



# Product Data

# 30GN,GT Flotronic™ and Flotronic II Air-Cooled Reciprocating Liquid Chillers 50/60 Hz

Nominal Capacities: 36 to 210 Tons  
127 to 740 kW

## Quality Assurance



Certificate No FM 21837

### Approvals:

ISO 9002

EN 29002

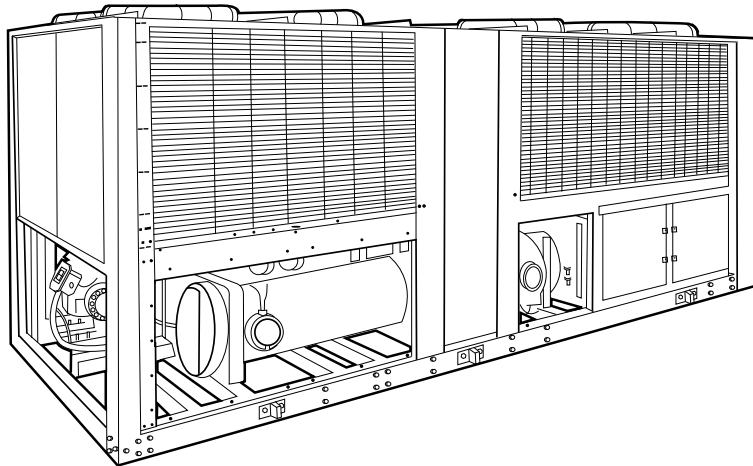
BS5750 PART 2

ANSI/ASQC Q92

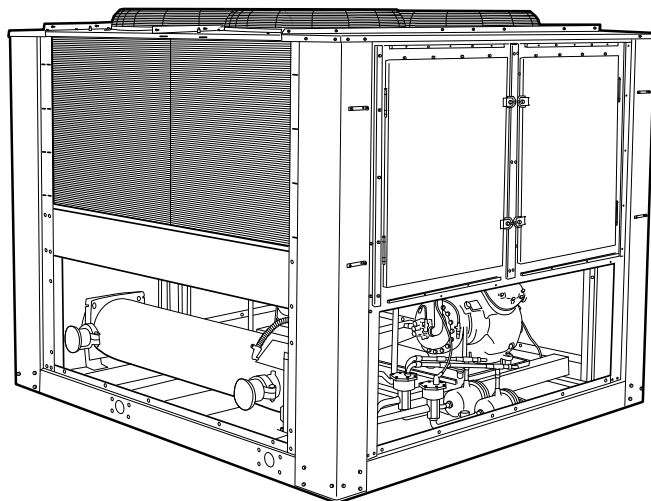
## Performance Assurance



Rated in accordance with  
ARI Standard 590-92  
(60 Hz only)



30GT



30GN

Highly Advanced Chiller Electronics  
For Years of Operating Efficiency

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

## Features/Benefits

### Quality design and construction

The 30GN Flotronic II and 30GT Flotronic chillers are the result of extensive engineering development and testing. Every component has been tested to provide many years of superior performance in every climate. Major components are qualified to 500-hour salt spray test according to the American Society for Testing and Materials (ASTM) B-117 Standard to assure longevity and reliability. All export chillers are packaged with woodboard coil protection and wood top cap. A polyvinyl bag is wrapped around the export units for increased protection against hazards of land and sea transportation to ensure product delivery in original factory condition.

### Advanced technology and serviceability

The 30GT040-210 Flotronic chillers incorporate the latest in integrated microprocessor control and refrigeration cycle optimization devices. The long-stroke electronic expansion valve (EXV) and the microprocessor control let the chiller operate at low refrigerant pressure differentials, and accurately control refrigerant superheat during start-up and load changes.



The result is efficient energy usage and leaving-fluid temperature (LWT) accurate to  $\pm 1.25$  F ( $\pm 0.7$  C) from the LWT set point.

The Flotronic™ II direct digital control (30GN040-210) adds to the original Flotronic functions. It expands the capabilities of user-programmed time schedules of the chiller operation (7-day), standard return-fluid temperature reset, and real-time display of operating temperatures and pressures. Flotronic II chillers include data communication capability to the Carrier Comfort Network (CCN) and an 8-digit alpha-numeric display that is part of the chiller special interface panel.

Each of the Carrier Flotronic and Flotronic II chillers features ease of service and maintenance that add to operating savings. Built-in self diagnostics capability quickly pinpoints the location of any system problem — no need to spend costly hours guessing. The Flotronic II control maintains a valuable record of the machine's history, complete with start and run data, for periodic service or maintenance reference.

The electronic record system is invaluable for the efficiency of chiller diagnosis and long-term equipment management. Ground current sensing (070, 50 Hz and all 080-210 units) 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.

**Installation ease**

The model 30GN (Flotronic II) and 30GT (Flotronic) chillers are fully packaged systems that arrive at the jobsite completely ready for installation in minimal time. On-site inspection time is also reduced because the units are UL (Underwriters' Laboratories, U.S.A.) (208/230- and 460-v) and CSA (Canadian Standards Association) listed, and meet ASME (American Society of Mechanical Engineers) standards. Important added standard features include dual refrigerant circuits and pulldown capability from 95 F (35 C) 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 30GT 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 fluid temperature control through the application of proportional integral derivative (PID) logic with return fluid temperature compensation. This Carrier exclusive permits variable flow and application flexibility. The following 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). See Factory-Installed Options and Field-Installed Accessories sections on pages 17 and 18 for a complete list of available choices.

**Quality and reliability**

To assure long life and quality performance, every standard unit is factory run tested. The dependable direct-drive fans are built to NEMA (National Electrical Manufacturing Association, U.S.A.) standards, and the 06E Carrier semi-hermetic compressors are built for performance excellence in Carrier equipment worldwide. Refrigerant flow control provided by EXV precision keeps compressor motors cooler while operating at 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 and dependability. The microprocessor controls the full refrigeration cycle (compressors, fans, and EXV) to ensure efficient, synchronized operation.

**Operating efficiency**

The Flotronic and Flotronic II 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.

The EXV allows operation at reduced condensing pressures (down to 15 psig [103 kPa] pressure differential) by letting the microprocessor operate the fans down to a lower outdoor temperature than a conventional chiller. The microprocessor senses the position of the valve and the actual condensing temperature. The EXV also increases evaporator pressure by minimizing superheat in the evaporator. Therefore, a greater percentage of the cooler is used for evaporation than in a thermostatic expansion valve (TXV) system. In a unit with a TXV, the superheat is the difference between the refrigerant temperature measured (after the compressor motor) and the saturated

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# Features/Benefits (cont)



evaporating temperature. 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 fluid temperature reset.

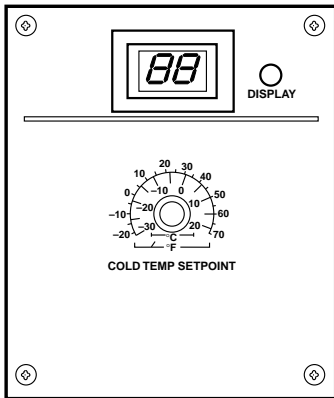
NOTE: Prove the operating savings for your building by using the Flotronic™ and Flotronic II chiller operating cost analysis on your own microcomputer, available from your local Carrier representative.

## Cost-saving features

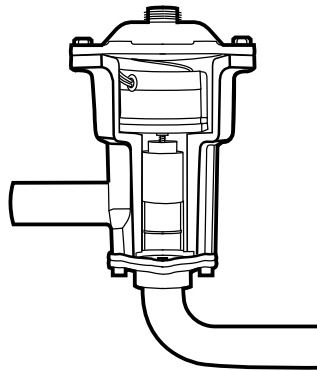
Model 30GN and 30GT chillers reduce operating costs with:

- Precise multiple-step capacity control.
- Operating capability at outdoor temperatures to 125 F (52 C).
- Direct-drive fan motors internally protected and shielded by PVC-coated steel wire fan guards for weather protection.
- Compressors mounted on spring-isolated steel rails or pans to minimize vibration (no need for external isolation).

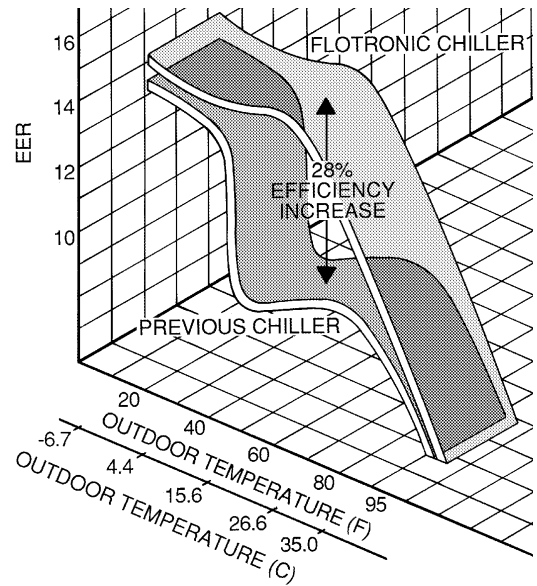
- Weather-protected controls and factory wiring.
- Hinged electrical component access panels.
- Compressor crankcase heaters.
- Multiple compressor operation.
- Dual, independent refrigerant circuits.
- Oil level sight glasses.



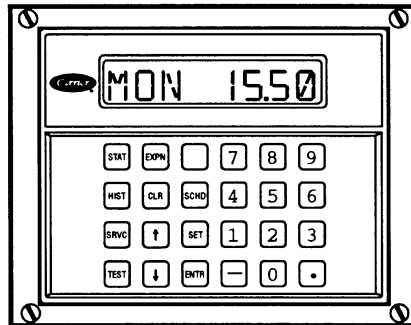
**STANDARD 30GT 2-DIGIT FLOTRONIC DISPLAY**



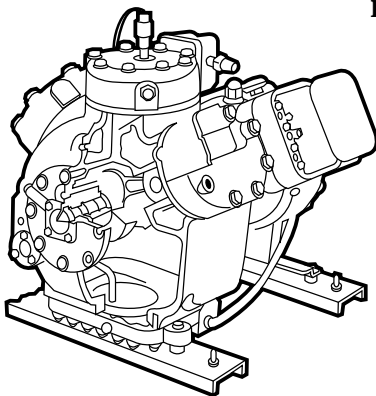
**ELECTRONIC EXPANSION VALVE (EXV)**



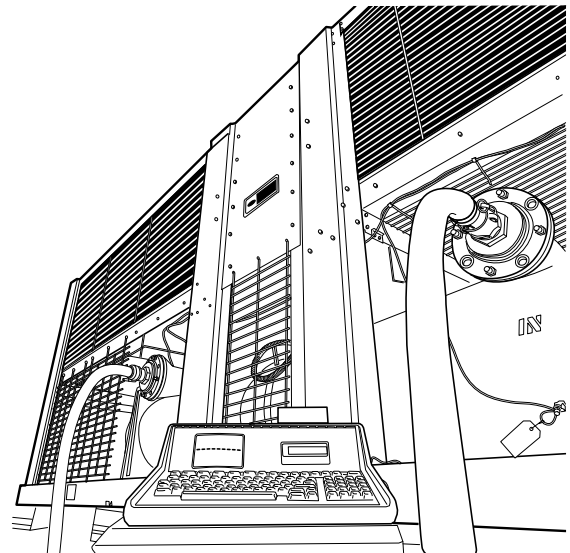
**PART-LOAD EFFICIENCY 28% GAIN**



**STANDARD 30GN 8-CHARACTER FLOTRONIC II DISPLAY**



**06E COMPRESSOR**



**FACTORY RUN TEST**

# Model number nomenclature



30GT - 040 - C 6 - 1 - -

## Air-Cooled Liquid Chillers

30GN — Flotronic™ II Controls  
 30GT — Flotronic Controls

## Compressor Start

- — Across-The-Line Start  
 P — Part-Wind Start

## Unit Sizes

040 070 110 190  
 045 080 130 210  
 050 090 150  
 060 100 170

## Not Used

## Sound Option

- — None  
 L — Sound Reduction

## Options

-- — NOTE: Contact your Carrier representative for details on available factory-installed options.

## Packaging

1 — Domestic  
 3 — Export

## Not Used

## V-Ph-Hz

1 — 575-3-60  
 2 — 380-3-60 \*  
 3 — 346-3-50  
 5 — 208/230-3-60  
 6 — 460-3-60  
 8 — 230-3-50  
 9 — 380/415-3-50

## Condenser Material

- — Copper Tube, Aluminum Fins  
 C — Copper Tube, Copper Fins  
 H — Copper Tube, Aluminum Heresite Coated Fin†  
 J — Copper Tube, Copper Heresite Coated Fin†  
 K — Copper Tube, Pre-Coated Aluminum Fin†

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

†Contact your local Carrier representative for more details.

# Physical data — 30GN,GT — English



60 Hz

30GN/GT UNIT SIZE		040	045	050	060	070
APPROX OPERATING WEIGHT — lb*	C-AL†	3550	3681	3856	4740	5028
	C-C**	3838	3969	4289	5157	5656
REFRIGERANT CHARGE — lb	R-22	39/12	40/12	48/12	52/14	70/15
	Ckt A Ckt B	Total/Over Clear Glass				
		48/12	46/12	60/12	54/14	69/15
COMPRESSORS, Type...rpm		Reciprocating, Semi-Hermetic...1750				
06E††	(No.) Ckt A	(1) 250	(1) 250	(1) 265	(1) 275	(1) 299
	(No.) Ckt B	(1) 250	(1) 265	(1) 275	(1) 299	(1) 299
Oil Charge — Compressor/pt		250/14, 265/19, 275/19, 299/19				
Capacity Control Steps		4	4	4	4	4
% Cap.	Ckt A	50.0	42.4	47.6	43.3	50.0
	Ckt B	50.0	57.6	52.4	56.7	50.0
Minimum Step Capacity — %		25.0	21.2	31.7	28.8	33.3
CONDENSER FANS — Type		Propeller, Direct Drive				
Standard/Low Noise						
Fan Speed — rpm		1140	1140	1140	1140	1140
No. Blades...Diameter — in.		4...30	4...30	4...30	4...30	4...30
No. Fans...Total kW		4...6.2	4...6.2	4...6.2	6...9.3	6...9.3
Total Airflow — cfm		35,000	35,000	34,000	52,000	51,000
High Static						
Fan Speed — rpm		1750	1750	1750	1750	1750
No. Blades...Diameter — in.		12...30	12...30	12...30	12...30	12...30
No. Fans...Total kW		4...14.8	4...14.8	4...14.8	6...22.2	6...22.2
Total Airflow — cfm		40,000	40,000	40,000	60,000	60,000
CONDENSER COILS — Type		Vertical and Horizontal, Plate Fin, Enhanced Tubing				
Tubes (Copper), OD — in.		0.375	0.375	0.375	0.375	0.375
No. Rows — Ckt A or B		2	2	3	2	3
Face Area sq ft — Ckt A and B Total		80.5	80.5	80.5	116.7	116.7
Max Working Pressure Refrigerant — psig		450				
COOLER — No. ...Type		One...Direct Expansion, Shell and Tube				
No. Refrigerant Circuits		2	2	2	2	2
Net Fluid Volume — Gal. (includes nozzles)		10.9	13.5	13.5	18.0	18.0
Max Working Pressure Refrigerant Side/Fluid Side — psig		278/300				
FLUID CONNECTIONS — in.		Cooler Inlet and Outlet; Victaulic Type				
Inlet and Outlet		3	3	3	4	4
Drain		¾ NPT				

LEGEND

Ckt — Circuit  
OD — Outside Diameter

\*Contact your local Carrier representative for more information on epoxy- and Heresite-coated fins.

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

\*\*C-C — Copper Tubing — Copper Fins Condenser Coil.

††06E250 compressors have 4 cylinders; all others have 6.

|| Based on rated external static pressure (ESP) of 0.4 in. wg or 1.0 in. wg as appropriate.

NOTE: When facing the compressors, Circuit A is on the right and Circuit B is on the left.

# Physical data — 30GN,GT — English (cont)



## 60 Hz (cont)

30GN/GT UNIT SIZE		080	090	100	110
APPROX OPERATING WEIGHT — lb*	C-AL†	6630	7015	8610	8660
	C-C**	7355	7740	9560	9610
REFRIGERANT CHARGE — lb R-22	Ckt A	78/15	78/15	98/20	98/20
	Ckt B	78/15	78/15	105/20	105/20
Total/Over Clear Glass					
COMPRESSORS, Type...rpm		Reciprocating, Semi-Hermetic...1750			
06E††	(Qty) Ckt A	(1) 275, (1) 250	(1) 265, (1) 250	(1) 265, (1) 275	(1) 265, (1) 299
	(Qty) Ckt B	(1) 299	(2) 265	(1) 265, (1) 275	(1) 265, (1) 275
Oil Charge — Compressor/pt		250/14, 265/19, 275/19, 299/19			
Capacity Control Steps (GN/GT)	Ckt A	7/6	11/8	11/8	11/8
% Cap.	Ckt A	56	47	50	54
	Ckt B	44	53	50	46
Minimum Step Capacity — % (GN/GT)		22/22	18/18	16/15	14/14
CONDENSER FANS — Type		Propeller, Direct Drive			
Standard/Low Noise					
Fan Speed — rpm		1140	1140	1140	1140
No. Blades...Diameter — in.		4...30	4...30	4...30	4...30
No. Fans...Total kW		6...9.4	6...9.4	8...12.7	8...12.7
Total Airflow — cfm		57,000	57,000	76,000	76,000
High Static					
Fan Speed — Rpm		1750	1750	1750	1750
No. Blades...Diameter — in.		12...30	12...30	12...30	12...30
No. Fans...Total kW		6...22.2	6...22.2	8...29.6	8...29.6
Total Airflow...cfm		60,000	60,000	80,000	80,000
CONDENSER COILS — Type		Vertical and Horizontal, Plate Fin, Enhanced Tubing			
Tubes (Copper), OD — in.		0.375	0.375	0.375	0.375
No. Rows — Ckt A or B		3	3	3	3
Face Area sq ft — Ckt A and B Total		128.3	128.3	168	168
Max Working Pressure Refrigerant — psig		450			
COOLER — No. ...Type		One...Direct Expansion, Shell and Tube			
No. Refrigerant Circuits		2	2	2	2
Net Fluid Volume — Gal. (includes nozzles)		24.5	24.5	30.3	30.3
Max Working Pressure Refrigerant Side/Fluid Side — psig		278/300			
FLUID CONNECTIONS — in.		Cooler Inlet and Outlet; Victaulic Type			
Inlet and Outlet		4	4	5	5
Drain		¾ NPT			

### LEGEND

Ckt — Circuit  
OD — Outside Diameter

\*Contact your local Carrier representative for more information on epoxy- and Heresite-coated fins.

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

\*\*C-C — Copper Tubing — Copper Fins Condenser Coil.

††06E250 compressors have 4 cylinders; all others have 6.

||Based on rated external static pressure (ESP) of 0.4 in. wg or 1.0 in. wg as appropriate.

NOTE: When facing the compressors, Circuit A is on the right and Circuit B is on the left.



**60 Hz (cont)**

30GN/GT UNIT SIZE		130	150	170	190	210
APPROX OPERATING WEIGHT — lb*	C-AL†	10,046	10,481	11,293	12,676	13,380
	C-C**	11,318	11,753	12,565	14,195	14,899
REFRIGERANT CHARGE — lb	R-22 Ckt A	133/28	143/35	153/45	178/30	190/40
	Ckt B	137/28	144/35	162/45	173/30	185/40
Total/Over Clear Glass						
COMPRESSORS, Type...rpm		Reciprocating, Semi-Hermetic...1750				
06E††	(Qty) Ckt A	(1) 275, (1) 299	(3) 265	(3) 275	(1) 265, (1) 275, (1) 299	(3) 265, (1) 275
	(Qty) Ckt B	(1) 275, (1) 299	(2) 299	(3) 275	(1) 265, (1) 275, (1) 299	(1) 275, (2) 299
Oil Charge — Compressor/pt		265/19, 275/19, 299/19				
Capacity Control Steps (GN/GT)	Ckt A	11/8	14/10	17/12	6/6	7/7
	Ckt B	50	50	50	50	50
% Cap.	Ckt A	50	50	50	50	50
	Ckt B	14/14	11/11	11/11	13/14	11/12
Minimum Step Capacity — % (GN/GT)						
CONDENSER FANS — Type		Propeller				
Standard/Low Noise						
Fan Speed — rpm		1140	1140	1140	1140	1740
No. Blades...Diameter — in.		4...30	4...30	4...30	4...30	4...30
No. Fans...Total kW		10...15.9	10...15.9	10...15.9	12...19.1	12...19.1
Total Airflow — cfm		100,000	100,000	100,000	120,000	120,000
High Static						
Fan Speed — rpm		1740	1740	1740	1740	1740
No. Blades...Diameter — in.		12...30	12...30	12...30	12...30	12...30
No. Fans...Total kW		10...37	10...37	10...37	12...44.4	12...44.4
Total Airflow — cfm		100,000	100,000	100,000	120,000	120,000
CONDENSER COILS — Type		Vertical and Horizontal, Plate Fin, Enhanced Tubing				
Tubes (Copper), OD — in.		.375	.375	.375	.375	.375
No. Rows — Ckt A or B		3	3	3	3	3
Face Area sq ft — Ckt A and B Total		225.1	225.1	225.1	268.9	268.9
Max Working Pressure Refrigerant — psig		450	450	450	450	450
COOLER — No. ...Type		One...Direct Expansion, Shell and Tube				
No. Refrigerant Circuits		2	2	2	2	2
Net Fluid Volume — Gal. (includes nozzles)		52.0	52.0	61.0	61.0	70.4
Max Working Pressure Refrigerant Side/Fluid Side — psig		278/300	278/300	278/300	278/300	278/300
FLUID CONNECTIONS — in.		Victaulic Type				
Inlet and Outlet		6				
Drain		¾ NPT				

LEGEND

Ckt — Circuit  
OD — Outside Diameter

\*Contact your local Carrier representative for more information on epoxy- and Heresite-coated fins.

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

\*\*C-C — Copper Tubing — Copper Fins Condenser Coil.

††06E250 compressors have 4 cylinders; all others have 6.

||Based on rated external static pressure (ESP) of 0.4 in. wg or 1.0 in. wg as appropriate.

NOTE: When facing the compressors, Circuit A is on the right and Circuit B is on the left.

# Physical data — 30GN,GT — English (cont)



50 Hz

30GN/GT UNIT SIZE		040	045	050	060	070
APPROX OPERATING WEIGHT — lb*	C-AL†	3590	3736	3916	4780	5453
	C-C**	3878	4024	4349	5197	6081
REFRIGERANT CHARGE — lb	R-22	Ckt A		Ckt B		Total/Over Clear Glass
		39/12	40/12	48/12	52/14	71/15
		48/12	46/12	60/12	54/14	69/15
COMPRESSORS, Type...rpm		Reciprocating, Semi-Hermetic...1450				
06E††	(No.) Ckt A	(1) 250	(1) 265	(1) 275	(1) 299	(2) 265
	(No.) Ckt B	(1) 265	(1) 275	(1) 299	(1) 299	(1) 299
Oil Charge — Compressor/pt		250/14, 265/19, 275/19, 299/19				
Capacity Control Steps		4	4	4	4	6
% Cap.	Ckt A	42.4	47.6	43.3	50.0	58.0
	Ckt B	57.6	52.4	56.7	50.0	42.0
Minimum Step Capacity — %		24.0	31.7	28.8	33.3	19.3
CONDENSER FANS — Type		Propeller, Direct Drive				
Standard/Low Noise						
Fan Speed — rpm		950	950	950	950	950
No. Blades...Diameter — in.		6...30	6...30	6...30	6...30	6...30
No. Fans...Total kW		4...6.2	4...6.2	4...6.2	6...9.3	6...9.3
Total Airflow — cfm		35,000	35,000	34,000	52,000	51,000
High Static						
Fan Speed — rpm		1445	1445	1445	1445	1445
No. Blades...Diameter — in.		12...30	12...30	12...30	12...30	12...30
No. Fans...Total kW		4...14.8	4...14.8	4...14.8	6...22.2	6...22.2
Total Airflow — cfm		40,000	40,000	40,000	60,000	60,000
CONDENSER COILS — Type		Vertical and Horizontal, Plate Fin, Enhanced Tubing				
Tubes (Copper), OD — in.		0.375	0.375	0.375	0.375	0.375
No. Rows — Ckt A or B		2	2	3	2	3
Face Area sq ft — Ckt A and B Total		80.5	80.5	80.5	116.7	116.7
Max Working Pressure Refrigerant — psig		450				
COOLER — No. ...Type		One...Direct Expansion, Shell and Tube				
No. Refrigerant Circuits		2	2	2	2	2
Net Fluid Volume — Gal. (includes nozzles)		10.9	13.5	13.5	18.0	18.0
Max Working Pressure Refrigerant Side/Fluid Side — psig		278/300				
FLUID CONNECTIONS — in.		Cooler Inlet and Outlet; Victaulic Type				
Inlet and Outlet		3	3	3	4	4
Drain		¾ NPT				

LEGEND

Ckt — Circuit  
OD — Outside Diameter

\*Contact your local Carrier representative for more information on epoxy- and Heresite-coated fins.

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

\*\*C-C — Copper Tubing — Copper Fins Condenser Coil.

††06E250 compressors have 4 cylinders; all others have 6.

|| Based on rated external static pressure (ESP) of 0.4 in. wg or 1.0 in. wg as appropriate.

NOTE: When facing the compressors, Circuit A is on the right and Circuit B is on the left.





50 Hz (cont)

30GN/GT UNIT SIZE		080	090	100	110
APPROX OPERATING WEIGHT — lb*	C-AL†	6720	7135	8710	8840
	C-C**	7445	7860	9660	9790
REFRIGERANT CHARGE — lb	Ckt A	78/15	78/15	98/20	98/20
	Ckt B	78/15	78/15	105/20	105/20
R-22 Total/Over Clear Glass					
COMPRESSORS, Type...rpm	Reciprocating, Semi-Hermetic...1450				
	(Qty) Ckt A	(1) 265, (1) 299	(1) 265, (1) 299	(1) 265, (1) 299	(2) 299
06E††	(Qty) Ckt B	(1) 299	(1) 265, (1) 275	(1) 265, (1) 299	(2) 299
Oil Charge — Compressor/pt		250/14, 265/19, 275/19, 299/19			
Capacity Control Steps (GN/GT)	Ckt A	8/6	11/8	11/8	11/8
	Ckt B	62	54	50	50
% Cap.	Ckt A	38	46	50	50
Minimum Step Capacity — % (GN/GT)	Ckt B	17/16	14/14	13/13	17/17
CONDENSER FANS — Type		Propeller, Direct Drive			
Standard/Low Noise					
Fan Speed — rpm		950	950	950	950
No. Blades...Diameter — in.		4...30	4...30	4...30	4...30
No. Fans...Total kW		6...9.4	6...9.4	8...12.7	8...12.7
Total Airflow — cfm		57,000	57,000	76,000	76,000
High Static					
Fan Speed — rpm		1445	1445	1445	1445
No. Blades...Diameter — in.		12...30	12...30	12...30	12...30
No. Fans...Total kW		6...22.2	6...22.2	8...29.6	8...29.6
Total Airflow...cfm		60,000	60,000	80,000	80,000
CONDENSER COILS — Type		Vertical and Horizontal, Plate Fin, Enhanced Tubing			
Tubes (Copper), OD — in.		0.375	0.375	0.375	0.375
No. Rows — Ckt A or B		3	3	3	3
Face Area sq ft — Ckt A and B Total		128.3	128.3	168	168
Max Working Pressure Refrigerant — psig		450			
COOLER — No. ...Type		One...Direct Expansion, Shell and Tube			
No. Refrigerant Circuits		2	2	2	2
Net Fluid Volume — Gal. (includes nozzles)		24.5	24.5	30.3	30.3
Max Working Pressure Refrigerant Side/Fluid Side — psig		278/300			
FLUID CONNECTIONS — in.		Cooler Inlet and Outlet; Victaulic Type			
Inlet and Outlet		4	4	5	5
Drain		¾ NPT			

LEGEND

Ckt — Circuit  
OD — Outside Diameter

\*Contact your local Carrier representative for more information on epoxy- and Heresite-coated fins.

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

\*\*C-C — Copper Tubing — Copper Fins Condenser Coil.

††06E250 compressors have 4 cylinders; all others have 6.

||Based on rated external static pressure (ESP) of 0.4 in. wg or 1.0 in. wg as appropriate.

NOTE: When facing the compressors, Circuit A is on the right and Circuit B is on the left.

# Physical data — 30GN,GT — English (cont)



## 50 Hz (cont)

30GN/GT UNIT SIZE		130	150	170	190	210
APPROX OPERATING WEIGHT — lb*	C-AL†	10,511	10,676	11,443	12,906	13,545
	C-C**	11,783	11,948	12,715	14,425	15,064
REFRIGERANT CHARGE — lb						
R-22	Ckt A	133/28	143/35	153/45	178/30	190/40
	Ckt B	137/28	143/35	162/45	173/30	185/40
Total/Over Clear Glass						
COMPRESSORS, Type...rpm		Reciprocating, Semi-Hermetic...1450				
06E††	(Qty) Ckt A	(1) 265, (2) 275	(3) 299	(2) 275, (1) 299	(3) 299	(2) 265, (2) 299
	(Qty) Ckt B	(2) 299	(2) 299	(1) 275, (2) 299	(3) 299	(3) 299
Oil Charge — Compressor/pt		265/19, 275/19, 299/19				
Capacity Control Steps (GN/GT)						
% Cap.	Ckt A	14/10 52	14/10 60	17/12 48	6/6 50	7/7 52
	Ckt B	48	40	52	50	48
Minimum Step Capacity — % (GN/GT)		10/10	13/13	9/10	17/17	9/10
CONDENSER FANS — Type		Propeller				
Standard/Low Noise						
Fan Speed — rpm		950	950	950	950	950
No. Blades...Diameter — in.		6...30	4...30	4...30	4...30	4...30
No. Fans...Total kW		10...15.9	10...15.9	10...15.9	12...19.1	12...19.1
Total Airflow — cfm		100,000	100,000	100,000	120,000	120,000
High Static						
Fan Speed — rpm		1445	1445	1445	1445	1445
No. Blades...Diameter — in.		6...30	12...30	12...30	12...30	12...30
No. Fans...Total kW		10...37	10...37	10...37	12...44.4	12...44.4
Total Airflow — cfm		100,000	100,000	100,000	120,000	120,000
CONDENSER COILS — Type		Vertical and Horizontal, Plate Fin, Enhanced Tubing				
Tubes (Copper), OD — in.		.375	.375	.375	.375	.375
No. Rows — Ckt A or B		3	3	3	3	3
Face Area sq ft — Ckt A and B Total		225.1	225.1	225.1	268.9	268.9
Max Working Pressure Refrigerant — psig		450	450	450	450	450
COOLER — No. ...Type		One...Direct Expansion, Shell and Tube				
No. Refrigerant Circuits		2	2	2	2	2
Net Fluid Volume — Gal. (includes nozzles)		52.0	52.0	61.0	61.0	70.4
Max Working Pressure Refrigerant Side/Fluid Side — psig		278/300	278/300	278/300	278/300	278/300
FLUID CONNECTIONS — in.		Victaulic Type				
Inlet and Outlet		6				
Drain		¾ NPT				

### LEGEND

Ckt — Circuit  
OD — Outside Diameter

\*Contact your local Carrier representative for more information on epoxy- and Heresite-coated fins.

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

\*\*C-C — Copper Tubing — Copper Fins Condenser Coil.

††06E250 compressors have 4 cylinders; all others have 6.

||Based on rated external static pressure (ESP) of 0.4 in. wg or 1.0 in. wg as appropriate.

NOTE: When facing the compressors, Circuit A is on the right and Circuit B is on the left.

# Physical data — 30GN,GT — SI



60 Hz

30GN/GT UNIT SIZE		040	045	050	060	070
APPROX OPERATING WEIGHT — kg*	C-AL†	1610	1669	1749	2150	2280
	C-C**	1741	1800	1945	2339	2565
REFRIGERANT CHARGE — kg	R-22	Ckt A	Ckt B	Total/Over Clear Glass	17.7/5.4	18.1/5.4
					21.8/5.4	20.9/5.4
COMPRESSORS, Type...rpm		Reciprocating, Semi-Hermetic...29.2				
06E††	(No.) Ckt A	(1) 250	(1) 250	(1) 265	(1) 275	(1) 299
		(1) 250	(1) 265	(1) 275	(1) 299	(1) 299
Oil Charge — Compressor/L		250/6.6, 265/9.0, 275/9.0, 299/9.0				
Capacity Control Steps		4	4	4	4	4
% Cap.	Ckt A	50.0	42.4	47.6	43.3	50.0
	Ckt B	50.0	57.6	52.4	56.7	50.0
Minimum Step Capacity (%)		25.0	21.2	31.7	28.8	33.3
CONDENSER FANS — Type		Propeller, Direct Drive				
Standard/Low Noise		19	19	19	19	19
Fan Speed — r/s		4...762	4...762	4...762	4...762	4...762
No. Blades...Diameter — mm		4...6.2	4...6.2	4...6.2	6...9.3	6...9.3
No. Fans...Total kW		16 517	16 517	16 045	24 540	24 068
Total Airflow — L/s		High Static				
Fan Speed — r/s		29	29	29	29	29
No. Blades...Diameter — mm		12...762	12...762	12...762	12...762	12...762
No. Fans...Total kW		4...14.8	4...14.8	4...14.8	6...22.2	6...22.2
Total Airflow — L/s		18 876	18 876	18 876	28 314	28 314
CONDENSER COILS — Type		Vertical and Horizontal, Plate Fin, Enhanced Tubing				
Tubes (Copper), OD — mm		9.53	9.53	9.53	9.53	9.53
No. Rows — Ckt A or B		2	2	3	2	3
Face Area m <sup>2</sup> — Ckt A and B Total		7.48	7.48	7.48	10.84	10.84
Max Working Pressure Refrigerant — kPa		3103				
COOLER — No. ...Type		One...Direct Expansion, Shell and Tube				
No. Refrigerant Circuits		2	2	2	2	2
Net Fluid Volume — L (includes nozzles)		41.3	51.2	51.2	68.3	68.3
Max Working Pressure Refrigerant Side/Fluid Side — kPa		1916/2068				
FLUID CONNECTIONS — in.		Cooler Inlet and Outlet; Victaulic Type				
Inlet and Outlet		3	3	3	4	4
Drain		¾ NPT				

LEGEND

Ckt — Circuit

OD — Outside Diameter

\*Contact your local Carrier representative for more information on epoxy- and Heresite-coated fins.

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

\*\*C-C — Copper Tubing — Copper Fins Condenser Coil.

††06E250 compressors have 4 cylinders; all others have 6.

|| Based on rated external static pressure (ESP) of 100 Pa or 250 Pa as appropriate.

NOTE: When facing the compressors, Circuit A is on the right and Circuit B is on the left.

# Physical data — 30GN,GT — SI (cont)



## 60 Hz (cont)

30GN/GT UNIT SIZE		080	090	100	110
APPROX OPERATING WEIGHT — kg*	C-AL†	3013	3189	3914	3935
	C-C**	3343	3518	4346	4368
REFRIGERANT CHARGE — kg	Ckt A	35.4/6.8	35.4/6.8	44.5/9.1	44.5/9.1
	Ckt B				
R-22 Total/Over Clear Glass		35.4/6.8	35.4/6.8	47.7/9.1	47.7/9.1
COMPRESSORS, Type...r/s		Reciprocating, Semi-Hermetic...29.2			
06E††	(Qty) Ckt A	(1) 275, (1) 250	(1) 265, (1) 250	(1) 265, (1) 275	(1) 265, (1) 299
	(Qty) Ckt B	(1) 299	(2) 265	(1) 265, (1) 275	(1) 265, (1) 275
Oil Charge — Compressor/L		250/6.6, 265/9.0, 275/9.0, 299/9.0			
Capacity Control Steps (GN/GT)	Ckt A	7/6	11/8	11/8	11/8
	Ckt B	56	47	50	54
% Cap.	Ckt A	44	53	50	46
	Ckt B	22/22	18/18	16/15	14/14
CONDENSER FANS — Type		Propeller, Direct Drive			
Standard/Low Noise					
Fan Speed — r/s		19	19	19	19
No. Blades...Diameter — mm		4...762	4...762	4...762	4...762
No. Fans...Total kW		6...9.4	6...9.4	8...12.7	8...12.7
Total Airflow — L/s		26 898	26 898	35 864	35 864
High Static					
Fan Speed — r/s		29	29	29	29
No. Blades...Diameter — mm		12...762	12...762	12...762	12...762
No. Fans...Total kW		6...22.2	6...22.2	8...29.6	8...29.6
Total Airflow...L/s		28 315	28 315	37 750	37 750
CONDENSER COILS — Type		Vertical and Horizontal, Plate Fin, Enhanced Tubing			
Tubes (Copper), OD — mm		9.53	9.53	9.53	9.53
No. Rows — Ckt A or B		3	3	3	3
Face Area m <sup>2</sup> — Ckt A and B Total		11.92	11.92	15.61	15.61
Max Working Pressure Refrigerant — kPa		3103			
COOLER — No. ...Type		One...Direct Expansion, Shell and Tube			
No. Refrigerant Circuits		2	2	2	2
Net Fluid Volume — L (includes nozzles)		92.9	92.9	114.6	114.6
Max Working Pressure Refrigerant Side/Fluid Side — kPa		1916/2068			
FLUID CONNECTIONS — in.		Cooler Inlet and Outlet; Victaulic-Type			
Inlet and Outlet		4	4	5	5
Drain		¾ NPT			

### LEGEND

Ckt — Circuit  
OD — Outside Diameter

\*Contact your local Carrier representative for more information on epoxy- and Heresite-coated fins.

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

\*\*C-C — Copper Tubing — Copper Fins Condenser Coil.

††06E250 compressors have 4 cylinders; all others have 6.

||Based on rated external static pressure (ESP) of 100 Pa or 250 Pa as appropriate.

NOTE: When facing the compressors, Circuit A is on the right and Circuit B is on the left.



**60 Hz (cont)**

30GN/GT UNIT SIZE		130	150	170	190	210
APPROX OPERATING WEIGHT — kg*	C-AL†	4566	4754	5133	5761	6081
	C-C**	5144	5342	5711	6452	6772
REFRIGERANT CHARGE — kg						
R-22	Ckt A	60.5/12.7	65.0/15.9	69.5/20.5	80.9/13.6	86.4/18.2
	Ckt B	62.3/12.7	65.0/15.9	73.6/20.5	78.6/13.6	84.1/18.2
COMPRESSORS, Type...r/s		Reciprocating, Semi-Hermetic...29.2				
06E††	(Qty) Ckt A	(1) 275, (1) 299	(3) 265	(3) 275	(1) 265, (1) 275, (1) 299	(3) 265, (1) 275
	(Qty) Ckt B	(1) 275, (1) 299	(2) 299	(3) 275	(1) 265, (1) 275, (1) 299	(1) 275, (2) 299
Oil Charge — Compressor/L		265/9.0, 275/9.0, 299/9.0				
Capacity Control Steps (GN/GT)		11/8	14/10	17/12	6/6	7/7
% Cap.	Ckt A	50	50	50	50	50
	Ckt B	50	50	50	50	50
Minimum Step Capacity — % (GN/GT)		14/14	11/11	11/11	13/14	11/12
CONDENSER FANS — Type		Propeller				
Standard/Low Noise						
Fan Speed — r/s		19	19	19	19	19
No. Blades...Diameter — mm		4...762	4...762	4...762	4...762	4...762
No. Fans...Total kW		10...15.9	10...15.9	10...15.9	12...19.1	12...19.1
Total Airflow — L/s		47 190	47 190	47 190	56 630	56 630
High Static						
Fan Speed — r/s		29	29	29	29	29
No. Blades...Diameter — mm		12...762	12...762	12...762	12...762	12...762
No. Fans...Total kW		10...37.0	10...37.0	10...37.0	12...44.4	12...44.4
Total Airflow — L/s		47 190	47 190	47 190	56 630	56 630
CONDENSER COILS — Type		Vertical and Horizontal, Plate Fin, Enhanced Tubing				
Tubes (Copper), OD — mm		9.53	9.53	9.53	9.53	9.53
No. Rows — Ckt A or B		3	3	3	3	3
Face Area m <sup>2</sup> — Ckt A and B Total		20.92	20.92	20.92	20.92	20.92
Max Working Pressure Refrigerant — kPa		3103	3103	3103	3103	3103
COOLER — No. ...Type		One...Direct Expansion, Shell and Tube				
No. Refrigerant Circuits		2	2	2	2	2
Net Fluid Volume — L (includes nozzles)		197	197	229	229	267
Max Working Pressure Refrigerant Side/Fluid Side — kPa		1916/2068	1916/2068	1916/2068	1916/2068	1916/2068
FLUID CONNECTIONS — in.		Victaulic Type				
Inlet and Outlet		6				
Drain		¾ NPT				

LEGEND

Ckt — Circuit  
OD — Outside Diameter

\*Contact your local Carrier representative for more information on epoxy- and Heresite-coated fins.

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

\*\*C-C — Copper Tubing — Copper Fins Condenser Coil.

††06E250 compressors have 4 cylinders; all others have 6.

||Based on rated external static pressure (ESP) of 100 Pa or 250 Pa as appropriate.

NOTE: When facing the compressors, Circuit A is on the right and Circuit B is on the left.

# Physical data — 30GN,GT — SI (cont)



50 Hz

30GN/GT UNIT SIZE		040	045	050	060	070
APPROX OPERATING WEIGHT — kg*	C-AL†	1628	1694	1776	2168	2473
	C-C**	1759	1825	1972	2357	2758
REFRIGERANT CHARGE — kg	R-22	Ckt A		Ckt B		Total/Over Clear Glass
		17.7/5.4	18.1/5.4	21.8/5.4	23.6/6.3	32.2/16.8
		21.8/5.4	20.9/5.4	27.2/5.4	24.5/6.3	31.3/16.8
COMPRESSORS, Type...r/s		Reciprocating, Semi-Hermetic...24.2				
06E††	(No.) Ckt A	(1) 250	(1) 265	(1) 275	(1) 299	(2) 265
	(No.) Ckt B	(1) 265	(1) 275	(1) 299	(1) 299	(1) 299
Oil Charge — Compressor/pt		250/6.6, 265/9.0, 275/9.0, 299/9.0				
Capacity Control Steps (GN/GT)		4	4	4	4	6
% Cap.	Ckt A	42.4	47.6	43.3	50.0	58.0
	Ckt B	57.6	52.4	56.7	50.0	42.0
Minimum Step Capacity — % (GN/GT)		24.0	31.7	28.8	33.3	19.3
CONDENSER FANS — Type		Propeller, Direct Drive				
Standard/Low Noise						
Fan Speed — r/s		15.8	15.8	15.8	15.8	15.8
No. Blades...Diameter — mm		6...762	6...762	6...762	6...762	6...762
No. Fans...Total kW		4...6.2	4...6.2	4...6.2	6...9.3	6...9.3
Total Airflow — L/s		16 517	16 517	16 045	24 540	24 068
High Static						
Fan Speed — r/s		24	24	24	24	24
No. Blades...Diameter — mm		12...762	12...762	12...762	12...762	12...762
No. Fans...Total kW		4...14.8	4...14.8	4...14.8	6...22.2	6...22.2
Total Airflow — L/s		18 876	18 876	18 876	28 314	28 314
CONDENSER COILS — Type		Vertical and Horizontal, Plate Fin, Enhanced Tubing				
Tubes (Copper), OD — mm		9.53	9.53	9.53	9.53	9.53
No. Rows — Ckt A or B		2	2	3	2	3
Face Area m <sup>2</sup> — Ckt A and B Total		7.48	7.48	7.48	10.84	10.84
Max Working Pressure Refrigerant — kPa		3103				
COOLER — No. ...Type		One...Direct Expansion, Shell and Tube				
No. Refrigerant Circuits		2	2	2	2	2
Net Fluid Volume — L (includes nozzles)		41.3	51.2	51.2	68.3	68.3
Max Working Pressure Refrigerant Side/Fluid Side — kPa		1916/2068				
FLUID CONNECTIONS — in.		Cooler Inlet and Outlet; Victaulic Type				
Inlet and Outlet		3	3	3	4	4
Drain		¾ NPT				

## LEGEND

Ckt — Circuit  
OD — Outside Diameter

\*Contact your local Carrier representative for more information on epoxy- and Heresite-coated fins.

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

\*\*C-C — Copper Tubing — Copper Fins Condenser Coil.

††06E250 compressors have 4 cylinders; all others have 6.

||Based on rated external static pressure (ESP) of 100 Pa or 250 Pa as appropriate.

NOTE: When facing the compressors, Circuit A is on the right and Circuit B is on the left.



50 Hz (cont)

30GN/GT UNIT SIZE		080	090	100	110
APPROX OPERATING WEIGHT — kg*	C-AL†	3055	3243	3960	4018
	C-C**	3384	3573	4390	4450
REFRIGERANT CHARGE — kg R-22	Ckt A	35.4/6.8	35.4/6.8	44.5/9.1	44.5/9.1
	Ckt B	35.4/6.8	35.4/6.8	47.7/9.1	47.7/9.1
Total/Over Clear Glass					
COMPRESSORS, Type...r/s		Reciprocating, Semi-Hermetic...24.2			
06E††	(Qty) Ckt A	(1) 265, (1) 299	(1) 265, (1) 299	(1) 265, (1) 299	(2) 299
	(Qty) Ckt B	(1) 299	(1) 265, (1) 275	(1) 265, (1) 299	(2) 299
Oil Charge — Compressor/L		250/6.6, 265/9.0, 275/9.0, 299/9.0			
Capacity Control Steps (GN/GT)	Ckt A	8/6	11/8	11/8	11/8
	Ckt B	62	54	50	50
% Cap.					
Minimum Step Capacity — % (GN/GT)	Ckt A	38	46	50	50
	Ckt B	17/16	14/14	13/13	17/17
CONDENSER FANS — Type		Propeller, Direct Drive			
Standard/Low Noise					
Fan Speed — r/s		15.8	15.8	15.8	15.8
No. Blades...Diameter — mm		4...762	4...762	4...762	4...762
No. Fans...Total kW		6...9.4	6...9.4	8...12.7	8...12.7
Total Airflow — L/s		26 898	26 898	35 864	35 864
High Static					
Fan Speed — r/s		29	29	29	29
No. Blades...Diameter — mm		12...762	12...762	12...762	12...762
No. Fans...Total kW		6...22.2	6...22.2	8...29.6	8...29.6
Total Airflow — L/s		28 315	28 315	37 750	37 750
CONDENSER COILS — Type		Vertical and Horizontal, Plate Fin, Enhanced Tubing			
Tubes (Copper), OD — mm		9.53	9.53	9.53	9.53
No. Rows — Ckt A or B		3	3	3	3
Face Area m <sup>2</sup> — Ckt A and B Total		11.92	11.92	15.61	15.61
Max Working Pressure Refrigerant — kPa		3103			
COOLER — No. ...Type		One...Direct Expansion, Shell and Tube			
No. Refrigerant Circuits		2	2	2	2
Net Fluid Volume — L (includes nozzles)		92.9	92.9	114.6	114.6
Max Working Pressure Refrigerant Side/Fluid Side — kPa		1916/2068			
FLUID CONNECTIONS — in.		Cooler Inlet and Outlet; Victaulic Type			
Inlet and Outlet		4	4	5	5
Drain		¾ NPT			

LEGEND

Ckt — Circuit  
OD — Outside Diameter

\*Contact your local Carrier representative for more information on epoxy- and Heresite-coated fins.

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

\*\*C-C — Copper Tubing — Copper Fins Condenser Coil.

††06E250 compressors have 4 cylinders; all others have 6.

||Based on rated external static pressure (ESP) of 100 Pa or 250 Pa as appropriate.

NOTE: When facing the compressors, Circuit A is on the right and Circuit B is on the left.

# Physical data — 30GN,GT — SI (cont)



## 50 Hz (cont)

30GN/GT UNIT SIZE		130	150	170	190	210
APPROX OPERATING WEIGHT — kg*	C-AL†	4778	4852	5201	5866	6156
	C-C**	5335	5430	5779	6556	6847
REFRIGERANT CHARGE — kg						
R-22	Ckt A	60.5/12.7	65.0/15.9	69.5/20.5	80.9/13.6	86.4/18.2
	Ckt B	62.3/12.7	65.0/15.9	73.6/20.5	78.6/13.6	84.1/18.2
COMPRESSORS, Type...r/s		Reciprocating, Semi-Hermetic...24.2				
06E††	(Qty) Ckt A	(1) 265, (2) 275	(3) 299	(2) 275, (1) 299	(3) 299	(2) 265, (2) 299
	(Qty) Ckt B	(2) 299	(2) 299	(1) 275, (2) 299	(3) 299	(3) 299
Oil Charge — Compressor/L		265/9.0, 275/9.0, 299/9.0				
Capacity Control Steps (GN/GT)		14/10	14/10	17/12	6/6	7/7
% Cap.	Ckt A	52	60	48	50	52
	Ckt B	48	40	52	50	48
Minimum Step Capacity — % (GN/GT)		10/10	13/13	9/10	17/17	9/10
CONDENSER FANS — Type		Propeller				
Standard/Low Noise						
Fan Speed — r/s		15.8	15.8	15.8	15.8	15.8
No. Blades...Diameter — mm		6...762	4...762	4...762	4...762	4...762
No. Fans...Total kW		10...15.9	10...15.9	10...15.9	12...19.1	12...19.1
Total Airflow — L/s		47 190	47 190	47 190	56 630	56 630
High Static						
Fan Speed — r/s		24.1	24.1	24.1	24.1	24.1
No. Blades...Diameter — mm		6...762	12...762	12...762	12...762	12...762
No. Fans...Total kW		10...37	10...37	10...37	12...44.4	12...44.4
Total Airflow — L/s		47 190	47 190	47 190	56 630	56 630
CONDENSER COILS — Type		Vertical and Horizontal, Plate Fin, Enhanced Tubing				
Tubes (Copper), OD — mm		9.53	9.53	9.53	9.53	9.53
No. Rows — Ckt A or B		3	3	3	3	3
Face Area m <sup>2</sup> — Ckt A and B Total		20.92	20.92	20.92	24.98	24.98
Max Working Pressure Refrigerant — kPa		3103	3103	3103	3103	3103
COOLER — No. ...Type		One...Direct Expansion, Shell and Tube				
No. Refrigerant Circuits		2	2	2	2	2
Net Fluid Volume — L (includes nozzles)		197	197	229	229	267
Max Working Pressure Refrigerant Side/Fluid Side — kPa		1916/2068	1916/2068	1916/2068	1916/2068	1916/2068
FLUID CONNECTIONS — in.		Victaulic Type				
Inlet and Outlet		6				
Drain		¾ NPT				

### LEGEND

Ckt — Circuit  
OD — Outside Diameter

\*Contact your local Carrier representative for more information on epoxy- and Heresite-coated fins.

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

\*\*C-C — Copper Tubing — Copper Fins Condenser Coil.

††06E250 compressors have 4 cylinders; all others have 6.

||Based on rated external static pressure (ESP) of 100 Pa or 250 Pa as appropriate.

NOTE: When 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 costs are most important. With this option, the EXV, related controls, and part-load energy savings related to the EXV function are replaced by TXVs and liquid line solenoid valves (LLSV). 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 micro-processor 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 30GN040 and 30GT040-070 units. NOTE: Accessory unloaders (where available) eliminate the need for hot gas bypass and provide a more efficient solution.

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

**Sound reduction** option consists of specially designed system of fans and acoustic enclosures for reducing sound levels without compromising chiller performance.

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

**Condenser coil options** are available to match coil construction to the site conditions for the best durability. See the guide below and consult your Carrier representative for further information.

**Part-wind (PW) start** generally is not required where multiple 06E compressors are installed. The starting current is usually 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 fluid 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.

**Non-fused electrical disconnect** is available factory installed on 380/415 v and 460 v units only. For 040-110 sizes, disconnect is a “thru-the-door” type. For 130-210 sizes, disconnect mounts on center panel.

**High-static fans** allow the 30GN,GT units to be used in applications with an external static pressure of up to 1 in. wg (250 kPa) (external to the chiller) at nominal condenser airflow. Two options are available: 0.4 in. wg (100 kPa) and 1 in. wg (250 kPa).

## CONDENSER COIL OPTION RECOMMENDATIONS

COPPER-TUBE COILS WITH	ENVIRONMENT				
	Standard	Mild Coastal	Severe Coastal	Industrial	Combined Industrial/Coastal
AL Fins (Standard Coils)	X				
CU Fins		X			
AL Fins, Heresite Post-Coating				X	
CU Fins, Heresite Post-Coating			X		X
AL Fins, Pre-Coated		X			

### LEGEND

AL — Aluminum  
CU — Copper

# 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 ground, the sensor shuts down the compressor to prevent contamination of the refrigerant system. This protection is an accessory for 040-060 and 070 (60 Hz) sizes only (standard on 070 [50 Hz] and 080-210 sizes).

**Motormaster® III head-pressure control** allows unit to operate down to -20 F (-29 C) on all unit sizes.

NOTE: No motor change-out is required on 60 Hz units.

**Sound reduction kit** 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 head-pressure control. This accessory is sold 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).

Unloader(s) eliminate the need for hot gas bypass and operate more efficiently. On 30GN/GT040-070 sizes, they also provide automatic lead/lag operation.

**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.

**Remote cooler mounting** permits indoor relocation of the cooler up to 75 ft (22 m) away from base unit.

**Multi-chiller control** — The control panel sequences up to 4 chillers and circulating pumps by sensing mixed leaving-water temperature.

The control features include:

- lead/lag control for reliable compressor operation
- 7-day programmable timeclock for scheduling flexibility and energy savings
- daylight savings time changeover for accurate scheduling
- a.m./p.m. time display
- battery back-up of programmed events for reliable operation

**Oil pressure switch package** includes 2 oil pressure switches for unit. The switch mounts on lead compressor in each refrigerant circuit. This is an accessory for 040-070 sizes (standard on 080-210 sizes).

**Temperature reset board (30GT)** is used for leaving-fluid temperature reset. Reset can be based on return-fluid temperature, space temperature, or outdoor-air temperature. The temperature reset board lets the unit reset the leaving-fluid temperature to a higher value during low load conditions. An accessory thermistor for outdoor air and space temperature reset is required.

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

**Hot gas bypass package** includes solenoid control valves and a hot gas bypass valve. 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** is sized to supply the needs of the control circuit, sourcing power from the main unit power connection.

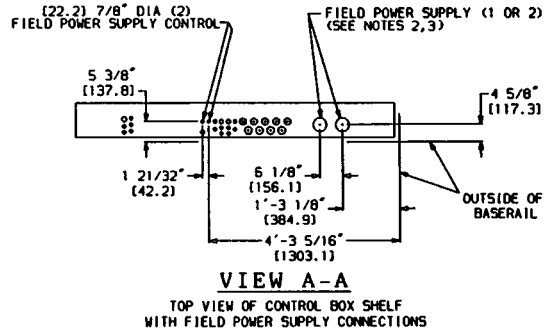
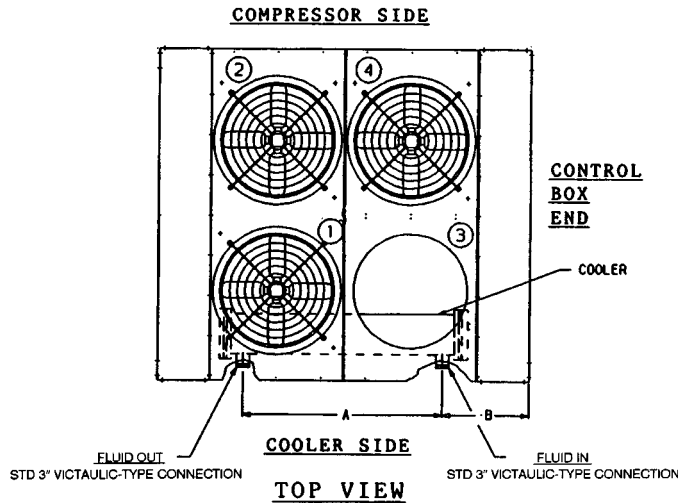
**Chilled fluid flow switch** accessory is available for field installation (all sizes) although low fluid flow detection is provided by the unit internal control devices.

**Convenience outlet** accessory kit provides a 115-v, GFI (Ground Fault Interrupter) female receptacle. The outlet is field mounted in the control box and is powered by the unit control circuit.

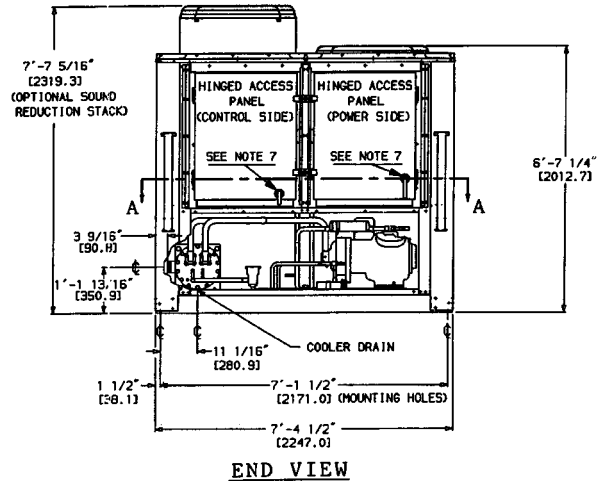
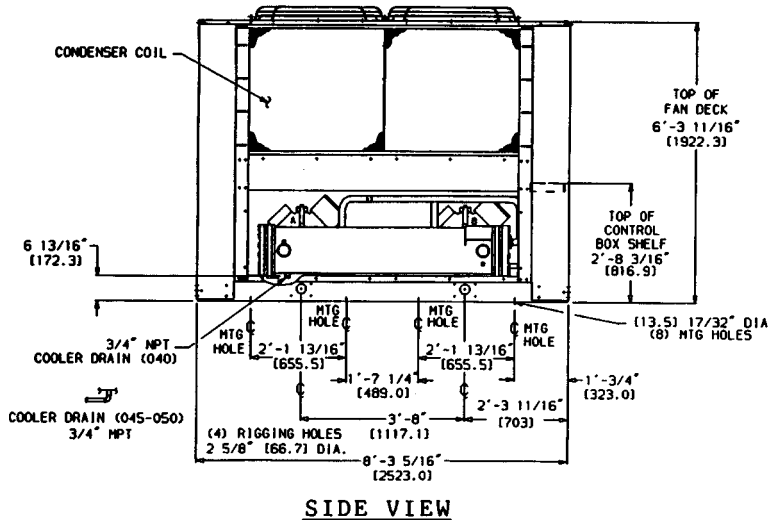
**Unit control display access door** provides easy access to the unit control module through a see-through door without having to open or remove control box panels.

**High-ambient kit** may be required in areas where the outdoor ambient temperatures are expected to be above 115 F (46.1 C) and return fluid temperatures are expected to be above 60 F (15.5 C).

# Base unit dimensions — 30GN,GT040-050



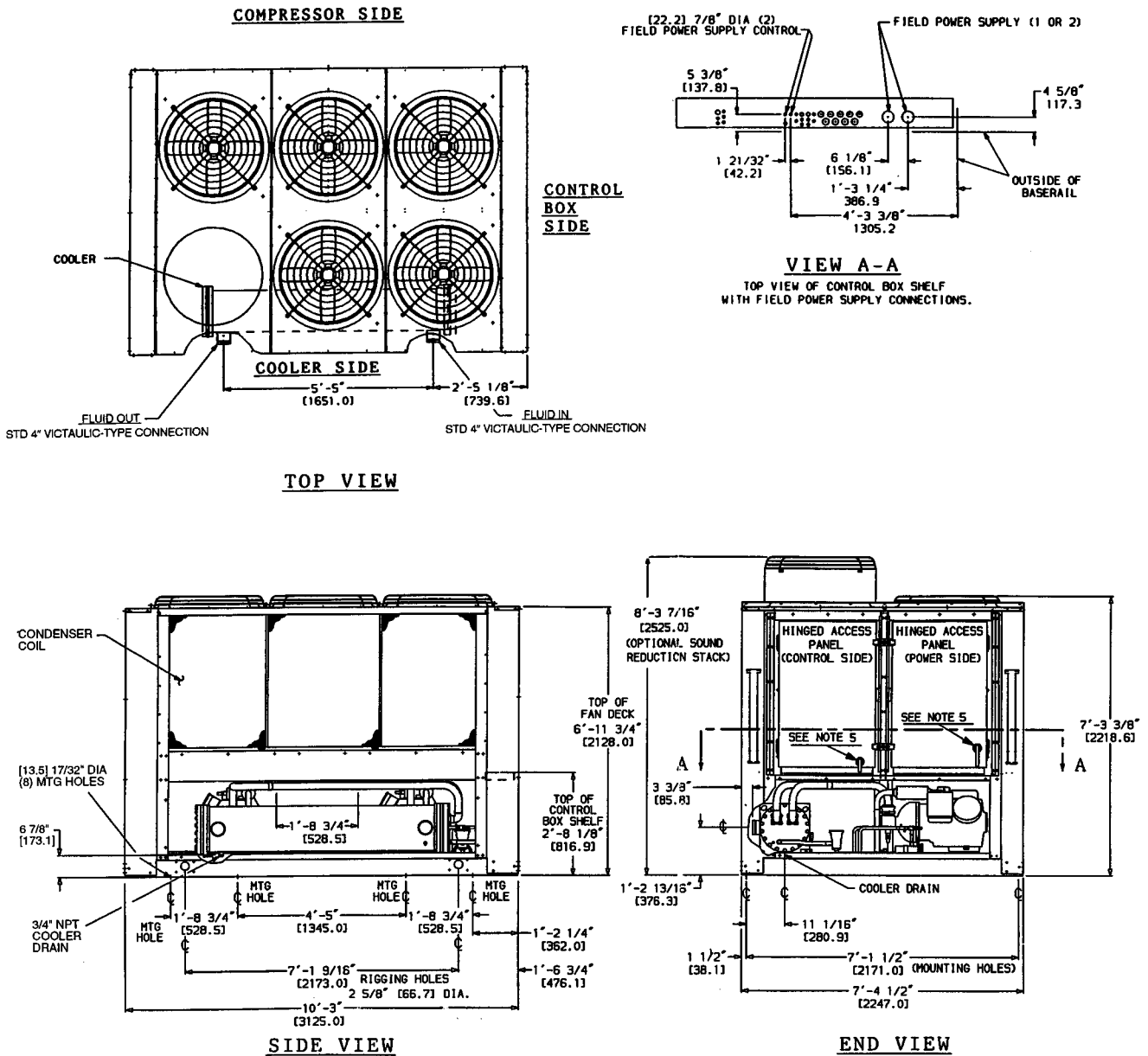
30GN,GT	A	B
040	4'-5 1/2" (1359)	1'-11 1/8" (588)
045, 050	5'-5 1/2" (1663)	1'-5 3/16" (437)



**NOTES:**

- Unit must have clearances for airflow (from solid surfaces) 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 size 040 and 045 (208/230 v) units.
- One 3 5/8 in. dia hole is recommended for single entry power on size 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.
- Thru-the-door handles for non-fused disconnect option on 380/415 v and 460 v units only. When unit has non-fused disconnect option, power-side door opens from right side, NOT left side as shown for standard units.

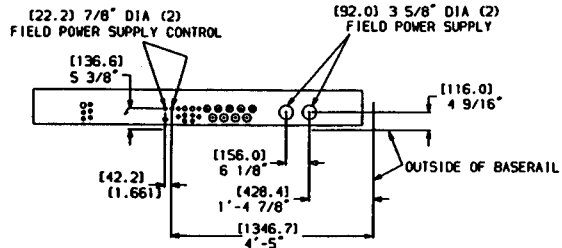
# Base unit dimensions — 30GN,GT060,070



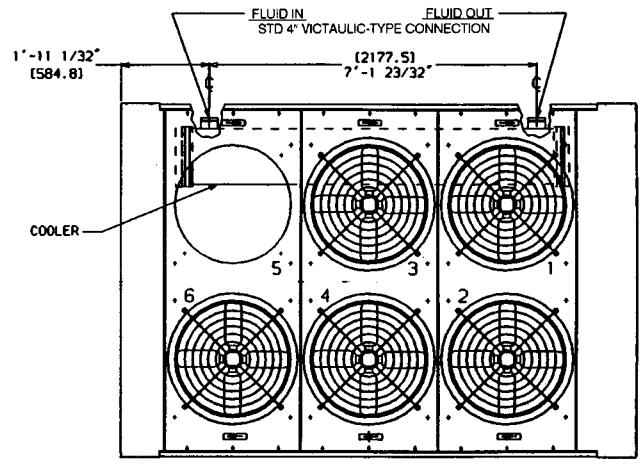
**NOTES:**

1. Unit must have clearances for airflow (from solid surfaces) 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. They are not recommended for spring isolator location.
3. If spring isolators are used, a perimeter support channel between the unit and the isolators is recommended.
4. Dimensions in [ ] are in millimeters.
5. Thru-the-door handles for non-fused disconnect option on 380/415 v and 460 v units only. When unit has non-fused disconnect option, power-side door opens from right side, NOT left side as shown for standard units.

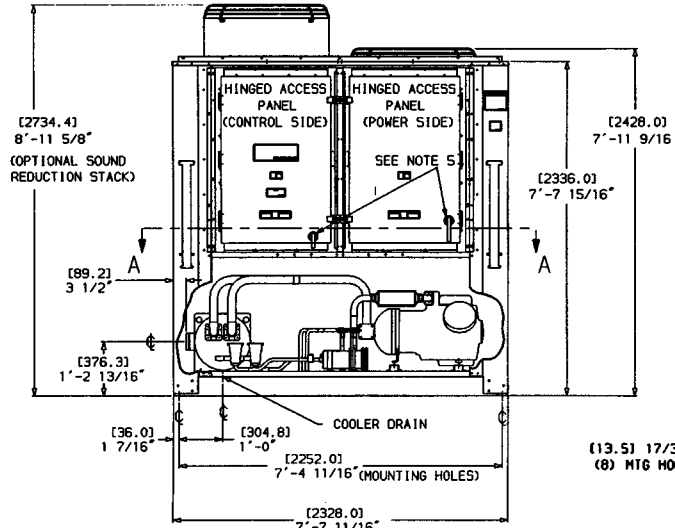
# Base unit dimensions — 30GN,GT080,090



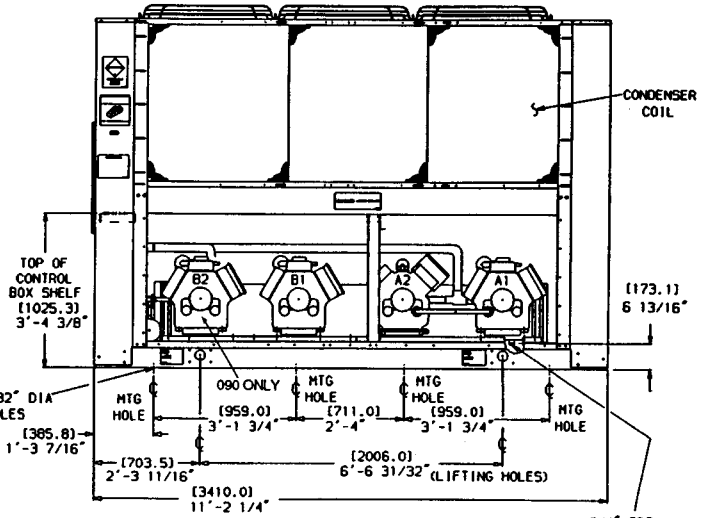
**VIEW A-A**  
TOP VIEW OF CONTROL BOX SHELF  
WITH FIELD POWER SUPPLY CONNECTIONS



**TOP VIEW**



**END VIEW**

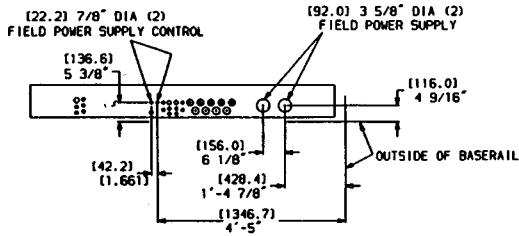


**SIDE VIEW**

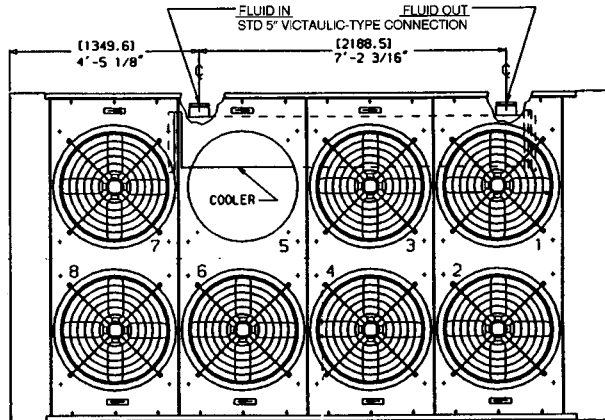
**NOTES:**

1. Unit must have clearances for airflow (from solid surfaces) 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. They are not recommended for spring isolator location.
3. If spring isolators are used, a perimeter support channel between the unit and the isolators is recommended.
4. Dimensions in [ ] are in millimeters.
5. Thru-the-door handles for non-fused disconnect option on 380/415 v and 460 v units only. When unit has non-fused disconnect option, power-side door opens from right side, NOT left side as shown for standard units.

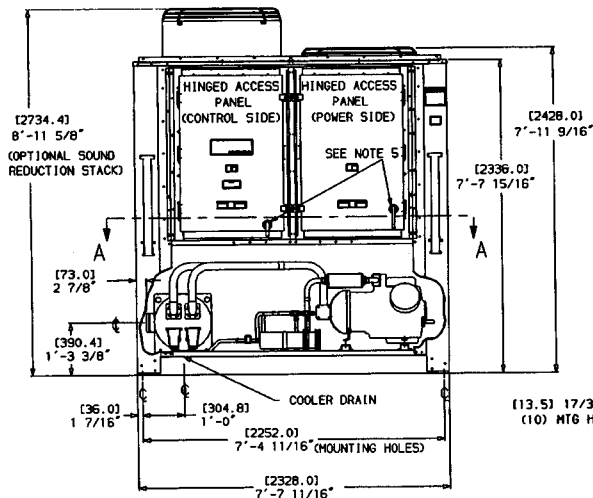
# Base unit dimensions — 30GN,GT100,110



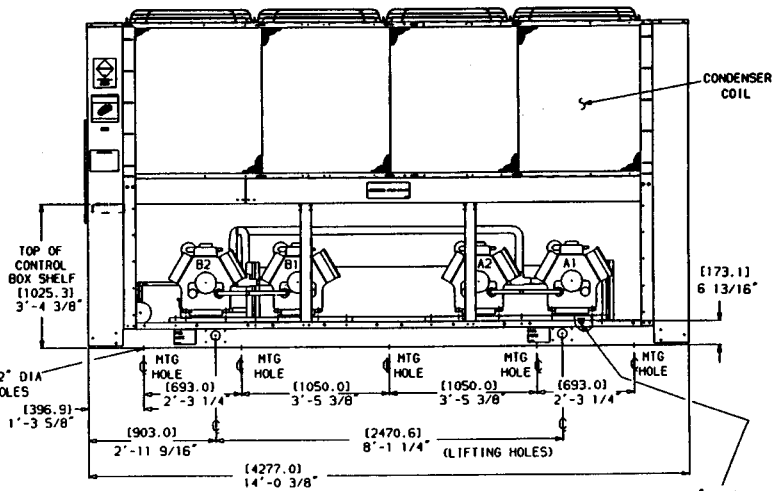
**VIEW A-A**  
TOP VIEW OF CONTROL BOX SHELF  
WITH FIELD POWER SUPPLY CONNECTIONS



**TOP VIEW**



**END VIEW**



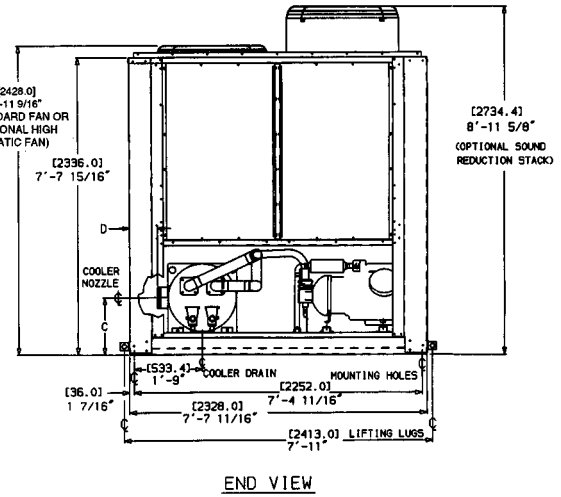
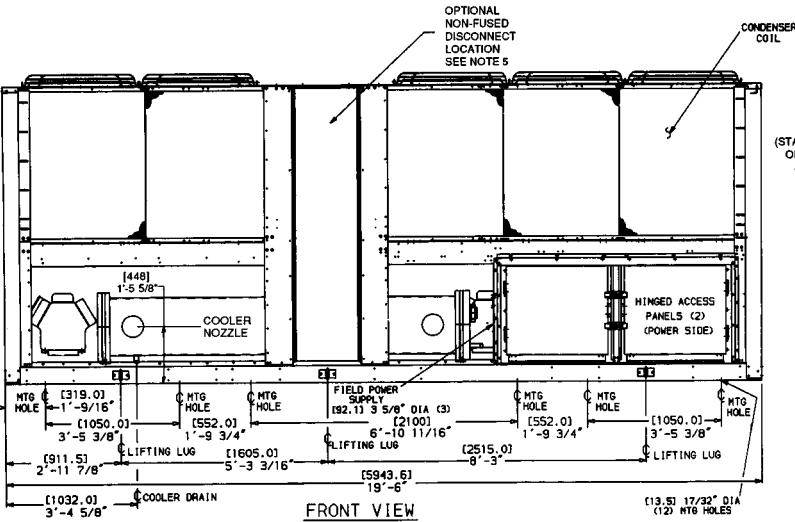
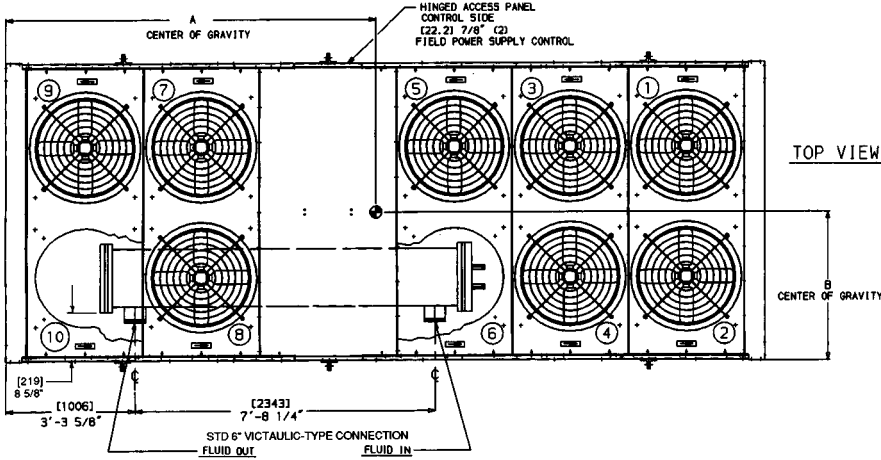
**SIDE VIEW**

3/4\"/>

**NOTES:**

1. Unit must have clearances for airflow (from solid surfaces) 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. They are not recommended for spring isolator location.
3. If spring isolators are used, a perimeter support channel between the unit and the isolators is recommended.
4. Dimensions in [ ] are in millimeters.
5. Thru-the-door handles for non-fused disconnect option on 380/415 v and 460 v units only. When unit has non-fused disconnect option, power-side door opens from right side, NOT left side as shown for standard units.

# Base unit dimensions — 30GN,GT130-170



**NOTES:**

1. Unit must have clearances for airflow (from solid surfaces) as follows:
  - Top — Do not restrict in any way
  - Ends — 5 ft [1524 mm]
  - Sides — 6 ft [1829 mm]
2. Mounting holes may be used to mount unit to concrete pad. They are not recommended for spring isolator location.
3. If spring isolators are used, a perimeter support channel between the unit and the isolators is recommended.
4. Dimensions in [ ] are in millimeters.
5. Optional non-fused disconnect shown on page 25.

**CENTER OF GRAVITY (ft-in.)**

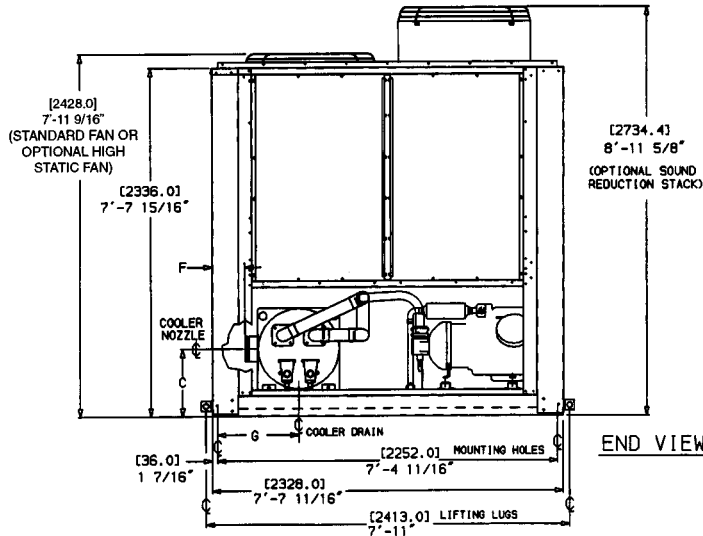
SIZE	A	B	C	D
130	9-4½ [2858]	4-1⅛ [1267]	1-4¾ [425]	0-9½ [242]
150	9-4 [2849]	4-2½ [1283]	1-4¾ [425]	0-9½ [242]
170	9-4⅞ [2865]	4-2½ [1283]	1-5⅞ [448]	0-8⅞ [219]

# Base unit dimensions — 30GN,GT190,210



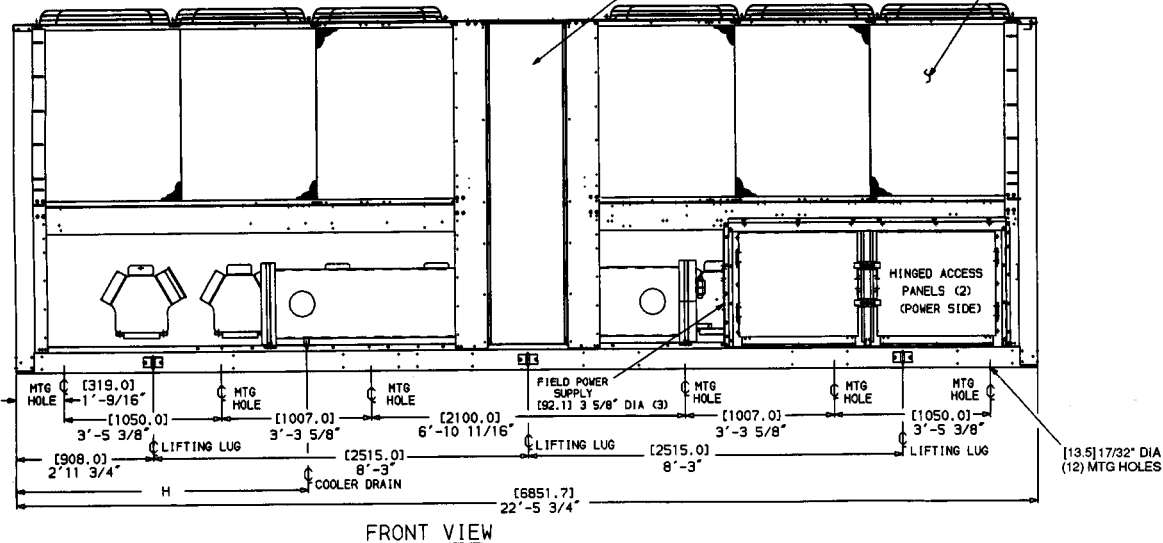
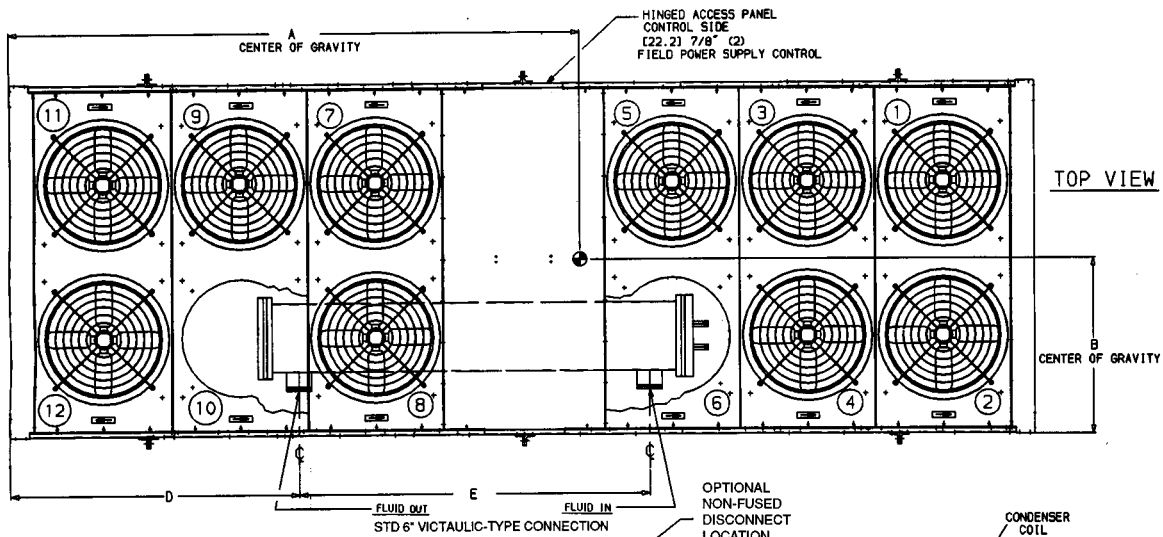
## DIMENSIONS (ft-in.)

SIZE	A	B	C	D	E	F	G	H
190	11-4 [3454]	4-2½ [1283]	1-5⅝ [448]	6- 3¼ [1916]	7-8¼ [2343]	8⅝ [219]	1- 9 [533.4]	6- 4⅞ [1941.3]
210	11-3 [3444]	4-2 [1285]	1-6¼ [468]	5-11½ [1816]	8-2⅞ [2504]	9½ [242]	1-11 [584]	5-11½ [1816.2]



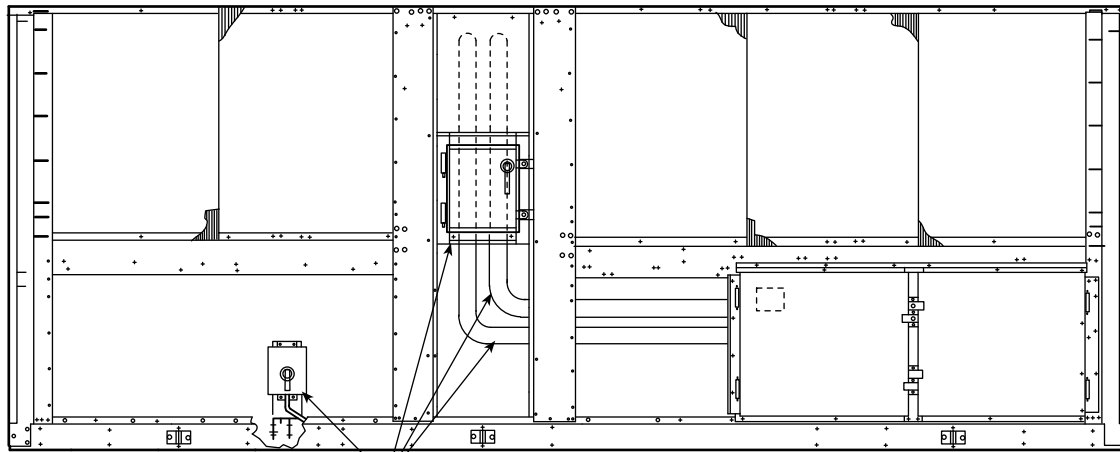
### NOTES:

- Unit must have clearances for airflow (from solid surfaces) as follows:  
 Top — Do not restrict in any way  
 Ends — 5 ft [1524 mm]  
 Sides — 6 ft [1829 mm]
- 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.
- Optional non-fused disconnect shown on page 25.





# Non-Fused Disconnect Option, 30GN,GT Sizes 130-210 (130-170 Shown)

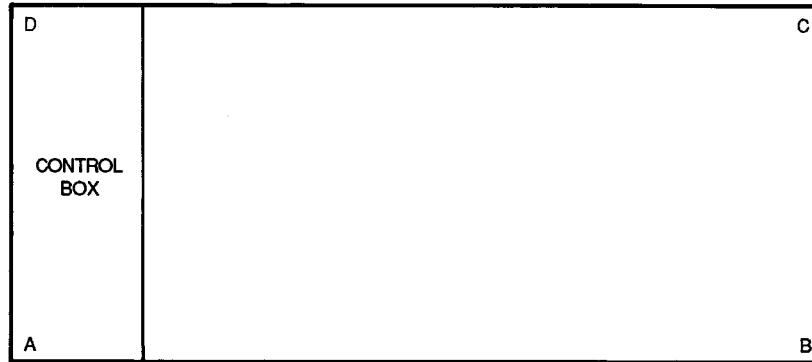


NON-FUSED DISCONNECT OPTION

# 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

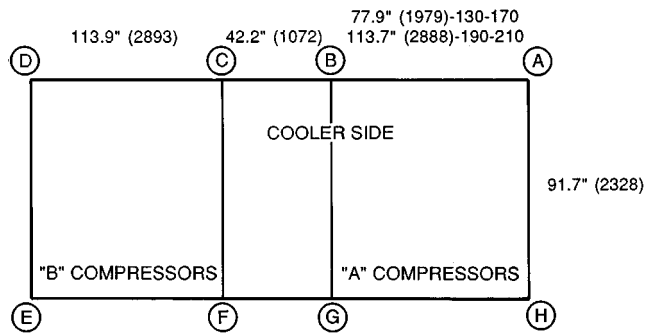
### LEGEND

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

\*Points A, B, C, and D are located in the corners of the unit. See pages 19-22 for dimensions.  
 †Contact your local Carrier representative for more information on epoxy-coated and pre-coated aluminum fins.

NOTE: If spring isolators are used, a perimeter support channel between the unit and the isolators is recommended.

## Mounting Weights (Approximate) — Sizes 130-210



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

### LEGEND

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

\*Contact your local Carrier representative for more information on epoxy-coated and pre-coated aluminum fins.

### NOTES:

- Dimensions in ( ) are in millimeters.
- If spring isolators are used, a perimeter support channel between the unit and the isolators is recommended.

## Leveling unit

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

While most outdoor locations are suitable for 30GN and 30GT 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 fluid temperature

1. *Maximum* leaving chilled fluid temperature (LCWT) for unit is 70 F (21 C). Unit can start and pull down with up to 95 F (35 C) entering-fluid temperature due to MOP (maximum operating pressure) feature of the TXV. For sustained operation, it is recommended that entering-fluid 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™ or Flotronic II chiller with leaving-fluid 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 literature 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 of 34 to 15 F (1° to -9.4 C) may require unit with factory modification. For ratings below 40 F (4.5 C) LCWT, contact your local Carrier representative.

## Leaving-fluid 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 fluid 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 the following:

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

**Outdoor-air temperature** — Increases LCWT as outdoor ambient temperature decreases (indicating load decrease). This reset should be applied only where outdoor ambient temperature 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 literature. Obtain ordering part numbers for reset option from current price pages or contact your local Carrier representative.

## 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. Both Flotronic and Flotronic II chillers may be operated using a different temperature range, provided flow limits are not exceeded. For minimum flow rates, see Minimum Cooler Fluid 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 on page 34.

**MINIMUM COOLER FLUID 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

### LEGEND

- ARI — Air Conditioning and Refrigeration Institute  
 N — Liters per kW  
 V — Gallons per ton

### NOTES:

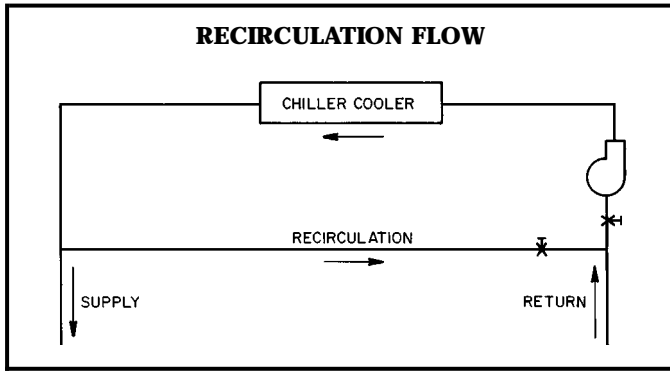
1. Minimum flow based on 1.0 fps (0.30 m/s) velocity in cooler without special cooler baffling.
2. Minimum Loop Volumes: Gallons = V x ARI Cap. (tons)  
 Liters = N x ARI Cap. (kW)

APPLICATION	V	N
Normal Air Conditioning	3	3.25
Process Type Cooling	6 to 10	6.5 to 10.8
Low Ambient Unit Operation	6 to 10	6.5 to 10.8

**Minimum cooler flow (maximum cooler temperature rise)** — The minimum cooler flow for standard units is shown in Minimum Cooler Fluid Flow Rates and Minimum Loop Volume table. When gpm (L/s) required is lower (or rise higher), follow recommendations below:

- a. Multiple smaller chillers may be applied in series, each providing a portion of the design temperature rise.
- b. Cooler fluid 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.
- c. Special cooler baffling is required to allow minimum flow rate to be reduced.

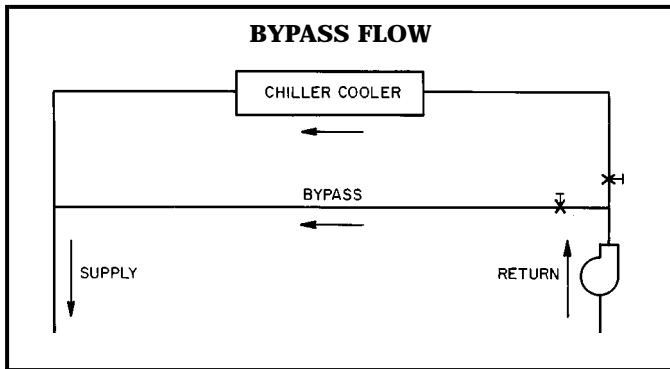
NOTE: Recirculation flow is shown on next page.



**Maximum cooler flow** — The maximum cooler flow ( $> 5$  gpm/ton or  $< 5^\circ$  F rise [ $> 0.09$  L/s · kW or  $< 2.7^\circ$  C rise]) results in practical maximum pressure drop through cooler.

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

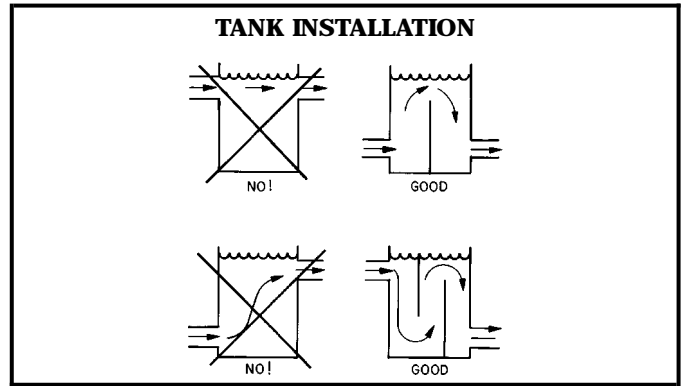
NOTE: Bypass flow is shown below.



**Variable cooler flow rates** — Variable rates may be applied to standard chiller. Unit will, however, attempt to maintain a constant leaving chilled fluid temperature. In such cases, minimum flow must be in excess of minimum flow given in Minimum Cooler Fluid 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.

**Fluid loop volume** — The 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 30GT210 would require 603 gal. [2232 L].) In process cooling applications, or for operation at ambient temperature below 32 F ( $0^\circ$  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.

NOTE: Tank installation is shown in next column.



**Cooler fouling factor** — The 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, unit capacity decreases and compressor power increases. 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** — Protection against low ambient freeze-up is required for unit operation in areas that experience temperatures below 32 F ( $0^\circ$  C). Protection should be in the form of inhibited 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 fluid 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 Low Ambient Temperature Operation section page 30.

## Condenser

**Altitude correction factors** — Correction factors must be applied to standard ratings at altitudes above 2000 ft (610 m) using the following multipliers:

ALTITUDE		CAPACITY MULTIPLIER	COMPRESSOR POWER MULTIPLIER
ft	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** — Airflow restrictions on units with standard fans 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 as follows:

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

# Application data (cont)



## High ambient temperature

High outdoor ambient chiller start-up and operation (fully loaded) is possible for standard 30GN,GT chillers at ambient temperatures up to 125 F (52 C) at nominal voltage. In some cases, where return water temperature is expected to exceed 60 F (15.5 C), an accessory kit may be required.

## Low ambient temperature operation

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

0° F (–18 C) for EXV units

35° F (1.7 C) for 30GT040-110 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)** — Baffles must be added to all units for operation below 32 F (0° C) if wind velocity is anticipated to be greater than 5 mph (8 km/h).

**Antifreeze solution** — Inhibited ethylene glycol or other suitable corrosion-resistant anti-freeze solution must be field supplied and installed in all units for unit operation below 32 F (0° C). Solution must be added to fluid loop to protect loop down to 15° F (8° C) below minimum operating ambient temperature.

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

## Capacity correction (antifreeze)

*Inhibited 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 inhibited ethylene glycol as shown in following example. Correction factors can be derived from curves in the Inhibited Ethylene Glycol Performance chart at right. Additional performance information on this and other fluids is available in Carrier's Electronic Catalog (E-CAT) software program.

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

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

Consider the 30GT110 unit from the Selection Procedure example on page 34 (refer to correction curves at 40% solution).

**Correct unit capacity** — On the capacity correction curve at right, 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 below, read 1.15.

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

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

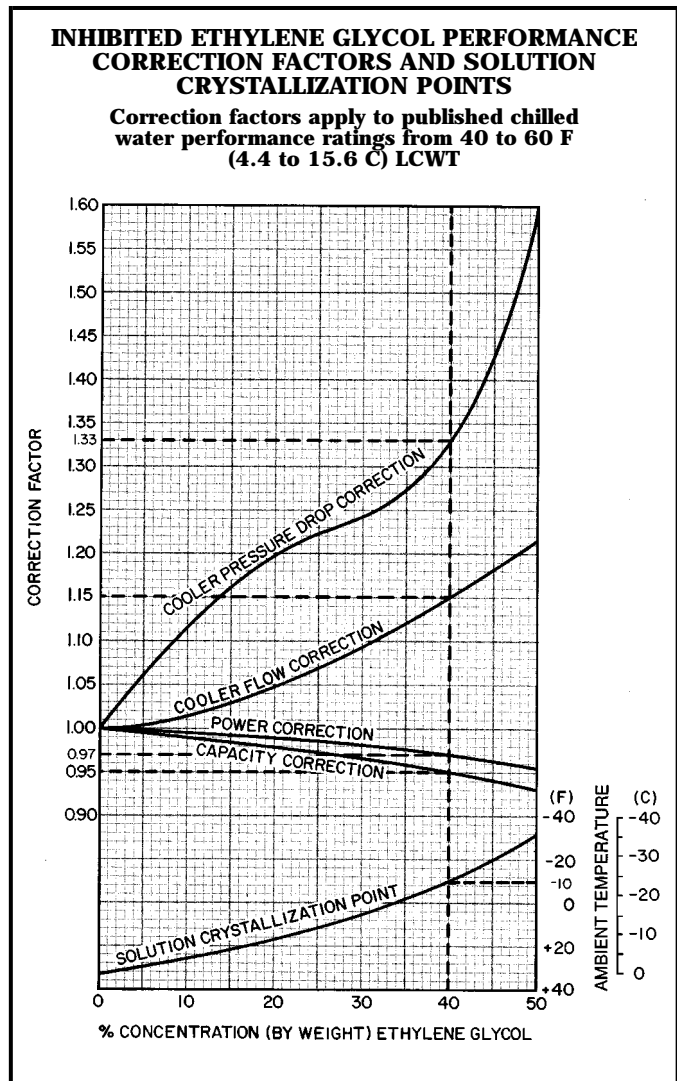
**Correct cooler pressure drop** — On cooler pressure drop correction curve below, read 1.33.

On cooler pressure drop curve on page 32, for 206.8 gpm, read pressure drop = 8.1 ft water gage. The pressure drop for 40% solution = 1.33 x 8.1 = 10.8 ft water.

**Correct compressor power input (kW)** — On power correction curve below, 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 inhibited ethylene glycol to protect the system to  $-23\text{ C}$  ambient temperature at zero flow.

Enter the solution crystallization point curve on previous page, at  $-23\text{ C}$ , read 40% concentration inhibited ethylene glycol is required to prevent crystals from forming in solution.

Consider 30GT110 unit selected from the Selection Procedure example (refer to correction curves at 40% solution).

**Correct unit capacity** — On glycol performance capacity correction curve on page 30, 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 on page 30, read 1.15.

Chilled water flow (at corrected capacity)

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

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

**Correct cooler pressure drop** — On cooler pressure drop correction curve on page 30, read 1.33.

On cooler pressure drop curve on page 32, for 12.4 L/s, read pressure drop of 24 kPa. The pressure drop for 40% solution  $= 1.33 \times 24 = 31.92 \text{ kPa}$ .

**Correct compressor power input (kW)** — On the power correction curve on page 30, 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

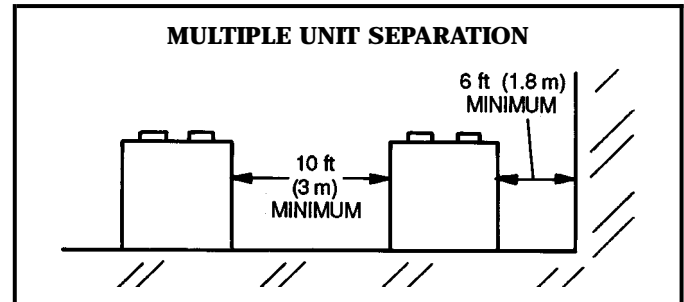
Oversizing chillers by more than 15% at design conditions must be avoided as the system operating efficiency is adversely affected (resulting in greater or excessive electrical demand). When future expansion of equipment is anticipated, install a single chiller to meet present load requirements and add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

It is also recommended that 2 smaller chillers be installed where operation at minimum load is critical. The operation of a smaller chiller loaded to a greater percentage over 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 210 tons (740 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 fluid flows. Where a large temperature drop ( $> 25^\circ \text{ F}$  [ $13.9^\circ \text{ C}$ ]) is desired, chillers may be installed in *series*. Fluid 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 Multiple Unit Separation figure below. See Base Unit Dimensions section on page 19 for service clearances.



## Electrical/utility interests

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

**Demand limiting (also called load shedding)** — When a utility's 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 fluid temperature, or by using a demand limit accessory that unloads the chiller to a given predetermined percentage of the load. Both features require a 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 the 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 literature) or by Carrier Comfort Network (CCN) with Flotronic™ II option.

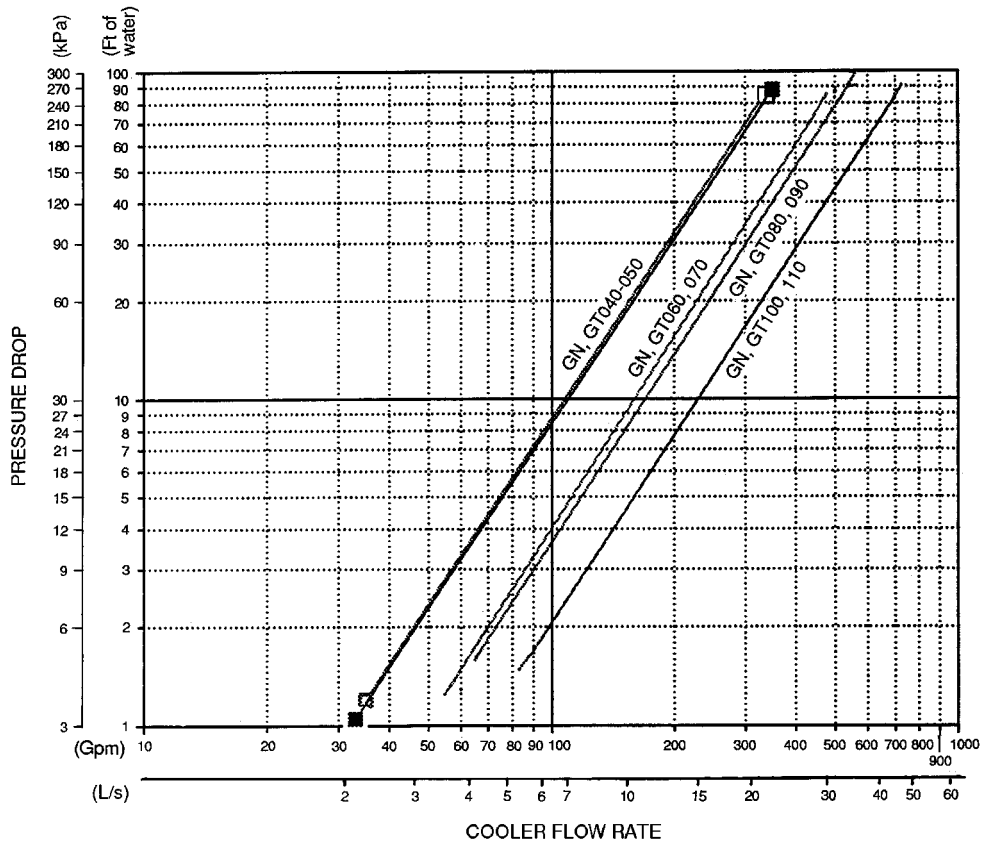
## Part-wind start

This is not generally required on 30GN,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 table on page 46) should be used in determining need.

## Strainers

It is recommended that a strainer with a minimum of 20 mesh be installed in the cooler fluid inlet line, just ahead of and as close as possible to the cooler.

## COOLER FLUID PRESSURE DROP CURVES — 30GN,GT040-110 ENGLISH AND SI



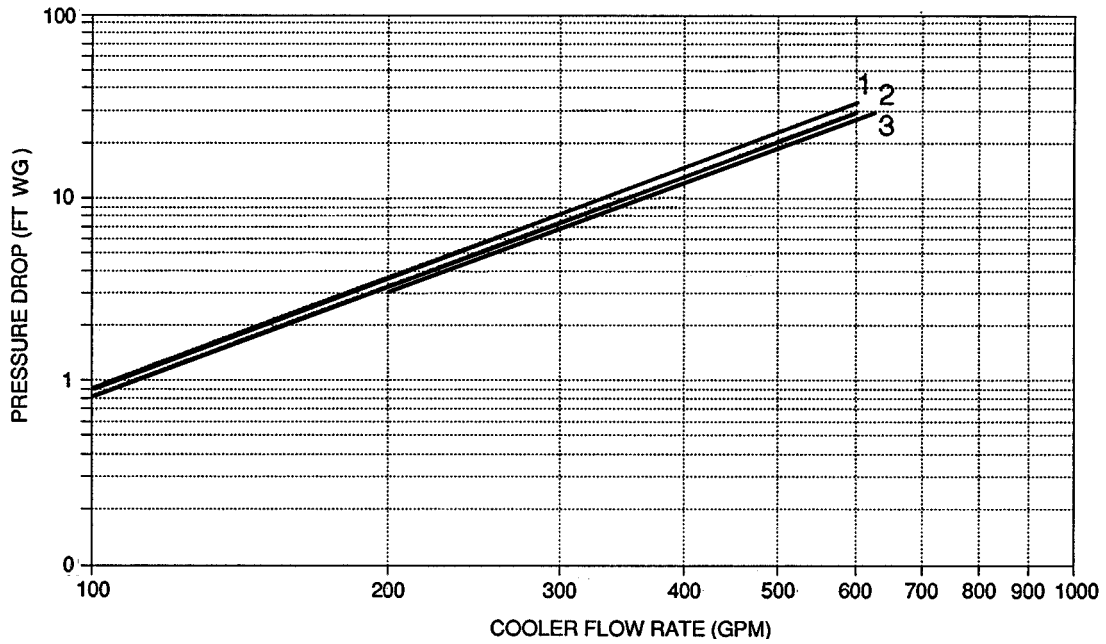
### LEGEND

- — 040
- — 045,050

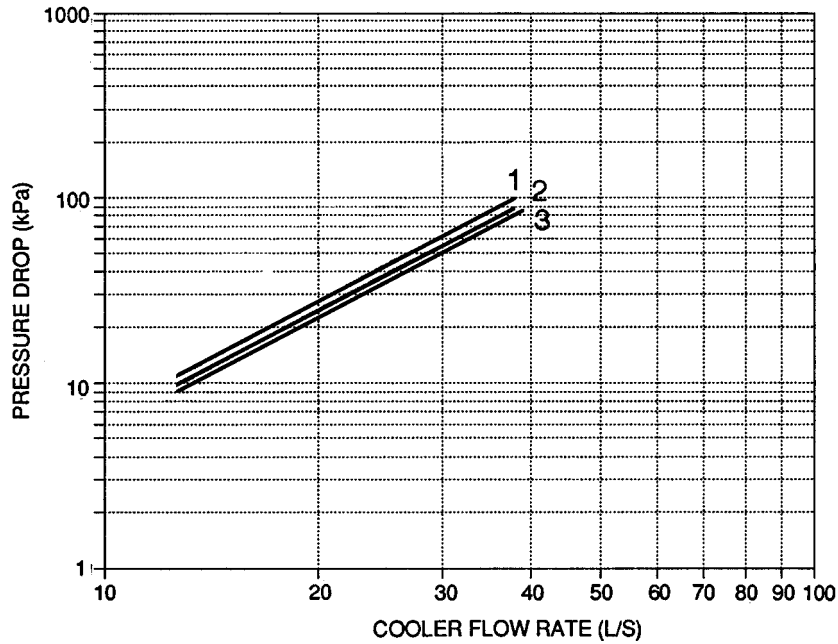
NOTE: Ft of water = 2.31 x change in psig.



**COOLER FLUID PRESSURE DROP CURVES — 30GN,GT130-210  
ENGLISH**



**SI**



- COOLER PRESSURE DROP KEY**
- 1 — 30GN,GT130,150
  - 2 — 30GN,GT170,190
  - 3 — 30GN,GT210

NOTE: Ft of water =2.31 x change in psig.

# Selection procedure — English (60 Hz) (with 30GT example)



NOTE: The Carrier electronic catalog provides quick, easy computer selection of Carrier chillers. The 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 35) 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 — 95 F and 45 F, respectively.

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 30GT110. 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.

$$\text{Water flow} = \frac{24 \times \text{corr cap. in tons}}{\text{temperature rise } ^\circ\text{F}} = \text{U.S. gpm}$$

$$= \frac{24 \times 110.4}{14} = 189.3 \text{ U.S. gpm}$$

## V Calculate the cooler pressure drop.

Enter cooler pressure drop curve (page 32) at the corrected flow rate (189.3 U.S. gpm) and read, for the 30GT110, a pressure drop of 7.0 ft of water.

## VI Check loop volume and cooler water flow rate.

Minimum loop volume, from application data, is 323 gal. for 30GT110. Therefore, given volume of 350 gal. is satisfactory. Minimum water flow rate, from application data, is 73 gpm for 30GT110. Flow rate of 189.3 gpm is well above minimum required.

# Selection procedure — SI (60 Hz) (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 35) 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 — 35 C and 6 C, respectively.

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 30GT110. 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.

$$\text{Water flow} = \frac{0.239 \times \text{corr cap. in kW}}{\text{temperature rise } ^\circ\text{C}} = \text{L/s}$$

$$= \frac{0.239 \times 371.8}{7.8} = 11.4 \text{ L/s}$$

## V Calculate cooler pressure drop.

Enter cooler pressure drop curve (page 32) at corrected flow rate (11.4 L/s) and read, for 30GT110, a pressure drop of 17.5 kPa.

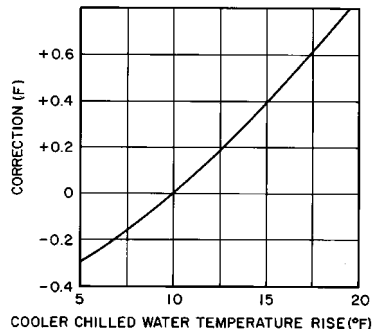
## VI Check loop volume and cooler water flow rate.

Minimum loop volume, from application data, is 1222 L for 30GT110. Therefore, given volume of 1300 L is satisfactory. Minimum water flow rate, from application data, is 4.6 L/s for 30GT110. Flow rate of 11.4 L/s is well above minimum required.

# Selection procedure — English and SI

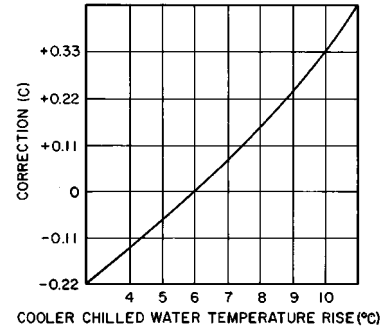


**LCWT CORRECTION (ENGLISH)**



Above 10 F, ADD correction to design LCWT.  
Below 10 F, SUBTRACT.

**LCWT CORRECTION (SI)**



Above 6 C, ADD correction to design LCWT.  
Below 6 C, SUBTRACT.

LCWT — Leaving Chilled Water Temperature

## Performance data

**STANDARD RATINGS\* — REFRIGERANT 22, 60 Hz**

UNIT SIZE 30GN,GT	CAPACITY		COMPRESSOR POWER INPUT (kW)	FAN POWER (kW)	COOLER WATER PRESSURE DROP (ft water)	ENERGY EFFICIENCY RATIO (EER)	COEFFICIENT OF PERFORMANCE (COP)
	Tons	Btuh					
040	35.9	430,800	38.5	6.2	8.2	9.6	2.82
045	41.6	499,200	46.5	6.2	11.5	9.5	2.77
050	50.4	604,800	56.0	6.2	16.5	9.7	2.84
060	63.3	759,600	70.9	9.3	17.0	9.5	2.77
070	72.5	870,000	82.4	9.3	22.0	9.5	2.78
080	81.9	982,800	93.6	9.4	16.9	9.5	2.79
090	87.4	1,048,800	98.4	9.5	19.2	9.7	2.85
100	99.6	1,195,200	107.9	12.7	15.2	9.9	2.90
110	107.6	1,291,200	123.0	12.8	17.6	9.5	2.79
130	121.4	1,456,800	137.3	15.5	6.6	9.5	2.78
150	140.2	1,682,400	161.6	15.5	8.7	9.5	2.78
170	157.2	1,945,200	181.0	15.5	11.8	9.5	2.81
190	172.4	2,116,800	199.2	18.6	14.1	9.5	2.86
210	201.0	2,419,200	235.3	18.6	15.0	9.5	2.78

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

\*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 ft<sup>2</sup> · hr · °F/Btu (.000044 m<sup>2</sup> · °C/W) cooler fouling allowance.

# Performance data (cont)



## STANDARD RATINGS — REFRIGERANT 22, 50 Hz

UNIT SIZE 30GN,GT	CAPACITY		COMPRESSOR POWER INPUT (kW)	FAN POWER (kW)	COOLER WATER PRESSURE DROP (ft water)	ENERGY EFFICIENCY RATIO (EER)	COEFFICIENT OF PERFORMANCE (COP)
	Tons	Btuh					
040	35.0	420,000	37.8	6.2	5.3	9.54	2.79
045	41.9	502,800	47.6	6.2	8.4	9.34	2.73
050	51.1	613,200	59.4	6.2	12.3	9.35	2.74
060	60.2	722,400	68.9	9.3	11.2	9.24	2.71
070	70.1	841,200	77.8	9.3	15.0	9.67	2.83
080	81.0	972,000	92.9	9.4	11.3	9.50	2.83
090	90.6	1,087,200	105.6	9.4	14.0	9.45	2.77
100	100.2	1,202,400	112.8	12.7	9.5	9.58	2.81
110	111.0	1,332,000	134.0	12.7	11.6	9.07	2.66
130	123.5	1,482,000	140.6	15.5	6.8	9.50	2.78
150	144.6	1,735,200	175.3	15.4	9.4	9.10	2.66
170	158.3	1,899,600	186.6	15.4	11.9	9.40	2.75
190	179.6	2,155,200	213.2	18.5	15.3	9.30	2.72
210	201.0	2,412,000	238.1	18.6	14.6	9.40	2.75

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

NOTE: 95 F (35 C) condenser entering-air temperature; 54 F (12 C) entering/44 F (6.7 C) leaving cooler water; .00025 ft<sup>2</sup> · hr · °F/Btu (.000044 m<sup>2</sup> · °C/W) cooler fouling allowance.

## PART LOAD DATA, 60 Hz UNITS PERCENT DISPLACEMENT — SEQUENCE A

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

## PERCENT DISPLACEMENT — SEQUENCE B\*

CAPACITY STEPS	30GT SIZE													
	040	045	050	060	070	080	090	100	110	130	150	170	190	210
1	25	38	35	38	33	29	18	15	14	14	17	11	14	14
2	50	58	52	57	50	52	35	31	29	29	19	22	27	26
3	75	60	67	67	83	63	44	39	36	36	33	28	43	44
4	100	81	83	81	100	78	53	46	43	43	43	33	59	56
5	—	100	84	100	—	89	71	65	68	64	58	44	79	74
6	—	—	100	—	—	100	80	73	75	72	67	50	100	86
7	—	—	—	—	—	—	91	92	93	93	75	61	—	100
8	—	—	—	—	—	—	100	100	100	100	83	67	—	—
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 standard 30GN unit has the same steps, but additional steps are available when accessory unloaders are used.
2. Accessory hot gas bypass and accessory unloaders (where available on sizes larger than 070) are not considered. Contact your local Carrier representative for details.



**PART LOAD DATA, 50 Hz UNITS**  
**PERCENT DISPLACEMENT — SEQUENCE A**

CAPACITY STEPS	30GT SIZE													
	040	045	050	060	070	080	090	100	110	130	150	170	190	210
1	21	32	29	33	19	16	14	13	17	10	13	10	17	10
2	42	78	43	50	29	42	29	26	33	21	27	24	33	26
3	79	84	86	83	62	54	36	33	42	29	33	29	50	37
4	100	100	100	100	71	62	43	40	50	34	40	39	67	52
5	—	—	—	—	90	92	68	63	67	47	53	43	83	68
6	—	—	—	—	100	100	75	70	75	58	60	53	100	84
7	—	—	—	—	—	—	93	93	92	77	73	57	—	100
8	—	—	—	—	—	—	100	100	100	82	80	62	—	—
9	—	—	—	—	—	—	—	—	—	95	93	76	—	—
10	—	—	—	—	—	—	—	—	—	100	100	81	—	—
11	—	—	—	—	—	—	—	—	—	—	—	95	—	—
12	—	—	—	—	—	—	—	—	—	—	—	100	—	—

**PERCENT DISPLACEMENT — SEQUENCE B\***

CAPACITY STEPS	30GT SIZE													
	040	045	050	060	070	080	090	100	110	130	150	170	190	210
1	38	35	38	33	19	25	14	13	17	10	13	10	17	16
2	58	52	57	50	29	42	29	26	33	21	27	24	33	26
3	60	67	67	83	47	50	36	33	42	29	33	34	50	42
4	81	83	81	100	48	62	43	40	50	34	40	38	67	52
5	100	84	100	—	58	92	68	63	67	47	53	43	83	68
6	—	100	—	—	61	100	75	70	75	58	60	48	100	84
7	—	—	—	—	71	—	93	93	92	77	73	57	—	100
8	—	—	—	—	90	—	100	100	100	82	80	62	—	—
9	—	—	—	—	100	—	—	—	—	95	93	76	—	—
10	—	—	—	—	—	—	—	—	—	100	100	81	—	—
11	—	—	—	—	—	—	—	—	—	—	—	95	—	—
12	—	—	—	—	—	—	—	—	—	—	—	100	—	—

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

**NOTES:**

1. The standard 30GN unit has the same steps, but additional steps are available when accessory unloaders are used.
2. Accessory hot gas bypass and accessory unloaders (where available on sizes larger than 070) are not considered. Contact your local Carrier representative for details.

**Part Load Efficiency Data**

Carrier's reciprocating chiller selection program 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 percent capacity or the actual capacity step. Contact your local Carrier representative for details.



## COOLING CAPACITIES, 60 Hz

UNIT SIZE 30GN,GT	LCWT (F)	CONDENSER ENTERING-AIR TEMPERATURE (F)														
		85			95			105			115			125		
		Cap. (Tons)	Input kW	Cooler Flow Rate (Gpm)	Cap. (Tons)	Input kW	Cooler Flow Rate (Gpm)	Cap. (Tons)	Input kW	Cooler Flow Rate (Gpm)	Cap. (Tons)	Input kW	Cooler Flow Rate (Gpm)	Cap. (Tons)	Input kW	Cooler Flow Rate (Gpm)
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	—	—	—	
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	—	—	—	
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	121.4	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	—	—	—	

Ratings per ARI (Air Conditioning and Refrigeration Institute, U.S.A.) Standard 590-92.

### LEGEND

- Cap. — Cooling Capacity Tons of Refrigeration
- Input kW — Compressor Power Input
- LCWT — Leaving Chilled Water Temperature (F)

### NOTES:

1. Ratings apply to units with electronic or thermostatic expansion valves.
2. All ratings are in accordance with ARI Standard 590-92, based on:
  - a. 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.
  - b. A fouling factor of 0.00025 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 (tons) and power input (kW) to compressor at its rated voltage.
  - b. Calculate corrected flow rate through the cooler:
 
$$= \frac{24 \times \text{capacity in tons}}{\text{temperature rise } ^\circ\text{F}} = \text{U.S. gpm}$$
  - c. Enter cooler pressure drop curve (pages 32 and 33) at corrected flow rate and read pressure drop.
4. 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, 50 Hz (cont)**

UNIT SIZE 30GN,GT	LCWT (F)	CONDENSER ENTERING-AIR TEMPERATURE (F)														
		85			95			105			115			125		
		Cap. (Tons)	Input kW	Cooler Flow Rate (Gpm)	Cap. (Tons)	Input kW	Cooler Flow Rate (Gpm)	Cap. (Tons)	Input kW	Cooler Flow Rate (Gpm)	Cap. (Tons)	Input kW	Cooler Flow Rate (Gpm)	Cap. (Tons)	Input kW	Cooler Flow Rate (Gpm)
040	48	38.9	36.2	93.5	37.1	38.9	89.0	35.2	41.6	84.6	33.3	44.1	79.9	31.3	46.4	75.2
045		47.6	46.6	114.3	45.0	49.5	107.9	42.3	52.2	101.4	39.5	54.6	94.9	36.8	56.8	88.3
050		57.7	58.2	138.4	54.7	61.7	131.4	51.8	64.9	124.2	48.8	67.8	117.0	45.7	70.5	109.7
060		68.0	67.6	163.2	64.5	71.6	154.9	61.1	75.3	146.6	57.6	78.8	138.3	54.1	82.0	129.9
070		79.3	75.9	190.4	75.1	80.8	180.3	71.0	85.4	170.3	66.8	89.7	160.3	62.6	93.7	150.1
080		91.8	81.5	220.2	86.9	86.4	208.6	82.0	90.8	196.9	77.2	95.1	185.4	72.4	99.0	173.7
090		102.7	103.9	246.6	97.2	110.1	233.2	91.6	115.8	219.7	85.9	121.1	206.2	80.2	125.9	192.5
100		114.1	111.1	273.8	107.9	117.7	259.0	101.9	123.9	244.5	95.7	129.7	229.8	89.6	135.0	215.1
110		125.5	133.1	301.3	119.2	140.1	286.2	113.0	146.6	271.1	106.6	152.7	255.8	100.2	158.4	240.5
130		136.8	136.2	328.2	130.0	144.6	312.1	123.1	152.5	295.5	116.3	160.0	279.0	109.2	166.8	262.1
150		159.0	170.8	381.5	151.7	180.4	364.1	144.5	189.6	346.8	137.1	198.3	329.1	—	—	—
170		176.2	182.8	422.8	167.4	193.0	401.7	158.4	202.6	380.2	149.4	211.4	358.5	140.2	219.6	336.4
190	199.2	209.4	478.0	189.8	220.6	455.5	180.3	231.2	432.7	170.7	241.2	409.6	—	—	—	
210	228.1	237.4	547.5	216.1	249.3	518.6	204.0	260.4	489.6	192.1	270.9	460.9	—	—	—	
040	50	40.1	36.7	96.2	38.2	39.5	91.7	36.3	42.2	87.2	34.3	44.8	82.5	32.3	47.2	77.6
045		49.3	47.5	118.4	46.6	50.5	111.8	43.8	53.3	105.2	41.0	55.8	98.5	38.2	58.1	91.8
050		59.6	59.3	143.1	56.6	62.9	135.9	53.6	66.2	128.6	50.5	69.3	121.3	47.4	72.1	113.8
060		70.3	68.8	168.8	66.8	73.0	160.3	63.2	76.8	151.8	59.7	80.4	143.2	56.1	83.8	134.7
070		82.1	77.3	197.1	77.7	82.3	186.7	73.4	87.0	176.4	69.2	91.5	166.2	64.9	95.6	155.8
080		94.9	83.1	227.8	90.0	88.1	216.1	85.0	92.8	204.2	80.0	97.1	192.1	75.1	101.2	180.3
090		106.3	106.0	255.2	100.6	112.3	241.5	94.8	118.3	227.7	89.1	123.8	213.8	83.3	128.8	199.9
100		118.2	113.4	283.9	112.0	120.2	268.9	105.7	126.6	253.8	99.5	132.6	238.8	93.2	138.2	223.8
110		130.0	136.0	312.2	123.5	143.2	296.6	117.1	150.0	281.1	110.6	156.3	265.5	104.0	162.2	249.7
130		140.2	138.0	336.6	133.4	146.7	320.2	126.4	154.8	303.6	119.3	162.4	286.5	112.2	169.5	269.4
150		162.7	173.2	390.7	155.4	183.0	373.1	148.0	192.4	355.2	140.5	201.3	337.4	—	—	—
170		180.9	185.7	434.4	172.0	196.3	412.9	162.9	206.1	391.1	153.7	215.3	369.0	—	—	—
190	204.5	212.8	490.9	194.9	224.3	468.1	185.2	235.2	444.7	175.5	245.5	421.5	—	—	—	
210	236.2	242.7	567.0	223.8	255.0	537.4	211.5	266.6	507.8	199.1	277.3	478.1	—	—	—	
040	60	45.8	39.2	110.3	43.8	42.3	105.4	41.6	45.3	100.1	38.8	47.8	93.4	35.7	49.8	85.8
045		56.7	51.3	136.5	53.1	54.3	127.8	49.5	57.1	119.1	45.9	59.5	110.5	42.4	61.7	101.9
050		69.5	64.6	167.2	65.4	68.2	157.2	61.2	71.4	147.3	57.1	74.4	137.3	53.0	77.0	127.4
060		79.9	73.7	192.2	75.2	77.9	180.9	70.6	81.7	169.8	66.0	85.1	158.7	61.4	88.2	147.7
070		95.1	83.6	228.9	90.2	89.1	216.9	84.2	93.8	202.5	78.4	98.0	188.5	72.6	101.9	174.6
080		106.6	89.0	256.4	100.1	93.9	240.8	93.7	98.4	225.3	87.3	102.4	210.1	81.0	106.1	195.0
090		122.0	114.8	293.5	114.2	121.1	274.8	106.6	126.7	256.3	98.9	131.8	238.0	—	—	—
100		138.3	123.8	332.7	129.7	130.7	312.1	121.3	137.0	291.8	113.0	142.8	271.7	104.7	148.0	251.9
110		153.6	150.9	369.5	145.6	158.7	350.3	136.4	165.1	328.0	127.4	171.0	306.5	118.6	176.4	285.2
130		157.9	147.3	379.9	150.6	157.0	362.3	143.2	166.3	344.4	135.5	175.0	326.0	—	—	—
150		182.0	185.3	437.9	174.2	196.3	419.0	166.3	206.8	400.0	157.6	216.3	379.1	—	—	—
170		205.7	201.0	494.8	196.0	213.0	471.5	185.6	223.6	446.5	173.0	232.0	415.2	—	—	—
190	232.0	230.3	558.1	221.6	243.3	533.0	211.2	255.8	507.9	200.6	267.7	482.5	—	—	—	
210	267.8	263.2	644.3	251.9	275.2	606.0	236.2	286.2	568.1	—	—	—	—	—	—	

**LEGEND**

- Cap. — Cooling Capacity Tons of Refrigeration
- Input kW — Compressor Power Input
- LCWT — Leaving Chilled Water Temperature (F)

**NOTES:**

1. Ratings apply to units with electronic or thermostatic expansion valves.
2. All ratings are in accordance with ARI (Air Conditioning and Refrigeration Institute, U.S.A.) Standard 590-92, based on:
  - a. 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.
  - b. A fouling factor of 0.00025 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 (tons) and power input (kW) to compressor at its rated voltage.
  - b. Calculate corrected flow rate through the cooler:
 
$$= \frac{24 \times \text{capacity in tons}}{\text{temperature rise } ^\circ\text{F}} = \text{U.S. gpm}$$
  - c. On Cooler Pressure Drop chart (pages 32 and 33), enter cooler pressure drop curve at corrected flow rate and read pressure drop.
4. When chilled 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 — 60 Hz

UNIT SIZE 30GN,GT	LCWT (C)	CONDENSER ENTERING-AIR TEMPERATURE (C)														
		30			35			40			45			50		
		Cap. (kW)	Input kW	Cooler Flow Rate (L/s)	Cap. (kW)	Input kW	Cooler Flow Rate (L/s)	Cap. (kW)	Input kW	Cooler Flow Rate (L/s)	Cap. (kW)	Input kW	Cooler Flow Rate (L/s)	Cap. (kW)	Input kW	Cooler Flow Rate (L/s)
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	
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	
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	

### LEGEND

- Cap. — Cooling Capacity kW of Refrigeration
- Input kW — Compressor Power Input
- LCWT — Leaving Chilled Water Temperature (C)

### NOTES:

1. Ratings apply to units with electronic or thermostatic expansion valves.
2. All ratings are in accordance with ARI (Air Conditioning and Refrigeration Institute, U.S.A.) Standard 590-92, 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 .000044 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 (pages 32 and 33) 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.



# Performance data — SI (cont)



## COOLING CAPACITIES — 50 Hz

UNIT SIZE 30GN,GT	LCWT (C)	CONDENSER ENTERING-AIR TEMPERATURE (C)														
		30			35			40			45			50		
		Cap. (kW)	Input kW	Cooler Flow Rate (L/s)	Cap. (kW)	Input kW	Cooler Flow Rate (L/s)	Cap. (kW)	Input kW	Cooler Flow Rate (L/s)	Cap. (kW)	Input kW	Cooler Flow Rate (L/s)	Cap. (kW)	Input kW	Cooler Flow Rate (L/s)
040	4	119.7	34.2	5.1	114.2	36.4	4.9	108.6	38.5	4.7	102.9	40.4	4.4	97.1	42.3	4.2
045		142.4	43.1	6.1	134.7	45.3	5.8	126.9	47.3	5.4	119.1	49.1	5.1	111.3	50.8	4.8
050		173.5	54.0	7.4	165.0	56.6	7.1	156.4	59.0	6.7	147.8	61.2	6.3	139.1	63.2	6.0
060		204.1	62.6	8.8	194.3	65.7	8.3	184.5	68.5	7.9	174.7	71.2	7.5	164.9	73.7	7.1
070		238.2	70.6	10.2	226.1	74.3	9.7	214.1	77.8	9.2	202.1	81.1	8.7	190.1	84.1	8.2
080		274.7	75.2	11.8	260.7	78.9	11.2	247.0	82.3	10.6	233.3	85.5	10.0	219.6	88.5	9.4
090		307.8	95.7	13.2	291.8	100.4	12.5	275.7	104.7	11.8	259.8	108.7	11.2	243.7	112.3	10.5
100		338.4	102.1	14.5	321.3	107.1	13.8	304.0	111.8	13.0	286.9	116.2	12.3	269.8	120.2	11.6
110		374.5	121.6	16.1	356.6	126.9	15.3	338.7	131.9	14.5	320.8	136.5	13.8	302.7	140.8	13.0
130		427.6	129.0	18.4	407.7	135.8	17.5	387.4	142.1	16.6	367.1	148.0	15.8	346.7	153.4	14.9
150		500.5	161.4	21.5	479.2	169.2	20.6	457.7	176.5	19.6	435.9	183.5	18.7	413.7	190.0	17.8
170		545.7	171.0	23.4	519.8	179.1	22.3	493.7	186.6	21.2	467.2	193.5	20.1	440.4	199.8	18.9
190	618.1	195.7	26.5	591.0	204.7	25.4	563.6	213.2	24.2	535.6	221.2	23.0	507.4	228.7	21.8	
210	680.9	216.0	29.2	646.6	225.2	27.8	612.5	233.7	26.3	578.4	241.6	24.8	544.1	248.8	23.4	
040	5	123.1	34.7	5.3	117.5	36.9	5.0	111.8	39.0	4.8	106.0	41.1	4.6	100.1	43.0	4.3
045		147.2	43.9	6.3	139.3	46.2	6.0	131.4	48.3	5.6	123.4	50.2	5.3	115.4	51.9	5.0
050		179.1	54.9	7.7	170.4	57.6	7.3	161.7	60.1	6.9	152.9	62.5	6.6	144.0	64.6	6.2
060		210.8	63.7	9.1	200.8	66.9	8.6	190.7	69.8	8.2	180.7	72.6	7.8	170.6	75.1	7.3
070		245.9	71.7	10.6	233.6	75.6	10.0	221.4	79.3	9.5	209.1	82.7	9.0	196.9	85.8	8.5
080		283.8	76.6	12.2	269.7	80.4	11.6	255.5	84.0	11.0	241.5	87.3	10.4	227.5	90.4	9.8
090		318.1	97.5	13.7	301.6	102.3	13.0	285.2	106.8	12.3	268.8	111.0	11.5	252.5	114.8	10.8
100		350.4	104.0	15.1	332.6	109.2	14.3	314.9	114.1	13.5	297.5	118.7	12.8	279.9	122.9	12.0
110		387.4	124.1	16.6	369.0	129.6	15.9	350.6	134.7	15.1	332.3	139.5	14.3	313.9	144.0	13.5
130		437.8	130.7	18.8	417.6	137.5	17.9	397.1	144.1	17.1	376.3	150.1	16.2	355.6	155.7	15.3
150		511.7	163.5	22.0	490.1	171.5	21.1	468.3	179.0	20.1	446.2	186.1	19.2	423.9	192.9	18.2
170		559.8	173.6	24.1	533.5	181.9	22.9	506.9	189.6	21.8	480.0	196.8	20.6	452.8	203.3	19.5
190	633.6	198.6	27.2	605.9	207.9	26.0	578.5	216.6	24.9	550.2	224.9	23.6	521.5	232.6	22.4	
210	704.0	220.5	30.2	669.0	230.0	28.7	634.1	238.8	27.2	599.2	247.1	25.7	564.3	254.7	24.2	
040	6	126.4	35.1	5.4	120.7	37.4	5.2	115.0	39.6	4.9	109.2	41.7	4.7	103.2	43.7	4.4
045		152.1	44.7	6.5	144.0	47.0	6.2	136.0	49.2	5.8	127.8	51.2	5.5	119.7	53.0	5.1
050		184.8	55.8	7.9	176.0	58.7	7.6	167.1	61.3	7.2	158.1	63.7	6.8	149.0	65.9	6.4
060		217.6	64.8	9.4	207.3	68.1	8.9	197.0	71.1	8.5	186.7	74.0	8.0	176.4	76.6	7.6
070		253.9	72.9	10.9	241.4	76.9	10.4	228.8	80.7	9.8	216.3	84.2	9.3	203.8	87.5	8.8
080		292.9	78.0	12.6	278.7	81.9	12.0	264.3	85.6	11.4	249.8	89.0	10.7	235.5	92.3	10.1
090		328.5	99.3	14.1	311.8	104.3	13.4	294.9	108.9	12.7	278.1	113.3	12.0	261.3	117.2	11.2
100		362.5	106.0	15.6	344.5	111.4	14.8	326.4	116.4	14.0	308.3	121.2	13.3	290.3	125.6	12.5
110		400.4	126.6	17.2	381.7	132.3	16.4	362.9	137.6	15.6	344.1	142.6	14.8	325.1	147.2	14.0
130		448.1	132.3	19.3	427.6	139.4	18.4	406.8	146.0	17.5	385.9	152.3	16.6	364.6	158.0	15.7
150		523.1	165.6	22.5	501.1	173.7	21.5	479.0	181.5	20.6	456.6	188.8	19.6	434.0	195.8	18.7
170		574.1	176.2	24.7	547.4	184.7	23.5	520.4	192.7	22.4	493.1	200.1	21.2	465.4	206.9	20.0
190	649.7	201.7	27.9	621.2	211.0	26.7	592.8	220.0	25.5	564.6	228.5	24.3	535.8	236.6	23.0	
210	727.3	225.0	31.3	691.9	234.9	29.7	656.1	244.0	28.2	620.4	252.6	26.7	584.6	260.5	25.1	

### LEGEND

- Cap. — Cooling Capacity kW of Refrigeration
- Input kW — Compressor Power Input
- LCWT — Leaving Chilled Water Temperature (C)

### NOTES:

1. Ratings apply to units with electronic or thermostatic expansion valves.
2. All ratings are in accordance with ARI (Air Conditioning and Refrigeration Institute, U.S.A.) Standard 590-92, 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 .000044 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. On Cooler Pressure Drop chart (pages 32 and 33), enter cooler pressure drop curve 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.



## UNIT ELECTRICAL DATA — 30GN,GT040-070

UNIT SIZE 30GN,GT	VOLTAGE			STANDARD CONDENSER FAN								HIGH STATIC CONDENSER FAN							
				MCA		MOCP		Rec Fuse Size		ICF		MCA		MOCP		Rec Fuse Size		ICF	
	Nameplate V-Hz (3 phase)	Supplied*		XL	PW	XL	PW	XL	PW	XL	PW	XL	PW	XL	PW	XL	PW	XL	PW
		Min	Max																
040	208/230-60	187	253	174.6	174.6	225	225	200	200	434.7	296.7	211.2	211.2	250	250	250	250	471.3	333.3
	460-60	414	506	100.0	100.0	100	100	100	100	218.6	148.3	114.2	114.2	125	125	125	110	232.2	162.5
	575-60	518	633	100.0	100.0	100	100	90	90	162.4	113.7	107.2	107.2	125	125	100	100	169.6	120.9
	380-60	342	418	100.0	100.0	125	100	110	100	241.2	163.9	114.0	114.0	125	125	125	125	255.2	177.9
	346-50	325	380	107.0	107.0	150	150	125	125	297.9	198.9	124.2	124.2	150	150	125	125	315.1	216.1
380/415-50	342	440	101.1	101.4	125	125	125	125	269.6	179.3	118.3	118.6	150	150	150	150	150	286.8	196.5
045	208/230-60	187	253	201.8	201.8	250	250	225	225	535.7	357.7	238.4	238.4	300	300	300	300	572.3	394.3
	460-60	414	506	100.1	100.4	125	125	125	125	268.6	178.3	114.3	114.3	150	150	150	150	282.8	192.5
	575-60	518	633	100.0	100.0	125	100	100	100	206.4	139.8	107.2	107.2	125	125	110	100	213.6	147.0
	380-60	342	418	107.1	105.0	150	150	125	125	297.2	196.9	121.1	118.0	150	150	150	150	311.2	210.9
	346-50	325	380	129.8	129.8	175	175	150	150	342.5	230.5	147.0	147.0	200	200	150	150	359.7	247.7
380/415-50	342	440	114.1	117.8	150	150	150	150	335.6	208.9	131.3	135.0	175	175	150	150	150	352.8	226.1
050	208/230-60	187	253	244.5	244.5	350	350	300	300	617.5	415.5	281.1	281.1	350	350	350	350	654.1	452.1
	460-60	414	506	113.1	116.8	150	150	125	150	307.6	207.9	128.3	131.0	175	175	150	150	321.8	222.1
	575-60	518	633	100.6	100.0	125	100	125	100	226.1	152.9	108.0	107.2	125	125	125	125	233.3	160.1
	380-60	342	418	126.9	127.8	175	175	150	150	341.1	228.5	140.9	141.8	175	175	175	175	355.1	242.5
	346-50	325	380	170.8	170.8	250	250	200	200	453.4	300.4	188.0	188.0	250	250	175	175	470.6	317.6
380/415-50	342	440	140.6	145.6	200	200	175	175	403.8	267.7	157.8	162.8	225	225	175	175	421.0	284.9	
060	208/230-60	187	253	323.3	323.3	450	450	400	400	823.6	547.6	378.3	378.3	500	500	450	450	878.6	602.6
	460-60	414	506	139.6	144.6	200	200	175	175	408.2	272.1	161.0	166.0	225	225	200	200	429.6	293.5
	575-60	518	633	125.4	121.0	175	150	150	150	336.8	218.7	136.2	131.8	175	175	175	175	347.6	229.5
	380-60	342	418	174.5	176.6	250	250	200	200	458.0	306.2	195.5	197.6	250	250	225	225	479.0	327.2
	346-50	325	380	205.3	205.3	250	250	250	250	487.9	334.9	231.1	231.1	300	300	225	225	513.7	360.7
380/415-50	342	440	165.2	170.8	225	225	200	200	428.4	292.9	191.0	196.6	250	250	225	225	454.2	318.7	
070	208/230-60	187	253	364.3	364.3	500	500	450	450	864.6	588.6	475.5	475.5	600	600	500	500	919.6	643.6
	460-60	414	506	163.6	169.2	225	225	200	200	426.8	291.3	196.0	190.4	250	250	225	225	448.2	312.7
	575-60	518	633	148.9	141.5	200	175	175	175	353.5	239.2	159.7	152.3	200	200	175	175	364.3	250.0
	380-60	342	418	200.7	202.3	250	250	225	225	484.2	331.9	221.7	223.3	300	300	250	250	505.2	352.9
	346-50	325	380	215.6	215.6	250	250	250	250	498.2	345.2	241.4	241.4	300	300	225	225	524.0	371.0
380/415-50	342	440	187.0	192.7	250	250	225	225	450.2	314.8	212.8	218.5	275	275	250	250	455.2	340.6	

### LEGEND

- CCN — Carrier Comfort Network
- 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
- Rec Fuse Size — Recommended dual element fuse amps: 150% of largest compressor RLA plus 100% of sum of remaining compressor RLAs. Size up to the next larger standard fuse size.
- 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%.  
 †Wherever across-the-line and part-wind data differs, the higher value of the two is listed.

### NOTES:

1. All units have single point primary power connection. Main power must be supplied from a field-supplied disconnect.
2. The unit control circuit power (115 v, single-phase for 208/230-, 460-, and 575-v units; 230 v, single-phase for all other voltages) must be supplied from a separate source, through a field-supplied disconnect. 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 or LOCAL/ENABLE-STOP-CCN circuit switch is turned to OFF or STOP position.

4. Units have the following power wiring terminal blocks and parallel conductors:

30GN,GT UNIT SIZE	VOLTAGE	TERMINAL BLOCKS	PARALLEL CONDUCTORS
040-070	208/230	1	3 (040,045),6 (050-070)
	460	1	3
	575	1	3
	380	1	3
	346	1	3
080-110	380/415	1	3
	208/230	1	6
	460	1	3
	575	1	3
	380	1	3
130-210	346	1	3
	380/415	1	3
	208/230	3	9
	460	2	6
	575	2	6
080-110	380	2	6
	230	3	9
	346	2	6
	380/415	2	6

5. Maximum incoming wire size for each terminal block is 500 kcmil.
6. Power draw of control circuits includes both crankcase heaters (where used) and cooler heaters. Each compressor has a crankcase heater which draws 180 watts of power.

Units ordered with cooler heater option have 4 (040-050), 6 (060,070), or 8 (080-210) cooler heaters, 210 w each, and 30GT units also have a 120-w circuit board heater.



208/230 v  
460 v  
575 v



208/230 v  
460 v



**UNIT ELECTRICAL DATA — 30GN,GT080-210**

UNIT SIZE	VOLTAGE			STANDARD CONDENSER FAN						HIGH-STATIC CONDENSER FAN					
	Nameplate V-Hz (3 Phase)	Supplied*		MCA	MOCP	Rec Fuse Size		ICF		MCA	MOCP	Rec Fuse Size		ICF	
		Min	Max			XL	PW	XL	PW			XL	PW	XL	PW
080	208/230-60	187	253	398.5	500	450	450	896.9	620.9	446.5	500	500	500	951.9	675.9
	460-60	414	506	185.8†	250	200	225	442.8	305.4	204.7	250	225	225	464.2	326.8
	575-60	518	633	160.9	200	200	175	365.6	246.9	171.8	225	200	200	376.4	257.7
	380-60	342	418	209.9	250	250	250	492.6	339.5	230.9	300	250	300	513.6	360.5
	346-50	325	380	250.1	300	275	275	532.8	379.8	276.0	350	250	300	558.6	405.6
380/415-50	342	440	218.5†	250	250	250	472.0	292.9	234.6	250	300	300	497.8	257.7	
090	208/230-60	187	253	397.4	450	450	450	722.3	547.9	447.0	500	500	500	780.9	602.9
	460-60	414	506	198.0†	225	225	225	361.2	273.5	217.0	250	225	250	382.6	294.9
	575-60	518	633	168.0	200	200	175	286.2	213.2	178.6	200	200	200	297.0	230.4
	380-60	342	418	205.9	250	225	225	396.0	294.5	226.9	250	250	250	417.0	315.5
	346-50	325	380	269.3	300	275	275	552.0	399.0	295.2	350	300	300	577.8	424.8
380/415-50	342	440	244.1†	300	250	250	497.0	363.5	267.2	300	300	300	522.8	389.3	
100	208/230-60	187	253	470.1	500	500	500	835.2	633.2	535.6	600	600	600	908.6	706.6
	460-60	414	506	224.8†	250	250	250	408.8	312.3	242.9	250	300	300	437.4	336.4
	575-60	518	633	191.1	225	225	200	289.4	233.1	205.5	225	200	200	331.0	261.0
	380-60	342	418	242.1	250	300	300	454.8	342.8	268.6	300	300	300	482.8	370.8
	346-50	325	380	303.8	350	350	350	586.5	433.5	366.3	400	350	350	648.9	495.9
380/415-50	342	440	270.2†	300	300	300	521.6	388.7	292.8	350	350	350	556.0	418.0	
110	208/230-60	187	253	521.4	600	600	600	1019.2	743.2	587.2	700	600	700	1092.6	816.6
	460-60	414	506	248.9†	300	250	300	500.8	367.3	273.8	300	300	300	529.4	395.9
	575-60	518	633	212.0	250	225	200	416.6	292.1	208.8	250	200	225	394.6	306.5
	380-60	342	418	274.1	350	300	300	556.8	403.8	302.2	350	300	350	585.2	431.8
	346-50	325	380	373.0	450	400	400	655.7	502.7	407.5	450	350	400	690.1	537.1
380/415-50	342	440	316.4†	350	350	350	565.2	434.7	344.9	400	350	400	599.6	467.6	
130	208/230-60	187	253	610.2	700	700	700	1111.1	835.1	701.8	800	800	800	1202.7	926.7
	460-60	414	506	271.8†	300	300	300	534.1	397.0	303.8	350	350	350	567.0	429.0
	575-60	518	633	245.9	300	300	300	350.5	318.5	263.9	300	300	300	368.5	336.5
	380-60	342	418	331.1	400	400	400	612.8	460.8	366.1	400	400	400	647.8	495.8
	230-50	207	253	559.1	600	600	600	969.5	751.5	617.1	700	700	700	1027.5	809.5
346-50	325	380	382.9	450	400	400	682.6	522.6	425.9	500	450	450	725.6	565.6	
380/415-50	342	440	338.6†	350	350	350	583.0	463.7	377.6†	400	400	400	622.0	502.7	
150	208/230-60	187	253	664.2	800	800	800	1165.1	889.1	755.8	800	800	800	1256.7	980.7
	460-60	414	506	312.9	350	350	350	576.1	438.1	334.9	400	400	400	608.1	470.1
	575-60	518	633	272.3	300	300	300	440.9	344.9	290.3	350	350	350	458.9	362.9
	380-60	342	418	359.9	400	400	400	641.6	489.6	394.9	450	450	450	676.6	524.6
	230-50	207	253	629.4	700	700	700	1039.8	821.8	629.4	700	800	800	1039.8	879.8
346-50	325	380	465.1	500	450	450	764.8	604.8	508.1	600	500	500	807.8	647.8	
380/415-50	342	440	377.9	400	400	400	641.0	503.0	416.9	450	450	450	680.0	542.0	
170	208/230-60	187	253	727.5	800	800	800	1098.9	896.9	819.1	1000	1000	1000	1190.5	988.5
	460-60	414	506	323.6	350	350	350	518.0	417.0	355.5	400	400	400	550.0	449.0
	575-60	518	633	294.6	300	350	350	418.5	348.5	312.6	350	350	350	436.5	366.5
	380-60	342	418	387.8	400	450	450	598.0	486.0	422.8	450	450	450	633.0	521.0
	230-50	207	253	677.7	700	800	800	1088.1	870.1	735.7	800	800	800	1146.1	928.1
346-50	325	380	472.1	500	500	500	771.8	611.8	515.1	600	600	600	814.8	654.8	
380/415-50	342	440	387.3	450	450	450	650.4	512.4	426.3	450	450	450	689.4	551.4	
190	208/230-60	187	253	800.0	800	1000	1000	1301.5	1025.5	910.6	1000	1000	1000	1411.5	1135.5
	460-60	414	506	368.2	400	400	400	631.4	493.4	406.2	450	450	450	669.4	531.4
	575-60	518	633	325.9	350	350	350	494.5	398.5	347.5	400	400	400	516.1	420.1
	380-60	342	418	432.5	500	450	450	714.2	562.2	474.5	500	500	500	756.2	604.2
	230-50	207	253	749.9	800	800	800	1160.3	942.3	819.5	700	1000	1000	1229.9	1011.9
346-50	325	380	554.1	600	600	600	853.8	693.8	605.7	1000	700	700	905.4	745.4	
380/415-50	342	440	515.7	500	500	500	669.4	575.3	497.0	500	600	600	760.1	622.1	
210	208/230-60	187	253	890.4	1000	1000	1000	1391.3	1115.3	1000.0	1000	1200	1200	1501.3	1225.3
	460-60	414	506	413.1	450	450	450	676.3	538.3	451.1	500	500	500	714.3	576.3
	575-60	518	633	362.5	400	400	400	531.1	435.1	384.1	400	400	400	552.7	456.7
	380-60	342	418	479.3	500	500	500	761.0	609.0	521.3	600	600	600	803.0	651.0
	230-50	207	253	796.2	800	800	800	1206.6	988.3	865.8	1000	800	800	1276.2	1058.2
346-50	325	380	567.5	600	600	600	867.2	707.2	619.1	700	700	700	918.8	758.8	
380/415-50	342	440	474.5	500	500	500	737.6	599.6	521.3	600	600	600	784.4	646.4	

See legend and notes on page 46.



## CONTROL CIRCUIT

UNIT POWER SUPPLY (V-Ph-Hz)	CONTROL POWER			AMPS					
	V-Ph-Hz	Min	Max	040-070 Units		080-110 Units		130-210 Units	
				With Cooler Heater	Without Cooler Heater	With Cooler Heater	Without Cooler Heater	With Cooler Heater	Without Cooler Heater
203/230-3-60	115-1-60	104	127	30	30	30	30	30	30
460-3-60	115-1-60	104	127	30	30	30	30	30	30
575-3-60	115-1-60	104	127	30	30	30	30	30	30
380-3-60	230-1-60	207	254	15	5	15	5	15	10
346-3-50	230-1-50	198	254	15	5	15	5	15	10
230-3-50	230-1-50	198	254	—	—	—	—	15	10
380/415-3-50	230-1-50	198	254	15	5	15	5	15	10

See legend and notes on page 46.

## COMPRESSOR ELECTRICAL DATA

UNIT 30GN,GT	NAMEPLATE VOLTAGE V-Hz (3 Phase)	COMPRESSOR NUMBERS													
		A1		A2		A3		A4		B1		B2		B3	
		RLA	LRA	RLA	LRA	RLA	LRA	RLA	LRA	RLA	LRA	RLA	LRA	RLA	LRA
040	208/230-60	67.9	345							67.9	345				
	460-60	34.6	173							34.6	173				
	575-60	28.8	120	—	—	—	—	—	—	28.8	120	—	—	—	—
	380-60	34.6	191							34.6	191				
	346-50	33.3	191							44.9	247				
380/415-50	34.6	173							43.6	223					
040-PW	208/230-60	67.9	207							67.9	207				
	460-60	33.3	104							33.3	104				
	575-60	28.2	72	—	—	—	—	—	—	28.2	72	—	—	—	—
	380-60	33.3	115							33.3	115				
	346-50	33.3	115							44.9	148				
380/415-50	33.3	104							44.9	134					
045	208/230-60	67.9	345							89.7	446				
	460-60	34.6	173							43.6	223				
	575-60	28.8	120	—	—	—	—	—	—	36.5	164	—	—	—	—
	380-60	34.6	191							45.5	247				
	346-50	44.9	247							53.8	280				
380/415-50	43.6	223							46.8	280					
045-PW	208/230-60	67.9	207							89.7	268				
	460-60	33.3	104							44.9	134				
	575-60	28.2	72	—	—	—	—	—	—	33.3	98	—	—	—	—
	380-60	33.3	115							44.9	148				
	346-50	44.9	148							53.8	168				
380/415-50	44.9	134							48.7	152					
050	208/230-60	89.7	446							106.4	506				
	460-60	43.6	223							46.8	253				
	575-60	36.5	164	—	—	—	—	—	—	40.4	176	—	—	—	—
	380-60	45.5	247							52.6	280				
	346-50	53.8	280							79.5	382				
380/415-50	46.8	280							65.4	345					
050-PW	208/230-60	89.7	268							106.4	304				
	460-60	44.9	134							48.7	152				
	575-60	33.3	98	—	—	—	—	—	—	33.3	106	—	—	—	—
	380-60	44.9	148							53.8	168				
	346-50	53.8	168							79.5	229				
380/415-50	48.7	152							67.9	207					
060	208/230-60	106.4	506							147.7	690				
	460-60	46.8	253							65.4	345				
	575-60	40.4	176	—	—	—	—	—	—	57.1	276	—	—	—	—
	380-60	52.6	280							78.8	382				
	346-50	79.5	382							79.5	382				
380/415-50	65.4	345							67.9	345					
060-PW	208/230-60	106.4	304							147.4	414				
	460-60	48.7	152							65.4	207				
	575-60	33.3	106	—	—	—	—	—	—	57.1	165	—	—	—	—
	380-60	53.8	168							78.8	229				
	346-50	79.5	229							79.5	229				
380/415-50	67.9	207							65.4	207					
070	208/230-60	147.4	690	—	—	—	—	—	—	147.4	690	—	—	—	—
	460-60	65.4	345	—	—	—	—	—	—	65.4	345	—	—	—	—
	575-60	57.1	276	—	—	—	—	—	—	57.1	276	—	—	—	—
	380-60	78.8	382							78.8	382				
	346-50	44.9	247							79.5	382				
380/415-50	43.6	223	44.9	247	43.6	223			65.4	345					
070-PW	208/230-60	147.4	414	—	—	—	—	—	—	147.4	414	—	—	—	—
	460-60	67.9	207	—	—	—	—	—	—	67.9	207	—	—	—	—
	575-60	53.8	165	—	—	—	—	—	—	53.8	165	—	—	—	—
	380-60	79.5	229							79.5	229				
	346-50	44.9	148							79.5	229				
380/415-50	44.9	134	44.9	247	44.9	223			67.9	207					

See legend and notes on page 46.





**COMPRESSOR ELECTRICAL DATA (cont)**

UNIT 30GN,GT	NAMEPLATE V-Hz (3 Phase)	COMPRESSOR NUMBERS							
		A1		A2		B1		B2	
		RLA	LRA	RLA	LRA	RLA	LRA	RLA	LRA
080	208/230-60	106.4	506	67.9	345	147.7	690		
	460-60	46.8	253	34.6	173	65.4	345		
	575-60	40.4	176	28.8	120	57.1	276	—	—
	380-60	52.6	280	34.6	191	78.8	382		
	346-50	44.9	247	79.5	382	79.5	382		
	380/415-50	43.6	223	65.4	345	65.4	345		
080-PW	208/230-60	106.4	304	67.9	207	147.4	414		
	460-60	48.7	152	33.3	104	67.9	207		
	575-60	33.3	106	28.2	72	53.8	165	—	—
	380-60	53.8	168	33.3	115	79.5	229		
	346-50	44.9	148	79.5	229	79.5	229		
	380/415-50	44.9	134	67.9	207	67.9	207		
090	208/230-60	89.7	446	67.9	345	89.7	446	89.7	446
	460-60	43.6	223	34.6	173	43.6	223	43.6	223
	575-60	36.5	164	28.8	120	36.5	164	36.5	164
	380-60	45.5	247	34.6	191	45.5	247	45.5	247
	346-50	44.9	247	79.5	382	44.9	247	53.8	280
	380/415-50	43.6	223	65.4	345	43.6	223	46.8	280
090-PW	208/230-60	89.7	268	67.9	207	89.7	268	89.7	268
	460-60	44.9	134	33.3	104	44.9	134	44.9	134
	575-60	33.3	98	28.2	72	33.3	98	33.3	98
	380-60	44.9	148	33.3	115	44.9	148	44.9	148
	346-50	44.9	148	79.5	229	44.9	148	53.8	168
	380/415-50	43.6	134	67.9	207	44.9	134	48.7	152
100	208/230-60	89.7	446	106.4	506	89.7	446	106.4	506
	460-60	43.6	223	46.8	253	43.6	223	46.8	253
	575-60	36.5	164	40.4	176	36.5	164	40.4	176
	380-60	45.5	247	52.6	280	45.5	247	52.6	280
	346-50	44.9	247	79.5	382	44.9	247	79.5	382
	380/415-50	43.6	223	65.4	345	43.6	223	65.4	345
100-PW	208/230-60	89.7	268	106.4	304	89.7	268	106.4	304
	460-60	44.9	134	48.7	152	44.9	134	48.7	152
	575-60	33.3	98	33.3	106	33.3	98	33.3	106
	380-60	44.9	148	53.8	168	44.9	148	53.8	168
	346-50	44.9	148	79.5	229	44.9	148	79.5	229
	380/415-50	44.9	134	67.9	207	44.9	134	67.9	207
110	208/230-60	89.7	446	147.4	690	89.7	446	106.4	506
	460-60	43.6	223	65.4	345	43.6	223	46.8	253
	575-60	36.5	164	57.1	276	36.5	164	40.4	176
	380-60	45.5	247	78.8	382	45.5	247	52.6	280
	346-50	79.5	382	79.5	229	79.5	382	79.5	382
	380/415-50	65.4	345	65.4	207	65.4	345	65.4	345
110-PW	208/230-60	89.7	268	147.4	414	89.7	268	106.4	304
	460-60	44.9	134	67.9	207	44.9	134	48.7	152
	575-60	33.3	98	53.8	165	33.3	98	33.3	106
	380-60	44.9	148	79.5	229	44.9	148	53.8	168
	346-50	79.5	229	79.5	229	79.5	229	79.5	229
	380/415-50	67.9	207	67.9	207	67.9	207	67.9	207

See legend and notes on page 46.

# Electrical data (cont)



## COMPRESSOR ELECTRICAL DATA (cont)

UNIT 30GN,GT	NAMEPLATE V-Hz (3 Phase)	COMPRESSOR NUMBERS													
		A1		A2		A3		A4		B1		B2		B3	
		RLA	LRA	RLA	LRA	RLA	LRA	RLA	LRA	RLA	LRA	RLA	LRA	RLA	LRA
130	208/230-60	107.7	506	151.3	690	—	—	—	—	107.7	506	151.3	690	—	—
	460-60	46.8	253	64.5	345	—	—	—	—	46.8	253	65.4	345	—	—
	575-60	41.7	176	57.1	176	—	—	—	—	41.7	176	57.1	176	—	—
	380-60	55.8	280	80.2	382	—	—	—	—	55.8	280	80.2	382	—	—
	346-50	46.8	259	55.8	294	55.8	294	80.2	400	80.2	400	80.2	400	—	—
	230-50	77.0	342	87.9	366	87.9	366	107.7	545	107.7	545	107.7	545	—	—
	380/415-50	44.9	223	46.8	253	46.8	253	65.5	345	65.5	345	65.5	345	—	—
130-PW	208/230-60	107.7	304	151.3	414	—	—	—	—	107.7	304	151.3	414	—	—
	460-60	46.8	152	65.4	207	—	—	—	—	46.8	152	65.4	207	—	—
	575-60	41.7	106	57.1	144	—	—	—	—	41.7	106	57.1	144	—	—
	380-60	55.8	168	80.2	230	—	—	—	—	55.8	168	80.2	230	—	—
	346-50	46.8	155	55.8	155	55.8	155	80.2	240	80.2	240	80.2	240	—	—
	230-50	77.0	206	87.9	220	87.9	220	107.7	327	107.7	327	107.7	327	—	—
	380/415-50	44.9	134	65.5	207	46.8	152	65.5	207	65.5	207	65.5	207	—	—
150	208/230-60	89.8	446	89.8	446	89.8	446	—	—	151.3	690	151.3	690	—	—
	460-60	44.9	223	44.9	223	44.9	223	—	—	65.4	345	65.4	345	—	—
	575-60	36.6	164	36.6	164	36.6	164	—	—	57.1	240	57.1	240	—	—
	380-60	46.8	247	46.8	247	46.8	247	—	—	80.2	382	80.2	382	—	—
	346-50	80.2	400	80.2	400	80.2	400	—	—	80.2	400	80.2	400	—	—
	230-50	107.7	545	107.7	545	107.7	545	—	—	107.7	545	107.7	545	—	—
	380/415-50	65.5	345	65.5	345	65.5	345	—	—	65.5	345	65.5	345	—	—
150-PW	208/230-60	89.8	268	89.8	268	89.8	268	—	—	151.3	414	151.3	414	—	—
	460-60	44.9	134	44.9	134	44.9	134	—	—	65.4	207	65.4	207	—	—
	575-60	36.6	99	36.6	99	36.6	99	—	—	57.1	144	57.1	144	—	—
	380-60	46.8	149	46.8	149	46.8	149	—	—	80.2	230	80.2	230	—	—
	346-50	80.2	240	80.2	240	80.2	240	—	—	80.2	240	80.2	240	—	—
	230-50	107.7	268	107.7	268	107.7	268	—	—	107.7	327	107.7	327	—	—
	380/415-50	65.5	207	65.5	207	65.5	207	—	—	65.5	207	65.5	207	—	—
170	208/230-60	107.7	506	107.7	506	107.7	506	—	—	107.7	506	107.7	506	107.7	506
	460-60	46.8	253	46.8	253	46.8	253	—	—	46.8	253	46.8	253	46.8	253
	575-60	41.7	176	41.7	176	41.7	176	—	—	41.7	176	41.7	176	41.7	176
	380-60	55.8	280	55.8	280	55.8	280	—	—	55.8	280	55.8	280	55.8	280
	346-50	55.8	294	55.8	294	80.2	400	—	—	55.8	294	80.2	400	80.2	400
	230-50	87.9	366	87.9	366	107.7	545	—	—	87.9	366	107.7	545	107.7	545
	380/415-50	46.8	253	46.8	253	65.5	345	—	—	46.8	253	65.5	345	65.5	345
170-PW	208/230-60	107.7	304	107.7	304	107.7	304	—	—	107.7	304	107.7	304	107.7	304
	460-60	46.8	152	46.8	152	46.8	152	—	—	46.8	152	46.8	152	46.8	152
	575-60	41.7	106	41.7	106	41.7	106	—	—	41.7	106	41.7	106	41.7	106
	380-60	55.8	168	55.8	168	55.8	168	—	—	55.8	168	55.8	168	55.8	168
	346-50	55.8	177	55.8	177	80.2	240	—	—	55.8	177	80.2	240	80.2	240
	230-50	87.9	220	87.9	220	107.7	327	—	—	87.9	220	107.7	327	107.7	327
	380/415-50	46.8	152	46.8	152	65.5	207	—	—	46.8	152	65.5	207	65.5	207
190	208/230-60	89.8	446	107.7	506	151.3	690	—	—	89.8	446	107.7	506	151.3	690
	460-60	44.9	223	46.8	253	65.4	345	—	—	44.9	223	46.8	253	65.4	345
	575-60	36.6	164	41.7	176	57.1	240	—	—	36.6	164	41.7	176	57.1	240
	380-60	46.8	247	55.8	280	80.2	382	—	—	46.8	247	55.8	280	80.2	382
	346-50	80.2	400	80.2	400	80.2	400	—	—	80.2	400	80.2	400	80.2	400
	230-50	107.7	545	107.7	545	107.7	545	—	—	107.7	545	107.7	545	107.7	545
	380/415-50	65.5	345	65.5	345	65.5	345	—	—	65.5	345	65.5	345	65.5	345
190-PW	208/230-60	89.8	268	107.7	304	151.3	414	—	—	89.8	268	107.7	304	151.3	414
	460-60	44.9	134	46.8	152	65.4	207	—	—	44.9	134	46.8	152	65.4	207
	575-60	36.6	99	41.7	106	57.1	144	—	—	36.6	99	41.7	106	57.1	144
	380-60	46.8	149	55.8	168	80.2	230	—	—	46.8	149	55.8	168	80.2	230
	346-50	80.2	240	80.2	240	80.2	240	—	—	80.2	240	80.2	240	80.2	240
	230-50	107.7	327	107.7	327	107.7	327	—	—	107.7	327	107.7	327	107.7	327
	380/415-50	65.5	207	65.5	207	65.5	207	—	—	65.5	207	65.5	207	65.5	207
210	208/230-60	89.8	446	89.8	446	89.8	446	107.7	506	107.7	506	151.3	690	151.3	690
	460-60	44.9	223	44.9	223	44.9	223	46.8	253	46.8	253	65.4	345	65.4	345
	575-60	36.6	164	36.6	164	36.6	164	41.7	176	41.7	176	57.1	240	57.1	240
	380-60	46.8	247	46.8	247	46.8	247	55.8	280	55.8	280	80.2	382	80.2	382
	346-50	46.8	259	46.8	259	80.2	400	80.2	400	80.2	400	80.2	400	80.2	400
	230-50	77.0	342	77.0	342	107.7	545	107.7	545	107.7	545	107.7	545	107.7	545
	380/415-50	44.9	223	44.9	223	65.5	345	65.5	345	65.5	345	65.5	345	65.5	345
210-PW	208/230-60	89.8	268	89.8	268	89.8	268	107.7	304	107.7	304	151.3	414	151.3	414
	460-60	44.9	134	44.9	134	44.9	134	46.8	152	46.8	152	65.4	207	65.4	207
	575-60	36.6	99	36.6	99	36.6	99	41.7	106	41.7	106	57.1	144	57.1	144
	380-60	46.8	149	46.8	149	46.8	149	55.8	168	55.8	168	80.2	230	80.2	230
	346-50	46.8	155	46.8	155	80.2	240	80.2	240	80.2	240	80.2	240	80.2	240
	230-50	77.0	206	77.0	206	107.7	327	107.7	327	107.7	327	107.7	327	107.7	327
	380/415-50	44.9	134	44.9	134	65.5	207	65.5	207	65.5	207	65.5	207	65.5	207

See legend and notes on page 46.



**CONDENSER FAN ELECTRICAL DATA**

UNIT 30GN,GT	NAMEPLATE VOLTAGE V-Hz (3 Phase)	STANDARD CONDENSER FANS					HIGH-STATIC CONDENSER FANS				
		Total Quantity	Hp	kW	(Quantity) FLA (ea)	(Quantity) LRA (ea)	Total Quantity	Hp	kW	(Quantity) FLA (ea)	(Quantity) LRA (ea)
040	208/230-60	4	1	0.746	(2) 6.6, (2) 5.5	(2) 31.6, (2) 30.0	4	5	3.73	(4) 14.6	(4) 41.6
	460-60				(2) 3.3, (2) 2.8	(2) 31.6, (2) 30.0				(4) 6.3	(4) 41.6
	575-60				(4) 3.4	(4) 30.0				(4) 5.2	(4) 42.0
	380-60				(4) 3.9	(4) 20.9				(4) 7.4	(4) 54.0
	346-50				(4) 4.4	(4) 20.9				(4) 8.7	(4) 53.0
380/415-50	(4) 3.4	(4) 30.0	(4) 7.3	(4) 41.0							
045	208/230-60	4	1	0.746	(2) 6.6, (2) 5.5	(2) 31.6, (2) 30.0	4	5	3.73	(4) 14.6	(4) 41.6
	460-60				(2) 3.3, (2) 2.8	(2) 31.6, (2) 30.0				(4) 6.3	(4) 41.6
	575-60				(4) 3.4	(4) 30.0				(4) 5.2	(4) 42.0
	380-60				(4) 3.9	(4) 20.9				(4) 7.4	(4) 54.0
	346-50				(4) 4.4	(4) 20.9				(4) 8.7	(4) 53.0
380/415-50	(4) 3.4	(4) 30.0	(4) 7.3	(4) 41.0							
050	208/230-60	4	1	0.746	(2) 6.6, (2) 5.5	(2) 31.6, (2) 30.0	4	5	3.73	(4) 14.6	(4) 41.6
	460-60				(2) 3.3, (2) 2.8	(2) 31.6, (2) 30.0				(4) 6.3	(4) 41.6
	575-60				(4) 3.4	(4) 30.0				(4) 5.2	(4) 42.0
	380-60				(4) 3.9	(4) 20.9				(4) 7.4	(4) 54.0
	346-50				(4) 4.4	(4) 20.9				(4) 8.7	(4) 53.0
380/415-50	(4) 3.4	(4) 30.0	(4) 7.3	(4) 41.0							
060	208/230-60	6	1	0.746	(4) 6.6, (2) 5.5	(4) 31.6, (2) 30.0	6	5	3.73	(6) 14.6	(6) 41.6
	460-60				(4) 3.3, (2) 2.8	(4) 31.6, (2) 30.0				(6) 6.3	(6) 41.6
	575-60				(6) 3.4	(6) 30.0				(6) 5.2	(6) 42.0
	380-60				(6) 3.9	(6) 20.9				(6) 7.4	(6) 54.0
	346-50				(6) 4.4	(6) 20.9				(6) 8.7	(6) 53.0
380/415-50	(6) 3.4	(6) 30.0	(6) 7.3	(6) 41.0							
070	208/230-60	6	1	0.746	(4) 6.6, (2) 5.5	(4) 31.6, (2) 30.0	6	5	3.73	(6) 14.6	(6) 41.6
	460-60				(4) 3.3, (2) 2.8	(4) 31.6, (2) 30.0				(6) 6.3	(6) 41.6
	575-60				(6) 3.4	(6) 30.0				(6) 5.2	(6) 42.0
	380-60				(6) 3.9	(6) 20.9				(6) 7.4	(6) 54.0
	346-50				(6) 4.4	(6) 20.9				(6) 8.7	(6) 53.0
380/415-50	(6) 3.4	(6) 30.0	(6) 7.3	(6) 41.0							
080,090	208/230-3-60	6	1	0.746	(4) 6.6, (2) 5.5	(4) 31.6, (2) 30.0	6	5	3.73	(6) 14.6	(6) 41.6
	460-3-60				(4) 3.3, (2) 2.8	(4) 31.6, (2) 30.0				(6) 6.3	(6) 41.6
	575-3-60				(6) 3.4	(6) 30.0				(6) 5.2	(6) 42.0
	380-3-60				(6) 3.9	(6) 20.9				(6) 7.4	(6) 54.0
	346-3-50				(6) 4.4	(6) 20.9				(6) 8.7	(6) 53.0
380/415-3-50	(6) 3.4	(6) 30.0	(6) 7.3	(6) 41.0							
100,110	208/230-3-60	8	1	0.746	(6) 6.6, (2) 5.5	(6) 31.6, (2) 30.0	8	5	3.73	(8) 14.6	(8) 41.6
	460-3-60				(6) 3.3, (2) 2.8	(6) 31.6, (2) 30.0				(8) 6.3	(8) 41.6
	575-3-60				(8) 3.4	(8) 30.0				(8) 5.2	(8) 42.0
	380-3-60				(8) 3.9	(8) 20.9				(8) 7.4	(8) 54.0
	346-3-50				(8) 4.4	(8) 20.9				(8) 8.7	(8) 53.0
380/415-3-50	(8) 3.4	(8) 30.0	(8) 7.3	(8) 41.0							
130-170	208/230-3-60	10	1	0.746	(6) 6.6, (4) 5.5	(6) 31.6, (4) 30.0	10	5	3.73	(10) 14.6	(10) 41.6
	460-3-60				(6) 3.3, (4) 2.8	(6) 31.6, (4) 30.0				(10) 6.3	(10) 41.6
	575-3-60				(10) 3.4	(10) 30.0				(10) 5.2	(10) 42.0
	380-3-60				(10) 3.9	(10) 20.9				(10) 7.4	(10) 54.0
	346-3-50				(10) 4.4	(10) 20.9				(10) 8.7	(10) 53.0
230-3-50	(10) 6.4	(10) 30.3	(10) 12.2	(10) 41.6							
380/415-3-50	(10) 3.4	(10) 30.0	(10) 7.3	(10) 41.0							
190,210	208/230-3-60	12	1	0.746	(8) 6.6, (4) 5.5	(8) 31.6, (4) 30.0	12	5	3.73	(12) 14.6	(12) 41.6
	460-3-60				(8) 3.3, (4) 2.8	(8) 31.6, (4) 30.0				(12) 6.3	(12) 41.6
	575-3-60				(12) 3.4	(12) 30.0				(12) 5.2	(12) 42.0
	380-3-60				(12) 3.9	(12) 20.9				(12) 7.4	(12) 54.0
	346-3-50				(12) 4.4	(12) 20.9				(12) 8.7	(12) 53.0
230-3-50	(12) 6.4	(12) 30.3	(12) 12.2	(12) 41.6							
380/415-3-50	(12) 3.4	(12) 30.0	(12) 7.3	(12) 41.0							

See legend and notes on page 46.

## Microprocessor

A microprocessor controls overall unit operation. Its central executive routine controls a number of processes simultaneously. These include internal timers, reading inputs, analog to digital 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 position (30GT Flotronic™ units) or LOCAL/ENABLE-STOP-CCN switch to LOCAL/ENABLE or CCN position (30GN Flotronic II units). (This switch is also used to reset microprocessor should any safety device trip and also functions as circuit breaker for electronic processor and relay boards.)

On 30GN (Flotronic II) units, when the unit receives a call for cooling (either from the internal control or CCN network command), the unit stages up in capacity to maintain the cooler fluid set point. The first compressor starts 1½ to 3 minutes after the call for cooling. The lead circuit can be specifically designated or randomly selected by the controls, depending on how the unit is field configured. A field configuration is also available to determine if the unit should stage up both circuits equally or load one circuit completely before bringing on the other.

On 30GT (Flotronic) units, when the switch is closed, a 2-minute initialization routine is begun. During this time, inputs are checked, EXV and internal constants are initialized, and **20** is displayed. If display button is pushed during this period, control goes into a 42-step quick test routine normally used for a readiness check during start-up or for service.

The microprocessor controls the capacity of the chiller by cycling compressors on and off at a rate to satisfy actual dynamic load conditions. The control maintains leaving-fluid temperature set with dial on display board through intelligent cycling of compressors. Accuracy depends on loop volume, loop flow rate, load, outdoor-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-fluid temperature and leaving-fluid temperature. This is referred to as *leaving-fluid temperature control with return-fluid 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-fluid temperature. When leaving-fluid temperature is close to set point and slowly moving closer, logic prevents addition of another stage. If leaving-fluid 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 fluid temperature goes to 35 F (1.7 C) or 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 are added as long as difference between leaving-

fluid temperature and set point is greater than 4° F (2.2° C) and rate of change in leaving-fluid 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 device trips. This prevents rapid cycling and also helps return oil during short *on* periods.

Where available, two sequences are used to obtain circuit lead/lag operation and balance compressor operating hours. This requires accessory unloaders on some units. First, as unit turns on, microprocessor functions as a random number generator to determine which circuit starts first. Later, when decreasing from maximum stage, control again randomly selects 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 or LLSV (TXV units) is closed first, and compressor is run until conditions are met to terminate pumpout to remove refrigerant that was in the cooler. At start-up, if a circuit has not run in the last 15 minutes, circuit is run to remove 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 fluid temperature
- T2 Cooler entering fluid (return) temperature
- T3 Saturated condensing temperature — Circuit A
- T4 Saturated condensing temperature — Circuit B
- T5 Cooler saturation temperature — Circuit A (30GT only)
- T6 Cooler saturation temperature — Circuit B (30GT only)
- 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 1500 discrete steps. The piston is repositioned by the microprocessor every 3 seconds as required.

The EXV is used to control superheat in compressor. Two thermistors in each circuit (T5 and T7 or T6 and T8) are used to determine superheat. One thermistor (T5 or T6) is located in cooler and the other (T7 or T8) in compressor after motor in the gas passage entering the cylinders. The EXV is controlled to maintain superheat entering pistons at approximately 30 F (16 C), which results in slightly superheated refrigerant leaving cooler.



The electronic control provides for a prepurge and pump-out cycle each time the lead compressor in a circuit is started or stopped. 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 fluid temperatures, up to 95 F (35 C), without overloading compressor. Another feature that is factory set (can 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 accessory interfaces with microprocessor to control unit so that chiller's kW demand does not exceed its setting. It is activated from an external switch.

The microprocessor is programmed to accept various accessory temperature reset options (based on return-fluid temperature, outdoor-air temperature, or space temperature), that reset the LCWT. An accessory thermistor (T10) is required if outdoor-air temperature or space temperature reset is selected.

### Ground current protection

The 30GN,GT080-210 and 070 (50 Hz) units have ground current protection that shuts off compressor(s) if a 2 to 3 amp ground current is sensed by a toroid around the compressor power leads.

Ground current protection is also offered as accessory on 040-060 and 070 (60 Hz) sizes.

### 30GT Flotronic™ controls with 2-digit display/set point board

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

If display button is pressed, display shows 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 literature.

### 30GN Flotronic™ II (CCN) controls with 8-character display/set point board

An 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, 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 (30GT only) are also energized. Electronic expansion valves are closed.

**Start-up** — After control circuit switches on, prestart process takes place, then 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-fluid 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 or LLSV (TXV units) remains closed, 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 fluid.

As less cooling is required, circuits shut down (or unload) in an order that balances each circuit's compressor run time. When no further cooling is called for (in each compressor circuit), EXV or LLSV (TXV units) 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 the 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 fluid, space temperature, or outdoor-air temperature with the accessory board settings, and adjusts LCWT appropriately.

**Electronic expansion valve and condenser-fan control** — The EXV 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.) Condenser fans (operated by microprocessor) run to as low an ambient as possible to maintain a minimum EXV pressure differential.

## Abnormal conditions

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 makes appropriate decision to shut down a compressor due to a safety trip or bad sensor reading and 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 sizes 040-060; 070, 60 Hz). 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 sizes 040-070 [60 Hz]).

**Compressor anti-cycling** — This feature limits compressor cycling.

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

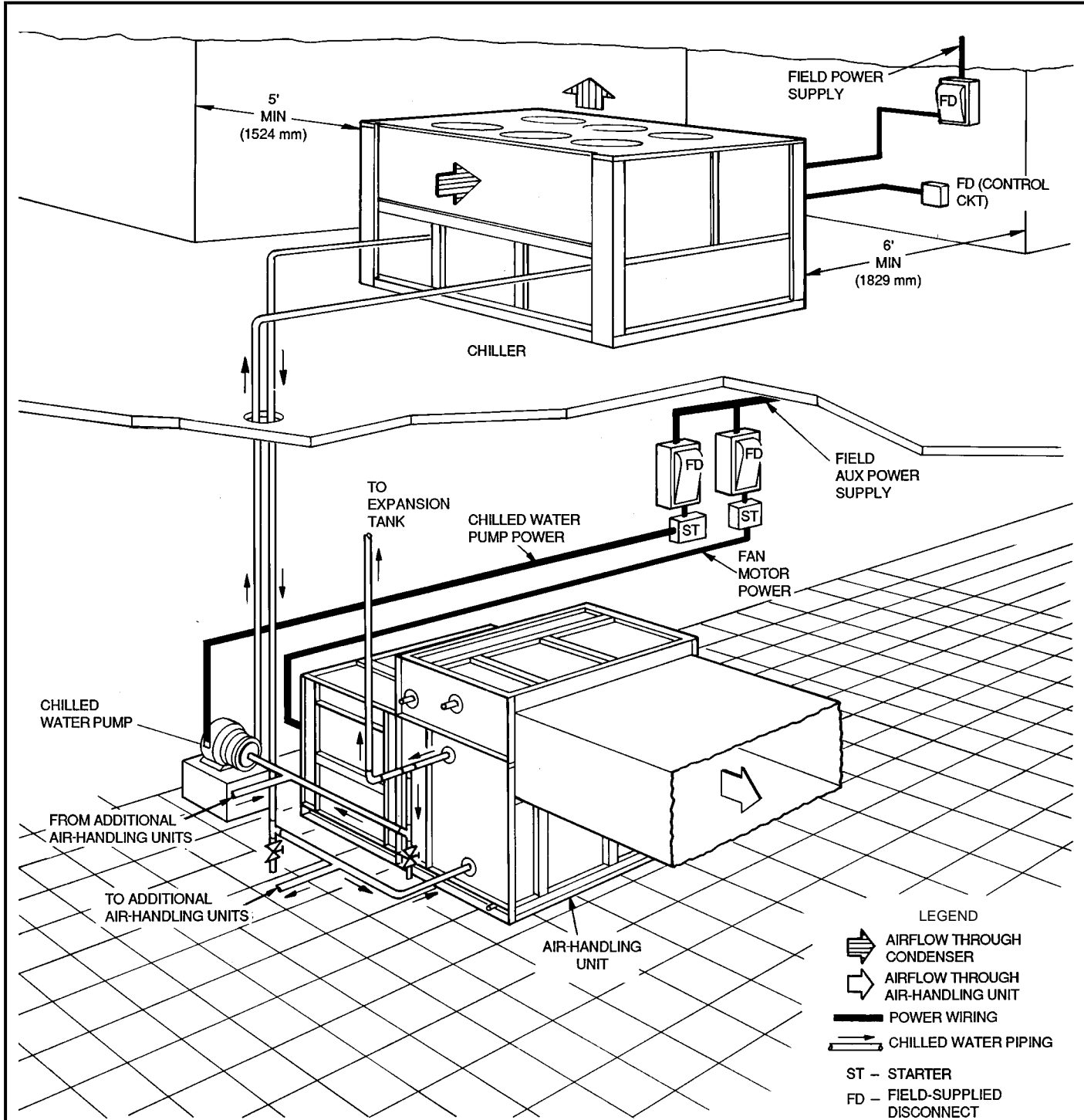
**Sensor failures** — Failures are detected by the microprocessor.

## Diagnostics

Microprocessor may be put through quick test (see Controls and Troubleshooting literature) 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).

NOTE: The STAT test function on 30GN units allows for the same function as quick test on the 30GT units.

# Typical piping and wiring



**NOTES:**

1. Chiller must be installed *levelly* 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 fluid volume. This may require the addition of a holding tank to ensure adequate volume.

## Reciprocating Air-Cooled Liquid Chiller

### HVAC Guide Specifications

Size Range: **36 to 210 Tons (127 to 740 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 long-stroke electronic expansion valves.

##### 1.02 QUALITY ASSURANCE

- A. Unit shall be rated in accordance with ARI Standard 590-92 (U.S.A.).
- B. Unit construction shall be designed to conform to ASHRAE 15 latest revision safety standard, NEC (U.S.A.), and ASME (U.S.A.) applicable codes.
- C. Unit shall have UL (U.S.A.) or CSA (Canada) approvals (60 Hz).
- D. Unit shall be manufactured in a facility registered to ISO 9002/BS5750, Part 2 (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 150 F (66 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. Cabinet shall be galvanized steel casing with a pre-painted finish.
3. Cabinet shall be capable of withstanding 500-hour salt spray test in accordance with the ASTM B-117 standard.

###### 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. Steel wire safety guards coated with PVC.
3. Statically and dynamically balanced fan blades.

###### 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 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 fluid connections.
4. Shell shall be insulated with 3/4-in. (19-mm) PVC foam (closed-cell) with a maximum K factor of 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). Cooler shall have a maximum fluid-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 switch, liquid line shutoff valves, suction and discharge shutoff valves, filter drier, moisture-indicating sight glass, stepper motor actuated electronic expansion valve (EXV) or thermostatic expansion valve (TXV), 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 (30GT).



- b. Unit controls shall be capable of performing the following functions:
    - 1) Automatic circuit lead/lag (accessory unloader required on 30GT040-070).
    - 2) Pumpout at beginning and end of every circuit cycle.
    - 3) Capacity control based on leaving chilled fluid temperature and compensated by rate of change of return-fluid temperature.
    - 4) Limiting of the chilled fluid temperature pull-down 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 fluid temperature reset from return fluid (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 (30GT) 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 fluid flow detection.
    - 3) Low chilled fluid temperature protection.
    - 4) Low and high superheat protection.
    - 5) Low control voltage (to unit) protection.
    - 6) High-pressure switch.
    - 7) Low oil protection for each compressor circuit (sizes 080-210).
    - 8) Ground current compressor protection (sizes 080-210 and 070, 50 Hz).
  - 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 fluid flow.
    - 4) Low oil pressure.
    - 5) Cooler freeze protection.
    - 6) High or low suction superheat.
    - 7) Thermistor, transducer (30GN only), or potentiometer (30GT only) malfunction.
    - 8) Entering and leaving-fluid 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. Display module, in conjunction with the microprocessor, must also be capable of displaying the output (results) of a run test. Run test shall verify operation of every switch, thermistor, potentiometer (30GT) or transducer (30GN), 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-fluid 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.
3. Fan motors are totally enclosed, air-over (TEAO) type in accordance with IP-55 (50 Hz only).

## K. Electrical Requirements:

1. Unit primary electrical power supply (3-phase) shall be connected to a single location.
2. Unit control power (single-phase) 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 with suitable corrosion inhibitor 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 with suitable corrosion inhibitor 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, copper tubes and aluminum heresite fins, copper tubes and copper heresite fins, or copper tubes and pre-coated aluminum fins.

### \* 5. Hot Gas Bypass:

Hot gas bypass allows the unit to operate at lower capacity levels than standard. Available as a factory-installed option on 30GN040 and 30GT040-070. Available as a field-installed accessory on 30GN,GT080-210.

### 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 fluid temperature.

### 10. Flow Switch:

A chilled fluid flow switch shall be field-installed for low fluid 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 and 070 (50 Hz), accessory with all other sizes.

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

Unit shall have factory-installed thermostatic expansion valves (TXV) instead of EXVs. 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. (Two-stage control is standard on 30GN units.)

### 15. Pressure Gages:

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

### 16. Temperature Reset Board (30GT unit):

Board shall allow microprocessor control to compare either return or outdoor temperature with the accessory board settings and adjust leaving-water temperature accordingly. Shall include necessary sensor. (Temperature reset is standard on 30GN units.)

- \* 17. Sound Reduction Kit:  
Unit shall be equipped with kit 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 040-060, 070 [60 Hz]; standard on sizes 070 [50 Hz], 040-070 brine units, and 080-210).
- \* 19. High-Static Fan:  
Special condenser fans, motors, and mounts shall be factory installed allowing fans to generate 0.4 in. wg (0.10 kPa) and 1 in. wg (0.25 kPa) static pressure external to the chiller at nominal condenser airflow (cfm).
- 20. Non-Fused Disconnect (380/415 v and 460 v Units):  
A non-fused electrical disconnect for main unit power shall be factory installed. Disconnect shall be thru-the-door type with locking handle (unit sizes 040-110) or mounted on central panel (unit sizes 130-210).
- 21. Convenience Outlet:  
Kit provides a 115-v, GFI female receptacle to be field mounted in control box. Receptacle shall be powered by unit control circuit.
- 22. Remote Cooler Mounting:  
Kit shall provide valves and EXV cable to permit operation of cooler from a remote location (up to 75 ft [23 m] away from base unit).
- 23. Unit Control Display Access Door:  
Kit contains door and necessary mounting hardware to permit control module access without opening or removing control box panels.
- 24. Multi-Chiller Control:  
The multi-chiller control shall be field installed, and shall sequence up to 4 circulating pumps and chillers in parallel (one pump and proof-of-flow switch per chiller). Both the leaving fluid temperature and proof-of-flow inputs shall be monitored by the control.
- 25. High-Ambient Kit:  
Field-installed kit shall contain high-ambient capacity control pressure switches, unloader coils, and all necessary hardware for installation. Kit may be required in areas where outdoor ambient temperatures are expected to be above 115 F (46.1 C) and return fluid temperatures are expected to be above 60 F (15.5 C).

