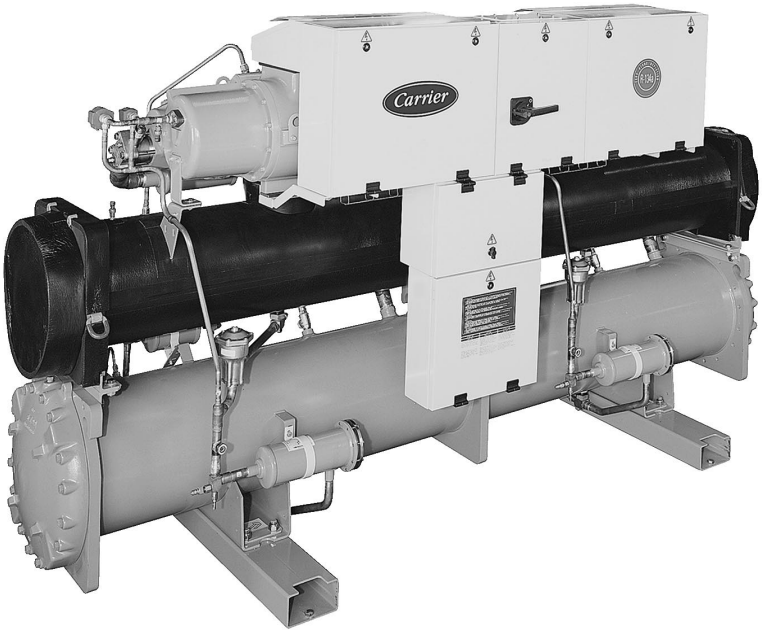
Carrier

Water-Cooled Screw Compressor Liquid Chillers

PRO-DIALOG PLUS

GLOBAL CHILLER



Quality Management System Approval

HFC-134a

30HXC - 60 HZ
Option 60 or 61

Nominal cooling capacity 284-1280 kW

The 30HXC units are water-cooled chillers, designed from the ground up to meet the needs of today and tomorrow:
- ecological 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 optimize the efficiency of the refrigerant circuit.

Features

- Quality design and construction make the 30HXC unit the preferred choice.
- Non-controlled, ozone-benign HFC-134a refrigerant. HCF-134a is a proven, non-toxic, non-flammable refrigerant which will have the highest usage of any new refrigerant.
- Medium-pressure refrigerant HFC-134a minimizes 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.
- 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 optimized part-load efficiency and minimized starting current.
- Series star/delta starter, limiting the start-up current on 30HXC 080-190 units.
- 30HXC 080-375 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°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.

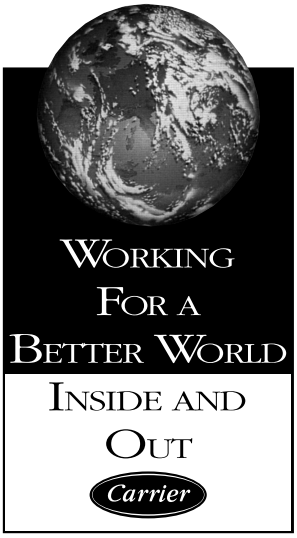
- Equalisation of compressor operating hours
- No capillary tubes or pressostats (except as safety device)
- PRO-DIALOG Plus monitors all chiller safety parameters. The fault history function and the fault codes facilitate immediate location of faults and in certain cases the conditions causing the alarm.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

PRO-DIALOG Plus 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 monitoring 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 monitoring 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.

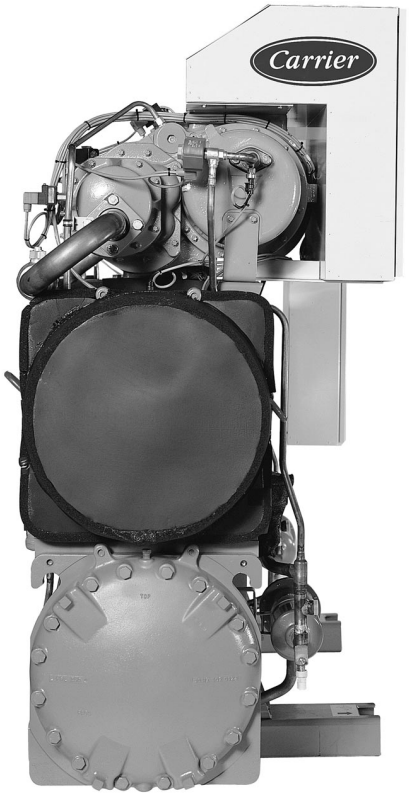
Options and accessories

	Option	Accessory
Compressor suction valve	92	
Evaporator with one pass less	100C	
Evaporator maximum water-side operating pressure of 21 bar	104	
Reversed evaporator water inlet/outlet	107	
Condenser with one pass less	102C	
Condenser maximum water-side operating pressure of 21 bar	104C	
Reversed condenser water inlet/outlet	107C	
RS485 communications interface with open protocol		X
Compressor soft start (30HXC 200-375) - electronic starter	25	
Electrical protection to IP44C	20	
Brine unit for leaving brine < +4°C to > -6°C	5	
High condensing temperature unit and non-reversible heat pump	150/150A	
Tropicalized control box	22	
Disassembled unit	52	
Evaporator connection flanges		X



Carrier´s environmental leadership

PRO-DIALOG Plus operator interface



The 30HXC fits through a standard doorway, minimizing installation costs

Carrier POWER^3 twin-screw compressor

Physical data

30HXC		080	090	100	110	120	130	140	155	175	190	200	230	260	285	310	345	375
Net nominal cooling capacity*	kW	284	309	339	371	415	446	505	537	593	639	701	806	889	963	1081	1185	1280
Operating weight	kg	2274	2279	2302	2343	2615	2617	2702	2712	3083	3179	3873	4602	4656	4776	5477	5543	5721
Refrigerant charge**		HFC-134a																
Circuit A**	kg	33	33	32	31	49	51	48	51	54	56	92	115	117	117	109	104	104
Circuit B**	kg	34	34	30	35	52	47	48	50	50	59	54	63	75	75	106	102	112
Compressors		Semi-hermetic, twin-screw POWER [3]																
Quantity - Circuit A		1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2
Quantity - Circuit B		1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2
Capacity control		PRO-DIALOG Plus control																
No. of control steps		6	6	6	6	6	6	6	6	6	6	8	8	8	8	10	10	10
Minimum step capacity	%	19	19	21	19	21	19	17	19	21	21	14	14	14	14	10	10	10
Evaporator		Shell and tube with internally finned copper tubes																
Net water volume	l	50	50	58	69	65	65	75	75	88	88	126	155	170	170	191	208	208
Water connections		Victaulic connections																
Inlet/outlet	in	4	4	4	5	5	5	5	5	5	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	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	1000	1000	1000	1000	1000	1000	1000	1000
Condenser		Shell and tube with internally finned copper tubes																
Net water volume	l	48	48	48	48	78	78	90	90	108	108	141	190	190	190	255	255	255
Water connections		Victaulic connections																
Inlet/outlet	in	5	5	5	5	5	5	5	5	6	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	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	1000	1000	1000	1000	1000	1000	1000	1000

* Standard ARI conditions: Evaporator entering/leaving water temperature 12.2°C and 6.7°C. Condenser entering/leaving water temperature 29.6°C/35°C. Evaporator and condenser fouling factor = 0.000044 m^2 K/W.
Not applicable to high condensing temperature units - please refer to electronic selection catalogue.
** The weights shown are guidelines only. For the unit refrigerant charge please refer to the unit nameplate.

Electrical data 460 V – 60 Hz – option 60

30HXC		080	090	100	110	120	130	140	155	175	190	200	230	260	285	310	345	375
Power circuit																		
Nominal power supply (Un)*	V-ph-Hz	460-3-60																
Voltage range	V	414-506																
Control circuit supply		The control circuit is supplied via the factory-installed transformer																
Nominal power input*	kW	56	63	69	78	82	91	103	111	123	129	142	166	189	198	223	249	261
Nominal current drawn*	A	94	101	109	121	133	147	164	178	194	213	228	260	291	319	355	388	425
Max. power input**	kW	87	96	105	118	130	144	159	172	187	212	223	253	281	318	344	374	424
Circuit A	kW	-	-	-	-	-	-	-	-	-	-	144	159	187	212	172	187	212
Circuit B	kW	-	-	-	-	-	-	-	-	-	-	79	94	94	106	172	187	212
Max. current drawn (Un - 10%)***	A	134	147	161	180	200	220	243	263	286	324	340	386	429	486	526	572	648
Circuit A	A	-	-	-	-	-	-	-	-	-	-	220	243	286	324	263	286	324
Circuit B	A	-	-	-	-	-	-	-	-	-	-	120	143	143	162	263	286	324
Maximum current drawn (Un)***	A	122	134	146	164	182	200	221	239	260	294	309	351	390	441	478	520	588
Circuit A	A	-	-	-	-	-	-	-	-	-	-	200	221	260	294	239	260	294
Circuit B	A	-	-	-	-	-	-	-	-	-	-	109	130	130	147	239	260	294
Maximum starting current, standard unit (Un)****	A	165	165	177	201	219	244	274	292	313	363	685	801	840	979	928	970	1126
Circuit A***	A	-	-	-	-	-	-	-	-	-	-	576	671	710	832	689	710	832
Circuit B***	A	-	-	-	-	-	-	-	-	-	-	485	580	580	685	689	710	832
Max. starting current/max. current draw ratio, unit		1.35	1.23	1.21	1.23	1.20	1.22	1.24	1.22	1.20	1.23	2.22	2.28	2.15	2.22	1.94	1.87	1.91
Max. starting current/max. current draw ratio, circuit A		-	-	-	-	-	-	-	-	-	-	2.88	3.04	2.73	2.83	2.88	2.73	2.83
Max. starting current/max. current draw ratio, circuit B		-	-	-	-	-	-	-	-	-	-	4.44	4.46	4.46	4.66	2.88	2.73	2.83
Max. starting current - reduced current start (Un) ******	A	std.	std.	std.	std.	std.	std.	std.	std.	std.	std.	450	521	560	639	648	690	786
Circuit A	A	std.	std.	std.	std.	std.	std.	std.	std.	std.	std.	341	391	430	492	409	430	492
Circuit B	A	std.	std.	std.	std.	std.	std.	std.	std.	std.	std.	205	245	245	285	409	430	492
Max.starting current - red. current start/max. current draw ratio, unit		std.	std.	std.	std.	std.	std.	std.	std.	std.	std.	1.70	1.77	1.65	1.67	1.71	1.65	1.67
Circuit A		std.	std.	std.	std.	std.	std.	std.	std.	std.	std.	1.88	1.88	1.88	1.94	1.71	1.65	1.67
Circuit B		std.	std.	std.	std.	std.	std.	std.	std.	std.	std.	1.46	1.48	1.44	1.45	1.36	1.33	1.34
Three-phase short circuit holding current	kA	25	25	25	25	25	25	25	25	25	25	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Circuit A	kA	-	-	-	-	-	-	-	-	-.	-	25	25	25	25	25	25	25
Circuit B	kA	-	-	-	-	-	-	-	-	-	-	15	15	15	15	25	25	25
Customer standby power, unit or circuit B, for evaporator water pump connections†	kW	8	8	8	11	11	11	15	15	15	15	15	18	18	30	30	30	30

* Standard ARI conditions: Evaporator entering/leaving water temperature 12.2°C and 6.7°C. Condenser entering/leaving water temperature 29.6°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 460 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

Electrical data for units with high condensing temperatures 460 V – 60 Hz (option 60 + 150/150A)

30HXC		080	090	100	110	120	130	140	155	175	190	200	230	260	285	310	345	375
Power circuit																		
Nominal power supply (Un)*	V-ph-Hz	460-3-60																
Voltage range	V	414-506																
Control circuit supply		The control circuit is supplied via the factory-installed transformer																
Max. power input*	kW	107	119	131	146	162	180	196	214	231	277	279	312	347	415	429	462	553
Circuit A	kW	-	-	-	-	-	-	-	-	-	-	180	196	231	277	214	231	277
Circuit B	kW	-	-	-	-	-	-	-	-	-	-	99	116	116	138	214	231	277
Max. current drawn (Un - 10%)**	A	167	185	204	227	251	278	303	331	356	427	431	481	534	641	662	712	854
Circuit A	A	-	-	-	-	-	-	-	-	-	-	278	303	356	427	331	356	427
Circuit B	A	-	-	-	-	-	-	-	-	-	-	153	178	178	214	331	356	427
Maximum current drawn (Un)**	A	152	169	185	207	228	253	276	301	324	388	392	438	486	582	602	648	776
Circuit A	A	-	-	-	-	-	-	-	-	-	-	253	276	324	388	301	324	388
Circuit B	A	-	-	-	-	-	-	-	-	-	-	139	162	162	194	301	324	388
Maximum starting current, standard unit (Un)***	A	229	259	276	309	330	373	405	430	453	565	1073	1196	1244	1563	1359	1405	1758
Circuit A***	A	-	-	-	-	-	-	-	-	-	-	934	1034	1082	1369	1059	1082	1369
Circuit B***	A	-	-	-	-	-	-	-	-	-	-	820	920	920	1175	1059	1082	1369
Max. starting current/max. current draw ratio, unit		1.51	1.54	1.49	1.49	1.45	1.48	1.47	1.43	1.40	1.46	2.74	2.73	2.56	2.68	2.26	2.17	2.26
Max. starting current/max. current draw ratio, circuit A		-	-	-	-	-	-	-	-	-	-	3.69	3.75	3.34	3.53	3.52	3.34	3.53
Max. starting current/max. current draw ratio, circuit B		-	-	-	-	-	-	-	-	-	-	5.91	5.69	5.69	6.05	3.52	3.34	3.53
Max. starting current - reduced current start (Un) * **	A	std.	std.	std.	std.	std.	std.	std.	std.	std.	std.	663	736	784	923	899	945	1118
Circuit A	A	std.	std.	std.	std.	std.	std.	std.	std.	std.	std.	524	574	622	729	599	622	729
Circuit B	A	std.	std.	std.	std.	std.	std.	std.	std.	std.	std.	290	320	320	405	599	622	729
Max.starting current - red. current start/max. current draw ratio, unit		std.	std.	std.	std.	std.	std.	std.	std.	std.	std.	2.07	2.08	1.92	1.88	1.99	1.92	1.88
Circuit A		std.	std.	std.	std.	std.	std.	std.	std.	std.	std.	2.09	1.98	1.98	2.09	1.99	1.92	1.88
Circuit B		std.	std.	std.	std.	std.	std.	std.	std.	std.	std.	1.69	1.68	1.61	1.58	1.50	1.46	1.44
Three-phase short circuit holding current	kA	25	25	25	25	25	25	25	25	25	25	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Circuit A	kA	-	-	-	-	-	-	-	-	-.	-	25	25	25	25	25	25	25
Circuit B	kA	-	-	-	-	-	-	-	-	-	-	15	15	15	15	25	25	25
Customer standby power, unit or circuit B, for evaporator water pump connections†	kW	8	8	8	11	11	11	15	15	15	15	15	18	18	30	30	30	30

* Power input, compressor, at unit operating limits (evaporator water entering/leaving temperature = 15°C/10°C, condensing temperature = 68°C) and a nominal voltage of 460 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

Electrical data 380 V – 60 Hz – option 61

30HXC		080	090	100	110	120	130	140	155	175	190	200	230	260	285	310	345	375
Power circuit																		
Nominal power supply (Un)*	V-ph-Hz	380-3-60																
Voltage range	V	342-418																
Control circuit supply		The control circuit is supplied via the factory-installed transformer																
Nominal power input*	kW	56	63	69	78	82	91	103	111	123	129	142	166	189	198	223	249	261
Nominal current drawn*	A	114	123	132	146	161	178	198	215	235	257	276	315	352	386	430	469	515
Max. power input**	kW	87	96	105	118	130	144	159	172	187	212	223	253	281	318	344	374	424
Circuit A	kW	-	-	-	-	-	-	-	-	-	-	144	159	187	212	172	187	212
Circuit B	kW	-	-	-	-	-	-	-	-	-	-	79	94	94	106	172	187	212
Max. current drawn (Un - 10%)***	A	162	178	194	218	242	266	294	319	346	392	412	467	519	588	637	692	784
Circuit A	A	-	-	-	-	-	-	-	-	-	-	266	294	346	392	319	346	392
Circuit B	A	-	-	-	-	-	-	-	-	-	-	145	173	173	196	319	346	392
Maximum current drawn (Un)***	A	148	162	177	198	220	242	267	290	315	356	374	424	472	534	580	630	712
Circuit A	A	-	-	-	-	-	-	-	-	-	-	242	267	315	356	290	315	356
Circuit B	A	-	-	-	-	-	-	-	-	-	-	132	157	157	178	290	315	356
Maximum starting current, standard unit (Un)****	A	189	189	203	229	251	279	313	335	360	417	778	908	956	1113	1063	1113	1291
Circuit A***	A	-	-	-	-	-	-	-	-	-	-	646	751	798	935	773	798	935
Circuit B***	A	-	-	-	-	-	-	-	-	-	-	536	641	641	757	773	798	935
Max. starting current/max. current draw ratio, unit		1.28	1.16	1.15	1.16	1.14	1.15	1.17	1.16	1.14	1.17	2.08	2.14	2.02	2.08	1.84	1.77	1.81
Max. starting current/max. current draw ratio, circuit A		-	-	-	-	-	-	-	-	-	-	2.67	2.81	2.54	2.63	2.67	2.54	2.63
Max. starting current/max. current draw ratio, circuit B		-	-	-	-	-	-	-	-	-	-	4.05	4.07	4.07	4.25	2.67	2.54	2.63
Max. starting current - reduced current start (Un) ******	A	std.	std.	std.	std.	std.	std.	std.	std.	std.	std.	492	597	645	736	752	802	914
Circuit A	A	std.	std.	std.	std.	std.	std.	std.	std.	std.	std.	360	440	487	558	462	487	558
Circuit B	A	std.	std.	std.	std.	std.	std.	std.	std.	std.	std.	225	270	270	315	462	487	558
Max.starting current - red. current start/max. current draw ratio, unit		std.	std.	std.	std.	std.	std.	std.	std.	std.	std.	1.31	1.41	1.37	1.38	1.30	1.27	1.28
Circuit A		std.	std.	std.	std.	std.	std.	std.	std.	std.	std.	1.49	1.65	1.55	1.57	1.60	1.55	1.57
Circuit B		std.	std.	std.	std.	std.	std.	std.	std.	std.	std.	1.70	1.72	1.72	1.77	1.60	1.55	1.57
Three-phase short circuit holding current	kA	25	25	25	25	25	25	25	25	25	25	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Circuit A	kA	-	-	-	-	-	-	-	-	-.	-	25	25	25	25	25	25	25
Circuit B	kA	-	-	-	-	-	-	-	-	-	-	15	15	15	15	25	25	25
Customer standby power, unit or circuit B, for evaporator water pump connections†	kW	8	8	8	11	11	11	15	15	15	15	15	18	18	30	30	30	30

* Standard ARI conditions: Evaporator entering/leaving water temperature 12.6°C and 6.7°C. Condenser entering/leaving water temperature 29.6°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 380 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

Electrical data for units with high condensing temperatures 380 V – 60 Hz (option 61 + 150/150A)

30HXC		080	090	100	110	120	130	140	155	175	190	200	230	260	285	310	345	375
Power circuit																		
Nominal power supply (Un)*	V-ph-Hz	380-3-60																
Voltage range	V	342-418																
Control circuit supply		The control circuit is supplied via the factory-installed transformer																
Max. power input*	kW	107	119	131	146	162	180	196	214	231	277	279	312	347	415	429	462	553
Circuit A	kW	-	-	-	-	-	-	-	-	-	-	180	196	231	277	214	231	277
Circuit B	kW	-	-	-	-	-	-	-	-	-	-	99	116	116	138	214	231	277
Max. current drawn (Un - 10%)**	A	203	225	246	275	304	337	367	400	431	517	522	582	646	776	800	862	1034
Circuit A	A	-	-	-	-	-	-	-	-	-	-	337	367	431	517	400	431	517
Circuit B	A	-	-	-	-	-	-	-	-	-	-	185	215	215	259	400	431	517
Maximum current drawn (Un)**	A	184	204	224	250	276	306	334	364	392	470	474	530	588	705	728	784	940
Circuit A	A	-	-	-	-	-	-	-	-	-	-	306	334	392	470	364	392	470
Circuit B	A	-	-	-	-	-	-	-	-	-	-	168	196	196	235	364	392	470
Maximum starting current, standard unit (Un)***	A	261	295	315	351	377	424	459	489	517	645	1212	1351	1409	1769	1549	1605	2004
Circuit A***	A	-	-	-	-	-	-	-	-	-	-	1044	1155	1213	1534	1185	1213	1534
Circuit B***	A	-	-	-	-	-	-	-	-	-	-	906	1017	1017	1299	1185	1213	1534
Max. starting current/max. current draw ratio, unit		1.42	1.45	1.41	1.40	1.37	1.39	1.37	1.34	1.32	1.37	2.56	2.55	2.40	2.51	2.13	2.05	2.13
Max. starting current/max. current draw ratio, circuit A		-	-	-	-	-	-	-	-	-	-	3.41	3.46	3.10	3.26	3.26	3.10	3.26
Max. starting current/max. current draw ratio, circuit B		-	-	-	-	-	-	-	-	-	-	5.39	5.19	5.19	5.53	3.26	3.10	3.26
Max. starting current - reduced current start (Un) * **	A	std.	std.	std.	std.	std.	std.	std.	std.	std.	std.	756	844	902	1070	1042	1098	1305
Circuit A	A	std.	std.	std.	std.	std.	std.	std.	std.	std.	std.	588	648	706	835	678	706	835
Circuit B	A	std.	std.	std.	std.	std.	std.	std.	std.	std.	std.	320	360	360	450	678	706	835
Max.starting current - red. current start/max. current draw ratio, unit		std.	std.	std.	std.	std.	std.	std.	std.	std.	std.	1.59	1.59	1.53	1.52	1.43	1.40	1.39
Circuit A		std.	std.	std.	std.	std.	std.	std.	std.	std.	std.	1.92	1.94	1.80	1.78	1.86	1.80	1.78
Circuit B		std.	std.	std.	std.	std.	std.	std.	std.	std.	std.	1.90	1.84	1.84	1.91	1.86	1.80	1.78
Three-phase short circuit holding current	kA	25	25	25	25	25	25	25	25	25	25	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Circuit A	kA	-	-	-	-	-	-	-	-	-.	-	25	25	25	25	25	25	25
Circuit B	kA	-	-	-	-	-	-	-	-	-	-	15	15	15	15	25	25	25
Customer standby power, unit or circuit B, for evaporator water pump connections†	kW	8	8	8	11	11	11	15	15	15	15	15	18	18	30	30	30	30

* Power input, compressor, at unit operating limits (evaporator water entering/leaving temperature = 15°C/10°C, condensing temperature = 68°C) and a nominal voltage of 380 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

Operating limits

Condenser water flow rates

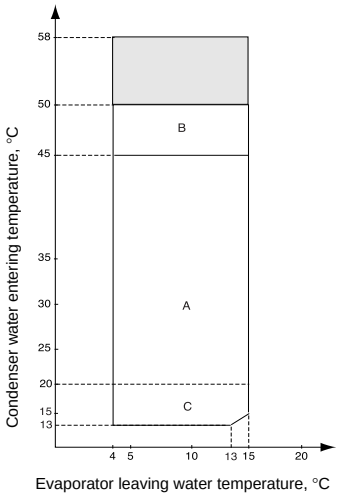
30HXC	Minimum flow rate, l/s*		Maximum flow rate, l/s**
	Closed loop	Open loop	
080-110	2.3	7.0	28.2
120-130	3.1	9.3	37.1
140-155	3.7	11.1	44.5
175-190	4.3	13.0	51.9
200	4.9	14.8	59.2
230-285	6.7	20.1	80.4
310-375	8.0	24.0	95.9

* 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	23.0	91.9

Unit operating range at full load

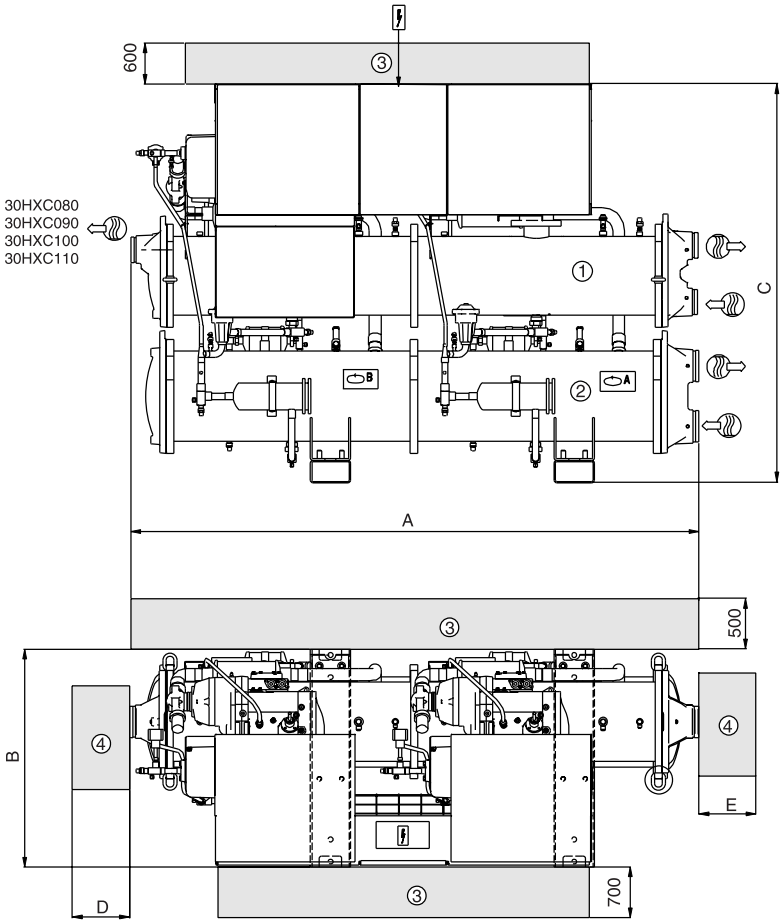


Notes:
1. Evaporator and condenser ΔT = 5 K
2. For start-up at full load with a condenser water entering temperature below 20°C, a three-way valve must be used to maintain the correct condensing temperature
3. Maximum condenser water leaving temperature 50°C (at full load)
A Standard unit operating at full load.
B Standard unit operating at reduced load.
C 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.

Dimensions/clearances

30HXC 080-190



30HXC	A	B	C	D	E
080-090-100	2557	980	1800	2100	1000
110	2565	980	1850	2100	1000
120-130-140-155	3277	980	1825	2920	1000
175-190	3295	980	1950	2920	1000

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).

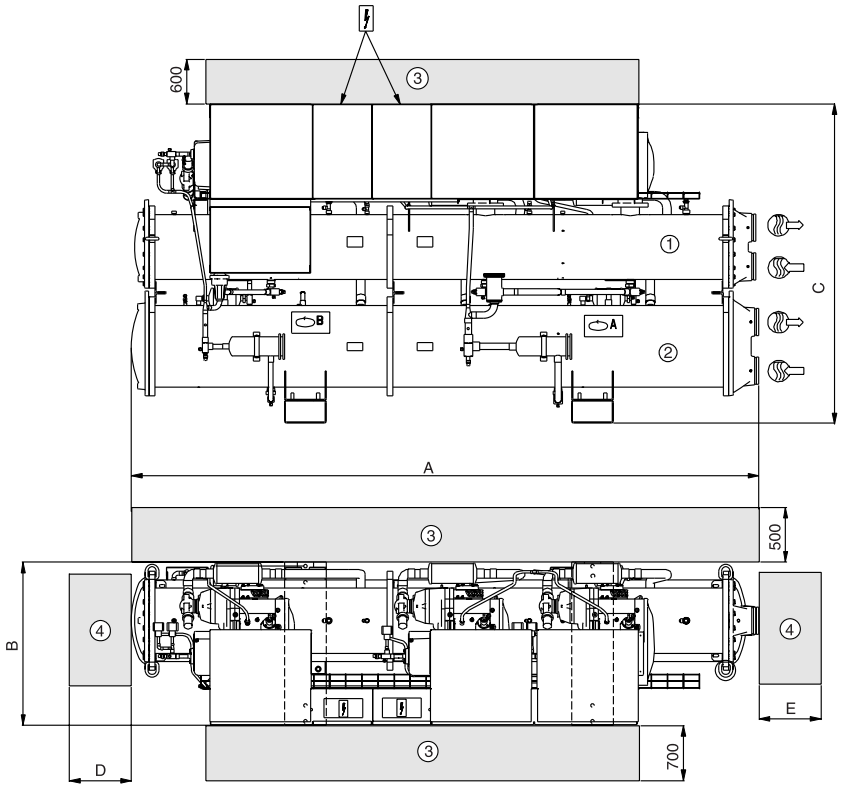
Water inlet

Water outlet

Power supply

NOTE:
For a specific installation, consult the certified dimensional drawings, available on request.

30HXC 200-375



30HXC	A	B	C	D	E
200	3900	1015	1985	3500	1000
230-260-285	3921	1015	2065	3500	1000
310-345-375	4530	1015	2115	4120	1000

Guide specifications

Water-cooled liquid chillers
Size range: 284 to 1280 kW
Carrier model number: 30HXC

Part 1 - General

1.01 System description

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

1.02 Quality assurance

- Unit shall be rated in accordance with Eurovent standard.
- Unit construction shall comply with European directives:
  - Machinery directive 98/37/EC, modified
  - Low voltage directive 73/23/EEC, modified
  - Electromagnetic compatibility directive 89/336/EEC, 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 a environment management system certified ISO 14001.
- Unit shall be run tested at the factory.

1.03 Delivery, storage and handling

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

Part 2 - Products

2.01 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 shut-off 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 tested and stamped in accordance with applicable European pressure code for a refrigerant-side operating pressure of 1700 kPa (Service des Mines units) and a maximum water side pressure of 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 (accessory flanges on request).
  - Shell shall be insulated with 19-mm closed-cell, polyvinyl-chloride foam with a maximum K factor of 0.28.
  - 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 tested and stamped in accordance with applicable European pressure code for a refrigerant-side operating pressure of 1700 kPa, and 2500 kPa for option 150 and 150A (Service des Mines units) and a maximum water-side pressure of 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 (accessory flanges on request).
  - Design shall incorporate 2 independent refrigerant circuits and the oil separator.

- Refrigeration circuits
  Refrigerant circuit 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, Safeties, and Diagnostics
  1. Controls
  a. Unit controls shall include as a minimum: the microprocessor board, and a 6 digit diagnostic display with keypad.
  b. Shall be capable of performing the following functions:
     - Automatic change-over between compressors.
     - 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°C to 1.1°C 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 to the outdoor temperature.
     - Provide a dual set point for the leaving chilled water temperature activated by a remote contact closure signal.
     - Enable a 2-level demand limit control (between 0 and 100%), activated by a remote contact closure or a 0 to 10 V signal.
     - Control condenser and evaporator water pump operation.
     - Enable automatic lead-lag of two chillers in a single system.

2. Diagnostics
   a. Display module shall be capable of displaying set points, system status (including temperatures, pressures, run times and percent loading), and any alarm or alert conditions.
   b. Control module, in conjunction with the microprocessor, shall be capable of displaying the output of a run test to verify operation of every switch, sensor, potentiometer, and compressor before chiller is started, and carrying out a diagnosis and preventive maintenance (incorrect water loop, oil filter dirty etc.).
   c. Control shall provide a general alarm remote indication for each refrigeration circuit.
   d. Control system shall have a RS485 serial output port (option and accessory).

3. 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

NOTES for electrical data:
- 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:
- Starter and motor protection devices for each compressor
- 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 (machine safety - electrical machine components - part 1: general regulations) are specifically taken into account, when designing the electrical equipment.

Electrical reserves:
Circuit A 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 § 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 30HXC units is specified below:
   a. 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 AS2 (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
   b. Competence of personnel, class BA4S (trained personnel - IEC 60364)

2. Power supply frequency variation: ± 2 Hz.

3. The neutral (N) line 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.

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.

Environmental Management System Approval

Order No. 13034-20, October 1999. Supersedes order No. New.
Manufacturer reserves the right to change any product specifications without notice.

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