30GZ 040-245

Air-Cooled Liquid Chillers

Nominal cooling capacity 102-750 kW

PRO-DIALOG PLUS CONTROL

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

HFC-407C

The 30GZ series of air-cooled liquid chillers is designed for operation with refrigerant HFC-407C to meet new environmental protection requirements. These chillers feature extra-quiet operation and a new ecological refrigerant, and offer an ideal solution for chilled water production.

Features

- The new, ecological refrigerant HFC-407C has an ozone depletion potential of zero and is not affected by international regulations on the usage of CFCs and their derivatives. This new refrigerant ensures similar performances to HCFC-22 and offers an economical solution to environmental protection problems.
  HFC-407C is a blend of HFC-32, 125 and 134a. As it is produced and distributed world-wide, there are no availability problems. These new HFC-407C chillers have been designed using specific refrigeration components and new production methods and are backed by thousands of hours of laboratory and field tests. This allows Carrier to offer tomorrow?s chiller technology today.
- Low-noise operation. The revolutionary, low-noise, shrouded axial Flying Bird fan is made of a composite plastic material which is fully recyclable. Together with the substantial reduction of compressor noise transmission (discharge muffler, anti-vibration mountings), this results in a uniform chiller sound spectrum and eliminates intrusive low frequency noises.
- Excellent part-load energy efficiency through use of multiple compressors and electronic expansion valves (optional on some models). As the chiller rarely operates at full load, significant savings are ensured.
  This reduced power consumption also contributes to limiting the greenhouse effect, resulting from power generation from fossil energy.
- Two independent refrigerant circuits, the second one takes over automatically when the first one malfunctions, maintaining partial cooling under all circumstances.
- Refrigerant containment - rigorous factory tightness tests and use of temperature or pressure sensors without capillary tubes eliminate the risk of leaks. Shut-off valves permit isolation of the refrigerant charge in the heat exchangers. Maintenance operations become less frequent and more effective.

PRO-DIALOG Plus control

PRO-DIALOG Plus is an advanced numeric control system that combines complex intelligence with great operating simplicity.

PRO-DIALOG Plus ensures intelligent leaving water temperature control and optimises energy requirements.

- The PID control algorithm with return water temperature compensation anticipates load variations, guarantees leaving water temperature stability and prevents unnecessary compressor cycling.
- The long-stroke electronic expansion valves (EXV) and PID superheat control (standard on 30GZ 085-245), together with a patented head pressure control algorithm allow a significant energy efficiency improvement at part load conditions, and faultless chiller operation in a wider temperature range.
- 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.
- 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.

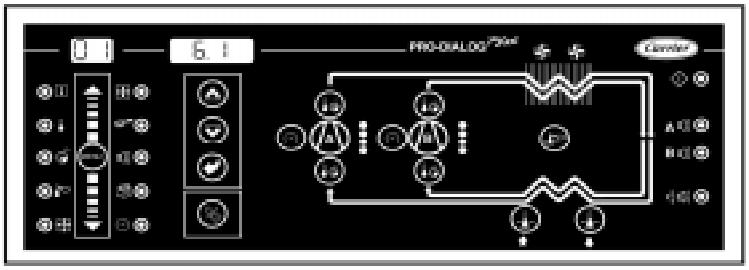
PRO-DIALOG Plus ensures preventive protection and enhances chiller reliability.

- 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 80 fault codes facilitate immediate fault location (see Technical Description)

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 50 parameters).
- Parallel piloting of two units as standard, or of several units with Flotronic System Manager (FSM) and Chiller System Manager (CSM III) options.

Low-noise Flying Bird fan



PRO-DIALOG Plus operator interface

Options and accessories

	Option	Accessory
Condenser anti-corrosion treatment for marine applications	X	
Condenser anti-corrosion treatment for rural, urban and industrial applications	X	
Low leaving brine temperatures from 5°C to -6°C	X	
Very low leaving brine temperatures from -6°C to -10°C (except ISPESL code)	X	
Electrical box protection to IP55	X	
Protection grilles	X	X
High and low pressure manometers	X	
Electronic compressor oil pressure protection and display	X	
Head pressure control for low outside temperature applications (fan speed variation)	X	X
220-3-50 power supply (30GZ 040-100)	X	
Main power disconnect switch with auxiliary circuit power supply transformer	X	
Compressor suction valve (30GZ 085-245)	X	
Evaporator with fewer or more baffles	X	
Electronic expansion valves (30GZ 045-060)	X	
Compressor sound enclosure	X	
Compressor part-winding start (30GZ 085-100)	X	
RS485 communications interface with open protocol	X	X

Sound levels

30GZ	040	045		060	085	095	100	120	130	145	150	160	170	190	220	245
Sound power, dB(A)	91	97	97	97	95	96	96	97	97	98	98	98	99	99	100	100

Note: According to ISO standard 3744 and Eurovent 8/1.

Physical data

30GZ		040	045	050	060	085	095	100	120	130	145	150	160	170	190	220	245
Net nominal cooling capacity*	kW	102	119	150	181	240	284	321	375	425	429	463	481	525	608	671	750
Operating weight	kg	1380	1445	1710	1780	3012	3067	3439	3884	4330	4452	5010	5172	5592	6442	6742	7992
Refrigerant charge	kg	R-407C															
Circuit A		16.5	16.5	19	21.5	33	34	28	36	47	46	53	59	59	59	59	66
Circuit B		16.5	16.5	19	21.5	19	24	28	36	32	35	38.5	46	48	56	59	66
Compressors		Semi-hermetic, 4 or 6 cylinders, 24.2 r/s															
Quantity - Circuit A		1	1	1	1	2	2	2	2	3	3	3	3	3	4	4	4
Quantity - Circuit B		1	1	1	1	1	1	2	2	2	2	2	2	3	3	4	4
Capacity control		PRO-DIALOG Plus control															
No. of control steps		4	4	4	4	6	6	4	4	5	5	5	5	6	7	8	8
Minimum step capacity	%	25	33	33	33	20	22	22	25	16.7	17	20	20	14	12	10	12.5
Evaporator		Direct-expansion, multi-tube shell type															
Net water volume	l	55	55	63	63	92	92	154	154	199	242	199	242	242	242	242	242
Water connections		Flat flange PN 16, corresponding to NFE 29 203															
Inlet/outlet		DN 80	DN 80	DN 80	DN 80	DN 100	DN 100	DN125	DN125	DN 150	DN 150	DN 150	DN 150	DN 150	DN 150	DN 150	DN 150
Drain	in	1/2 NPT	1/2 NPT	1/2 NPT	1/2 NPT	1/2 NPT	1/2 NPT	1/2 NPT	1/2 NPT	1/2 NPT	1/2 NPT	1/2 NPT	1/2 NPT	1/2 NPT	1/2 NPT	1/2 NPT	1/2 NPT
Max. water side operating pressure	kPa	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
Condenser		Copper tubes, aluminium fins															
Condenser fans		Shrouded axial, Flyinçg Bird fan															
Quantity		2	2	4	4	6	6	6	8	8	8	10	10	10	12	12	16
Total air flow	l/s	9444	9444	19890	19890	29830	29830	29830	39780	39780	39780	49720	49720	49720	59670	59670	79560
Fan speed	r/s	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5

* Standard Eurovent conditions: Evaporator entering/leaving water temperature 12°C and 7°C. Condenser entering air temperature 35°C.
Net cooling capacity = gross cooling capacity minus the water pump heat against the internal evaporator pressure drop.

Electrical data

30GZ		040	045	050	060	085	095	100	120	130	145	150	160	170	190	220	245
Power wiring																	
Nominal power supply	V-ph-Hz	400-3-50															
Voltage range	V	360-440															
Auxiliary circuit (heaters)	V-ph-Hz	230-1-50															
Power input	W	570	570	570	570	980	980	1160	1160	1460	1460	1460	1460	1640	1820	2000	2000
Max. unit power input*	kW	41	55	64	87	110	134	152	174	192	202	228	225	241	282	328	358
Circuit A**	kW	-	-	-	-	-	-	-	-	-	-	-	-	141	165	164	179
Circuit B**	kW	-	-	-	-	-	-	-	-	-	-	-	-	100	117	164	179
Fan power supply	V-ph-Hz	400-3-50															
Fan power input	kW	2.3	2.3	4.6	4.6	7	7	7	9	9	9	12	12	12	14	14	19
Max. starting current (compr. + fans)	A																
Total (30GZ standard unit)		144	186	219	296	476	518	553	601	636	636	684	684	719	802	879	934
Circuit A**		-	-	-	-	-	-	-	-	-	-	-	-	517	574	574	601
Circuit B**		-	-	-	-	-	-	-	-	-	-	-	-	469	497	574	601
Total (30GZ with part-winding start)		std	std	std	std	338	380	415	463	498	498	546	546	581	664	741	796
Max. unit current drawn (compr. + fans)*	A																
Total		72	97	113	154	194	238	264	308	338	354	394	393	405	496	565	641
Circuit A**		-	-	-	-	-	-	-	-	-	-	-	-	238	290	282	320
Circuit B**		-	-	-	-	-	-	-	-	-	-	-	-	167	206	282	320

* Compressor and fan, at maximum unit operating values.
** Unit sizes 30GZ 170-245 have a separate power supply per circuit. All current values are at nominal voltage.

Electrical data notes:

- 30GZ units have a single power connection point (except 30GZ 170-245 which have two connection points).
- A separate power source (230 V, 1 ph, 50 Hz) that does not exceed the main switch capacity is required to power the compressor crankcase heater circuit. This source must be supplied from a transformer. It must not be supplied from a phase + neutral supply (for ground + neutral systems).
- The control box includes the following standard features:
  - Starter and motor protection devices for each compressor and the fan(s)
  - Control devices
- **Field connections:**
  All connections to the system and the electrical installations must be in full accordance with all applicable local codes.
- The Carrier 30GZ chillers are designed and built to ensure conformance with these codes. The recommendations of European standard EN 60 204-1 (machine safety - electrical machine components - part 1: general regulations) are specifically taken into account, when designing the electrical equipment.

NOTES:

- Generally the recommendations of IEC 364 are accepted as compliance with the requirements of the installation directives. Conformance with EN 60 204 is the best means of ensuring compliance with the Machines Directive § 1.5.1.
- Annex B of EN 60204-1 describes the electrical characteristics used for the operation of the machines.

1. The operating environment for the 30GZ chillers is specified below:
   - Environment* - Environment as classified in EN 60 721:
     - outdoor installation*
     - ambient temperature range: -18°C to +46°C, class 4K4H*
     - altitude: ≤ 2000 m
     - presence of hard solids, class 4S2 (no significant dust present)
     - presence of corrosive and polluting substances, class 4C2 (negligible)
     - vibration and shock, class 4M2
   - Competence of personnel, class BA4* (trained personnel - IEC 364)
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 optional factory-installed circuit breaker is of type "a" (EN 60 204-1 § 5.3.2).

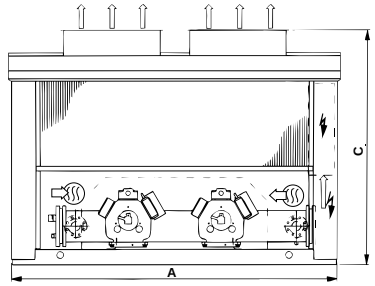
NOTE:
If particular aspects of an actual installation do not conform to the conditions described above, or if there are other conditions which should be considered, always contact your local Carrier representative.

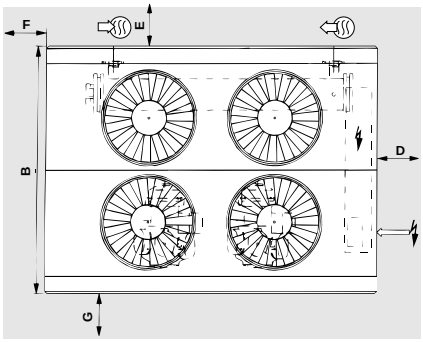
* The required protection level for this class is IP43BW (according to reference document IEC 529). All 30GZ units are protected to IP44CW and fulfill this protection condition.

Dimensions/clearances

30GZ 040-060

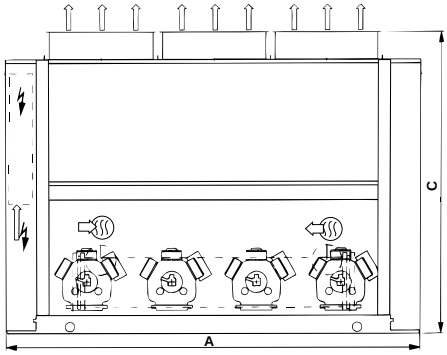
Do not obstruct

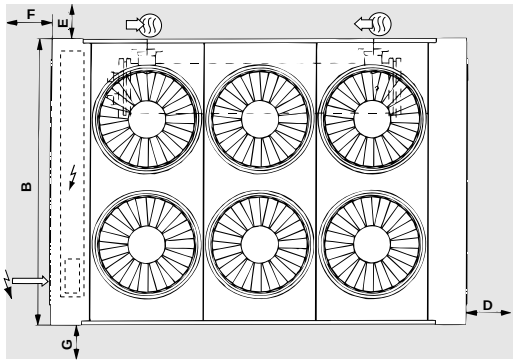




30GZ 085-145

Do not obstruct

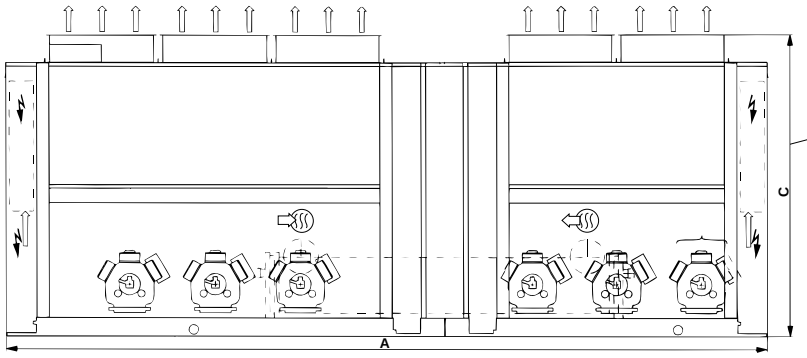




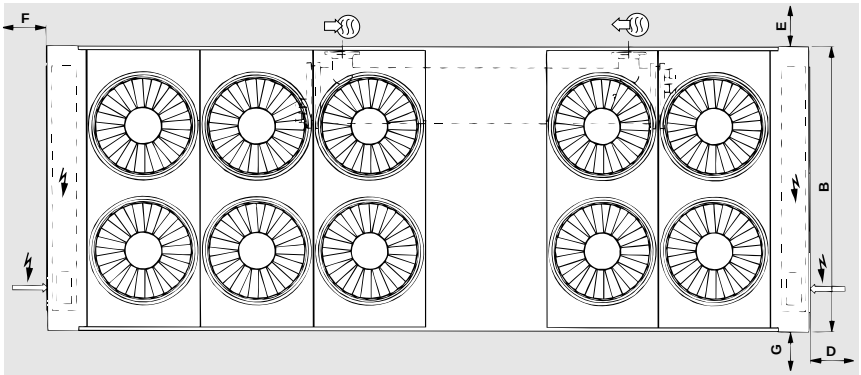
30GZ 150-245

Do not obstruct

Do not obstruct



30GZ 170-245 only



ATTENTION: 30GZ 170-245 units have two power connection points.

30GZ	A	B	C	D	E	F	G
040-045	2450	1870	1912	2500	1200	500	1200
050-060	2900	2156	2060	2500	1200	500	1200
085-100	3404	2328	2471	1600	1800	1600	1800
120-145	4322	2328	2471	1600	1800	1600	1800
150-170	6229	2328	2471	1600	1800	1600	1800
190-220	7147	2328	2471	1600	1800	1600	1800
245	8983	2328	2471	1600	1800	1600	1800

Legend:

All dimensions are given in mm.

Required clearances for operation and maintenance

Power supply

Water inlet

Water outlet

NOTE:
Certified dimensional drawings are available on request.

Cooling capacities

30GZ	LCWT °C	Condenser entering air temperature °C																								
		25				30				35				40				45				Max. entering air temperature, °C*				
		CAP kW	COMP kW	UNIT kW	COOL kPa	CAP kW	COMP kW	UNIT kW	COOL kPa	CAP kW	COMP kW	UNIT kW	COOL kPa	CAP kW	COMP kW	UNIT kW	COOL kPa	CAP kW	COMP kW	UNIT kW	COOL kPa	CAP kW	COMP kW	UNIT kW	COOL kPa	Max. temp.
040	5	109	29.2	32.5	17	102	30.8	34.1	15	95	32.5	35.7	13	87	34.1	37.3	11	80	35.8	38.9	9	73	37.5	40.5	8	50
045		129	42.5	46.1	20	120	44.1	47.5	18	111	45.6	49	15	102	47.2	50	13	92	48.7	52	11	91	49	52	11	46
050		164	45.4	51	21	152	47.8	54	18	140	50	56	16	128	53	58	13	116	55	61	11	107	57	62	9	49
060		193	61	67	30	181	64	70	26	169	67	73	23	157	70	76	20	145	73	79	17	138	75	81	15	48
085		255	75	84	21	239	79	88	19	223	83	92	16	208	87	96	14	192	92	100	12	173	96	105	10	51
095		299	92	101	30	282	97	106	26	264	102	111	23	247	108	117	21	229	113	122	18	219	116	125	16	48
100		346	111	120	21	323	116	125	19	299	121	130	16	275	125	134	14	252	130	139	11	233	134	143	10	49
120		399	125	137	29	374	131	143	26	350	138	149	23	325	144	155	20	301	151	162	17	286	154	165	15	48
130		456	143	156	32	427	149	162	28	398	156	168	24	369	163	175	21	****	****	****	****	345	168	180	18	44
145		467	149	161	23	435	155	167	20	402	160	172	17	370	166	178	15	337	172	183	12	312	177	188	11	49
150		499	158	175	39	466	166	182	34	433	174	190	29	400	182	197	25	366	190	205	21	353	193	208	19	47
160		518	159	175	29	485	166	182	26	452	173	189	22	419	180	195	19	385	187	202	16	365	191	206	15	48
170		568	173	190	34	530	181	197	30	493	189	205	26	455	197	212	22	417	205	220	19	409	206	221	18	46
190		653	204	225	45	611	214	234	40	568	224	243	35	526	233	252	30	483	243	261	25	449	251	268	22	49
220		723	245	267	55	676	253	275	48	629	261	282	42	582	269	289	36	535	278	296	31	506	283	301	27	48
245		800	253	283	68	751	266	295	60	702	279	306	52	653	292	318	45	604	305	330	39	555	318	342	33	50
040	6	113	29.6	33	18	106	31.3	34.6	16	98	33.1	36.3	14	91	34.8	38	12	83	36.5	39.7	10	77	37.9	41	9	49
045		134	43.4	47	22	124	45	48.5	19	115	46.6	50	16	105	48.3	52	14	96	49.9	53	12	96	49.9	53	12	45
050		170	46.3	52	23	157	48.7	55	20	145	51	57	17	133	54	59	14	121	56	62	12	111	58	64	10	49
060		200	62	68	32	187	65	71	28	175	68	74	25	163	72	78	21	151	75	81	18	146	76	82	17	47
085		264	77	86	22	248	81	90	20	232	85	94	17	215	89	98	15	199	94	102	13	183	98	106	11	50
095		310	93	103	32	292	99	108	28	274	104	114	25	256	110	119	22	238	115	124	19	231	118	126	18	47
100		359	113	123	23	334	118	128	20	310	123	132	17	285	128	137	15	261	133	142	12	246	136	145	11	48
120		413	128	140	32	388	134	146	28	362	141	152	24	337	147	158	21	312	154	165	18	296	158	169	17	48
130		472	145	159	35	442	152	165	30	411	159	172	26	381	166	178	22	****	****	****	****	357	172	184	20	44
145		482	152	164	25	449	158	170	21	416	164	175	18	382	170	181	16	349	176	187	13	329	179	190	12	48
150		516	161	178	42	482	170	186	36	448	178	194	31	413	186	201	27	379	194	209	22	365	198	212	21	47
160		535	163	179	31	501	170	186	27	466	177	192	24	432	184	199	20	397	191	206	17	384	194	208	16	47
170		586	176	193	37	548	184	201	32	509	192	208	28	470	200	216	24	431	208	223	20	423	210	225	19	46
190		676	208	229	48	632	218	238	42	588	228	248	37	545	238	257	32	501	248	266	27	474	254	272	24	48
220		747	251	274	59	699	259	281	52	650	267	288	45	601	276	296	38	553	284	303	33	523	289	308	29	48
245		827	827	827	72	776	272	301	64	726	285	313	56	676	299	325	48	625	312	337	42	574	325	350	35	50
040	7	118	30.1	33.4	19	110	31.9	35.2	17	102	33.7	36.9	15	94	35.4	38.6	13	86	37.2	40.4	11	80	38.7	41.8	9	49
045		139	44.2	47.9	23	129	45.9	49.5	20	119	47.6	51	18	109	49.4	53	15	99	51	54	12	99	51	54	12	45
050		176	47.1	53	24	163	49.7	56	21	150	52	58	18	138	55	60	15	125	57	63	13	118	59	64	11	48
060		206	63	69	34	194	66	73	30	181	70	76	26	169	73	79	23	156	77	83	20	151	78	84	18	47
085		273	78	87	24	256	82	91	21	240	87	96	19	223	91	100	16	207	95	104	14	190	100	108	12	50
095		320	95	105	34	302	101	110	30	284	107	116	27	265	112	121	24	246	118	127	20	239	120	129	19	47
100		371	116	125	24	346	121	130	21	321	126	135	18	295	131	140	16	270	136	145	13	255	140	148	12	48
120		427	130	142	34	401	137	149	30	375	143	155	26	349	150	162	23	323	157	168	20	312	159	171	18	47
130		487	148	162	37	456	156	169	32	425	163	175	28	394	170	182	24	****	****	****	****	368	176	187	21	44
145		497	155	167	26	463	161	173	23	429	167	179	20	395	173	185	17	360	179	190	14	340	183	194	12	48
150		534	164	182	45	498	173	190	39	463	181	198	33	427	190	206	28	392	199	214	24	377	202	217	22	47
160		553	166	182	33	517	173	189	29	481	180	196	25	445	187	203	22	410	195	209	18	395	197	212	17	47
170		605	179	197	39	565	187	204	34	525	195	211	30	485	203	219	25	445	211	227	21	437	213	228	21	46
190		698	212	233	52	653	222	243	45	608	233	252	39	563	243	262	34	518	254	272	29	491	260	278	26	48
220		770	257	281	62	721	265	288	55	671	274	295	48	621	282	302	41	571	290	310	35	551	294	313	32	47
245		853	264	295	77	801	277	307	68	750	291	320	59	698	305	332	52	645	319	344	44	604	330	355	39	49
040	8	122	30.5	33.9	21	114	32.4	35.7	18	105	34.2	37.5	16	97	36.1	39.3	14	89	38	41.1	12	84	39.1	42.2	10	48
045		143	45.1	48.8	25	133	46.9	50	22	123	48.7	52	19	113	50	54	16	****	****	****	****	105	52	55	14	44
050		181	48	54	26	169	51	57	22	156	53	59	19	143	56	62	16	130	58	64	13	122	60	66	12	48
060		213	64	71	36	200	68	74	32	188	71	77	28	175	75	81	24	162	78	84	21	159	79	85	20	46
085		282	80	89	26	265	84	93	23	248	88	97	20	231	93	102	17	214	97	106	15	200	101	109	13	49
095		331	97	107	36	312	103	112	32	293	109	118	29	274	114	124	25	255	120	129	22	251	121	130	21	46
100		384	118	128	26	358	123	133	23	332	129	138	20	305	134	143	17	279	139	148	14	269	142	150	13	47
120		441	132	145	36	414	139	152	32	387	146	158	28	360	153	165	24	333	160	171	21	328	161	172	20	46
130		503	151	165	40	470	159	172	34	438	166	179	30	406	173	186	25	****	****	****	****	380	179	191	22	44
145		512	158	170	28	477	164	176	24	442	170	182	21	407	176	188	18	372	183	194	15	357	185	196	14	47
150		551	168	185	48	515	176	193	42	478	185	201	36	441	194	210	30	404	203	218	25	397	204	220	24	46
160		570	169	186	35	533	176	193	31	496	184	199	27	459	191	206	23	422	198	213	20	407	201	216	18	47
170		624	182	200	41	582	190	207	36	541	198	215	31	500	207	222	27	458	215	230	23	450	216	232	22	46
190		720	215	238	55	674	226	247	48	628	237	257	42	582	248	267	36	535	259	278	31	517	264	282	29	47
220		794	263	287	66	743	271	294	58	691	280	301	51	640	288	309	43	588	297	316	37	568	300	319	34	47
245		880	269	301	82	826	283	314	72	773	297	326	63	720	311	339	55	666	325	352	47	634	334	359	43	48
040	10	130	31.4	34.9	23	121	33.4	36.8	20	113	35.4	38.7	18	104	37.4	40.7	15	96	39.4	42.6	13	92	40.2	43.4	12	47
045		153	46.8	51	28	142	48.7	52	24	131	51	54	21	120	53	56	18	****	****	****	****	114	54	57	16	43
050		193	49.7	56	29	180	52	59	25	166	55	61	22	153	58	64	18	139	61	66	15	134	62	67	14	47
060		227	66	73	41	213	70	77	36	200	74	80	32	186	78	84	28	173	82	88	24	173	82	88	24	45
085		300	82	92	29	283	87	96	26	265	92	101	23	247	97	105	20	229	101	110	17	218	104	113	16	48
095		353	100	111	41	332	107	116	37	312	113	122	32	292	119	128	28	272	125	134	25	272	125	134	25	45
100		409	122	133	29	381	128	138	26	353	134	143	22	326	140	149	19	298	146	154	16	292	147	156	15	46
120		469	137	150	40	441	144	157	36	412	152	164	31	384	159	171	27	355	166	178	24	355	166	178	24	45
130		533	157	172	45	499	165	179	39	465	173	186	34	431	181	193	29	****	****	****	****	403	187	199	25	44
145		543	163	177	31	506	170	183	27	469	176	189	23	431	183	195	20	394	189	201	17	394	189	201	17	45
150		586	174	193	54	547	183	201	47	508	192	209	41	469	202	218	34	430	211	227	29	422	213	228	28	46
160		604	176	193	39	565	183	200	35	525	191	207	30	486	198	214	26	446	206	221	22	438	207	222	21	46
170		661	187	206	46	617	196	214	41	574	204	222	35	530	213	229	30	486	222	237	25	486	222	237	25	45
190		765	223	246	62	716	234	257	54	668	246	267	47	619	258	278	41	570	270	289	35	560	272	291	34	46
220		841	274	301	74	787	283	308	65	733	292	315	57	679	301	322	49	624	310	330	41	624	310	330	41	45
245		932	279	314	92	876	294	327	81	820	309	339	71	764	324	353	62	707	339	366	53	684	345	371	50	47

Legend:

LCWT Leaving chilled water temperature °C

CAP kW Net cooling capacity (gross cooling capacity minus the water pump heat against the internal evaporator pressure drop)

COMP kW Compressor power input

UNIT kW Effective unit power input (power input of the compressors, control circuit and fans plus the power input of the pump against the internal evaporator pressure drop)

COOL kPa Evaporator water pressure drop

Capacity at Eurovent conditions

* Max. operating temperature: for temperatures above 46°C contact Carrier.

Application data:

Refrigerant: R-407C

Evaporator temperature rise: 5 K

Evaporator fluid: Fresh water

Fouling factor: 0.44 x 10^{-4} (m^2K)/W

Full load correction factors for Eurovent laboratory test:

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

Note: Evaporator water flow rate$_{(l/s)}$= CAP$_{(kW)}$x 860 / [5$_{(°C)}$x 3600]

The published performances are Eurovent certified in accordance with document 6C/003.

Operating limits

Minimum cooler flow rates

30GZ	Minimum flow, l/s
040-045	3.6
050-060	4.0
085-095	6.0
100-120	8.5
130	9.8
145	12.1
150	9.8
160-245	12.1

Minimum chilled water loop flow rate

Whatever the size of the system, the water loop minimum volume is given by the following formula:
Volume = $CAP_{[kW]}$ x N = litres
where CAP is the nominal system capacity (kW) at the nominal operating conditions of the installation.

Application	N
Air conditioning	3.25
Industrial process cooling	6.50
Low ambient temperature	6.50

This volume is necessary for stable operation and accurate control. It is often necessary to add a buffer water reservoir to the circuit in order to achieve the required volume.

Technical description

Air-cooled packaged liquid chillers for outdoor installation, equipped with numerical control and electronic expansion valves (30GZ 085-245) and operating with chlorine-free refrigerant HFC-407C.

Quality assurance

Designed and manufactured in a factory, accredited to Quality Assurance Standard ISO 9001. Performances in accordance with EUROVENT recommendations.

Chassis and casing

Galvanized steel, with polyester-powder paint finish, baked-in electrostatically before assembly, colour light grey (RAL 7035).

Compressors

- 30GZ 040-245: Semi-hermetic reciprocating Carrier compressors with anti-friction treatment specially designed for operation with HFC-407C, lubricated by POE oil, using a reversible oil pump.
- Crankcase heater includes a protection device that stops the compressor in case of a fault. 4-pole electric motor with two windings (part-winding for 30GZ 040-060), cooled by suction gas and protected by the following safety devices against abnormal operating conditions: thermo-magnetic circuit breaker (breaking capacity 22 kA), ground current detector to avoid acid formation (multi-compressor circuit).
- The compressors are mounted on rubber anti-vibration dampers and equipped with a discharge muffler and suction (optional on 30GZ 085-245) and discharge service valves.

Condensers

Aluminium fins mechanically bonded to seamless copper tubes, with built-in subcoolers. Ultra low-noise axial Carrier Flying Bird fan(s) with 15 blades and rotating shroud, made of recyclable composite material. 8-pole, 3-phase motor(s) to IP55, protected by built-in circuit breaker.

Evaporator

Multi-tube evaporator with two refrigerant circuits, internally finned copper tubes, expanded into tube sheets with internal polypropylene baffles. Water connections threaded (MPT) or with standard flat flange. Freeze-up protection down to an outside temperature of -20°C using 19 mm closed-cell polyurethane foam and trace heater.

Refrigerant circuits

Each circuit includes: one or more compressors, filter drier, combined moisture indicator and sightglass, liquid line shut-off/drain valve, thermostatic expansion valve or Carrier electronic expansion valve (EXV) (30GZ 085-245), controlled by a stepper motor (1500 steps) for improved refrigerant flow control and pump-down, dual-safety high pressure switch.

Control box, power and control wiring

Galvanized sheet steel, polyester paint finish, with hinged access doors and removable sun protection shield. Control box contains: circuit breakers and compressor and fan contactors, control circuit transformer, 3-phase power supply terminals (30GZ 170-245 units have a power supply terminal at each end), and separate 230 V power supply for heater circuits. Control circuit cables and electrical components are numbered.

Numeric PRO-DIALOG Plus control accessible without opening the control box, offers:

- PID control of leaving water temperature with return temperature compensation for control of compressors, fans and electronic expansion valves (30GZ 085-245).
- Protection against abnormal operating conditions, compressor faults, high or low refrigerant pressure, low suction temperature, evaporator freeze-up, pump-down when the circuit shuts down, etc.
- Communications
  Digital display of parameters: suction and discharge pressures and temperatures, evaporator entering/leaving water temperatures, number of compressors running, compressor operating hours, history of recorded faults, etc.
  Remote location of controls: start/stop, dual setpoint, setpoint reset, demand limit control, general fault reporting by circuit.
- Series RS485 port for connection to a building monitoring system.

Delivery

All chillers are factory-tested before shipping. Standard packing: wooden skid.

Carrier

The cover photo is solely for illustration purposes, and is not contractually binding.
The photo shows a unit with optional compressor sound enclosure.

Order No. 13190-20, August 1997. Supersedes order No. June 1997.
Manufacturer reserves the right to change any product specifications without notice.

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