



Product Data

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

Nominal Capacity: 220 to 400 Tons
770 to 1400 kW

Quality Assurance



Certificate No FM 21837

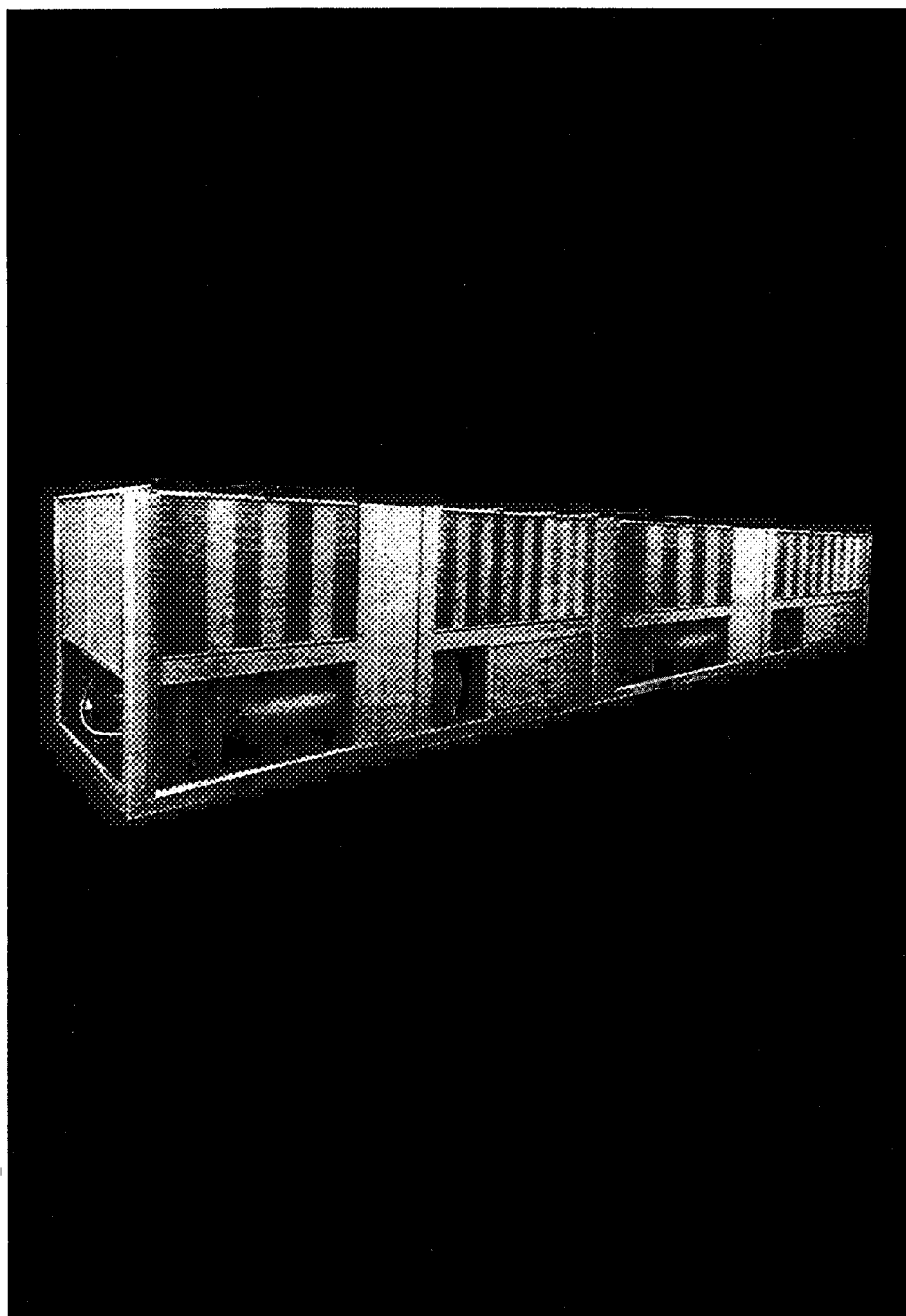
Approvals:

ISO 9002

EN 29002

BS5750 PART 2

ANSI/ASQC Q92



State of the Art Chillers with Advanced Microprocessor-Based Electronic Controls for Years of Reliability

- wide size range for every application need
- flexibility through multiple compressors and refrigerant circuits
- optimized design, strict component qualification, and diagnostics for dependability
- efficient, reliable 06E semi-hermetic compressors
- factory charged with R-22 — tested under load
- quality construction, and sturdy, protective shipping package
- Flotronic or Flotronic II controls

Features/Benefits

Quality design and construction

Model 30GN,GT 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. Units are UL (Underwriters' Laboratories) listed. 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. The chiller is packaged with woodboard coil protection and hardwood top cap. A polyolefin bag with a rust inhibitor is shrink-wrapped around the unit for increased protection against hazards of land and sea transportation, and ensures product delivery in original factory condition (export units).

Advanced technology and serviceability

The powerful 30GN,GT Flotronic chillers incorporate the latest in integrated microprocessor control and refrigeration cycle optimization devices. The electronic expansion valve (EXV) and the microprocessor controller let the chiller operate at low pressure differentials, and accurately control refrigerant superheat during start-up and load changes. The result is efficient energy usage and accurate leaving-water temperature (LWT) ($\pm 1.25^\circ\text{F}$ [0.7°C] from the LWT set point).

functions. It advances the capabilities of user-programmed time schedules of the chiller operation (7-day), standard return-water temperature reset, and real-time display of operating temperatures and pressures. Flotronic™ II (30GN) 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 or 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 option maintains a valuable record of the machine's history, complete with starts and run data, for periodic service or maintenance reference.

Service technicians find this electronic record system invaluable for the efficiency of chiller diagnosis and long-term equipment management. Ground current sensing eliminates the need for refrigerant replacement by preventing compressor motor burnouts that add acids to the refrigerant.

Ease of installation

The 30GN,GT240-420 Flotronic chillers are fully packaged systems. They arrive at the jobsite in 2 modules with a full refrigerant charge and are completely ready for installation in minimal time. The conveniently located power supply and water inlet and outlet connections assure a short and cost-efficient job installation. The handy cabinet access panels permit fast, easy inspection of interior components, which helps keep installation costs down and reliability up.

Quality and reliability

To assure long-life quality performance, every standard unit is factory run-tested

The dependable direct-drive fan motors are built to NEMA (National Electrical Manufacturing Association, U.S.A.) standards. The units are equipped with famous 06E Carrier semi-hermetic compressors, 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 (standard on Flotronic units) manages an even distribution of starts and run hours between compressors and refrigerant circuits. The superior microprocessor control package requires fewer moving control circuit parts for long-life dependability. The microprocessor controls the full refrigeration cycle (compressors, fans, and expansion valve) to assure efficient synchronized operation.

A low-oil-pressure safety switch on the lead compressor in each refrigerant circuit protects the compressor from damage due to lack of proper lubrication.

High operating efficiency

The Flotronic chillers offer outstanding EERs (Energy Efficiency Ratios). Exceptional part load performance (chillers in general operate at part load 97% of the time) provides increased operating savings through use of multiple compressors in each refrigerant circuit, and suction cut-off unloading (unloaders are standard on 130-170 modular components).

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 TXV system. In this situation, the superheat is the difference between the refrigerant temperature measured after the compressor motor and the saturated evaporating temperature.

The system-integrated subcooler provides an extra measure of unit efficiency. Additional increases in EER up to 15% may result with standard return-water temperature reset.

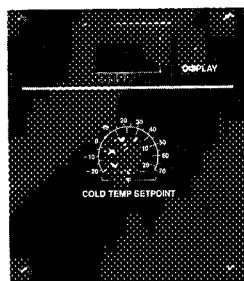
NOTE: Prove the operating savings for your building by using the Flotronic chiller operating cost analysis on your own microcomputer, available from your local Carrier representative.

Cost-saving features

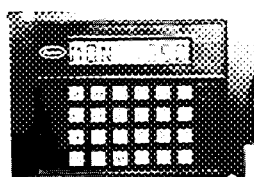
Model 30GN,GT Flotronic chillers reduce operating costs with:

- Precise multiple-step capacity control
- Operating capability at outdoor temperatures to 125 F (52 C).
- Direct-drive fan motors inherently protected and shielded by PVC-coated steel wire fan guards for weather protection
- Compressors mounted on spring-isolated steel rails 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

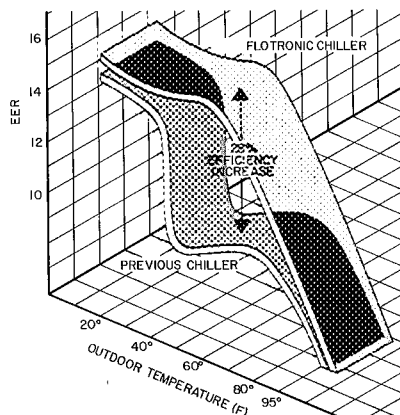
STANDARD
2-DIGIT DISPLAY



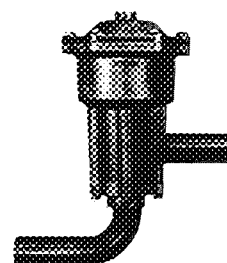
OPTIONAL 8-CHARACTER
DISPLAY



PART-LOAD EFFICIENCY 28% GAIN



ELECTRONIC
EXPANSION VALVE (EXV)



06E COMPRESSOR

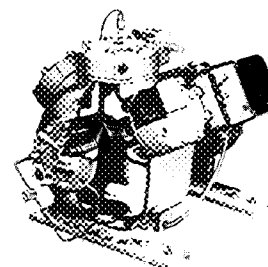
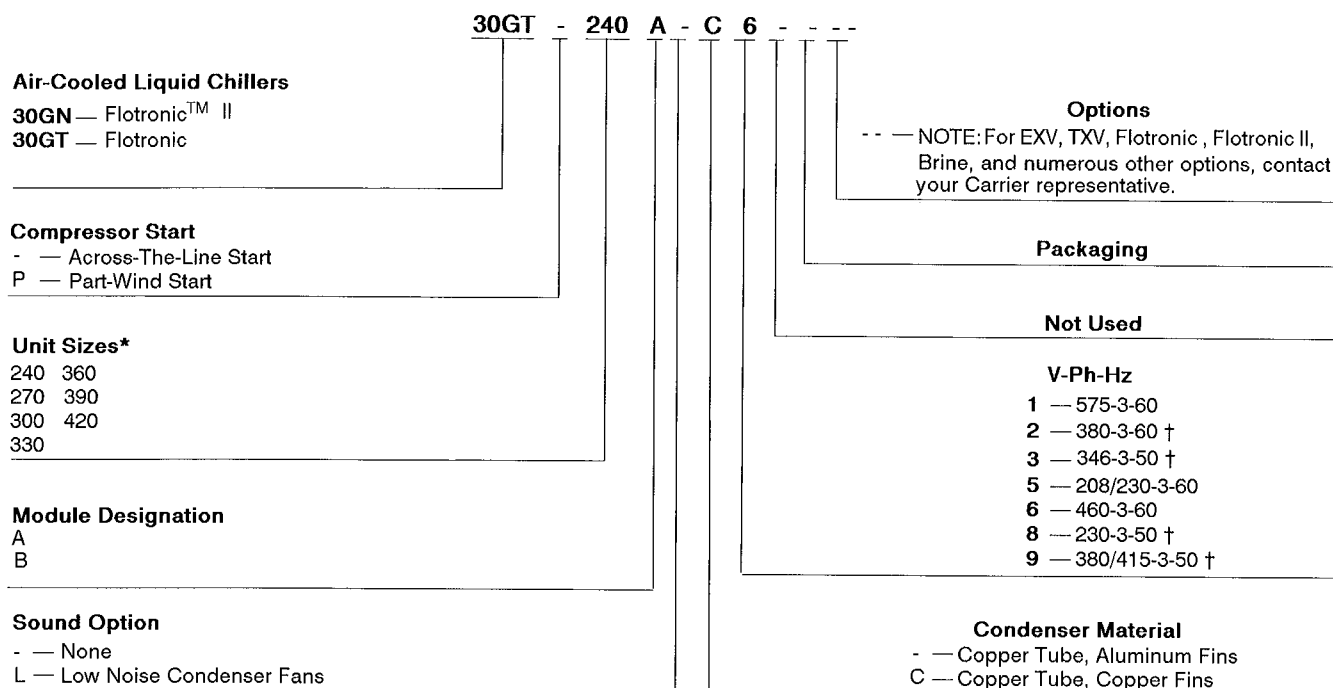


Table of contents



	Page		Page
Features/Benefits	1,2	Selection Procedure	20
Model Number Nomenclature	3	Performance Data	21-29
Physical Data	4-11	Electrical Data	30-35
Factory-Installed Options	12	Controls	36-38
Field-Installed Accessories	12	Typical Piping and Wiring	39
Base Unit Dimensions	13-15	Guide Specifications	40-43
Application Data	16-19		

Model number nomenclature



LEGEND

EXV — Electronic Expansion Valve
TXV — Thermal Expansion Valve

*Refer to Unit Sizes and Modular Combinations table below.

†Export only — not for U S domestic sale

UNIT SIZES AND MODULAR COMBINATIONS

UNIT MODEL 30GN,GT	SECTION A UNIT	SECTION B UNIT
240	30GN,GT130	30GN,GT100
270	30GN,GT170	30GN,GT100
300	30GN,GT130	30GN,GT170
330	30GN,GT170	30GN,GT170
360	30GN,GT190	30GN,GT190/30GN,GT170*
390	30GN,GT210	30GT190
420	30GN,GT210	30GT210

*60 Hz units/50 Hz units.

ENGLISH

UNIT SIZE	240			270			300			330		
	A	B	Total	A	B	Total	A	B	Total	A	B	Total
SYSTEM MODULES												
APPROX OPERATING WEIGHT — lb												
C-AL	10,046	8,610	18,656	11,293	8,610	19,903	10,046	11,293	21,339	11,293	11,293	22,586
C-C	11,318	9,560	20,878	12,565	9,560	22,125	11,318	12,565	23,883	12,565	12,565	25,130
REFRIGERANT CHARGE — lb												
R-22	133/28	98/20	—/—	153/45	98/20	—/—	133/28	153/45	—/—	153/45	153/45	—/—
Ckt A Total/Over	137/28	105/20	—/—	162/45	105/20	—/—	137/28	162/45	—/—	162/45	162/45	—/—
Ckt B Clear Glass												
COMPRESSORS, Type...rpm												
06E*	(1) 275, (1) 299	(1) 265, (1) 275	—	(3) 275	(1) 265, (1) 275	—	(1) 275, (1) 299	(3) 275	—	(3) 275	(3) 275	—
Oil Charge — Compressor/pt	275/21.0, 299/19.0	265/21.0, 275/21.0	—	275/21.0	265/21.0, 275/21.0	—	275/21.0, 299/19.0	275/21.0	—	275/21.0	275/21.0	—
Capacity Control Steps	11	11	—	17	11	—	11	17	—	17	17	—
% Cap.	50	50	50	50	50	50	50	50	50	50	50	50
Minimum Step Capacity (%)	14	15	—	11	15	—	14	11	—	11	11	—
CONDENSER FANS — Type												
Standard/Low Noise	Propeller	Propeller, Direct Drive	—	Propeller	Propeller, Direct Drive	—	Propeller	Propeller	—	Propeller	Propeller	—
Fan Speed — rpm	1140	1140	—	1140	1140	—	1140	1140	—	1140	1140	—
No. Blades...Diameter — in.	4...30	4...30	—	4...30	4...30	—	4...30	4...30	—	4...30	4...30	—
No. Fans...Total kW	10...13.9	8...12.7	18...28.6	10...15.9	8...12.7	18...28.6	10...15.9	10...15.9	20...31.8	10...15.9	10...15.9	20...31.8
Total Airflow — cfm	100,000	76,000	176,000	100,000	76,000	176,000	100,000	100,000	200,000	100,000	100,000	200,000
High Static			—			—			—			—
Fan Speed — rpm	1740	1750	—	1740	1750	—	1740	1740	—	1740	1740	—
No. Blades...Diameter — in.	12...30	12...30	—	12...30	12...30	—	12...30	12...30	—	12...30	12...30	—
No. Fans...Total kW	10...37	8...29.6	18...66.6	10...37	8...29.6	18...66.6	10...37	10...37	20...74	10...37	10...37	20...74
Total Airflow — cfm	100,000	80,000	180,000	100,000	80,000	180,000	100,000	100,000	200,000	100,000	100,000	200,000
CONDENSER COILS — Type												
Tubes (Copper), OD — in.	0.375	0.375	—	0.375	0.375	—	0.375	0.375	—	0.375	0.375	—
Fins/in. Standard/Heresite	17/15	17/—	—	17/15	17/—	—	17/15	17/15	—	17/15	17/15	—
No. Rows — Ckt A or B	3	3	—	3	3	—	3	3	—	3	3	—
Face Area sq ft — Ckt A and B Total	225.1	168	393.1	225.1	168	393.1	225.1	225.1	450.2	225.1	225.1	450.2
Max Working Pressure Refrigerant — psig	450	450	—	450	450	—	450	450	—	450	450	—
COOLER — No...Type												
No. Refrigerant Circuits	1...10HB160	1...10HB110	—	1...10HB200	1...10HB110	—	1...10HB160	1...10HB200	—	1...10HB200	1...10HB200	—
Net Water Volume — Ga. (includes nozzles)	52.0	30.3	82.3	61.0	30.3	91.3	52.0	61.0	113.0	61.0	61.0	122
Max Working Pressure	278/300	278/300	—	278/300	278/300	—	278/300	278/300	—	278/300	278/300	—
Refrigerant Side/Water Side — psig												
WATER CONNECTIONS — in.												
Inlet and Outlet	Victaulic Type 6	Victaulic Type 5	—	Victaulic Type 6	Victaulic Type 5	—	Victaulic Type 6	Victaulic Type 6	—	Victaulic Type 6	Victaulic Type 6	—
Drain	3/4 NPT	3/4 NPT	—	3/4 NPT	3/4 NPT	—	3/4 NPT	3/4 NPT	—	3/4 NPT	3/4 NPT	—

LEGEND

C-AL — Copper Tubing — Aluminum Fins Condenser Coil
 C-C — Copper Tubing — Copper Fins Condenser Coil
 OD — Outside Diameter

*All compressors have 6 cylinders.

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

ENGLISH (cont)

UNIT SIZE	360			390			420		
	A	B	Total	A	B	Total	A	B	Total
SYSTEM MODULES									
APPROX OPERATING WEIGHT — lb									
C-AL	12,676	12,676	25,352	13,380	12,676	26,056	13,380	13,380	26,760
C-C	14,195	14,195	28,390	14,899	14,195	29,094	14,899	14,899	29,798
REFRIGERANT CHARGE — lb									
R-22	178/30	178/30	—/—	190/40	178/30	—/—	190/40	190/40	—/—
Ckt A Total/Over	173/30	173/30	—/—	185/40	173/30	—/—	185/40	185/40	—/—
Ckt B Clear Glass									
COMPRESSORS, Type...rpm									
06E* (Qty) Ckt A	(1) 265, (1) 275, (1) 299	(1) 265, (1) 275, (1) 299	—	(3) 265, (1) 275, (1) 299	(1) 265, (1) 275, (1) 299	—	(3) 265, (1) 275, (1) 299	(3) 265, (1) 275, (1) 299	—
(Qty) Ckt B	(1) 265, (1) 275, (1) 299	(1) 265, (1) 275, (1) 299	—	(1) 265, (1) 275, (1) 299	(1) 265, (1) 275, (1) 299	—	(1) 265, (1) 275, (1) 299	(1) 265, (1) 275, (1) 299	—
Oil Charge — Compressor/pt	265/21.0, 275/21.0, 299/19.0	265/21.0, 275/21.0, 299/19.0	—	265/21.0, 275/21.0, 299/19.0	265/21.0, 275/21.0, 299/19.0	—	265/21.0, 275/21.0, 299/19.0	265/21.0, 275/21.0, 299/19.0	—
Capacity Control Steps									
% Cap.	6	6	—	7	6	—	7	7	—
Ckt A	50	50	50	50	50	50	50	50	50
Ckt B	50	50	50	50	50	50	50	50	50
Minimum Step Capacity (%)	14	14	—	12	14	—	12	12	—
CONDENSER FANS — Type									
Standard/Low Noise	Propeller	Propeller	—	Propeller	Propeller	—	Propeller	Propeller	—
Fan Speed — rpm	1140	1140	—	1740	1140	—	1740	1740	—
No. Blades...Diameter — in.	4...30	4...30	—	4...30	4...30	—	4...30	4...30	—
No. Fans...Total kW	12...19.1	12...19.1	24...38.2	12...19.1	12...19.1	24...38.2	12...19.1	12...19.1	24...38.2
Total Airflow — cfm	100,000	100,000	200,000	100,000	100,000	200,000	100,000	100,000	200,000
High Static									
Fan Speed — rpm	1740	1740	—	1740	1740	—	1740	1740	—
No. Blades...Diameter — in.	12...30	12...30	—	12...30	12...30	—	12...30	12...30	—
No. Fans...Total kW	12...44.4	12...44.4	24...88.8	12...44.4	12...44.4	24...88.8	12...44.4	12...44.4	24...88.8
Total Airflow — cfm	100,000	100,000	200,000	100,000	100,000	200,000	100,000	100,000	200,000
CONDENSER COILS — Type									
Tubes (Copper), OD — in.	0.375	0.375	—	0.375	0.375	—	0.375	0.375	—
Fins/in. Standard/Heresite	17/15	17/15	—	17/15	17/15	—	17/15	17/15	—
No. Rows — Ckt A or B	3	3	—	3	3	—	3	3	—
Face Area sq ft — Ckt A and B Total	268.9	268.9	537.8	268.9	268.9	537.8	268.9	268.9	537.8
Max Working Pressure Refrigerant — psig	450	450	—	450	450	—	450	450	—
COOLER — No. ...Type									
No. Refrigerant Circuits	1...10HB200	1...10HB200	4	1...10HB210	1...10HB200	—	1...10HB210	1...10HB210	4
Net Water Volume — Gal. (includes nozzles)	2	2	122	2	2	—	2	2	140.8
Max Working Pressure	61.0	61.0	—	70.4	61.0	—	70.4	70.4	—
Refrigerant Side/Water Side — psig	278/300	278/300	—	278/300	278/300	—	278/300	278/300	—
WATER CONNECTIONS — in.									
Inlet and Outlet	Victaulic Type 6	Victaulic Type 6	—	Victaulic Type 6	Victaulic Type 6	—	Victaulic Type 6	Victaulic Type 6	—
Drain	3/4 NPT	3/4 NPT	—	3/4 NPT	3/4 NPT	—	3/4 NPT	3/4 NPT	—

LEGEND

C-AL — Copper Tubing — Aluminum Fins Condenser Coil
 C-C — Copper Tubing — Copper Fins Condenser Coil
 OD — Outside Diameter

*All compressors have 6 cylinders.

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

Physical data — 60 Hz (cont)



SI

UNIT SIZE	240			270			300			330		
	A	B	Total	A	B	Total	A	B	Total	A	B	Total
SYSTEM MODULES												
APPROX OPERATING WEIGHT — kg												
C-AL	4566	3914	8480	5133	3914	9047	4566	5133	9699	5133	5133	10,266
C-C	5144	4346	9490	5711	4346	10,057	5144	5711	10,885	5711	5711	11,422
REFRIGERANT CHARGE — kg												
R-22	60.5/12.7	44.5/9.1	—/—	69.5/20.5	44.5/9.1	—/—	60.5/12.7	69.5/20.5	—/—	69.5/20.5	69.5/20.5	—/—
Ckt A Total/Over	62.3/12.7	47.7/9.1	—/—	73.6/20.5	47.7/9.1	—/—	62.3/12.7	73.6/20.5	—/—	73.6/20.5	73.6/20.5	—/—
COMPRESSORS, Type...r/s												
06E*	(1) 275, (1) 299	(1) 265, (1) 275	—	(3) 275	(1) 265, (1) 275	—	(1) 275, (1) 299	(3) 275	—	(3) 275	(3) 275	—
(Qty) Ckt A	(1) 275, (1) 299	(1) 265, (1) 275	—	(3) 275	(1) 265, (1) 275	—	(1) 275, (1) 299	(3) 275	—	(3) 275	(3) 275	—
(Qty) Ckt B	275/9.9, 299/9.0	265/9.9, 275/9.9	—	275/9.9	265/9.9, 275/9.9	—	275/9.9, 299/9.0	275/9.9	—	275/9.9	275/9.9	—
Oil Charge — Compressor/L												
Capacity Control Steps	11	11	—	17	11	—	11	17	—	17	17	—
% Cap.	50	50	50	50	50	50	50	50	50	50	50	50
Ckt A	50	50	50	50	50	50	50	50	50	50	50	50
Ckt B	14	15	—	11	15	—	14	11	—	11	11	—
Minimum Step Capacity (%)												
CONDENSER FANS — Type												
Standard/Low Noise												
Fan Speed — r/s	19	19	—	19	19	—	19	19	—	19	19	—
No. Blades...r/s	4..762	4..762	—	4..762	4..762	—	4..762	4..762	—	4..762	4..762	—
No. Blades...Diameter — mm	10..15.9	8..12.7	18..28.6	10..15.9	8..12.7	18..28.6	10..15.9	10..15.9	20..31.8	10..15.9	10..15.9	20..31.8
No. Fans...Total kW	47,190	35,864	83,054	47,190	35,864	83,054	47,190	47,190	94,380	47,190	47,190	94,380
Total Airflow — L/s												
High Static												
Fan Speed — r/s	29	29	—	29	29	—	29	29	—	29	29	—
No. Blades...Diameter — mm	12...762	12...762	18..66.6	12...762	12...762	18..66.6	12...762	12...762	20..74.0	12...762	12...762	20..74.0
No. Fans...Total kW	10...37.0	8...29.6	18..66.6	10...37.0	8...29.6	18..66.6	10...37.0	10...37.0	20..74.0	10...37.0	10...37.0	20..74.0
Total Airflow — L/s	47,190	37,750	84,940	47,190	37,750	84,940	47,190	47,190	94,380	47,190	47,190	94,380
CONDENSER COILS — Type												
Tubes (Copper), OD — mm	9.53	9.53	—	9.53	9.53	—	9.53	9.53	—	9.53	9.53	—
Fins/in. Standard/Heresite	669.3/590.6	669.3/590.6	—	669.3/590.6	669.3/590.6	—	669.3/590.6	669.3/590.6	—	669.3/590.6	669.3/590.6	—
No. Rows — Ckt A or B	3	3	—	3	3	—	3	3	—	3	3	—
Face Area sq ft — Ckt A and B Total	20.92	15.61	36.53	20.92	15.61	36.53	20.92	20.92	41.84	20.92	20.92	41.84
Max Working Pressure Refrigerant — kPa	3103	3103	—	3103	3103	—	3103	3103	—	3103	3103	—
COOLER — No. ...Type												
No. Refrigerant Circuits	1...10HB160	1...10HB110	—	1...10HB200	1...10HB110	—	1...10HB200	1...10HB200	—	1...10HB200	1...10HB200	—
Net Water Volume — L (includes nozzles)	2	2	4	2	2	4	2	2	4	2	2	4
Max Working Pressure	1916/2068	114.6	311.6	1916/2068	114.6	311.6	1916/2068	1916/2068	426	1916/2068	1916/2068	458
Refrigerant Side/Water Side — kPa												
WATER CONNECTIONS — mm												
Inlet and Outlet	Victaulic Type 6	Victaulic Type 5	—	Victaulic Type 6	Victaulic Type 5	—	Victaulic Type 6	Victaulic Type 6	—	Victaulic Type 6	Victaulic Type 6	—
Drain	3/4 NPT	3/4 NPT	—	3/4 NPT	3/4 NPT	—	3/4 NPT	3/4 NPT	—	3/4 NPT	3/4 NPT	—

LEGEND

C-AL — Copper Tubing — Aluminum Fins Condenser Coil
C-C — Copper Tubing — Copper Fins Condenser Coil
OD — Outside Diameter

*All compressors have 6 cylinders.

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

SI (cont)

UNIT SIZE	360			390			420		
	A	B	Total	A	B	Total	A	B	Total
SYSTEM MODULES									
APPROX OPERATING WEIGHT — kg									
C-AL	5761	5761	11,522	6081	5761	11,842	6081	5761	12,162
C-C	6452	6452	12,904	6772	6452	13,224	6772	6452	13,544
REFRIGERANT CHARGE — kg									
R-22	80.9/13.6	80.9/13.6	—/—	86.4/18.2	80.9/13.6	—/—	86.4/18.2	80.9/13.6	—/—
Ckt A Total/Over	78.6/13.6	78.6/13.6	—/—	84.1/18.2	78.6/13.6	—/—	84.1/18.2	78.6/13.6	—/—
Ckt B Clear Glass									
COMPRESSORS, Type...r/s									
06E*	(1) 265, (1) 275, (1) 299	(1) 265, (1) 275, (1) 299	—	(3) 265, (1) 275, (1) 299	(1) 265, (1) 275, (1) 299	—	(3) 265, (1) 275, (1) 299	(1) 265, (1) 275, (1) 299	—
(Qty) Ckt A	(1) 265, (1) 275, (1) 299	(1) 265, (1) 275, (1) 299	—	(1) 275, (2) 299	(1) 265, (1) 275, (1) 299	—	(1) 275, (2) 299	(1) 275, (2) 299	—
(Qty) Ckt B	265/9.9, 275/9.9, 299/9.0	265/9.9, 275/9.9, 299/9.0	—	265/9.9, 275/9.9, 299/9.0	265/9.9, 275/9.9, 299/9.0	—	265/9.9, 275/9.9, 299/9.0	265/9.9, 275/9.9, 299/9.0	—
Oil Charge — Compressor/L									
Capacity Control Steps	6	6	—	7	6	—	7	6	—
% Cap. Ckt A	50	50	50	50	50	50	50	50	50
Ckt B	14	14	—	12	14	—	12	14	—
Minimum Step Capacity (%)									
CONDENSER FANS — Type									
Standard/Low Noise	Propeller	Propeller	—	Propeller	Propeller	—	Propeller	Propeller	—
Fan Speed — r/s	19	19	—	19	19	—	19	19	—
No. Blades...Diameter — mm	4...762	4...762	—	4...762	4...762	—	4...762	4...762	—
No. Fans...Total kW	12...19.1	12...19.1	24...38.2	12...19.1	12...19.1	24...38.2	12...19.1	12...19.1	24...38.2
Total Airflow — L/s	47,190	47,190	94,380	47,190	47,190	94,380	47,190	47,190	94,380
High Static									
Fan Speed — r/s	29	29	—	29	29	—	29	29	—
No. Blades...Diameter — mm	12...762	12...762	—	12...762	12...762	—	12...762	12...762	—
No. Fans...Total kW	12...44.4	12...44.4	24...88.8	12...44.4	12...44.4	24...88.8	12...44.4	12...44.4	24...88.8
Total Airflow — L/s	47,190	47,190	94,380	47,190	47,190	94,380	47,190	47,190	94,380
CONDENSER COILS — Type									
Tubes (Copper), OD — mm	9.53	9.53	—	9.53	9.53	—	9.53	9.53	—
Fins/in. Standard/Herseyite	669.3/590.6	669.3/590.6	—	669.3/590.6	669.3/590.6	—	669.3/590.6	669.3/590.6	—
No. Rows — Ckt A or B	3	3	—	3	3	—	3	3	—
Face Area sq ft — Ckt A and B Total	20.92	20.92	41.84	20.92	20.92	41.84	20.92	20.92	41.84
Max Working Pressure Refrigerant — kPa	3103	3103	—	3103	3103	—	3103	3103	—
COOLER — No. ...Type									
No. Refrigerant Circuits	1...10HB200	1...10HB200	4	10...10HB210	1...10HB200	4	1...10HB210	1...10HB210	4
Net Water Volume — L (includes nozzles)	229	229	458	267	229	496	267	267	534
Max Working Pressure Refrigerant Side/Water Side — kPa	1916/2068	1916/2068	—	1916/2068	1916/2068	—	1916/2068	1916/2068	—
WATER CONNECTIONS — mm									
Inlet and Outlet	Victaulic Type 6 3/4 NPT	Victaulic Type 6 3/4 NPT	—	Victaulic Type 6 3/4 NPT	Victaulic Type 6 3/4 NPT	—	Victaulic Type 6 3/4 NPT	Victaulic Type 6 3/4 NPT	—
Drain									

LEGEND

C-AL — Copper Tubing — Aluminum Fins Condenser Coil
C-C — Copper Tubing — Copper Fins Condenser Coil
OD — Outside Diameter

*All compressors have 6 cylinders.

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

Physical data — 50 Hz



ENGLISH

UNIT SIZE	240			270			300			330		
	A	B	Total	A	B	Total	A	B	Total	A	B	Total
SYSTEM MODULES												
APPROX OPERATING WEIGHT — lb												
C-AL	10,511	8,710	19,211	11,443	8,710	20,153	10,511	11,443	21,954	11,443	11,443	22,886
C-C	11,783	9,660	21,443	12,715	9,660	22,375	11,783	12,715	24,498	12,715	12,715	25,430
REFRIGERANT CHARGE — lb												
R-22	133/28	98/20	—/—	153/45	98/20	—/—	133/28	153/45	—/—	153/45	153/45	—/—
Ckt A Total/Over	137/28	105/20	—/—	162/45	105/20	—/—	137/28	162/45	—/—	162/45	162/45	—/—
Ckt B Clear Glass												
COMPRESSORS, Type...rpm												
06E* (Qty) Ckt A	(1) 265, (2) 275	(1) 265, (1) 299	—	(2) 275, (1) 299	(1) 265, (1) 299	—	(1) 265, (2) 275	(2) 275, (1) 299	—	(2) 275, (1) 299	(2) 275, (1) 299	—
(Qty) Ckt B	(2) 299	(1) 265, (1) 299	—	(1) 275, (2) 299	(1) 265, (1) 299	—	(2) 299	(1) 275, (2) 299	—	(1) 275, (2) 299	(1) 275, (2) 299	—
Oil Charge — Compressor/pt	265/21.0, 275/21.0, 299/19.0	265/21.0, 299/19.0	—	275/21.0, 299/19.0	265/21.0, 299/19.0	—	265/21.0, 275/21.0, 299/19.0	275/21.0, 299/19.0	—	275/21.0, 299/19.0	275/21.0, 299/19.0	—
Capacity Control Steps	14	11	—	17	11	—	14	17	—	17	17	—
Ckt A	52	50	51	48	50	49	52	48	50	48	52	48
Ckt B	48	50	51	52	50	51	48	52	50	52	52	52
Minimum Step Capacity (%)	10	13	—	10	13	—	10	10	—	10	10	—
CONDENSER FANS — Type												
Standard/Low Noise	Propeller	Propeller, Direct Drive	—	Propeller	Propeller, Direct Drive	—	Propeller	Propeller	—	Propeller	Propeller	—
Fan Speed — rpm	950	950	—	950	950	—	950	950	—	950	950	—
No. Blades...Diameter — in.	6...30	6...30	—	6...30	6...30	—	6...30	6...30	—	6...30	6...30	—
No. Fans...Total kW	10...15.9	8...12.7	18...28.6	10...15.9	8...12.7	18...28.6	10...15.9	10...15.9	20...31.8	10...15.9	10...15.9	20...15.9
Total Airflow — cfm	100,000	76,000	176,000	100,000	76,000	176,000	100,000	100,000	200,000	100,000	100,000	200,000
High Static												
Fan Speed — rpm	1445	1750	—	1445	1750	—	1445	1445	—	1445	1445	—
No. Blades...Diameter — in.	6...30	12...30	—	6...30	12...30	—	6...30	6...30	—	6...30	6...30	—
No. Fans...Total kW	10...37	8...29.6	18...66.6	10...37	8...29.6	18...66.6	10...37	10...37	20...74	10...37	10...37	20...74
Total Airflow — cfm	100,000	80,000	180,000	100,000	80,000	180,000	100,000	100,000	200,000	100,000	100,000	200,000
CONDENSER COILS — Type												
Tubes (Copper), OD — in.	0.375	0.375	—	0.375	0.375	—	0.375	0.375	—	0.375	0.375	—
Fins/in. Standard/Heresite	17/15	17/15	—	17/15	17/15	—	17/15	17/15	—	17/15	17/15	—
No. Rows — Ckt A or B	3	3	—	3	3	—	3	3	—	3	3	—
Face Area sq ft — Ckt A and B Total	225.1	168	393.1	225.1	168	393.1	225.1	225.1	450.2	225.1	225.1	450.2
Max Working Pressure Refrigerant — psig	450	450	—	450	450	—	450	450	—	450	450	—
COOLER — No. ...Type	1...10HB160	1...10HB110	—	1...10HB200	1...10HB110	—	1...10HB160	1...10HB200	—	1...10HB200	1...10HB200	—
No. Refrigerant Circuits	2	2	4	2	2	4	2	2	4	2	2	4
Net Water Volume — Gal. (includes nozzles)	52.0	30.3	82.3	61.0	30.3	91.3	52.0	61.0	113.0	61.0	61.0	122.0
Max Working Pressure Refrigerant Side/Water Side — psig	278/300	278/300	—	278/300	278/300	—	278/300	278/300	—	278/300	278/300	—
WATER CONNECTIONS — in.												
Inlet and Outlet	Victaulic Type 6	Victaulic Type 6	—	Victaulic Type 6	Victaulic Type 6	—	Victaulic Type 6	Victaulic Type 6	—	Victaulic Type 6	Victaulic Type 6	—
Drain	3/4 NPT	3/4 NPT	—	3/4 NPT	3/4 NPT	—	3/4 NPT	3/4 NPT	—	3/4 NPT	3/4 NPT	—

LEGEND

C-AL — Copper Tubing — Aluminum Fins Condenser Coil
 C-C — Copper Tubing — Copper Fins Condenser Coil
 OD — Outside Diameter

*All compressors have 6 cylinders.

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

ENGLISH (cont)

UNIT SIZE	360			390			420		
	A	B	Total	A	B	Total	A	B	Total
SYSTEM MODULES									
APPROX OPERATING WEIGHT — lb									
C-AL	12,906	11,443	24,349	13,545	12,906	26,451	13,545	13,545	27,090
C-C	14,425	12,715	27,140	15,064	14,425	29,489	15,064	15,064	30,128
REFRIGERANT CHARGE — lb									
R-22	178/30	152/45	—/—	190/40	178/30	—/—	190/40	190/40	—/—
Ckt A Total/Over	178/30	162/45	—/—	185/40	173/30	—/—	185/40	185/40	—/—
COMPRESSORS, Type...rpm									
06E*	(3) 299	(2) 275, (1) 299	—	(2) 265, (2) 299	(3) 299	—	(2) 265, (2) 299	(2) 265, (2) 299	—
(Qty) Ckt A	(3) 299	(1) 275, (2) 299	—	(3) 299	(3) 299	—	(3) 299	(3) 299	—
(Qty) Ckt B	299/19.0	275/21.0, 299/19.0	—	265/21.0, 299/19.0	299/19.0	—	265/21.0, 299/19.0	265/21.0, 299/19.0	—
Oil Charge — Compressor/pt									
Capacity Control Steps	6	17	—	7	6	—	7	7	—
% Cap.	50	48	49	52	50	51	52	52	52
Ckt A	50	52	51	48	50	49	48	48	48
Ckt B	17	10	—	10	17	—	10	10	—
Minimum Step Capacity (%)									
Standard/Low Noise	Propeller	Propeller	—	Propeller	Propeller	—	Propeller	Propeller	—
Fan Speed — rpm	950	950	—	950	950	—	950	950	—
No. Blades...Diameter — in.	6...30	6...30	—	6...30	6...30	—	6...30	6...30	—
No. Fans...Total kW	12...19.1	10...15.9	22...35	12...19.1	12...19.1	24...38.2	12...19.1	12...19.1	24...38.2
Total Airflow — cfm	120,000	120,000	240,000	120,000	120,000	240,000	120,000	120,000	240,000
High Static	1445	1445	—	1445	1445	—	1445	1445	—
Fan Speed — rpm	6...30	6...30	—	6...30	6...30	—	6...30	6...30	—
No. Blades...Diameter — in.	12...44.4	10...37	22...81.4	12...44.4	12...44.4	24...88.8	12...44.4	12...44.4	24...88.8
No. Fans...Total kW	100,000	100,000	200,000	100,000	100,000	200,000	100,000	100,000	200,000
Total Airflow — cfm									
CONDENSER COILS — Type									
Tubes (Copper), OD — in.	0.375	0.375	—	0.375	0.375	—	0.375	0.375	—
Fins/in. Standard/Hersite	17/15	17/15	—	17/15	17/15	—	17/15	17/15	—
No. Rows	3	3	—	3	3	—	3	3	—
Ckt A or B	268.9	225.1	494	268.9	268.9	537.8	268.9	268.9	537.8
Face Area sq ft — Ckt A and B Total	450	450	—	450	450	—	450	450	—
Max Working Pressure Refrigerant — Ppsig									
COOLER — No. ...Type	1...10HB200	1...10HB200	—	1...10HB210	1...10HB200	—	1...10HB210	1...10HB210	—
No. Refrigerant Circuits	2	2	4	2	2	4	2	2	4
Net Water Volume — Gal. (includes nozzles)	61.0	61.0	122	70.4	61.0	131.4	70.4	70.4	140.8
Max Working Pressure	278/300	278/300	—	278/300	278/300	—	278/300	278/300	—
Refrigerant Side/Water Side — psig									
WATER CONNECTIONS — in.									
Inlet and Outlet	Victaulic Type 6	Victaulic Type 6	—	Victaulic Type 6	Victaulic Type 6	—	Victaulic Type 6	Victaulic Type 6	—
Drain	3/4 NPT	3/4 NPT	—	3/4 NPT	3/4 NPT	—	3/4 NPT	3/4 NPT	—

LEGEND

C-AL — Copper Tubing — Aluminum Fins Condenser Coil
 C-C — Copper Tubing — Copper Fins Condenser Coil
 OD — Outside Diameter

*All compressors have 6 cylinders.

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

Physical data — 50 Hz (cont)



SI

UNIT SIZE	240			270			300			330		
	A	B	Total	A	B	Total	A	B	Total	A	B	Total
SYSTEM MODULES												
APPROX OPERATING WEIGHT — kg												
C-AL	4778	3960	8738	5201	3960	9161	4778	5201	9979	5201	5201	10,402
C-C	5335	4390	9725	5779	4390	10,169	5335	5779	11,114	5779	5779	11,558
REFRIGERANT CHARGE — kg												
R-22	60.5/12.7	44.5/9.1	—/—	69.5/20.5	44.5/9.1	—/—	60.5/12.7	69.5/20.5	—/—	69.5/20.5	69.5/20.5	—/—
Ckt A Total/Over	62.3/12.7	47.7/9.1	—/—	73.6/20.5	47.7/9.1	—/—	62.3/12.7	73.6/20.5	—/—	73.6/20.5	73.6/20.5	—/—
Ckt B Clear Glass												
COMPRESSORS, Type.../s												
06E* (Qty) Ckt A	(1) 265, (2) 275	(1) 265, (1) 299	—	(2) 275, (1) 299	(1) 265, (1) 299	—	(1) 265, (2) 275	(2) 275, (1) 299	—	(2) 275, (1) 299	(2) 275, (1) 299	—
(Qty) Ckt B	(2) 299	(1) 265, (1) 299	—	(1) 275, (2) 299	(1) 265, (1) 299	—	(2) 299	(1) 275, (2) 299	—	(1) 275, (2) 299	(1) 275, (2) 299	—
Oil Charge — Compressor/L	265/9.9, 275/9.9, 299/9.0	265/9.9, 299/9.0	—	275/9.9, 299/9.0	265/9.9, 299/9.0	—	265/9.9, 275/9.9, 299/9.0	275/9.9, 299/9.0	—	275/9.9, 299/9.0	275/9.9, 299/9.0	—
Capacity Control Steps	14	11	—	17	11	—	14	17	—	17	17	—
% Cap.	52	50	51	48	50	49	52	48	50	48	48	52
Minimum Step Capacity (%)	48	50	—	52	50	—	48	52	50	52	52	—
	10	13	—	10	13	—	10	10	—	10	10	—
CONDENSER FANS — Type												
Standard/Low Noise	Propeller	Propeller, Direct Drive	Propeller	Propeller	Propeller, Direct Drive	Propeller	Propeller	Propeller	Propeller	Propeller	Propeller	Propeller
Fan Speed — r/s	15.8	15.8	—	15.8	15.8	—	15.8	15.8	—	15.8	15.8	—
No. Blades...Diameter — mm	6...762	6...762	—	6...762	6...762	—	6...762	6...762	—	6...762	6...762	—
No. Fans...Total kW	10...15.9	8...12.7	18...28.6	10...15.9	8...12.7	18...28.6	10...15.9	10...15.9	20...31.8	10...15.9	10...15.9	20...31.8
Total Airflow — L/s	47,190	35,864	83,054	47,190	35,864	83,054	47,190	47,190	94,380	47,190	47,190	94,380
High Static												
Fan Speed — r/s	24.1	29	—	24.1	29	—	24.1	24.1	—	24.1	24.1	—
No. Blades...Diameter — mm	12...762	12...762	—	12...762	12...762	—	12...762	12...762	—	12...762	12...762	—
No. Fans...Total kW	10...370.0	8...29.6	18...66.6	10...370.0	8...29.6	18...66.6	10...370.0	10...370.0	20...74	10...370.0	10...370.0	20...74
Total Airflow — L/s	47,190	37,750	84,940	47,190	37,750	84,940	47,190	47,190	94,380	47,190	47,190	94,380
CONDENSER COILS — Type												
Tubes (Copper), OD — mm	9.53	9.53	—	9.53	9.53	—	9.53	9.53	—	9.53	9.53	—
Fins/mm Standard/Heresite	689.3/590.6	689.3/590.6	—	689.3/590.6	689.3/590.6	—	689.3/590.6	689.3/590.6	—	689.3/590.6	689.3/590.6	—
No. Rows — Ckt A or B	3	3	—	3	3	—	3	3	—	3	3	—
Face Area sq ft — Ckt A and B Total	20.92	15.61	36.53	20.92	15.61	36.53	20.92	20.92	41.84	20.92	20.92	41.84
Max Working Pressure Refrigerant — kPa	3103	3103	—	3103	3103	—	3103	3103	—	3103	3103	—
COOLER — No. ...Type	1...10HB160	1...10HB110	—	1...10HB200	1...10HB110	—	1...10HB160	1...10HB200	—	1...10HB200	1...10HB200	—
No. Refrigerant Circuits	2	2	4	2	2	4	2	2	4	2	2	4
Net Water Volume — L (includes nozzles)	197	114.6	311.6	229	114.6	311.6	197	229	426	229	229	458
Max Working Pressure Refrigerant Side/Water Side — kPa	1916/2068	1916/2068	—	1916/2068	1916/2068	—	1916/2068	1916/2068	—	1916/2068	1916/2068	—
WATER CONNECTIONS — mm												
Inlet and Outlet	Victaulic Type 6	Victaulic Type 5	—	Victaulic Type 6	Victaulic Type 5	—	Victaulic Type 6	Victaulic Type 6	—	Victaulic Type 6	Victaulic Type 6	—
Drain	¾ NPT	¾ NPT	—	¾ NPT	¾ NPT	—	¾ NPT	¾ NPT	—	¾ NPT	¾ NPT	—

LEGEND

C-AL — Copper Tubing — Aluminum Fins Condenser Coil
C-C — Copper Tubing — Copper Fins Condenser Coil
OD — Outside Diameter

*All compressors have 6 cylinders.

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

SI (cont)

UNIT SIZE	360			390			420		
	A	B	Total	A	B	Total	A	B	Total
SYSTEM MODULES									
APPROX OPERATING WEIGHT — kg									
C-AL	5866	5201	11,067	6156	5866	12,022	6156	6156	12,312
C-C	6556	5779	12,335	6847	6556	13,403	6847	6847	13,694
REFRIGERANT CHARGE — kg									
R-22	80.9/13.6	69.5/20.5	—/—	86.4/18.2	80.9/13.6	—/—	86.4/18.2	86.4/18.2	—/—
Ckt A Total/Over	78.6/13.6	73.6/20.5	—/—	84.1/18.2	78.6/13.6	—/—	84.1/18.2	84.1/18.2	—/—
Ckt B Clear Glass									
COMPRESSORS, Type...r/s									
06E*	(3) 299	(2) 275, (1) 299	—	(2) 265, (1) 299	(3) 299	—	(2) 265, (1) 299	(3) 299	—
(Qty) Ckt A	(3) 299	(1) 275, (2) 299	—	(3) 299	(3) 299	—	(3) 299	(3) 299	—
(Qty) Ckt B	299/9.0	275/9.9, 299/9.0	—	265/9.9, 299/9.0	299/9.0	—	265/9.9, 299/9.0	265/9.9, 299/9.0	—
Oil Charge — Compressor/L									
% Cap.	6	17	—	7	6	—	7	7	—
Ckt A	50	48	49	52	50	51	52	52	52
Ckt B	50	52	51	48	50	49	48	48	48
Minimum Step Capacity (%)	17	10	—	10	17	—	10	10	—
CONDENSER FANS — Type									
Standard/Low Noise	Propeller	Propeller	—	Propeller	Propeller	—	Propeller	Propeller	—
Fan Speed — r/s	15.8	15.8	—	15.8	15.8	—	15.8	15.8	—
No. Blades...Diameter — mm	6...762	6...762	—	6...762	6...762	—	6...762	6...762	—
No. Fans...Total kW	12...19.1	10...15.9	22...35	12...19.1	12...19.1	24...38.2	12...19.1	12...19.1	24...38.2
Total Airflow — L/s	56,630	47,190	103,820	56,630	56,630	113,260	56,630	56,630	113,260
High Static									
Fan Speed — r/s	24.1	24.1	—	24.1	24.1	—	24.1	24.1	—
No. Blades...Diameter — mm	12...762	12...762	—	12...762	12...762	—	12...762	12...762	—
No. Fans...Total kW	12...44.4	10...37.0	22...81.4	12...44.4	12...44.4	24...88.8	12...44.4	12...44.4	24...88.8
Total Airflow — L/s	47,190	47,190	94,380	47,190	47,190	94,380	47,190	47,190	94,380
CONDENSER COILS — Type									
Tubes (Copper), OD — mm	9.53	9.53	—	9.53	9.53	—	9.53	9.53	—
Fins/in. Standard/Heresite	669.3/590.6	669.3/590.6	—	669.3/590.6	669.3/590.6	—	669.3/590.6	669.3/590.6	—
No. Rows — Ckt A or B	3	3	—	3	3	—	3	3	—
Face Area sq ft — Ckt A and B Total	24.98	20.92	45.9	24.98	24.98	49.96	24.98	24.98	49.96
Max Working Pressure Refrigerant — kPa	3103	3103	—	3103	3103	—	3103	3103	—
COOLER — No. ...Type									
No. Refrigerant Circuits	1...10HB200	1...10HB200	4	1...10HB210	1...10HB200	—	1...10HB210	1...10HB210	4
Net Water Volume — L (includes nozzles)	2	2	4	2	2	4	2	2	4
Max Working Pressure	229	229	458	267	229	496	267	267	534
Refrigerant Side/Water Side — kPa	1916/2068	1916/2068	—	1916/2068	1916/2068	—	1916/2068	1916/2068	—
WATER CONNECTIONS — mm									
Inlet and Outlet	Victaulic Type 6	Victaulic Type 6	—	Victaulic Type 6	Victaulic Type 6	—	Victaulic Type 6	Victaulic Type 6	—
Drain	3/4 NPT	3/4 NPT	—	3/4 NPT	3/4 NPT	—	3/4 NPT	3/4 NPT	—

LEGEND

C-AL — Copper Tubing — Aluminum Fins Condenser Coil
C-C — Copper Tubing — Copper Fins Condenser Coil
OD — Outside Diameter

*All compressors have 6 cylinders.

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

Factory-installed options



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

Copper/copper condenser coils — A **C** in the eleventh position of the unit model number indicates copper tubing and copper fins. The standard copper tube/aluminum fin condenser coil is replaced by internally enhanced copper tubing mechanically bonded to sine wave copper fin stock.

Motormaster® III low ambient control — The Motormaster III head pressure control device is available from the factory. This control permits operation of 30GN,GT units to -20 F (-29 C) ambient temperature. The control is prewired at the factory.

Brine — The Brine option permits supply liquid temperatures to be set to a minimum of 15 F (-9 C). Refrigeration circuit components, such as the expansion device, are modified to correct for the lower refrigeration flow rates.

Unloaders (30GN Only) — The unloader option provides increased cost savings for exceptional part-load performance.

Cooler heater — A cooler heater may be factory installed. The package includes controls to energize the heater at 35 F (2 C) and below, and 8 cooler tape heaters, 210 watts each.

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

Non-fused disconnect — A non-fused electrical disconnect is available factory installed.

Sound reduction package kit — This kit consists of a specially designed system of condenser fans and orifices to reduce system sound levels without compromising unit performance.

Controls (30GN only) and diagnostics — Optional controls and a diagnostics module are available to increase unit efficiency and ease in troubleshooting.

Field-installed accessories

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

Gage panel — (For 30GT Only) Accessory package includes one suction gage and one discharge gage mounted on the same panel, with a shutoff valve for each gage. Two gage panels are required for **each** circuit. For 30GN, all system pressures are monitored through the 8-character display.

Motormaster III control — This device permits unit operation down to -20 F (-29 C). The package includes sensor, control, and installation hardware. Factory-installed fan motors compatible with the Motormaster III require no field motor changes. A Motormaster III control is required for **each** circuit. In 575-v applications, 4 transformers must be field supplied.

Chilled water flow switch — Although low water flow detection is provided by the unit internal control devices, this accessory is available for field installation.

Temperature reset — For Flotronic™ (30GT) units only, for leaving-water temperature reset. The accessory lets the unit reset the leaving-water temperature to a higher value during low-load conditions. Temperature reset can be initiated from return water temperature, space temperature, or outdoor temperature.

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

NOTE: This control module is standard on 30GN units.

NOTE: If application requires reset to be determined based on space or outdoor-air temperature, an additional field-installed sensor (T10) will be required.

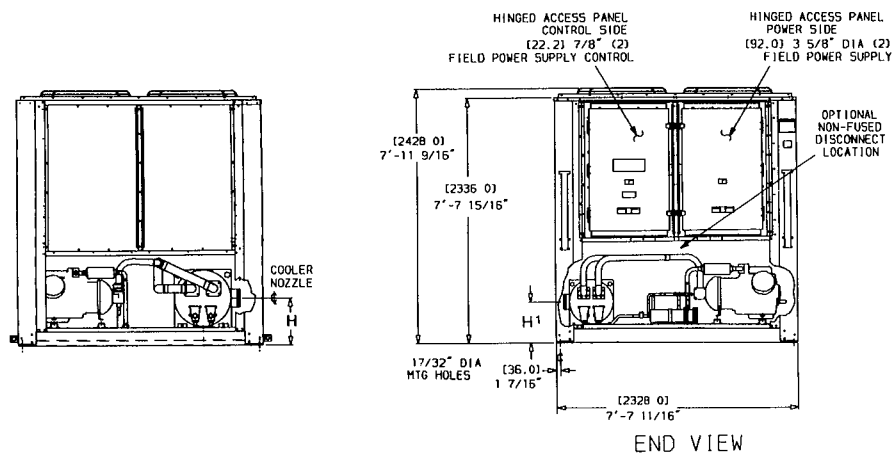
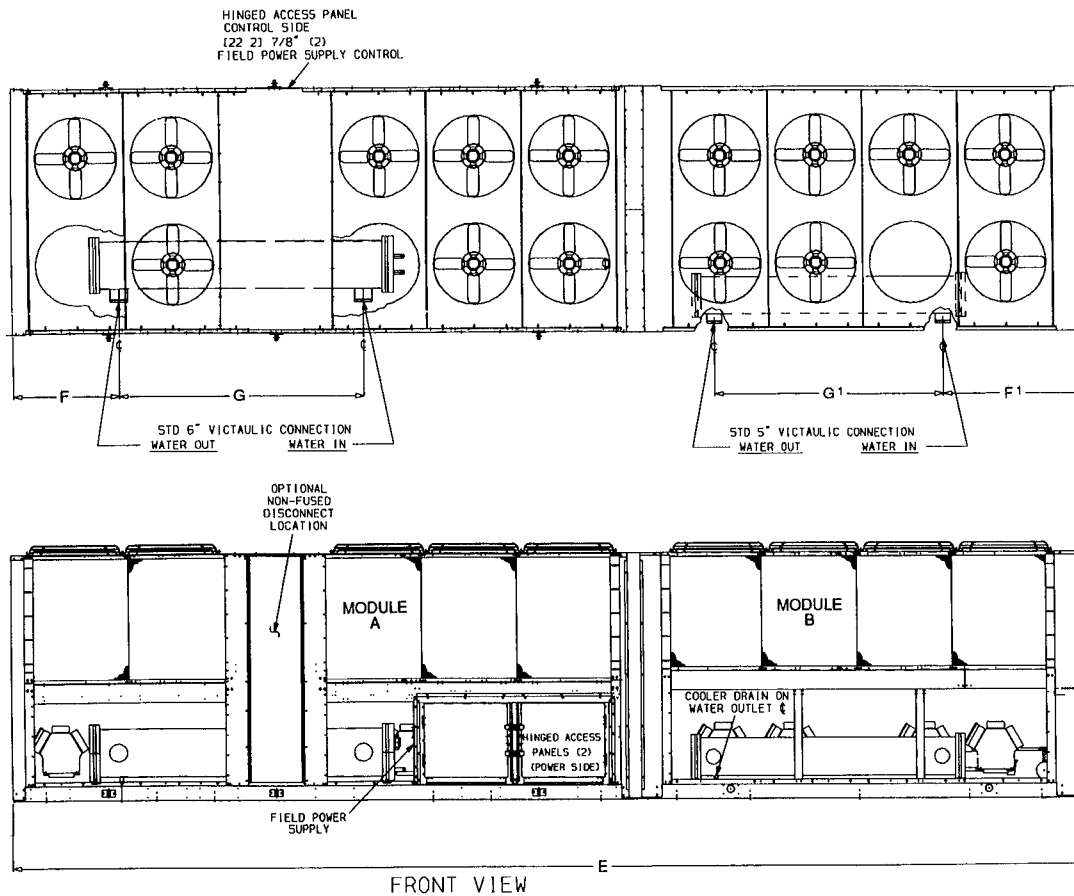
Control transformer — The transformer is sized to supply the needs of the control circuit, sourcing power from the main unit power connection.

Sound reduction kit — Kit consists of a specially designed fan system of fans and orifices for reducing system noise without compromising unit performance. No fan motor change is required, and the fan system is compatible with Motormaster III control. Accessory is packaged in sets of 2 per package.

Security grilles for condenser coils and/or compressor section — These accessory grilles mount to the condenser coil shelf and to the base rail.

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

Base unit dimensions — 30GN,GT240,270

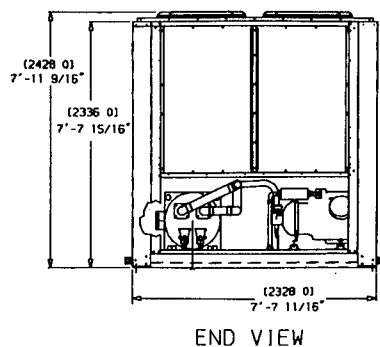
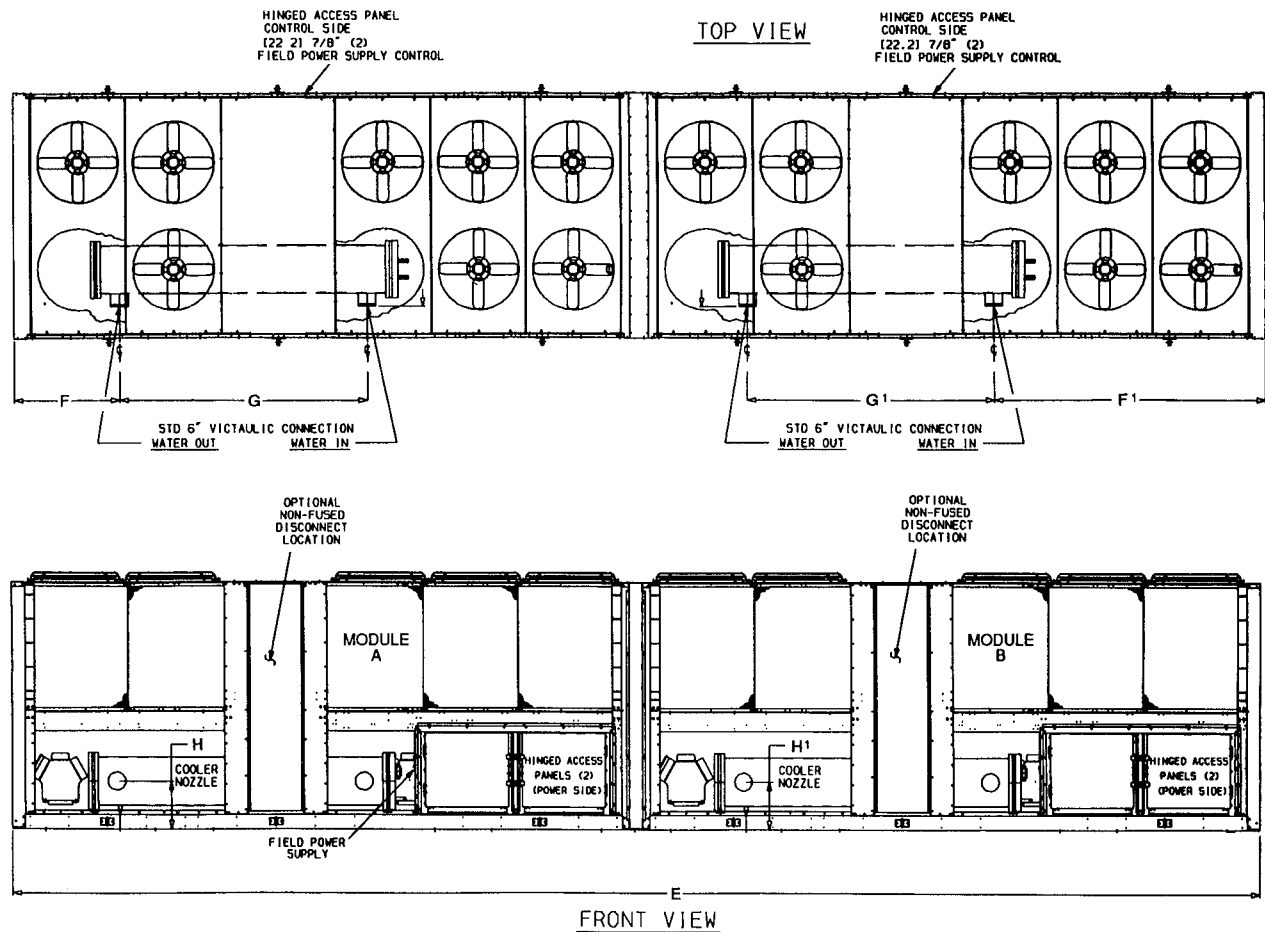


NOTE: Dimensions in [] are in mm.

DIMENSIONS — ft-in. (mm)

30GN,GT	240	270
E — OVERALL LENGTH	33-7 $\frac{1}{8}$	(10221)
F — LEFT END TO COOLER OUTLET — 'A'	3-6 $\frac{5}{8}$	(1032)
F' — RIGHT END TO COOLER INLET — 'B'	4-5 $\frac{1}{8}$	(1350)
G — COOLER INLET TO OUTLET — 'A'	7-8 $\frac{1}{4}$	(2343)
G' — COOLER INLET TO OUTLET — 'B'	7-2 $\frac{3}{16}$	(2189)
H — COOLER NOZZLE HEIGHT — 'A'	1-4 $\frac{5}{8}$	(423)
H' — COOLER NOZZLE HEIGHT — 'B'	1-3 $\frac{3}{8}$	(390)

Base unit dimensions — 30GN,GT300-420

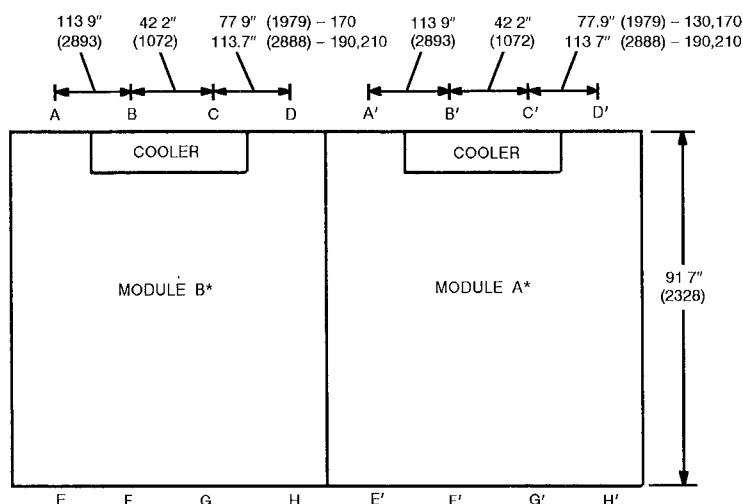


NOTE: Dimensions in [] are in mm.

DIMENSIONS — ft-in. (mm)

30GN,GT	300	330	360 (50 HZ)	360 (60 HZ)	390	420
E — OVERALL LENGTH	39-¾ (11906)		42-½ (12815)	45-¼ (13722)		
F — LEFT END TO COOLER OUTLET — 'A'	3-3⅝ (1032)		1-5⅝ (448)	6-37/16 (1916)	5-11½ (1816)	
F' — RIGHT END TO COOLER INLET — 'B'	8-6⅞ (2593)					8-3⅞ (2332)
G — COOLER INLET TO OUTLET — 'A'	7-8¼ (2343)				8-2⅝ (2504)	
G' — COOLER INLET TO OUTLET — 'B'	7-8¼ (2343)				8-2⅝ (2504)	
H — COOLER NOZZLE HEIGHT — 'A'	1-4¾ (425)	1-5⅝ (448)			1-67/16 (468)	
H' — COOLER NOZZLE HEIGHT — 'B'	1-5⅝ (448)					1-67/16 (468)

→ Base unit dimensions — Mounting weights (approximate)



WEIGHT (lb)

UNIT SIZE	CONDENSER COIL†	MODULE B								MODULE A							
		A	B	C	D	E	F	G	H	A'	B'	C'	D'	E'	F'	G'	H'
240	Cu/Al	2121	—	—	2120	2185	—	—	2185	928	1569	1160	834	1438	1375	1764	1444
	Cu/Cu	2360	—	—	2360	2420	—	—	2420	1056	1696	1287	961	1628	1566	1954	1635
270	Cu/Al	2121	—	—	2120	2185	—	—	2185	963	1744	1348	873	1527	1673	1849	1466
	Cu/Cu	2360	—	—	2360	2420	—	—	2420	1090	1871	1475	1000	1718	1864	2040	1657
300	Cu/Al	963	1744	1348	873	1527	1673	928	1569	928	1569	1160	834	1438	1375	1764	1444
	Cu/Cu	1090	1871	1475	1000	1718	1864	1056	1696	1056	1696	1287	961	1628	1566	1954	1635
330	Cu/Al	963	1744	1348	873	1527	1673	963	1744	963	1744	1348	873	1527	1673	1849	1466
	Cu/Cu	1090	1871	1475	1000	1718	1864	1090	1871	1090	1871	1475	1000	1718	1864	2040	1657
360 (50 Hz)	Cu/Al	1365	1953	1807	1127	1430	1839	963	1744	963	1744	1348	873	1527	1673	1849	1466
	Cu/Cu	1555	2143	1997	1316	1620	2029	1090	1871	1090	1871	1475	1000	1718	1864	2040	1657
360 (60 Hz)	Cu/Al	1365	1953	1807	1127	1430	1839	1365	1953	1365	1953	1807	1127	1430	1839	1765	1621
	Cu/Cu	1555	2143	1997	1316	1620	2029	1555	2143	1555	2143	1997	1316	1620	2029	1955	1711
390	Cu/Al	1383	2151	1876	1128	1430	1860	1365	1953	1365	1953	1807	1127	1430	1839	1765	1621
	Cu/Cu	1573	2341	2066	1318	1620	2050	1555	2143	1555	2143	1997	1316	1620	2029	1955	1711
420	Cu/Al	1383	2151	1876	1128	1430	1860	1383	2151	1383	2151	1876	1128	1430	1860	2102	1616
	Cu/Cu	1573	2341	2066	1318	1620	2050	1573	2341	1573	2341	2066	1318	1620	2050	2292	1805

WEIGHT (kg)

UNIT SIZE	CONDENSER COIL†	MODULE B								MODULE A							
		A	B	C	D	E	F	G	H	A'	B'	C'	D'	E'	F'	G'	H'
240	Cu/Al	964	—	—	964	993	—	—	993	422	713	527	379	654	625	802	656
	Cu/Cu	1073	—	—	1073	1100	—	—	1100	480	771	585	437	740	712	888	743
270	Cu/Al	964	—	—	964	993	—	—	993	438	793	613	397	694	760	840	666
	Cu/Cu	1073	—	—	1073	1100	—	—	1100	495	850	670	455	781	847	927	753
300	Cu/Al	438	793	613	397	694	760	422	713	422	713	527	379	654	625	802	656
	Cu/Cu	495	850	670	455	781	847	480	771	480	771	585	437	740	712	888	743
330	Cu/Al	438	793	613	397	694	760	438	793	438	793	613	397	694	760	840	666
	Cu/Cu	495	850	670	455	781	847	495	850	495	850	670	455	781	847	927	753
360 (50 Hz)	Cu/Al	620	888	821	512	650	836	438	793	438	793	613	397	694	760	840	666
	Cu/Cu	707	974	908	598	736	922	495	850	495	850	670	455	781	847	927	753
360 (60 Hz)	Cu/Al	620	888	821	512	650	836	620	888	620	888	821	512	650	836	802	737
	Cu/Cu	707	974	908	598	736	922	707	974	707	974	908	598	736	922	889	778
390	Cu/Al	629	978	853	513	650	845	620	888	620	888	821	512	650	836	802	737
	Cu/Cu	715	1064	939	599	736	932	707	974	707	974	908	598	736	922	889	778
420	Cu/Al	629	978	853	513	650	845	629	978	629	978	853	513	650	845	955	735
	Cu/Cu	715	1064	939	599	736	932	715	1064	715	1064	939	599	736	932	1042	820

Al — Aluminum

Cu — Copper

*See Unit Sizes and Modular Combinations table on page 3 for Module A and Module B unit sizes.

For 30GN,GT100 Modules, Points A', D', E', and H' are located in the corners. See page 13 for dimensions

†Tubing material/fin material.

NOTE: Dimensions in () are in millimeters

Application data



Leveling unit

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

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

Cooler water temperature

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

Medium temperature brine application

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

Leaving water temperature reset

This feature (accessory on Flotronic units; standard on Flotronic II units) provides reset of LCWT in constant water flow systems. Reset reduces compressor power usage at part load when design LCWT is not necessary. Humidity control should be considered since higher coil temperatures resulting from reset will reduce latent heat capacity.

Three reset options are offered, based on.

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

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

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

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

Cooler temperature range

Ratings and performance data in this publication are based on a 10° F (5.6° C) rise, and are suitable for a range from 5 F to 15 F (2.8 C to 8.3 C) temperature rise without adjustment. Flotronic chillers with microprocessor control may be operated at a different temperature range provided flow limits are not exceeded. For minimum flow rates, see Minimum Cooler Water Flow Rates 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 example

Minimum cooler flow (maximum cooler temperature rise) for standard units is shown in Minimum Cooler Water Flow Rates table. When L/s (gpm) 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 water may be recirculated to raise flow rate. However, mixed temperature entering cooler must be maintained a minimum of at least 5° F (2.8° C) above the LCWT.
- c. Special cooler baffling is required to allow minimum flow rate to be reduced.

MINIMUM COOLER FLOW RATE AND LOOP VOLUME

UNIT SIZE	MINIMUM COOLER FLOW RATE				MINIMUM LOOP VOLUME	
	Module A		Module B		Gallons	Liters
	Gpm	L/s	Gpm	L/s		
240	110	6.9	72.7	4.6	675	2572
270	120	7.5	72.7	4.6	780	2972
300	110	6.9	120	7.5	855	3258
330	120	7.5	120	7.5	975	3715
360	120	7.5	120	7.5	1050	4001
390	148	9.3	120	7.5	1140	4343
420	148	9.3	148	9.3	1200	4572

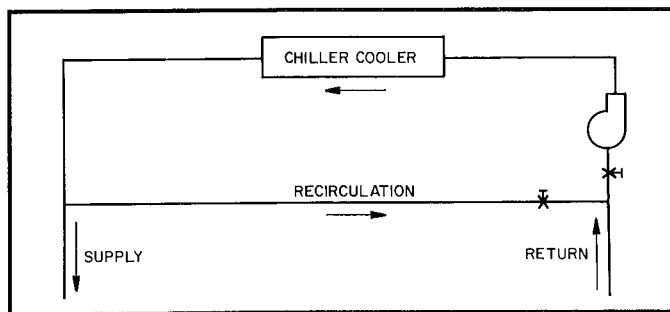
LEGEND

ARI — Air Conditioning & Refrigeration Institute
PD — Pressure Drop

NOTES: 1. Minimum flow based on 1.0 fps (0.30 m/s) velocity in cooler without special cooler baffling.
2. Minimum Loop Volumes — determined by equations below (based on Normal Air Conditioning)
Liters = N x ARI Cap (kW)
Gallons = V x ARI Cap (tons)

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

N — Liters Per kW of Nominal Cooling Capacity
V — Gallons Per Ton of Nominal Cooling Capacity



Low ambient temperature operation

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

0° F (–18 C)

If operation is intended below 0° F (–18 C), the Carrier accessory Motormaster® condenser head pressure control and its associated components must be added. Motormaster control allows operation down to –20 F (–29 C). Consult your Carrier representative for details.

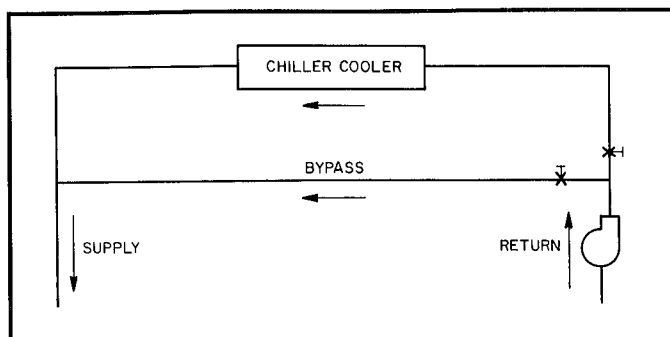
Wind baffles (field fabricated and installed) must be added to all units for operation below 32 F (0° C) if wind velocity is anticipated greater than 5 mph (8 km/h).

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

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

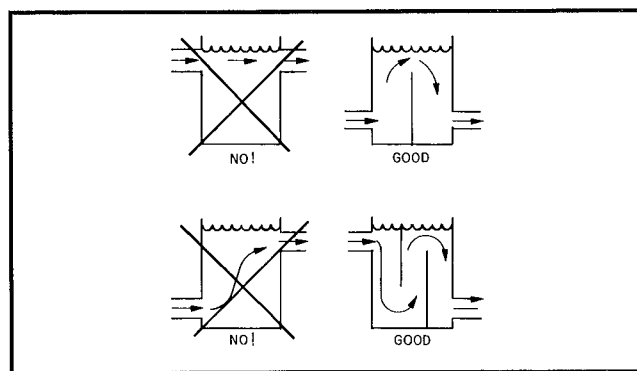
Maximum cooler flow (>5 gpm/ton or <5° F rise [$>0.09 \text{ L/s} \cdot \text{kW}$ or $<2.7^\circ \text{ C rise}$]) results in practical maximum pressure drop through cooler.

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



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

Water loop volume in circulation must equal or exceed 3 gallons per nominal ton (3.25 liters per kW) of cooling for temperature stability and accuracy in air conditioning applications. For example, a 30GT420 50 Hz unit would require 1207 gallons (4597 liters). In jobs where accuracy is vital or for operation at ambient below 32 F (0° C) with low loading conditions, there should be from 6 to 10 gallons per ton (6.5 to 10.8 liters per kW). To achieve this volume, it is often necessary to install a tank in the loop. Tank should be baffled to ensure there is no stratification and that water (or brine) entering tank is adequately mixed with liquid in the tank.



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

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

Cooler protection — When operating in areas that experience temperatures below 32 F (0° C), cooler protection in form of ethylene glycol (or other suitable brine) is required to protect cooler from low ambient freeze-up. Even though unit cooler is equipped with insulation and an electric heater that helps prevent freeze-up, it does not protect water piping external to unit. Use only antifreeze solutions approved for heat exchanger duty. Use of automotive type antifreezes is not recommended because of the fouling that can occur once their relatively short-lived inhibitor breaks down.

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

Application data (cont)



Condenser

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

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

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

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

Medium and high static fan options

These should be used whenever an application requires external ductwork which will raise the job static requirements to prevent a reduction in airflow to the conditioned space.

Capacity correction (antifreeze)

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

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

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

Consider the 30GT420 unit from the Selection Procedure example (refer to correction curves at 40% solution).

Correct unit capacity — On glycol capacity correction curve in Ethylene Glycol Performance chart, read 0.95.

$$\begin{aligned}\text{Corrected capacity} &= 0.95 \times \text{determined capacity} \\ &= 0.95 \times 412.1 \\ &= 391.5 \text{ tons.}\end{aligned}$$

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

Cooler water flow (at corrected capacity)

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

$$= \frac{24 \times 391.5 \text{ tons}}{14 \text{ F}} = 671.1 \text{ U.S. gpm}$$

$$\begin{aligned}\text{Cooler water flow (40\% solution)} &= 1.15 \times 671.1 \\ &= 771.8 \text{ U.S. gpm}\end{aligned}$$

Correct cooler pressure drop — On cooler pressure drop correction curve in Ethylene Glycol Performance chart, read 1.33

On Cooler Pressure Drop curve (page 22), for 385.9 (½ x 771.8) gpm, read pressure drop = 9.6 ft water gage (per module). The pressure drop for 40% solution = 1.33 x 9.6 = 12.8 ft water per module.

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

Power input from Selection Procedure example = 478.0 kW.

$$\text{Corrected power input} = 0.97 \times 478.0 = 463.7 \text{ kW}$$

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

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

Consider 30GT420 unit from the Selection Procedure example (refer to correction curves at 40% solution).

Correct unit capacity — On capacity correction curve in Ethylene Glycol Performance chart, read 0.95.

$$\begin{aligned}\text{Corrected capacity} &= 0.95 \times \text{determined capacity} \\ &= 0.95 \times 1391.9 \\ &= 1322.3 \text{ kW}\end{aligned}$$

Correct cooler water flow — On cooler flow correction curve in Ethylene Glycol Performance chart, read 1.15

Cooler water flow (at corrected capacity)

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

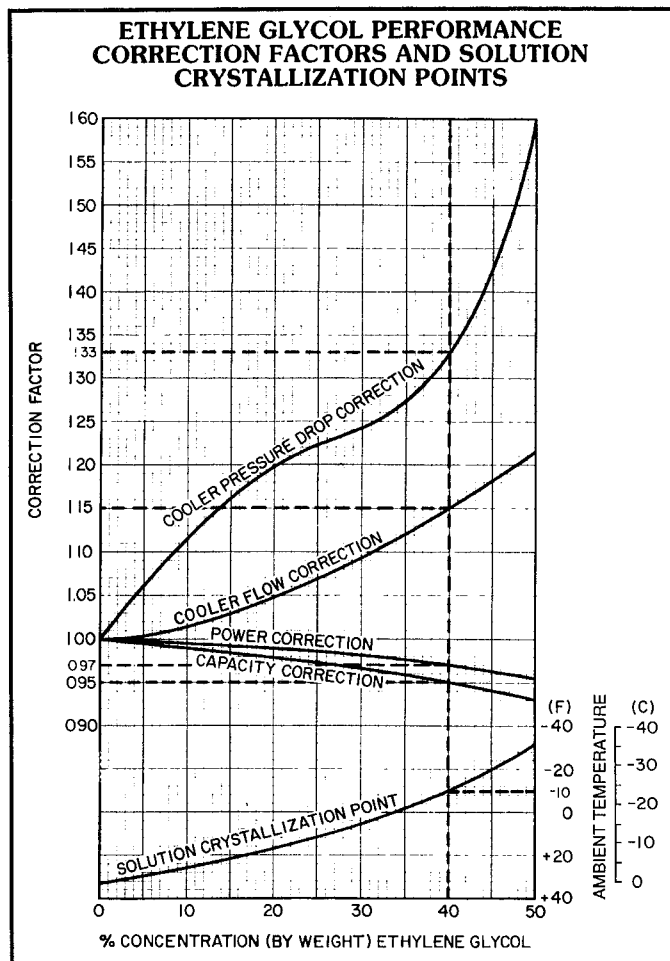
$$= \frac{0.239 \times 1322.3}{7.8} = 40.5 \text{ L/s}$$

$$\begin{aligned}\text{Cooler water flow (40\% solution)} &= 1.15 \times 40.5 \\ &= 46.6 \text{ L/s}\end{aligned}$$

Correct cooler pressure drop — On cooler pressure drop correction curve in Ethylene Glycol Performance chart, read 1.33.

On Cooler Pressure Drop Curve (page 22), for 23.3 (½ x 46.6) L/s, read pressure drop 26.6 kPa per module. The pressure drop for 40% solution = 1.33 x 26.6 = 35.4 kPa per module.

Correct compressor power input (kW) — On the power correction curve in Ethylene Glycol Performance chart, read 0.97 correction factor at 40% ethylene glycol concentration. Power input from Selection Procedure example = 471.5 kW. Corrected power input = $0.97 \times 471.5 = 457.3$ kW.



Oversizing chillers

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

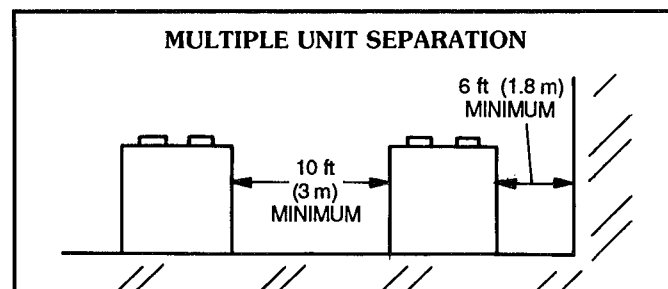
It is also recommended that the installation of 2 smaller chillers be considered where operation at minimum load is critical. The operation of a smaller chiller loaded to a greater percent of minimum is preferred to operating a single chiller at or near its minimum recommended value.

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

Multiple chillers

Where chiller capacities greater than 400 tons (1400 kW) are required, or where stand-by capability is desired, chillers may be installed in *parallel*. Units should be of equal size to

ensure balanced water flows. Where a large temperature drop ($>25^{\circ}\text{F}$ [13.9°C]) is desired, chillers may be installed in *series*. Water temperature sensors need not be moved for multiple chiller operation. A 10-ft (3-m) separation is required between units for airflow, and a 6-ft (1.8-m) distance is required from units to obstructions. See Multiple Unit Separation figure below. See Base Unit Dimensions section for service clearances.



Strainer

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

Electrical/utility interests

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

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

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

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

Remote ON-OFF control

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

Part-wind start

Part-wind start generally is not 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) should be used in determining need.

Additionally, no soft starters or autotransformers are required, as the instantaneous current flow resulting from the start of the 06E compressor is very small, and the duration of the start is very short (0.8 seconds).

Selection procedure — English



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

Capacity required 405 tons
 Leaving chilled water temperature (LCWT) . . . 45 F
 Cooler water temperature rise 14 F
 Condenser entering-air temperature (CEAT) . . 95 F
 Loop volume 1300 gal
 Electrical Power 460-3-60

Unit can be selected from ratings provided in this catalog, or by using the Carrier 30-Series Chiller Selection Program (contact your Carrier representative).

Ratings are based on 10° F rise and are suitable for a temperature rise range from 5 F 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 24) at 14 F and read a correction of 0.3 F. Corrected LCWT is, therefore, 45 + 0.3 = 45.3 F.

III Determine capacity, unit size, and power input.

Enter Cooling Capacities table at given CEAT and LCWT — respectively, 95 F and 45 F. In this case, for a 30GT420 the capacity is 409.8 tons, and power input is

476.3 kW. Interpolate between 45 F and 46 F to find determined capacity and power input at a corrected LCWT (45.3 F).

Values are:

Capacity 412.1 tons
 Power input 478.0 kW

IV Calculate corrected cooler water flow.

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

$$= \frac{24 \times 412.1}{14} = 706.4 \text{ U.S. gpm}$$

V Calculate the cooler pressure drop.

Enter Cooler Pressure Drop curve (page 22) at corrected flow rate proportional to 2 modules. In this selection, enter at 1/2 the corrected flow rate (1/2 x 706.4 = 303.2 gpm) and read, for 30GT420, a pressure drop of 6.2 (per module) of water.

VI Check loop volume and cooler water flow rate.

Minimum loop volume, from application data, is 1200 gallons for 30GT420. Therefore, given volume of 1300 gallons is satisfactory. Minimum water flow rate, from application data, is 402 gpm for 30GT420. Flow rate of 706.4 gpm is well above minimum required.

Selection procedure — SI

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

Capacity required 1380 kW
 Leaving chilled water temperature (LCWT) . . . 6 C
 Cooler water temperature rise 7.8° C
 Condenser entering-air temperature (CEAT) . . 35 C
 Loop volume 4800 L
 Electrical Power 400-3-50

Unit can be selected from ratings provided in this catalog, or by using the Carrier 30-Series Chiller Selection Program (contact your Carrier representative).

Ratings are based on 5.6° C rise and are suitable for a temperature rise range from 2.8 C 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 28) at 7.8 C and read a correction of 0.14 C. Corrected LCWT is, therefore, 6 + 0.14 = 6.14 C.

III Determine capacity, unit size, and power input.

Enter Cooling Capacities table at given CEAT and LCWT — respectively, 35 C and 6 C. In this case, 1383.7 kW

is delivered by a 30GT420. Interpolate between 6 C and 7 C to find the determined capacity and power input at corrected LCWT (6.14 C)

Values are:

Capacity 1391.9 kW
 Power input 471.5 kW

IV Calculate corrected cooler water flow.

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

$$= \frac{0.239 \times 1391.9}{7.8} = 42.7 \text{ L/s}$$

V Calculate cooler pressure drop.

Enter Cooler Pressure Drop curve (page 22) at corrected flow rate proportional to 2 modules. In this selection, enter at 1/2 the corrected flow rate (1/2 x 42.7 = 21.4 L/s) and read, for 30GT420, a pressure drop of 22.6 (per module) kPa

VI Check loop volume and cooler water flow rate.

Minimum loop volume, from application data, is 4597 L for 30GT420. Therefore, given volume of 4800 L is satisfactory. Minimum water flow rate, from application data, is 25.4 L/s for 30GT420. Flow rate of 42.7 L/s is well above minimum required.

Performance data — English and SI



60 Hz — STANDARD RATINGS* — REFRIGERANT 22

UNIT SIZE	OUTPUT (CAPACITY)			INPUT POWER (kW)		EFFICIENCY	
	kW	Tons	Btuh	Compressor	Fan	EER	COP
240	776.2	220.7	2,648,400	245.2	28.2	9.7	2.8
270	903.5	256.9	3,082,800	289.0	28.1	9.7	2.8
300	978.1	278.1	3,337,200	318.3	31.0	9.6	2.8
330	1105.4	314.3	3,771,600	362.0	31.0	9.6	2.8
360	1212.7	344.8	4,137,600	398.5	37.1	9.5	2.8
390	1314.7	373.8	4,485,600	434.9	37.1	9.5	2.8
420	1414.5	402.2	4,826,400	470.8	37.1	9.5	2.8

LEGEND

ARI — Air Conditioning and Refrigeration Institute

COP — Coefficient of Performance

EER — Energy Efficiency Ratio

*Per ARI Standard 590-92

NOTE: 95 F (35 C) condenser entering air temperature;
54 F (12.2 C) entering/44 F (6.7 C) leaving cooler water;
.00025 ft² • hr • °F/Btu (.000044 m² • K/W) cooler fouling allowance.

$$\text{EER} = \frac{\text{Capacity (Btuh)}}{\text{Unit Input Power (W)}} \quad \text{COP} = \frac{\text{Capacity (kW)}}{\text{Unit Input Power (kW)}}$$

50 Hz — STANDARD RATINGS* — REFRIGERANT 22

UNIT SIZE	OUTPUT (CAPACITY)			INPUT POWER (kW)		EFFICIENCY	
	kW	Tons	Btuh	Compressor	Fan	EER	COP
240	786.8	223.7	2,684,400	253.4	28.1	9.5	2.8
270	909.5	258.6	3,103,200	299.5	28.2	9.5	2.8
300	991.1	281.8	3,381,600	327.2	30.9	9.4	2.8
330	1113.5	316.6	3,799,200	373.3	31.0	9.4	2.8
360	1188.4	337.9	4,054,800	399.8	34.0	9.3	2.7
390	1339.3	380.8	4,569,600	451.5	37.1	9.4	2.7
420	1413.8	402.0	4,824,000	476.2	37.1	9.4	2.8

LEGEND

ARI — Air Conditioning and Refrigeration Institute

COP — Coefficient of Performance

EER — Energy Efficiency Ratio

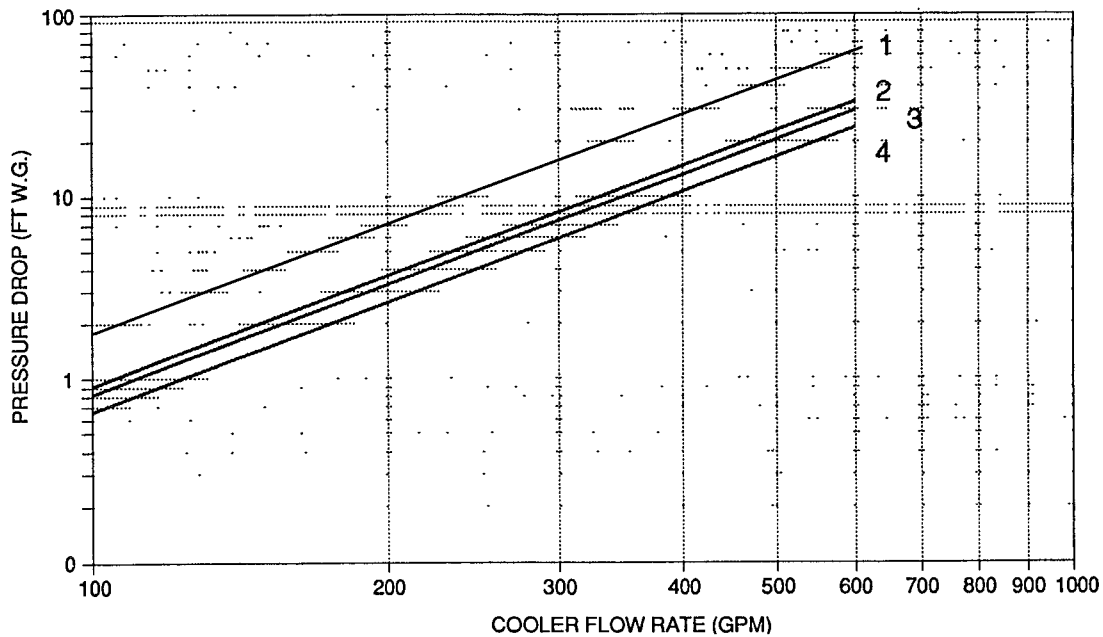
*Per ARI Standard 590-92.

NOTE: 95 F (35 C) condenser entering air temperature;
54 F (12.2 C) entering/44 F (6.7 C) leaving cooler water;
.00025 ft² • hr • °F/Btu (.000044 m² • K/W) cooler fouling allowance.

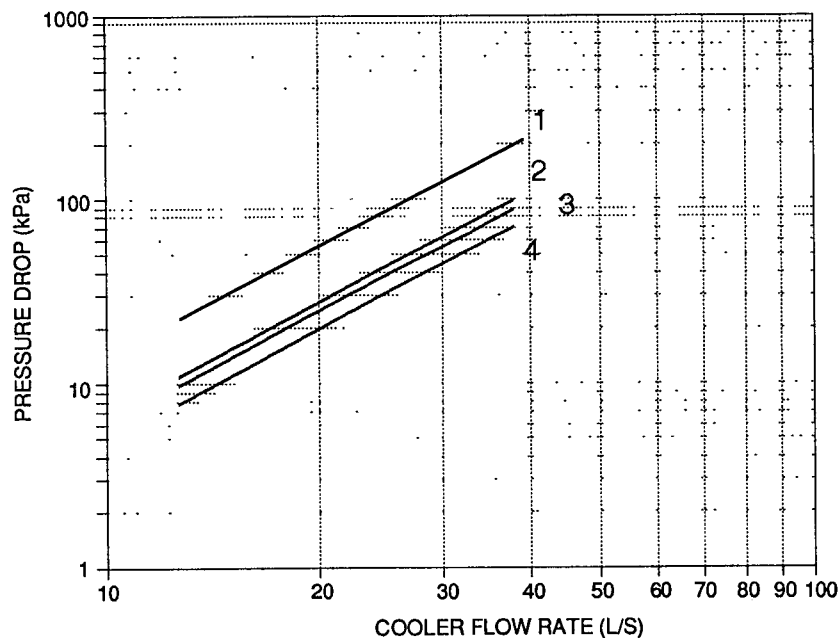
$$\text{EER} = \frac{\text{Capacity (Btuh)}}{\text{Unit Input Power (W)}} \quad \text{COP} = \frac{\text{Capacity (kW)}}{\text{Unit Input Power (kW)}}$$

PRESSURE DROP CURVES

ENGLISH



SI



COOLER PRESSURE DROP KEY

- 1 Module B — 30GN,GT240,270
- 2 Module A — 30GN,GT240,300
- 3 Module A — 30GN,GT270,330
Module B — 30GN,GT300,330,360 (50 Hz)
- 4 Module A — 30GN,GT360 (50 or 60 Hz), 390 & 420
Module B — 30GN,GT360 (60 Hz), 390 & 420

Performance data — English



COOLING CAPACITIES — 60 HZ ENGLISH

CONDENSER ENTERING-AIR TEMPERATURE (F)																
LCWT (F)	Unit Size	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)
40	240	218.9	223.6	524.0	206.9	237.1	495.4	194.9	249.6	466.7	182.8	260.8	437.6	170.4	270.9	408.0
	270	254.9	263.4	610.2	240.4	278.6	575.6	225.9	292.5	540.7	211.1	304.9	505.4	196.1	315.7	469.4
	300	277.7	291.8	664.8	263.0	308.5	629.6	248.1	323.8	593.9	232.9	337.6	557.6	217.4	349.9	520.5
	330	313.7	331.5	751.0	296.5	350.0	709.8	279.0	366.8	668.0	261.3	381.7	625.4	243.1	394.6	581.9
	360	343.7	364.9	822.8	325.9	385.7	780.2	307.7	404.8	736.5	289.1	422.4	692.0	270.4	438.5	647.4
	390	369.9	396.7	885.5	349.3	417.6	836.2	328.7	436.8	786.9	308.1	454.5	737.6	287.3	470.3	687.8
	420	395.9	428.2	947.7	372.8	449.3	892.4	349.7	468.5	837.2	327.0	486.3	782.9	304.0	501.8	727.7
42	240	226.0	227.2	541.3	213.8	241.2	512.1	201.4	254.0	482.6	189.1	265.9	453.0	176.5	276.5	422.9
	270	263.3	267.9	630.8	248.6	283.8	595.7	233.7	298.2	559.8	218.6	311.2	523.7	203.4	322.6	487.2
	300	285.4	296.2	683.8	270.5	313.4	648.0	255.3	329.2	611.6	239.9	343.6	574.7	224.2	356.4	537.1
	330	322.8	336.9	773.3	305.4	356.0	731.6	287.6	373.4	688.9	269.4	388.9	645.5	251.0	402.5	601.3
	360	353.6	370.8	847.1	335.1	392.0	802.8	316.9	411.9	759.2	298.0	430.2	713.9	279.0	446.9	668.4
	390	382.4	404.5	916.1	361.5	426.2	866.1	340.3	446.1	815.2	319.1	464.4	764.5	297.8	480.9	713.4
	420	410.9	438.0	984.3	387.5	460.1	928.2	363.8	480.1	871.4	340.1	498.3	814.8	316.4	514.7	758.0
44	240	233.1	230.8	558.8	220.7	245.2	529.0	208.1	258.6	499.0	195.4	270.8	468.5	182.7	282.1	438.0
	270	271.8	272.5	651.6	256.9	289.0	615.9	241.8	304.0	579.5	226.3	317.5	542.5	210.7	329.5	505.1
	300	293.2	300.6	703.0	278.1	318.3	666.7	262.7	334.7	629.6	246.9	349.5	591.9	231.0	363.0	553.8
	330	332.0	342.3	795.8	314.3	362.0	753.5	296.3	380.1	710.2	277.8	396.2	665.9	259.0	410.4	620.9
	360	363.7	376.9	871.9	344.8	398.5	826.7	326.2	419.1	781.9	307.2	438.1	736.5	287.6	455.4	689.5
	390	395.1	412.4	947.1	373.8	434.9	896.2	352.3	455.6	844.6	330.4	474.5	792.1	—	—	—
	420	426.4	447.9	1022.1	402.2	470.8	964.2	378.2	491.9	906.6	353.8	510.9	848.2	—	—	—
45	240	236.7	232.7	567.7	224.2	247.3	537.7	211.5	260.9	507.2	198.8	273.5	476.7	185.8	284.8	445.6
	270	276.2	274.9	662.2	261.1	291.6	626.1	245.8	306.9	589.4	230.3	320.7	552.2	214.4	333.0	514.2
	300	297.2	302.8	712.6	281.9	320.8	676.1	266.4	337.4	638.7	250.6	352.6	601.0	234.4	366.3	562.2
	330	336.6	345.0	807.2	318.8	365.1	764.5	300.7	383.4	720.9	282.1	399.9	676.4	263.1	414.4	630.8
	360	368.7	379.8	884.2	349.8	401.9	838.7	330.8	422.7	793.3	311.8	442.0	747.7	292.1	459.7	700.5
	390	401.5	416.4	962.7	380.0	439.2	911.1	358.3	460.3	859.1	336.2	479.6	806.2	—	—	—
	420	434.1	453.0	1041.0	409.8	476.3	982.8	385.3	497.6	923.8	360.7	517.1	865.0	—	—	—
46	240	240.4	234.5	576.6	227.8	249.4	546.3	214.9	263.2	515.5	202.0	276.0	484.6	189.0	287.7	453.3
	270	280.5	277.2	672.7	265.3	294.2	636.4	249.9	309.8	599.4	234.2	323.9	561.8	218.2	336.5	523.5
	300	301.2	305.0	722.4	285.8	323.3	685.5	270.1	340.2	647.8	254.2	355.6	609.8	237.9	369.6	570.7
	330	341.2	347.7	818.5	323.4	368.1	775.6	305.0	386.7	731.7	286.3	403.6	686.8	267.2	418.4	640.8
	360	373.9	382.9	896.9	354.9	405.3	851.3	335.5	426.2	804.7	316.3	445.9	758.7	296.6	464.0	711.4
	390	408.0	420.4	978.5	386.2	443.5	926.3	364.2	465.0	873.6	342.1	484.9	820.6	—	—	—
	420	442.0	458.1	1060.2	417.4	481.8	1001.2	392.7	503.7	942.0	368.0	523.7	882.6	—	—	—
48	240	247.8	238.2	594.7	234.9	253.5	563.7	221.9	267.8	532.5	208.7	281.1	500.8	195.4	293.2	468.9
	270	289.3	281.8	694.2	273.9	299.4	657.3	258.1	315.6	619.5	242.2	330.3	581.2	226.0	343.6	542.3
	300	309.2	309.5	742.0	293.6	328.3	704.6	277.7	345.7	666.4	261.4	361.7	627.4	244.9	376.2	587.8
	330	350.7	353.2	841.6	332.5	374.2	798.1	313.9	393.4	753.4	294.9	410.9	707.8	275.5	426.5	661.3
	360	384.2	388.9	922.0	364.8	412.0	875.6	345.1	433.4	828.3	325.6	453.9	781.5	305.6	472.5	733.4
	390	421.1	428.6	1010.5	398.9	452.4	957.3	376.6	474.7	903.8	353.9	495.3	849.4	—	—	—
	420	458.0	468.3	1099.1	432.8	492.9	1038.7	407.6	515.6	978.2	382.2	536.5	917.2	—	—	—
50	240	255.3	241.9	613.1	242.2	257.7	581.6	228.9	272.5	549.7	215.5	286.2	517.2	201.8	298.8	484.6
	270	298.2	286.6	716.1	282.5	304.7	678.3	266.5	321.4	640.0	250.3	336.8	600.9	233.8	350.6	561.3
	300	317.3	314.0	762.0	301.5	333.3	723.9	285.3	351.3	685.1	268.9	367.8	645.6	252.1	382.8	605.2
	330	360.3	358.7	865.0	341.8	380.3	820.6	323.0	400.2	775.4	303.7	418.3	729.1	283.9	434.6	681.8
	360	394.7	395.0	947.7	374.9	418.7	900.2	354.9	440.7	852.2	334.9	461.7	804.2	314.8	481.2	755.8
	390	434.5	436.9	1043.3	411.8	461.4	988.7	389.0	484.4	934.0	366.0	505.8	878.8	—	—	—
	420	474.2	478.8	1138.6	448.5	504.1	1077.0	422.7	527.7	1015.0	396.8	549.5	952.6	—	—	—

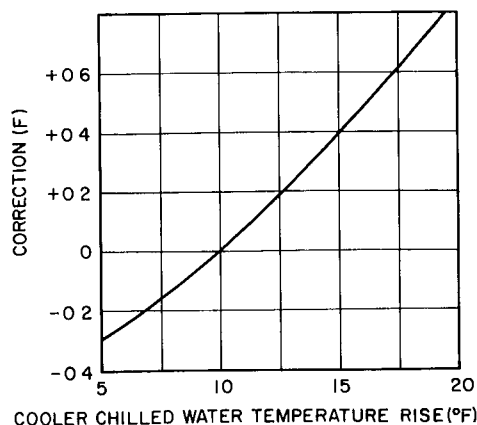
Performance data — English (cont)



COOLING CAPACITIES — 60 HZ ENGLISH (cont)

CONDENSER ENTERING-AIR TEMPERATURE (F)																
LCWT (F)	Unit Size	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)
55	240	274.7	251.2	660.2	261.0	268.2	627.2	247.2	284.2	594.0	233.0	299.2	560.1	218.7	313.1	525.7
	270	321.2	298.5	772.0	304.8	318.0	732.7	288.1	336.2	692.5	271.1	353.1	651.6	—	—	—
	300	338.2	325.5	812.9	321.8	346.1	773.5	305.1	365.4	733.2	288.0	383.2	692.1	—	—	—
	330	384.6	372.8	924.5	365.5	395.9	878.6	346.0	417.3	831.5	325.9	437.0	783.4	—	—	—
	360	421.4	410.5	1012.8	401.0	435.8	963.8	380.3	459.6	914.1	359.1	481.8	863.1	—	—	—
	390	469.1	458.3	1127.4	445.1	484.5	1069.8	421.1	509.2	1012.1	—	—	—	—	—	—
	420	516.4	505.9	1241.1	489.1	533.2	1175.5	461.8	558.8	1109.9	—	—	—	—	—	—
	420	516.4	505.9	1241.1	489.1	533.2	1175.5	461.8	558.8	1109.9	—	—	—	—	—	—
60	240	292.3	259.5	703.1	276.4	276.7	664.9	260.5	292.7	626.5	244.4	307.4	587.9	228.2	320.9	549.1
	270	342.7	309.5	824.4	324.0	329.4	779.5	304.3	347.1	732.0	282.5	361.6	679.6	—	—	—
	300	359.5	337.2	864.9	342.6	359.1	824.2	324.5	378.9	780.7	304.1	395.8	731.5	—	—	—
	330	410.0	387.2	986.2	390.2	411.8	938.6	368.4	433.3	886.2	342.2	450.1	823.2	—	—	—
	360	449.0	426.4	1080.0	427.8	453.2	1029.0	406.3	478.7	977.3	384.5	502.7	924.9	—	—	—
	390	494.1	473.0	1188.7	466.9	498.7	1123.3	439.7	522.7	1057.7	—	—	—	—	—	—
	420	538.9	519.3	1296.4	505.8	544.0	1216.7	472.9	566.5	1137.6	—	—	—	—	—	—
	420	538.9	519.3	1296.4	505.8	544.0	1216.7	472.9	566.5	1137.6	—	—	—	—	—	—

LCWT CORRECTION (ENGLISH)



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

LEGEND

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

NOTES:

- All ratings are based on.
 - A cooler water temperature rise of 10° F. When greater accuracy is desired, correct design LCWT, before entering rating tables, by reference to the LCWT correction curve.
 - A fouling factor of 0.00025 in the cooler
 - Refrigerant 22
- When a corrected LCWT is used, cooler pressure drop must also be corrected for new LCWT.
 - Enter rating table for corrected LCWT. By interpolation, determine corrected capacity (tons) and power input (kW) to compressor at its rated voltage.
 - Calculate corrected flow rate through the cooler:

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

COOLING CAPACITIES – 50 HZ ENGLISH

CONDENSER ENTERING-AIR TEMPERATURE (F)

LCWT (F)	Unit Size	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)
40	240	221.8	231.4	531.0	210.0	244.7	502.6	198.0	257.0	474.0	186.1	268.4	445.4	174.1	278.9	416.7
	270	256.1	273.6	613.1	242.4	288.5	580.2	228.5	302.1	547.0	214.6	314.7	513.7	200.5	326.1	480.0
	300	281.3	300.2	673.3	266.7	316.9	638.5	251.9	332.4	603.0	237.0	346.6	567.4	221.9	359.6	531.3
	330	315.5	342.4	755.3	299.1	360.7	715.9	282.4	377.5	676.0	265.5	392.9	635.6	248.4	406.8	594.6
	360	336.3	367.2	805.1	319.4	386.4	764.5	302.4	404.4	724.0	285.2	421.1	682.7	267.5	436.2	640.4
	390	376.4	413.1	901.0	356.7	433.5	853.8	337.1	452.7	807.0	317.3	470.4	759.6	297.3	486.6	711.8
	420	395.2	433.9	946.1	373.4	454.6	893.8	351.6	473.8	841.6	329.8	491.5	789.5	307.9	507.5	737.0
42	240	228.9	235.3	548.3	216.8	249.0	519.3	204.6	261.8	490.2	192.3	273.6	460.8	180.1	284.6	431.4
	270	264.5	278.6	633.5	250.4	294.0	599.9	236.3	308.2	566.0	222.0	321.2	531.9	207.7	333.1	497.5
	300	289.0	304.8	692.4	274.2	322.0	656.9	259.2	338.0	621.0	244.0	352.7	584.5	228.6	366.2	547.7
	330	324.5	348.1	777.5	307.8	367.0	737.4	290.8	384.4	696.7	273.3	400.3	655.5	256.2	414.8	613.7
	360	345.9	373.4	828.6	328.6	393.1	787.2	311.2	411.6	745.6	293.7	428.9	703.7	275.7	444.6	660.4
	390	388.7	421.3	931.3	368.8	442.6	883.6	348.6	462.3	835.2	328.4	480.7	786.8	—	—	—
	420	409.8	443.8	981.8	387.7	465.4	928.7	365.3	485.3	875.1	342.9	503.8	821.5	—	—	—
44	240	236.1	239.3	566.1	223.7	253.4	536.3	211.3	266.7	506.5	198.7	278.9	476.4	186.2	290.3	446.3
	270	272.9	283.7	654.3	258.6	299.5	619.9	244.2	314.2	585.3	229.6	327.8	550.4	214.9	340.3	515.2
	300	296.9	309.5	711.7	281.8	327.2	675.6	266.6	343.7	639.0	251.0	358.9	601.8	235.4	372.9	564.3
	330	333.7	353.9	799.9	316.6	373.3	759.1	299.4	391.2	717.7	281.9	407.8	675.7	264.1	422.9	633.1
	360	355.6	379.6	852.6	337.9	399.8	810.0	320.3	418.9	767.8	302.4	436.8	724.9	284.1	453.2	681.2
	390	401.4	429.7	962.2	380.8	451.5	912.9	360.4	472.0	863.9	339.8	491.1	814.5	—	—	—
	420	425.0	453.9	1018.8	402.0	476.2	963.8	379.3	497.0	909.3	356.4	516.2	854.3	—	—	—
45	240	239.7	241.3	574.9	227.2	255.7	544.8	214.8	269.2	515.0	202.1	281.6	484.5	189.3	293.1	453.9
	270	277.2	286.2	664.8	262.7	302.3	630.1	248.2	317.3	595.1	233.5	331.1	559.8	218.6	343.8	524.2
	300	300.9	311.9	721.4	285.6	329.8	684.9	270.3	346.6	648.2	254.7	362.0	610.8	238.8	376.2	572.7
	330	338.3	356.8	811.2	321.1	376.4	770.0	303.7	394.7	728.3	286.0	411.5	685.9	268.1	426.9	642.9
	360	360.5	382.7	864.5	342.7	403.3	821.8	324.8	422.6	778.8	306.8	440.7	735.6	288.5	457.5	691.8
	390	407.8	433.9	977.8	387.0	456.1	928.0	366.3	476.9	878.5	345.6	496.4	828.7	—	—	—
	420	432.7	459.0	1037.6	409.5	481.7	981.8	386.4	503.0	926.6	363.2	522.5	870.9	—	—	—
46	240	243.4	243.3	583.8	230.8	257.9	553.6	218.1	271.5	523.1	205.4	284.3	492.7	192.4	296.0	461.6
	270	281.6	288.8	675.3	266.9	305.1	640.3	252.2	320.4	604.9	237.3	334.5	569.3	222.3	347.4	533.3
	300	304.9	314.2	731.2	289.6	332.4	694.6	274.1	349.4	657.3	258.3	365.1	619.6	242.3	379.6	581.2
	330	342.9	359.7	822.6	325.6	379.6	781.0	308.1	398.2	738.9	290.2	415.3	696.2	272.2	431.0	652.8
	360	365.4	385.8	876.5	347.4	406.7	833.4	329.3	426.3	790.0	311.2	444.7	746.4	292.8	461.8	702.2
	390	414.3	438.2	993.6	393.3	460.7	943.3	372.4	481.8	893.2	351.4	501.7	842.8	—	—	—
	420	440.5	464.2	1056.5	416.9	487.3	1000.1	393.6	508.9	944.2	370.1	528.9	887.7	—	—	—
48	240	250.8	247.3	601.9	238.0	262.4	571.2	225.0	276.4	540.0	212.0	298.6	508.9	198.9	301.9	477.3
	270	290.3	293.9	696.7	275.4	310.8	661.0	260.4	326.6	624.9	245.2	341.2	588.5	229.9	354.7	551.7
	300	312.9	318.9	751.0	297.4	337.7	713.7	281.6	355.1	675.8	265.6	371.4	637.5	249.4	386.4	598.5
	330	352.3	365.5	845.6	334.7	386.1	803.3	316.9	405.2	760.5	298.7	422.9	717.0	280.3	439.2	672.8
	360	375.3	392.1	900.8	357.2	413.6	857.2	338.7	433.8	813.0	320.0	452.6	768.1	—	—	—
	390	427.4	446.8	1025.7	405.9	469.9	974.2	384.4	491.7	922.5	363.1	512.4	871.4	—	—	—
	420	456.2	474.7	1094.9	432.1	498.6	1037.1	408.0	520.9	979.3	384.1	541.7	921.9	—	—	—
50	240	258.4	251.4	620.5	245.3	266.9	589.0	232.1	281.4	557.4	218.8	295.0	525.3	205.4	307.7	493.2
	270	299.2	299.1	718.5	284.0	316.5	682.0	268.7	332.8	645.2	253.2	347.9	608.0	—	—	—
	300	321.1	323.7	771.0	305.3	342.9	733.1	289.3	361.0	694.7	273.0	377.7	655.5	—	—	—
	330	361.9	371.4	868.8	344.0	392.5	825.9	325.8	412.2	782.3	307.4	430.5	738.0	—	—	—
	360	385.4	398.5	925.4	366.9	420.6	881.0	348.1	441.3	835.9	329.2	460.8	790.5	—	—	—
	390	440.7	455.6	1058.2	418.8	479.4	1005.7	396.8	501.8	952.8	374.7	522.9	899.7	—	—	—
	420	472.3	485.4	1134.1	447.7	510.0	1074.9	423.0	533.1	1015.6	398.2	554.6	956.2	—	—	—

Performance data — English (cont)



COOLING CAPACITIES — 50 HZ ENGLISH (cont)

CONDENSER ENTERING-AIR TEMPERATURE (F)																
LCWT (F)	Unit Size	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)
55	240	277.9	261.7	667.9	264.1	278.3	634.9	250.3	294.0	601.7	236.4	308.8	568.3	222.3	322.7	534.4
	270	322.1	312.4	774.1	306.1	331.1	735.8	290.1	348.6	697.1	273.9	365.1	658.3	—	—	—
	300	341.9	335.8	821.8	325.5	356.3	782.3	308.9	375.5	742.3	292.1	393.7	702.0	—	—	—
	330	386.0	386.4	927.8	367.4	408.9	883.0	348.6	430.1	837.8	329.5	449.9	791.9	—	—	—
	360	410.9	414.6	987.7	391.7	438.2	941.5	372.3	460.4	894.8	352.5	481.4	847.3	—	—	—
	390	475.1	478.0	1141.8	452.1	503.6	1086.6	428.9	527.8	1031.0	—	—	—	—	—	—
	420	513.9	513.0	1235.2	487.8	539.6	1172.5	461.6	564.6	1109.5	—	—	—	—	—	—
60	240	296.2	271.1	712.6	280.4	287.7	674.5	264.5	303.3	636.2	248.5	317.8	597.7	232.5	331.2	559.4
	270	344.0	324.8	827.5	325.8	343.6	783.6	306.9	360.6	738.3	286.0	374.7	688.0	—	—	—
	300	363.6	348.3	874.6	346.6	370.0	833.8	328.8	389.9	790.9	308.5	407.0	742.2	—	—	—
	330	411.4	402.0	989.6	392.0	425.9	943.0	371.2	447.2	893.0	346.1	463.9	832.5	—	—	—
	360	437.7	431.3	1052.9	417.6	456.3	1004.5	396.8	479.4	954.5	373.6	499.6	898.8	—	—	—
	390	500.0	493.7	1202.7	473.7	518.6	1139.5	447.5	542.1	1076.5	—	—	—	—	—	—
	420	535.7	526.5	1288.7	503.9	550.4	1212.2	472.4	572.4	1136.4	—	—	—	—	—	—

Performance data — SI



COOLING CAPACITIES — 60 HZ SI

CONDENSER ENTERING-AIR TEMPERATURE (C)																
LCWT (C)	Unit Size	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)
5	240	777.9	226.8	33.4	739.8	239.1	31.8	701.4	250.5	30.1	662.6	261.1	28.5	623.4	270.8	26.8
	270	906.1	267.3	38.9	860.1	281.2	37.0	813.2	294.0	34.9	766.1	305.6	32.9	718.4	316.0	30.9
	300	984.9	295.7	42.3	938.1	310.9	40.3	890.6	325.0	38.3	842.2	337.9	36.2	793.1	349.6	34.1
	330	1113.2	336.2	47.8	1058.5	353.0	45.5	1002.5	368.5	43.1	945.8	382.4	40.6	888.2	394.8	38.2
	360	1219.7	370.0	52.4	1162.7	388.9	49.9	1104.7	406.5	47.5	1045.6	422.9	44.9	986.0	437.9	42.4
	390	1316.2	402.8	56.5	1249.4	421.8	53.7	1184.0	439.6	50.9	1117.6	456.0	48.0	1050.7	470.9	45.1
	420	1410.9	435.4	60.6	1336.2	454.6	57.4	1262.9	472.5	54.3	1189.2	488.8	51.1	1115.0	503.5	47.9
6	240	800.4	230.1	34.4	761.5	242.8	32.7	722.3	254.6	31.1	682.8	265.6	29.4	642.9	275.6	27.6
	270	932.8	271.4	40.1	886.0	285.9	38.1	838.6	299.1	36.1	790.3	311.2	34.0	741.7	322.0	31.9
	300	1009.6	299.7	43.4	961.9	315.4	41.3	913.6	329.9	39.3	864.6	343.2	37.2	814.8	355.3	35.0
	330	1142.0	341.0	49.1	1086.6	358.4	46.7	1030.0	374.4	44.3	972.2	388.8	41.8	913.6	401.7	39.3
	360	1251.0	375.4	53.8	1191.8	394.6	51.2	1134.0	412.9	48.7	1074.7	429.8	46.2	1013.4	445.4	43.6
	390	1354.6	409.8	58.2	1288.4	429.5	55.4	1220.8	447.9	52.5	1153.3	464.9	49.6	1085.4	480.5	46.7
	420	1458.1	444.2	62.7	1382.8	464.2	59.4	1307.4	482.7	56.2	1232.4	499.8	53.0	1156.8	515.3	49.7
7	240	823.1	233.4	35.4	783.6	246.5	33.7	743.4	258.7	32.0	703.7	270.1	30.3	662.8	280.5	28.5
	270	959.9	275.6	41.3	912.3	290.5	39.2	864.1	304.3	37.2	815.3	316.8	35.1	765.5	328.1	32.9
	300	1034.3	303.8	44.5	986.2	319.8	42.4	937.0	334.7	40.3	887.5	348.6	38.2	836.7	361.0	36.0
	330	1171.1	346.0	50.4	1114.9	363.8	48.0	1057.6	380.3	45.5	999.2	395.3	43.0	939.5	408.7	40.4
	360	1283.2	380.9	55.2	1223.2	400.6	52.6	1163.4	419.2	50.0	1103.6	436.7	47.5	1041.8	452.9	44.8
	390	1395.4	417.1	60.0	1327.1	437.4	57.1	1259.1	456.3	54.2	1189.6	473.8	51.2	1120.5	490.1	48.2
	420	1507.3	453.4	64.8	1430.3	474.0	61.5	1353.3	493.2	58.2	1276.0	510.9	54.9	1199.0	527.2	51.6
8	240	846.1	236.8	36.4	806.0	250.2	34.7	765.4	262.8	32.9	724.3	274.5	31.2	683.1	285.4	29.4
	270	987.4	279.9	42.5	939.1	295.2	40.4	890.1	309.4	38.3	840.1	322.4	36.2	789.7	334.2	34.0
	300	1059.4	307.8	45.6	1010.6	324.3	43.5	960.9	339.7	41.4	910.2	353.8	39.2	859.1	366.9	37.0
	330	1200.6	350.9	51.7	1143.7	369.3	49.2	1085.6	386.3	46.7	1026.0	401.7	44.2	965.7	415.7	41.6
	360	1315.6	386.4	56.6	1255.1	406.6	54.0	1193.0	425.5	51.3	1132.7	443.6	48.7	1070.3	460.4	46.1
	390	1436.2	424.5	61.8	1366.9	445.3	58.8	1297.5	464.9	55.8	1227.7	483.2	52.8	1156.0	499.8	49.7
	420	1557.0	462.6	67.0	1478.7	484.0	63.6	1399.9	503.9	60.2	1321.5	522.3	56.9	1241.8	539.1	53.4
9	240	869.6	240.1	37.4	828.6	254.0	35.7	787.4	266.9	33.9	745.6	279.0	32.1	703.5	290.2	30.3
	270	1015.1	284.1	43.7	966.9	299.9	41.6	916.4	314.6	39.5	865.8	328.1	37.3	814.4	340.4	35.1
	300	1084.8	311.9	46.7	1035.3	328.8	44.6	984.9	344.6	42.4	933.5	359.2	40.2	881.4	372.6	38.0
	330	1230.3	355.9	53.0	1172.7	374.8	50.5	1113.8	392.3	48.0	1053.8	408.3	45.4	992.3	422.8	42.7
	360	1348.0	391.8	58.0	1286.6	412.6	55.4	1224.5	432.1	52.7	1163.0	450.8	50.1	1099.4	468.0	47.3
	390	1477.7	431.9	63.6	1407.3	453.3	60.6	1336.6	473.5	57.5	1264.9	492.3	54.5	—	—	—
	420	1607.5	471.9	69.2	1527.7	494.0	65.8	1447.6	514.6	62.3	1366.9	533.7	58.9	—	—	—
10	240	893.1	243.5	38.5	851.9	257.7	36.7	809.9	271.1	34.9	767.4	283.6	33.1	724.3	295.2	31.2
	270	1043.4	288.4	44.9	993.5	304.7	42.8	943.1	319.8	40.6	891.7	333.8	38.4	839.7	346.6	36.2
	300	1110.3	316.0	47.8	1060.3	333.3	45.7	1009.2	349.5	43.5	957.3	364.6	41.2	904.2	378.4	38.9
	330	1260.5	360.9	54.3	1202.0	380.3	51.8	1142.5	398.3	49.2	1081.6	414.8	46.6	1019.6	429.9	43.9
	360	1381.3	397.5	59.5	1318.5	418.7	56.8	1256.1	438.7	54.1	1193.0	457.8	51.4	1128.5	475.5	48.6
	390	1520.1	439.5	65.5	1448.2	461.4	62.4	1376.0	482.1	59.3	1303.5	501.6	56.1	—	—	—
	420	1658.6	481.4	71.4	1577.4	504.1	67.9	1495.7	525.4	64.4	1413.7	545.2	60.9	—	—	—

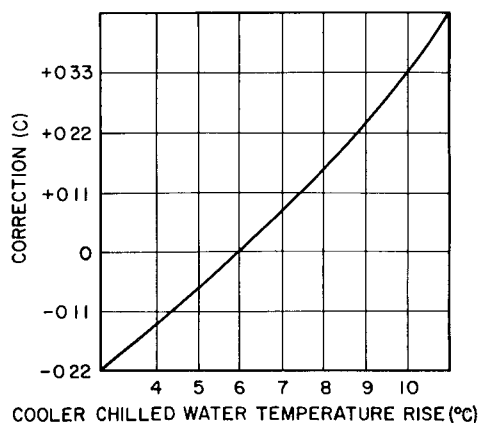
Performance data — SI (cont)



COOLING CAPACITIES — 60 HZ SI (cont)

CONDENSER ENTERING-AIR TEMPERATURE (C)																
LCWT (C)	Unit Size	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)
13	240	966.7	253.7	41.7	923.2	269.1	39.8	879.3	283.6	37.9	834.5	297.3	36.0	789.3	310.1	34.0
	270	1130.5	301.5	48.7	1078.5	319.1	46.5	1025.4	335.6	44.2	971.6	351.1	41.9	916.7	365.4	39.5
	300	1189.7	328.5	51.3	1137.6	347.1	49.1	1084.5	364.6	46.8	1030.1	381.0	44.4	975.1	396.2	42.0
	330	1353.0	376.3	58.3	1292.4	397.1	55.7	1230.3	416.6	53.1	1166.9	434.7	50.3	1102.2	451.4	47.5
	360	1482.4	414.4	63.9	1417.5	437.2	61.1	1352.1	458.7	58.3	1285.5	479.3	55.4	1218.6	498.6	52.5
	390	1651.2	462.7	71.2	1575.0	486.5	67.9	1498.6	508.8	64.6	—	—	—	—	—	—
	420	1818.6	510.9	78.4	1731.7	535.6	74.7	1645.0	558.9	70.9	—	—	—	—	—	—
16	240	1027.6	262.0	44.4	977.2	277.5	42.2	926.5	292.0	40.0	875.7	305.5	37.8	824.5	318.1	35.6
	270	1206.2	312.8	52.1	1144.6	330.3	49.4	1078.4	345.6	46.5	1009.4	358.9	43.6	—	—	—
	300	1270.7	341.3	54.8	1214.6	360.7	52.4	1153.4	378.0	49.8	1088.8	393.6	47.0	—	—	—
	330	1449.3	392.1	62.6	1382.1	413.4	59.6	1305.3	431.6	56.3	1222.4	446.9	52.8	—	—	—
	360	1587.7	431.8	68.5	1519.7	456.0	65.6	1451.4	479.2	62.6	1383.3	501.1	59.7	—	—	—
	390	1736.6	476.9	75.0	1650.0	500.1	71.2	1563.7	521.9	67.5	—	—	—	—	—	—
	420	1884.6	521.9	81.3	1779.7	544.0	76.8	1675.4	564.4	72.3	—	—	—	—	—	—

LCWT CORRECTION (SI)



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

LEGEND

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

NOTES:

- All ratings are based on.
 - A cooler water temperature rise of 5.6° C. When greater accuracy is desired, correct design LCWT, before entering rating tables, by reference to the LCWT correction curve.
 - A fouling factor of 0.000044 in the cooler.
 - Refrigerant 22
- When a corrected LCWT is used, cooler pressure drop must also be corrected for new LCWT:
 - Enter rating table for corrected LCWT. By interpolation, determine corrected capacity (kW) and power input (kW) to compressor at its rated voltage.
 - Calculate corrected flow rate through the cooler:

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

COOLING CAPACITIES — 50 HZ SI

CONDENSER ENTERING-AIR TEMPERATURE (C)																
LCWT (C)	Unit Size	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)
5	240	788.3	234.7	33.9	750.3	246.8	32.2	712.2	258.2	30.6	673.8	268.8	28.9	635.5	278.6	27.3
	270	910.5	277.7	39.1	866.5	291.2	37.2	822.2	303.8	35.3	777.6	315.5	33.4	732.7	326.2	31.5
	300	997.7	304.3	42.9	951.1	319.5	40.9	904.1	333.7	38.8	856.4	346.9	36.8	808.3	359.1	34.7
	330	1119.7	347.2	48.1	1067.1	363.8	45.8	1013.9	379.3	43.6	960.0	393.6	41.2	905.5	406.7	38.9
	360	1193.4	372.2	51.3	1139.5	389.8	49.0	1085.4	406.3	46.6	1030.3	421.7	44.3	974.2	436.0	41.9
	390	1338.4	419.4	57.5	1275.3	437.9	54.8	1212.7	455.6	52.1	1149.6	472.0	49.4	1086.1	487.4	46.7
	420	1408.1	441.0	60.5	1338.1	460.0	57.5	1268.2	477.7	54.5	1198.4	494.1	51.5	1128.6	509.3	48.5
6	240	810.7	238.3	34.9	772.1	250.8	33.2	733.2	262.5	31.5	694.3	273.5	29.8	655.0	283.6	28.2
	270	937.0	282.3	40.3	892.1	296.2	38.3	847.0	309.2	36.4	801.6	321.3	34.5	755.8	332.5	32.5
	300	1022.3	308.5	43.9	975.1	324.1	41.9	927.2	338.7	39.9	879.0	352.4	37.8	830.0	364.9	35.7
	330	1148.3	352.4	49.4	1094.9	369.5	47.1	1040.8	385.4	44.7	986.1	400.2	42.4	930.7	413.7	40.0
	360	1223.8	377.9	52.6	1168.7	395.8	50.2	1113.2	412.7	47.9	1057.7	428.6	45.5	1001.1	443.5	43.0
	390	1377.6	426.8	59.2	1313.4	446.1	56.5	1249.7	464.2	53.7	1185.3	481.2	51.0	1120.5	497.2	48.2
	420	1454.6	450.1	62.5	1383.7	469.7	59.5	1312.2	488.0	56.4	1240.7	505.1	53.3	1169.2	520.9	50.3
7	240	833.6	242.0	35.9	794.2	254.8	34.2	754.6	266.8	32.5	714.9	278.1	30.7	675.0	288.7	29.0
	270	963.8	286.9	41.5	918.2	301.2	39.5	872.2	314.6	37.5	825.9	327.2	35.5	779.3	338.7	33.5
	300	1047.2	312.8	45.0	999.1	328.8	43.0	950.7	343.8	40.9	901.7	357.8	38.8	852.1	370.9	36.7
	330	1177.2	357.6	50.6	1123.0	375.2	48.3	1068.1	391.6	45.9	1012.5	406.8	43.6	956.2	420.9	41.1
	360	1254.8	383.6	54.0	1198.6	401.9	51.6	1142.0	419.3	49.1	1085.4	435.6	46.7	1028.0	451.0	44.2
	390	1417.8	434.5	61.0	1352.3	454.3	58.2	1287.2	472.9	55.4	1221.8	490.6	52.6	1155.5	507.0	49.7
	420	1502.7	459.3	64.6	1429.5	479.5	61.5	1357.1	498.6	58.4	1283.9	516.2	55.2	1210.6	532.7	52.1
8	240	856.6	245.6	36.9	816.7	258.8	35.1	776.3	271.2	33.4	735.8	282.8	31.7	695.2	293.8	29.9
	270	991.2	291.5	42.7	944.7	306.3	40.7	897.9	320.1	38.6	850.7	333.1	36.6	803.1	345.1	34.6
	300	1072.4	317.0	46.2	1023.9	333.5	44.1	974.6	348.9	41.9	924.7	363.3	39.8	874.2	376.7	37.6
	330	1206.6	362.9	51.9	1151.5	380.9	49.6	1095.8	397.8	47.2	1039.3	413.5	44.7	982.1	428.0	42.3
	360	1285.8	389.3	55.3	1228.6	408.1	52.9	1171.6	425.9	50.4	1113.8	442.7	47.9	1055.0	458.5	45.4
	390	1458.6	442.2	62.8	1391.9	462.5	59.9	1325.5	481.7	57.0	1258.7	499.9	54.2	—	—	—
	420	1551.7	468.7	66.8	1476.9	489.5	63.6	1402.5	509.2	60.4	1328.0	527.5	57.1	—	—	—
9	240	880.1	249.3	37.9	839.5	262.8	36.1	798.6	275.6	34.4	757.3	287.6	32.6	715.7	298.9	30.8
	270	1018.9	296.2	43.9	971.6	311.4	41.8	923.9	325.6	39.8	875.9	339.0	37.7	827.4	351.5	35.6
	300	1097.9	321.4	47.3	1048.7	338.2	45.2	998.8	354.0	43.0	948.1	368.9	40.8	896.8	382.7	38.6
	330	1236.3	368.2	53.2	1180.4	386.7	50.8	1123.8	404.0	48.4	1066.5	420.2	45.9	1008.3	435.2	43.4
	360	1317.2	395.0	56.7	1259.5	414.3	54.2	1201.0	432.6	51.7	1141.7	449.7	49.2	1082.8	466.1	46.6
	390	1500.1	450.1	64.6	1432.1	470.9	61.7	1363.8	490.6	58.7	1296.3	509.4	55.8	—	—	—
	420	1601.6	478.2	69.0	1525.2	499.7	65.7	1448.8	519.9	62.4	1372.9	539.0	59.1	—	—	—
10	240	904.2	253.0	38.9	862.7	266.9	37.2	821.0	280.0	35.4	778.8	292.4	33.5	736.6	304.0	31.7
	270	1047.0	300.9	45.1	998.9	316.5	43.0	950.4	331.2	40.9	901.5	345.0	38.8	852.1	357.9	36.7
	300	1123.8	325.7	48.4	1073.8	342.9	46.3	1023.2	359.2	44.1	971.6	374.4	41.9	919.8	388.7	39.6
	330	1266.3	373.6	54.5	1209.7	392.5	52.1	1152.2	410.3	49.6	1094.0	427.0	47.1	1034.9	442.5	44.6
	360	1348.9	400.7	58.1	1290.4	420.6	55.6	1230.9	439.3	53.0	1171.1	457.0	50.4	1110.5	473.7	47.8
	390	1542.2	458.0	66.4	1473.0	479.4	63.4	1403.4	499.7	60.5	1333.6	518.9	57.4	—	—	—
	420	1652.4	488.0	71.2	1574.4	510.0	67.8	1496.2	530.9	64.4	1418.0	550.5	61.1	—	—	—
13	240	978.0	264.3	42.2	934.6	279.3	40.3	890.5	293.5	38.4	846.3	307.0	36.5	801.8	319.8	34.6
	270	1133.6	315.4	48.9	1083.0	332.2	46.7	1031.9	348.2	44.5	980.7	363.3	42.3	—	—	—
	300	1202.7	338.9	51.9	1150.8	357.4	49.6	1097.7	374.8	47.3	1044.5	391.4	45.0	—	—	—
	330	1358.0	390.0	58.6	1298.8	410.3	56.0	1238.9	429.5	53.4	1178.6	447.6	50.8	—	—	—
	360	1445.8	418.3	62.3	1384.8	439.6	59.7	1323.2	459.8	57.1	1260.8	479.0	54.4	—	—	—
	390	1672.5	482.5	72.1	1599.5	505.6	69.0	1526.0	527.6	65.8	1451.8	548.2	62.6	—	—	—
	420	1810.2	518.1	78.1	1727.1	542.0	74.5	1643.9	564.8	70.9	1560.1	585.8	67.3	—	—	—
16	240	1041.6	273.6	45.0	991.3	288.6	42.8	940.8	302.7	40.6	890.3	316.0	38.4	839.4	328.4	36.2
	270	1210.9	328.0	52.3	1152.5	344.7	49.7	1087.3	359.1	46.9	1021.3	372.1	44.1	—	—	—
	300	1285.1	352.5	55.5	1230.6	371.9	53.1	1168.5	389.0	50.4	1104.9	404.8	47.7	—	—	—
	330	1454.3	406.9	62.8	1391.9	428.1	60.1	1315.0	445.5	56.8	1235.9	460.9	53.3	—	—	—
	360	1547.5	436.6	66.8	1483.0	458.9	64.0	1411.4	479.0	60.9	1338.2	497.6	57.8	—	—	—
	390	1757.4	497.7	75.8	1674.1	520.2	72.3	1590.9	541.5	68.7	1507.7	561.5	65.1	—	—	—
	420	1873.7	529.1	80.9	1773.0	550.5	76.5	1673.2	570.3	72.2	—	—	—	—	—	—

UNIT

UNIT SIZE	VOLTAGE			MODULE A										MODULE B							
				Standard Condenser Fan					High-Static Condenser Fan					Standard Condenser Fan				High-Static Condenser Fan			
	Nameplate V-Hz (3 Phase)	Supplied*		MCA	MOCP	ICF		MCA	MOCP	ICF		MCA	MOCP	ICF		MCA	MOCP	ICF			
		Min	Max			XL	PW			XL	PW			XL	PW			XL	PW	XL	PW
240	208/230-60	187	253	610.2	700	1111.1	835.1	701.8	800	1202.7	926.7	462.3†	500†	896.9	620.9	535.6	600	908.6	706.6		
	460-60	414	506	305.5	350	555.9	417.9	341.1	400	591.5	453.5	221.2†	250†	442.8	305.4	242.9	250	437.4	336.4		
	575-60	518	633	257.4	300	355.6	323.6	275.4	300	373.6	341.6	191.1†	225†	365.6	246.9	205.5	225	331.0	261.0		
	380-60	342	418	331.1	400	612.8	460.8	366.1	400	647.8	495.8	242.1†	250†	492.6	339.5	268.6	300	482.8	370.8		
	230-50	207	253	559.1	600	969.5	751.5	617.1	700	1027.5	809.5	447.6†	500†	601.7	448.7	465.9	500	876.3	658.3		
	346-50	325	380	382.9	450	682.6	522.6	425.9	500	725.6	565.6	303.8†	350†	532.8	379.8	366.3	400	648.9	495.9		
	380/415-50	342	440	353.0	400	603.4	465.4	396.0	450	646.4	508.4	266.6†	300†	472.0	292.9	292.8	350	556.0	418.0		
270	208/230-60	187	253	727.5	800	1098.9	896.9	819.1	1000	1190.5	988.5	462.3†	500†	896.9	620.9	535.6	600	908.6	706.6		
	460-60	414	506	364.3	400	549.9	448.9	399.9	450	585.5	484.5	221.2†	250†	442.8	305.4	242.9	250	437.4	336.4		
	575-60	518	633	294.6	300	418.5	348.5	312.6	350	436.5	366.5	191.1†	225†	365.6	246.9	205.5	225	331.0	261.0		
	380-60	342	418	387.8	400	598.0	486.0	422.8	450	633.0	521.0	242.1†	250†	492.6	339.5	268.6	300	482.8	370.8		
	230-50	207	253	677.7	700	1088.1	870.1	735.7	800	1146.1	928.1	447.6†	500†	601.7	448.7	465.9	500	876.3	658.3		
	346-50	325	380	472.1	500	771.8	611.8	515.1	600	814.8	654.8	303.8†	350†	532.8	379.8	366.3	400	648.9	495.9		
	380/415-50	342	440	437.7	500	688.1	550.1	480.7	500	731.1	593.1	266.6†	300†	472.0	292.9	292.8	350	556.0	418.0		
300	208/230-60	187	253	610.2	700	1111.1	835.1	701.8	800	1202.7	926.7	462.3†	500	1098.9	896.9	819.1	1000	1190.5	988.5		
	460-60	414	506	305.5	350	555.9	417.9	341.1	400	591.5	453.5	221.2†	400	549.9	448.9	399.9	450	585.5	484.5		
	575-60	518	633	257.4	300	355.6	323.6	275.4	300	373.6	341.6	191.1†	300	418.5	348.5	312.6	350	436.5	366.5		
	380-60	342	418	331.1	400	612.8	460.8	366.1	400	647.8	495.8	242.1†	400	598.0	486.0	422.8	450	633.0	521.0		
	230-50	207	253	559.1	600	969.5	751.5	617.1	700	1027.5	809.5	447.6†	700	1088.1	870.1	735.7	800	1146.1	928.1		
	346-50	325	380	382.9	450	682.6	522.6	425.9	500	725.6	565.6	303.8†	500	771.8	611.8	515.1	600	814.8	654.8		
	380/415-50	342	440	353.0	400	603.4	465.4	396.0	450	646.4	508.4	437.7	500	688.1	550.1	480.7	500	731.1	593.1		
330	208/230-60	187	253	727.5	800	1098.9	896.9	819.1	1000	1190.5	988.5	462.3†	800	1098.9	896.9	819.1	1000	1190.5	988.5		
	460-60	414	506	364.3	400	549.9	448.9	399.9	450	585.5	484.5	221.2†	400	549.9	448.9	399.9	450	585.5	484.5		
	575-60	518	633	294.6	300	418.5	348.5	312.6	350	436.5	366.5	191.1†	300	418.5	348.5	312.6	350	436.5	366.5		
	380-60	342	418	387.8	400	598.0	486.0	422.8	450	633.0	521.0	242.1†	400	598.0	486.0	422.8	450	633.0	521.0		
	230-50	207	253	677.7	700	1088.1	870.1	735.7	800	1146.1	928.1	447.6†	700	1088.1	870.1	735.7	800	1146.1	928.1		
	346-50	325	380	472.1	500	771.8	611.8	515.1	600	814.8	654.8	303.8†	500	771.8	611.8	515.1	600	814.8	654.8		
	380/415-50	342	440	437.7	500	688.1	550.1	480.7	500	731.1	593.1	437.7	500	688.1	550.1	480.7	500	731.1	593.1		
360	208/230-60	187	253	800.0	800	1301.5	1025.5	910.6	1000	1411.5	1135.5	800.0	800	1301.5	1025.5	910.6	1000	1411.5	1135.5		
	460-60	414	506	400.7	450	651.1	513.1	443.5	500	693.9	555.9	400.7	450	651.1	513.1	443.5	500	693.9	555.9		
	575-60	518	633	337.4	350	499.6	403.6	359.0	400	521.2	425.2	337.4	350	499.6	403.6	359.0	400	521.2	425.2		
	380-60	342	418	432.5	500	714.2	562.2	474.5	500	756.2	604.2	432.5	500	714.2	562.2	474.5	500	756.2	604.2		
	230-50	207	253	749.9	800	1160.3	942.3	819.5	700	1229.9	1011.9	677.7	700	1088.1	870.1	735.7	800	1146.1	928.1		
	346-50	325	380	554.1	600	853.8	693.8	605.7	1000	905.4	745.4	472.1	500	771.8	611.8	515.1	600	814.8	654.8		
	380/415-50	342	440	509.1	600	759.5	621.5	560.7	600	811.1	673.1	437.7	500	688.1	550.1	480.7	500	731.1	593.1		
390	208/230-60	187	253	890.4	1000	1391.3	1115.3	1000.0	1000	1501.3	1225.3	800.0	800	1301.5	1025.5	910.6	1000	1411.5	1135.5		
	460-60	414	506	445.6	500	696.0	558.0	488.4	500	738.8	600.8	400.7	450	651.1	513.1	443.5	500	693.9	555.9		
	575-60	518	633	374.0	400	536.2	440.2	395.6	450	557.8	461.8	337.4	350	499.6	403.6	359.0	400	521.2	425.2		
	380-60	342	418	479.3	500	761.0	609.0	521.3	600	803.0	651.0	432.5	500	714.2	562.2	474.5	500	756.2	604.2		
	230-50	207	253	796.2	800	1206.6	988.3	865.8	1000	1276.2	1058.2	749.9	800	1160.3	942.3	819.5	700	1229.9	1011.9		
	346-50	325	380	567.5	600	867.2	707.2	619.1	700	918.8	758.8	554.1	600	853.8	693.8	605.7	1000	905.4	745.4		
	380/415-50	342	440	523.2	600	773.6	635.6	574.8	600	825.2	687.2	509.1	600	759.5	621.5	560.7	600	811.1	673.1		
420	208/230-60	187	253	890.4	1000	1391.3	1115.3	1000.0	1000	1501.3	1225.3	890.4	1000	1391.3	1115.3	1000.0	1000	1501.3	1225.3		
	460-60	414	506	445.6	500	696.0	558.0	488.4	500	738.8	600.8	445.6	500	696.0	558.0	488.4	500	738.8	600.8		
	575-60	518	633	374.0	400	536.2	440.2	395.6	450	557.8	461.8	374.0	400	536.2	440.2	395.6	450	557.8	461.8		
	380-60	342	418	479.3	500	761.0	609.0	521.3	600	803.0	651.0	479.3	500	761.0	609.0	521.3	600	803.0	651.0		
	230-50	207	253	796.2	800	1206.6	988.3	865.8	1000	1276.2	1058.2	796.2	800	1206.6	988.3	865.8	1000	1276.2	1058.2		
	346-50	325	380	567.5	600	867.2	707.2	619.1	700	918.8	758.8	567.5	600	867.2	707.2	619.1	700	918.8	758.8		
	380/415-50	342	440	523.2	600	773.6	635.6	574.8	600	825.2	687.2	523.2	600	773.6	635.6	574.8	600	825.2	687.2		

NOTE: See Legend and Notes on page 35.

COMPRESSOR – 30GN,GT240-330

UNIT SIZE	NAMEPLATE V-Hz (3 Phase)	MODULE A						
		Compressor Numbers						
		A1	A2	A3	A4	B1	B2	B3
		RLA/LRA	RLA/LRA	RLA/LRA	RLA/LRA	RLA/LRA	RLA/LRA	RLA/LRA
240	208/230-60	107 7/506	151 3/690	—/—		107.7/506	151.3/690	
	460-60	53 9/253	75 7/345	—/—		53 9/253	75.7/345	
	575-60	41 7/176	62.2/176	—/—		41 7/176	62.2/176	
	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	
	230-50	77.0/342	87.9/366	87.9/366		107 7/545	107.7/545	
	380/415-50	44 9/223	53.9/253	53.9/253		75 7/345	75.7/345	
240-PW	208/230-60	107.7/304	151.3/414	—/—		107 7/304	151.3/414	
	460-60	53.9/152	75.7/207	—/—		53.9/152	75 7/207	
	575-60	41.7/106	62.2/144	—/—		41 7/106	62 2/144	
	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	
	230-50	77.0/206	87 9/220	87.9/220		107 7/327	107 7/327	
	380/415-50	44.9/134	53.9/152	53.9/152		75 7/207	75 7/207	
270	208/230-60	107.7/506	107.7/506	107.7/506		107.7/506	107.7/506	107.7/506
	460-60	53.9/253	53.9/253	53.9/253		53.9/253	53.9/253	53.9/253
	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	53.9/253	53.9/253	75 7/345		53.9/253	75.7/345	75.7/345
270-PW	208/230-60	107 7/304	107 7/304	107 7/304		107.7/304	107.7/304	107.7/304
	460-60	53.9/152	53.9/152	53 9/152		53.9/152	53.9/152	53.9/152
	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	53.9/152	53.9/152	75.7/207		53.9/152	75.7/207	75.7/207
300	208/230-60	107.7/506	151.3/690	—/—		107.7/506	151.3/690	
	460-60	53.9/253	75.7/345	—/—		53.9/253	75.7/345	
	575-60	41 7/176	62 2/176	—/—		41.7/176	62.2/176	
	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	
	230-50	77 0/342	87.9/366	87 9/366		107.7/545	107.7/545	
	380/415-50	44.9/223	53.9/253	53.9/253		75.7/345	75.7/345	
300-PW	208/230-60	107.7/304	151.3/414	—/—		107.7/304	151.3/414	
	460-60	53.9/152	75 7/207	—/—		53 9/152	75.7/207	
	575-60	41.7/106	62.2/144	—/—		41 7/106	62.2/144	
	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	
	230-50	77.0/206	87.9/220	87.9/220		107 7/327	107.7/327	
	380/415-50	44.9/134	53.9/152	53.9/152		75.7/207	75.7/207	
330	208/230-60	107.7/506	107.7/506	107 7/506		107 7/506	107 7/506	107.7/506
	460-60	53.9/253	53.9/253	53 9/253		53.9/253	53 9/253	53 9/253
	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	53.9/253	53.9/253	75.7/345		53.9/253	75 7/345	75.7/345
330-PW	208/230-60	107.7/304	107 7/304	107.7/304		107 7/304	107.7/304	107 7/304
	460-60	53.9/152	53 9/152	53.9/152		53 9/152	53.9/152	53 9/152
	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	53.9/152	53 9/152	75 7/207		53.9/152	75.7/207	75 7/207

NOTE: See Legend and Notes on page 35.

Electrical data (cont)



COMPRESSOR — 30GN,GT240-330 (cont)

UNIT SIZE	NAMEPLATE V-Hz (3 Phase)	MODULE B						
		Compressor Numbers						
		A1	A2	A3	A4	B1	B2	B3
		RLA/LRA	RLA/LRA	RLA/LRA	RLA/LRA	RLA/LRA	RLA/LRA	RLA/LRA
240	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	
	230-50	77.0/342	107.7/545			77.0/342	107.7/545	
	380/415-50	43.6/223	65.4/345			43.6/223	65.4/345	
240-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	
	230-50	77.0/206	107.7/327			77.0/206	107.7/327	
	380/415-50	44.9/134	67.9/207			44.9/134	67.9/207	
270	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	
	230-50	77.0/342	107.7/545			77.0/342	107.7/545	
	380/415-50	43.6/223	65.4/345			43.6/223	65.4/345	
270-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	
	230-50	77.0/206	107.7/327			77.0/206	107.7/327	
	380/415-50	44.9/134	67.9/207			44.9/134	67.9/207	
300	208/230-60	107.7/506	107.7/506	107.7/506		107.7/506	107.7/506	107.7/506
	460-60	53.9/253	53.9/253	53.9/253		53.9/253	53.9/253	53.9/253
	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	53.9/253	53.9/253	75.7/345		53.9/253	75.7/345	75.7/345
300-PW	208/230-60	107.7/304	107.7/304	107.7/304		107.7/304	107.7/304	107.7/304
	460-60	53.9/152	53.9/152	53.9/152		53.9/152	53.9/152	53.9/152
	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	53.9/152	53.9/152	75.7/207		53.9/152	75.7/207	75.7/207
330	208/230-60	107.7/506	107.7/506	107.7/506		107.7/506	107.7/506	107.7/506
	460-60	53.9/253	53.9/253	53.9/253		53.9/253	53.9/253	53.9/253
	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	53.9/253	53.9/253	75.7/345		53.9/253	75.7/345	75.7/345
330-PW	208/230-60	107.7/304	107.7/304	107.7/304		107.7/304	107.7/304	107.7/304
	460-60	53.9/152	53.9/152	53.9/152		53.9/152	53.9/152	53.9/152
	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	53.9/152	53.9/152	75.7/207		53.9/152	75.7/207	75.7/207

NOTE: See Legend and Notes on page 35

COMPRESSOR — 30GN,GT360-420

UNIT SIZE	NAMEPLATE V-Hz (3 Phase)	MODULE A						
		Compressor Numbers						
		A1	A2	A3	A4	B1	B2	B3
		RLA/LRA	RLA/LRA	RLA/LRA	RLA/LRA	RLA/LRA	RLA/LRA	RLA/LRA
360	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	53 9/253	75.7/345		44.9/223	53.9/253	75.7/345
	575-60	36 6/164	41 7/176	62.2/240		36.6/164	41.7/176	62.2/240
	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	75 7/345	75 7/345	75.7/345		75.7/345	75.7/345	75.7/345
360-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 1/349	53 9/152	75.7/207		44.9/134	53 9/152	75.7/207
	575-60	36 6/ 99	41 7/106	62.2/144		36.6/ 99	41 7/106	62.2/144
	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	75.7/207	75.7/207	75.7/207		75.7/207	75.7/207	75.7/207
390	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	53 9/253	53.9/253	75.7/345	75.7/345
	575-60	36.6/164	36 6/164	36 6/164	41 7/176	41.7/176	62.2/240	62.2/240
	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	75.7/345	75.7/345	75.7/345	75.7/345	75.7/345
390-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	53.9/152	53.9/152	75.7/207	75.7/207
	575-60	36 6/ 99	36.6/ 99	36.6/ 99	41.7/106	41.7/106	62.2/144	62.2/144
	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	75.7/207	75.7/207	75.7/207	75.7/207	75.7/207
420	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	53.9/253	53.9/253	75.7/345	75.7/345
	575-60	36 6/164	36.6/164	36.6/164	41.7/176	41.7/176	62.2/240	62.2/240
	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	75.7/345	75.7/345	75.7/345	75 7/345	75.7/345
420-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	53.9/152	53.9/152	75.7/207	75.7/207
	575-60	36 6/ 99	36.6/ 99	36 6/ 99	41 7/106	41.7/106	62 2/144	62.2/144
	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	75 7/207	75 7/207	75.7/207	75.7/207	75.7/207

NOTE: See Legend and Notes on page 35

Electrical data (cont)



COMPRESSOR – 30GN,GT360-420 (cont)

UNIT SIZE	NAMEPLATE V-Hz (3 Phase)	MODULE B						
		Compressor Numbers						
		A1	A2	A3	A4	B1	B2	B3
		RLA/LRA	RLA/LRA	RLA/LRA	RLA/LRA	RLA/LRA	RLA/LRA	RLA/LRA
360	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	53.9/253	75.7/345		44.9/223	53.9/253	75.7/345
	575-60	36.6/164	41.7/176	62.2/240		36.6/164	41.7/176	62.2/240
	380-60	46.8/247	55.8/280	80.2/382		46.8/247	55.8/280	80.2/382
	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	53.9/253	53.9/253	75.7/345		53.9/253	75.7/345	75.7/345
360-PW	208/230-60	89.8/268	107.7/304	151.3/414	—/—	89.8/268	107.7/304	151.3/414
	460-60	44.1/349	53.9/152	75.7/207		44.9/134	53.9/152	75.7/207
	575-60	36.6/ 99	41.7/106	62.2/144		36.6/ 99	41.7/106	62.2/144
	380-60	46.8/149	55.8/168	80.2/230		46.8/149	55.8/168	80.2/230
	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	53.9/152	53.9/152	75.7/207		53.9/152	75.7/207	75.7/207
390	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	53.9/253	75.7/345		44.9/223	53.9/253	75.7/345
	575-60	36.6/164	41.7/176	62.2/240		36.6/164	41.7/176	62.2/240
	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	75.7/345	75.7/345	75.7/345		75.7/345	75.7/345	75.7/345
390-PW	208/230-60	89.8/268	107.7/304	151.3/414	—/—	89.8/268	107.7/304	151.3/414
	460-60	44.1/349	53.9/152	75.7/207		44.9/134	53.9/152	75.7/207
	575-60	36.6/ 99	41.7/106	62.2/144		36.6/ 99	41.7/106	62.2/144
	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	75.7/207	75.7/207	75.7/207		75.7/207	75.7/207	75.7/207
420	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	53.9/253	53.9/253	75.7/345	75.7/345
	575-60	36.6/164	36.6/164	36.6/164	41.7/176	41.7/176	62.2/240	62.2/240
	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	75.7/345	75.7/345	75.7/345	75.7/345	75.7/345
420-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	53.9/152	53.9/152	75.7/207	75.7/207
	575-60	36.6/ 99	36.6/ 99	36.6/ 99	41.7/106	41.7/106	62.2/144	62.2/144
	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	75.7/207	75.7/207	75.7/207	75.7/207	75.7/207

NOTE: See Legend and Notes on page 35

CONDENSER FANS

UNIT SIZE	NAMEPLATE VOLTAGE (V-Ph-Hz)	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)
240B, 270B	208/230-3-60	8	1	0.746	(6) 5.4, (2) 5.5	(6) 31.6, (2) 30.0	8	5	3.730	(8) 14.6	(8) 41.6
	460-3-60				(6) 2.7, (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
	230-3-50				(8) 6.4	(8) 30.0				(8) 12.2	(8) 41.6
	380/415-3-50				(8) 3.0	(8) 30.0				(8) 7.3	(8) 41.0
240A, 270A, 300A, B and 330A, B	208/230-3-60	10	1	0.746	(6) 5.4, (4) 5.5	(6) 31.6, (4) 30.0	10	5	3.730	(10) 14.6	(10) 41.6
	460-3-60				(6) 2.7, (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) 3.0	(10) 30.0				(10) 7.3	(10) 41.0
360A, B 390A, B and 420A, B	208/230-3-60	12	1	0.746	(8) 5.4, (4) 5.5	(8) 31.6, (4) 30.0	12	5	3.730	(12) 14.6	(12) 41.6
	460-3-60				(8) 2.7, (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) 3.0	(12) 30.0				(12) 7.3	(12) 41.0

LEGEND AND NOTES FOR ELECTRICAL DATA TABLES

LEGEND

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
MOC	— Maximum Overcurrent Protective Device Amps
NEC	— National Electrical Code, U.S.A.
PW	— Part Wind
RLA	— Rated Load Amps (Compressors)
XL	— Across-the-Line

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

†Wherever across-the-line and part-wind data differs, the higher value of the two is listed.

NOTES.

1. All modules have single point primary power connection. Main power must be supplied from a field-supplied disconnect. A field-installed accessory single-point power entry kit is available to connect 2 modules to a common primary power connection.
2. The unit control circuit power (115 v, 1-ph for 208/230-, 460-, and 575-v units; 230 v, 1-ph for all other voltages) must be supplied from a separate source, through a field-supplied disconnect. The control circuit transformer accessory may be applied to power from primary unit power.
3. Crankcase and cooler heaters are wired into the control circuit so they are always operable as long as the control circuit power supply disconnect is on, even if any safety device is open or the unit ON-OFF circuit switch is off.

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

UNIT SIZE	VOLTAGE	TERMINAL BLOCKS	PARALLEL CONDUCTORS
240B, 270B	208/230	1	6
	460	1	3
	575	1	3
	380	1	3
	230	1	6
	346	1	3
	380/415	1	3
240A, 270A, 300A, B to 420A, B	208/230	3	9
	460	2	6
	575	2	6
	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 8 cooler heaters, 210 w each, and a 120-w circuit board heater



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

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

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

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

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

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

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

Where available, 2 sequences are used to obtain circuit lead/lag operation and even out compressor operating hours. This requires accessory unloaders on some units (30GN). First, as unit turns on, microprocessor functioning as a random number generator determines which circuit will start first. Also, when decreasing from maximum stage, control will again randomly select which circuit is to run the longest.

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

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

- T1 Cooler leaving chilled water temperature
- T2 Cooler entering water (return temperature)
- T3 Saturated condensing temperature — Circuit A
- T4 Saturated condensing temperature — Circuit B
- T5 Cooler saturation temperature — Circuit A
- T6 Cooler saturation temperature — Circuit B
- T7 Return gas temperature entering compressor cylinder — Circuit A
- T8 Return gas temperature entering compressor cylinder — Circuit B
- T10 Remote temperature sensor (accessory used only when reset is determined based on space or outdoor-air temperature)

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

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

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

The electronic control provides for a pre-purge and pumpout cycle each time the lead compressor in a circuit is started or stopped. The compressor is allowed to run before and after

the EXV opens or closes. Prepurge cycle is eliminated if compressor has operated in last 15 minutes. These pumpout cycles minimize amount of excess refrigerant that can go to compressor on start-up and cause oil dilution which would result in eventual bearing wear.

The microprocessor software is programmed so that EXV functions as an MOP (maximum operating pressure) valve, limiting the suction temperatures to 50 F (9.9 C) on 30GN units, and 55 F (12.8 C) on 30GT units. This makes it possible to start unit at high water temperatures, up to 95 F (35 C), without overloading compressor. Another feature that is factory set (which may be reconfigured in the field) limits rate of pulldown to 1° F (0.6° C) per minute, thereby reducing the kW demand on start-up.

Accessory controls — Demand can be further limited by keeping a selected number of compressors from turning on by utilizing demand limit control accessory. The 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.

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

Compressor ground fault board (GCF) — The board provides compressor ground current protection in each circuit, shutting off compressor(s) if a 2 to 3 ampere ground current is sensed by a toroid around the compressor power leads.

Complete electronic control system contains several additional components.

Flotronic™ controls with 2-digit display/set point board (standard — 30GT only) — Display board, also connected to microprocessor by a ribbon cable, is used to communicate with operator. In addition to leaving-water set point potentiometer, board contains a 2-digit LED display. The LED display is normally off after initialization period. Pressing display button will result in LED displaying the appropriate overload or status code.

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

CODE	STATUS
0-12	Capacity Stage Number of Stages in Operation
20-26	Operating Mode
20	Initialization
21	Temperature Reset
22	Demand Limit
24	Pulldown Control
26	Remote ON-OFF
51-87	Overload Codes Alarm Light/Circuit Energized NOTE: These codes take priority.
51-58	Compressor Fault
59,60	Loss of Charge (Circuit A, Circuit B)
61	Low Water Flow
63,64	Low Oil Pressure (Circuit A, Circuit B)
65	Low Water Temperature
70	Illegal Configuration
71-80	Thermistor Failure
81-87	Reset/Set Point Limit Failure

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

Flotronic II (CCN) controls with 8-character display/set point board (optional — 30GN only) — Eight-digit LCD alphanumeric panel displays all of the above (with explanation of codes), plus set points, time of day, and actual temperatures, pressures, and superheat.

Control Sequence

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

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

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

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

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

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

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

Reset (accessory for Flotronic; standard for Flotronic II) — If applied, microprocessor compares either return water, space, or outdoor temperature with the board settings, and adjusts leaving chilled water temperature appropriately.

Controls (cont)



Electronic expansion valve and outdoor fan control

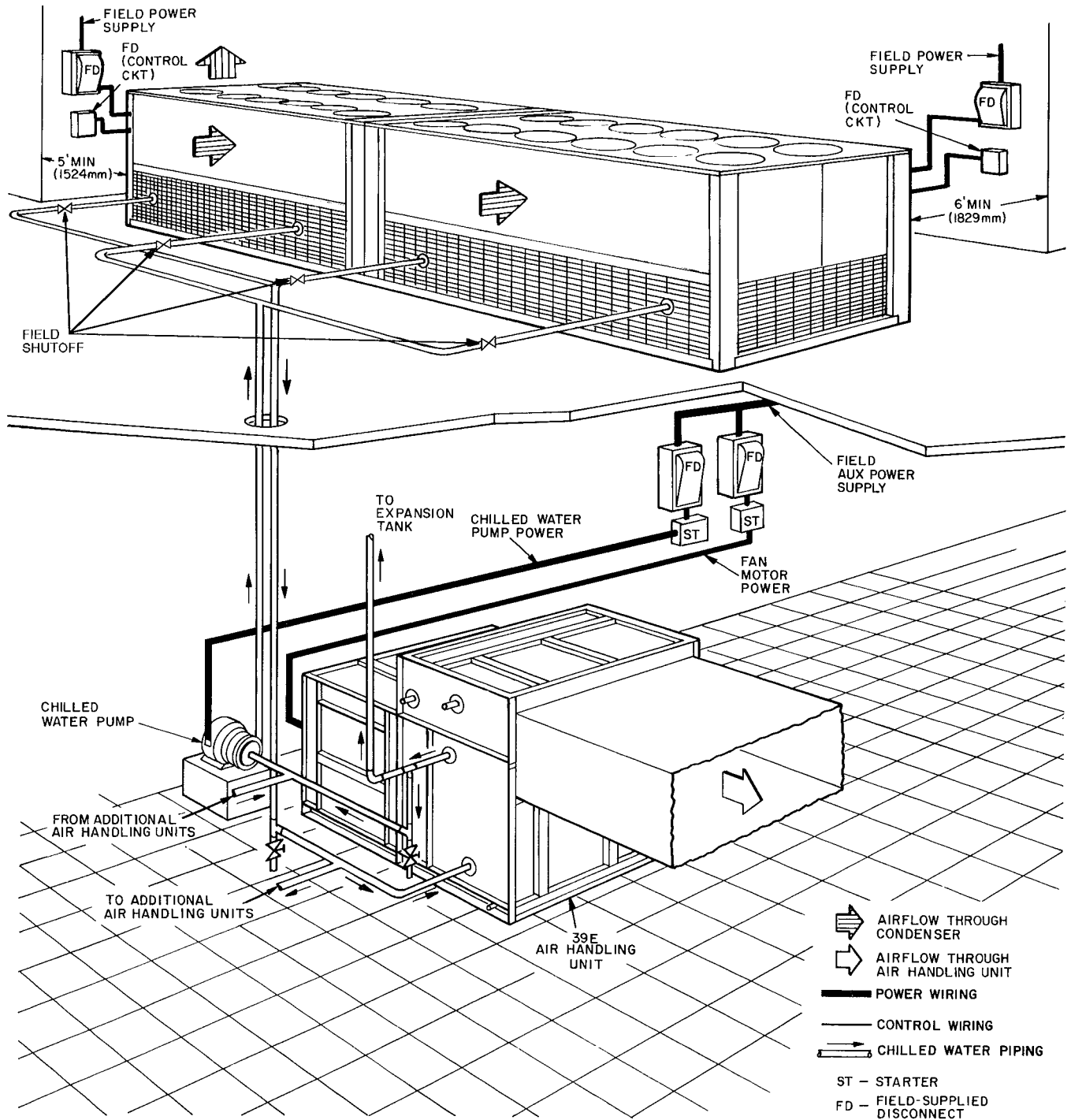
— Expansion valve opens and closes on signal from microprocessor to maintain an approximate 30 F (16 C) refrigerant superheat entering the compressor cylinders. (The compressor motor increases the refrigerant superheat from the approximate 5° F [3° C] leaving the cooler to that entering the cylinders.) Outdoor fans (operated by microprocessor) run to as low an ambient as possible to maintain a minimum expansion valve pressure differential.

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

Safeties include: — *Oil pressure safety* cuts out if pressure differential is below minimum. Safety is bypassed on start-up for 2 minutes. *Loss-of-charge safety* cuts out if system pressure drops below minimum. *High-pressure cutout* shuts down compressors if compressor discharge pressure increases to 395 psig (2724 kPa). *Ground current safety* opens on sensing a current-to-ground in compressor windings in excess of 2.5 amps. *Loss of flow protection* is provided by temperature differences between entering and leaving water temperature sensors if cooler temperature drops to 35 F (1.8 C). *Sensor failures* are detected by the microprocessor.

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

Typical piping and wiring



NOTES:

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

Reciprocating Air-Cooled Liquid Chiller

HVAC Guide Specifications —

Size Range: **220 to 400 Tons; 770 to 1400 kW**

Nominal

Carrier Model Number: **30GN,GT**

Part 1 — General

1.01 SYSTEM DESCRIPTION

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

1.02 QUALITY ASSURANCE

- A. Unit shall be rated in accordance with ARI Standard 590, latest edition.
- B. Unit construction shall be designed to conform to ANSI/ASHRAE 15/latest revision Safety Standard, NEC (National Electrical Code, U.S.A.) and ASME applicable codes.
- C. Unit shall be manufactured according to ISO 9002 (International Standards Organization) manufacturing quality standard.
- D. Unit operation shall be fully tested at the factory.

1.03 DELIVERY, STORAGE, AND HANDLING

Unit shall be stored and handled according to unit manufacturer's recommendations.

Part 2 — Products

2.01 EQUIPMENT

A. General:

Factory assembled, 2-module, air-cooled liquid chiller. Contained within the unit cabinets shall be all factory wiring, piping, controls, refrigerant charge (R-22), and special features required prior to field start-up.

B. Unit Cabinets:

1. Frames shall be of heavy-gage galvanized steel members.
2. Galvanized steel casings, zinc phosphatized, with an electrostatically applied baked-enamel finish with hinged access panels for controls section.
3. Cabinets shall be capable of withstanding Federal Test Method Standard No. 141 (Method 6061) 500-hour salt spray test.

C. Fans:

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

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

D. Compressors:

1. Reciprocating semi-hermetic type only.

2. Each equipped with an automatically reversible oil pump, operating oil charge, suction and discharge shutoff valves, and an insert-type factory-sized 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) for 60 Hz units or 1450 rpm (24.2 r/s) for 50 Hz units.
5. Cycles per hour per compressor shall not exceed 6.

E. Coolers:

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

F. Condensers:

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

G. Refrigeration Components:

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

H. Controls, Safeties, and Diagnostics:

1. Controls.

- a. Unit controls shall include the following minimum components:
 - 1) Microprocessor.
 - 2) Power and control circuit terminal blocks.
 - 3) ON/OFF control switch.
 - 4) Replaceable solid-state relay panel
 - 5) Eight-character diagnostic display/set point panel on 30GN unit. Two-digit panel on 30GT unit.
 - 6) Thermistors, and/or pressure transducers, and potentiometers (30GT only).

b. Capable of performing the following functions:

- 1) Automatic circuit lead/lag.
- 2) Pumpout at beginning and end of every circuit cycle.
- 3) Capacity control based on leaving chilled water temperature and compensated by rate of change of return-water temperature.
- 4) Limiting of the chilled water temperature pulldown rate at start-up to 1° F (0.6° C) per minute to prevent excessive demand spikes (charges) at start-up.
- 5) Seven-day time schedule (30GN only).
- 6) Leaving chilled water temperature reset from return water (30GN only).
- 7) Demand limit control with 2-point control (0 to 100% each) (30GN only).

2. Safeties:

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

3. Diagnostics:

- a. On 30GN units, diagnostic display module shall be capable of indicating the safety lock-out condition by displaying a code for which an explanation may be scrolled at the display. On 30GT units, display module shall be capable of indicating the tripping of protections through display of a 2-digit code, for which a legend shall be provided in control panel. Information included for display shall be:
 - 1) Compressor lockout.
 - 2) Loss of charge.
 - 3) Low water flow.
 - 4) Low oil pressure.
 - 5) Cooler freeze protection.
 - 6) High or low suction superheat.
 - 7) Thermistor, transducer (30GN only), or potentiometer malfunction.
 - 8) Entering and leaving water temperature
 - 9) Evaporator and condenser pressure (30GN only).
 - 10) Electronic expansion valve positions (30GN only).
 - 11) All set points (30GN only).
 - 12) Time of day (30GN only).
- b. Module in conjunction with the microprocessor must also be capable of displaying the output (results) of a run test to verify operation of every switch, thermistor, potentiometer, fan, and compressor before chiller is started.
- c. Provide serial output port.

I. Operating Characteristics:

1. Unit shall be capable of starting and running fully loaded at outdoor ambient temperatures from 0° F to 125 F (– 18 C to 52 C)
2. Unit shall be capable of starting up with 95 F (35 C) entering water temperature to the cooler.
3. Multi-step cooling capacity control shall be accomplished through the use of unloaders and compressor staging.
4. Two refrigerant circuits shall be provided in each module to protect against loss of total capacity
5. Unit shall operate without special controls down to an ambient temperature of 32 F (0° C).
6. Unit shall have automatic lead/lag feature to automatically alternate the lead circuit to ensure even compressor wear.

Guide specifications (cont)



J. Motors:

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

K. Electrical Requirements:

1. Each module's primary electrical power supply (3 ph) shall be connected to a single location
- 2 Each module's control power (1 ph) shall be connected to a separate entry point.
3. 60-Hz units require 115-v control circuit power; 50-Hz and 380-v, 60-Hz units require 230-v control circuit power.

L. Special Features:

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

* 1. Low Ambient Temperature Operation:

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

2. Unloaders (30GN units only):

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

3. Demand Limit Control (30GT units only):

Unit shall be equipped with a 2-point demand limit control activated remotely by an electric signal.

* 4. Optional Condenser Coil Material:

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

5. Hail Guard:

Unit shall be equipped with sheet metal type coil guard protection against debris and damage.

* 6. Part Wind Start:

Shall be factory installed to reduce compressor inrush current

7 Pressure Gages (30GT units only)

Unit shall be field-equipped with suction and discharge pressure gages with manual shutoff valves mounted on the same panel

* 8. Brine Units:

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

9 Temperature Reset Board (30GT units only):

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

10. Flow Switch:

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

* 11. Optional Controls and Diagnostics:

a. Controls (30GN units only).

1) Unit controls shall include the following minimum components:

- a) Microprocessor
- b) Power and control circuit terminal blocks
- c) On/off control switch
- d) Replaceable solid-state relay panel.
- e) 8-digit alphanumeric diagnostic display/set point panel.
- f) Thermistors and/or pressure transducers.

2) Capable of performing the following functions:

- a) Automatic compressor lead/lag
- b) Pumpout at beginning and end of every circuit cycle
- c) Capacity control based on leaving chilled water temperature and compensated by rate of change of return water temperature.
- d) Limiting of the chilled water temperature pulldown rate at start-up to 1° F (.56° C) per minute to prevent excessive demand spikes (charges) at start-up.
- e) Seven-day time schedule
- f) Leaving chilled water temperature reset from return.
- g) Demand limit control with 2-point control (0-100% each).

b. Diagnostics:

- 1) Diagnostic display module shall be capable of indicating the safety lockout condition by displaying a code for which an explanation may be scrolled at the display. Protections included for display shall be:
 - a) Compressor lockout.
 - b) Loss of charge.
 - c) Low water flow.
 - d) Low oil pressure.
 - e) Cooler freeze protection.
 - f) High or low suction superheat
 - g) Thermistor or potentiometer malfunction.
 - h) Entering- and leaving-water temperature.
 - i) Evaporator and condenser pressure.
 - j) Electronic expansion valve positions.
 - h) All set points
 - l) Time of day.
- 2) Module in conjunction with the microprocessor must also be capable of displaying the output (results) of a run test to verify operation of every switch, thermistor, fan, and compressor before chiller is started.

12. 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.

13. Hot Gas Bypass:

Shall be field installed to allow the unit to operate at lower capacity levels than standard.

14. Cooler Heater:

Unit shall be factory supplied with eight 210-watt cooler tape heaters and controls to energize the heaters at 35 F (2 C) and below.

15. High-Static Fans:

Two different factory-installed optional fans shall be available (0.4 in. wg [100 kPa] and 1.0 in. wg [250 kPa]) to permit operation of the unit at nominal airflows in high static applications

16. Non-Fused Disconnect:

Unit shall be equipped from the factory with a non-fused electrical disconnect.

17. Sound Reduction Package Kit:

This optional factory-installed option or field-installed accessory kit consists of a specially-designed fan system containing fans and orifices for reducing system noise without compromising unit performance. No fan motor change shall be required for accessory installation.

18. Control Transformer:

This field-installed accessory shall provide a transformer sized to supply the control circuit, and shall source the power from the main unit power connection.

