



Product Data

30GN,GT Flotronic™ Air-Cooled Reciprocating Liquid Chillers

Nominal Capacities: 36 to 280 Tons
127 to 985 kW

Quality Assurance



Certificate No FM 21837

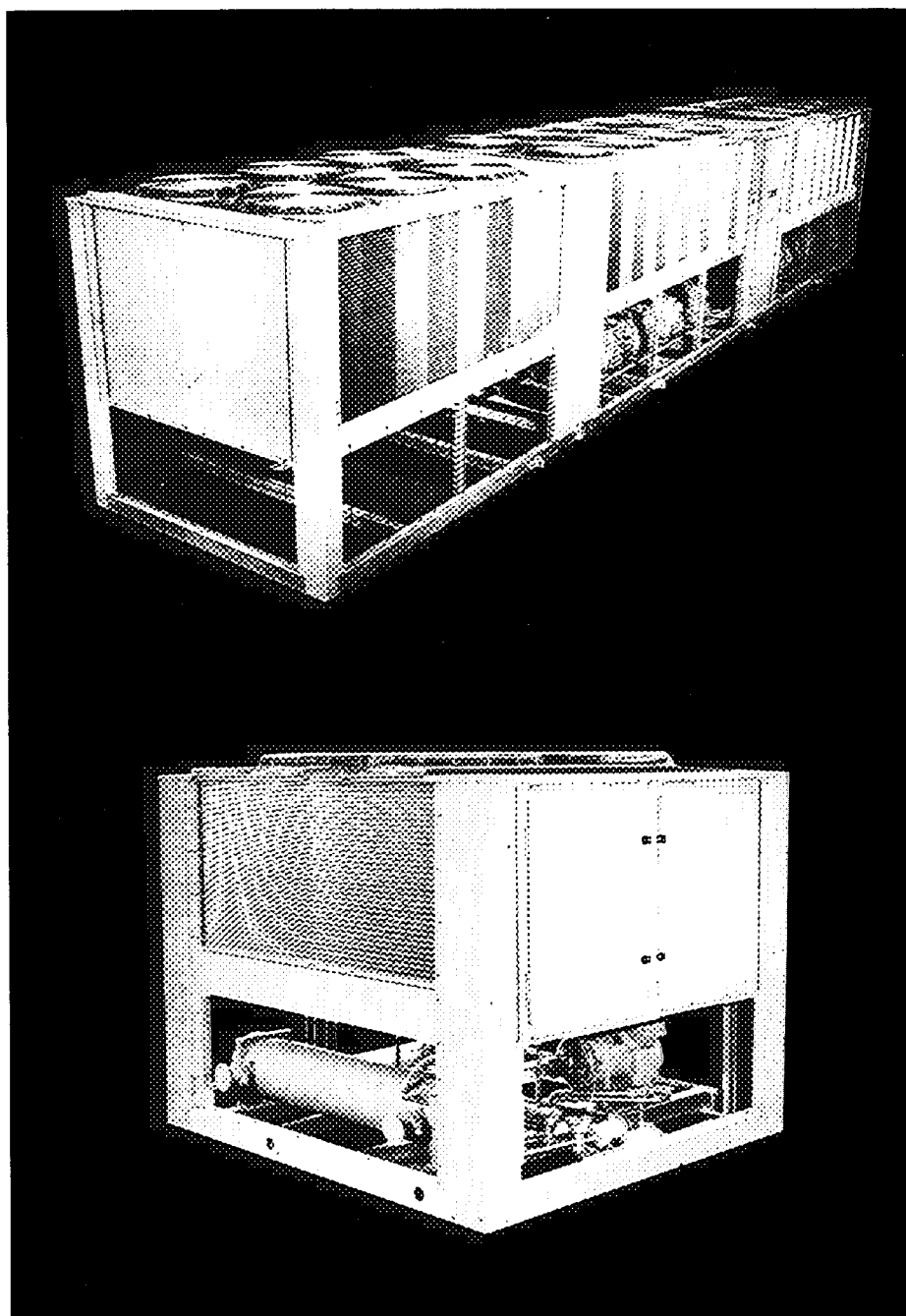
Approvals:

ISO 9002

EN 29002

BS5750 PART 2

ANSI/ASQC Q92



Highly Advanced Chiller Electronics For Years of Operating Efficiency

- wider size range
- application versatility
- long range cost savings
- dependability through high efficiency electronics
- factory ready and tested under load
- Flotronic or Flotronic II controls

Features/Benefits

Installation ease

The model 30GN and GT Flotronic chillers are fully packaged systems that arrive at the job site completely ready for installation in minimal time. On-site inspection time is also reduced because the units are UL (Underwriters' Laboratories) (208/230- and 460-v) and CSA (Canadian Standards Association) (575-v) listed, and meet ASME (American Society of Mechanical Engineers) standards. Important added standard features include dual refrigerant circuits, and pulldown capability from 95 F loop temperature. Installation time is further reduced through provision for single-point electrical and cooler connections.

Design flexibility

Consulting engineers will appreciate the wide chiller operating range offered by the 30GN and GT chiller systems. The advanced microprocessor controls enable building operators to select imaginative operating control strategies for their particular needs. In addition, the units offer the best water temperature control through the application of proportional integral derivative (PID) logic with return water temperature compensation. This Carrier

exclusive permits variable flow and application flexibility. These features are available for applications requiring them: Brine, copper fin/copper tube condensers, low ambient temperature operation down to -20°F , temperature reset, and 2-step load shedding (from network or remote source).

Flotronic™ control is available with 30GT040-280. Flotronic II control is available with 30GN040-210 and 30GT225-280. Flotronic II system offers the same superior control sophistication as the Flotronic system, with the addition of CCN (Carrier Comfort Network) compatibility, and 8-character alphanumeric information display with remote mounting capability, remote access to 88 chiller control information points, remote set point scheduling capability, and easy 3-wire hookup.

Serviceability

Ease of service and maintenance add to the long run operating savings benefits which are yours with the 30GN, GT units. Hinged access panels let the service technician get to the problem fast. A standard 2-digit (Flotronic) or optional 8-character (Flotronic II) diagnostic display panel quickly pinpoints the location of the

problem, eliminating the need to spend costly hours searching for a problem source. The Flotronic II control option maintains a valuable record of the machine's history, complete with starts and run data for periodic service or maintenance reference. Service technicians find this electronic record system invaluable in efficiency diagnosis and long-term equipment management. Ground current sensing eliminates the need for refrigerant replacement, by preventing compressor motor burnouts that add acids to the refrigerant.

Another advantage is the popular 06E compressor, long recognized by field technicians as easy to maintain.

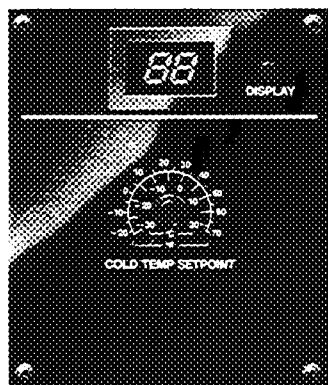
Quality and reliability

To assure long-life quality performance, every standard unit is factory run tested. The dependable direct drive fans are built to NEMA (National Electrical Manufacturing Association) standards, and the units are equipped with famous 06E Carrier semi-hermetic compressors, built for performance excellence in Carrier equipment worldwide. Refrigerant flow control provided by electronic expansion valve (EXV) precision keeps compressor motors cooler while operating at the

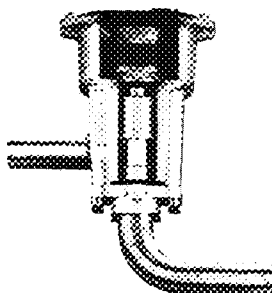
optimum efficiency. The automatic lead/lag control manages an even distribution of starts and run hours between refrigerant circuits. The superior microprocessor control package requires fewer moving control circuit parts for long-life dependability. The microprocessor controls the full refrigeration cycle (compressors, fans, and expansion valve) to assure efficient, synchronized operation.

Operating efficiency

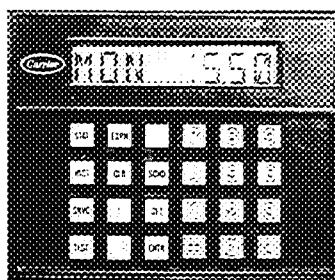
The Flotronic chillers offer outstanding EERs (Energy Efficiency Ratios). Exceptional part-load performance (chillers operate at part load 97% of the time) provides increased operating savings through use of multiple compressors per refrigerant circuit, and suction cutoff unloading. A fully integrated microprocessor control system (another Carrier exclusive) maintains efficient control over the compressors, EXV, and fans, to optimize chiller efficiency. Up to 28% efficiency improvement at part load conditions is achieved over standard competitive chillers. The system integrated subcooler provides an extra measure of unit efficiency. Additional increases in EER up to 15% may result with standard return water temperature reset.



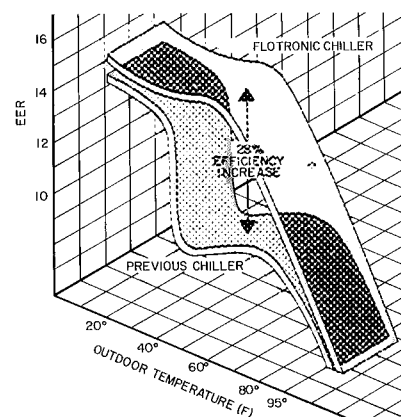
**STANDARD 2-DIGIT DISPLAY
(FLOTTRONIC)**



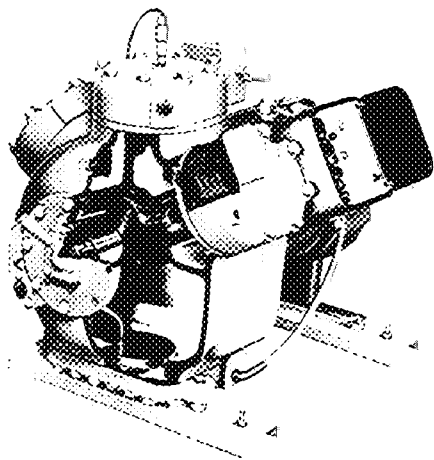
**ELECTRONIC EXPANSION
VALVE (EXV)**



**OPTIONAL 8-CHARACTER DISPLAY
(FLOTTRONIC II)**



**PART-LOAD EFFICIENCY
28% GAIN**



06E COMPRESSOR

**FACTORY
RUN TEST**

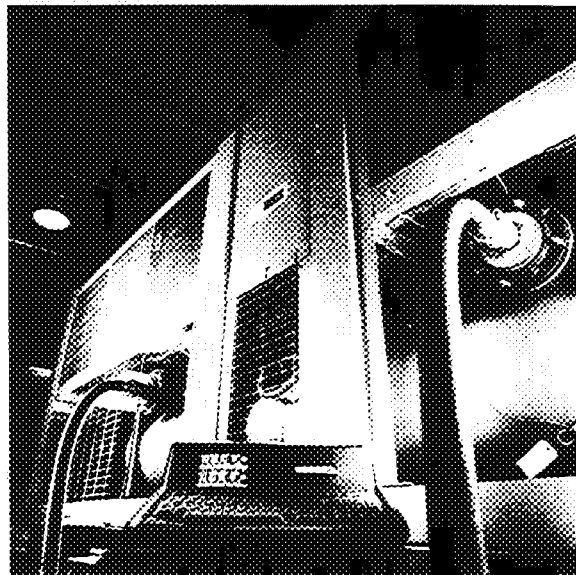
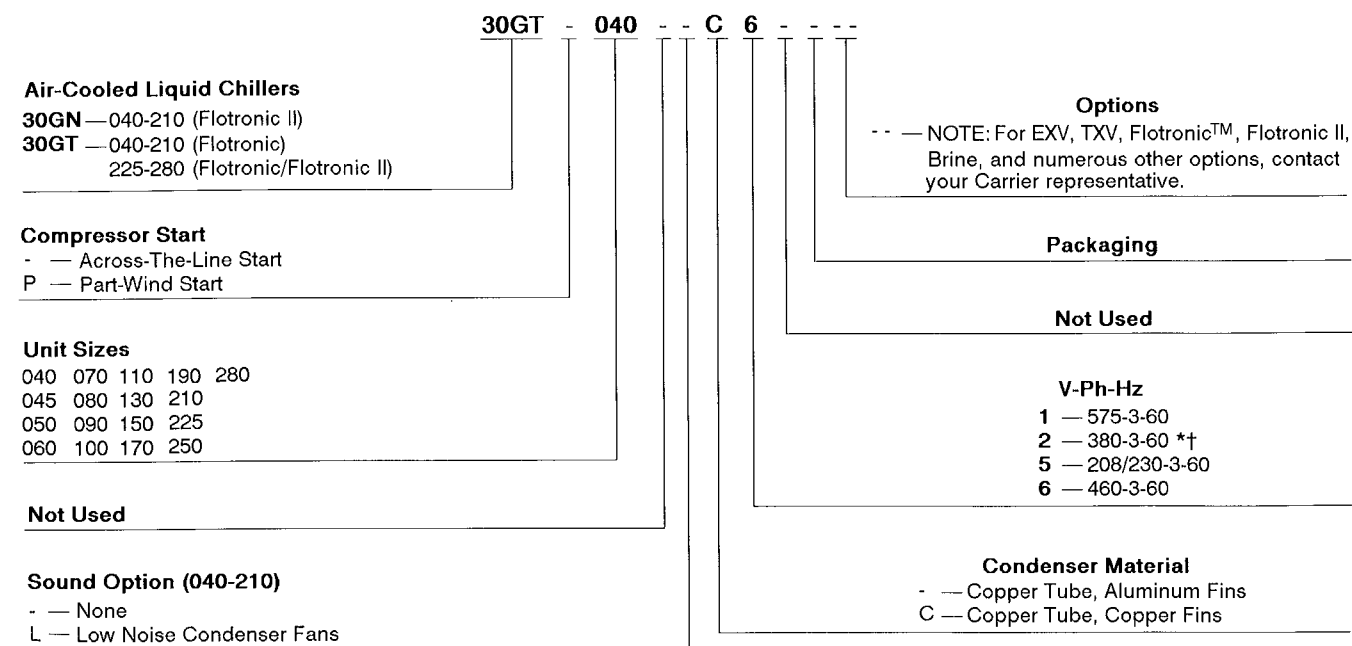


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Model number nomenclature



*Export only — not for U.S. domestic sale

†Three-phase, 3-wire or 4-wire (with neutral), depending on model.

Physical data — 30GN,GT — English



UNIT SIZE 30GN,GT		040	045	050	060	070	080	090
APPROX OPER WT — lb	C-AL	3550	3681	3856	4740	5028	6630	7015
	C-C	3838	3969	4289	5157	5656	7355	7740
REFRIG CHG — lb								
R-22	Ckt A	39	40	48	52	70	78	78
	Ckt B	48	46	60	54	69	78	78
COMPRESSORS, Type...Rpm		Reciprocating, Semi-Hermetic .1750						
06E	(Qty) Ckt A	(1) 250	(1) 250	(1) 265	(1) 275	(1) 299	(1) 275, (1) 250	(1) 265, (1) 250
	(Qty) Ckt B	(1) 250	(1) 265	(1) 275	(1) 299	(1) 299	(1) 299	(2) 265
Capacity Control Steps, GN/GT		4/4	4/4	4/4	4/4	4/4	8/6	11/8
% Cap.		50	42	48	43	50	56	47
Minimum Step Capacity (%)		50	58	52	57	50	44	53
Std/Accessory*		25/25†	21/19†	32/16†	29/14†	33/17†	22/11†	18/9†
CONDENSER FANS — Type		Propeller, Direct Drive						
Fan Speed — Rpm		1140						
No. Blades...Diameter — in.		4 30						
No. Fans...Total kW		4...6.2	4 6.2	4 6.2	6.. 9.3	6. 9.3	6. 9.4	6 9.4
Total Airflow — Cfm		35,000	35,000	34,000	52,000	51,000	57,000	57,000
CONDENSER COILS — Type		Alum Fins — Copper Tube (Std)**						
Tubes (Copper), OD — in.		3/8						
Fins/in.		17						
No. Rows — Each Ckt		2	2	3	2	3	3	3
Face Area — sq ft		80.5	80.5	80.5	116.7	116.7	128.3	128.3
Total 2 Ckts		450						
Max. Working Pressure, Refrigerant — psig								
COOLER — No. ...Type		One Direct Expansion, Shell and Tube						
No. Refrigerant Circuits		2	2	2	2	2	2	2
Net Water Volume — Gal. (includes nozzles)		10.9	13.5	13.5	18.0	18.0	24.5	24.5
Max. Working Press. Refrigerant Side/Water Side — psig		278/300						
WATER CONNECTIONS — in.		Cooler; Victaulic Type						
Inlet and Outlet		3	3	3	4	4	4	4
Drain		3/4 NPT						

UNIT SIZE 30GN,GT		100	110	130	150	170	190	210
APPROX OPER WT — lb	C-AL	8,610	8,660	10,046	10,481	11,293	12,676	13,380
	C-C	9,560	9,610	11,318	11,753	12,565	14,195	14,899
REFRIG CHG — lb								
R-22	Ckt A	98	98	160	160	160	220	220
	Ckt B	105	105	160	160	160	220	220
COMPRESSORS, Type...Rpm		Reciprocating, Semi-Hermetic.. 1750						
06E	(Qty) Ckt A	(1) 265, (1) 275	(1) 265, (1) 299	(1) 275, (1) 299	(3) 265	(3) 275	(1) 265, (1) 275, (1) 299	(3) 265, (1) 175
	(Qty) Ckt B	(1) 265, (1) 275	(1) 265, (1) 275	(1) 275, (1) 299	(2) 299	(3) 275	(1) 265, (1) 275, (1) 299	(1) 275, (2) 299
Capacity Control Steps		11 (GN), 8 (GT)						
% Cap.		50	54	50	50	50	50	42
Minimum Step Capacity (%)		50	46	50	50	50	50	58
Std/Accessory*		16/8†	14/7†	14/7†	11/6†	11/6†	9/5†	12/9†
CONDENSER FANS — Type		Propeller, Direct Drive						
Fan Speed — Rpm		1140						
No. Blades...Diameter — in.		4 30						
No. Fans...Total kW		8 . 12.7	8 . 12.7	10 15.5	10. 15.5	10. 15.5	12 18.6	12 18.6
Total Airflow — Cfm		76,000	76,000	98,000	98,000	98,000	117,600	117,600
CONDENSER COILS — Type		Alum. Fins — Copper Tube (Std)**						
Tubes (Copper), OD — in.		3/8						
Fins/in.		17						
No. Rows — Each Ckt		3						
Face Area — sq ft		168	168	225	225	225	269	269
Total 2 Ckts		450						
Max. Working Pressure, Refrigerant — psig								
COOLER — No. ...Type		One Direct Expansion, Shell and Tube						
No. Refrigerant Circuits		2						
Net Water Volume — Gal. (includes nozzles)		30.3	30.3	50.5	50.5	59.8	59.8	70.4
Max. Working Press. Refrigerant Side/Water Side — psig		278/300						
WATER CONNECTIONS — in.		Cooler; Victaulic Type						
Inlet and Outlet		5	5	6	6	6	6	6
Drain		3/4 NPT						



UNIT SIZE 30GT		225	250	280
APPROX OPER WT — lb	C-AL	15,340	19,290	19,590
	C-C	17,240	21,730	22,270
REFRIG CHG — lb				
R-22	Ckt A	190	280	305
	Ckt B	190	335	371
COMPRESSORS, Type...Rpm		Reciprocating, Semi-Hermetic.. 1750		
06E	(Qty) Ckt A	(3) 275, (1) 299	(2) 275, (2) 299	(4) 299
	(Qty) Ckt B	(3) 275, (1) 299	(2) 275, (2) 299	(4) 299
Capacity Control Steps		8	8	8
% Cap.	Ckt A	50	50	50
	Ckt B	50	50	50
Minimum Step Capacity (%)		12/7 7†	11/7 1†	13/8 3†
CONDENSER FANS — Type		Propeller, Direct Drive		
Fan Speed — Rpm		1140		
No. Blades...Diameter — in.		4 30		
No. Fans...Total kW		16 . 24 8	20 . 31 0	22 34 1
Total Airflow — Cfm		136,000	170,000	187,000
CONDENSER COILS — Type		Alum Fins — Copper Tube (Std)**		
Tubes (Copper), OD — in.		¾		
Fins/in.		17		
No. Rows — Each Ckt		3	3	3
Face Area — sq ft		336	430 7	474 4
Total 2 Ckts			450	
Max. Working Pressure, Refrigerant — psig				
COOLER — No. ...Type		One Direct Expansion, Shell and Tube		
No. Refrigerant Circuits		2	2	2
Net Water Volume — Gal. (includes nozzles)		70.4	100 7	100 7
Max. Working Press. Refrigerant Side/Water Side — psig			235/300	
WATER CONNECTIONS — in.		Cooler; Victaulic Type		
Inlet and Outlet		6	8	8
Drain			¾ FPT	

LEGEND

C-AL — Copper Tubing-Aluminum Fins Condenser Coil
C-C — Copper Tubing-Copper Fins Condenser Coil

*Standard unit with accessory unloader (040 step value is unchanged).

†Accessory unloaders can be added to GN,GT040-070, GN080-210, and GT225-280 (Flotronic™ II control only)

**Copper fins also available

NOTES:

- 1 For Capacity Control Steps for all units, see appropriate product Controls and Troubleshooting book
- 2 Facing the compressors, Circuit A is on the right, and Circuit B is on the left

Physical data — 30GN,GT — SI



UNIT SIZE 30GN,GT		040	045	050	060	070	080	090
APPROX OPER WT — kg	C-AL	1610	1669	1749	2150	2280	3013	3189
	C-C	1741	1800	1945	2339	2565	3343	3518
REFRIG CHG — kg								
R-22	Ckt A	18	18	22	24	32	35	35
	Ckt B	22	21	27	25	31	35	35
COMPRESSORS, Type...r/s		Reciprocating, Semi-Hermetic 29.2						
06E	(Qty) Ckt A	(1) 250	(1) 250	(1) 265	(1) 275	(1) 299	(1) 275, (1) 250	(1) 265, (1) 250
	(Qty) Ckt B	(1) 250	(1) 265	(1) 275	(1) 299	(1) 299	(1) 299	(2) 265
Capacity Control Steps, GN/GT		4/4	4/4	4/4	4/4	4/4	8/6	11/8
% Cap. Ckt A		50	42	48	43	50	56	47
Ckt B		50	57	52	57	50	44	53
Minimum Step Capacity (%)		25/25†	21/19†	32/16†	29/14†	33/17†	22/11†	18/9†
CONDENSER FANS — Type		Propeller, Direct Drive						
Fan Speed — r/s		19						
No. Blades...Diameter — mm		4 762						
No. Fans...Total kW		4. 6.2	4. 6.2	4. 6.2	6.. 9.3	6 9.3	6. 9.4	6. 9.4
Total Airflow — L/s		16 517	16 517	16 045	24 540	24 068	26 898	26 898
CONDENSER COILS — Type		Alum Fins — Copper Tube (Std)**						
Tubes (Copper), OD — mm		9.5						
Fins/m		669						
No. Rows — Each Ckt		2	2	3	2	3	3	3
Face Area — m ²		7.5	7.5	7.5	10.8	10.8	11.9	11.9
Total 2 Ckts		3103						
Max. Working Pressure, Refrigerant — kPa								
COOLER — No. ...Type		One Direct Expansion, Shell and Tube						
No. Refrigerant Circuits		2	2	2	2	2	2	2
Net Water Volume — L (includes nozzles)		41.3	51.2	51.2	68.3	68.3	92.9	92.9
Max. Working Press. Refrigerant Side/Water Side — kPa		1916/2068						
WATER CONNECTIONS — in.		Cooler; Victaulic Type						
Inlet and Outlet		3	3	3	4	4	4	4
Drain		¾ NPT						

UNIT SIZE 30GN,GT		100	110	130	150	170	190	210
APPROX OPER WT — kg	C-AL	3914	3935	4566	4754	5133	5761	6081
	C-C	4346	4566	5144	5342	5711	6452	6722
REFRIG CHG — kg								
R-22	Ckt A	45	45	72.7	72.7	72.7	100	100
	Ckt B	48	48	72.7	72.7	72.7	100	100
COMPRESSORS, Type...r/s		Reciprocating, Semi-Hermetic 29.2						
06E	(Qty) Ckt A	(1) 265, (1) 275	(1) 265, (1) 299	(1) 275, (1) 299	(3) 265	(3) 275	(1) 265, (1) 275, (1) 299	(3) 265, (1) 175
	(Qty) Ckt B	(1) 265, (1) 275	(1) 265, (1) 275	(1) 275, (1) 299	(2) 299	(3) 275	(1) 265, (1) 275, (1) 299	(1) 275, (2) 299
Capacity Control Steps		11 (GN), 8 (GT)						
% Cap. Ckt A		50	54	50	50	50	50	59
Ckt B		50	46	50	50	50	50	58
Minimum Step Capacity (%)		16/8†	14/7†	14/7†	11/6†	11/6†	9/5†	12/9†
CONDENSER FANS — Type		Propeller, Direct Drive						
Fan Speed — r/s		19						
No. Blades...Diameter — mm		4 762						
No. Fans...Total kW		8. 12.7	8 12.7	10.. 15.5	10. 15.5	10 15.5	12. 18.6	12. 18.6
Total Airflow — L/s		35 864	35 864	46 246	46 246	46 246	55 495	55 495
CONDENSER COILS — Type		Alum Fins — Copper Tube (Std)**						
Tubes (Copper), OD — mm		9.5						
Fins/m		669						
No. Rows — Each Ckt		3						
Face Area — m ²		15.6	15.6	20.6	20.6	20.6	25.0	25.0
Total 2 Ckts		3103						
Max. Working Pressure, Refrigerant — kPa								
COOLER — No. ...Type		One Direct Expansion, Shell and Tube						
No. Refrigerant Circuits		2						
Net Water Volume — L (includes nozzles)		114.6	114.6	191	191	226	226	266.5
Max. Working Press. Refrigerant Side/Water Side — kPa		1916/2068						
WATER CONNECTIONS — in.		Cooler; Victaulic Type						
Inlet and Outlet		5	5	6	6	6	6	6
Drain		¾ NPT						



UNIT SIZE 30GT		225	250	280
APPROX OPER WT — kg	C-AL	6958	8750	8886
	C-C	7820	9857	10 100
REFRIG CHG — kg				
R-22	Ckt A	86	127	138
	Ckt B	86	152	168
COMPRESSORS, Type...r/s		Reciprocating, Semi-Hermetic ..29 2		
06E	(Qty) Ckt A	(1) 275, (3) 299	(4) 299	(4) 299
	(Qty) Ckt B	(4) 299	(4) 299	(4) 299
Capacity Control Steps		8	8	8
% Cap.	Ckt A	50	50	50
	Ckt B	50	50	50
Minimum Step Capacity (%)		12/7 7†	11/7 1†	13/8 3†
CONDENSER FANS — Type		Propeller, Direct Drive		
Fan Speed — r/s		19		
No. Blades...Diameter — mm		4 . 762		
No. Fans...Total kW		16 24.8	20 31.0	22 34.1
Total Airflow — L/s		64 178	80 223	88 245
CONDENSER COILS — Type		Alum Fins — Copper Tube (Std)**		
Tubes (Copper), OD — mm		9.5		
Fins/m		669		
No. Rows — Each Ckt		3	3	3
Face Area — m ²		40		
Total 2 Ckts		31 2	44	44
Max. Working Pressure, Refrigerant — kPa		3103		
COOLER — No. ...Type		One Direct Expansion, Shell and Tube		
No. Refrigerant Circuits		2	2	2
Net Water Volume — L (includes nozzles)		266 5	381	381
Max. Working Press. Refrigerant Side/Water Side — kPa		1620/2068		
WATER CONNECTIONS — in.		Cooler; Victaulic Type		
Inlet and Outlet		6	8	8
Drain		¾ FPT		

LEGEND

C-AL — Copper Tubing-Aluminum Fins Condenser Coil

C-C — Copper Tubing-Copper Fins Condenser Coil

*Standard unit with accessory unloader (040 step value is unchanged).

†Accessory unloaders can be added to GN,GT040-070, GN080-210, and GT225-280 (Flotronic™ II control only)

**Copper fins also available

NOTES:

- 1 For Capacity Control Steps for all units, see appropriate product Controls and Troubleshooting book
- 2 Facing the compressors, Circuit A is on the right, and Circuit B is on the left

Factory-installed options



Thermostatic expansion valves (TXV) (30GT040-110) are for those situations where energy savings of the EXV are secondary and equipment first costs are most important. With this option, the electronic expansion valve and controls and part-load energy savings related to the EXV function are replaced by TXVs and liquid line solenoid valves. Minimum operating ambient temperature for TXV-equipped units with standard head pressure control is 35 F (1.7 C). Contact your Carrier representative for details on operation at temperatures below 35 F (1.7 C). This option has full microprocessor temperature control features and diagnostic capability

Hot gas bypass option allows additional capacity reduction for unit operation below the minimum step of unloading. It is available on all 30GT040-070 units, and on 30GN040 unit

Cooler heater protects cooler to -20 F (-29 C). Includes controls, and 4 cooler tape heaters (sizes 040-050), 6 heaters (sizes 060, 070), 8 heaters (sizes 080-210) — 210 w each. Standard on 30GT225-280.

Sound reduction option (30GN,GT040-210) consists of specially designed system of fans and acoustic enclosures for reducing sound levels without compromising chiller performance

Low-ambient Motormaster® III control allows unit operation to -20 F (-29 C) on all unit sizes

Copper tube/copper fin condensers prolong condenser coil life in seacoast applications

Flotronic™ II control includes standard features plus 7-day time schedule and 8-character alphanumeric diagnostic display/set point panel that displays evaporator and condensing pressures and actual temperatures. Panel has remote mounting capability. Control option also includes standard return reset and Carrier Comfort Network (CCN) compatibility

Part-wind (PW) start generally is not required where multiple 06E compressors are installed. The starting current is generally lower than a larger compressor using PW start. However, a part-wind start option is available (denoted by a **P** in the fifth position of the unit model number) for all sizes.

Brine option for all sizes permits leaving liquid temperatures to be set between 15 and 39 F (-9.4 and 3.9 C). Refrigeration circuit components, such as the expansion device, are modified to correct for the lower refrigeration flow rates

Field-installed accessories

Ground current protection includes an electronic sensor that monitors all phases of the 3-phase power supply to the compressor. At the first sign of a short to the ground, the sensor shuts down the compressor, preventing contamination of the refrigerant system. Accessory with 040-070 sizes only (standard on 080-280 sizes)

Motormaster III head-pressure control allows unit to operate down to -20 F (-29 C)

Control options board (30GT225-280 Flotronic II units) allows microprocessor control to control accessory unloaders, demand limit, and temperature reset.

Sound reduction kit (30GN,GT040-210) consists of a specially-designed system of fans and acoustic enclosures for reducing sound levels without compromising chiller performance. No fan motor change is required, and the fan system is compatible with Motormaster III control. Packaged in sets of 2 kits per package

Security grilles protect the chiller cooler compressors and condenser coils from damage due to vandalism

Additional electric suction cutoff unloader(s) can be field-installed as follows:

UNITS 30	UNLOADERS
GT040-070	One on Compressor B1
GN050-070	One on Compressor A1 Two on Compressor B1
GN040	One on Compressor B1 None on Compressor A1
GN045	None on Compressor A1 Two on Compressor B1
GN080-210	One for lead compressor of each circuit. Requires use of control options board (included)
GT225-280 Flotronic™ II	One for lead compressor of each circuit. Requires accessory control options board

Discharge and suction pressure gage panel aids in routine maintenance when reading system pressures. Both pressure gages are mounted on a common panel. Each gage is equipped with a shutoff valve. Each lead compressor requires a separate gage panel



Oil pressure switch package includes 2 oil pressure switches for unit. Mounts on lead compressor in each refrigerant circuit. Accessory with 040-070 sizes (standard on 080-280 sizes).

Temperature reset board (30GT) is used for leaving-water temperature reset. Reset can be based on return-water temperature, space temperature, or outdoor temperature. The temperature reset board lets the unit reset the leaving-water temperature to a higher value during low load conditions. On Flotronic™ II units, the accessory requires use of the control options board (not the reset board). Both boards require an accessory thermistor for outdoor and space temperature reset.

Demand limit control module accessory has a 2-point adjustment (0-49% and 50-100%), activated by a remote signal, either 115 v or 230 v. This module is a prewired board for 30GT units.

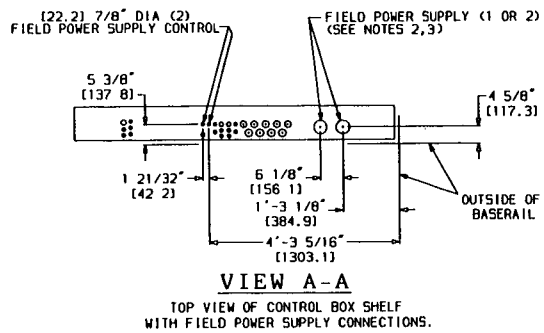
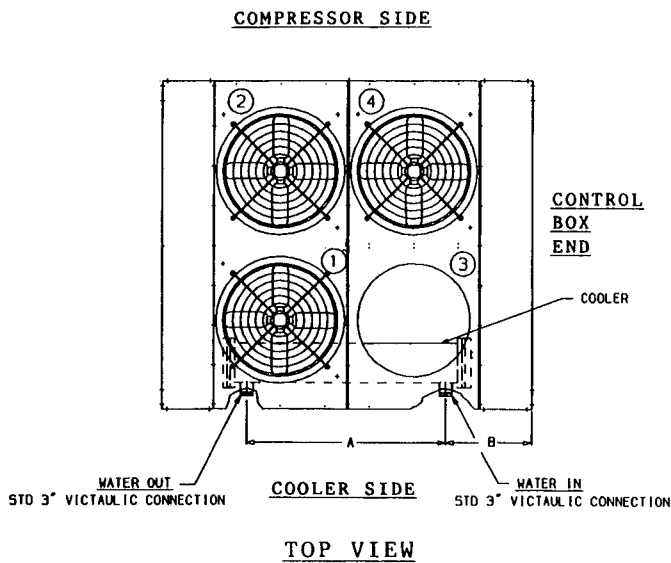
Hot gas bypass package, for sizes 040-210, includes control solenoid valves and the hot gas bypass valve along with installation instructions. Piping and electrical connections are made easy by factory-provided piping stubs and electrical terminal blocks.

Condenser coil hail guard package includes louvered condenser coil hail guards and installation hardware.

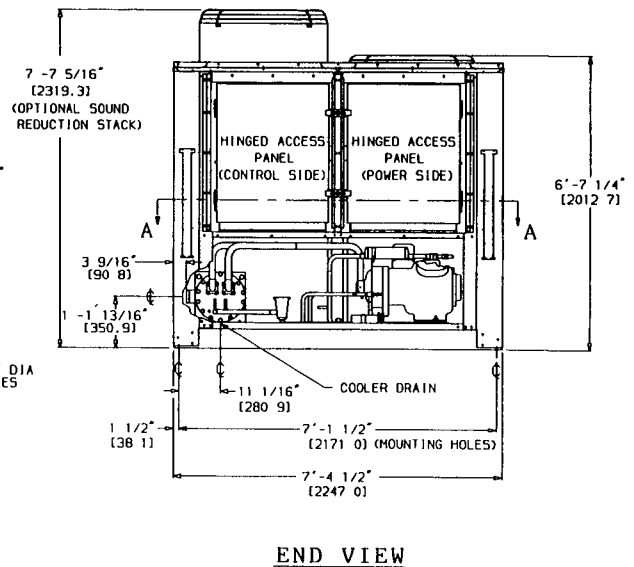
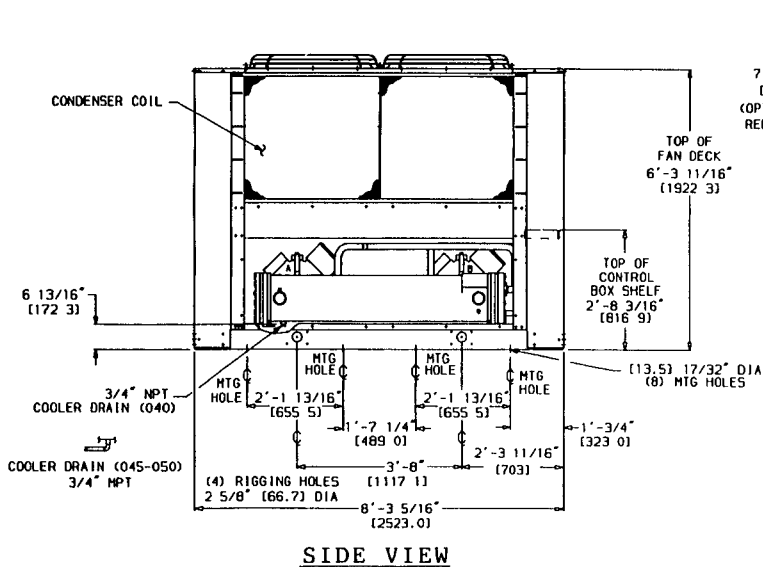
Control transformer (30GN,GT040-210) is sized to supply the needs of the control circuit, sourcing power from the main unit power connection.

Chilled water flow switch accessory is available for field installation (all sizes) although low water flow detection is provided by the unit internal control devices.

Base unit dimensions — 30GN,GT040-050



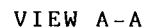
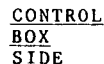
30GN,GT	A	B
040	4'-5 1/2" (1359)	1'-11 1/8" (588)
045, 050	5'-5 1/2" (1663)	1'-5 3/16" (437)



NOTES:

- Unit must have clearances for airflow as follows:
Top — Do not restrict in any way
Ends — 5 ft [1524]
Sides — 6 ft [1829]
- Two 2 in. dia holes are recommended for parallel conductors on 040 and 045 (208/230 v) units
- One 3 in. dia hole is recommended for single entry power on 050 (208/230 v) units
- Mounting holes may be used to mount unit to concrete pad. They are not recommended for spring isolator location.
- If spring isolators are used, a perimeter support channel between the unit and the isolators is recommended.
- Dimensions in [] are in millimeters

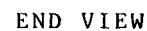
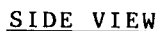
Carrier



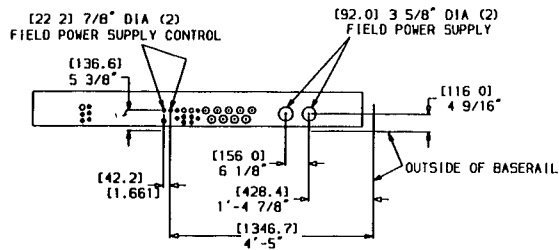
TOP VIEW OF CONTROL BOX SHELF
WITH FIELD POWER SUPPLY CONNECTIONS.

NOTES:

- NOTES:
- 1 Unit must have clearances for airflow as follows:
 - Top — Do not restrict in any way
 - Ends — 5 ft [1524]
 - Sides — 6 ft [1829]
 - 2 Mounting holes may be used to mount unit to concrete pad
 - 3 They are not recommended for spring isolator location
 - 4 If spring isolators are used, a perimeter support channel between the unit and the isolators is recommended
 - 5 Dimensions in [] are in millimeters



Base unit dimensions — 30GN,GT080,090

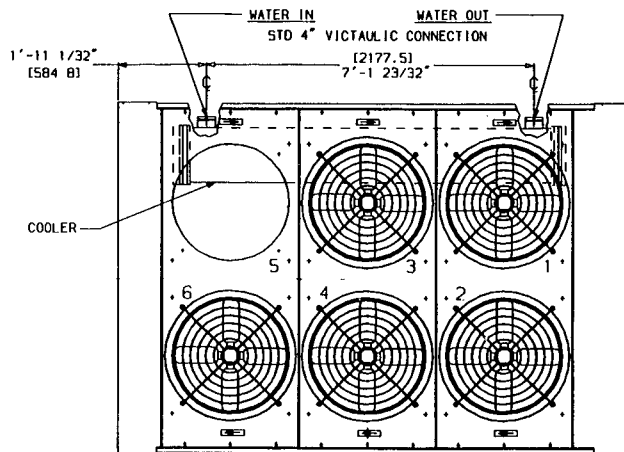


VIEW A-A

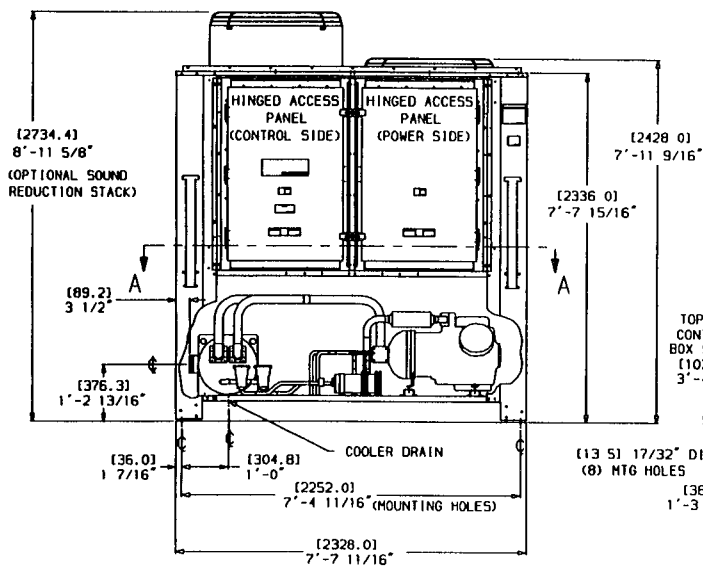
TOP VIEW OF CONTROL BOX SHELF
WITH FIELD POWER SUPPLY CONNECTIONS

NOTES:

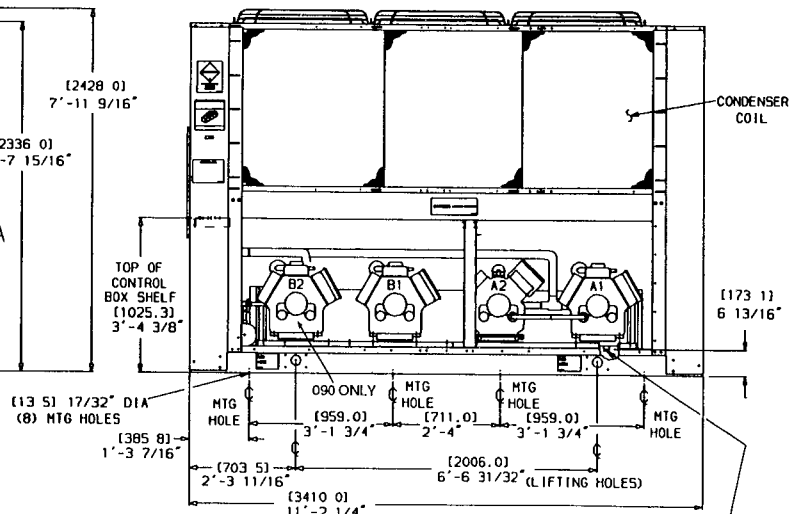
- Unit must have clearances for airflow as follows:
Top — Do not restrict in any way
Ends — 5 ft [1524]
Sides — 6 ft [1829]
- Mounting holes may be used to mount unit to concrete pad
They are not recommended for spring isolator location
- If spring isolators are used, a perimeter support channel between the unit and the isolators is recommended
- Dimensions in [] are in millimeters



TOP VIEW



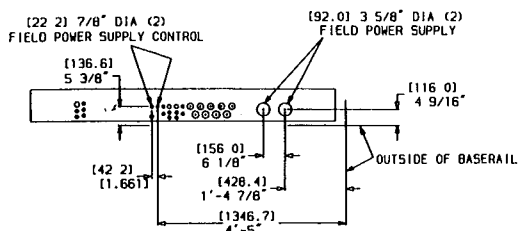
END VIEW



SIDE VIEW

3/4\"/>

Base unit dimensions — 30GN,GT100,110

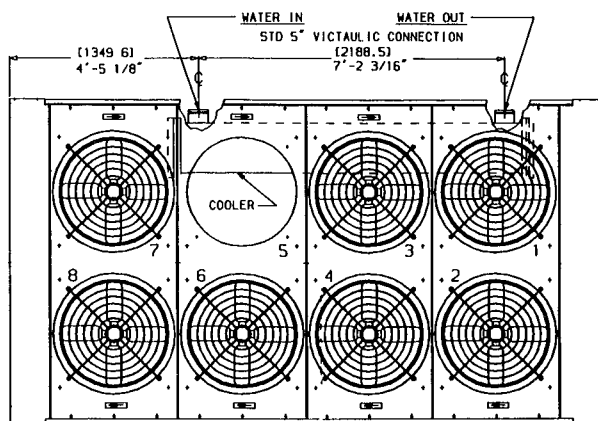


VIEW A-A

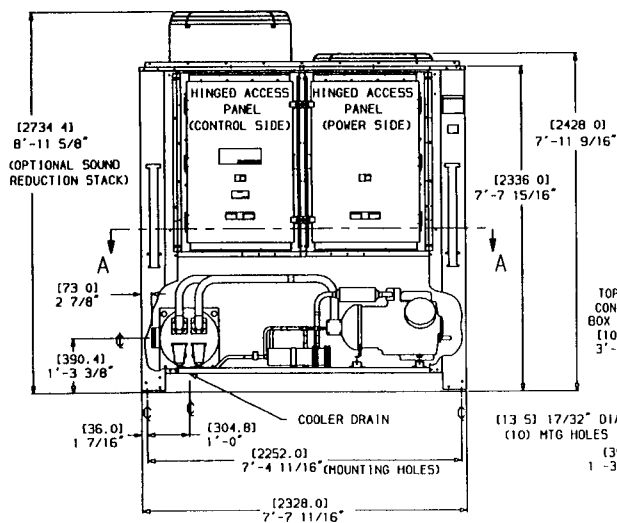
TOP VIEW OF CONTROL BOX SHELF
WITH FIELD POWER SUPPLY CONNECTIONS

NOTES:

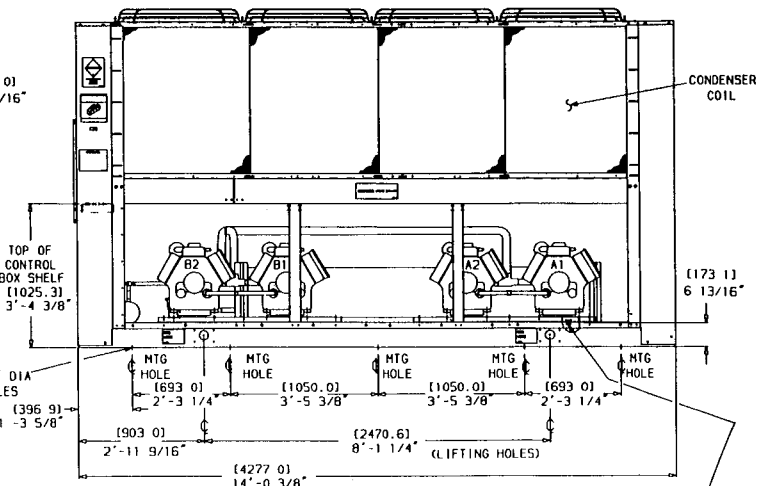
- Unit must have clearances for airflow as follows:
Top — Do not restrict in any way
Ends — 5 ft [1524]
Sides — 6 ft [1829]
- Mounting holes may be used to mount unit to concrete pad
They are not recommended for spring isolator location
- If spring isolators are used, a perimeter support channel between the unit and the isolators is recommended
- Dimensions in [] are in millimeters



TOP VIEW



END VIEW

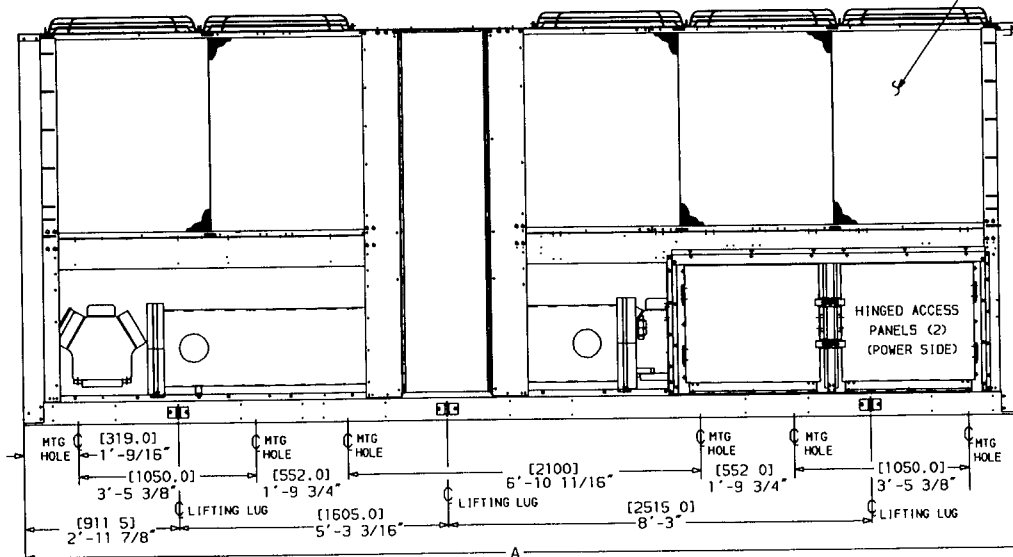
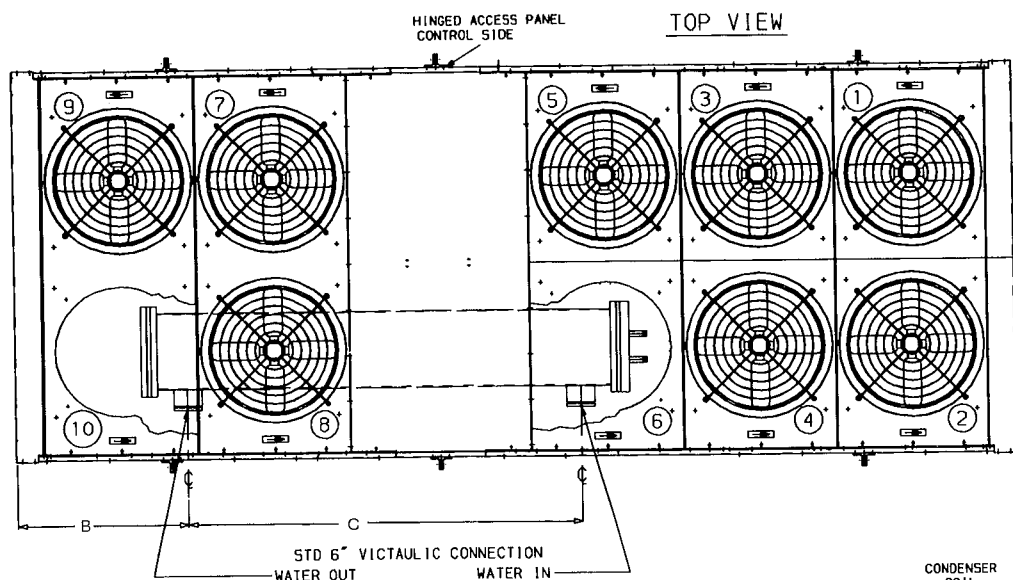


SIDE VIEW

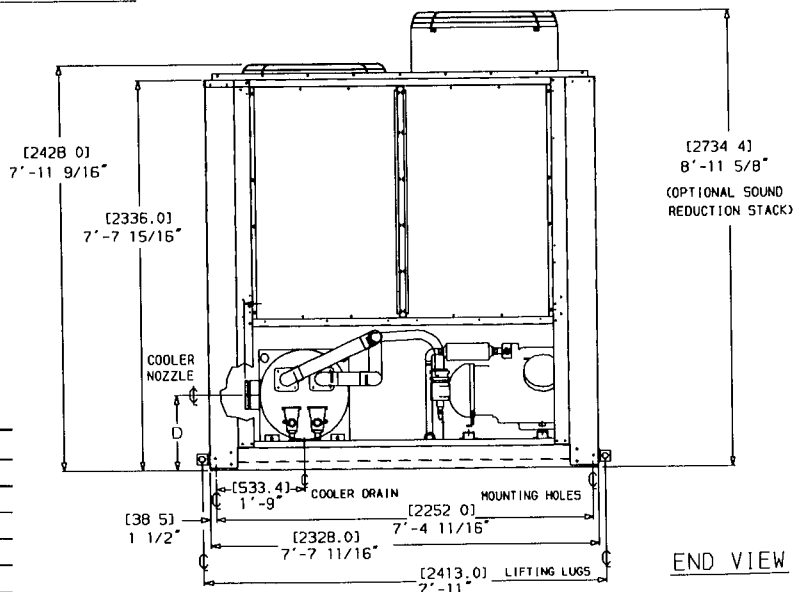
3/4\"/>

Base unit dimensions — 30GN,GT130-210

Carrier®



FRONT VIEW



END VIEW

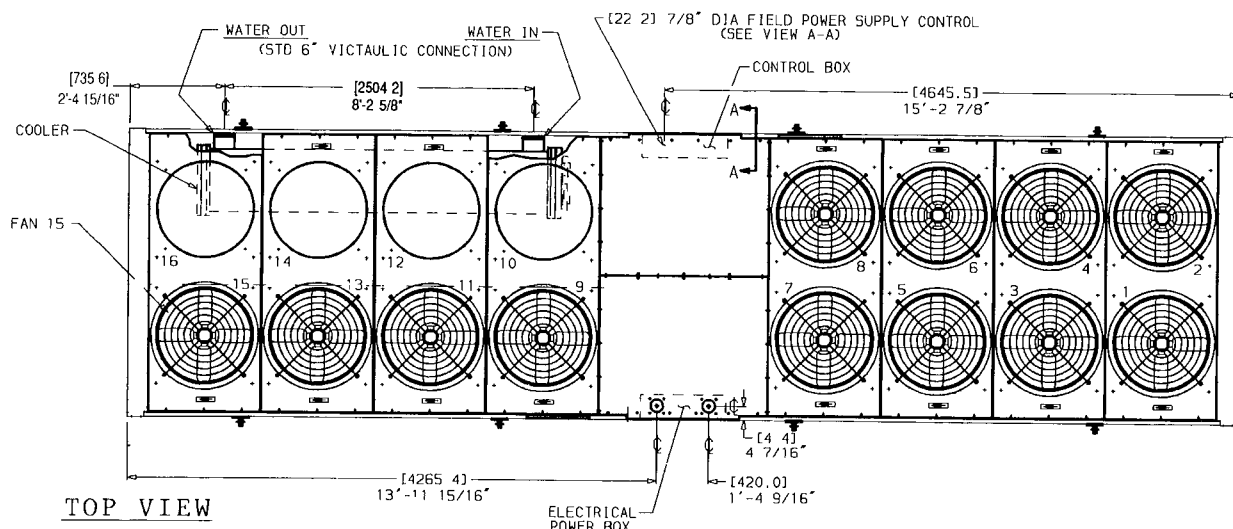
NOTES:

- Unit must have clearances for airflow as follows:
Top — Do not restrict in any way
Ends — 5 ft [1524]
Sides — 6 ft [1829]
- Unit sizes 190 and 210 have 12 fans
- Dimensions in [] are in millimeters

DIMENSIONS, ft-in. [mm]

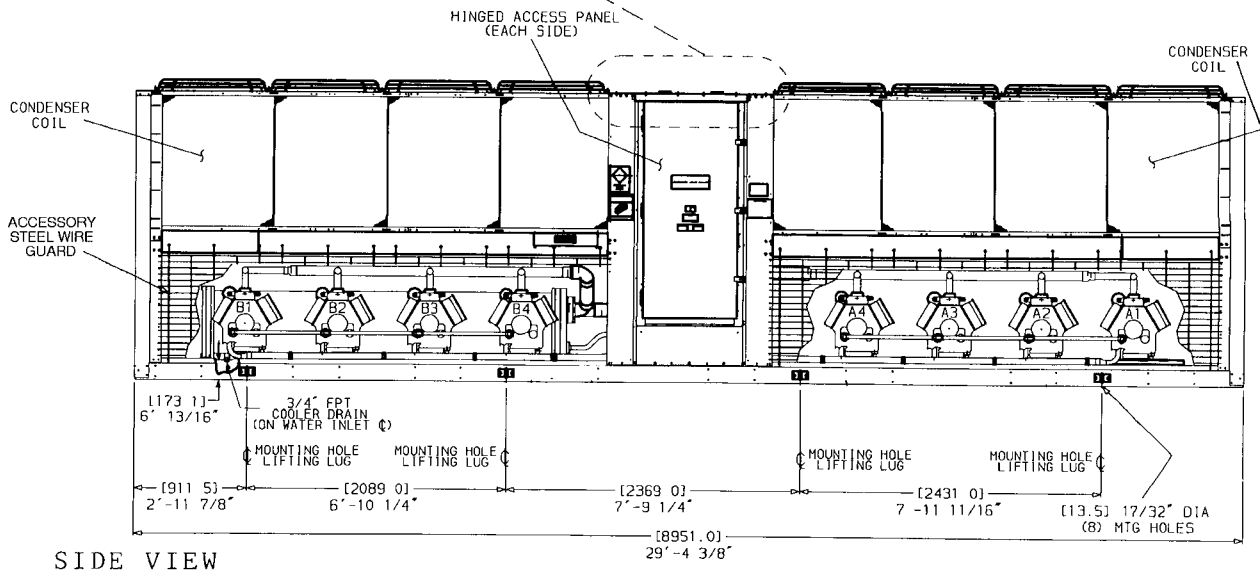
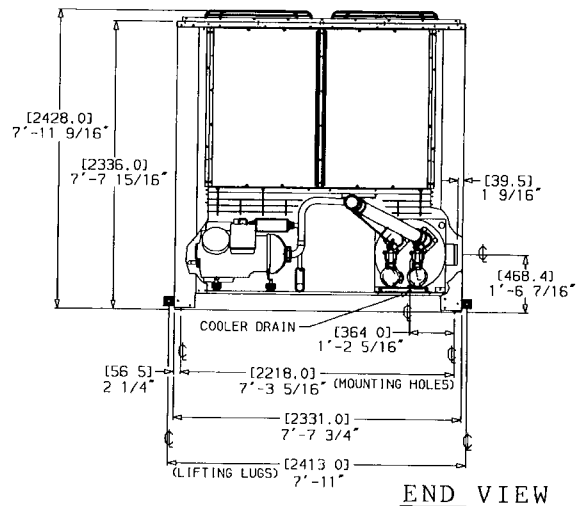
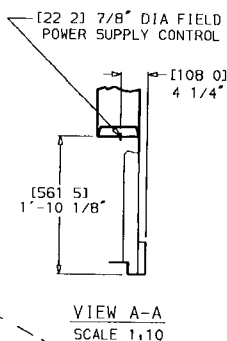
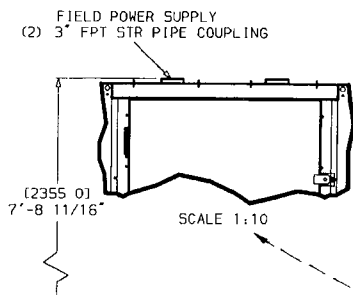
DIM.	UNIT 30GN,GT			
	130	150	170	210
A	19-5 ⁵ / ₁₆ [5926]			22-5 ¹ / ₂ [6845]
B	3-3 ³ / ₈ [1006]		6-3 ⁷ / ₁₆ [1916]	5-11 ⁷ / ₁₆ [1815]
C		7-8 ¹ / ₄ [2343]		8-2 ⁵ / ₈ [2505]
D	1-4 ³ / ₄ [425]		1-5 ⁵ / ₈ [448]	1-6 ⁷ / ₁₆ [468]

Base unit dimensions 30GT225



NOTES:

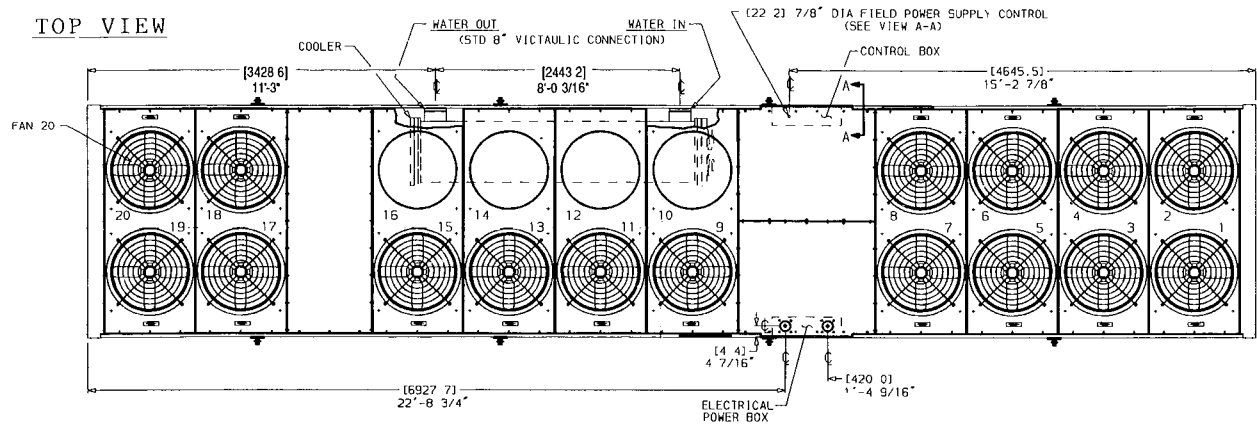
1. Dimensions in [] are in millimeters
2. Units must have clearances for airflow as follows:
Top — Do not restrict in any way
Ends — 5 ft [1524]
Sides — 6 ft [1829]



Base unit dimensions — 30GT250

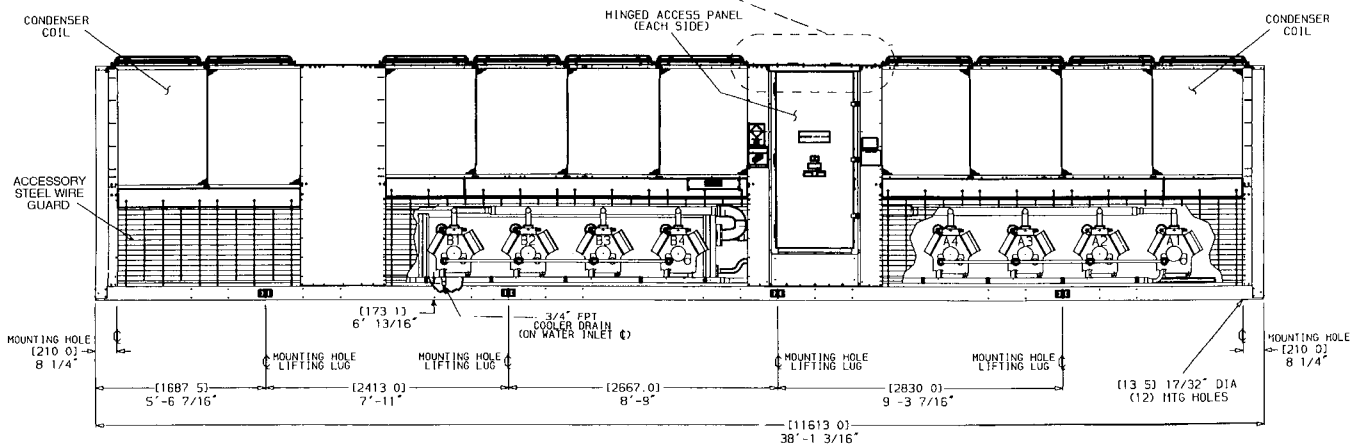
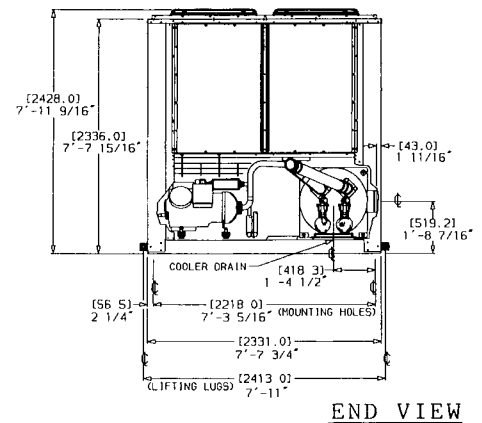
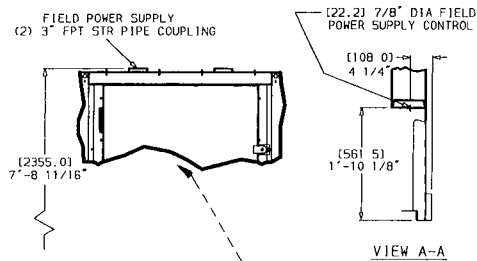


TOP VIEW



NOTES:

- 1 Dimensions in [] are in millimeters
- 2 Units must have clearances for airflow as follows:
 Top — Do not restrict in any way
 Ends — 5 ft [1524]
 Sides — 6 ft [1829]

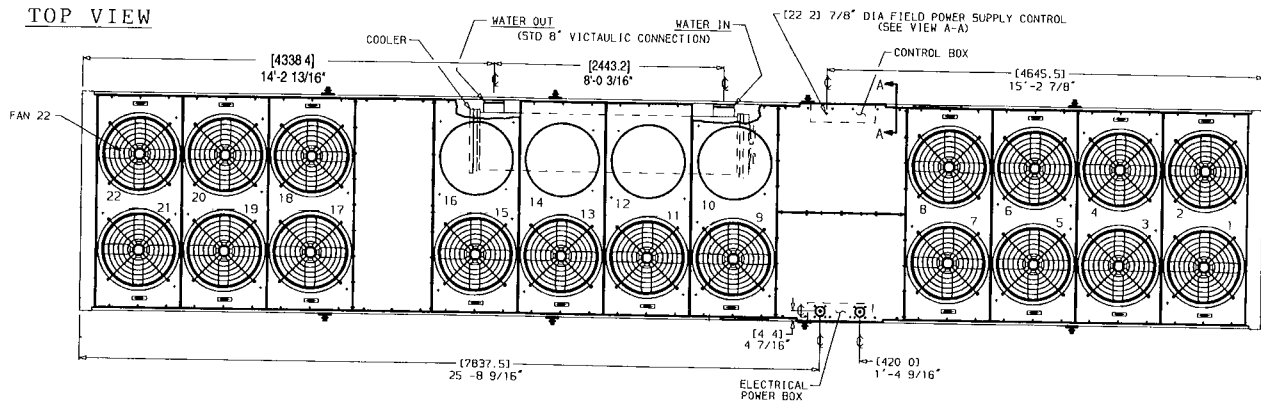


SIDE VIEW

Base unit dimensions — 30GT280

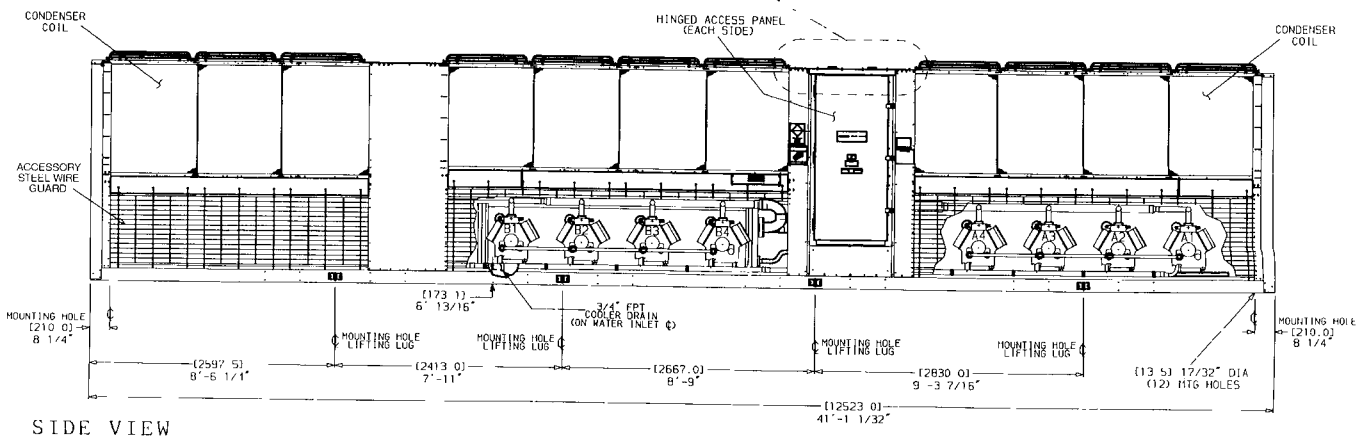
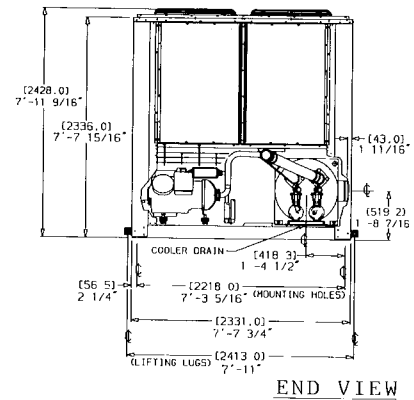
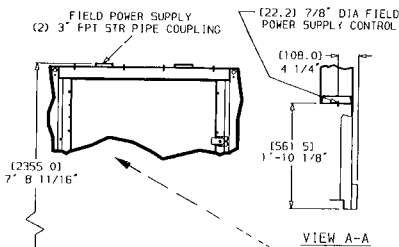


TOP VIEW



NOTES:

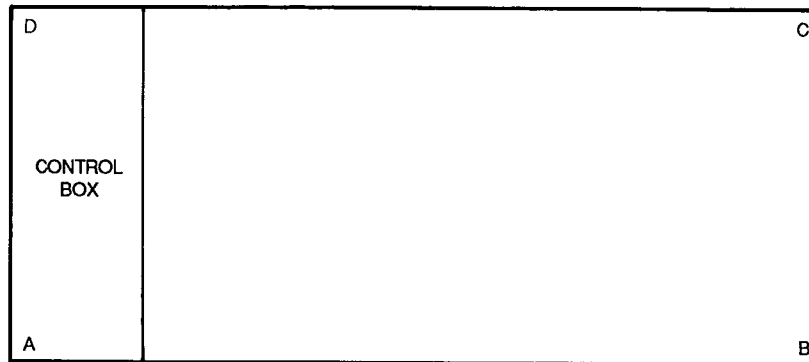
- 1 Dimensions in [] are in millimeters
- 2 Units must have clearances for airflow as follows:
 Top — Do not restrict in any way
 Ends — 5 ft [1524]
 Sides — 6 ft [1829]



Base unit dimensions (cont)



Mounting Weights (Approximate) — Sizes 040-110

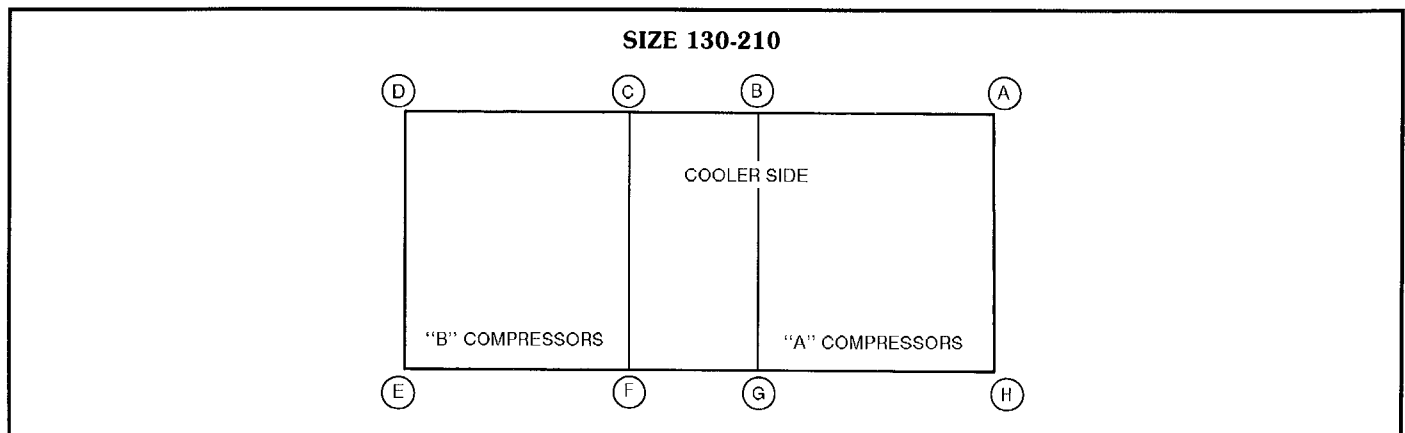


UNIT SIZE 30GN,GT	CONDENSER COIL	lb				kg			
		A	B	C	D	A	B	C	D
040	C-AL	972	876	807	895	441	397	366	406
	C-C	1044	948	879	968	473	430	399	439
045	C-AL	999	895	845	943	453	406	383	428
	C-C	1071	967	917	1015	486	438	416	460
050	C-AL	1047	948	884	976	475	430	401	443
	C-C	1155	1057	992	1085	524	479	450	492
060	C-AL	1258	1130	1130	1113	570	512	505	562
	C-C	1362	1234	1217	1344	618	560	552	609
070	C-AL	1332	1212	1184	1301	604	550	537	590
	C-C	1489	1369	1340	1458	675	621	608	661
080	C-AL	1624	1690	1666	1650	738	768	757	750
	C-C	1797	1880	1847	1831	817	854	840	832
090	C-AL	1817	1793	1720	1685	826	815	782	766
	C-C	1997	1970	1893	1880	908	895	860	855
100	C-AL	2185	2185	2120	2120	993	993	964	964
	C-C	2420	2420	2360	2360	1100	1100	1073	1073
110	C-AL	2191	2217	2136	2116	996	1007	970	962
	C-C	2428	2454	2374	2354	1104	1115	1079	1070

LEGEND

C-AL — Copper Tubing — Aluminum Fins
C-C — Copper Tubing — Copper Fins

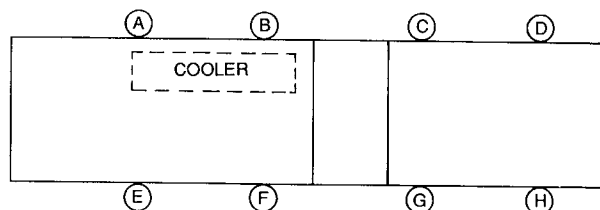
Mounting Weights (Approximate) — Sizes 130-280



Mounting Weights (Approximate) — Sizes 130-280 (cont)

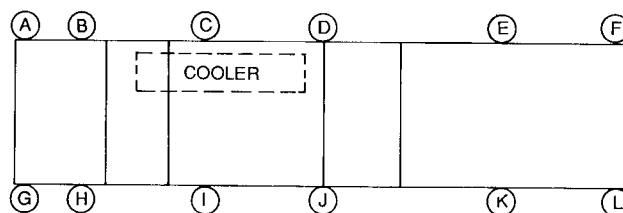
UNIT SIZE 30GN,GT	COND COIL	lb								kg							
		A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H
130	C-AL	923	1466	1156	825	1411	1365	1469	1431	419	666	525	375	641	620	668	650
	C-C	1051	1593	1283	952	1601	1556	1659	1622	478	723	583	433	728	707	754	737
150	C-AL	926	1563	1160	834	1438	1375	1747	1438	420	710	527	379	653	625	794	653
	C-C	1053	1690	1287	961	1628	1566	1938	1629	478	768	585	436	740	711	880	740
170	C-AL	962	1732	1333	862	1497	1629	1816	1462	437	787	605	392	680	740	825	664
	C-C	1089	1860	1460	990	1688	1819	2007	1653	495	845	663	450	767	826	912	751
190	C-AL	1346	1942	1793	1111	1385	1799	1733	1567	611	882	815	505	629	817	787	712
	C-C	1536	2132	1983	1301	1575	1989	1923	1757	698	969	901	591	715	904	874	798
210	C-AL	1376	2128	1871	1120	1407	1846	2037	1595	625	967	850	509	639	384	925	725
	C-C	1566	2318	2061	1310	1597	2036	2227	1784	711	1053	937	595	725	925	1012	810

SIZE 225



UNIT SIZE 30GT	COND COIL	lb								kg							
		A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H
225	C-AL	2400	2400	1400	1400	2350	2350	1520	1520	1089	1089	635	635	1066	1066	689	689
	C-C	2650	2650	1570	1570	2650	2650	1750	1750	1202	1202	712	712	1200	1200	793	793

SIZE 250, 280



UNIT SIZE 30GT	COND COIL	lb												kg											
		A	B	C	D	E	F	G	H	I	J	K	L	A	B	D	D	E	F	G	H	I	J	K	L
250	C-AL	500	1250	3450	2500	1200	600	500	750	3040	2050	2600	850	227	565	1565	1134	545	272	225	340	1378	930	1179	386
	C-C	560	1400	3900	2800	1350	680	560	850	3450	2300	2930	950	254	635	1769	1270	612	308	254	386	1565	1043	1329	431
280	C-AL	550	1400	3550	2450	1150	550	590	900	3100	2000	2500	850	249	635	1610	1111	522	249	268	408	1406	907	1134	386
	C-C	625	1600	4050	2800	1300	625	675	1020	3500	2275	2850	950	284	727	1837	1270	590	284	306	463	1588	1032	1293	431

LEGEND

C-AL — Copper Tubing — Aluminum Fins
C-C — Copper Tubing — Copper Fins

Application data



Leveling unit

Unit must be level when installed to ensure proper oil return to the compressors.

While most outdoor locations are suitable for 30GN,GT units, the roof is a common site that presents a problem if roof has been pitched to aid in water removal. To assure proper oil return, be sure that unit is level, particularly in its major lengthwise dimension, as compressor oil return piping runs in that direction.

It should be determined prior to installation if any special treatment is required to assure a level installation.

Cooler water temperature

1. Maximum leaving chilled water temperature (LCWT) for unit is 70 F (21 C). Unit can start and pull down with up to 95 F (35 C) entering-water temperature due to MOP (maximum operating pressure) feature of the expansion valve. For sustained operation, it is recommended that entering-water temperature not exceed 85 F (29.4 C).
2. Minimum LCWT for standard unit is 40 F (4.5 C). It is permissible to use a standard microprocessor-controlled Flotronic™ chiller with leaving-water temperatures in the range of 34 to 39.9 F (1° to 4.4 C) only if a protective brine solution (20% antifreeze solution, or greater) is used and microprocessor DIP (dual in-line package) switch (Flotronic units only) is properly set. (See Controls and Troubleshooting book for further information.)

Medium temperature brine application

Application of chiller for brine duty within the 39.9 to 34 F (4.4 to 1° C) range is possible with proper field change of control configuration. Application in the range 34 to 15 F (1° to -9.4 C) requires unit with factory modification. For ratings below 40 F (4.5 C) LCWT, contact your local Carrier representative.

Leaving-water temperature reset

Accessory board (required on Flotronic unit, standard on Flotronic II unit) may be installed in chiller to provide reset of LCWT in constant water flow systems. Reset reduces compressor power usage at part load when design LCWT is not necessary. Humidity control should be considered since higher coil temperatures resulting from reset will reduce latent heat capacity. Three reset options are offered, based on:

Return-water temperature — Increase LCWT temperature set point as return (or entering) water temperature decreases (indicating load decrease). Option may be used in any application where return water provides accurate load indication. Limitation of return water reset is: LCWT may only be reset to value of design return water temperature.

Outdoor temperature — Increases LCWT as outdoor ambient temperature decreases (indicating load decrease). This reset should be applied only where outdoor ambient is an accurate indication of load. An accessory thermistor is required.

Space temperature — Increases LCWT as space temperature decreases (indicating load decrease). This reset should be applied only where space temperature is an accurate indication of load. An accessory thermistor is required.

For details on applying a reset option, refer to unit Controls and Troubleshooting book. Obtain ordering part numbers for reset option from current price pages.

Cooler flow range

Ratings and performance data in this publication are for a cooling temperature rise of 10° F (6° C), and are suitable for a range from 5 to 15 F (2.8 to 8.3 C) temperature rise without adjustment. Flotronic chillers with microprocessor control may be operated at a different temperature range provided flow limits are not exceeded. For minimum flow rates, see Minimum Cooler Water Flow Rates and Minimum Loop Volume table. High flow rate is limited by pressure drop that can be tolerated. If another temperature range is used, apply LCWT correction as given in Selection Procedure example.

MINIMUM COOLER WATER FLOW RATES AND MINIMUM LOOP VOLUME

UNIT SIZE	MINIMUM FLOW		MINIMUM COOLER LOOP VOLUME	
	Gpm	L/s	Gal.	L
040	37	2.3	108	408
045	38	2.4	125	472
050	38	2.4	151	572
060	48	3.0	190	719
070	48	3.0	218	823
080	60	3.8	246	930
090	60	3.8	262	992
100	73	4.6	299	1131
110	73	4.6	323	1222
130	101	6.4	375	1419
150	101	6.4	429	1624
170	135	8.5	486	1840
190	135	8.5	528	1998
210	219	13.8	603	2232
225	219	13.8	678	2565
250	285	18.0	741	2803
280	285	18.0	833	3101

LEGEND

ARI — Air Conditioning and Refrigeration Institute

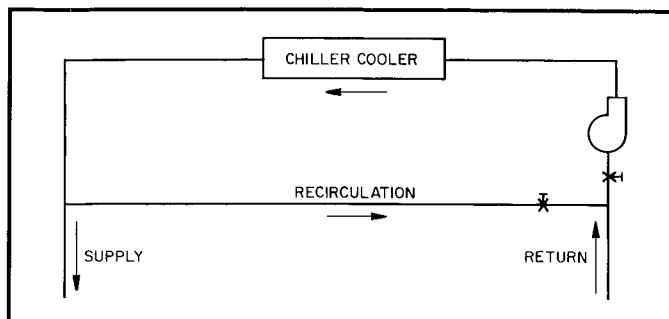
NOTES:

1. Minimum flow based on 1.0 fps (0.30 m/s) velocity in cooler without special cooler baffling.
2. Minimum Loop Volumes. Gallons = $V \times \text{ARI Cap (tons)}$
Liters = $N \times \text{ARI Cap (kW)}$

APPLICATION	V	N
Normal Air Conditioning	3	3.25
Process Type Cooling	6	6.5
Low Ambient Unit Operation	6	6.5

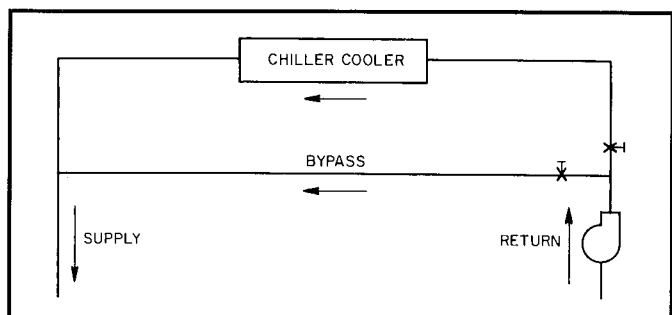
Minimum cooler flow (maximum cooler temperature rise) for standard units is shown in table below. When gpm (L/s) required is lower (or rise higher), follow recommendations below.

1. Multiple smaller chillers may be applied in series, each providing a portion of the design temperature rise.
2. Cooler water may be recirculated to raise flow rate. However, mixed temperature entering cooler must be maintained a minimum of at least 5° F (2.8° C) above the LCWT.
3. Special cooler baffling is required to allow minimum flow rate to be reduced.



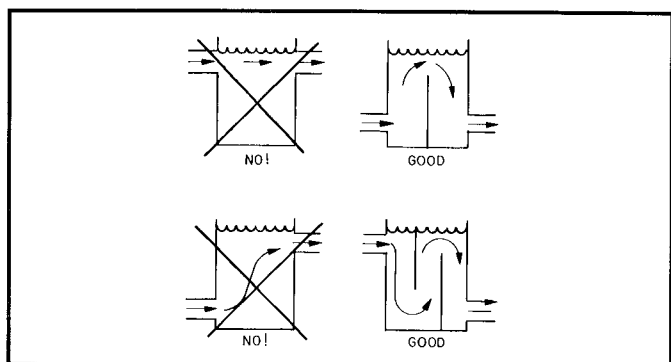
Maximum cooler flow (> 5 gpm/ton or $< 5^\circ\text{F}$ rise [$> 0.09\text{ L/s} \cdot \text{kW}$ or $< 2.7^\circ\text{C}$ rise]) results in practical maximum pressure drop through cooler

- 1 Return water may bypass the cooler to keep pressure drop through cooler within acceptable limits. This permits a higher ΔT with lower water flow through cooler and mixing after the cooler.
- 2 Special cooler baffling is available by special order, to permit a cooler flow rate increase of 10%.



Variable cooler flow rates may be applied to standard chiller. Unit will, however, attempt to maintain a constant leaving chilled water temperature. In such cases, minimum flow must be in excess of minimum flow given in Minimum Cooler Water Flow Rates and Minimum Loop Volume table, and flow rate must change in steps of less than 10% per minute. Apply 6 gal per ton (6.5 L per kW) water loop volume minimum if flow rate changes more rapidly.

Water loop volume in circulation must equal or exceed 3 gal per nominal ton (3.25 L per kW) of cooling for temperature stability and accuracy in normal air-conditioning applications. (For example, a GT210 would require 603 gal [2232 L]) In process cooling applications, or for operation at ambient below 32°F (0°C) with low loading conditions,



there should be from 6 to 10 gal per ton (6.5 to 10.8 L per kW). To achieve this volume, it is often necessary to install a tank in the loop. Tank should be baffled to ensure there is no stratification and that water (or brine) entering tank is adequately mixed with liquid in the tank.

Cooler fouling factor used to calculate tabulated ratings was $.00025\text{ ft}^2 \cdot \text{hr} \cdot ^\circ\text{F}/\text{Btu}$ ($.000044\text{ m}^2 \cdot ^\circ\text{C}/\text{W}$). As fouling factor is increased, both unit capacity and compressor power decrease. Standard ratings should be corrected using following multipliers:

FOULING FACTOR		CAPACITY MULTIPLIER	COMPRESSOR POWER MULTIPLIER
English ($\text{ft}^2 \cdot \text{hr} \cdot ^\circ\text{F}/\text{Btu}$)	SI ($\text{m}^2 \cdot ^\circ\text{C}/\text{W}$)		
.00025	.000044	1.00	1.00
.00075	.000132	0.97	0.98
.00175	.000308	0.91	0.91

Cooler protection against low ambient freeze-up is required for unit operation in areas that experience temperatures below 32°F (0°C). Protection should be in the form of ethylene glycol or other suitable brine.

Even though unit cooler is equipped with insulation and an electric heater that helps prevent freeze-up, it does not protect water piping external to unit. Use only antifreeze solutions approved for heat exchanger duty. Use of automotive type antifreezes is not recommended because of the fouling that can occur once their relatively short-lived inhibitor breaks down.

Draining cooler and outdoor piping is recommended if system is not to be used during freezing weather conditions. See section on low ambient temperature operation.

Condenser

Altitude correction factors must be applied to standard ratings at altitudes above 2000 ft (610 m) using following multipliers.

ALTITUDE		CAPACITY MULTIPLIER	COMPRESSOR POWER MULTIPLIER
English (ft)	SI (m)		
0	0	1.00	1.00
2000	610	0.99	1.01
4000	1220	0.98	1.02
6000	1830	0.97	1.03
8000	2440	0.96	1.04
10000	3050	0.95	1.05

Condenser airflow restrictions will affect the unit capacity, condenser head pressure, and compressor power input. Correction factors to be applied for external static restrictions up to 0.2 in. wg (50 Pa) are shown below.

EXTERNAL STATIC		CAPACITY MULTIPLIER	COMPRESSOR POWER MULTIPLIER
English (in. wg)	SI (Pa)		
0.0	0.0	1.000	1.00
0.1	25	0.986	1.01
0.2	50	0.968	1.03

High ambient temperature chiller start-up and operation (fully loaded) is possible for standard GN,GT chillers at ambient temperatures up to 125°F (52°C) at nominal voltage.

Application data (cont)



Low ambient temperature operation

With certain field provisions as described below, units will start and operate down to —

0° F (–18 C) for GN,GT040-210 (EXV units)

35 F (1.7 C) for 30GT040-110 and 225-280 (TXV units)

If operation is intended below these limits, the Carrier accessory Motormaster® III condenser head pressure control and its associated components must be added. The Motormaster control allows operation down to –20 F (–29 C). Consult your Carrier representative for details.

NOTE: Minimum load on chiller must be above minimum step of unloading.

Wind baffles (field fabricated and installed) must be added to all units for operation below 32 F (0° C) if wind velocity is anticipated greater than 5 mph (8 km/h).

Antifreeze solution must be field-supplied and -installed in all units for unit installation below 32 F (0° C). Antifreeze solution must be added to water loop to protect loop down to 15° F (8° C) below minimum operating ambient temperature.

Provide sufficient volume in the chilled water loop — At least 6 gal. per ton (6.5 L per kW) of refrigeration is recommended minimum, provided there is a moderate system load.

Capacity correction (antifreeze)

Ethylene glycol (or other suitable brine) should be used in installations where subfreezing temperatures are expected. Unit performance data must be corrected for the addition of ethylene glycol as shown in following example. Correction factors may be derived from following curves in the Ethylene Glycol Performance chart.

Example: English — Where a 5 F outdoor temperature is anticipated, determine concentration of ethylene glycol to protect system to –10 F ambient temperature at zero flow.

Enter the solution crystallization point curve at –10 F, read 40% concentration of ethylene glycol is required to prevent crystals from forming in solution.

Consider the GT110 unit from the Selection Procedure example (refer to correction curves at 40% solution).

Correct unit capacity — On glycol performance capacity correction curve, read 0.95.

$$\begin{aligned}\text{Corrected capacity} &= 0.95 \times \text{determined capacity} \\ &= 0.95 \times 110.4 \\ &= 104.9 \text{ tons}\end{aligned}$$

Correct chilled water flow — On the cooler flow correction curve, read 1.15.

$$\begin{aligned}\text{Chilled water flow (at corrected capacity)} \\ &= \frac{24 \times \text{corrected cap. in tons}}{\text{temperature rise } F} = \text{U.S. gpm} \\ &= \frac{24 \times 104.9}{14} = 179.8 \text{ U.S. gpm}\end{aligned}$$

$$\begin{aligned}\text{Chilled water flow (40\% solution)} &= 1.15 \times 179.8 \\ &= 206.8 \text{ U.S. gpm}\end{aligned}$$

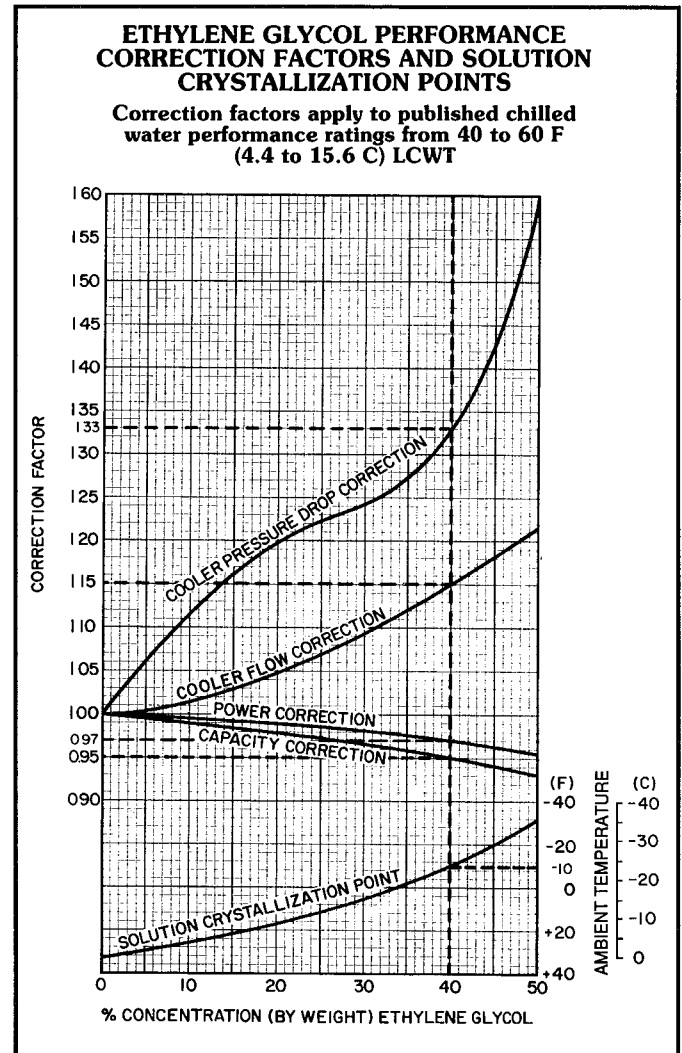
Correct cooler pressure drop — On cooler pressure drop correction curve, read 1.33.

On cooler pressure drop curve, for 206.8 gpm, read pressure drop = 12.3 ft water gage. The pressure drop for 40% solution = $1.33 \times 12.3 = 16.4$ ft water.

Correct compressor power input (kW) — On power correction curve, read 0.97 correction factor at 40% ethylene glycol concentration.

Power input from Selection Procedure example = 124.7 kW.

$$\text{Corrected power input} = 0.97 \times 124.7 = 120.9 \text{ kW.}$$



Example: SI — Determine concentration of ethylene glycol to protect the system to –23 C ambient temperature at zero flow.

Enter correction curves and on the solution crystallization point curve, at –23 C, read 40% concentration ethylene glycol is required to prevent crystals from forming in solution.

Consider GT110 unit selected from the Selection Procedure example (refer to correction curves at 40% solution).

Correct unit capacity — On glycol performance capacity correction curve read 0.95

$$\begin{aligned}\text{Corrected capacity} &= 0.95 \times \text{determined capacity} \\ &= 0.95 \times 371.8 \\ &= 353.2 \text{ kW}\end{aligned}$$

Correct chilled water flow — On cooler flow correction curve, read 1.15

Chilled water flow (at corrected capacity)

$$\begin{aligned}&= \frac{0.239 \times \text{corr cap in kW}}{\text{temperature rise } ^\circ\text{C}} = \text{L/s} \\ &= \frac{0.239 \times 353.2}{7.8^\circ} = 10.8 \text{ L/s}\end{aligned}$$

$$\begin{aligned}\text{Chilled water flow (40\% solution)} &= 1.15 \times 10.8 \\ &= 12.4 \text{ L/s}\end{aligned}$$

Correct cooler pressure drop — On cooler pressure drop correction curve, read 1.33

On cooler pressure drop curve, for 12.4 L/s, read pressure drop = 29 kPa. The pressure drop for 40% solution = $1.33 \times 29 = 38.6$ kPa.

Correct compressor power input (kW) — On the power correction curve, read 0.97 correction factor at 40% ethylene glycol concentration

Power input from Selection Procedure example = 121.7 kW.

$$\text{Corrected power input} = 0.97 \times 121.7 = 118.0 \text{ kW}.$$

Oversizing chillers

Oversizing chillers by more than 15% at design conditions must be avoided as the system operating efficiency would be affected adversely (resulting in greater or excessive electrical demand). When future expansion of equipment is anticipated, it is strongly recommended that a single chiller be installed to meet present load requirements and a second chiller added to meet the additional load demand.

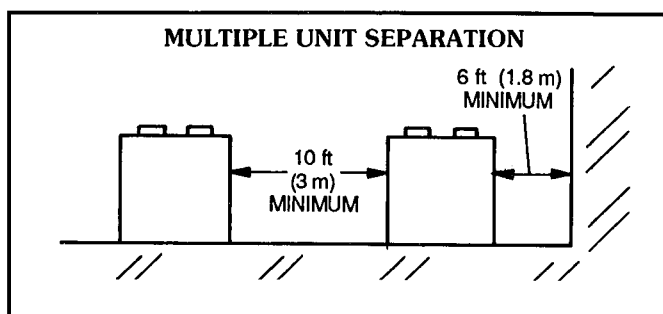
It is also recommended that the installation of 2 smaller chillers be considered where operation at minimum load is critical. The operation of a smaller chiller loaded to a greater percent of minimum is preferred to operating a single chiller at or near its minimum recommended value.

Hot gas bypass should not be used as a means to allow oversizing chillers. Hot gas bypass should be given consideration where substantial operating time is anticipated below the minimum unloading step.

Multiple chillers

Where chiller capacities greater than 280 ton (985 kW) are required, or where stand-by capability is desired, chillers may be installed in *parallel*. Units should be of equal size to ensure balanced water flows. Where a large temperature drop ($> 25^\circ\text{F}$ [13.9°C]) is desired, chillers may be installed in *series*. Water temperature sensors need not be moved for

multiple chiller operation. A 10-ft (3-m) separation is required between units for airflow, and a 6-ft (1.8-m) distance is required from units to obstructions. See figure below. See Base Unit Dimensions section for service clearances.



Electrical utility interests

Energy management — See Controls and Troubleshooting book and accessory installation instructions for details.

Demand limiting (also called load shedding) — When utilities demand for electricity exceeds a certain level, loads are shed to keep electricity demand below a prescribed maximum level. Typically, this happens on hot days when air conditioning is most needed.

Demand may be limited on unit by resetting water temperature, or by using a demand limit accessory that unloads the chiller to a given predetermined percent of the load. Both features require signal from an intelligent central control. Do not cycle demand limiter for less than 10 minutes on and 5 minutes off.

Duty cycling cycles electrical loads at regular intervals regardless of need. This reduces electrical operating costs of building by “fooling” demand indicating devices. Duty cycling of compressors or fans is *not* recommended since motor winding and bearing life suffer from constant cycling.

Remote ON-OFF control

Remote ON-OFF control may be applied by hard-wired connection (see Controls and Troubleshooting book) or by Carrier Comfort Network (CCN) with Flotronic™ II option.

Part-wind start

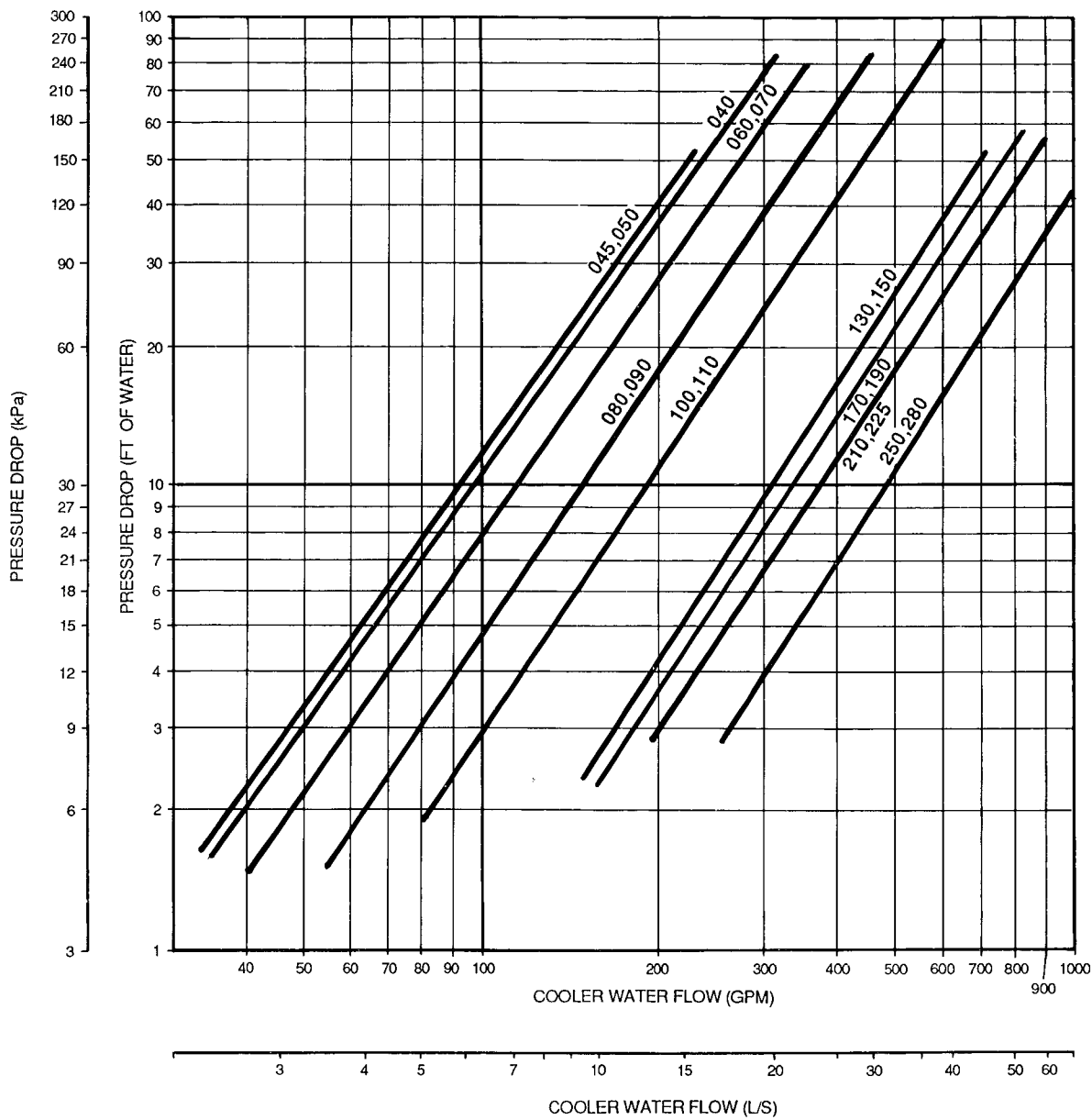
Not generally required on GN,GT chillers due to use of multiple compressors allowing smaller electrical load increments, but is available if required. Maximum instantaneous current flow (see ICF in Electrical Data) should be used in determining need.

Strainers

It is recommended that a 40-mesh strainer be installed in the cooler fluid inlet line, just ahead of and as close as possible to the cooler.



ENGLISH AND SI
COOLER PRESSURE DROP
(Water Side)



Selection procedure — English (with 30GT example)



NOTE: Carrier electronic catalog provides quick, easy computer selection of Carrier chillers. Catalog is available from your local Carrier representative

I Determine unit size and operating conditions required to provide specified capacity at given conditions:

Capacity required 108 tons
Leaving chilled water temperature (LCWT) . . 45 F
Chilled water temperature rise 14° F
Condenser entering-air temperature (CEAT) . 95 F
Loop volume 350 gal.
Ratings are based on 10° F rise and are suitable for a temperature rise range from 5° to 15° F without adjustment. In this case, however, greater accuracy is desired

II Correct LCWT for 14° F cooler water temperature rise.

Enter LCWT correction curve (page 26) at 14° F and read a correction of 0.3 F. Corrected LCWT is, therefore, 45 + 0.3 = 45.3 F.

III Determine capacity, unit size, and power input.

Enter Cooling Capacities table at given CEAT and LCWT — respectively 95 F and 45 F

Read down capacity column until the capacity nearest to but higher than specified required capacity is reached. In this case, 109.7 tons is delivered by a GT110. Interpolate between 45 F and 46 F to find determined capacity and power input at corrected LCWT (45.3 F). Values are

Capacity 110.4 tons
Power input 124.7 kW

IV Calculate corrected cooler water flow.

$$\begin{aligned} \text{Water flow} &= \frac{24 \times \text{corr cap. in tons}}{\text{temperature rise } ^\circ\text{F}} = \text{U.S. gpm} \\ &= \frac{24 \times 110.4}{14} = 189.3 \text{ U.S. gpm} \end{aligned}$$

V Calculate the cooler pressure drop.

Enter cooler pressure drop curve (page 24) at the corrected flow rate (189.3 U.S. gpm) and read, for the GT110, a pressure drop of 9.3 ft of water

VI Check loop volume and cooler water flow rate.

Minimum loop volume, from application data, is 323 gal. for GT110. Therefore, given volume of 350 gal. is satisfactory. Minimum water flow rate, from application data, is 73 gpm for GT110. Flow rate of 189.3 gpm is well above minimum required.

Selection procedure — SI (with 30GT example)

I Determine unit size and operating conditions required to provide specified capacity at given conditions:

Capacity required 360 kW
Leaving chilled water temperature (LCWT) . . 6 C
Chilled water temperature rise 7.8° C
Condenser entering air temperature (CEAT) . 35 C
Loop volume 1300 L
Ratings are based on 6 C rise and are suitable for a temperature rise range from 2.8° to 8.3° C without adjustment. In this case, however, greater accuracy is desired

II Correct LCWT for 7.8° C cooler water temperature rise.

Enter LCWT correction curve (page 26) at 7.8° C and read a correction of 0.14 C. Corrected LCWT is, therefore, 6 + 0.14 = 6.1 C

III Determine capacity, unit size, and power input.

Enter Cooling Capacities table at given CEAT and LCWT — respectively 35 C and 6 C.

Read down the capacity column until the capacity nearest to but higher than the specified required capacity is

reached. In this case, 370 kW is delivered by a GT110. Interpolate between 6 C and 7 C to find the determined capacity and power input at corrected LCWT (6.1 C). Values are:

Capacity 371.8 kW
Power input 121.7 kW

IV Calculate corrected cooler water flow.

$$\begin{aligned} \text{Water flow} &= \frac{0.239 \times \text{corr cap. in kW}}{\text{temperature rise } ^\circ\text{C}} = \text{L/s} \\ &= \frac{0.239 \times 371.8}{7.8} = 11.4 \text{ L/s} \end{aligned}$$

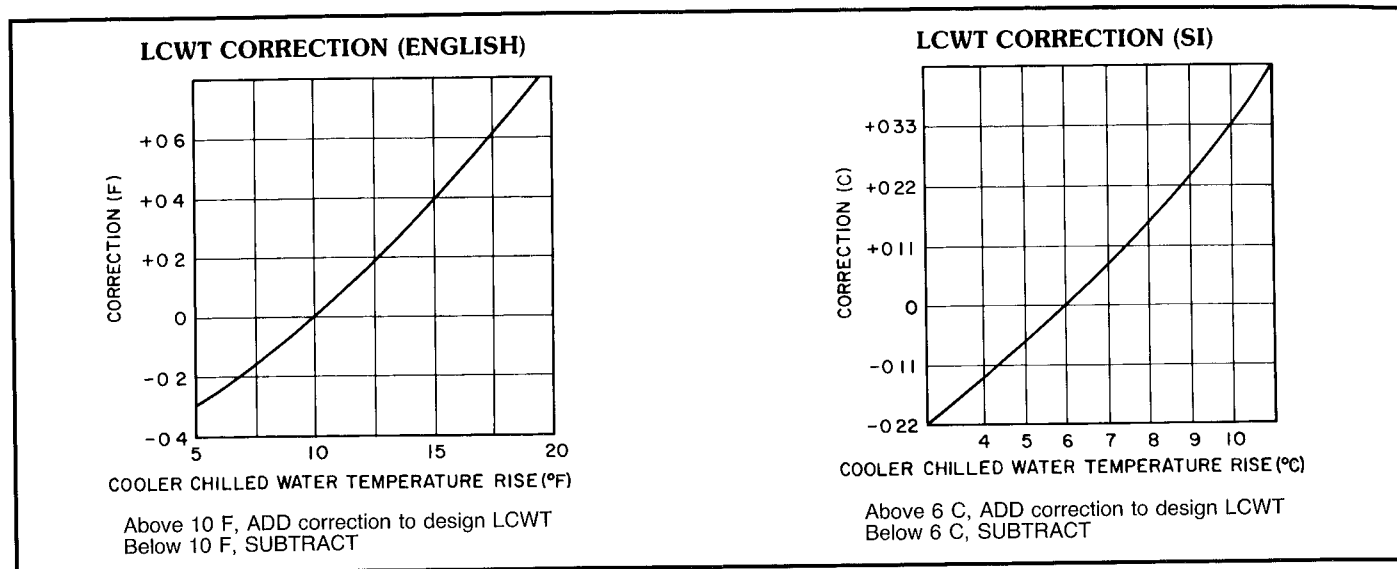
V Calculate cooler pressure drop.

Enter cooler pressure drop curve (page 24) at corrected flow rate (11.4 L/s) and read, for GT110, a pressure drop of 28.8 kPa.

VI Check loop volume and cooler water flow rate.

Minimum loop volume, from application data, is 1222 L for GT110. Therefore, given volume of 1300 L is satisfactory. Minimum water flow rate, from application data, is 4.6 L/s for GT110. Flow rate of 11.4 L/s is well above minimum required.

Selection procedure — English and SI



Performance data

STANDARD RATINGS* — REFRIGERANT 22

UNIT SIZE 30		CAPACITY		COMPRESSOR POWER INPUT (kW)	FAN POWER (kW)	COOLER WATER PRESSURE DROP (ft water)	ENERGY EFFICIENCY RATIO (EER)
		tons	Btuh				
GN,GT	040	35.9	430,800	38.5	6.2	8.2	9.6
	045	41.6	499,200	46.5	6.2	11.5	9.5
	050	50.4	604,800	56.0	6.2	16.5	9.7
	060	63.3	759,600	70.9	9.3	17.0	9.5
	070	72.5	870,000	82.4	9.3	22.0	9.5
	080	81.9	982,800	93.6	9.4	16.9	9.5
	090	87.4	1,048,800	98.4	9.5	19.2	9.7
	100	99.6	1,195,200	107.9	12.7	15.2	9.9
	110	107.6	1,291,200	123.0	12.8	17.6	9.5
	130	121.4	1,456,800	137.3	15.5	6.6	9.5
	150	140.2	1,682,400	161.6	15.5	8.7	9.5
	170	157.2	1,945,200	181.0	15.5	11.8	9.5
GT	190	172.4	2,116,800	199.2	18.6	14.1	9.5
	210	201.0	2,419,200	235.3	18.6	15.0	9.5
	225	226.5	2,718,000	266.4	24.8	20.0	9.3
	250	247.3	2,967,600	284.8	31.0	13.8	9.4
	280	277.7	3,332,400	324.6	34.0	17.1	9.3

$$\text{EER} = \frac{\text{Capacity (Btuh)}}{\text{Input Power (W)}}$$

*Per ARI (Air Conditioning and Refrigeration Institute) Standard 590-92.

NOTE: 95 F (35 C) condenser entering-air temperature; 54 F (12 C) entering/44 F (6.7 C) leaving cooler water, .00025 ft² · hr · °F/Btu (0.00044 m² · °C/W) cooler fouling allowance

PART LOAD DATA
% DISPLACEMENT – SEQUENCE A

CAPACITY STEPS	30GT SIZE																
	040	045	050	060	070	080	090	100	110	130	150	170	190	210	225	250	280
1	25	21	32	29	33	22	18	15	14	14	11	11	14	12	12	11	13
2	50	42	78	43	50	52	35	31	29	29	19	22	27	26	23	22	25
3	75	79	84	86	83	67	44	39	36	36	28	28	43	37	35	32	38
4	100	100	100	100	100	78	53	46	43	43	33	33	59	56	46	43	50
5	—	—	—	—	—	89	71	65	68	64	44	44	79	68	58	57	63
6	—	—	—	—	—	100	80	73	75	72	58	50	100	86	69	72	75
7	—	—	—	—	—	—	91	92	93	93	78	61	—	100	85	86	88
8	—	—	—	—	—	—	100	100	100	100	83	67	—	—	100	100	100
9	—	—	—	—	—	—	—	—	—	—	94	78	—	—	—	—	—
10	—	—	—	—	—	—	—	—	—	—	100	83	—	—	—	—	—
11	—	—	—	—	—	—	—	—	—	—	—	94	—	—	—	—	—
12	—	—	—	—	—	—	—	—	—	—	—	100	—	—	—	—	—

% DISPLACEMENT – SEQUENCE B*

CAPACITY STEPS	30GT SIZE																
	040	045	050	060	070	080	090	100	110	130	150	170	190	210	225	250	280
1	25	38	35	38	33	29	18	15	14	14	17	11	14	14	12	11	13
2	50	58	52	57	50	52	35	31	29	29	19	22	27	26	23	22	25
3	75	60	67	67	83	63	44	39	36	36	33	28	43	44	35	32	38
4	100	81	83	81	100	78	53	46	43	43	43	33	59	56	46	43	50
5	—	100	84	100	—	89	71	65	68	64	58	44	79	74	58	57	63
6	—	—	100	—	—	100	80	73	75	72	67	50	100	86	69	72	75
7	—	—	—	—	—	—	91	92	93	93	75	61	—	100	85	86	88
8	—	—	—	—	—	—	100	100	100	100	83	67	—	—	100	100	100
9	—	—	—	—	—	—	—	—	—	—	92	78	—	—	—	—	—
10	—	—	—	—	—	—	—	—	—	—	100	83	—	—	—	—	—
11	—	—	—	—	—	—	—	—	—	—	—	94	—	—	—	—	—
12	—	—	—	—	—	—	—	—	—	—	—	100	—	—	—	—	—

*Accessory unloaders are required on 040-070 sizes for auto lead/lag and Sequence B.

NOTES:

- 1 The 30GN unit has the same steps, but steps will be sequenced to best meet current and anticipated load requirements.
- 2 Accessory hot gas bypass and accessory unloaders (where available on sizes larger than 070) are not considered

Part Load Efficiency Data

Carrier's reciprocating chiller selection program, version 2.0, may be used to determine part load performance of Carrier chillers. This program has the ability to calculate part load performance based on the 'ARI LOAD' line or on a user-specified load line at either user-specified % capacity or the actual capacity step. Contact your local Carrier representative for details.

Performance data — English



COOLING CAPACITIES — ENGLISH

UNIT SIZE 30		LCWT (F)	CONDENSER ENTERING-AIR TEMPERATURE (F)														
			85			95			105			115			125		
			Cap.	Input kW	Cooler Flow Rate	Cap.	Input kW	Cooler Flow Rate	Cap.	Input kW	Cooler Flow Rate	Cap.	Input kW	Cooler Flow Rate	Cap.	Input kW	Cooler Flow Rate
GN,GT	040	40	35.6	34.9	85.3	33.8	37.4	80.8	31.9	39.8	76.3	29.9	41.9	71.5	27.9	43.9	66.7
	045		41.1	42.1	98.5	38.5	44.6	92.2	35.9	46.9	86.0	33.3	49.0	79.7	30.7	50.8	73.5
	050		49.7	50.8	119.0	46.8	53.9	112.1	43.9	56.8	105.2	41.0	59.4	98.2	38.1	61.7	91.2
	060		62.3	64.5	149.2	58.9	68.3	141.1	55.5	71.8	132.9	52.1	74.9	124.6	48.6	77.8	116.3
	070		71.3	75.0	170.6	67.6	79.3	161.9	64.0	83.3	153.2	60.3	87.0	144.4	56.6	90.5	135.6
	080		80.7	85.1	193.2	76.1	89.9	182.1	71.4	94.2	170.9	66.7	98.0	159.7	61.9	101.3	148.3
	090		86.4	89.0	206.8	81.1	94.4	194.1	75.9	99.4	181.6	70.6	103.9	169.0	65.3	107.9	156.4
	100		97.9	97.5	234.4	92.2	103.6	220.7	86.3	109.1	206.7	80.5	114.0	192.7	74.5	118.4	178.4
	110		105.7	111.5	253.0	99.6	117.8	238.5	93.6	123.6	224.0	87.5	128.9	209.4	81.4	133.7	194.9
	130		120.9	126.0	289.3	114.7	133.4	274.6	108.6	140.4	259.9	102.3	146.8	244.9	95.9	152.6	229.5
	150		140.4	148.2	336.0	133.3	157.0	319.1	126.1	165.4	301.8	118.9	173.3	284.7	111.7	180.8	267.3
	170		156.9	165.8	375.6	148.2	175.0	354.9	139.5	183.4	334.0	130.6	190.9	312.8	121.6	197.3	291.0
	190		171.8	182.4	411.3	163.0	192.8	390.2	153.9	202.4	368.3	144.5	211.2	345.9	135.2	219.2	323.6
	210		197.9	214.1	473.6	186.3	224.6	445.9	174.9	234.3	418.6	163.5	243.1	391.4	—	—	—
GT	225	40	223.1	242.5	534.0	210.4	254.9	503.6	197.5	266.0	472.7	184.4	275.7	441.3	171.1	284.2	409.7
	250		243.2	258.9	582.2	229.6	273.3	549.6	215.8	286.4	516.5	202.0	298.3	483.5	188.0	308.8	450.1
	280		273.1	296.0	653.7	258.4	311.2	618.7	243.9	325.4	583.7	229.1	338.5	548.5	214.5	350.6	513.5
GN,GT	040	42	36.7	35.3	87.9	34.8	38.0	83.4	32.9	40.4	78.8	30.9	42.7	74.0	28.8	44.7	69.1
	045		42.7	42.9	102.3	40.0	45.5	95.9	37.4	48.0	89.5	34.7	50.1	83.1	32.0	52.0	76.7
	050		51.5	51.7	123.4	48.6	55.0	116.4	45.6	58.0	109.3	42.6	60.7	102.2	39.6	63.1	95.0
	060		64.6	65.6	154.7	61.1	69.6	146.4	57.6	73.2	138.0	54.1	76.6	129.6	50.5	79.5	121.0
	070		73.7	76.4	176.6	70.0	80.8	167.8	66.3	85.0	158.8	62.5	88.9	149.8	58.8	92.5	140.8
	080		83.7	86.8	200.4	78.9	91.8	189.1	74.2	96.3	177.7	69.3	100.3	166.1	64.5	103.8	154.5
	090		89.6	90.8	214.6	84.2	96.4	201.8	78.9	101.6	188.9	73.5	106.3	176.0	68.1	110.5	163.1
	100		101.8	99.4	243.8	95.8	105.7	229.6	89.9	111.5	215.4	83.9	116.7	201.0	77.9	121.4	186.5
	110		109.8	113.8	263.0	103.6	120.4	248.2	97.4	126.4	233.2	91.1	132.0	218.3	84.9	137.0	203.4
	130		124.1	127.7	297.3	117.8	135.4	282.3	111.5	142.5	267.1	105.2	149.1	252.0	98.7	155.2	236.4
	150		143.9	150.2	344.8	136.7	159.3	327.5	129.5	168.0	310.2	122.2	176.1	292.7	114.8	183.8	275.0
	170		161.4	168.4	386.7	152.7	178.0	365.9	143.8	186.7	344.4	134.7	194.5	322.7	—	—	—
	190		176.7	185.3	423.3	167.6	196.0	401.4	158.5	206.0	379.6	149.0	215.1	356.9	139.5	223.4	334.1
	210		205.4	218.9	492.0	193.6	230.0	463.9	181.8	240.0	435.5	170.1	249.2	407.4	—	—	—
GT	225	42	231.3	247.7	554.0	218.3	260.6	522.9	205.1	272.2	491.4	191.8	282.6	459.4	178.2	291.5	427.0
	250		252.3	264.0	604.5	238.3	279.0	571.0	224.3	292.8	537.2	210.0	305.1	503.0	195.7	316.2	468.8
	280		283.0	302.1	678.0	267.9	317.9	641.8	253.0	332.7	606.1	238.0	346.3	570.1	222.8	358.9	533.7
GN,GT	040	44	37.8	35.8	90.6	35.9	38.5	86.1	33.9	41.1	81.4	31.9	43.4	76.5	29.9	45.6	71.6
	045		44.3	43.7	106.1	41.6	46.5	99.6	38.8	49.0	93.1	36.1	51.3	86.5	33.3	53.3	79.9
	050		53.3	52.7	127.9	50.4	56.0	120.7	47.3	59.2	113.5	44.3	62.0	106.2	41.2	64.6	98.8
	060		66.9	66.8	160.3	63.3	70.9	151.8	59.8	74.7	143.2	56.1	78.2	134.6	52.5	81.3	125.8
	070		76.3	77.8	182.9	72.5	82.4	173.8	68.6	86.7	164.5	64.8	90.7	155.3	60.9	94.5	146.1
	080		86.7	88.5	207.8	81.9	93.6	196.3	77.0	98.3	184.6	72.1	102.6	172.7	67.1	106.3	160.8
	090		92.9	92.6	222.8	87.4	98.4	209.5	81.9	103.8	196.3	76.4	108.7	183.1	70.8	113.1	169.7
	100		105.7	101.3	253.5	99.6	107.9	238.8	93.5	113.9	224.1	87.4	119.4	209.5	81.2	124.3	194.6
	110		114.0	116.2	273.2	107.6	123.0	258.0	101.3	129.3	242.8	94.9	135.1	227.5	88.5	140.4	212.1
	130		127.3	129.5	305.2	121.0	137.3	290.1	114.6	144.7	274.6	108.0	151.4	258.9	101.5	157.8	243.3
	150		147.5	152.3	353.6	140.2	161.6	336.2	132.9	170.5	318.5	125.5	178.9	300.7	117.9	186.8	282.7
	170		166.0	171.1	398.0	157.2	181.0	376.8	148.2	190.0	355.2	138.9	198.1	332.9	—	—	—
	190		181.8	188.4	435.8	172.4	199.2	413.4	163.1	209.6	391.0	153.6	219.1	368.3	143.8	227.7	344.6
	210		213.2	224.0	511.0	201.0	235.3	481.9	189.0	245.9	453.1	176.8	255.4	423.9	—	—	—
GT	225	44	239.8	253.0	574.8	226.5	266.4	542.9	212.9	278.5	510.4	199.3	289.4	477.8	185.4	298.9	444.3
	250		261.5	269.2	626.9	247.3	284.8	592.9	232.8	299.1	558.2	218.3	312.1	523.3	203.5	323.8	487.9
	280		293.0	308.1	702.3	277.7	324.6	665.8	262.4	340.0	629.0	246.9	354.2	591.9	231.4	367.4	554.8

Ratings in accordance with latest ARI (Air Conditioning and Refrigeration Institute) Standard 590-92

LEGEND

Cap. — Cooling Capacity Tons of Refrigeration
kW — Compressor Power Input
LCWT — Leaving Chilled Water Temperature
Flow Rate — U.S. Gpm

NOTES.

- Ratings apply to units with electronic or thermostatic expansion valves
- All ratings are based on:
 - A cooler water temperature rise of 10° F. When greater accuracy is desired, correct design LCWT, before entering rating tables, by reference to the LCWT correction curve.
 - A fouling factor of 0.00025 in the cooler
 - Refrigerant 22

- When a corrected LCWT is used, cooler pressure drop must also be corrected for new LCWT:

- Enter rating table for corrected LCWT. By interpolation, determine corrected capacity (tons) and power input (kW) to compressor at its rated voltage
- Calculate corrected flow rate through the cooler

$$= \frac{24 \times \text{capacity in tons}}{\text{temperature rise } F} = \text{U.S. gpm}$$

- Enter cooler pressure drop curve (page 24) at corrected flow rate and read pressure drop

- When cooler water temperature rise is less than 5 F, high flow rate will normally be accompanied by an excessive pressure drop. In such cases, contact your Carrier representative for special selection of a cooler with wider baffle spacing

COOLING CAPACITIES – ENGLISH (cont)

UNIT SIZE 30		LCWT (F)	CONDENSER ENTERING-AIR TEMPERATURE (F)														
			85			95			105			115			125		
			Cap.	Input kW	Cooler Flow Rate	Cap.	Input kW	Cooler Flow Rate	Cap.	Input kW	Cooler Flow Rate	Cap.	Input kW	Cooler Flow Rate	Cap.	Input kW	Cooler Flow Rate
GN,GT	040	45	38.3	36.1	92.0	36.4	38.8	87.4	34.5	41.4	82.7	32.4	43.8	77.8	30.4	46.0	72.8
	045		45.1	44.1	108.1	42.3	46.9	101.5	39.6	49.5	94.9	36.8	51.8	88.3	34.0	53.9	81.6
	050		54.3	53.1	130.2	51.3	56.6	122.9	48.2	59.8	115.6	45.1	62.7	108.2	42.0	65.3	100.8
	060		68.0	67.4	163.1	64.5	71.6	154.6	60.8	75.5	145.9	57.2	79.0	137.1	53.5	82.2	128.3
	070		77.6	78.5	186.1	73.7	83.1	176.8	69.8	87.5	167.4	65.9	91.6	158.1	62.0	95.4	148.8
	080		88.2	89.4	211.5	83.3	94.6	199.8	78.4	99.4	188.1	73.4	103.7	176.1	68.4	107.6	164.1
	090		94.6	93.6	226.8	89.0	99.4	213.5	83.4	104.9	200.1	77.9	109.9	186.7	72.2	114.5	173.2
	100		107.7	102.3	258.3	101.6	109.0	243.6	95.4	115.1	228.8	89.2	120.7	213.8	82.9	125.8	198.8
	110		116.1	117.3	278.4	109.7	124.3	263.0	103.2	130.8	247.6	96.8	136.7	232.1	90.3	142.1	216.5
	130		128.9	130.3	309.2	122.6	138.3	293.9	116.1	145.7	278.3	109.6	152.7	262.9	102.9	159.0	246.8
	150		149.4	153.4	358.3	142.0	162.8	340.5	134.6	171.8	322.7	127.1	180.3	304.8	119.5	188.3	286.7
	170		168.3	172.5	403.7	159.4	182.5	382.3	150.4	191.7	360.5	141.1	200.0	338.3	—	—	—
GT	190		184.3	189.9	441.9	174.8	200.9	419.2	165.4	211.3	396.6	155.9	221.0	373.9	146.0	229.8	350.2
	210		217.1	226.5	520.5	204.9	238.1	491.4	192.6	248.7	461.7	180.3	258.5	432.3	—	—	—
	225		243.9	255.6	585.0	230.6	269.3	553.0	216.9	281.7	520.1	203.1	292.9	487.0	189.1	302.7	453.5
GT	250	46	266.4	271.8	638.7	251.8	287.7	603.7	237.2	302.3	568.8	222.5	315.6	533.5	207.5	327.5	497.6
	280		298.1	311.2	714.8	282.7	328.1	678.0	267.0	343.6	640.3	251.5	358.2	603.1	235.8	371.6	565.3
	225		248.4	258.3	595.8	234.8	272.3	563.2	220.9	284.9	529.8	206.9	296.4	496.4	192.8	306.5	462.5
GN,GT	040	46	38.9	36.3	93.3	37.0	39.1	88.7	35.0	41.7	84.0	33.0	44.2	79.1	30.9	46.4	74.0
	045		45.9	44.5	110.1	43.1	47.4	103.4	40.3	50.0	96.7	37.5	52.4	90.0	34.7	54.5	83.3
	050		55.2	53.6	132.4	52.2	57.1	125.1	49.1	60.3	117.7	46.0	63.3	110.3	42.8	66.0	102.7
	060		69.2	68.0	166.0	65.6	72.2	157.3	61.9	76.2	148.6	58.2	79.8	139.7	54.5	83.1	130.7
	070		78.9	79.2	189.3	75.0	83.9	179.9	71.1	88.4	170.5	67.1	92.5	160.9	63.1	96.5	151.4
	080		89.8	90.2	215.3	84.8	95.6	203.5	79.9	100.5	191.6	74.8	104.9	179.5	69.7	108.8	167.2
	090		96.3	94.5	230.9	90.6	100.5	217.4	85.0	106.0	203.9	79.3	111.1	190.2	73.6	115.8	176.7
	100		109.8	103.2	263.3	103.5	110.1	248.4	97.2	116.3	233.2	90.9	122.1	218.1	84.6	127.3	203.0
	110		118.3	118.5	283.7	111.8	125.6	268.2	105.3	132.2	252.5	98.7	138.3	236.8	92.1	143.9	221.0
	130		130.6	131.2	313.2	124.2	139.3	297.8	117.6	146.8	282.1	111.0	153.9	266.3	104.3	160.4	250.2
	150		151.3	154.5	362.8	143.8	163.9	344.8	136.3	173.1	326.9	128.8	181.7	308.9	121.1	189.8	290.5
	170		170.6	173.8	409.2	161.7	184.0	387.9	152.6	193.4	365.9	143.2	201.8	343.5	—	—	—
GT	190		186.9	191.4	448.4	177.4	202.6	425.6	167.7	213.1	402.4	158.1	222.9	379.3	148.3	232.0	355.6
	210		221.0	229.0	530.1	208.7	240.9	500.6	196.3	251.8	470.8	183.9	261.8	444.0	—	—	—
	225		248.4	258.3	595.8	234.8	272.3	563.2	220.9	284.9	529.8	206.9	296.4	496.4	192.8	306.5	462.5
GN,GT	040	48	40.0	36.8	96.1	38.1	39.7	91.4	36.1	42.4	86.6	34.0	44.9	81.7	31.9	47.3	76.6
	045		47.5	45.4	114.1	44.7	48.3	107.3	41.9	51.1	100.4	39.0	53.6	93.6	36.1	55.8	86.7
	050		57.1	54.5	137.1	54.0	58.2	129.6	50.9	61.5	122.0	47.7	64.6	114.4	44.5	67.5	106.7
	060		71.6	69.1	171.8	67.9	73.6	162.9	64.2	77.7	154.0	60.4	81.5	144.9	56.6	84.9	135.8
	070		81.5	80.6	195.7	77.5	85.5	186.1	73.5	90.1	176.4	69.5	94.5	166.8	65.4	98.5	157.0
	080		92.9	91.9	222.9	87.9	97.5	210.9	82.8	102.6	198.7	77.7	107.2	186.4	72.4	111.4	173.8
	090		99.7	96.3	239.2	93.9	102.5	225.4	88.1	108.3	211.4	82.3	113.6	197.6	76.5	118.5	183.7
	100		113.8	105.2	273.2	107.5	112.2	258.0	101.1	118.8	242.6	94.6	124.8	227.0	88.1	130.3	211.5
	110		122.6	120.9	294.3	116.0	128.3	278.3	109.3	135.1	262.4	102.6	141.5	246.3	95.9	147.3	230.2
	130		133.9	132.9	321.3	127.4	141.2	305.7	120.8	149.0	289.8	114.0	156.2	273.6	107.2	162.9	257.3
	150		155.0	156.5	372.0	147.4	166.3	353.9	139.7	175.6	335.4	132.1	184.5	317.1	124.4	192.9	298.6
	170		175.3	176.6	420.8	166.3	187.1	399.1	157.0	196.7	376.8	147.5	205.5	354.0	—	—	—
GT	190		192.1	194.4	461.0	182.3	205.9	437.6	172.5	216.6	413.9	162.8	226.9	390.8	—	—	—
	210		229.0	234.1	549.5	216.4	246.4	519.3	203.8	257.8	489.0	191.0	268.2	458.3	—	—	—
	225		257.1	263.7	617.1	243.2	278.2	583.8	229.0	291.4	549.7	214.7	303.4	515.4	200.3	314.0	480.6
GT	250	48	280.8	279.7	673.8	265.8	296.5	637.9	250.5	312.0	601.2	235.3	326.2	564.8	219.8	339.1	527.6
	280		313.6	320.6	752.7	297.6	338.3	714.2	281.5	354.8	675.7	265.5	370.3	637.1	249.1	384.6	597.7
	225		257.1	263.7	617.1	243.2	278.2	583.8	229.0	291.4	549.7	214.7	303.4	515.4	200.3	314.0	480.6

Performance data — English (cont)



COOLING CAPACITIES — ENGLISH (cont)

UNIT SIZE 30		LCWT (F)	CONDENSER ENTERING-AIR TEMPERATURE (F)														
			85			95			105			115			125		
			Cap.	Input kW	Cooler Flow Rate	Cap.	Input kW	Cooler Flow Rate	Cap.	Input kW	Cooler Flow Rate	Cap.	Input kW	Cooler Flow Rate	Cap.	Input kW	Cooler Flow Rate
GN,GT	040	50	41.2	37.3	98.8	39.2	40.2	94.1	37.2	43.0	89.3	35.1	45.6	84.3	32.9	48.1	79.1
	045		49.2	46.2	118.1	46.3	49.3	111.2	43.4	52.1	104.2	40.5	54.7	97.2	37.6	57.1	90.2
	050		59.0	55.5	141.8	55.9	59.2	134.2	52.7	62.7	126.4	49.4	66.0	118.7	46.1	68.9	110.8
	060		74.0	70.3	177.7	70.3	74.9	168.7	66.4	79.2	159.5	62.6	83.1	150.3	58.7	86.7	140.9
	070		84.2	82.0	202.3	80.1	87.1	192.4	76.0	91.8	182.5	71.9	96.3	172.6	67.7	100.6	162.7
	080		96.2	93.7	230.9	91.0	99.4	218.5	85.8	104.7	206.0	80.6	109.6	193.4	75.2	113.9	180.6
	090		103.1	98.1	247.7	97.2	104.5	233.4	91.3	110.5	219.3	85.4	116.1	205.1	79.5	121.2	190.9
	100		118.0	107.1	283.4	111.5	114.5	267.8	105.0	121.3	252.0	98.4	127.5	236.3	91.7	133.2	220.1
	110		127.1	123.3	305.1	120.3	130.9	288.8	113.5	138.1	272.4	106.6	144.7	255.9	99.7	150.8	239.4
	130		137.2	134.7	329.5	130.6	143.2	313.7	123.9	151.2	297.5	117.1	158.6	281.2	110.1	165.5	264.4
	150		158.7	158.7	381.2	151.1	168.7	362.8	143.4	178.2	344.2	135.5	187.3	325.3	—	—	—
	170		180.1	179.4	432.5	170.9	190.2	410.3	161.5	200.1	387.8	151.9	209.2	364.6	—	—	—
	190		197.3	197.5	473.8	187.4	209.3	449.9	177.5	220.4	426.1	167.5	230.8	402.1	—	—	—
	210		237.0	239.4	569.2	224.3	252.0	538.4	211.3	263.8	507.4	198.3	274.7	476.2	—	—	—
GT	225	50	266.0	269.2	638.7	251.8	284.2	604.7	237.4	298.0	570.1	222.7	310.4	534.8	207.9	321.7	499.2
	250		290.5	285.0	697.5	275.3	302.4	661.0	259.8	318.6	623.8	244.0	333.3	585.9	228.3	346.8	548.1
	280		324.5	327.0	779.1	307.9	345.2	739.2	291.4	362.3	699.6	274.7	378.3	659.7	258.2	393.3	620.0
GN,GT	040	60	47.0	39.7	113.1	45.0	43.0	108.2	42.6	46.0	102.5	39.4	48.4	94.7	35.9	50.3	86.5
	045		56.8	49.9	136.6	52.9	53.0	127.4	49.2	55.8	118.3	45.4	58.3	109.2	41.7	60.5	100.2
	050		68.9	60.0	165.8	64.5	63.9	155.2	60.1	67.4	144.7	55.8	70.5	134.2	51.5	73.2	123.8
	060		84.5	75.2	203.3	79.5	79.9	191.1	74.4	84.1	178.9	69.3	87.9	166.8	64.3	91.2	154.7
	070		96.2	87.9	231.4	90.5	93.0	217.8	84.9	97.6	204.3	79.4	101.8	191.0	73.9	105.6	177.8
	080		107.6	99.8	258.7	100.9	105.5	242.7	94.2	110.6	226.7	—	—	—	—	—	—
	090		118.3	106.1	284.6	110.3	112.4	265.4	102.5	118.1	246.5	94.7	123.3	227.8	—	—	—
	100		137.7	115.9	331.3	128.9	123.5	310.1	120.1	130.4	288.9	111.4	136.6	268.0	102.7	142.1	247.1
	110		150.2	135.5	361.4	141.6	143.6	340.6	132.1	150.6	317.8	122.8	157.0	295.4	113.5	162.7	273.1
	130		154.6	143.6	371.8	147.5	153.2	354.8	140.3	162.2	337.6	133.0	170.8	319.9	—	—	—
	150		178.1	169.5	428.5	169.9	180.7	408.7	161.6	191.4	388.8	153.3	201.7	368.7	—	—	—
	170		205.0	193.6	493.1	195.1	205.9	469.4	184.2	216.7	443.1	171.1	225.0	411.6	—	—	—
	190		224.4	213.1	539.7	213.8	226.5	514.3	203.1	239.3	488.5	192.2	251.2	462.3	—	—	—
	210		269.5	259.7	648.2	252.9	272.0	608.4	236.5	283.2	568.8	—	—	—	—	—	—
GT	225	60	312.8	298.0	752.6	297.2	315.5	714.9	281.1	331.9	676.2	—	—	—	—	—	—
	250		342.4	312.5	823.7	325.3	332.9	782.6	307.7	351.9	740.2	—	—	—	—	—	—
	280		380.6	359.9	915.6	362.2	381.2	871.4	343.8	401.3	827.1	325.1	420.3	782.1	—	—	—

LEGEND

Cap. — Cooling Capacity Tons of Refrigeration
 kW — Compressor Power Input
 LCWT — Leaving Chilled Water Temperature
 Flow Rate — U.S. Gpm

NOTES

- Ratings apply to units with electronic or thermostatic expansion valves.
- All ratings are based on
 - A cooler water temperature rise of 10° F. When greater accuracy is desired, correct design LCWT, before entering rating tables, by reference to the LCWT correction curve
 - A fouling factor of 0.00025 in the cooler
 - Refrigerant 22

- When a corrected LCWT is used, cooler pressure drop must also be corrected for new LCWT.
 - Enter rating table for corrected LCWT. By interpolation, determine corrected capacity (tons) and power input (kW) to compressor at its rated voltage
 - Calculate corrected flow rate through the cooler:

$$= \frac{24 \times \text{capacity in tons}}{\text{temperature rise } F} = \text{U.S. gpm}$$
 - Enter cooler pressure drop curve (page 24) at corrected flow rate and read pressure drop
- When cooler water temperature rise is less than 5 F, high flow rate will normally be accompanied by an excessive pressure drop. In such cases, contact your Carrier representative for special selection of a cooler with wider baffle spacing.

Performance data – SI



COOLING CAPACITIES – SI

UNIT SIZE 30		LCWT (C)	CONDENSER ENTERING-AIR TEMPERATURE (C)														
			30			35			40			45			50		
			Cap.	Input kW	Cooler Flow Rate	Cap.	Input kW	Cooler Flow Rate	Cap.	Input kW	Cooler Flow Rate	Cap.	Input kW	Cooler Flow Rate	Cap.	Input kW	Cooler Flow Rate
GN,GT	040	4	123.1	34.9	5.3	117.3	37.2	5.0	111.3	39.3	4.8	105.1	41.2	4.5	98.7	43.0	4.2
	045		141.6	42.0	6.1	133.4	44.3	5.7	125.3	46.3	5.4	117.1	48.2	5.0	108.8	49.8	4.7
	050		171.3	50.8	7.4	162.3	53.5	7.0	153.2	56.1	6.6	144.1	58.4	6.2	134.9	60.5	5.8
	060		214.9	64.4	9.2	204.3	67.8	8.8	193.5	70.9	8.3	182.7	73.7	7.8	171.8	76.3	7.4
	070		246.0	74.9	10.6	234.6	78.7	10.1	223.1	82.3	9.6	211.6	85.6	9.1	200.1	88.7	8.6
	080		278.1	84.9	11.9	263.6	89.1	11.3	248.9	92.9	10.7	234.2	96.4	10.1	219.3	99.4	9.4
	090		297.4	88.9	12.8	280.9	93.6	12.1	264.4	98.0	11.3	247.9	102.0	10.6	231.5	105.7	9.9
	100		337.1	97.4	14.5	318.8	102.7	13.7	300.7	107.6	12.9	282.4	112.1	12.1	263.8	116.0	11.3
	110		363.9	111.2	15.6	344.8	116.8	14.8	325.9	121.9	14.0	306.9	126.7	13.2	287.8	131.0	12.4
	130		418.6	126.1	18.0	399.4	132.7	17.1	380.0	138.9	16.3	360.3	144.6	15.5	340.1	149.9	14.6
	150		486.4	148.2	20.9	464.0	156.1	19.9	441.4	163.6	18.9	418.8	170.7	18.0	395.9	177.4	17.0
	170		542.5	165.7	23.3	515.3	173.8	22.1	487.8	181.3	20.9	460.0	188.0	19.7	431.6	194.0	18.5
	190		594.5	182.3	25.5	566.3	191.5	24.3	537.5	200.0	23.1	508.5	208.0	21.8	479.2	215.3	20.6
	210		681.5	213.2	29.3	645.2	222.5	27.7	609.5	231.1	26.2	573.3	238.9	24.6	537.8	246.1	23.1
GT	225		768.7	241.7	33.0	728.7	252.6	31.3	687.9	262.4	29.5	647.3	271.2	27.8	605.9	278.9	26.0
	250		838.1	258.3	36.0	794.9	271.0	34.1	752.0	282.7	32.3	708.8	293.3	30.4	665.3	302.9	28.6
	280		941.6	295.1	40.4	895.7	308.6	38.5	850.0	321.2	36.5	803.9	332.9	34.5	758.1	343.8	32.5
GN,GT	040	5	126.5	35.4	5.4	120.6	37.7	5.2	114.5	39.9	4.9	108.3	41.9	4.7	101.9	43.7	4.4
	045		146.5	42.8	6.3	138.1	45.1	5.9	129.8	47.2	5.6	121.4	49.2	5.2	113.0	50.9	4.9
	050		177.0	51.6	7.6	167.8	54.5	7.2	158.5	57.1	6.8	149.2	59.6	6.4	139.8	61.8	6.0
	060		221.9	65.4	9.5	211.1	68.9	9.1	200.1	72.2	8.6	189.1	75.1	8.1	178.0	77.8	7.6
	070		253.7	76.2	10.9	242.1	80.1	10.4	230.4	83.8	9.9	218.6	87.2	9.4	206.9	90.4	8.9
	080		287.4	86.5	12.3	272.6	90.8	11.7	257.6	94.8	11.1	242.5	98.4	10.4	227.4	101.6	9.8
	090		307.5	90.5	13.2	290.6	95.4	12.5	273.9	100.0	11.8	257.0	104.2	11.0	240.2	108.0	10.3
	100		349.1	99.1	15.0	330.7	104.7	14.2	311.9	109.7	13.4	293.2	114.4	12.6	274.4	118.6	11.8
	110		376.7	113.3	16.2	357.3	119.1	15.4	337.8	124.5	14.5	318.4	129.4	13.7	298.9	133.9	12.8
	130		428.4	127.6	18.4	409.0	134.4	17.6	389.4	140.8	16.7	369.3	146.7	15.9	349.1	152.2	15.0
	150		497.6	150.1	21.4	474.9	158.2	20.4	452.0	165.9	19.4	429.0	173.2	18.4	406.0	180.1	17.4
	170		556.7	168.1	23.9	529.4	176.5	22.7	501.2	184.2	21.5	472.9	191.2	20.3	444.2	197.4	19.1
	190		609.7	185.0	26.2	581.4	194.4	25.0	552.4	203.2	23.7	522.8	211.4	22.5	492.8	218.9	21.2
	210		705.3	217.7	30.3	667.7	227.2	28.7	631.2	236.2	27.1	594.6	244.4	25.5	557.5	251.8	23.9
GT	225		794.2	246.4	34.1	753.7	257.7	32.4	712.5	268.0	30.6	670.4	277.2	28.2	628.4	285.3	27.0
	250		866.4	263.0	37.2	822.7	276.2	35.3	778.3	288.3	33.4	734.1	299.4	31.5	689.6	309.4	29.6
	280		972.1	300.6	41.8	925.4	314.6	39.8	878.8	327.6	37.8	831.9	339.8	35.7	784.5	351.1	33.7
GN,GT	040	6	129.9	35.8	5.6	124.0	38.2	5.3	117.8	40.4	5.1	111.5	42.5	4.8	105.1	44.5	4.5
	045		151.4	43.5	6.5	142.9	45.9	6.1	134.4	48.1	5.8	125.9	50.2	5.4	117.3	52.0	5.0
	050		182.7	52.4	7.9	173.3	55.4	7.5	163.9	58.2	7.0	154.4	60.7	6.6	144.8	63.0	6.2
	060		229.1	66.5	9.8	218.0	70.1	9.4	206.9	73.5	8.9	195.6	76.6	8.4	184.2	79.4	7.9
	070		261.7	77.4	11.2	249.7	81.4	10.7	237.7	85.3	10.2	225.8	88.8	9.7	213.7	92.2	9.2
	080		296.7	88.0	12.8	281.7	92.5	12.1	266.5	96.6	11.5	251.1	100.4	10.8	235.7	103.8	10.1
	090		317.9	92.1	13.7	300.7	97.2	12.9	283.5	102.0	12.1	266.2	106.2	11.4	249.0	110.3	10.7
	100		361.4	100.9	15.5	342.4	106.6	14.7	323.3	111.9	13.9	304.2	116.8	13.1	284.9	121.2	12.2
	110		389.8	115.4	16.8	370.0	121.4	15.9	350.1	127.0	15.1	330.1	132.1	14.2	310.2	136.9	13.3
	130		438.7	129.2	18.9	418.7	136.2	18.0	398.8	142.7	17.1	378.5	148.8	16.3	357.9	154.4	15.4
	150		508.7	152.0	21.9	485.9	160.2	20.9	462.7	168.2	19.9	439.2	175.6	18.9	415.9	182.7	17.9
	170		571.1	170.5	24.5	543.4	179.2	23.4	515.1	187.2	22.1	486.1	194.4	20.9	456.8	200.9	19.6
	190		625.2	187.6	26.9	595.9	197.3	25.6	567.0	206.4	24.4	537.4	214.9	23.1	506.5	222.6	21.8
	210		728.8	222.1	31.3	691.2	232.0	29.7	653.3	241.3	28.1	615.9	249.9	26.5	578.4	257.7	24.9
GT	225		820.5	251.2	35.3	779.0	262.9	33.5	736.9	273.6	31.7	694.5	283.3	29.9	651.1	291.8	28.0
	250		895.5	267.7	38.5	850.7	281.3	36.6	805.7	294.0	34.6	760.0	305.5	32.7	714.4	316.0	30.7
	280		1004.2	306.2	43.2	956.1	320.6	41.1	908.3	334.2	39.0	860.1	346.8	37.0	811.9	358.6	34.9

LEGEND

Cap. — Cooling Capacity kW of Refrigeration
 kW — Compressor Power Input
 LCWT — Leaving Chilled Water Temperature
 Flow Rate — L/s

NOTES:

- Ratings apply to units with electronic or thermostatic expansion valves
- All ratings are based on
 - A cooler chilled water temperature rise of 6° C. When greater accuracy is desired, correct design LCWT, before entering rating tables, by reference to the LCWT correction curve.
 - A fouling factor of 0.00044 in the cooler
 - Refrigerant 22

- When a corrected LCWT is used, cooler pressure drop must also be corrected for new LCWT
 - Enter rating table for corrected LCWT. By interpolation, determine corrected capacity (kW) and power input (kW) to compressor at its rated voltage.
 - Calculate corrected flow rate through the cooler:

$$= \frac{0.239 \times \text{capacity in kW}}{\text{temperature rise } ^\circ\text{C}} = \text{L/s}$$
 - Enter cooler pressure drop curve (page 24) at corrected flow rate and read pressure drop
- When chilled water temperature rise is less than 3° C, high flow rate will normally be accompanied by an excessive pressure drop. In such cases, contact your Carrier representative for special selection of a cooler with wider baffle spacing

Performance data — SI (cont)



COOLING CAPACITIES — SI (cont)

UNIT SIZE 30		LCWT (C)	CONDENSER ENTERING-AIR TEMPERATURE (C)														
			30			35			40			45			50		
			Cap.	Input kW	Cooler Flow Rate	Cap.	Input kW	Cooler Flow Rate	Cap.	Input kW	Cooler Flow Rate	Cap.	Input kW	Cooler Flow Rate	Cap.	Input kW	Cooler Flow Rate
GN,GT	040	7	133.4	36.2	5.7	127.4	38.7	5.5	121.2	41.0	5.2	114.8	43.2	4.9	108.3	45.2	4.7
	045		156.4	44.3	6.7	147.8	46.8	6.4	139.1	49.1	6.0	130.4	51.2	5.6	121.6	53.1	5.2
	050		188.5	53.3	8.1	179.0	56.4	7.7	169.4	59.2	7.3	159.7	61.9	6.9	149.9	64.3	6.4
	060		236.3	67.6	10.2	225.1	71.3	9.7	213.7	74.8	9.2	202.2	78.0	8.7	190.6	80.9	8.2
	070		269.7	78.7	11.6	257.5	82.8	11.1	245.3	86.8	10.5	233.0	90.5	10.0	220.7	93.9	9.5
	080		306.3	89.6	13.2	291.1	94.2	12.5	275.6	98.5	11.9	259.9	102.5	11.2	243.9	106.0	10.5
	090		328.4	93.8	14.1	310.8	99.0	13.4	293.2	103.9	12.6	275.6	108.5	11.9	257.9	112.6	11.1
	100		373.9	102.6	16.1	354.5	108.5	15.2	334.9	114.0	14.4	315.4	119.1	13.6	295.8	123.8	12.7
	110		403.2	117.6	17.3	382.9	123.8	16.5	362.6	129.6	15.6	342.2	134.9	14.7	321.7	139.9	13.8
	130		448.9	130.8	19.3	428.9	137.9	18.4	408.3	144.6	17.6	388.1	150.9	16.7	366.9	156.7	15.8
	150		520.4	153.9	22.4	496.9	162.3	21.4	473.4	170.4	20.4	449.9	178.1	19.4	426.1	185.4	18.3
	170		585.6	173.0	25.2	557.6	181.9	24.0	528.9	190.2	22.7	499.7	197.7	21.5	469.7	204.3	20.2
	190		641.3	190.4	27.6	611.4	200.2	26.3	581.7	209.6	25.0	551.9	218.4	23.7	520.8	226.4	22.4
	210		753.6	226.7	32.4	714.9	237.0	30.7	676.4	246.5	29.1	637.6	255.4	27.4	—	—	—
GT	225		847.6	256.0	36.5	805.2	268.1	34.6	761.9	279.3	32.8	718.5	289.4	30.9	674.7	298.5	29.0
	250		925.1	272.4	39.8	879.3	286.6	37.8	833.2	299.6	35.8	786.9	311.7	33.8	739.7	322.6	31.8
	280		1035.7	311.7	44.5	987.4	326.7	42.5	937.9	340.7	40.3	889.0	353.8	38.2	839.5	366.0	36.1
GN,GT	040	8	136.9	36.7	5.9	130.9	39.2	5.6	124.6	41.6	5.4	118.2	43.8	5.1	111.5	45.9	4.8
	045		161.5	45.0	7.0	152.7	47.6	6.6	143.9	50.0	6.2	135.0	52.2	5.8	126.1	54.2	5.4
	050		194.4	54.1	8.4	184.7	57.3	7.9	174.9	60.3	7.5	165.1	63.0	7.1	155.1	65.5	6.7
	060		243.8	68.6	10.5	232.3	72.5	10.0	220.7	76.1	9.5	209.0	79.4	9.0	197.1	82.5	8.5
	070		278.0	80.0	12.0	265.5	84.2	11.4	253.1	88.3	10.9	240.4	92.1	10.3	227.8	95.7	9.8
	080		316.1	91.1	13.6	300.5	95.9	12.9	284.8	100.4	12.3	268.8	104.5	11.6	252.5	108.2	10.9
	090		339.0	95.4	14.6	321.0	100.9	13.8	303.1	105.9	13.0	285.0	110.6	12.3	267.0	115.0	11.5
	100		386.7	104.3	16.6	366.9	110.5	15.8	346.9	116.2	14.9	327.0	121.5	14.1	306.7	126.3	13.2
	110		416.6	119.7	17.9	396.1	126.1	17.0	375.4	132.2	16.2	354.6	137.7	15.3	333.6	142.9	14.4
	130		459.2	132.4	19.8	438.9	139.7	18.9	418.3	146.5	18.0	397.2	153.0	17.1	376.2	159.0	16.2
	150		532.0	155.9	22.9	508.1	164.4	21.9	484.4	172.7	20.8	460.4	180.6	19.8	436.5	188.0	18.8
	170		600.4	175.5	25.8	571.9	184.6	24.6	542.9	193.1	23.4	513.0	200.9	22.1	482.8	207.8	20.8
	190		657.7	193.1	28.3	627.4	203.2	27.0	596.6	212.8	25.7	566.2	221.8	24.4	535.1	230.2	23.0
	210		778.4	231.3	33.5	739.3	242.0	31.8	699.7	251.9	30.1	660.4	261.1	28.4	—	—	—
GT	225		874.9	260.9	37.6	831.6	273.5	35.8	787.4	285.0	33.9	743.1	295.5	32.0	698.3	305.1	30.1
	250		955.1	277.2	41.1	908.5	291.8	39.1	861.3	305.4	37.1	813.8	317.9	35.0	766.0	329.4	33.0
	280		1068.0	317.3	46.0	1018.4	332.8	43.8	968.8	347.3	41.7	918.0	360.9	39.5	867.8	373.6	37.3
GN,GT	040	9	140.5	37.1	6.0	134.3	39.7	5.8	128.0	42.2	5.5	121.5	44.5	5.2	114.8	46.7	4.9
	045		166.7	45.8	7.2	157.7	48.4	6.8	148.7	50.9	6.4	139.7	53.2	6.0	130.6	55.3	5.6
	050		200.4	55.0	8.6	190.6	58.3	8.2	180.6	61.3	7.8	170.5	64.2	7.3	160.4	66.8	6.9
	060		251.3	69.7	10.8	239.6	73.7	10.3	227.8	77.4	9.8	215.8	80.9	9.3	203.7	84.1	8.8
	070		286.3	81.2	12.3	273.5	85.6	11.8	260.9	89.8	11.2	248.1	93.8	10.7	235.3	97.5	10.1
	080		326.0	92.7	14.0	310.1	97.7	13.4	294.0	102.3	12.7	277.8	106.6	12.0	261.3	110.4	11.2
	090		349.7	97.1	15.1	331.5	102.7	14.3	313.0	107.9	13.5	294.7	112.8	12.7	276.3	117.3	11.9
	100		399.5	106.1	17.2	379.5	112.5	16.3	359.1	118.4	15.5	338.8	123.9	14.6	318.0	129.0	13.7
	110		430.4	121.9	18.5	409.4	128.5	17.6	388.2	134.7	16.7	367.1	140.6	15.8	345.7	146.0	14.9
	130		469.7	134.0	20.2	449.1	141.4	19.3	428.2	148.5	18.4	406.7	155.0	17.5	385.3	161.2	16.6
	150		543.7	157.8	23.4	519.8	166.6	22.4	495.4	174.9	21.3	471.1	183.0	20.3	446.8	190.7	19.2
	170		615.1	178.0	26.5	586.5	187.4	25.2	557.0	196.1	24.0	527.0	204.2	22.7	—	—	—
	190		674.0	195.9	29.0	643.0	206.3	27.7	612.3	216.0	26.4	581.6	225.4	25.0	549.7	234.0	23.7
	210		803.7	235.9	34.6	763.8	247.0	32.9	723.7	257.3	31.2	683.2	266.8	29.4	—	—	—
GT	225		902.5	265.8	38.9	858.4	278.8	37.0	813.4	290.8	35.0	768.1	301.8	33.1	722.4	311.7	31.1
	250		985.6	282.0	42.4	938.0	297.1	40.4	890.0	311.2	38.3	841.5	324.2	36.2	792.5	336.1	34.1
	280		1101.1	323.0	47.4	1050.1	338.9	45.2	999.3	353.9	43.0	948.4	368.1	40.8	896.1	381.2	38.6

LEGEND

Cap. — Cooling Capacity kW of Refrigeration
 kW — Compressor Power Input
 LCWT — Leaving Chilled Water Temperature
 Flow Rate — L/s

NOTES:

- 1 Ratings apply to units with electronic or thermostatic expansion valves.
- 2 All ratings are based on:
 - a A cooler chilled water temperature rise of 6° C. When greater accuracy is desired, correct design LCWT, before entering rating tables, by reference to the LCWT correction curve
 - b A fouling factor of 0.00044 in the cooler
 - c Refrigerant 22

- 3 When a corrected LCWT is used, cooler pressure drop must also be corrected for new LCWT
 - a Enter rating table for corrected LCWT. By interpolation, determine corrected capacity (kW) and power input (kW) to compressor at its rated voltage
 - b Calculate corrected flow rate through the cooler

$$= \frac{0.239 \times \text{capacity in kW}}{\text{temperature rise } ^\circ\text{C}} = \text{L/s}$$
 - c Enter cooler pressure drop curve (page 24) at corrected flow rate and read pressure drop
4. When chilled water temperature rise is less than 3° C, high flow rate will normally be accompanied by an excessive pressure drop. In such cases, contact your Carrier representative for special selection of a cooler with wider baffle spacing.

COOLING CAPACITIES — SI (cont)

UNIT SIZE 30		LCWT (C)	CONDENSER ENTERING-AIR TEMPERATURE (C)														
			30			35			40			45			50		
			Cap.	Input kW	Cooler Flow Rate	Cap.	Input kW	Cooler Flow Rate	Cap.	Input kW	Cooler Flow Rate	Cap.	Input kW	Cooler Flow Rate	Cap.	Input kW	Cooler Flow Rate
GN,GT	040	10	144.1	37.6	6.2	137.9	40.2	5.9	131.5	42.7	5.7	124.9	45.1	5.4	118.2	47.4	5.1
	045		172.0	46.5	7.4	162.9	49.3	7.0	153.7	51.8	6.6	144.5	54.2	6.2	135.2	56.4	5.8
	050		206.6	55.9	8.9	196.5	59.2	8.5	186.3	62.4	8.0	176.1	65.3	7.6	165.7	68.0	7.1
	060		259.0	70.8	11.2	247.1	74.9	10.6	235.0	78.8	10.1	222.8	82.4	9.6	210.5	85.7	9.1
	070		294.8	82.5	12.7	281.9	87.1	12.1	268.8	91.4	11.6	255.8	95.4	11.0	242.7	99.3	10.5
	080		336.4	94.3	14.5	320.0	99.4	13.8	303.5	104.2	13.1	286.9	108.6	12.4	270.2	112.7	11.6
	090		360.7	98.8	15.5	341.9	104.5	14.7	323.2	109.9	13.9	304.6	115.0	13.1	285.8	119.7	12.3
	100		412.9	107.9	17.8	392.3	114.5	16.9	371.5	120.6	16.0	350.8	126.3	15.1	329.4	131.6	14.2
	110		444.5	124.1	19.1	423.0	130.9	18.2	401.4	137.4	17.3	379.7	143.4	16.4	358.0	149.0	15.4
	130		480.1	135.6	20.7	459.4	143.2	19.8	438.2	150.4	18.9	416.7	157.2	17.9	394.6	163.5	17.0
	150		555.6	159.7	23.9	531.4	168.7	22.9	506.9	177.3	21.8	482.0	185.5	20.8	457.4	193.4	19.7
	170		630.2	180.5	27.1	601.0	190.2	25.9	571.3	199.1	24.6	540.9	207.4	23.3	—	—	—
	190		690.5	198.7	29.7	659.0	209.3	28.4	627.9	219.3	27.0	596.5	228.9	25.7	564.2	237.7	24.3
	210		829.1	240.7	35.7	788.7	252.0	34.0	747.8	262.7	32.2	706.8	272.6	30.4	—	—	—
GT	225		930.6	270.8	40.1	885.7	284.2	38.1	840.2	296.7	36.2	793.6	308.0	34.2	746.9	318.4	32.2
	250		1016.3	286.8	43.8	968.1	302.4	41.7	919.1	317.0	39.6	869.6	330.5	37.5	819.5	342.9	35.3
	280		1135.3	328.9	48.9	1082.7	345.2	46.6	1030.5	360.6	44.4	977.9	375.2	42.1	925.8	389.0	39.9
GN,GT	040	13	155.0	38.9	6.7	148.7	41.7	6.4	142.1	44.5	6.1	135.3	47.1	5.8	128.3	49.5	5.5
	045		188.4	48.9	8.1	178.8	51.9	7.7	169.1	54.7	7.3	159.4	57.3	6.9	149.2	59.7	6.4
	050		225.5	58.5	9.7	214.9	62.1	9.3	204.2	65.6	8.8	193.4	68.9	8.3	182.4	71.9	7.9
	060		282.8	74.1	12.2	270.2	78.6	11.7	257.5	82.8	11.1	243.8	86.6	10.5	229.6	90.0	9.9
	070		321.2	86.4	13.8	307.5	91.4	13.3	293.7	96.1	12.7	279.9	100.6	12.1	265.0	104.5	11.4
	080		367.9	99.2	15.9	350.6	104.8	15.1	331.5	109.8	14.3	—	—	—	—	—	—
	090		394.3	104.0	17.0	374.7	110.2	16.2	353.8	115.8	15.3	332.1	121.0	14.3	310.8	125.9	13.4
	100		453.9	113.3	19.6	432.1	120.5	18.6	410.1	127.3	17.7	388.0	133.7	16.7	365.5	139.6	15.8
	110		488.1	130.8	21.0	465.3	138.3	20.1	442.4	145.4	19.1	419.1	152.0	18.1	395.9	158.3	17.1
	130		512.8	140.4	22.1	491.1	148.6	21.2	469.1	156.3	20.2	446.4	163.6	19.3	423.7	170.5	18.3
	150		591.7	165.6	25.5	566.7	175.1	24.4	541.3	184.3	23.3	515.6	193.1	22.2	489.8	201.6	21.1
	170		676.3	188.1	29.2	646.2	198.6	27.9	615.1	208.3	26.5	583.5	217.4	25.2	—	—	—
	190		740.9	207.1	31.9	708.5	218.5	30.6	675.9	229.3	29.1	642.5	239.6	27.7	—	—	—
	210		909.3	255.4	39.2	865.6	267.8	37.3	822.3	279.4	35.5	—	—	—	—	—	—
GT	225		1017.1	286.1	43.9	969.7	300.8	41.8	921.7	314.6	39.7	873.1	327.3	37.6	—	—	—
	250		1112.6	301.6	48.0	1061.6	318.7	45.8	1009.0	334.7	43.5	956.4	349.7	41.2	903.2	363.7	38.9
	280		1239.8	346.5	53.5	1184.4	364.4	51.1	1128.7	381.3	48.7	1072.6	397.3	46.3	1015.6	412.3	43.8
GN,GT	040	16	166.3	40.2	7.2	159.8	43.2	6.9	151.6	45.9	6.5	140.9	48.0	6.1	130.1	49.8	5.6
	045		198.5	50.3	8.6	186.3	53.0	8.0	174.3	55.5	7.5	162.3	57.8	7.0	150.5	59.9	6.5
	050		240.9	60.5	10.4	227.0	63.9	9.8	213.1	67.0	9.2	199.4	69.9	8.6	185.7	72.4	8.0
	060		295.6	75.7	12.8	279.6	79.9	12.1	263.4	83.7	11.4	247.5	87.2	10.7	231.5	90.3	10.0
	070		336.5	88.4	14.5	318.6	93.0	13.7	300.8	97.1	13.0	283.3	101.0	12.2	265.9	104.5	11.5
	080		376.2	100.4	16.2	355.1	105.5	15.3	334.0	110.1	14.4	—	—	—	—	—	—
	090		413.5	106.7	17.8	388.2	112.4	16.8	363.3	117.6	15.7	338.7	122.3	14.6	314.4	126.5	13.6
	100		481.5	116.7	20.8	453.5	123.5	19.6	425.7	129.8	18.4	398.1	135.4	17.2	370.6	140.5	16.0
	110		528.4	136.6	22.8	498.1	143.6	21.5	468.2	150.0	20.2	438.6	155.8	18.9	409.2	161.1	17.7
	130		546.1	145.3	23.6	523.6	154.0	22.6	500.7	162.2	21.6	477.6	170.1	20.6	453.9	177.5	19.6
	150		629.1	171.5	27.2	602.9	181.7	26.0	576.7	191.4	24.9	550.2	200.8	23.7	—	—	—
	170		724.7	196.0	31.3	691.0	206.7	29.8	652.7	215.8	28.2	611.2	223.5	26.4	—	—	—
	190		793.7	215.8	34.3	759.5	228.0	32.8	725.4	239.6	31.3	691.8	250.6	29.9	—	—	—
	210		942.3	261.0	40.7	889.8	272.0	38.4	837.7	282.2	36.2	—	—	—	—	—	—
GT	225		1107.9	302.2	47.8	1058.4	318.1	45.7	1007.1	333.1	43.5	—	—	—	—	—	—
	250		1213.5	316.9	52.4	1155.6	334.8	49.9	1096.7	351.5	47.3	1036.2	366.9	44.7	—	—	—
	280		1348.5	364.8	58.2	1289.9	384.1	55.7	1231.1	402.5	53.1	1168.7	419.3	50.4	—	—	—

Electrical data



UNIT SIZE 30		VOLTAGE			MCA		MOCP		ICF	
		Nameplate (3 Ph, 60 Hz)	Supplied*		XL	PW	XL	PW	XL	PW
			Min	Max						
GN,GT	040	208/230	187	253	174.6	174.6	225	225	434.7	296.7
		460	414	506	100.0	100.0	100	100	218.6	148.3
		575	518	633	100.0	100.0	100	100	162.4	113.7
		380	342	418	100.0	100.0	125	100	241.2	163.9
	045	208/230	187	253	201.8	201.8	250	250	535.7	357.7
		460	414	506	100.1	100.4	125	125	268.6	178.3
		575	518	633	100.0	100.0	125	100	206.4	139.8
		380	342	418	107.1	105.0	150	150	297.2	196.9
	050	208/230	187	253	244.5	244.5	350	350	617.5	415.5
		460	414	506	113.1	116.8	150	150	307.6	207.9
		575	518	633	100.6	100.0	125	100	226.1	152.9
		380	342	418	126.9	127.8	175	175	341.1	228.5
	060	208/230	187	253	323.3	323.3	450	450	823.6	547.6
		460	414	506	139.6	144.6	200	200	408.2	272.1
		575	518	633	125.4	121.0	175	150	336.8	218.7
		380	342	418	174.5	176.6	250	250	458.0	306.2
	070	208/230	187	253	364.3	364.3	500	500	864.6	588.6
		460	414	506	163.6	169.2	225	225	426.8	291.3
		575	518	633	148.9	141.5	200	175	353.5	239.2
		380	342	418	200.7	202.3	250	250	484.2	331.9
	080	208/230	187	253	391.3	391.3	500	500	896.9	620.9
		460	414	506	179.5	183.4	225	250	442.8	305.4
		575	518	633	160.9	149.2	200	200	365.6	246.9
		380	342	418	209.1	209.9	250	250	492.6	339.5
	090	208/230	187	253	392.2	392.2	450	450	722.3	547.9
		460	414	506	192.7	195.6	225	225	361.2	273.5
		575	518	633	168.0	156.9	200	175	286.2	213.2
		380	342	418	205.9	202.6	250	225	396.0	294.5
	100	208/230	187	253	462.3	462.3	500	500	835.2	633.2
		460	414	506	214.3	221.2	250	250	408.8	312.3
		575	518	633	191.1	168.9	225	200	289.4	233.1
		380	342	418	240.5	242.1	250	250	454.8	342.8
	110	208/230	187	253	513.6	513.6	600	600	1019.2	743.2
		460	414	506	237.5	245.2	300	300	500.8	367.3
		575	518	633	212.0	194.5	250	225	416.6	292.1
		380	342	418	273.3	274.1	350	350	556.8	403.8
	130	208/230	187	253	610.2	610.2	700	700	1111.1	835.1
		460	414	506	305.5	305.5	350	350	555.9	417.9
		575	518	633	257.4	257.4	300	300	355.6	323.6
		380	342	418	331.1	331.1	400	400	612.8	460.8
	150	208/230	187	253	664.2	664.2	800	800	1165.1	889.1
		460	414	506	332.4	332.4	400	400	582.8	444.8
		575	518	633	283.8	283.8	300	300	446.0	350.0
		380	342	418	359.9	359.9	400	400	641.6	489.6
	170	208/230	187	253	727.5	727.5	800	800	1098.9	896.9
		460	414	506	364.3	364.3	400	400	549.9	448.9
		575	518	633	294.6	294.6	300	300	418.5	348.5
		380	342	418	387.8	387.8	400	400	598.0	486.0
	190	208/230	187	253	800.0	800.0	800	800	1301.5	1025.5
		460	414	506	400.7	400.7	450	450	651.1	513.1
		575	518	633	337.4	337.4	350	350	499.6	403.6
		380	342	418	432.5	432.5	500	500	714.2	562.2
	210	208/230	187	253	890.4	890.4	1000	1000	1391.3	1115.3
		460	414	506	445.6	445.6	500	500	696.0	558.0
		575	518	633	374.0	374.0	400	400	536.2	440.2
		380	342	418	479.3	479.3	500	500	761.0	609.0
GT	225	460	414	506	487.0	495.0	500	500	749.0	617.0
		575	518	633	416.0	—	450	—	626.0	—
		380	342	418	592.0	—	600	—	874.0	—
	250	460	414	506	535.0	545.0	600	600	798.0	667.0
		575	518	633	455.0	—	500	—	665.0	—
		380	342	418	651.0	—	700	—	933.0	—
	280	460	414	506	610.0	628.0	700	700	873.0	750.0
		575	518	633	509.0	—	600	—	719.0	—
		380	342	418	742.0	—	800	—	1024.0	—

NOTE See Legend and Notes on page 39

POWER CIRCUIT

UNIT SIZE 30		VOLTAGE	TERMINAL BLOCKS	PARALLEL CONDUCTORS
GN,GT	040-070	208/230	1	3 (040,045), 6 (050-070)
		460	1	3
		575	1	3
		380	1	3
	080-110	208/230	1	6
		460	1	3
		575	1	3
		380	1	3
	130-210	208/230	3	9
		460	2	6
		575	2	6
		380	2	6
GT	225-280	460	2	6
		575	2	6
		380	2	6

CONTROL CIRCUIT

UNIT SIZE 30		UNIT POWER	CONTROL POWER			AMPS
		V-3 Ph-60 Hz	V-1 Ph-60 Hz	Min	Max	
GN,GT	040-070	208/230	115	104	127	30
		460	115	104	127	30
		575	115	104	127	30
		380	230	207	254	15/5†
	080-210	208/230	115	104	127	30
		460	115	104	127	30
		575	115	104	127	30
		380	230	207	254	15/5†
GT	225-280	460	115	104	127	30
		575	115	104	127	30
		380	230	207	254	15

NOTE: See Legend and Notes on page 39

Electrical data (cont)



COMPRESSOR AND CONDENSER ELECTRICAL DATA

UNIT SIZE 30GN,GT	NAMEPLATE VOLTAGE 3 Ph, 60 Hz	COMPRESSOR NUMBERS				CONDENSER FAN (QUANTITY) FLA (ea)
		A1		B1		
		RLA	LRA	RLA	LRA	
040	208/230	67.9	345	67.9	345	(2) 5.4, (2) 5.5
	460	34.6	173	34.6	173	(2) 2.7, (2) 2.8
	575	28.8	120	28.8	120	(4) 3.4
	380	34.6	191	34.6	191	(4) 3.9
040-PW	208/230	67.9	207	67.9	207	(2) 5.4, (2) 5.5
	460	33.3	104	33.3	104	(2) 2.7, (2) 2.8
	575	28.2	72	28.2	72	(4) 3.4
	380	33.3	115	33.3	115	(4) 3.9
045	208/230	67.9	345	89.7	446	(2) 5.4, (2) 5.5
	460	34.6	173	43.6	223	(2) 2.7, (2) 2.8
	575	28.8	120	36.5	164	(4) 3.4
	380	34.6	191	45.5	247	(4) 3.9
045-PW	208/230	67.9	207	89.7	268	(2) 5.4, (2) 5.5
	460	33.3	104	44.9	134	(2) 2.7, (2) 2.8
	575	28.2	72	33.3	98	(4) 3.4
	380	33.3	115	44.9	148	(4) 3.9
050	208/230	89.7	446	106.4	506	(2) 5.4, (2) 5.5
	460	43.6	223	46.8	253	(2) 2.7, (2) 2.8
	575	36.5	164	40.4	176	(4) 3.4
	380	45.5	247	52.6	280	(4) 3.9
050-PW	208/230	89.7	268	106.4	304	(2) 5.4, (2) 5.5
	460	44.9	134	48.7	152	(2) 2.7, (2) 2.8
	575	33.3	98	33.3	106	(4) 3.4
	380	44.9	148	53.8	168	(4) 3.9
060	208/230	106.4	506	147.7	690	(4) 5.4, (2) 5.5
	460	46.8	253	65.4	345	(4) 2.7, (2) 2.8
	575	40.4	176	57.1	276	(6) 3.4
	380	52.6	280	78.8	382	(6) 3.9
060-PW	208/230	106.4	304	147.4	414	(4) 5.4, (2) 5.5
	460	48.7	152	65.4	207	(4) 2.7, (2) 2.8
	575	33.3	106	57.1	165	(6) 3.4
	380	53.8	168	78.8	229	(6) 3.9
070	208/230	147.7	690	147.4	690	(4) 5.4, (2) 5.5
	460	65.4	345	67.9	345	(4) 2.7, (2) 2.8
	575	57.1	276	53.8	276	(6) 3.4
	380	78.8	382	79.5	382	(6) 3.9
070-PW	208/230	147.4	414	147.4	414	(4) 5.4, (2) 5.5
	460	67.9	207	67.9	207	(4) 2.7, (2) 2.8
	575	53.8	165	53.8	165	(6) 3.4
	380	79.5	229	79.5	229	(6) 3.9

NOTE: See Legend and Notes on page 39.



COMPRESSOR AND CONDENSER ELECTRICAL DATA (cont)

UNIT SIZE 30GN,GT	NAMEPLATE VOLTAGE 3 Ph, 60 Hz	COMPRESSOR NUMBERS								CONDENSER FAN (QUANTITY) FLA (ea)
		A1		A2		B1		B2		
		RLA	LRA	RLA	LRA	RLA	LRA	RLA	LRA	
080	208/230	106.4	506	67.9	345	147.7	690	—	—	(4) 5.4, (2) 5.5
	460	46.8	253	34.6	173	65.4	345	—	—	(4) 2.7, (2) 2.8
	575	40.4	176	28.8	120	57.1	276	—	—	(6) 3.4
	380	52.6	280	34.6	191	78.8	382	—	—	(6) 3.9
080-PW	208/230	106.4	304	67.9	207	147.4	414	—	—	(4) 5.4, (2) 5.5
	460	48.7	152	33.3	104	67.9	207	—	—	(4) 2.7, (2) 2.8
	575	33.3	106	28.2	72	53.8	165	—	—	(6) 3.4
	380	53.8	168	33.3	115	79.5	229	—	—	(6) 3.9
090	208/230	89.7	446	67.9	345	89.7	446	89.7	446	(4) 5.4, (2) 5.5
	460	43.6	223	34.6	173	43.6	223	43.6	223	(4) 2.7, (2) 2.8
	575	36.5	164	28.8	120	36.5	164	36.5	164	(6) 3.4
	380	45.5	247	34.6	191	45.5	247	45.5	247	(6) 3.9
090-PW	208/230	89.7	268	67.9	207	89.7	268	89.7	268	(4) 5.4, (2) 5.5
	460	44.9	134	33.3	104	44.9	134	44.9	134	(4) 2.7, (2) 2.8
	575	33.3	98	28.2	72	33.3	98	33.3	98	(6) 3.4
	380	44.9	148	33.3	115	44.9	148	44.9	148	(6) 3.9
100	208/230	89.7	446	106.4	506	89.7	446	106.4	506	(6) 5.4, (2) 5.5
	460	43.6	223	46.8	253	43.6	223	46.8	253	(6) 2.7, (2) 2.8
	575	36.5	164	40.4	176	36.5	164	40.4	176	(8) 3.4
	380	45.5	247	52.6	280	45.5	247	52.6	280	(8) 3.9
100-PW	208/230	89.7	268	106.4	304	89.7	268	106.4	304	(6) 5.4, (2) 5.5
	460	44.9	134	48.7	152	44.9	134	48.7	152	(6) 2.7, (2) 2.8
	575	33.3	98	33.3	106	33.3	98	33.3	106	(8) 3.4
	380	44.9	148	53.8	168	44.9	148	53.3	168	(8) 3.9
110	208/230	89.7	446	147.4	690	89.7	446	106.4	506	(6) 5.4, (2) 5.5
	460	43.6	223	65.4	345	43.6	223	46.8	253	(6) 2.7, (2) 2.8
	575	36.5	164	57.1	276	36.5	164	40.4	176	(8) 3.4
	380	45.5	247	78.8	382	45.5	247	52.6	280	(8) 3.9
110-PW	208/230	89.7	268	147.4	414	89.7	268	106.4	304	(6) 5.4, (2) 5.5
	460	44.9	134	67.9	207	44.9	134	48.7	152	(6) 2.7, (2) 2.8
	575	33.3	98	53.8	165	33.3	98	33.3	106	(8) 3.4
	380	44.9	148	79.5	229	44.9	148	53.8	168	(8) 3.9

NOTE See Legend and Notes on page 39

Electrical data (cont)



COMPRESSOR AND CONDENSER ELECTRICAL DATA (cont)

UNIT SIZE 30GN,GT	NAMEPLATE VOLTAGE 3 Ph, 60 Hz	COMPRESSOR NUMBERS														CONDENSER FAN (QUANTITY) FLA (ea)
		A1		A2		A3		A4		B1		B2		B3		
		RLA	LRA	RLA	LRA	RLA	LRA	RLA	LRA	RLA	LRA	RLA	LRA	RLA	LRA	
130	208/230	107.7	506	151.3	690	—	—	—	—	107.7	506	151.3	690	—	—	(4) 5.5, (6**) 5.4
	460	53.9	253	75.7	345	—	—	—	—	53.9	253	75.7	345	—	—	(4) 2.8, (6**) 2.7
	575	41.7	176	62.2	176	—	—	—	—	41.7	176	62.2	176	—	—	(10) 3.4
	380	55.8	280	80.2	382	—	—	—	—	55.8	280	80.2	382	—	—	(10) 3.9
130-PW	208/230	107.7	304	151.3	414	—	—	—	—	107.7	304	151.3	414	—	—	(4) 5.5, (6**) 5.4
	460	53.9	152	75.7	207	—	—	—	—	53.9	152	75.7	207	—	—	(4) 2.8, (6**) 2.7
	575	41.7	106	62.2	144	—	—	—	—	41.7	106	62.2	144	—	—	(10) 3.4
	380	55.8	168	80.2	230	—	—	—	—	55.8	168	80.2	230	—	—	(10) 3.9
150	208/230	89.8	446	89.8	446	89.8	446	—	—	151.3	690	151.3	690	—	—	(4) 5.5, (6**) 5.4
	460	44.9	223	44.9	223	44.9	223	—	—	75.7	345	75.7	345	—	—	(4) 2.8, (6**) 2.7
	575	36.6	164	36.6	164	36.6	164	—	—	62.2	240	62.2	240	—	—	(10) 3.4
	380	46.8	247	46.8	247	46.8	247	—	—	80.2	382	80.2	382	—	—	(10) 3.9
150-PW	208/230	89.8	268	89.8	268	89.8	268	—	—	151.3	414	151.3	414	—	—	(4) 5.5, (6**) 5.4
	460	44.9	134	44.9	134	44.9	134	—	—	75.7	207	75.7	207	—	—	(4) 2.8, (6**) 2.7
	575	36.6	99	36.6	99	36.6	99	—	—	62.2	144	62.2	144	—	—	(10) 3.4
	380	46.8	149	46.8	149	46.8	149	—	—	80.2	230	80.2	230	—	—	(10) 3.9
170	208/230	107.7	506	107.7	506	107.7	506	—	—	107.7	506	107.7	506	107.7	506	(4) 5.5, (6**) 5.4
	460	53.9	253	53.9	253	53.9	253	—	—	53.9	253	53.9	253	53.9	253	(4) 2.8, (6**) 2.7
	575	41.7	176	41.7	176	41.7	176	—	—	41.7	176	41.7	176	41.7	176	(10) 3.4
	380	55.8	280	55.8	280	55.8	280	—	—	55.8	280	55.8	280	55.8	280	(10) 3.9
170-PW	208/230	107.7	304	107.7	304	107.7	304	—	—	107.7	304	107.7	304	107.7	304	(4) 5.5, (6**) 5.4
	460	53.9	152	53.9	152	53.9	152	—	—	53.9	152	53.9	152	53.9	152	(4) 2.8, (6**) 2.7
	575	41.7	106	41.7	106	41.7	106	—	—	41.7	106	41.7	106	41.7	106	(10) 3.4
	380	55.8	168	55.8	168	55.8	168	—	—	55.8	168	55.8	168	55.8	168	(10) 3.9
190	208/230	89.8	446	107.7	506	151.3	690	—	—	89.8	446	107.7	506	151.3	690	(4) 5.5, (8**) 5.4
	460	44.9	223	53.9	253	75.7	345	—	—	44.9	223	53.9	253	75.7	345	(4) 2.8, (8**) 2.7
	575	36.6	164	41.7	176	62.2	240	—	—	36.6	164	41.7	176	62.2	240	(12) 3.4
	380	46.8	247	55.8	280	80.2	382	—	—	46.8	247	55.8	280	80.2	382	(12) 3.9
190-PW	208/230	89.8	268	107.7	304	151.3	414	—	—	89.8	268	107.7	304	151.3	414	(4) 5.5, (8**) 5.4
	460	44.9	134	53.9	152	75.7	207	—	—	44.9	134	53.9	152	75.7	207	(4) 2.8, (8**) 2.7
	575	36.6	99	41.7	106	62.2	144	—	—	36.6	99	41.7	106	62.2	144	(12) 3.4
	380	46.8	149	55.8	168	80.2	230	—	—	46.8	149	55.8	168	80.2	230	(12) 3.9
210	208/230	89.8	446	89.8	446	89.8	446	107.7	506	107.7	506	151.3	690	151.3	690	(4) 5.5, (8**) 5.4
	460	44.9	223	44.9	223	44.9	223	53.9	253	53.9	253	75.7	345	75.7	345	(4) 2.8, (8**) 2.7
	575	36.6	164	36.6	164	36.6	164	41.7	176	41.7	176	62.2	240	62.2	240	(12) 3.4
	380	46.8	247	46.8	247	46.8	247	55.8	280	55.8	280	80.2	382	80.2	382	(12) 3.9
210-PW	208/230	89.8	268	89.8	268	89.8	268	107.7	304	107.7	304	151.3	414	151.3	414	(4) 5.5, (8**) 5.4
	460	44.9	134	44.9	134	44.9	134	53.9	152	53.9	152	75.7	207	75.7	207	(4) 2.8, (8**) 2.7
	575	36.6	99	36.6	99	36.6	99	41.7	106	41.7	106	62.2	144	62.2	144	(12) 3.4
	380	46.8	149	46.8	149	46.8	149	55.8	168	55.8	168	80.2	230	80.2	230	(12) 3.9

UNIT SIZE 30GT-	NAMEPLATE VOLTAGE 3 Ph, 60 Hz	COMPRESSOR NUMBERS				CONDENSER FAN (QUANTITY) FLA (ea)
		A4, B4		A1-A3, B1-B3		
		RLA (ea)	LRA (ea)	RLA (ea)	LRA (ea)	
225	460	66 0	345	48 1	253	(12) 3.2, (4) 2 8
	460-PW	67 9	207	48 7	152	(12) 3.2, (4) 2 8
	575	53.0	276	40 4	176	(16) 3 4
	380	80 1	382	58 2	280	(16) 3 9
250	460 460-PW 575 380	A3, A4, B3, B4		A1, A2, B1, B2		(14) 3 2, (6) 2 8 (14) 3 2, (6) 2 8 (20) 3 4 (20) 3 9
		66.2	345	48 1	253	
		67 9	207	48 7	152	
		53.0	276	40 4	176	
		80 1	382	58 2	280	
		A1-A4, B1-B4		—		
65.7	345					
67 9	207					
52.6	276					
280	460 460-PW 575 380	79 5	382			(16) 3 2, (6) 2 8 (16) 3 2, (6) 2 8 (22) 3 4 (22) 3 9

NOTE See Legend and Notes on page 39.

LEGEND AND NOTES FOR ELECTRICAL DATA

LEGEND

CB	— Circuit Breaker
FCB	— Fan Circuit Breaker
FLA	— Full Load Amps (Fan Motors)
ICF	— Maximum Instantaneous Current Flow during starting (the point in the starting sequence where the sum of the LRA for the starting compressor, plus the total RLA for all running compressors, plus the total FLA for all running fan motors is maximum)
kW	— Total condenser fan motor power input
LRA	— Locked Rotor Amps
MCA	— Minimum Circuit Amps (for wire sizing) — complies with NEC Section 430-24
MOCP	— Maximum Overcurrent Protective Device Amps
NEC	— National Electrical Code, U S A
PW	— Part Wind
RLA	— Rated Load Amps (Compressors)
XL	— Across-the-Line

*Units are suitable for use on electrical systems where voltage supplied to the unit terminals is not below or above the listed minimum and maximum limits. Maximum allowable phase imbalance is voltage, 2%; amps, 10%.

†First value is for chiller with cooler heater. Second value (if applicable) is for chiller without cooler heater.

**Factory-installed Motormaster® III control fan motors.

NOTES.

1. All units have single point primary power connection. Main power must be fused and supplied through a field-supplied disconnect.
2. The unit control circuit power (115 v, 1-ph for 208/230-, 460-, and 575-v units; 230 v, 1-ph for all other voltages) must be supplied from a separate source, through a field-supplied disconnect. See Note 5.

- The control circuit transformer accessory may be applied to power from primary unit power.
3. Crankcase and cooler heaters are wired into the control circuit so they are always operable as long as the control circuit power supply disconnect is on, even if any safety device is open or the unit ON-OFF circuit breaker is off.
 4. Maximum incoming wire size for each terminal block is 500 kcmil.
 5. Power draw of control circuits includes both crankcase heaters (where used) and cooler heaters. Each compressor has a crankcase heater which draws 180 w of power. Units ordered with cooler heater option have 4 cooler heaters (040-050), 6 cooler heaters (060, 070), 8 cooler heaters (080-210), 210 w each, and a 120-w circuit board heater.
 6. All motors are 3-ph, nominal unit voltage.
 7. All units constructed in accordance with NEC.
 8. Italics denote export models (not for sale in U S.A.).
 9. As shipped, all units are XL start.



040-210
208/230 v
460 v

225-280
460 v



040-280
575 v

Controls

Microprocessor

Microprocessor controls overall unit operation. Its central executive routine controls a number of processes simultaneously. These include internal timers, reading inputs, A to D conversions, fan control, display control, diagnostic control, output relay control, demand limit, capacity control, head pressure control, and temperature reset. Some processes are updated almost continuously, others every 2 to 3 seconds, and some every 30 seconds.

The microprocessor routine is started by switching control circuit ON-OFF circuit breaker switch to ON. (This switch is also used to reset microprocessor should any safety trip and also functions as circuit breaker for electronic processor and relay boards.) On Flotronic™ II, ON-OFF switch is replaced by the LOCAL/STOP/CCN switch.

When the switch is closed, a 2-minute initialization routine is begun. During this time, inputs are checked, EXV (electronic expansion valve) and internal constants are initialized and a **20** appears on display. If display button is pushed during this period, control goes into a 42-step Quick Test routine (not on Flotronic II), normally used for a readiness check during start-up, or for service.

Microprocessor controls capacity of chiller by cycling compressors on and off at a rate to satisfy actual dynamic load conditions. Control will maintain leaving-water temperature set with dial on display board, through intelligent cycling of compressors. Accuracy will depend on loop volume, loop

flow rate, load, outside-air temperature number of stages, and particular stage being cycled off. No adjustment for cooling range or cooler flow rate is required, because the control automatically compensates for cooling range by measuring both return-water temperature and leaving-water temperature. This is referred to as *leaving-water temperature control with return-water temperature compensation*.

The basic logic for determining when to add or remove a stage is a time band integration of deviation from set point plus rate of change of leaving-water temperature. When leaving-water temperature is close to set point and slowly moving closer, logic prevents addition of another stage. If leaving-water temperature is less than 35 F (1.7 C) for water, or 6° F (3.3° C) below the set point for brine units, the unit is shut off until the water temperature goes to 6° F (3.3° C) above the set point, to protect against freezing.

If 1° F per minute (0.6° C per minute) pulldown control has been selected (factory setting), no additional steps of capacity will be added as long as difference between leaving-water temperature and set point is greater than 4° F (2.2° C) and rate of change in leaving-water temperature is less than 1° F per minute (0.6° C per minute).

If it has been less than 90 seconds since the last capacity change, compressors will continue to run unless a safety trips. This prevents rapid cycling and also helps return oil during short on periods.

Controls (cont)



Where available, two sequences are used to obtain circuit lead/lag operation and even out compressor operating hours. This requires accessory unloaders on some units. First, as unit turns on, microprocessor functioning as a random number generator determines which circuit will start first. Also, when decreasing from maximum stage, control will again randomly select which circuit is to run the longest.

The control also performs other special functions when turning on or off. When a circuit is to be turned off, EXV is closed first and compressor is run for an additional 10 seconds to pump out refrigerant that was in the cooler. Again, at start-up, if compressor has not run in the last 15 minutes, EXV is held closed for 10 seconds while compressor runs to pump out any refrigerant that has migrated to the cooler. The oil pressure switch is bypassed for 2 minutes during start-up and for 45 seconds during normal operation.

Thermistors

Eight thermistors are used for temperature sensing inputs to microprocessor. (A ninth [T10] may be used as a remote temperature sensor for optional LCWT reset.)

- T1 Cooler leaving chilled water temperature
- T2 Cooler entering water (return) temperature
- T3 Saturated condensing temperature — Circuit A
- T4 Saturated condensing temperature — Circuit B
- T5 Cooler saturation temperature — Circuit A
- T6 Cooler saturation temperature — Circuit B
- T7 Return gas temperature entering compressor cylinder — Circuit A
- T8 Return gas temperature entering compressor cylinder — Circuit B
- T10 Remote temperature sensor (accessory)

The microprocessor uses these temperatures to control capacity, fan cycling, and EXV operation.

Electronic expansion valve (EXV)

To control flow of refrigerant for different operating conditions, EXV piston moves up and down over slot orifices through which refrigerant flows to modulate size of opening. Piston is moved by a stepper motor through 760 discrete steps. The piston is repositioned by microprocessor every 3 seconds.

The EXV is used to control superheat in compressor. Two thermistors in each circuit (T5 and T7/T6 and T8) are used to determine superheat. One thermistor (T5/T6) is located in cooler and other (T7/T8) in compressor after motor in the gas passage entering the cylinders. The EXV is controlled to maintain superheat entering pistons at approximately 15° to 20° F (8.3° to 11.1° C), which results in slightly superheated refrigerant leaving cooler.

The electronic control provides for a prepurge and pumpout cycle each time the lead compressor in a circuit is started or stopped. The compressor is allowed to run for approximately 10 seconds before and after the liquid line solenoid valve and/or EXV opens or closes. Prepurge cycle is eliminated if compressor has operated in last 15 minutes. These pumpout cycles minimize amount of excess refrigerant that can go to compressor on start-up and cause oil dilution which would result in eventual bearing wear.

The microprocessor software is programmed so that EXV functions as a MOP (maximum operating pressure) valve, limiting the suction temperatures to 55 F (12.8 C). This makes it possible to start unit at high water temperatures, up to 95 F (35 C), without overloading compressor. Another feature that is factory set (which may be reconfigured in the field) limits rate of pulldown to 1° F (0.6° C) per minute thereby reducing the kW demand on start-up.

Accessory controls

Demand can be further limited by keeping a selected number of compressors from turning on by utilizing demand limit control accessory. This interfaces with microprocessor to control unit so that chiller's kW demand does not exceed its setting. It is activated from an external switch.

Microprocessor is programmed to accept various accessory temperature reset options, based on return-water temperature, outdoor temperature, or space temperature, that reset the LCWT. An accessory thermistor (T10) is required if outdoor temperature or space temperature reset is elected.

Ground current protection

GN,GT080-280 units have ground current protection, shutting off compressor(s) if a 2 to 3 amps ground current is sensed by a toroid around the compressor power leads.

Ground current protection is also offered as accessory on 040-070 sizes.

Flotronic™ controls with 2-digit display/set point board (standard)

Display board, also connected to microprocessor by a ribbon cable, is used to communicate with operator. In addition to leaving-water set point potentiometer, board contains 2-digit LED (light-emitting diode) display. The LED display is normally off after initialization period. Pressing display button will result in LED displaying the appropriate overload or status code.

If this is done, display will show from one to 3 codes, alternating every 2 seconds, as follows:

CODE	STATUS
0-12	Capacity Stage Number of stages in operation
20-26	Operating Mode
20	Initialization
21	Temperature Reset
22	Demand Limit
24	Pulldown Control
26	Remote ON-OFF
51-87	Overload Codes
	Alarm light/circuit energized
	NOTE: These codes take priority
51-58	Compressor fault
59,60	Loss of charge (circuit A, circuit B)
61	Low water flow
63,64	Low oil pressure (circuit A, circuit B)
65	Low water temperature
70	Illegal configuration
71-80	Thermistor failure
81-87	Reset/Set Point Limit Failure

These codes are summarized on a chart in each unit's control box, and are described in detail in the Controls and Troubleshooting book.

Flotronic™ II (CCN) controls with 8-character display/set point board (optional)

Eight-digit LCD (liquid crystal display) alphanumeric panel displays all of the Flotronic control codes (with explanation of codes), plus set points, time of day, and actual temperatures, pressures, and superheat

Control sequence

Off cycle — During unit off cycle, crankcase heater is energized. If ambient temperature is below 36 F (2 C), cooler and control box heaters are also energized. Electronic expansion valves are closed.

Start-up — After control circuit ON-OFF circuit breaker switches ON, prestart process takes place for 2 minutes, when microprocessor checks itself and waits for temperature to stabilize. First circuit to start may be A or B (automatic lead/lag feature). The controlled pulldown feature limits compressor loading on start-up to reduce demand on start-up and unnecessary compressor usage. The microprocessor limits supply-water temperature decrease (start-up only) to 1° F (0.6° C) per minute

Capacity control

On first call for cooling, microprocessor starts initial compressor and fan stage on lead circuit. The EXV remains closed for 10 seconds, permitting a pumpout on start-up. After pumpout, the valves open and, if necessary, additional outdoor fans are energized. Crankcase heaters are deenergized when a compressor is started. As additional cooling is required, lag circuit starts. If further cooling is needed, compressors are added, alternating between lead and lag circuits. Speed at which capacity is added or decreased is controlled by temperature deviation from set point and rate of temperature change of chilled water.

As less cooling is required, circuits shut down (or unload) in an order that evens out each circuit's compressor run time. When no further cooling is called for (in each compressor circuit), EXV closes and compressor and fans continue to run while pumping down cooler.

Control features

Low-temperature override — This feature prevents LCWT from overshooting the set point and possibly causing a nuisance trip-out by the freeze protection.

High-temperature override — This feature allows chiller to add capacity quickly during rapid load variations.

Demand limit — If applied, unit step controls limit total power draw of unit to selected point by controlling number of operational compressors during periods of peak electrical demand. Consult Accessory Demand Limit Control Module Installation Instructions for further details.

Reset accessory — If applied, microprocessor compares either return water, space or outdoor temperature with the accessory board settings, and adjusts LCWT appropriately.

Electronic expansion valve and outdoor fan control

— Expansion valve opens and closes on signal from microprocessor to maintain an approximate 20° F (11° C) refrigerant superheat entering the compressor cylinders. (The compressor motor increases the refrigerant superheat from the approximate 5° F [3° C] leaving the cooler to that entering the cylinders.) Outdoor fans (operated by microprocessor) run to as low an ambient as possible to maintain a minimum expansion valve pressure differential.

Abnormal conditions (alarm light)

All control safeties in chiller operate through compressor protection board or control relay and microprocessor. High-pressure switch directly shuts down compressor(s) through compressor protection board or control relay. For other safeties, microprocessor (1) makes appropriate decision to shut down a compressor due to a safety trip or bad sensor reading, (2) energizes *alarm light*, and (3) displays appropriate failure code on the display. Chiller holds in safety mode until reset. It then reverts to normal control when unit is reset.

Oil pressure safety — Safety cuts out if pressure differential is below minimum (accessory on 040-070). Safety is bypassed on start-up for 2 minutes.

Loss-of-charge safety — Safety cuts out if system pressure drops below minimum.

High-pressure cutout — Switch shuts down compressors if compressor discharge pressure increases to 426 psig (2937 kPa).

Ground current safety — Safety opens on sensing a current-to-ground in compressor windings in excess of 2.5 amps (accessory on 040-070).

Compressor anti-recycling — This feature limits compressor cycling.

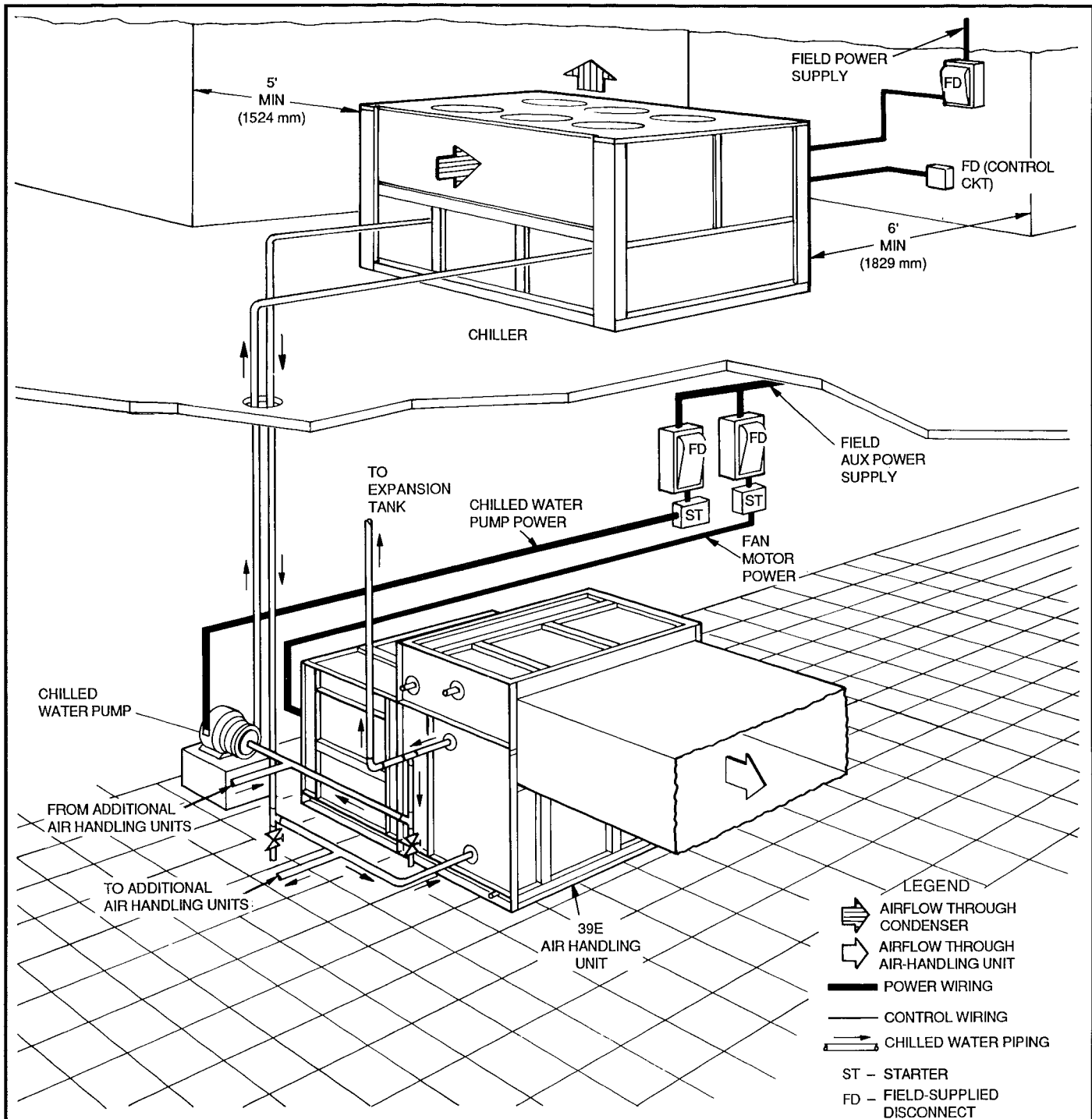
Loss of flow protection — Protection is provided by temperature differences between entering and leaving water temperature sensors if cooler temperature drops to 35 F (1.8 C).

Sensor failures — Failures are detected by the microprocessor.

Diagnostics

Microprocessor may be put through Quick Test (see Controls and Troubleshooting book) without additional equipment or tools. Quick Test (not on Flotronic II units) confirms microprocessor is functional, informs observer through LED display the condition of each sensor and switch in chiller, and allows observer to check for proper operation of fans and compressor(s).

Typical piping and wiring



NOTES

- 1 Chiller must be installed *level* to maintain proper compressor oil return.
- 2 Wiring and piping shown are general points-of-connection guides only and are not intended for a specific installation. Wiring and piping shown are for a quick overview of system and are not in accordance with recognized standards
3. All wiring must comply with applicable local and national codes.
4. All piping must follow standard piping techniques. Refer to Carrier System Design Manual or appropriate ASHRAE (American Society of Heating, Refrigeration, and Air Conditioning Engineers) handbook for details
- 5 See Application Data for minimum system water volume. This may require the addition of a holding tank to ensure adequate volume

Guide specifications — 30GN,GT040-210



Reciprocating Air-Cooled Liquid Chiller

HVAC Guide Specifications

Size Range. **36 to 200 Tons (127 to 703 kW) Nominal**

Carrier Model Number **30GN,GT**

Part 1 — General

1 01 SYSTEM DESCRIPTION

- A. Microprocessor controlled air-cooled liquid chiller utilizing reciprocating compressors and electronic expansion valves

1 02 QUALITY ASSURANCE

- A Unit shall be rated in accordance with ARI Standard 590-92.
- B. Unit construction shall be designed to conform to ASHRAE 15 latest revision safety standard, NEC (U S A.), and ASME applicable codes.
- C. Unit shall have UL or CSA approvals.
- D. Unit shall be manufactured according to ISO 9002 (International Standards Organization) manufacturing quality standard.
- E Unit operation shall be fully tested at the factory

1.03 DELIVERY, STORAGE, AND HANDLING

- A Unit shall be stored and handled per unit manufacturer's recommendations.
- B. Unit controls shall be capable of withstanding 185 F (85 C) storage temperature in the control compartment for an indefinite period of time

Part 2 — Products

2 01 EQUIPMENT

A General

Factory assembled, single piece, air-cooled liquid chiller Contained within the unit cabinet shall be all factory wiring, piping, controls, refrigerant charge (R-22), and special features required prior to field start-up.

B Unit Cabinet:

1. Frame shall be of heavy-gage galvanized steel members
- 2 Galvanized steel casing, zinc phosphatized, with an electrostatically applied baked-enamel finish
3. Cabinet shall be capable of withstanding Federal Test Method Standard No. 141 (Method 6061) 500-hour salt spray test

C Fans

Condenser fans shall be direct-driven propeller type discharging air vertically upward and shall be equipped with the following features:

1. Permanently lubricated bearings
- 2 PVC coated steel wire safety guards.
3. Inherent corrosion resistance shafts.
- 4 Statically and dynamically balanced fan wheels.

D Compressors:

- 1 Reciprocating semi-hermetic type only
- 2 Each equipped with an automatically reversible oil pump, operating oil charge, suction and discharge

shutoff valves, and an insert-type factory-sized crank-case heater to control oil dilution

- 3 Each mounted on spring vibration isolators with an isolation efficiency of no less than 95%
- 4 Speed shall not exceed 1750 rpm (29.2 r/s).
5. Cycles per hour per compressor shall not exceed 6.

E. Cooler

- 1 Shell-and-tube type with removable heads.
2. Tubes shall be internally enhanced seamless-copper type rolled into tube sheets
- 3 Equipped with victaulic-type water connections.
- 4 Shell shall be insulated with 3/4-in. (19-mm) PVC foam (closed-cell) of maximum K factor 0.28.
5. Design shall incorporate 2 independent direct expansion refrigerant circuits.
6. Cooler shall be tested and stamped in accordance with ASME Code for a refrigerant working side pressure of 278 psig (1916 kPa) and a minimum water-side pressure of 300 psig (2068 kPa).

F Condenser

- 1 Coil shall be air-cooled with integral subcooler, constructed of aluminum fins mechanically bonded to seamless copper tubes which are then cleaned, dehydrated, and sealed.
- 2 Air-cooled condenser coils shall be leak tested at 150 psig (1034 kPa) and pressure tested at 450 psig (3103 kPa).

G. Refrigeration Components

Refrigerant circuit components shall include hot gas muffler, high side pressure relief device, liquid line shutoff valves, suction and discharge shutoff valves, replaceable core filter drier, moisture-indicating sight glass, stepper motor actuated electronic expansion valve (EXV), and complete operating charge of refrigerant R-22 and compressor oil

H Controls, Safeties, and Diagnostics

1 Controls

- a. Unit controls shall include the following minimum components
 - 1) Microprocessor
 - 2) Power and control circuit terminal blocks
 - 3) ON/OFF control switch.
 - 4) Replaceable solid-state relay panel.
 - 5) Eight-character diagnostic display/set point panel on 30GN unit Two-digit panel on 30GT unit.
 - 6) Thermistors, and/or pressure transducers (30GN only), and potentiometers.
- b Capable of performing the following functions
 - 1) Automatic circuit lead/lag (accessory with 30GT040-070 [requires accessory unloaders], standard with 30GN040-210, 30GT080-210)
 - 2) Pumpout at beginning and end of every circuit cycle.

Guide specifications

— 30GN,GT040-210 (cont)



- 3) Capacity control based on leaving chilled water temperature and compensated by rate of change of return-water temperature.
- 4) Limiting of the chilled water temperature pulldown rate at start-up to 1° F (.56° C) per minute to prevent excessive demand spikes (charges) at start-up.
- 5) Seven-day time schedule (30GN only)
- 6) Leaving chilled water temperature reset from return water (30GN only).
- 7) Demand limit control with 2-point control (0 to 100% each) (30GN only)

2 Safeties

- a. Unit shall be equipped with thermistors and/or potentiometers and all necessary components in conjunction with the control system to provide the unit with the following protections:
 - 1) Loss of refrigerant charge protection
 - 2) Low water flow detection.
 - 3) Low chilled water temperature protection.
 - 4) Low and high superheat protection
 - 5) Low control voltage (to unit) protection
 - 6) Visual alarm signal (alarm light).
 - 7) High-pressure switch
 - 8) Low oil protection for each compressor circuit (080-210).
 - 9) Ground current compressor protection (080-210)
- b. Compressors shall be equipped with the following manual-reset type protections
 - 1) Pressure overload.
 - 2) Electrical overload through the use of definite-purpose contactors and calibrated, ambient compensated, magnetic trip circuit breakers. Circuit breakers shall open all 3 phases in the event of an overload in any one phase (single-phasing condition).
- c. Fan motors shall have inherent overcurrent protection.

3 Diagnostics

- a. On 30GN units, diagnostic display module shall be capable of indicating the safety lock-out condition by displaying a code for which an explanation may be scrolled at the display. On 30GT units, display module shall be capable of indicating the tripping of protections through display of a 2-digit code, for which a legend shall be provided in control panel. Information included for display shall be:
 - 1) Compressor lockout
 - 2) Loss of charge

- 3) Low water flow.
- 4) Low oil pressure.
- 5) Cooler freeze protection
- 6) High or low suction superheat.
- 7) Thermistor, transducer (30GN only), or potentiometer malfunction.
- 8) Entering and leaving-water temperature.
- 9) Evaporator and condenser pressure (30GN only).
- 10) Electronic expansion valve positions (30GN only)
- 11) All set points (30GN only)
- 12) Time of day (30GN only)

- b. Module in conjunction with the microprocessor must also be capable of displaying the output (results) of a run test to verify operation of every switch, thermistor, potentiometer, fan, and compressor before chiller is started
- c. Provide serial output port.

I. Operating Characteristics.

1. Unit shall be capable of starting and running fully loaded at outdoor ambient temperatures from 0° F to 125 F (-18 to 52 C), without special controls.
2. Unit shall be capable of starting up with 95 F (35 C) entering-water temperature to the cooler
3. Multi-step cooling capacity control shall be accomplished through the use of unloaders and compressor staging.
4. Two refrigerant circuits shall be provided to protect against loss of total capacity.
5. Unit shall have automatic lead/lag feature to automatically alternate the lead circuit to ensure even compressor wear

J. Motors:

1. Compressor motors shall be cooled by suction gas passing around motor windings.
2. Condenser-fan motors shall be 3-phase type with permanently lubricated bearings and Class B insulation

K. Electrical Requirements

1. Unit primary electrical power supply (3 ph) shall be connected to a single location
2. Unit control power (1 ph) shall be connected to a separate entry point.
3. Unit shall be shipped with factory control and power wiring installed.

L. Special Features.

Certain standard features are not applicable when the features designated by * are specified. For assistance in amending the specifications, your local Carrier Sales Office should be contacted

* 1. Low Ambient Temperature Operation

a. Unit shall be capable of operating down to 0° F (-18 C) with the addition of antifreeze in the evaporator circuit, and with the addition of field-fabricated and field-installed wind baffles. The wind baffles shall be installed when wind velocity greater than 5 mph (8 km/h) is anticipated, and ambient temperature is below 32 F (0° C).

b. Unit shall be capable of operating down to -20 F (-29 C) with the addition of the field or factory-installed solid-state Motormaster® III control with condenser coil temperature sensor. In addition, adequate field-supplied antifreeze protection shall be field-installed in the evaporator circuit — and where wind velocity greater than 5 mph (8 km/h) is anticipated, field-fabricated and installed wind baffles shall be required.

2. Unloaders

Electric suction cutoff unloaders shall be field-installed as required.

* 3. Cooler Heater:

Optional factory-installed heater shall protect cooler to -20 F (-29 C).

* 4. Optional Condenser Coil Material

Unit shall be factory equipped with a condenser coil made from copper tubes and copper fins.

* 5. Hot Gas Bypass:

Shall be field-installed to allow the unit to operate at lower capacity levels than standard (Available as factory-installed option on 30GN040 size and 30GT040-070)

6. Security Condenser Grilles

A set of metal grilles complete with support retainers and fasteners shall be provided for the protection of the condensing coils, compressors, and cooler.

7. Hail Guard:

Unit shall be field-equipped with louvered condenser coil hail guards and installation hardware.

* 8. Part-Wind Start:

Shall be factory installed to reduce compressor inrush current

* 9. Brine Units:

Unit shall be factory-equipped to operate down to 15 F (-9 C) leaving chilled water temperature

10. Flow Switch.

A chilled water flow switch shall be field-installed for low water flow detection

* 11. Control Transformer:

A transformer shall be field-installed to permit single-point power connection combining unit primary electrical power supply with control power supply (115 v).

12. Ground current compressor protection:

Protection shall be standard with sizes 080-210, accessory with all other sizes

* 13. TXV Option (30GT040-110 unit):

Unit shall have factory-installed thermostatic expansion valves (TXV) instead of electronic expansion valves. Unit shall be capable of starting and running fully loaded at outdoor temperatures from 35 to 125 F (1° to 52 C) without special control or field provisions.

14. Demand Limit Control (30GT unit):

Unit shall be equipped with a 2-point demand limit control (0 to 49% and 50 to 100%) activated remotely by an electric signal.

15. Pressure Gages (30GT unit):

Unit shall be field-equipped with suction and discharge pressure gages with manual shutoff valves

16. Temperature Reset Board (30GT unit):

Allows microprocessor control to compare either return or outdoor temperature with the accessory board settings and adjust leaving-water temperature accordingly. Shall include necessary sensor.

* 17. Sound Reduction Kits

Unit shall be equipped with kits to reduce system noise without compromising performance

18. Oil Pressure Switch:

Unit shall be equipped with an oil pressure safety switch to protect compressor against loss of lubrication (sizes 040-070; standard on sizes 080-210).

Guide specifications — 30GT225-280



Reciprocating Air-Cooled Liquid Chiller

HVAC Guide Specifications

Size Range: **225 to 280 Tons (790 to 985 kW)**

Nominal

Carrier Model Number **30GT**

Part 1 — General

1.01 SYSTEM DESCRIPTION

- A Microprocessor controlled air-cooled liquid chiller utilizing reciprocating compressors and electronic expansion valves

1.02 QUALITY ASSURANCE

- A Unit shall be rated in accordance with ARI Standard 590-92.
 - B Unit construction shall be designed to conform to ASHRAE 15 latest revision safety standard, NEC (U.S.A.), and ASME applicable codes.
 - C Unit shall have UL or CSA approvals.
 - D Unit cabinet shall be capable of withstanding Federal Test Method Standard No. 141 (Method 6061) 500-hour salt spray test
 - E Cooler shall be tested and stamped in accordance with ASME Code for a refrigerant working side pressure of 235 psig (1620 kPa) and a minimum water side pressure of 300 psig (2068 kPa)
 - F Unit shall be manufactured according to ISO 9002 (International Standards Organization) manufacturing quality standard
 - G Air-cooled condenser coils shall be leak tested at 150 psig (1034 kPa) and pressure tested at 450 psig (3103 kPa)
 - H Unit shall be fully tested at the factory.
- #### 1.03 DELIVERY, STORAGE, AND HANDLING

- A Unit controls shall be capable of withstanding 185 F (85 C) storage temperature in the control compartment for an indefinite period of time
- B Unit shall be stored and handled per unit manufacturer's recommendations.

Part 2 — Products

2.01 EQUIPMENT

- A General:
 - Factory assembled, single piece, air-cooled liquid chiller
 - Contained within the unit cabinet shall be all factory wiring, piping, controls, refrigerant charge (R-22), and special features required prior to field start-up.
- B Unit Cabinet.
 - Galvanized steel casing, zinc phosphatized, with an electrostatically applied baked enamel finish.
- C Fans:
 - Condenser fans shall be direct driven propeller type discharging air vertically upward
 - 1 Equipped with permanently lubricated bearings.

- 2. Equipped with PVC-coated steel wire safety guards.
- 3 Shafts shall have inherent corrosion resistance
- 4 Statically and dynamically balanced
- D Compressors.
 - 1. Reciprocating semi-hermetic type built by equipment manufacturer only
 - 2 Each equipped with an automatically reversible oil pump, operating oil charge, shutoff valves, and an insert-type factory sized crankcase heater to control oil dilution
 - 3 Each mounted on spring vibration isolators with an isolation efficiency of no less than 95%
 - 4 Speed shall not exceed 1750 rpm (29.2 r/s)
 - 5 Cycles per hour per compressor shall not exceed 6
- E. Cooler
 - 1 Shell-and-tube type with removable heads.
 - 2 Tubes shall be internally enhanced seamless copper type rolled into tube sheets
 - 3. Equipped with victaulic-type water connections
 - 4 Shell shall be insulated with 3/4-in (19-mm) closed cell polyvinyl chloride foam of maximum K factor 0.28.
 - 5 Equipped with electric heaters along the shell under the insulation to protect against cooler freeze-up
 - 6 Design shall incorporate 2 independent direct expansion refrigerant circuits
- F. Condenser:
 - Coil shall be air-cooled with integral subcooler, constructed of aluminum fins mechanically bonded to seamless copper tubes which are then cleaned, dehydrated, and sealed.
- G. Refrigeration Components
 - Refrigerant circuit components shall include hot gas muffler, high side pressure relief device, liquid line shutoff valve, replaceable core filter drier, moisture-indicating sight glass, stepper motor actuated electronic expansion valve, and complete operating charge of refrigerant R-22 and compressor oil
- H. Controls, Safeties, and Diagnostics
 - 1. Controls.
 - a. Unit controls shall include the following minimum components
 - 1) Microprocessor
 - 2) Power and control circuit terminal blocks.
 - 3) On/off control switch
 - 4) Replaceable solid-state relay panel
 - 5) Leaving chilled water set point panel
 - 6) 2-digit diagnostic display
 - 7) Thermistors and/or potentiometers

- b. Capable of performing the following functions.
 - 1) Automatic circuit lead/lag.
 - 2) Pumpout at beginning and end of every circuit cycle
 - 3) Capacity control based on leaving chilled water temperature and compensated by rate of change of return water temperature.
 - 4) Limiting of the chilled water temperature pull-down rate at start-up to 1° F (56° C) per minute to prevent excessive demand spikes (charges) at start-up
- c. Control compartment shall be equipped with a 115-v convenience outlet (except 380-v).

2 Safeties.

- a. Unit shall be equipped with thermistors and/or potentiometers and all necessary components in conjunction with the control system to provide the unit with the following protections:
 - 1) Loss of refrigerant charge protection
 - 2) Low water flow detection.
 - 3) Low chilled water temperature protection
 - 4) Low and high superheat protection.
 - 5) Low oil protection for each compressor circuit.
 - 6) Low control voltage (to unit) protection
 - 7) Ground current protection for each compressor which shuts down compressor when no more than 2.5 amps are measured to prevent formation of acids.
 - 8) High-pressure switch.
 - 9) Visual alarm signal (alarm light)
- b. Compressors shall be equipped with the following manual-reset type protections
 - 1) Pressure overload.
 - 2) Electrical overload through the use of definite-purpose contactors and calibrated, ambient compensated, magnetic trip circuit breakers. Circuit breakers shall open all three phases in the event of an overload in any one phase, or single-phasing condition
- c. Fan motors shall have inherent overcurrent protection.

3 Diagnostics

- a. Diagnostic display module shall be capable of indicating the safety lockout condition through displaying a 2-number code for which a legend shall be provided in control panel The protections included for display shall be
 - 1) Compressor lockout
 - 2) Loss of charge.
 - 3) Low water flow.

- 4) Low oil pressure.
 - 5) Cooler freeze protection
 - 6) High or low suction superheat
 - 7) Thermistor or potentiometer malfunction
- b. Module in conjunction with the microprocessor must also be capable of displaying the output (results) of a run test to verify operation of every switch, thermistor, potentiometer, fan, and compressor before chiller is started

I. Operating Characteristics:

1. Unit shall be capable of starting and running fully loaded at outdoor ambient temperatures from 35 to 115 F (1.7 to 46 C).
2. Unit shall be capable of starting up with 95 F (35 C) entering-water temperature to the cooler.

J. Motors:

1. Compressor motors shall be cooled by suction gas passing around motor windings
2. Condenser-fan motors shall be 3-phase type with permanently lubricated bearings and Class B insulation.

K. Electrical Requirements:

1. Unit primary electrical power supply shall be connected to a single point.
2. Unit shall operate on 3-phase, 60-cycle power at the voltage shown in the equipment schedule.
3. Unit shall be shipped with factory control and power wiring installed

L. Special Features.

Certain standard features are not applicable when the features designated by * are specified.

* 1 Low Ambient Temperature Operation:

- a. Unit shall be capable of operating down to 0° F (- 18 C) with the addition of antifreeze in the evaporator circuit, and with the addition of field-fabricated and field-installed wind baffles. The wind baffles shall be installed when wind velocity greater than 5 mph (8 km/h) is anticipated, and ambient temperature is below 32 F (0° C).
- b. Unit shall be capable of operating down to - 20 F (- 29 C) with the addition of the field-installed solid-state Motormaster® III control with condenser coil temperature sensor In addition, adequate field-supplied antifreeze protection shall be field-installed in the evaporator circuit — and where wind velocity greater than 5 mph (8 km/h) is anticipated, field-fabricated and installed wind baffles shall be required

2. Unloaders (Flotronic™ II units).

Unit shall be equipped with electrically actuated suction cutoff type cylinder unloaders.

Guide specifications — 30GT225-280 (cont)



- 3 Demand Limit Control
Unit shall be equipped with a 2-point demand limit control (0-49% and 50-100%) activated remotely by an electric signal.
- * 4 Optional Condenser Coil Material:
Unit shall be factory equipped with a condenser coil made from copper tubes and copper fins
- 5 Hail Guard:
Unit shall be equipped with sheet metal type coil guard protection against debris and damage
- * 6 Part Wind Start:
Shall be factory installed to reduce compressor inrush current
- 7 Pressure Gages
Unit shall be field-equipped with suction and discharge pressure gages with manual shutoff valves.
- * 8 Brine Units:
Unit shall be factory-equipped to operate down to 15 F (– 9 C) leaving chilled water temperature.
9. Temperature Reset Board:
Allows microprocessor control to compare either return or outdoor temperature with the accessory board settings and adjust leaving-water temperature accordingly. Shall include necessary sensor.
- 10 Flow Switch:
A chilled water flow switch shall be field-installed for low water flow detection
- 11 Control Options Board (Flotronic II units).
Allows microprocessor control to control accessory unloaders, demand limit, and temperature reset
- * 12. Optional Controls and Diagnostics:
 - a. Controls (Flotronic™ II units)
 - 1) Unit controls shall include the following minimum components.
 - a) Microprocessor.
 - b) Power and control circuit terminal blocks.
 - c) On/off control switch.
 - d) Replaceable solid-state relay panel.
 - e) 8-digit alphanumeric diagnostic display/set point panel
 - f) Thermistors and/or pressure transducers
 - 2) Capable of performing the following functions:
 - a) Automatic compressor lead/lag
 - b) Pumpout at beginning and end of every circuit cycle
 - b. Diagnostics:
 - 1) Diagnostic display module shall be capable of indicating the safety lockout condition by displaying a code for which an explanation may be scrolled at the display. Protections included for display shall be:
 - a) Compressor lockout
 - b) Loss of charge
 - c) Low water flow.
 - d) Low oil pressure.
 - e) Cooler freeze protection
 - f) High or low suction superheat
 - g) Thermistor or potentiometer malfunction.
 - h) Entering- and leaving-water temperature
 - i) Evaporator and condenser pressure
 - j) Electronic expansion valve positions
 - h) All set points.
 - l) Time of day
 - 2) Module in conjunction with the microprocessor must also be capable of displaying the output (results) of a run test to verify operation of every switch, thermistor, potentiometer, fan, and compressor before chiller is started.
- c) Capacity control based on leaving chilled water temperature and compensated by rate of change of return water temperature.
- d) Limiting of the chilled water temperature pulldown rate at start-up to 1° F (.56° C) per minute to prevent excessive demand spikes (charges) at start-up
- e) Seven-day time schedule
- f) Leaving chilled water temperature re-set from return
- g) Demand limit control with 2-point control (0-100% each)

13 Security Condenser Grilles

A set of metal grilles complete with support retainers and fasteners shall be provided for the protection of the condensing coils, compressors, and cooler.

