	368	5.75	17.6	90	350	4.93	16.7	81	331	4.14	15.8	73
100	12	431	6.63	20.6	90	411	5.79	19.7	82	391	4.95	18.7	75	370	4.16	17.7	67
110	12	464	6.36	22.2	78	442	5.46	21.1	71	420	4.67	20.1	64	397	3.93	19	58
120	12	508	6.68	24.3	69	487	5.80	23.3	64	464	4.99	22.2	58	440	4.19	21	53
130	12	554	6.67	26.5	79	530	5.70	25.3	73	506	4.87	24.2	66	480	4.07	23	60
140	12	629	6.55	30	77	602	5.68	28.8	71	575	4.91	27.5	65	545	4.13	26	59
155	12	669	6.43	32	86	641	5.57	30.6	79	611	4.74	29.2	72	580	3.97	27.7	65
175	12	740	6.49	35.4	84	709	5.67	33.9	77	676	4.86	32.3	70	641	4.11	30.6	64
190	12	776	6.41	37.1	90	756	5.64	36.1	85	734	4.93	35.1	81	710	4.23	33.9	76
200	12	865	6.71	41.3	86	828	5.75	39.6	79	789	4.87	37.7	72	748	4.07	35.7	65
230	12	1007	6.54	48.1	82	963	5.70	46	75	918	4.88	43.8	69	870	4.10	41.6	62
260	12	1112	6.18	53	84	1063	5.37	51	77	1012	4.60	48.4	70	959	3.88	45.8	63
285	12	1176	6.39	56	90	1145	5.64	55	86	1110	4.91	53	81	1073	4.21	51	76
310	12	1370	6.72	65	90	1312	5.78	63	83	1250	4.94	60	76	1186	4.13	57	68
345	12	1493	6.35	71	91	1429	5.52	68	84	1361	4.74	65	76	1290	3.99	62	69
375	12	1554	6.32	74	98	1512	5.56	72	93	1467	4.84	70	88	1419	4.15	68	82

### Legend

LWT Leaving water temperature, °C  
 Qc Cooling capacity, kW  
 EER Energy efficiency ratio, kW/kW  
 q Evaporator water flow rate, l/s  
 Δp Evaporator pressure drop, kPa

### Application data

Standard units, refrigerant: R-134a  
 Evaporator and condenser entering/leaving water temperature difference: 5 K  
 Evaporator and condenser fluid: chilled water  
 Fouling factor: 0 m<sup>2</sup> K/W

Gross performances, not in accordance with 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.

# Cooling capacities in accordance with EN14511-3 : 2013

## 30HXC units with high condensing temperatures (option 150)

30HXC Opt. 150	LWT °C	Condenser entering water temperature, °C																							
		25				30				35				40				45				50			
		Qc kW	EER kW/kW	q l/s	Δp kPa	Qc kW	EER kW/kW	q l/s	Δp kPa	Qc kW	EER kW/kW	q l/s	Δp kPa	Qc kW	EER kW/kW	q l/s	Δp kPa	Qc kW	EER kW/kW	q l/s	Δp kPa	Qc kW	EER kW/kW	q l/s	Δp kPa
080	5	279	4.73	13.4	54	267	4.31	12.8	50	254	3.85	12.2	45	240	3.33	11.5	40	225	2.92	10.8	36	209	2.49	10	31
090		306	4.64	14.7	64	293	4.19	14.1	59	278	3.76	13.3	53	262	3.28	12.6	48	246	2.86	11.8	42	228	2.43	11	37
100		338	4.63	16.2	59	322	4.18	15.5	54	305	3.72	14.7	49	288	3.27	13.8	44	269	2.80	12.9	38	249	2.42	12	33
110		371	4.64	17.8	51	354	4.21	17	47	336	3.73	16.1	43	317	3.27	15.2	38	297	2.83	14.2	34	276	2.44	13.2	29
120		400	4.76	19.2	46	383	4.30	18.3	42	364	3.87	17.4	38	344	3.37	16.5	34	323	2.94	15.5	30	300	2.52	14.4	27
130		449	4.58	21.6	54	430	4.17	20.6	49	409	3.75	19.6	45	387	3.28	18.6	40	364	2.87	17.4	36	339	2.47	16.3	31
140		491	4.50	23.5	49	470	4.12	22.6	45	448	3.70	21.5	41	425	3.27	20.4	37	400	2.86	19.2	33	373	2.47	17.9	29
155		528	4.33	25.4	56	507	3.96	24.3	51	483	3.55	23.2	47	458	3.14	22	42	432	2.75	20.7	38	405	2.40	19.4	33
175		566	4.29	27.2	51	544	3.91	26.1	47	519	3.53	24.9	43	493	3.14	23.7	39	466	2.76	22.3	35	437	2.41	21	31
190		616	4.28	29.6	60	603	3.94	29	57	589	3.59	28.3	55	574	3.22	27.5	52	557	2.87	26.7	49	539	2.55	25.9	46
200		709	4.60	34	58	677	4.18	32.5	54	644	3.74	30.9	49	609	3.29	29.2	44	572	2.86	27.4	39	533	2.47	25.6	34
230		778	4.45	37.3	51	746	4.05	35.8	47	711	3.65	34.1	43	674	3.22	32.3	39	635	2.82	30.4	35	594	2.45	28.5	31
260		851	4.23	40.8	51	816	3.89	39.1	47	779	3.49	37.3	43	740	3.10	35.5	39	698	2.73	33.5	35	655	2.38	31.4	31
285		929	4.24	44.6	60	909	3.90	43.6	58	887	3.55	42.6	55	863	3.17	41.4	52	838	2.83	40.2	49	810	2.51	38.9	46
310		1058	4.35	51	57	1013	3.97	48.6	53	966	3.58	46.3	48	916	3.16	43.9	44	863	2.77	41.4	39	807	2.39	38.7	34
345		1133	4.24	54	56	1087	3.88	52	51	1038	3.51	49.8	47	986	3.11	47.2	43	930	2.74	44.6	38	872	2.38	41.8	34
375		1235	4.24	59	65	1209	3.91	58	62	1180	3.55	57	60	1149	3.18	55	57	1115	2.84	53	54	1079	2.52	52	50
080	7	299	4.90	14.4	62	286	4.47	13.7	57	272	4.00	13.1	51	257	3.47	12.4	46	242	3.06	11.6	41	226	2.63	10.8	36
090		328	4.82	15.8	73	313	4.35	15.1	67	298	3.92	14.3	61	282	3.44	13.5	55	265	2.98	12.7	48	246	2.56	11.8	42
100		362	4.83	17.4	68	345	4.37	16.6	62	328	3.90	15.7	56	309	3.40	14.8	50	290	2.96	13.9	44	269	2.54	12.9	38
110		397	4.78	19.1	59	379	4.36	18.2	54	360	3.87	17.3	49	340	3.40	16.3	44	319	2.98	15.3	39	297	2.56	14.3	34
120		429	4.93	20.6	52	410	4.46	19.7	48	391	4.03	18.7	44	370	3.52	17.7	39	348	3.08	16.7	35	324	2.66	15.6	31
130		481	4.76	23.1	61	460	4.34	22.1	56	439	3.88	21.1	51	416	3.44	20	46	392	3.02	18.8	41	366	2.60	17.6	36
140		526	4.65	25.3	56	505	4.28	24.2	51	482	3.86	23.1	47	457	3.41	21.9	43	432	3.02	20.7	38	404	2.62	19.4	34
155		566	4.49	27.2	63	543	4.11	26.1	59	519	3.71	24.9	54	493	3.29	23.6	49	465	2.89	22.3	44	437	2.53	20.9	39
175		607	4.43	29.1	58	583	4.08	28	54	557	3.69	26.7	49	531	3.30	25.4	45	502	2.90	24.1	41	472	2.54	22.6	36
190		655	4.43	31.4	67	641	4.08	30.8	64	626	3.73	30	61	609	3.35	29.2	58	592	2.99	28.4	55	573	2.65	27.5	52
200		760	4.78	36.5	67	727	4.35	34.9	61	692	3.91	33.2	56	655	3.43	31.4	50	617	3.01	29.6	45	576	2.61	27.6	39
230		834	4.61	40	58	800	4.21	38.4	54	764	3.80	36.6	49	725	3.37	34.8	45	685	2.97	32.8	40	642	2.59	30.8	35
260		912	4.38	43.7	58	875	4.03	42	54	836	3.65	40.1	49	795	3.24	38.1	45	752	2.86	36	40	707	2.51	33.9	36
285		987	4.39	47.4	67	965	4.04	46.3	65	942	3.68	45.2	62	917	3.30	44	59	889	2.93	42.7	55	860	2.61	41.3	52
310		1134	4.52	54	66	1087	4.13	52	60	1038	3.73	49.8	55	985	3.31	47.2	50	930	2.91	44.6	45	872	2.53	41.8	40
345		1214	4.38	58	63	1166	4.03	56	59	1114	3.65	53	54	1060	3.25	51	49	1002	2.87	48	44	942	2.51	45.1	39
375		1313	4.39	63	73	1285	4.04	62	70	1254	3.69	60	67	1220	3.31	59	64	1184	2.95	57	60	1145	2.62	55	56
080	10	329	5.14	15.8	74	315	4.70	15.1	68	300	4.23	14.4	62	284	3.74	13.6	56	267	3.26	12.8	50	250	2.81	12	44
090		360	5.00	17.3	87	345	4.60	16.6	80	328	4.10	15.8	73	311	3.66	14.9	66	293	3.18	14.1	59	274	2.77	13.1	52
100		398	5.04	19.1	81	380	4.58	18.3	74	361	4.10	17.4	67	342	3.60	16.4	61	321	3.15	15.4	54	299	2.72	14.4	47
110		436	5.01	21	70	417	4.58	20	64	397	4.09	19	58	375	3.61	18	53	353	3.15	16.9	47	330	2.75	15.8	41
120		472	5.19	22.6	62	452	4.71	21.7	58	431	4.27	20.7	53	409	3.75	19.6	48	385	3.29	18.5	43	361	2.87	17.3	38
130		528	4.98	25.4	73	506	4.56	24.3	67	483	4.09	23.2	61	459	3.64	22	56	434	3.21	20.8	50	407	2.79	19.5	44
140		579	4.87	27.8	67	557	4.49	26.7	62	532	4.09	25.5	57	507	3.65	24.3	52	479	3.21	23	47	451	2.82	21.6	41
155		622	4.68	29.9	76	598	4.30	28.7	70	572	3.92	27.4	65	544	3.49	26.1	59	515	3.08	24.7	53	485	2.71	23.3	47
175		667	4.63	32	70	642	4.28	30.8	65	615	3.89	29.5	60	586	3.49	28.1	54	556	3.09	26.7	49	524	2.73	25.1	44
190		713	4.63	34.3	79	697	4.28	33.5	75	681	3.91	32.7	72	663	3.51	31.8	68	643	3.14	30.9	65	623	2.79	29.9	61
200		836	4.98	40.2	80	801	4.55	38.5	74	764	4.13	36.7	67	725	3.64	34.8	61	684	3.21	32.8	55	640	2.79	30.7	48
230		918	4.83	44.1	70	881	4.43	42.3	65	842	4.03	40.4	59	801	3.58	38.4	54	758	3.17	36.4	49	713	2.77	34.2	43
260		1002	4.60	48.1	70	963	4.22	46.2	65	922	3.84	44.2	59	878	3.43	42.1	54	832	3.05	39.9	49	784	2.68	37.6	44
285		1074	4.57	52	79	1050	4.22	50	76	1024	3.85	49.2	72	996	3.46	47.8	69	966	3.09	46.4	65	935	2.75	44.9	61
310		1247	4.72	60	78	1197	4.34	57	73	1145	3.95	55	67	1089	3.51	52	61	1030	3.10	49.4	55	969	2.71	46.4	49
345		1336	4.59	64	76	1284	4.24	62	70	1229	3.85	59	65	1171	3.44	56	59	1110	3.06	53	53	1046	2.70	50	48
375		1430	4.58	69	86	1398	4.22	67	82	1364	3.85	65	78	1327	3.46	64	74	1287	3.09	62	70	1245	2.75	60	66
080	12	349	5.29	16.8	82	334	4.84	16	76	318	4.36	15.3	69	302	3.87	14.5	63	284	3.38	13.7	56	266	2.96	12.8	49
090		382	5.16	18.4	98	365	4.68	17.6	90	348	4.24	16.8	82	330	3.75	15.9	74	311	3.31	15	66	292	2.89	14	58
100		422	5.15	20.3	91	403	4.69	19.4	83	384	4.22	18.4	76	363	3.74	17.5	68	342	3.29	16.4	61	319	2.85	15.3	53
110		462	5.13	22.2	78	442	4.70	21.2	72	421	4.21	20.2	65	399	3.73	19.2	59	376	3.30	18	53	352	2.86	16.9	46
120		500	5.32	24	70	479</																			

# Cooling capacities

## 30HXC units with high condensing temperatures (option 150)

30HXC Opt. 150	LWT °C	Condenser entering water temperature, °C																							
		25				30				35				40				45				50			
		Qc kW	EER kW/kW	q l/s	Δp kPa	Qc kW	EER kW/kW	q l/s	Δp kPa	Qc kW	EER kW/kW	q l/s	Δp kPa	Qc kW	EER kW/kW	q l/s	Δp kPa	Qc kW	EER kW/kW	q l/s	Δp kPa	Qc kW	EER kW/kW	q l/s	Δp kPa
080	5	279	4.73	13.4	54	267	4.31	12.8	50	254	3.85	12.2	45	240	3.33	11.5	40	225	2.92	10.8	36	209	2.49	10	31
090		306	4.64	14.7	64	293	4.19	14.1	59	278	3.76	13.3	53	262	3.28	12.6	48	246	2.86	11.8	42	228	2.43	11	37
100		338	4.63	16.2	59	322	4.18	15.5	54	305	3.72	14.7	49	288	3.27	13.8	44	269	2.80	12.9	38	249	2.42	12	33
110		371	4.64	17.8	51	354	4.21	17	47	336	3.73	16.1	43	317	3.27	15.2	38	297	2.83	14.2	34	276	2.44	13.2	29
120		400	4.76	19.2	46	383	4.30	18.3	42	364	3.87	17.4	38	344	3.37	16.5	34	323	2.94	15.5	30	300	2.52	14.4	27
130		449	4.58	21.6	54	430	4.17	20.6	49	409	3.75	19.6	45	387	3.28	18.6	40	364	2.87	17.4	36	339	2.47	16.3	31
140		491	4.50	23.5	49	470	4.12	22.6	45	448	3.70	21.5	41	425	3.27	20.4	37	400	2.86	19.2	33	373	2.47	17.9	29
155		528	4.33	25.4	56	507	3.96	24.3	51	483	3.55	23.2	47	458	3.14	22	42	432	2.75	20.7	38	405	2.40	19.4	33
175		566	4.29	27.2	51	544	3.91	26.1	47	519	3.53	24.9	43	493	3.14	23.7	39	466	2.76	22.3	35	437	2.41	21	31
190		616	4.28	29.6	60	603	3.94	29	57	589	3.59	28.3	55	574	3.22	27.5	52	557	2.87	26.7	49	539	2.55	25.9	46
200		709	4.60	34	58	677	4.18	32.5	54	644	3.74	30.9	49	609	3.29	29.2	44	572	2.86	27.4	39	533	2.47	25.6	34
230		778	4.45	37.3	51	746	4.05	35.8	47	711	3.65	34.1	43	674	3.22	32.3	39	635	2.82	30.4	35	594	2.45	28.5	31
260		851	4.23	40.8	51	816	3.89	39.1	47	779	3.49	37.3	43	740	3.10	35.5	39	698	2.73	33.5	35	655	2.38	31.4	31
285		929	4.24	44.6	60	909	3.90	43.6	58	887	3.55	42.6	55	863	3.17	41.4	52	838	2.83	40.2	49	810	2.51	38.9	46
310		1058	4.35	51	57	1013	3.97	48.6	53	966	3.58	46.3	48	916	3.16	43.9	44	863	2.77	41.4	39	807	2.39	38.7	34
345		1133	4.24	54	56	1087	3.88	52	51	1038	3.51	49.8	47	986	3.11	47.2	43	930	2.74	44.6	38	872	2.38	41.8	34
375		1235	4.24	59	65	1209	3.91	58	62	1180	3.55	57	60	1149	3.18	55	57	1115	2.84	53	54	1079	2.52	52	50
080	7	299	4.90	14.4	62	286	4.47	13.7	57	272	4.00	13.1	51	257	3.47	12.4	46	242	3.06	11.6	41	226	2.63	10.8	36
090		328	4.82	15.8	73	313	4.35	15.1	67	298	3.92	14.3	61	282	3.44	13.5	55	265	2.98	12.7	48	246	2.56	11.8	42
100		362	4.83	17.4	68	345	4.37	16.6	62	328	3.90	15.7	56	309	3.40	14.8	50	290	2.96	13.9	44	269	2.54	12.9	38
110		397	4.78	19.1	59	379	4.36	18.2	54	360	3.87	17.3	49	340	3.40	16.3	44	319	2.98	15.3	39	297	2.56	14.3	34
120		429	4.93	20.6	52	410	4.46	19.7	48	391	4.03	18.7	44	370	3.52	17.7	39	348	3.08	16.7	35	324	2.66	15.6	31
130		481	4.76	23.1	61	460	4.34	22.1	56	439	3.88	21.1	51	416	3.44	20	46	392	3.02	18.8	41	366	2.60	17.6	36
140		526	4.65	25.3	56	505	4.28	24.2	51	482	3.86	23.1	47	457	3.41	21.9	43	432	3.02	20.7	38	404	2.62	19.4	34
155		566	4.49	27.2	63	543	4.11	26.1	59	519	3.71	24.9	54	493	3.29	23.6	49	465	2.89	22.3	44	437	2.53	20.9	39
175		607	4.43	29.1	58	583	4.08	28	54	557	3.69	26.7	49	531	3.30	25.4	45	502	2.90	24.1	41	472	2.54	22.6	36
190		655	4.43	31.4	67	641	4.08	30.8	64	626	3.73	30	61	609	3.35	29.2	58	592	2.99	28.4	55	573	2.65	27.5	52
200		760	4.78	36.5	67	727	4.35	34.9	61	692	3.91	33.2	56	655	3.43	31.4	50	617	3.01	29.6	45	576	2.61	27.6	39
230		834	4.61	40	58	800	4.21	38.4	54	764	3.80	36.6	49	725	3.37	34.8	45	685	2.97	32.8	40	642	2.59	30.8	35
260		912	4.38	43.7	58	875	4.03	42	54	836	3.65	40.1	49	795	3.24	38.1	45	752	2.86	36	40	707	2.51	33.9	36
285		987	4.39	47.4	67	965	4.04	46.3	65	942	3.68	45.2	62	917	3.30	44	59	889	2.93	42.7	55	860	2.61	41.3	52
310		1134	4.52	54	66	1087	4.13	52	60	1038	3.73	49.8	55	985	3.31	47.2	50	930	2.91	44.6	45	872	2.53	41.8	40
345		1214	4.38	58	63	1166	4.03	56	59	1114	3.65	53	54	1060	3.25	51	49	1002	2.87	48	44	942	2.51	45.1	39
375		1313	4.39	63	73	1285	4.04	62	70	1254	3.69	60	67	1220	3.31	59	64	1184	2.95	57	60	1145	2.62	55	56
080	10	329	5.14	15.8	74	315	4.70	15.1	68	300	4.23	14.4	62	284	3.74	13.6	56	267	3.26	12.8	50	250	2.81	12	44
090		360	5.00	17.3	87	345	4.60	16.6	80	328	4.10	15.8	73	311	3.66	14.9	66	293	3.18	14.1	59	274	2.77	13.1	52
100		398	5.04	19.1	81	380	4.58	18.3	74	361	4.10	17.4	67	342	3.60	16.4	61	321	3.15	15.4	54	299	2.72	14.4	47
110		436	5.01	21	70	417	4.58	20	64	397	4.09	19	58	375	3.61	18	53	353	3.15	16.9	47	330	2.75	15.8	41
120		472	5.19	22.6	62	452	4.71	21.7	58	431	4.27	20.7	53	409	3.75	19.6	48	385	3.29	18.5	43	361	2.87	17.3	38
130		528	4.98	25.4	73	506	4.56	24.3	67	483	4.09	23.2	61	459	3.64	22	56	434	3.21	20.8	50	407	2.79	19.5	44
140		579	4.87	27.8	67	557	4.49	26.7	62	532	4.09	25.5	57	507	3.65	24.3	52	479	3.21	23	47	451	2.82	21.6	41
155		622	4.68	29.9	76	598	4.30	28.7	70	572	3.92	27.4	65	544	3.49	26.1	59	515	3.08	24.7	53	485	2.71	23.3	47
175		667	4.63	32	70	642	4.28	30.8	65	615	3.89	29.5	60	586	3.49	28.1	54	556	3.09	26.7	49	524	2.73	25.1	44
190		713	4.63	34.3	79	697	4.28	33.5	75	681	3.91	32.7	72	663	3.51	31.8	68	643	3.14	30.9	65	623	2.79	29.9	61
200		836	4.98	40.2	80	801	4.55	38.5	74	764	4.13	36.7	67	725	3.64	34.8	61	684	3.21	32.8	55	640	2.79	30.7	48
230		918	4.83	44.1	70	881	4.43	42.3	65	842	4.03	40.4	59	801	3.58	38.4	54	758	3.17	36.4	49	713	2.77	34.2	43
260		1002	4.60	48.1	70	963	4.22	46.2	65	922	3.84	44.2	59	878	3.43	42.1	54	832	3.05	39.9	49	784	2.68	37.6	44
285		1074	4.57	52	79	1050	4.22	50	76	1024	3.85	49.2	72	996	3.46	47.8	69	966	3.09	46.4	65	935	2.75	44.9	61
310		1247	4.72	60	78	1197	4.34	57	73	1145	3.95	55	67	1089	3.51	52	61	1030	3.10	49.4	55	969	2.71	46.4	49
345		1336	4.59	64	76	1284	4.24	62	70	1229	3.85	59	65	1171	3.44	56	59	1110	3.06	53	53	1046	2.70	50	48
375		1430	4.58	69	86	1398	4.22	67	82	1364	3.85	65	78	1327	3.46	64	74	1287	3.09	62	70	1245	2.75	60	66
080	12	349	5.29	16.8	82	334	4.84	16	76	318	4.36	15.3	69	302	3.87	14.5	63	284	3.38	13.7	56	266	2.96	12.8	49
090		382	5.16	18.4	98	365	4.68	17.6	90	348	4.24	16.8	82	330	3.75	15.9	74	311	3.31	15	66	292	2.89	14	58
100		422	5.15	20.3	91	403	4.69	19.4	83	384	4.22	18.4	76	363	3.74	17.5	68	342	3.29	16.4	61	319	2.85	15.3	53
110		462	5.13	22.2	78	442	4.70	21.2	72	421	4.21	20.2	65	399	3.73	19.2	59	376	3.30	18	53	352	2.86	16.9	46
120		500	5.32	24	70	479	4.84	23	65																



# Guide specifications

Water-cooled liquid chillers, size range: 286 to 1302 kW,  
Carrier model number: 30HXC

## Part 1 - General

### 1.1 - System description

- Microprocessor controlled, water-cooled liquid chiller utilising HFC-134a, dual refrigeration circuit, screw compressors and electronic expansion valves.

### 1.2 - Quality assurance

- Unit shall be rated in accordance with Eurovent standard.
- Unit construction shall comply with European directives:
  - Pressurised equipment directive (PED) 97/23/EC
  - Machinery directive 2006/42/EC, modified
  - Low voltage directive 2006/95/EC, modified
  - Electromagnetic compatibility directive 2004/108/EC, modified, and the applicable recommendations of European standards:
  - Machine safety: electrical equipment in machines, general regulations, EN 60204-1
  - Electromagnetic emission EN 50081-2
  - Electromagnetic immunity EN 50082-2.
- Unit shall be designed, manufactured and tested at a facility with a quality assurance system certified ISO 9001.
- Unit shall be manufactured at a facility with an environment management system certified ISO 14001.
- Unit shall be run tested at the factory.

### 1.3 - Delivery, storage and handling

- Unit controls shall be capable of withstanding 55°C storage temperatures in the control compartment.

## Part 2 - Equipment

### ■ General

Factory assembled, single-piece, water-cooled liquid chiller. Contained within the unit cabinet shall be all factory wiring, piping, controls, refrigerant charge (HFC-134a), required prior to field start-up.

### ■ Compressors

- Semi-hermetic twin-screw compressors with internal muffler and check valve.
- Each compressor shall be equipped with a discharge shutoff valve.
- Capacity control shall be provided by pilot-operated solenoid valve, capable of reducing unit capacity to 20% of full load. Compressor shall start in unloaded condition.
- Motor cooling shall be provided by direct liquid injection and protected by internal overload thermistor.
- Lube oil system shall include pre-filter and internal filter capable of filtration to 3 microns.

### ■ Evaporator

- Unit shall be equipped with a single evaporator.
- Shall be manufactured, tested and stamped in accordance with the European directive for pressurised equipment 97/23/EC. The maximum refrigerant-side operating pressure will be 2500 kPa, and the maximum water-side pressure will be 1000 kPa.
- Shall be mechanically cleanable shell-and-tube type with removable heads.
- Tubes shall be internally-enhanced, seamless-copper type, and shall be rolled into tube sheets.
- Shall be equipped with Victaulic water connections (water connection kit on demand).
- Shell shall be insulated with 19-mm closed-cell, polyurethane foam with a maximum K factor of 0.28. For the very low temperature option this insulation is 38 mm thick.
- Shall have an evaporator drain and vent.
- Design shall incorporate 2 independent refrigerant circuits.
- Shall incorporate a refrigerant level control system.

### ■ Condenser

- Unit shall be equipped with a single condenser.
- Shall be manufactured, tested and stamped in accordance with the European directive for pressurised equipment 97/23/EC. The maximum refrigerant-side operating pressure will be 2500 kPa, and the maximum water-side pressure will be 1000 kPa.
- Shall be mechanically cleanable shell-and-tube type with removable heads.
- Tubes shall be internally-enhanced, seamless-copper type, and shall be rolled into tube sheets.
- Shall be equipped with Victaulic water connections (water connection kit on demand).
- Design shall incorporate two independent refrigerant circuits and the oil separator.

### ■ Refrigerant circuits

Components shall include oil separators, high and low side pressure relief devices (according to applicable standards), discharge and liquid line shutoff valves, filter driers, moisture indicating sight glasses, expansion devices, refrigerant economizers (unit sizes 190, 285, 375), and complete operating charge of both HFC-134a refrigerant and compressor oil.

### ■ Controls

Unit controls shall include as a minimum: the microprocessor, the LOCAL/OFF/REMOTE/CCN selector and a 6-digit diagnostic display (scroll-down text) with keypad. It shall be capable of performing the following functions:

- Automatic change-over between the main compressor and the non-active compressor(s).
- Capacity control based on leaving chilled fluid temperature with return fluid temperature sensing.
- Limit the chilled fluid temperature pull-down rate at start-up to an adjustable range of 0.1 K to 1.1 K per minute to prevent excessive demand spikes at start-up.
- Enable adjustment of leaving chilled water temperature according to the return water temperature or by means of a 0-10 V signal.
- Provide a dual set point for the leaving chilled water temperature activated by a remote contact closure signal.
- Enable a two-level demand limit control (between 0 and 100%), activated by a remote contact closure or a 0 to 10 V signal.
- Control evaporator water pump, safety pump (if installed), and the condenser pump.
- Enable automatic changeover in the main phase or shutdown of two chillers in a single system.
- With two time scheduling programs enable unit startup control and set-point change

### ■ Diagnostics

- Display module shall be capable of displaying set points, system status (including temperatures, pressures, currents for each compressor, run times and percent loading), and any alarm or alert conditions.
- The control shall allow a quick test of all machine elements to verify the correct operation of every switch, circuit breaker, contactor etc. before the chiller is started.
- The control shall be capable of balancing the compressor operating times and the number of compressor startups.
- EXV control, based on throttling (Carrier patent) optimises evaporator charging, ensuring condenser superheat and subcooling.

### ■ 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:

- Loss of refrigerant charge
- Reverse rotation
- Low chilled fluid temperature
- Low oil pressure
- Current imbalance
- Thermal overload
- High pressure
- Electrical overload
- Loss of phase.

- Operating characteristics
  - Unit shall be capable of starting up with 13°C entering water temperature to the condenser.
  - Unit shall be capable of starting up with 25°C entering water temperature to the evaporator.
- Electrical characteristics
  - Unit electrical power supply shall enter the unit at one (30HX 080-190) or two locations.
  - Unit shall operate on 3-phase power supply without neutral.
  - Unit with two compressors (30HX 080-190) shall have a factory-installed, star-delta starter to limit electrical inrush current.
  - Control voltage shall be supplied by a factory installed transformer.
  - Unit shall be supplied with factory-installed, electrical disconnect switch/circuit breaker.
- Finishing
  - Electrical cabinet colour: RAL 7035
  - Compressor/heat exchanger colour: RAL 7037.





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Manufacturer reserves the right to change any product specifications without notice.  
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Quality and Environment  
Management Systems  
Approval

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