

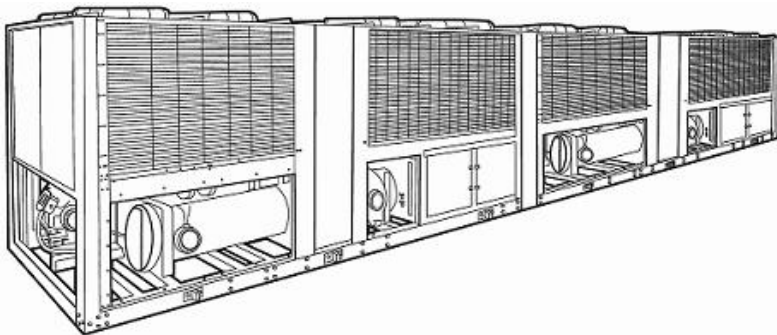
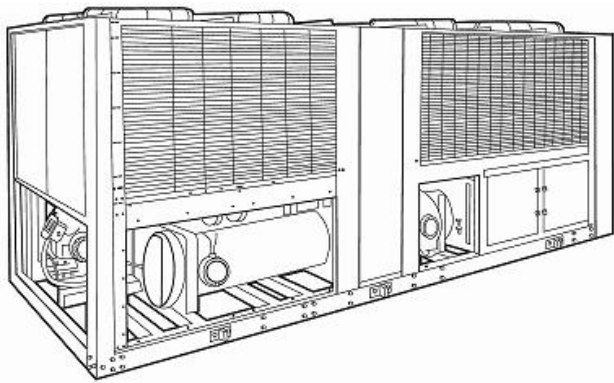


Product Data

30GTN,GTR Air-Cooled Reciprocating Liquid Chillers with **ComfortLink™** Controls 50/60 Hz

Nominal Capacities: 50 to 410 Tons
179 to 1445 kW

ComfortLink™



Features/Benefits

ComfortLink control

Your link to a world of simple and easy to use air-cooled chillers that offer out-standing performance and value. The 30GTN,GTR liquid chillers employ more than the latest advanced micro-processor controls, they utilize an expandable platform that grows as your needs change. From stand-alone operation to remotely monitored and operated multi-chiller plants, *ComfortLink* controls can keep you plugged in. *ComfortLink* controls are fully communicating, and are cable ready for connection to a Carrier Comfort Network (CCN). Occupancy scheduling, temperature and pressure read-outs, and the *ComfortLink* scrolling marquee clear language display compliment the standard features, linking you to a world of carefree comfort. The 30GTN,GTR chillers are built on the legendary performance of the Carrier model 30G Flotronic™ chiller and share many of the same time-proven features and technologies providing easy operation, quick installation and start-ups that save you money!

Superior temperature control equals potential for greater productivity

Whether in the classroom, on the production floor, or in the office, *ComfortLink* controls can help you to adapt to changing weather and business conditions. Accurate temperature control provided by the Carrier *ComfortLink* system helps to maintain higher levels of indoor air quality, thermal comfort, and productivity space. While many air-cooled chillers use only leaving fluid temperature control, the 30GTN,GTR chillers utilize leaving fluid temperature control with a standard entering fluid temperature.



compensation. This Carrier exclusive provides smart control and intelligent machine capacity staging. Unlike many chillers, Carrier model 30GTN,GTR chillers do not require constant fluid flow. The ability to operate with variable flow also allows building owners to realize even greater overall system energy savings in the chilled water pumping system of up to 85%, and not just at the chiller

Energy management made easy

While 30GTN,GTR chillers have many standard features such as network communications capability and temperature reset based on return fluid temperature, they can also expand as needs change. Supply temperature reset based on outside air or space temperature is as easy as adding a thermistor. The Energy Management option can allow you to take advantage of changing utility rate structures with easy to use load shedding, demand limiting and temperature reset capabilities. Reset triggered via 4 to 20 mA signal makes integrating from an existing building management system simple.

The *ComfortLink™* platform can be expanded further with the Service Option which has all of the features of the Energy Management option, along with an additional hand-held *ComfortLink Navigator* display, remote service connection port, and GFCI convenience outlet (60Hz only). While providing additional information in a clear language format, the Navigator display can be plugged into the unit at either the control panel or at the remote service port, allowing the service technician to operate the unit from where the maintenance or service work is being performed, thereby minimizing downtime to ensure the system is ready for operation in the shortest amount of time. Both the Energy Management and Service Options can be factory-supplied or can be added in the field at a later date as needs change.

Full and part load efficiency advantage

The 30GTN,GTR chillers with *ComfortLink* control offer outstanding efficiencies (EER [Energy Efficiency Ratio], COP [coefficient of performance], and IPLV [integrated part load value]) in both full (up to 10.0 EER) and part load operation (IPLVs up to 14.7). Increased part load efficiency is provided by dual independent refrigeration circuits, suction cut-off unloading, and return fluid temperature compensation.

The fully integrated *ComfortLink* control system maintains efficient control over the compressors, unloaders, expansion valves, and condenser fans to optimize performance as conditions change. The Carrier exclusive long-stroke electronic expansion valve (EXV) operates at reduced condensing pressures, thereby allowing the control to operate the fans down to lower outdoor temperatures. By utilizing valve position information, the control maintains the highest possible evaporator pressure and minimizes the excessive superheat that conventional thermal expansion valve (TXV) systems require. Wider operating ranges equal increased efficiencies and lower installed costs.

Building design flexibility

Design and consulting engineers will appreciate the broad selection of sizes and wide operating range offered by the 30GTN,GTR chillers. With built-in dual chiller control, imaginative large tonnage systems can be easily engineered and controlled with smaller, easier to handle modules. Modular design allows engineers to consider side by side, offset, or angled placement to fit the awkward spaces that the architect sometimes leaves for mechanical systems. Or, in the case of planned expansion, additional cooling can be brought on-line and controlled from the same system.

In some places facility managers may find that the cash flow provided by building up large air cooled multi-chiller plants can easily offset any efficiency losses when compared to large water cooled centrifugal type chilled water plants.

Quality and reliability

To assure long life and quality performance, every chiller (both 50 and 60Hz) is factory run tested. Individual components are also tested at many levels to assure that only the best parts

make it into 30GTN,GTR chillers. Long life and reliability are also a function of design. While some manufacturers like to talk about moving parts, Carrier's engineers recognized the potential dangers to chiller systems caused by problems in the power distribution system. Low voltage and phase imbalances are but a few of the conditions that can hurt the compressor's motor. Model 30G chillers were one of the first to offer ground current sensing to prevent compressor motor burn-out that would contaminate the system and potentially threaten the life of future replacement compressors. The 06E semi-hermetic compressors are built for performance and have proven themselves in commercial refrigeration equipment worldwide.

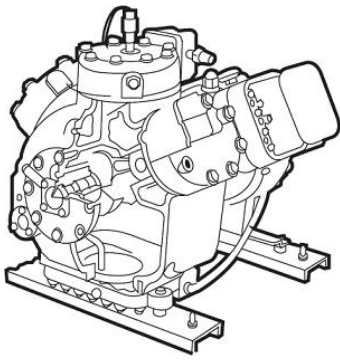
With tens of thousands of chillers operating in all corners of the world, end-users count on the reliability of Carrier 30G chillers. The Carrier Malaysia plant is an ISO 9001 registered facility as are many of Carrier's other component and assembly plants throughout the world.

Features

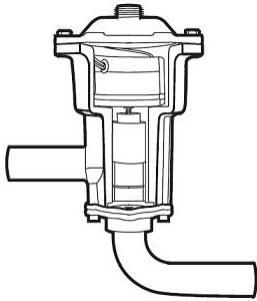
- Simple and easy to use *ComfortLink* communicating controls.
- Wide operating envelope from -28 to 52°C (-20 to 125°F).
- Accurate temperature control with return fluid compensation.
- Value added features built-in; dual chiller control, reset from return.
- Superior full and part-load efficiency.
- Precise multiple-step capacity.
- Low noise operation (quieter than many screw chillers).
- Dual independent refrigerant circuits.
- Factory run tested.
- Wide range of sizes available.
- History of proven performance and reliability.

Table of contents

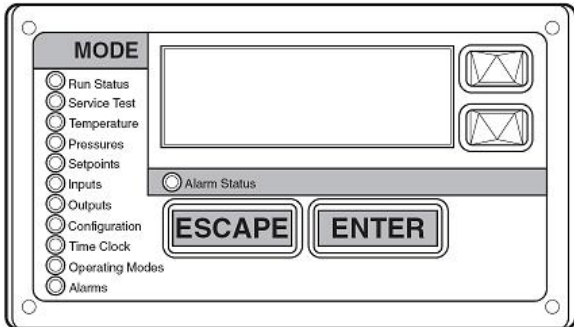
	Page
Features/Benefits	1-3
Model Number Nomenclature	4
Physical Data	5-14
Factory-Installed Options	15
Base Unit Dimensions	16-32
Application Data	33-41
Selection Procedure	42,43
Performance Data	44-56
Electrical Data	57-65
Controls	66-68
Typical Piping and Wiring	69,70
Guide Specifications	71-73



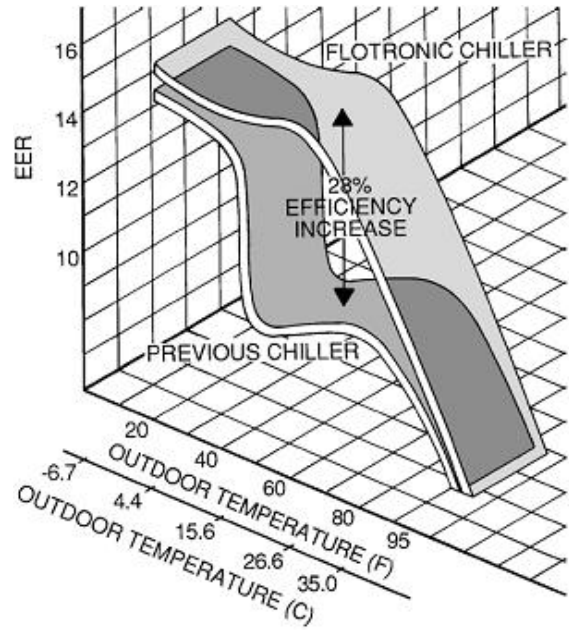
06E COMPRESSOR



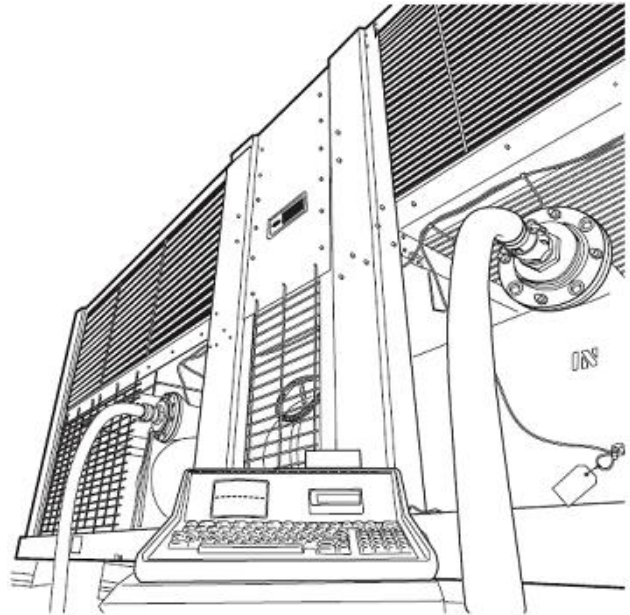
ELECTRONIC EXPANSION VALVE (EXV)



SCROLLING MARQUEE DISPLAY



**PART-LOAD EFFICIENCY
28% GAIN**



FACTORY SERVICE TEST

Model Number Nomenclature



30GT N 130 - - C 9 3 2 - -

30GT — Air-cooled Liquid Chiller

Compressor Start

- N** — Across The-line Start with *ComfortLink™* Controls
- R** — Part-Wind Start with *ComfortLink* Controls

Unit Sizes*

050	090	150	230	290	390
060	100	170	245	315	420
070	110	190	255	330	
080	130	210	270	360	

Module Designation (230-420 unit sizes only)*

- A**
- B**

Convenience Group Options

- — Standard Marquee Display

Options

- - — NOTE: contact your Carrier representative for details on available factory-installed options
- BK** — Low Noise Option

Packaging

- 2** — Standard
- 9** — Export (Low Noise Option)

Not used

V-Ph-Hz

- 2** — 380-3-60 **6** — 460-3-60
- 5** — 208/230-3-60 **9** — 380/415-3-50

Condenser Coil Options

- — Copper Tube, Aluminium Fins
- C** — Copper Tube, Copper Fins
- K** — Copper Tube, Pre-coated Aluminium Fins

LEGEND

EXV — Electronic Expansion Valve

* Refer to unit sizes and modular combinations below.

UNIT SIZES AND MODULAR COMBINATIONS

UNIT MODEL 30GTN, GTR	NOMINAL TONS	SECTION A UNIT 30GTN, GTR	SECTION B UNIT 30GTN, GTR
50	50	-	-
60	60	-	-
70	70	-	-
80	80	-	-
90	90	-	-
100	100	-	-
110	110	-	-
130	125	-	-
150	145	-	-
170	160	-	-
190	180	-	-
210	200	-	-
230	220	150	080
245	230	150	090
255	240	150	100
270	260	170	100
290	280	190	110
315	300	210	110
330	325	170	170
360	350	190	190/170 *
390	380	210	190
420	410	210	210

* 60-Hz units / 50-Hz units

60Hz SI

30GTR UNIT SIZE	050	060	070	080	090	100	110
SYSTEM MODULES							
APPROX OPERATING WEIGHT (kg)							
Cu-Al	1749	2150	2280	3013	3189	3914	3935
Cu-Cu	1945	2339	2565	3343	3518	4346	4368
REFRIGERANT TYPE				R-22			
Charge, Total/Over Clear Glass (kg)							
Ckt A	21.8/54	23.6/6.3	31.7/6.8	35.4/6.8	35.4/6.8	44.5/9.1	44.5/9.1
Ckt B	27.2/54	24.5/6.3	31.3/6.8	35.4/6.8	35.4/6.8	47.7/9.1	47.7/9.1
COMPRESSORS				Reciprocating, Semi-Hermetic			
Speed (r/s)				29.2			
06E* (Qty) Ckt A	(1) 265	(1) 275	(1) 299	(1) 250, (1) 275	(1) 250, (1) 265	(1) 265, (1) 275	(1) 265, (1) 299
(Qty) Ckt B	(1) 275	(1) 299	(1) 299	(1) 299	(2) 265	(1) 265, (1) 275	(1) 265, (1) 275
Oil Charge (Compressor/pt)				250/14.0, 265/19.0, 275/19.0, 299/19.0			
No. Capacity Control Steps	4	4	4	7	11	11	11
Capacity (%)							
Ckt A	47.6	43.3	50.0	56.0	47.0	50.0	54.0
Ckt B	52.4	56.7	50.0	44.0	53.0	50.0	46.0
Minimum Capacity Step (%)	31.7	28.8	33.3	22.0	18.0	15.0	14.0
CONDENSER FANS				Propeller, Direct Drive			
Standard							
Fan Speed (r/s)				19.0			
No. Blades...Dia (mm)				4...762			
No. Fans...HP/kW (each)	4...1.49	6...1.49	6...1.49	6...1.49	6...1.49	8...1.49	8...1.49
Total Airflow (L/s)	16,045	25,540	24,068	26,898	26,898	35,864	35,864
CONDENSER COILS				9.53mm OD Vertical and Horizontal, Plate Fin, Enhanced Copper Tubing			
Fins/in.	669	669	669	669	669	669	669
No. Rows (Ckt A or B)	3	2	3	3	3	3	3
Face Area, Ckt A and B Total (sq m)	7.48	10.84	10.84	11.92	11.92	15.61	15.61
Max Working Pressure Refrigerant (kPa)				3103			
COOLER				One...Direct Expansion, Shell and Tube			
Weight (empty, kg)	248	282	282	338	338	391	391
No. Refrigerant Circuits				2			
Net Water Volume, includes nozzles (L)	51.1	68.1	68.1	92.7	92.7	114.7	114.7
Max Working Pressure Refrigerant Side (kPa)	1916	1916	1916	1916	1916	1916	1916
Max Working Pressure Fluid Side (kPa)	2068	2068	2068	2068	2068	2068	2068
FLUID CONNECTIONS (in.)				Victaulic Type			
Inlet and Outlet	3	4	4	4	4	5	5
Drain (NPT)				3/4			

LEGEND

- Cu-Al** - Copper Tubing - Aluminium Fins Condenser Coil
- Cu-Cu** - Copper Tubing - Copper Fins Condenser Coil
- OD** - Outside Diameter

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

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

Physical Data (cont)



60 Hz (cont)

	130	150	170	190	210	230	Total
30GTR, GTR UNIT SIZE							
SYSTEM MODULES							
APPROX OPERATING WEIGHT (kg)							
Cu-Al	4566	4754	5133	5761	6081	3013	7747
Cu-Cu	5144	5342	5711	6452	6772	3343	8685
REFRIGERANT TYPE	R-22						
Charge, Total/Over Clear Glass (kg)							
Ckt A	60.5/12.7	65.0/15.9	69.5/20.5	80.9/13.6	86.4/18.2	60.5/15.9	35.4/6.8
Ckt B	67.3/12.7	65.0/15.9	73.6/20.5	78.6/13.6	84.1/18.2	65.0/15.9	35.4/6.8
COMPRESSORS	Reciprocating, Semi-Hermetic						
Speed (r/s)	29.2						
06E* (Qty) Ckt A (Qty) Ckt B	(1) 275, (1) 299	(3) 265	(3) 275	(1) 265, (1) 275, (1) 299	(3) 265, (1) 275	(3) 265	(1) 250, (1) 275
Oil Charge (Compressor/L)	(1) 275, (1) 299	(2) 299	(3) 275	(1) 265, (1) 275, (1) 299	(1) 275, (2) 299	(2) 299	(1) 299
No. Capacity Control Steps	250/606, 265/9.0, 275/9.0, 299/9.0						
Capacity (%)							
Ckt A	11	14	17	6	7	14	8
Ckt B	50	50	50	50	50	50	56
Minimum Capacity Step (%)	14	11	11	14	12	11	22
CONDENSER FANS	Propeller, Direct Drive						
Standard							
Fan Speed (r/s)	19.0	19.0	19.0	19.0	19.0	19.0	19.0
No. Blades...Dia. (mm)	4...762	4...762	4...762	4...762	4...762	4...762	4...762
No. Fans...kW (each)	10...1.49	10...1.49	10...1.49	12...1.49	12...1.49	10...1.49	6...1.49
Total Airflow (L/s)	47,190	47,190	47,190	56,630	56,630	47,190	26,898
High Static							
Fan Speed (r/s)	29.0	29.0	29.0	29.0	29.0	29.0	29.0
No. Blades...Dia. (mm)	12...762	12...762	2...762	12...762	12...762	12...762	12...762
No. Fans...kW (each)	10...3.73	10...3.73	10...3.73	12...3.73	12...3.73	10...3.73	6...3.73
Total Airflow (L/s)†	47,190	47,190	47,190	56,630	56,630	47,190	28,315
CONDENSER COILS	9.53 mm OD, Vertical and Horizontal, Plate Fin, Enhanced Copper Tubing						
Fins/m	669	669	669	669	669	669	669
No. Rows (Ckt A or B)	3	3	3	3	3	3	3
Face Area, Ckt A and B Total (sq m)	20.91	20.91	20.91	24.98	24.98	20.91	11.92
Max Working Pressure Refrigerant (kPa)	3103	3103	3103	3103	3103	3103	3103
COOLER	One...Direct Expansion, Shell and Tube						
Weight (empty, kg)	600	600	741	741	848	600	938
No. Refrigerant Circuits	2	2	2	2	2	2	2
Net Water Volume, includes nozzles (L)	196.8	196.8	230.9	230.9	266.5	196.8	92.7
Max Working Pressure Refrigerant Side (kPa)	1916	1916	1916	1916	1916	1916	1916
Max Working Pressure Fluid Side (kPa)	2068	2068	2068	2068	2068	2068	2068
FLUID CONNECTIONS (in.)	Victaulic Type						
Inlet and Outlet	6	6	6	6	6	6	4
Drain (NPT)					3/4		

LEGEND

- Cu-Al - Copper Tubing - Aluminium Fins Condenser Coil
- Cu-Cu - Copper Tubing - Copper Fins Condenser Coil
- OD - Outside Diameter
- * 06E250 compressors have 4 cylinders; all others have 6.
- NOTE: Facing the compressors, Circuit A is on the right and Circuit B is on the left.

Physical Data (cont)



60 Hz (cont)

30GTR UNIT SIZE	245			255			270		
	A	B	Total	A	B	Total	A	B	Total
SYSTEM MODULES									
APPROX OPERATING WEIGHT (kg)									
Cu-AI	4754	3189	7943	4754	3914	8668	5133	3914	9,047
Cu-Cu	5342	3518	8660	5342	4346	9688	5711	4346	10,057
REFRIGERANT TYPE									
Charge, Total/Over Clear Glass (kg)									
Ckt A	65.0/15.9	35.4/6.8	—/—	65.0/15.9	44.5/9.1	—/—	69.5/20.5	44.5/9.1	—/—
Ckt B	65.0/15.9	35.4/6.8	—/—	65.0/15.9	47.7/9.0	—/—	73.6/20.5	47.7/9.1	—/—
COMPRESSORS									
Speed (r/s)									
06E* (Qty) Ckt A	(3) 265	(1) 265, (1) 250	—	(3) 265	(1) 265, (1) 275	—	(3) 275	(10) 265, (1) 275	—
(Qty) Ckt B	(2) 299	(2) 265	—	(2) 299	(1) 265, (1) 275	—	(3) 275	(1) 265, (1) 275	—
Oil Charge (Compressor/L)									
No. Capacity Control Steps	14	11	—	14	11	—	17	11	—
Capacity (%)									
Ckt A	50	47	—	50	50	—	50	50	—
Ckt B	50	53	—	50	50	—	50	50	—
Minimum Capacity Step (%)	11	18	—	11	15	—	11	15	—
CONDENSER FANS									
Standard									
Fan Speed (r/s)	19.0	19.0	—	19.0	19.0	—	19.0	19.0	—
No. Blades...Dia. (mm)	4...762	4...762	—	4...762	4...762	—	4...762	4...762	—
No. Fans...kW (each)	10...1.49	6...1.49	16...1.49	10...1.49	8...1.49	18...1.49	10...1.49	8...1.49	18...1.49
Total Airflow (L/s)	47,190	26,898	74,088	47,190	35,864	85,054	47,190	35,864	85,054
High Static									
Fan Speed (r/s)	29.0	29.0	—	29.0	29.0	—	29.0	29.0	—
No. Blades...Dia. (mm)	12...762	12...762	—	12...762	12...762	—	12...762	12...762	—
No. Fans...kW (each)	10...3.73	6...3.73	16...3.73	10...3.73	8...3.73	18...3.73	10...3.73	8...3.73	18...3.73
Total Airflow (L/s)†	47,190	28,315	75,505	47,190	37,750	84,940	47,190	37,750	84,940
CONDENSER COILS									
9.53 mm OD, Vertical and Horizontal, Plate Fin, Enhanced Copper Tubing									
Fins/m	669	669	—	669	669	—	669	669	—
No. Rows (Ckt A or B)	3	3	—	3	3	—	3	3	—
Face Area, Ckt A and B Total (sq m)	20.91	11.92	32.83	20.91	15.61	36.52	20.91	15.61	36.52
Max Working Pressure Refrigerant (kPa)	3103	3103	—	3103	3103	—	3103	3103	—
COOLER									
One Per Module...Direct Expansion, Shell and Tube									
Weight (empty, kg)	600	338	938	600	391	991	741	391	1132
No. Refrigerant Circuits	2	2	4	2	2	4	2	2	4
Net Water Volume, includes nozzles (L)	196.8	92.7	289.5	196.8	114.7	311.5	230.9	114.7	345.6
Max Working Pressure Refrigerant Side (kPa)	1916	1916	—	1916	1916	—	1916	1916	—
Max Working Pressure Fluid Side (kPa)	2068	2068	—	2068	2068	—	2068	2068	—
FLUID CONNECTIONS (in.)									
Victaulic Type									
Inlet and Outlet	6	4	—	6	5	—	6	5	—
Drain (NPT)	3/4	3/4	—	3/4	3/4	—	3/4	3/4	—
LEGEND									
Cu-AI	- Copper Tubing - Aluminium Fins Condenser Coil								
Cu-Cu	- Copper Tubing - Copper Fins Condenser Coil								
OD	- Outside Diameter								
* 06E250	compressors have 4 cylinders; all others have 6.								
NOTE:	Facing the compressors, Circuit A is on the right and Circuit B is on the left.								

60 Hz (cont)

30GTN, GTR UNIT SIZE	290			315			330		
	A	B	Total	A	B	Total	A	B	Total
SYSTEM MODULES									
APPROX OPERATING WEIGHT (kg)									
Cu-Al	5761	3935	9,696	6081	3935	10,016	5133	5133	10,266
Cu-Cu	6452	4368	10,820	6772	4368	11,140	5711	5711	11,422
REFRIGERANT TYPE	R-22								
Charge, Total/Over Clear Glass (kg)									
Ckt A	80.9/13.6	44.5/9.1	—/—	86.4/18.2	44.5/9.1	—/—	69.5/20.5	69.5/20.5	—/—
Ckt B	78.6/13.6	47.7/9.1	—/—	84.1/18.2	47.7/9.1	—/—	73.6/20.5	73.6/20.5	—/—
COMPRESSORS	Reciprocating, Semi-Hermetic								
Speed (r/s)	29.2								
06E* (Qty) Ckt A	(1) 265, (1) 275, (1) 299	(1) 265, (1) 299	—	(3) 265, (1) 275	(1) 265, (1) 299	—	(3) 275	(3) 275	—
(Qty) Ckt B	(1) 265, (1) 275, (1) 299	(1) 265, (1) 275	—	(1) 275, (2) 299	(1) 265, (1) 275	—	(3) 275	(3) 275	—
Oil Charge (Compressor/L)	265/9.0, 275/9.0, 299/9.0								
No. Capacity Control Steps	6	11	—	7	11	—	17	17	—
Capacity (%)									
Ckt A	50	54	—	50	54	—	50	50	—
Ckt B	50	46	—	50	46	—	50	50	—
Minimum Capacity Step (%)	14	14	—	12	14	—	11	11	—
CONDENSER FANS	Propeller, Direct Drive								
Standard									
Fan Speed (r/s)	19.0	19.0	—	19.0	19.0	—	19.0	19.0	—
No. Blades...Dia. (mm)	4...762	4...762	—	4...762	4...762	—	4...762	4...762	—
No. Fans...kW (each)	12...1.49	8...1.49	20...1.49	12...1.49	8...1.49	20...1.49	10...1.49	10...1.49	20...1.49
Total Airflow (L/s)	56,630	35,864	92,494	56,630	35,864	92,494	47,190	47,190	94,380
High Static									
Fan Speed (r/s)	29.0	29.0	—	29.0	29.0	—	29.0	29.0	—
No. Blades...Dia. (mm)	12...762	12...762	—	12...762	12...762	—	12...762	12...762	—
No. Fans...kW (each)	12...3.73	8...3.73	20...3.73	12...3.73	8...3.73	20...3.73	10...3.73	10...3.73	20...3.73
Total Airflow (L/s)†	56,630	37,750	94,380	56,630	37,750	94,380	47,190	47,190	94,380
CONDENSER COILS	9.53 mm OD, Vertical and Horizontal, Plate Fin, Enhanced Copper Tubing								
Fins/m	669	669	—	669	669	—	669	669	—
No. Rows (Ckt A or B)	3	3	—	3	3	—	3	3	—
Face Area, Ckt A and B Total (sq m)	24.98	15.61	40.5	24.98	15.61	40.59	20.91	20.91	41.82
Max Working Pressure Refrigerant (kPa)	3103	3103	—	3103	3103	—	3103	3103	—
COOLER	One Per Module...Direct Expansion, Shell and Tube								
Weight (empty, kg)	741	391	1132	848	391	1239	741	741	1482
No. Refrigerant Circuits	2	2	4	2	2	4	2	2	4
Net Water Volume, includes nozzles (L)	230.9	114.7	345.6	266.5	114.7	381.2	230.9	230.9	461.8
Max Working Pressure Refrigerant Side (kPa)	1916	1916	—	1916	1916	—	1916	1916	—
Max Working Pressure Fluid Side (kPa)	2068	2068	—	2068	2068	—	2068	2068	—
FLUID CONNECTIONS (in.)	Victaulic Type								
Inlet and Outlet	6	5	—	6	5	—	6	6	—
Drain (NPT)	3/4	3/4	—	3/4	3/4	—	3/4	3/4	—

LEGEND

- Cu-Al - Copper Tubing - Aluminium Fins Condenser Coil
- Cu-Cu - Copper Tubing - Copper Fins Condenser Coil
- OD - Outside Diameter
- * 06E250 compressors have 4 cylinders; all others have 6.

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

Physical Data (cont)



60 Hz (cont)

30GTR UNIT SIZE	360			390			420		
	A	B	Total	A	B	Total	A	B	Total
SYSTEM MODULES									
APPROX OPERATING WEIGHT (kg)									
Cu-Al	5761	5761	11,522	6081	5761	11,842	6081	6081	12,162
Cu-Cu	6452	6452	12,904	6772	6452	13,224	6772	6772	13,544
REFRIGERANT TYPE									
Charge, Total/Over Clear Glass (kg)									
Ckt A	80.9/13.6	80.9/13.6	—/—	86.4/18.2	80.9/13.6	—/—	86.4/18.2	86.4/18.2	—/—
Ckt B	78.6/13.6	78.6/13.6	—/—	84.1/18.2	78.6/13.6	—/—	84.1/18.2	84.1/18.2	—/—
COMPRESSORS									
Speed (r/s)									
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	(3) 265, (1) 275	—
(Qty) Ckt B	(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	—
Oil Charge (Compressor/L)									
No. Capacity Control Steps	6	6	—	8	7	—	7	7	—
Capacity (%)									
Ckt A	50	50	—	50	50	—	50	50	—
Ckt B	50	50	—	50	50	—	50	50	—
Minimum Capacity Step (%)	14	14	—	12	14	—	12	12	—
CONDENSER FANS									
Standard									
Fan Speed (r/s)	19.0	19.0	—	19.0	19.0	—	19.0	19.0	—
No. Blades...Dia. (mm)	4...762	4...762	—	4...762	4...762	—	4...762	4...762	—
No. Fans...kW (each)	12...1.49	12...1.49	24...1.49	12...1.49	12...1.49	24...1.49	12...1.49	12...1.49	24...1.49
Total Airflow (L/s)	56,630	56,630	113,260	56,630	56,630	113,260	56,630	56,630	113,260
High Static									
Fan Speed (r/s)	29.0	29.0	—	29.0	29.0	—	29.0	29.0	—
No. Blades...Dia. (mm)	12...762	12...762	—	12...762	12...762	—	12...762	12...762	—
No. Fans...kW (each)	12...3.73	12...3.73	24...3.73	12...44.4	12...3.73	24...3.73	12...3.73	12...3.73	24...3.73
Total Airflow (L/s)†	56,630	56,630	113,260	56,630	56,630	113,260	56,630	56,630	113,260
CONDENSER COILS									
9.53 mm OD, Vertical and Horizontal, Plate Fin, Enhanced Copper Tubing									
Fins/m	669	669	—	669	669	—	669	669	—
No. Rows (Ckt A or B)	3	3	—	3	3	—	3	3	—
Face Area, Ckt A and B Total (sq m)	24.98	24.98	49.96	24.98	24.98	49.96	24.98	24.98	49.96
Max Working Pressure Refrigerant (kPa)	3103	3103	—	3103	3103	—	3103	3103	—
COOLER									
Weight (empty, kg)	741	741	1482	848	741	1589	848	848	1696
No. Refrigerant Circuits	2	2	4	2	2	4	2	2	4
Net Water Volume, includes nozzles (L)	230.9	230.9	461.8	266.5	230.9	497.4	266.5	266.5	533.0
Max Working Pressure Refrigerant Side (kPa)	1916	1916	—	1916	1916	—	1916	1916	—
Max Working Pressure Fluid Side (kPa)	2068	2068	—	2068	2068	—	2068	2068	—
FLUID CONNECTIONS (in.)									
Victaulic Type									
Inlet and Outlet	6	6	—	6	6	—	6	6	—
Drain (NPT)	3/4	3/4	—	3/4	3/4	—	3/4	3/4	—
LEGEND									
Cu-Al	- Copper Tubing - Aluminum Fins Condenser Coil								
Cu-Cu	- Copper Tubing - Copper Fins Condenser Coil								
OD	- Outside Diameter								
*	06E250 compressors have 4 cylinders; all others have 6.								
NOTE:	Facing the compressors, Circuit A is on the right and Circuit B is on the left.								

50 Hz

30GTN,GTR UNIT SIZE	050	060	070	080	090	100	110
SYSTEM MODULES	—	—	—	—	—	—	—
APPROX OPERATING WEIGHT (kg)							
Cu-Al	1776	2168	2473	3055	3243	3960	4018
Cu-Cu	1972	2357	2758	3384	3573	4390	4450
REFRIGERANT TYPE							
Charge, Total/Over Clear Glass (kg)							
Ckt A	21.8/5.4	23.6/6.3	32.2/6.8	35.4/6.8	35.4/6.8	44.5/9.1	44.5/9.1
Ckt B	27.2/5.4	24.5/6.3	31.3/6.8	35.4/6.8	35.4/6.8	44.7/9.1	47.7/9.1
COMPRESSORS							
Speed (r/s)							
06E* (Qty) Ckt A	(1) 275	(1) 299	(1) 265, (1) 265	(1) 265, (1) 299	(1) 265, (1) 299	(1) 265, (1) 299	(2) 299
(Qty) Ckt B	(1) 299	(1) 299	(1) 299	(1) 299	(1) 265, (1) 275	(1) 265, (1) 299	(2) 299
Oil Charge (Compressor/L)			250/6.6, 265/9.0, 275/9.0, 299/9.0				
No. Capacity Control Steps	4	4	6	8	11	11	11
Capacity (%)							
Ckt A	43.3	50.0	58.0	62.0	54.0	50.0	50.0
Ckt B	56.7	50.0	42.0	38.0	46.0	50.0	50.0
Minimum Capacity Step (%)	58.8	33.3	19.3	16.0	14.0	13.0	17.0
CONDENSER FANS							
Standard							
Fan Speed (r/s)							
No. Blades...Dia. (mm)				15.8			
No. Fans...kW (each)				6...762			
Total Airflow (L/s)	4...1.49	6...1.49	6...1.49	6...1.49	6...1.49	8...1.49	8...1.49
High Static	16,045	25,540	24,068	26,898	26,898	35,864	35,864
Fan Speed (r/s)				24.1			
No. Blades...Dia. (mm)				12...762			
No. Fans...kW (each)				6...3.73			
Total Airflow (L/s)†	4...3.73	6...3.73	6...3.73	6...3.73	6...3.73	8...3.73	8...3.73
	18,876	28,315	28,315	28,315	28,315	37,750	37,750
CONDENSER COILS							
Face Area, Ckt A and B Total (sq m)							
Max Working Pressure Refrigerant (kPa)							
Face Area, Ckt A and B Total (sq m)	3	2	3	3	3	3	3
Max Working Pressure Refrigerant (kPa)	7.48	10.84	10.84	11.92	11.92	15.61	15.61
COOLER							
Weight (empty, kg)							
No. Refrigerant Circuits	248	282	282	338	338	391	391
Net Water Volume, includes nozzles (L)				2			
Max Working Pressure Refrigerant Side (kPa)	51.1	68.1	68.1	92.7	92.7	114.7	114.7
Max Working Pressure Fluid Side (kPa)				1916			
				2068			
FLUID CONNECTIONS (in.)							
Inlet and Outlet	3	4	4	4	4	5	5
Drain (NPT)				3/4			

LEGEND
 Cu-Al — Copper Tubing — Aluminum Fins Condenser Coil
 Cu-Cu — Copper Tubing — Copper Fins Condenser Coil
 OD — Outside Diameter
 *06E250 compressors have 4 cylinders; all others have 6.
 †Based on rated external static pressure of 100 Pa or 250 Pa as appropriate.
 NOTE: Facing the compressors, Circuit A is on the right and Circuit B is on the left.

Physical Data (cont)



50 Hz (cont)

	130	150	170	190	210	230	Total
30GTN,GTR UNIT SIZE							
SYSTEM MODULES							
APPROX OPERATING WEIGHT (kg)							
Cu-Al	4778	4852	5201	5866	6156	4852	7907
Cu-Cu	5335	5430	5779	6556	6847	5430	8814
REFRIGERANT TYPE				R-22			
Charge, Total/Over Clear Glass (kg)							
Ckt A	60.5/12.7	65.0/15.9	69.5/20.5	80.9/13.6	86.4/18.2	60.5/15.9	35.4/6.8
Ckt B	62.2/12.7	65.0/15.9	73.6/20.5	78.6/13.6	84.1/18.2	65.4/15.9	35.4/6.8
COMPRESSORS				Reciprocating, Semi-Hermetic			
Speed (r/s)				24.2			
06E* (Qty) Ckt A	(1) 265, (2) 275	(3) 299	(2) 275, (1) 299	(3) 299	(2) 265, (2) 299	(3) 299	(1) 265, (1) 299
(Qty) Ckt B	(2) 299	(2) 299	(1) 275, (2) 299	(3) 299	(3) 299	(2) 299	(1) 299
Oil Charge (Compressor/L)	14	14	17	7	8	14	8
No. Capacity Control Steps				265/9.0, 275/9.0, 299/9.0			
Capacity (%)							
Ckt A	52	60	48	50	52	60	62
Ckt B	48	40	52	50	48	40	38
Minimum Capacity Step (%)	10	13	10	17	10	13	16
CONDENSER FANS				Propeller, Direct Drive			
Standard							
Fan Speed (r/s)	15.8	15.8	15.8	15.8	15.8	15.8	15.8
No. Blades...Dia. (mm)	6...762	6...762	6...762	6...762	6...762	6...762	6...762
No. Fans...kW (each)	10...1.49	10...1.49	10...1.49	12...1.49	12...1.49	10...1.49	16...1.49
Total Airflow (L/s)	47,190	47,190	47,190	56,630	56,630	47,190	26,898
High Static							
Fan Speed (r/s)	24.1	24.1	24.1	24.1	24.1	24.1	24.1
No. Blades...Dia. (mm)	12...762	12...762	12...762	12...762	12...762	12...762	12...76
No. Fans...kW (each)	10...3.73	10...3.73	10...3.73	12...3.73	12...3.73	10...3.73	26...3.73
Total Airflow (L/s)†	47,190	47,190	47,190	56,630	56,630	47,190	28,315
CONDENSER COILS				9.53 mm OD, Vertical and Horizontal, Plate Fin, Enhanced Copper Tubing			
Fins/m	669	669	669	669	669	669	669
No. Rows (Ckt A or B)	3	3	3	3	3	3	3
Face Area, Ckt A and B Total (sq m)	20.91	20.91	20.91	20.91	24.98	24.98	32.83
Max Working Pressure Refrigerant (kPa)	3103	3103	3103	3103	3103	3103	3103
COOLER				One...Direct Expansion, Shell and Tube	One Per Module...Direct Expansion, Shell and Tube		
Weight (empty, kg)	600	600	741	741	848	600	938
No. Refrigerant Circuits	2	2	2	2	2	2	4
Net Water Volume, includes nozzles (L)	196.8	196.8	230.9	230.9	266.5	196.8	290.5
Max Working Pressure Refrigerant Side (kPa)	1916	1916	1916	1916	1916	1916	1916
Max Working Pressure Fluid Side (kPa)	2068	2068	2068	2068	2068	2068	2068
FLUID CONNECTIONS (in.)				Victaulic Type			
Inlet and Outlet	6	6	6	6	6	6	4
Drain (NPT)				3/4			
LEGEND							
Cu-Al	Copper Tubing — Aluminum Fins Condenser Coil						
Cu-Cu	Copper Tubing — Copper Fins Condenser Coil						
OD	Outside Diameter						
*06E250	compressors have 4 cylinders; all others have 6.						
†	Based on rated external static pressure of 100 Pa or 250 Pa as appropriate.						
NOTE:	Facing the compressors, Circuit A is on the right and Circuit B is on the left.						

Physical Data (cont)



50 Hz (cont)

30G/TN, GTR UNIT SIZE	245			255			270		
	A	B	Total	A	B	Total	A	B	Total
SYSTEM MODULES									
APPROX OPERATING WEIGHT (kg)									
Cu-Al	4852	3243	8095	4852	3960	8812	5201	3960	9,161
Cu-Cu	5430	4390	9003	5430	4390	9820	5779	4390	10,169
REFRIGERANT TYPE									
Charge, Total/Over Clear Glass (kg)									
Ckt A	65.0/15.9	35.4/6.8	—/—	65.0/15.9	44.5/9.1	—/—	69.5/20.5	44.5/9.1	—/—
Ckt B	65.4/15.9	35.4/6.8	—/—	65.4/15.9	47.7/9.1	—/—	73.6/20.5	47.7/9.1	—/—
COMPRESSORS									
Speed (r/s)									
06E* (Qty) Ckt A	(3) 299	(1) 265, (1) 299	—	(3) 299	(1) 265, (1) 299	—	(2) 275, (1) 299	(1) 265, (1) 299	—
(Qty) Ckt B	(2) 299	(1) 265, (1) 275	—	(2) 299	(1) 265, (1) 299	—	(1) 275, (2) 299	(1) 265, (1) 299	—
Oil Charge (Compressor/L)									
No. Capacity Control Steps	14	11	—	14	11	—	17	11	—
Capacity (%)									
Ckt A	60	54	—	60	50	—	48	50	—
Ckt B	40	46	—	40	50	—	52	50	—
Minimum Capacity Step (%)	13	14	—	13	13	—	10	13	—
CONDENSER FANS									
Standard									
Fan Speed (r/s)	15.8	15.8	—	15.8	15.8	—	15.8	15.8	—
No. Blades...Dia. (mm)	6...762	6...762	—	6...762	6...762	—	6...762	6...762	—
No. Fans...kW (each)	10...1,49	6...1,49	16...1,49	10...1,49	8...1,49	18...1,49	10...1,49	8...1,49	18...1,49
Total Airflow (L/s)	47,190	26,898	74,088	47,190	35,864	85,054	47,190	35,864	85,054
High Static									
Fan Speed (r/s)	24.1	24.1	—	24.1	24.1	—	24.1	24.1	—
No. Blades...Dia. (mm)	12...762	12...762	—	12...762	12...762	—	12...762	12...762	—
No. Fans...kW (each)	10...3,73	6...3,73	16...3,73	10...3,73	8...3,73	18...3,73	10...3,73	8...3,73	18...3,73
Total Airflow (L/s)†	47,190	28,315	75,505	47,190	37,750	84,940	47,190	37,750	84,940
CONDENSER COILS									
9.53 mm OD, Vertical and Horizontal, Plate Fin, Enhanced Copper Tubing									
Fins/m	669	669	—	669	669	—	669	669	—
No. Rows (Ckt A or B)	3	3	—	3	3	—	3	3	—
Face Area, Ckt A and B Total (sq m)	20.91	11.92	32.83	20.91	15.61	36.52	20.91	15.61	36.52
Max Working Pressure Refrigerant (kPa)	3103	3103	—	3103	3103	—	3103	3103	—
COOLER									
One Per Module...Direct Expansion, Shell and Tube									
Weight (empty, kg)	600	338	938	600	391	991	741	391	1132
No. Refrigerant Circuits	2	2	4	2	2	4	2	2	4
Net Water Volume, includes nozzles (L)	196.8	92.7	289.5	196.8	114.7	311.5	230.9	114.7	345.6
Max Working Pressure Refrigerant Side (kPa)	1916	1916	—	1916	1916	—	1916	1916	—
Max Working Pressure Fluid Side (kPa)	2068	2068	—	2068	2068	—	2068	2068	—
FLUID CONNECTIONS (in.)									
Victaulic Type									
Inlet and Outlet	6	4	—	6	5	—	6	5	—
Drain (NPT)	3/4	3/4	—	3/4	3/4	—	3/4	3/4	—
LEGEND									
Cu-Al — Copper Tubing — Aluminum Fins Condenser Coil									
Cu-Cu — Copper Tubing — Copper Fins Condenser Coil									
OD — Outside Diameter									
*06E250 compressors have 4 cylinders; all others have 6.									
†Based on rated external static pressure of 100 Pa or 250 Pa as appropriate.									
NOTE: Facing the compressors, Circuit A is on the right and Circuit B is on the left.									

Physical Data (cont)



30GTN, GTR UNIT SIZE	290			315			330		
	A	B	Total	A	B	Total	A	B	Total
SYSTEM MODULES									
APPROX OPERATING WEIGHT (kg)									
Cu-AI	5866	4018	9884	6156	4018	10,174	5201	5201	10,402
Cu-Cu	6556	4450	11,006	6847	4450	11,297	5779	5779	11,558
REFRIGERANT TYPE									
Charge, Total/Over Clear Glass (kg)									
Ckt A	80.9/13.6	44.5/9.1	—/—	86.4/18.2	44.5/9.1	—/—	69.5/20.5	69.5/20.5	—/—
Ckt B	78.6/13.6	47.7/9.1	—/—	84.1/18.2	47.7/9.1	—/—	73.6/20.5	73.6/20.5	—/—
COMPRESSORS									
Speed (r/s)									
06E* (Qty) Ckt A	(3) 299	(2) 299	—	(2) 265, (2) 299	(2) 299	—	(2) 275, (1) 299	(2) 275, (1) 299	—
(Qty) Ckt B	(3) 299	(2) 299	—	(3) 299	(2) 299	—	(1) 275, (2) 299	(1) 275, (2) 299	—
Oil Charge (Compressor/L)	6	11	—	7	11	—	17	17	—
No. Capacity Control Steps									
Capacity (%)									
Ckt A	50	50	—	52	50	—	48	48	—
Ckt B	50	50	—	48	50	—	52	52	—
Minimum Capacity Step (%)	17	17	—	10	17	—	10	10	—
CONDENSER FANS									
Standard									
Fan Speed (r/s)	15.8	15.8	—	15.8	15.8	—	15.8	15.8	—
No. Blades...Dia. (mm)	6...762	6...762	—	6...762	6...762	—	6...762	6...762	—
No. Fans...kW (each)	12...1,49	8...1,49	20...1,49	12...1,49	8...1,49	20...1,49	10...1,49	10...1,49	20...1,49
Total Airflow (L/s)	56,630	35,864	92,494	56,630	35,864	92,494	47,190	47,190	94,380
High Static									
Fan Speed (r/s)	24.1	24.1	—	24.1	24.1	—	24.1	24.1	—
No. Blades...Dia. (mm)	12...762	12...762	—	12...762	12...762	—	12...762	12...762	—
No. Fans...kW (each)	12...3,73	8...3,73	20...3,73	12...3,73	8...3,73	20...3,73	10...3,73	10...3,73	20...3,73
Total Airflow (L/s)†	56,630	37,750	94,380	56,630	37,750	94,380	47,190	47,190	94,380
CONDENSER COILS									
9.53 mm OD, Vertical and Horizontal, Plate Fin, Enhanced Copper Tubing									
Fins/m	669	669	—	669	669	—	669	669	—
No. Rows (Ckt A or B)	3	3	—	3	3	—	3	3	—
Face Area, Ckt A and B Total (sq m)	24.98	15.61	40.59	24.98	15.61	40.59	20.91	20.91	41.82
Max Working Pressure Refrigerant (kPa)	3103	3103	—	3103	3103	—	3103	3103	—
COOLER									
One Per Module...Direct Expansion, Shell and Tube									
Weight (empty, kg)	741	391	1132	848	391	1239	741	741	1482
No. Refrigerant Circuits	2	2	4	2	2	4	2	2	4
Net Water Volume, includes nozzles (L)	230.9	114.7	345.6	266.5	114.7	381.2	230.9	230.9	461.8
Max Working Pressure Refrigerant Side (kPa)	1916	1916	—	1916	1916	—	1916	1916	—
Max Working Pressure Fluid Side (kPa)	2068	2068	—	2068	2068	—	2068	2068	—
FLUID CONNECTIONS (in.)									
Victaulic Type									
Inlet and Outlet	6	5	—	6	5	—	6	6	—
Drain (NPT)	3/4	3/4	—	3/4	3/4	—	3/4	3/4	—
LEGEND									
Cu-AI — Copper Tubing — Aluminum Fins Condenser Coil									
Cu-Cu — Copper Tubing — Copper Fins Condenser Coil									
OD — Outside Diameter									
*06E250 compressors have 4 cylinders; all others have 6.									
†Based on rated external static pressure of 100 Pa or 250 Pa as appropriate.									
NOTE: Facing the compressors, Circuit A is on the right and Circuit B is on the left.									

Physical Data (cont)



50 Hz (cont)

30GTN, GTR UNIT SIZE	360			390			420		
	A	B	Total	A	B	Total	A	B	Total
SYSTEM MODULES									
APPROX OPERATING WEIGHT (kg)									
Cu-Al	5866	5201	11,067	6156	5866	12,022	6156	6156	12,312
Cu-Cu	6556	5779	12,335	6847	6556	13,403	6847	6847	13,694
REFRIGERANT TYPE									
Charge, Total/Over Clear Glass (kg)									
Ckt A	80.9/13.6	80.9/13.6	—/—	86.4/18.2	80.9/13.6	—/—	86.4/18.2	86.4/18.2	—/—
Ckt B	78.6/13.6	73.6/13.6	—/—	84.1/18.2	78.6/13.6	—/—	84.1/18.2	84.1/18.2	—/—
COMPRESSORS									
Speed (r/s)									
06E* (Qty) Ckt A	(3) 299	(2) 275, (1) 299	—	(2) 265, (2) 299	(3) 299	—	(2) 265, (1) 299	(2) 265, (2) 299	—
(Qty) Ckt B	(3) 299	(1) 275, (2) 299	—	(3) 299	(3) 299	—	(3) 299	(3) 299	—
Oil Charge (Compressor/L)									
No. Capacity Control Steps	6	17	—	7	6	—	7	7	—
Capacity (%)									
Ckt A	50	48	—	52	50	—	52	52	—
Ckt B	50	52	—	48	50	—	48	48	—
Minimum Capacity Step (%)	17	16	—	10	17	—	10	10	—
CONDENSER FANS									
Standard									
Fan Speed (r/s)	15.8	15.8	—	15.8	15.8	—	15.8	15.8	—
No. Blades...Dia. (mm)	6...762	6...762	—	6...762	6...762	—	6...762	6...762	—
No. Fans...kW (each)	12...1.49	12...1.49	24...1.49	12...1.49	12...1.49	24...1.49	12...1.49	12...1.49	24...1.49
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...Dia. (mm)	12...762	12...762	—	12...762	12...762	—	12...762	12...762	—
No. Fans...kW (each)	12...3.73	12...3.73	24...3.73	12...3.73	12...3.73	24...3.73	12...3.73	12...3.73	24...3.73
Total Airflow (L/s)†	56,630	41,190	103,820	56,630	56,630	113,260	56,630	56,630	113,260
CONDENSER COILS									
9.53 mm OD, Vertical and Horizontal, Plate Fin, Enhanced Copper Tubing									
Fins/m	669	669	—	669	669	—	669	669	—
No. Rows (Ckt A or B)	3	3	—	3	3	—	3	3	—
Face Area, Ckt A and B Total (sq m)	24.98	20.91	45.89	24.98	24.98	49.96	24.98	24.98	49.96
Max Working Pressure Refrigerant (kPa)	3103	3103	—	3103	3103	—	3103	3103	—
COOLER									
One Per Module...Direct Expansion, Shell and Tube									
Weight (empty, kg)	741	741	1482	848	741	1589	848	848	1696
No. Refrigerant Circuits	2	2	4	2	2	4	2	2	4
Net Water Volume, includes nozzles (L)	230.9	230.9	461.8	266.5	230.9	497.4	266.5	266.5	533.0
Max Working Pressure Refrigerant Side (kPa)	1916	1916	—	1916	1916	—	1916	1916	—
Max Working Pressure Fluid Side (kPa)	2068	2068	—	2068	2068	—	2068	2068	—
FLUID CONNECTIONS (in.)									
Victaulic Type									
Inlet and Outlet	6	6	—	6	6	—	6	6	—
Drain (NPT)	3/4	3/4	—	3/4	3/4	—	3/4	3/4	—
LEGEND									
Cu-Al — Copper Tubing — Aluminum Fins Condenser Coil									
Cu-Cu — Copper Tubing — Copper Fins Condenser Coil									
OD — Outside Diameter									
*06E250 compressors have 4 cylinders; all others have 6.									
†Based on rated external static pressure of 100 Pa or 250 Pa as appropriate.									
NOTE: Facing the compressors, Circuit A is on the right and Circuit B is on the left.									

Factory-installed options



Cooler heater helps protect the cooler to -20°F (-29°C).
 NOTE: For ambient temperatures below 32°F (0°C), inhibited glycol antifreeze solutions are recommended to prevent freeze-up in the event of power failure.

Sound reduction option consists of specially designed system of fans and acoustic enclosures for reducing sound levels without compromising chiller performance. For 50 Hz units, this option uses low-noise AeroAcoustic (Flying Bird) fans and taller discharge stacks. (Additional packaging is required. See Price Pages for further details.)

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

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

Condenser coil options — Several options are available to match coil construction to the site conditions for the best durability. See page 37 for additional details or contact your Carrier representative for further information.

CONDENSER COIL OPTION RECOMMENDATIONS

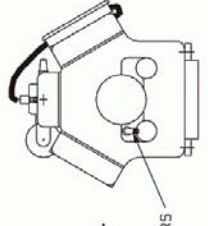
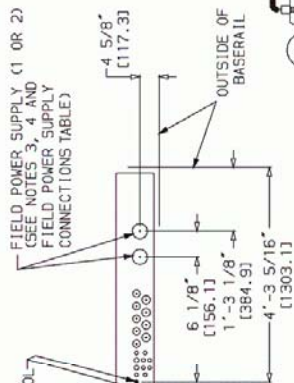
COPPER-TUBE COILS	ENVIRONMENT	
	Standard	Mild Coastal
AL Fins (Standard coils)	X	
CU Fins		X
AL Fins, Pre-coated		X

LEGEND

- AL** — Aluminium
- CU** — Copper

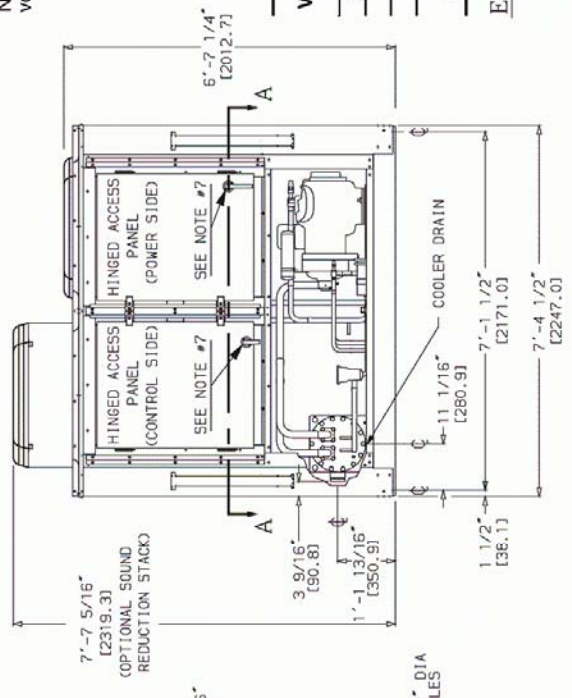
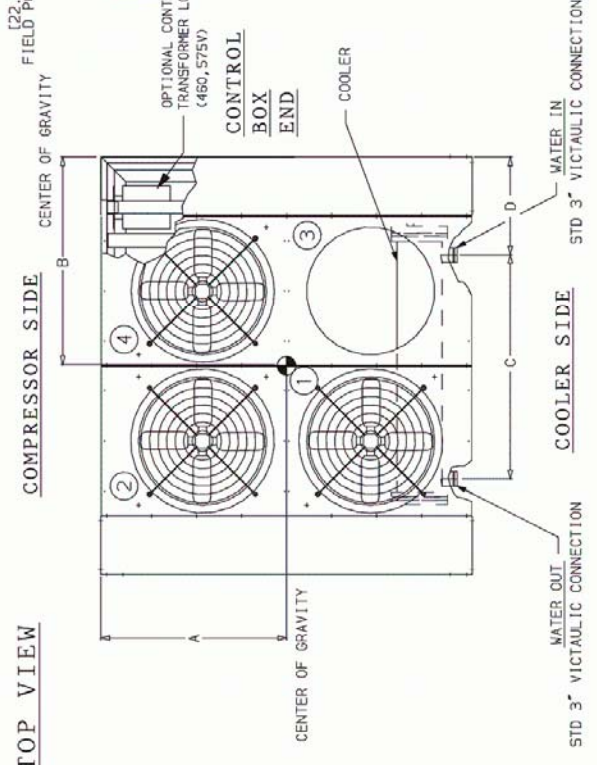
UNIT	DIMENSIONS — ft.-in. [mm]			
	A	B	C	D
30GTN,GTR				
050	3-57/8 [1064]	3-11 [1194]	5-51/2 [1663]	1-53/16 [436.6]
050C	3-6 [1067]	3-113/16 [1199]	5-51/2 [1663]	1-53/16 [436.6]

- NOTES:**
- Dimensions in [] are in mm.
 - Unit must have clearances for airflow as follows:
Top — Do not restrict in any way.
Ends — [1524 mm] 5 ft
Sides — [1829 mm] 6 ft
Two 2.0-in. dia holes would be recommended for parallel conductors on 040 and 045 (208/230 volt) units.
 - One 3/8-in. dia hole would be recommended for single entry power on 050 (208/230 volt) unit.
 - Mounting holes may be used to mount unit to concrete pad. They are not recommended for spring isolator location.
 - If spring isolators are used, a perimeter support channel between the unit and the isolators is recommended.
 - When unit has non-fused disconnect option, power side door opens in opposite direction.
 - Non-fused disconnect option available on all voltages.



DETAIL B
TYP. (2) PLACES
RELIEF VALVES ARE EQUIPPED WITH A 3/8" SAE FLARE FOR FIELD CONNECTION

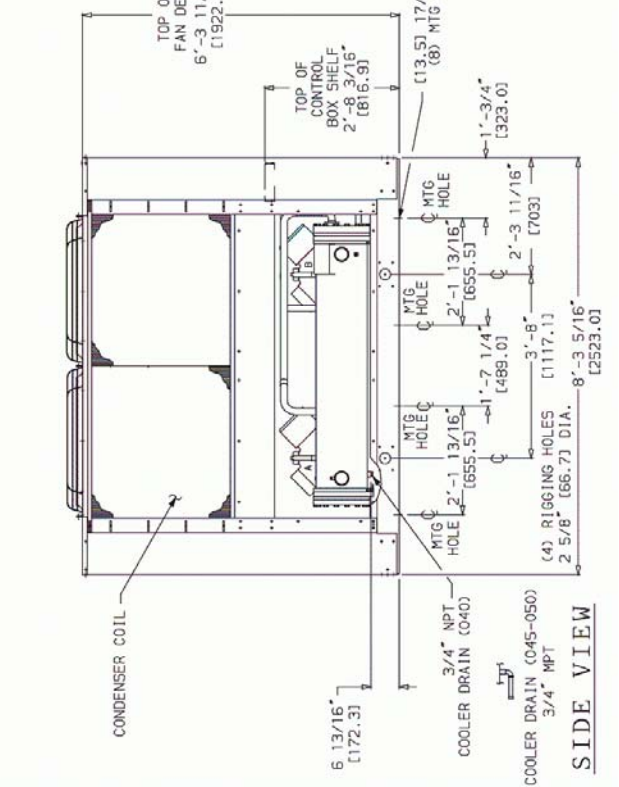
VIEW A-A
TOP VIEW OF CONTROL BOX SHELF WITH FIELD POWER SUPPLY CONNECTIONS.
RELIEF VALVE LOCATED ON A1 AND B1 COMPRESSORS



FIELD POWER SUPPLY CONNECTIONS

VOLTAGE	UNIT	DIAMETER —	QTY.
	30GTN, GTR	Hz	in. [mm]
208/230		60	2 1/2 [63.5]
460		60	2 1/2 [63.5]
575	050	60	2 1/2 [63.5]
380		60	2 1/2 [63.5]
380/415		50	3 5/8 [92.0]

END VIEW



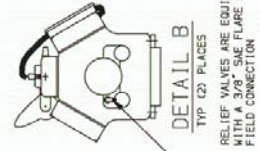
UNIT 30GTN, GTR	DIMENSIONS — ft.-in. [mm]	
	A	B
060	3-67/8 [1090]	4-10 ⁵ / ₁₆ [1481]
060C	3-7 [1092]	4-10 ⁹ / ₁₆ [1488]
070	3-6 [1067]	4-10 ¹ / ₂ [1486]
070C	3-6 ³ / ₁₆ [1072]	4-10 ⁷ / ₈ [1496]

NOTES:

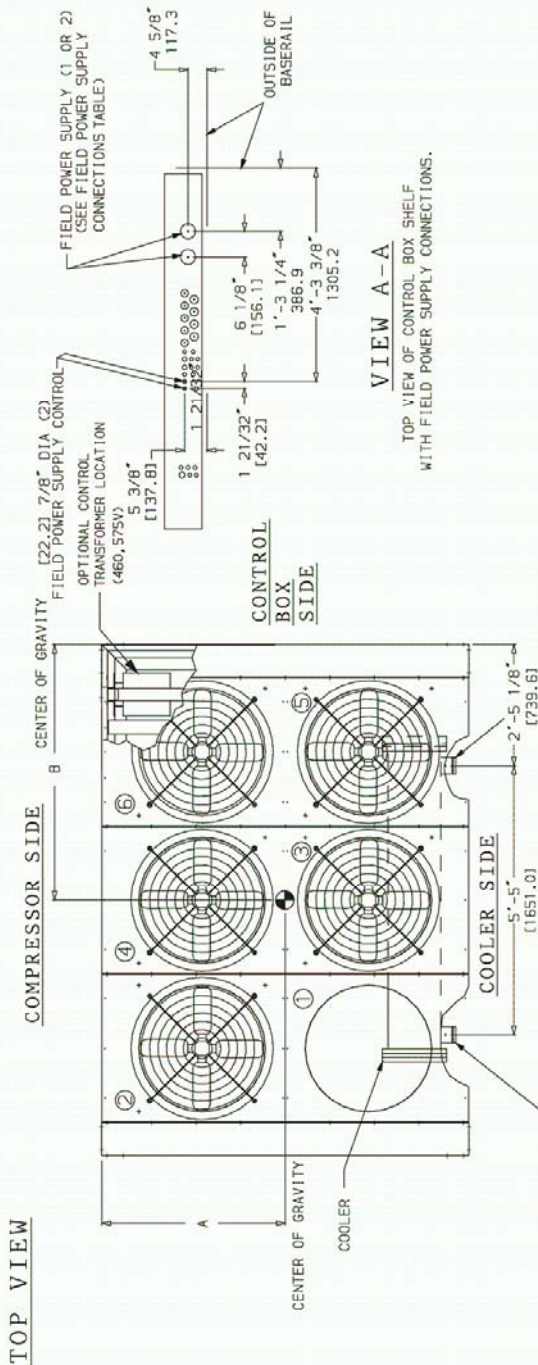
- Dimensions in [] are in mm.
- Unit must have clearances for airflow as follows:
Top — Do not restrict in any way.
Ends — [1524 mm] 5 ft
Sides — [1829 mm] 6 ft
- Mounting holes may be used to mount unit to concrete pad. They are not recommended for spring isolator location.
- If spring isolators are used, a perimeter support channel between the unit and the isolators is recommended.
- When unit has non-fused disconnect option, power side door opens in opposite direction. Non-fused disconnect option available on all voltages.

FIELD POWER SUPPLY CONNECTIONS

VOLTAGE	UNIT 30GTN, GTR	Hz	DIAMETER — in. [mm]	QTY.
208/230	060	60	2 1/2 [63.5]	2
	070	60	3 5/8 [92.0]	2
460	060	60	2 1/2 [63.5]	1
	070	60	3 5/8 [92.0]	1
575	060, 070	60	2 1/2 [63.5]	1
380	060, 070	60	3 5/8 [92.0]	1
380/415	060, 070	50	3 5/8 [92.0]	1

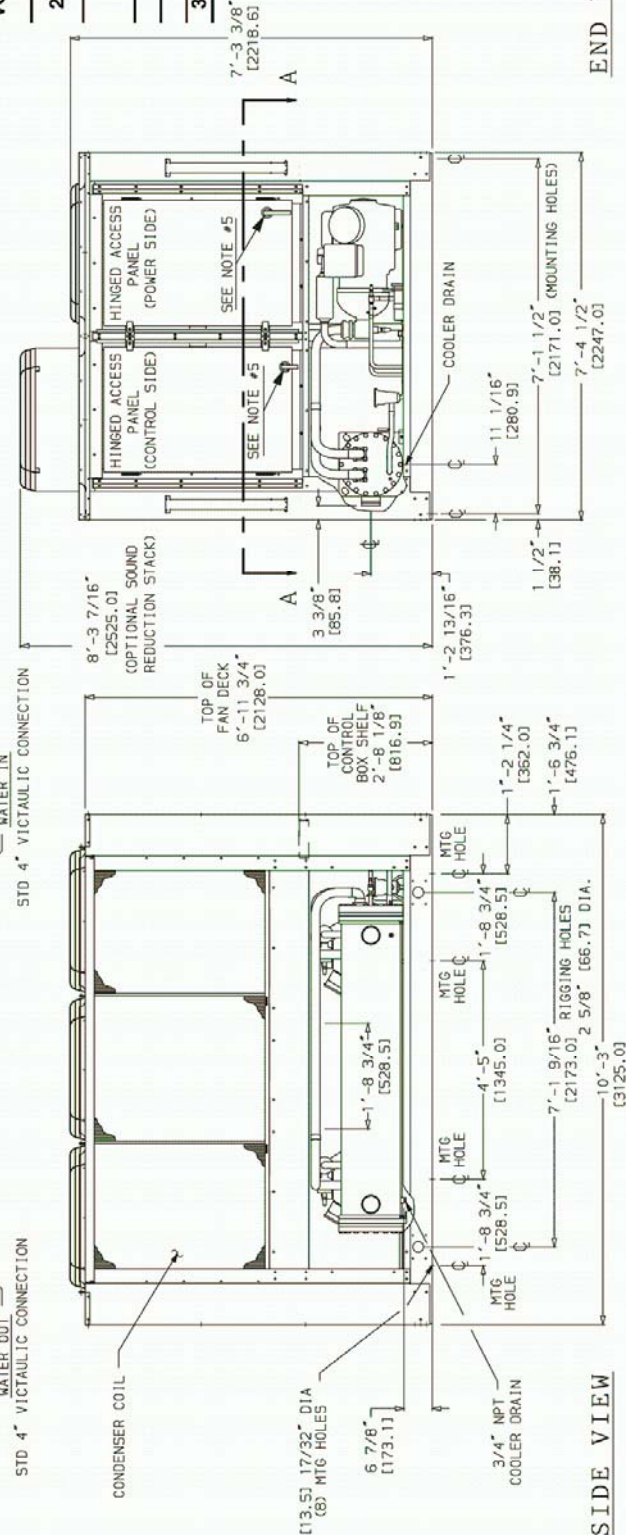


END VIEW

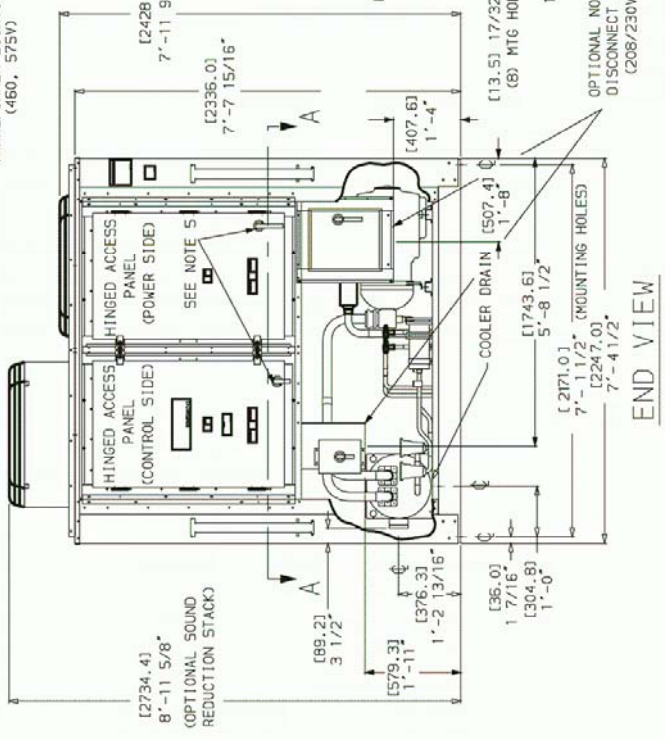
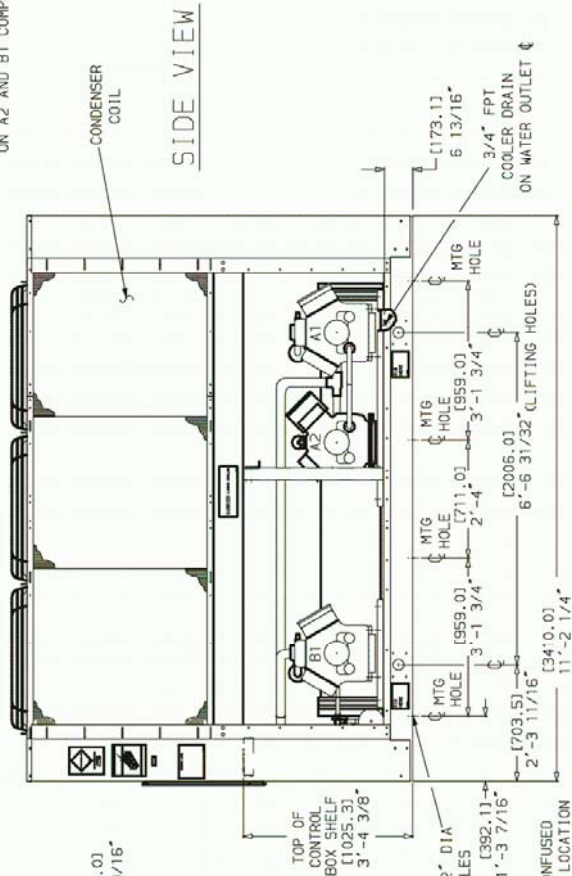
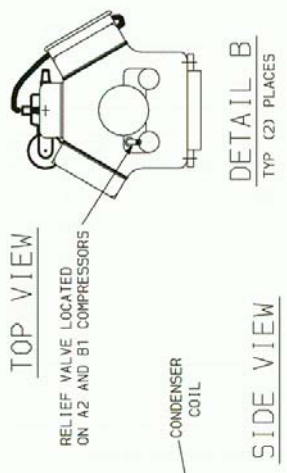
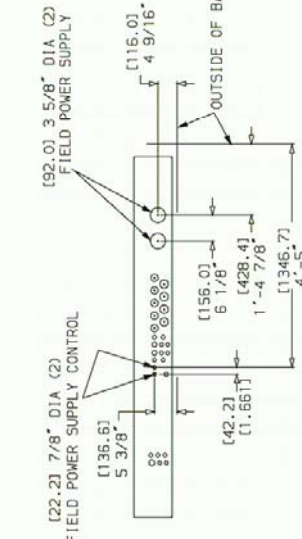
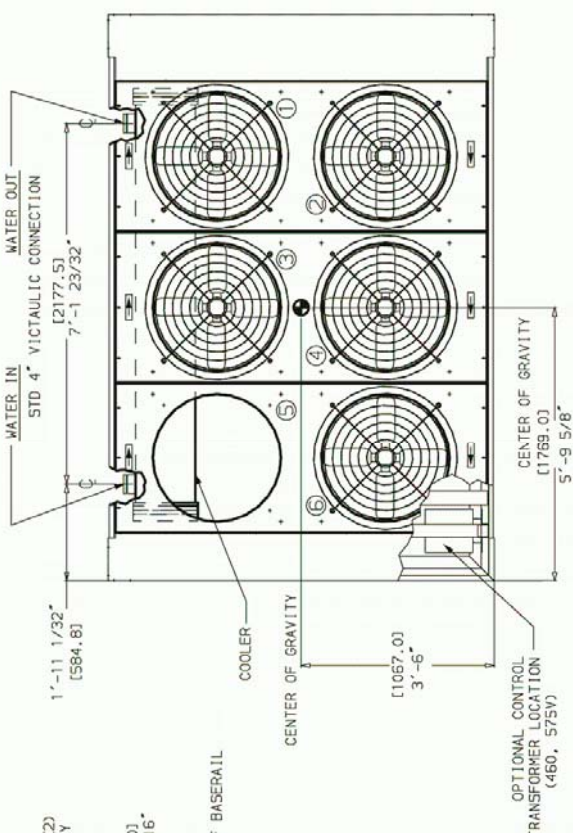


VIEW A-A

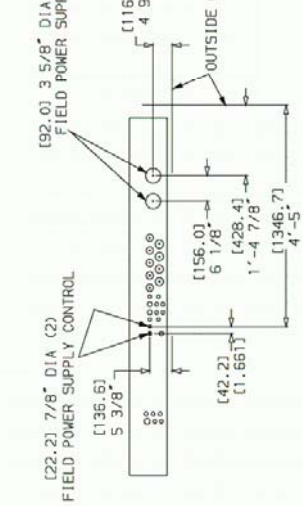
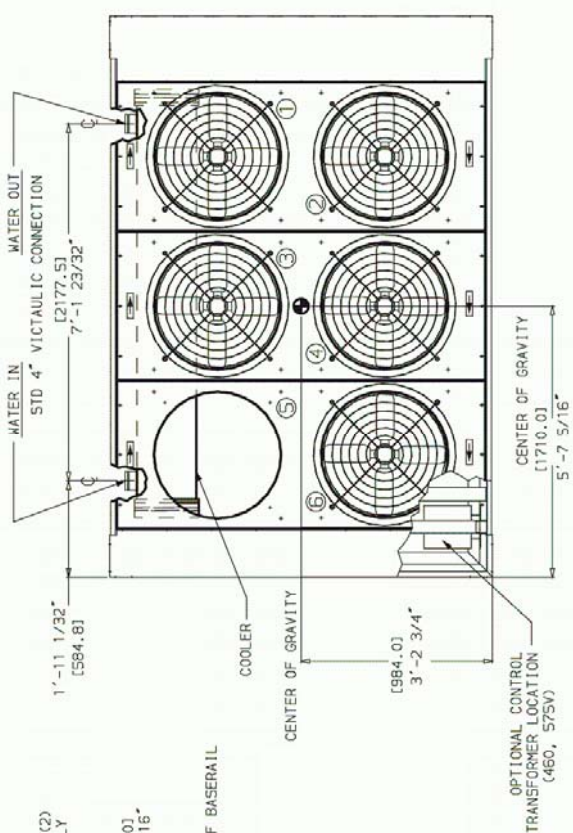
TOP VIEW OF CONTROL BOX SHELF WITH FIELD POWER SUPPLY CONNECTIONS.



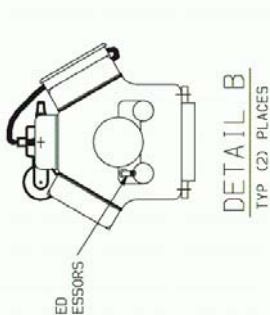
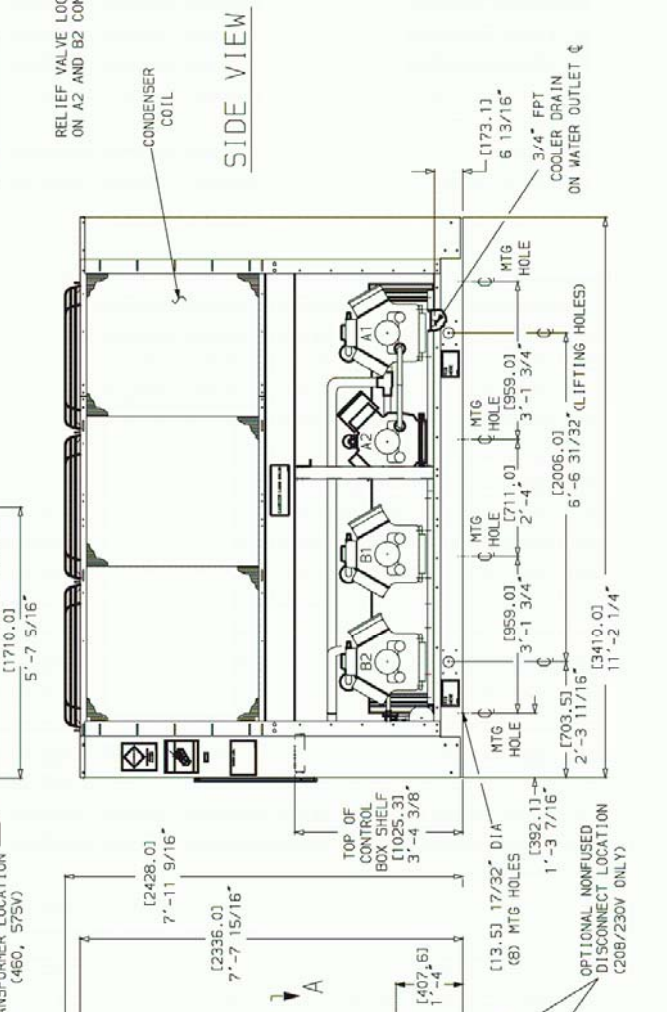
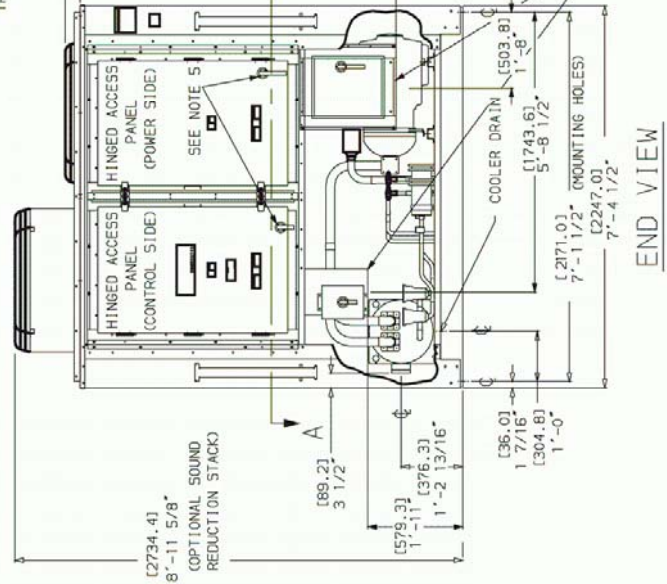
- NOTES:**
1. Dimensions in [] are in mm.
 2. Unit must have clearances for airflow as follows:
Top — Do not restrict in any way.
Ends — [1524 mm] 5 ft
Sides — [1829 mm] 6 ft
 3. Mounting holes may be used to mount unit to concrete location.
 4. If spring isolators are used, a perimeter support channel between the unit and the isolators is recommended.
 5. When unit has non-fused disconnect option, power side door opens in opposite direction. Non-fused disconnect option mounted in control box on 380, 460, 575 v (60 Hz) and 400 v (50 Hz). For 208/230 v (60 Hz), non-fused disconnect mounted underneath control box.
 6. 30GTN, GTR080 is also Module B for 30GTN, GTR230.



- NOTES:**
- Dimensions in [] are in mm.
 - Unit must have clearances for airflow as follows:
Top — Do not restrict in any way.
Top — [1524 mm] 5 ft
Sides — [1829 mm] 6 ft
 - Mounting holes may be used to mount unit to concrete pad. They are not recommended for spring isolator location.
 - If spring isolators are used, a perimeter support channel between the unit and the isolators is recommended.
 - When unit has non-fused disconnect option, power side door opens in opposite direction. Non-fused disconnect option mounted in control box on 380, 460, 575 v (60 Hz) and 400 v (50 Hz). For 208/230 v (60 Hz), non-fused disconnect mounted underneath control box.
 - 30GTN, GTR090 is also Module B for 30GTN, GTR245.

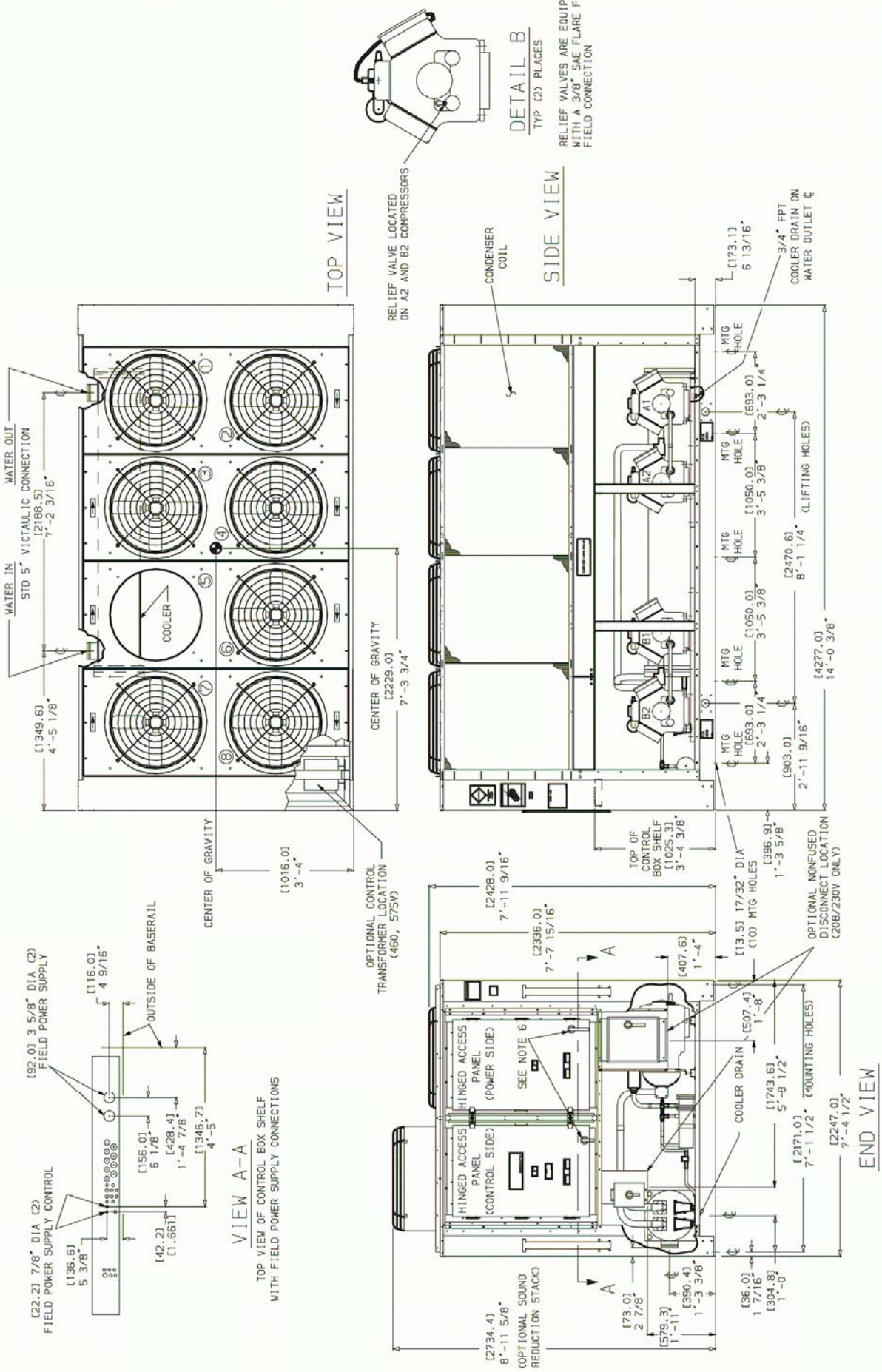


TOP VIEW OF CONTROL BOX SHELF WITH FIELD POWER SUPPLY CONNECTIONS



NOTES:

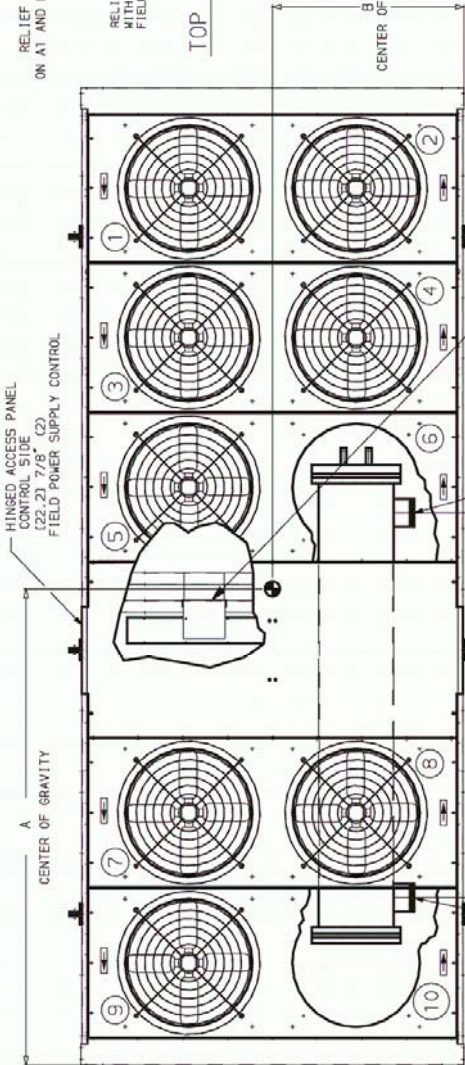
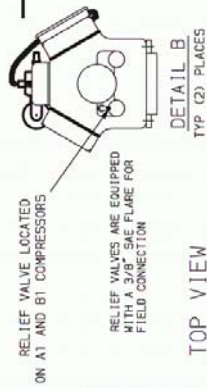
1. Dimensions in [] are in mm.
2. Unit must have clearances for airflow as follows:
 Top — Do not restrict in any way.
 Ends — [1524 mm] 5 ft
 Sides — [1829 mm] 6 ft
3. Mounting holes may be used to mount unit to concrete pad. They are not recommended for spring isolator location.
4. If spring isolators are used, a perimeter support channel between the unit and the isolators is recommended.
5. 30GTN, GTR100 is also Module B for 30GTN, GTR255, 270.
6. 30GTN, GTR110 is also Module B for 30GTN, GTR290, 315.
7. When unit has non-fused disconnect option, power side door opens in opposite direction. Non-fused disconnect option mounted in control box on 380, 460, 575 v (60 Hz) and 400 v (50 Hz). For 208/230 v (60 Hz), non-fused disconnect mounted underneath control box.



Base unit dimensions - 30GTN, GTR130-170

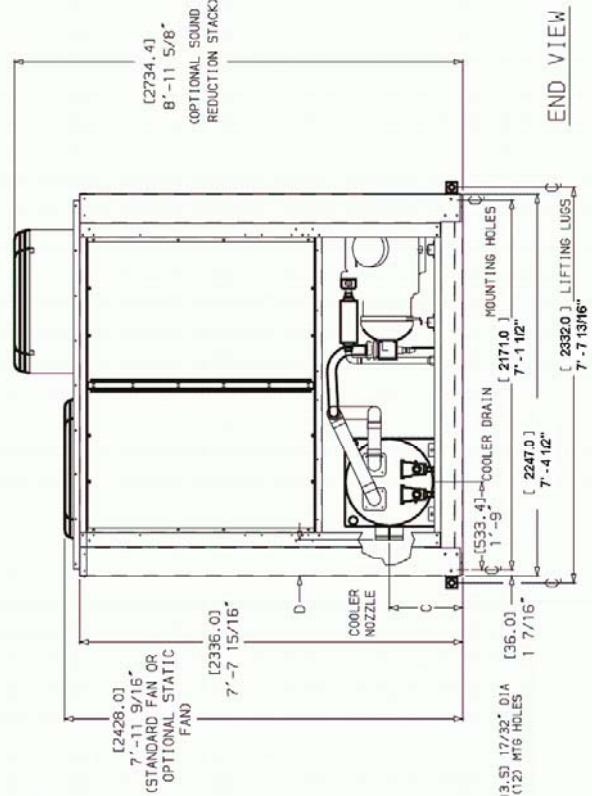


UNIT 30GTN, GTR	DIMENSIONS — ft.-in. [mm]			
	A	B	C	D
130	9-4 1/2 [2858]	4-1 1/8 [1267]	1-4 3/4 [425]	0-9 1/2 [242]
150	9-4 [2849]	4-2 1/2 [1283]	1-4 3/4 [425]	0-9 1/2 [242]
170	9-4 1/8 [2865]	4-2 1/2 [1283]	1-5 5/8 [448]	0-8 5/8 [219]

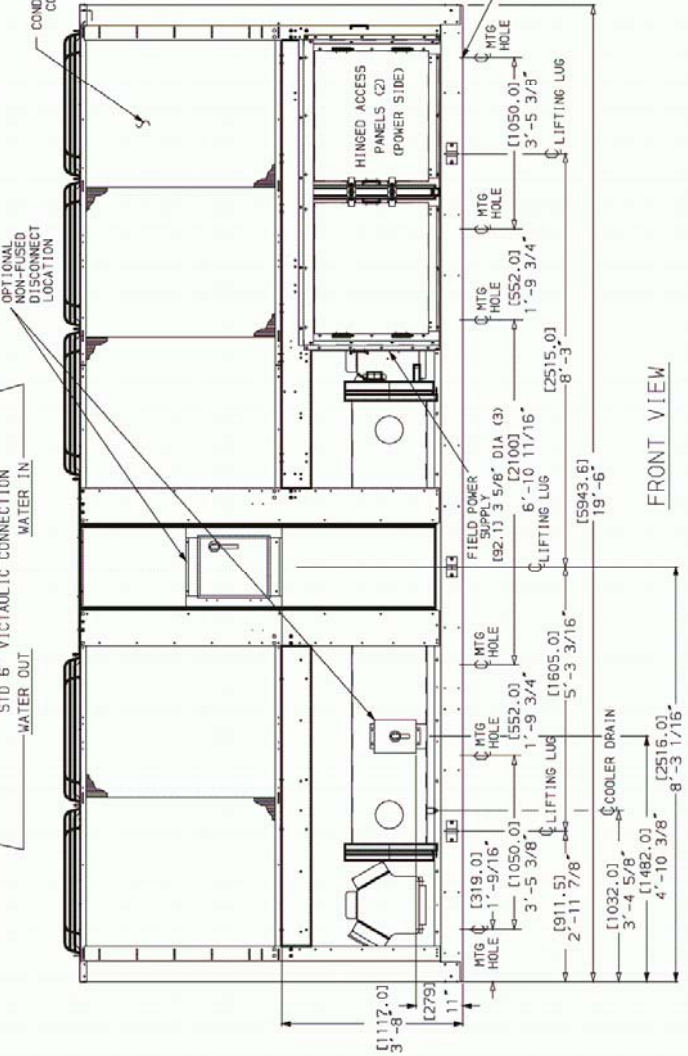


TOP VIEW

- NOTES:**
- Dimensions in [] are in mm.
 - Unit must have clearances for airflow as follows:
Top — Do not restrict in any way.
Ends — [1524 mm] 5 ft
Sides — [1829 mm] 6 ft
 - Mounting holes may be used to mount unit to concrete pad. They are not recommended for spring isolator location.
 - If spring isolators are used, a perimeter support channel between the unit and the isolators is recommended.
 - 30GTN, GTR150 is also Module A for 30GTN, GTR230, 245, 255. 30GTN, GTR170 is also Module A for 30GTN, GTR270, 330. 30GTN, GTR170 is also Module B for 30GTN, GTR330, 360 — 50 Hz.



END VIEW



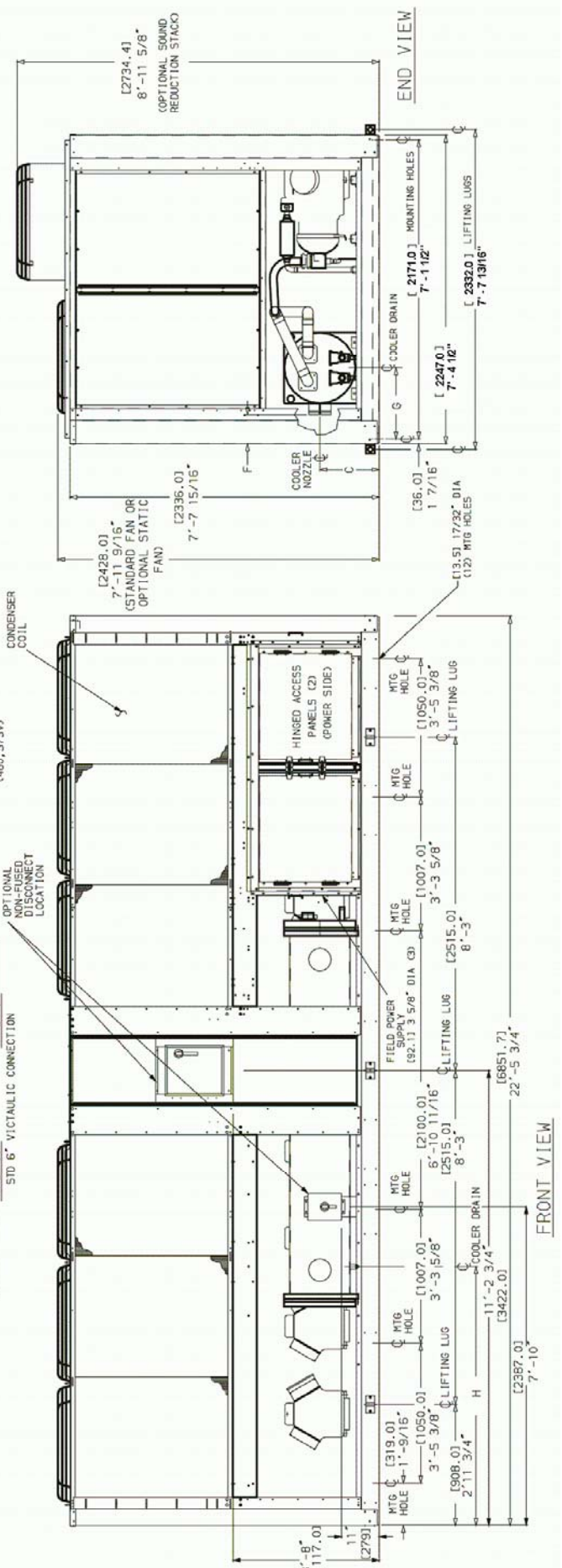
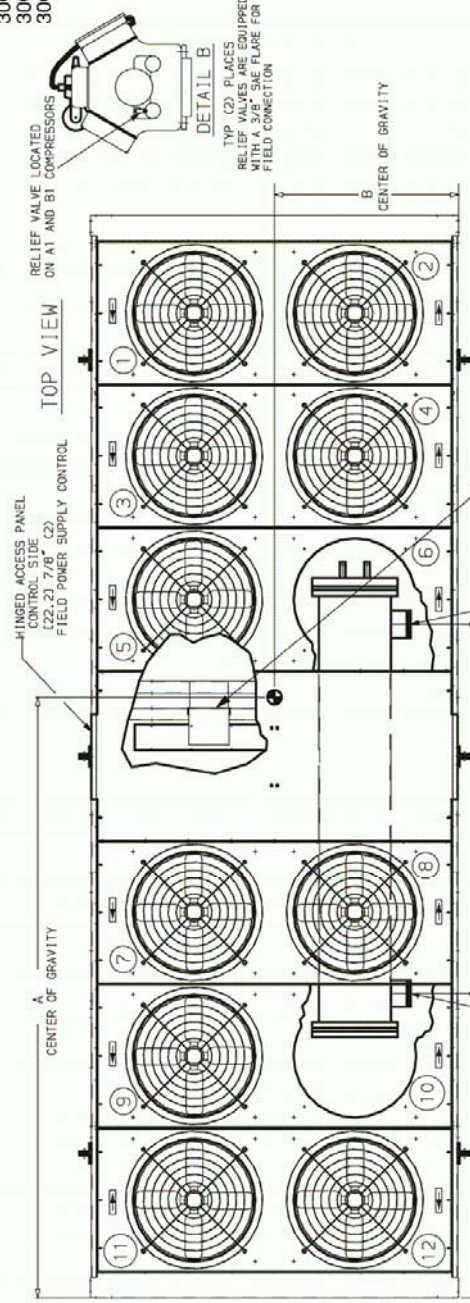
FRONT VIEW

Base unit dimensions - 30GTN,GTR190-210



1. Dimensions in [] are in mm.
2. Unit must have clearances for airflow as follows:
 Top — Do not restrict in any way.
 Ends — [1524 mm] 5 ft
 Sides — [1829 mm] 6 ft
3. Mounting holes may be used to mount unit to concrete pad. They are not recommended for spring isolator location.
4. If spring isolators are used, a perimeter support channel between the unit and the isolators is recommended.
5. 30GTN,GTR190 is also Module A for 30GTN,GTR290,360. 30GTN,GTR190 is also Module B for 30GTN,GTR360 (60 Hz), 390, 30GTN,GTR210 is also Module A for 30GTN,GTR315,390,420. 30GTN,GTR210 is also Module B for 30GTN,GTR420.

UNIT 30GTN,GTR	DIMENSIONS — ft-in. [mm]							
	A	B	C	D	E	F	G	H
190	11-4 [3454]	4-2 1/2 [1283]	1-5 5/8 [448]	6-37/16 [1916]	7-8 1/4 [2343]	0-8 5/8 [219]	1-9 [533.4]	6-47/16 [1941.3]
210	11-3 [3444]	4-2 [1270]	1-6 7/16 [468]	5-11 1/2 [1816]	8-29/16 [2504]	0-9 1/2 [242]	1-11 [584]	5-11 1/2 [1816.2]

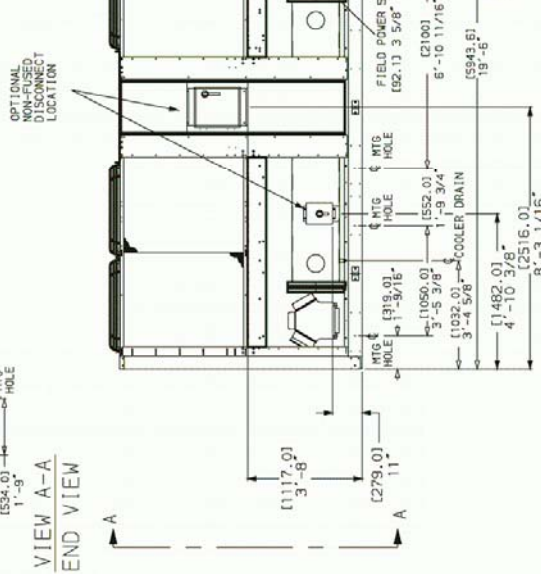
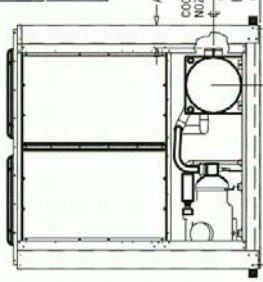
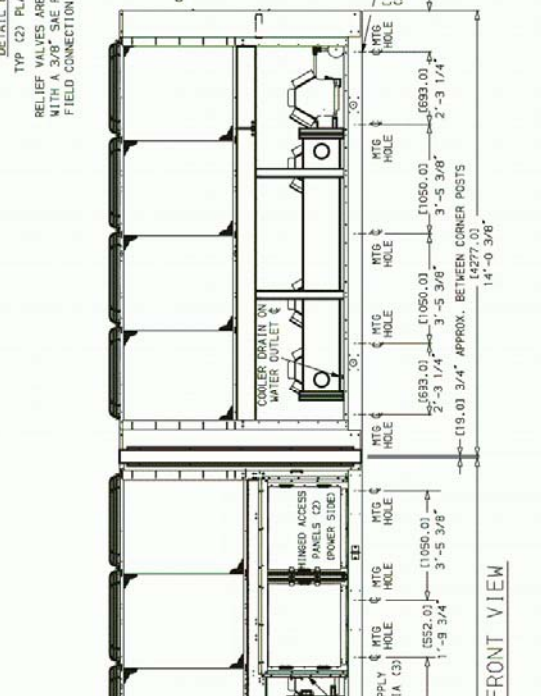
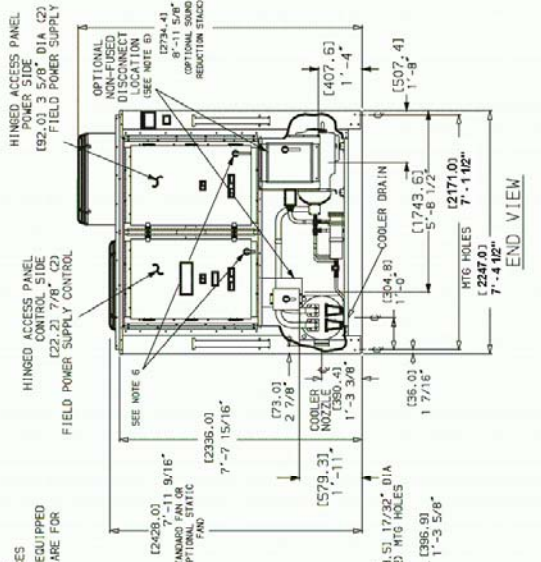
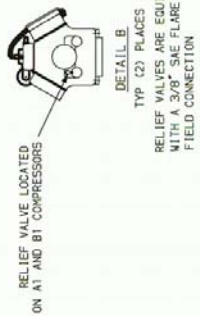
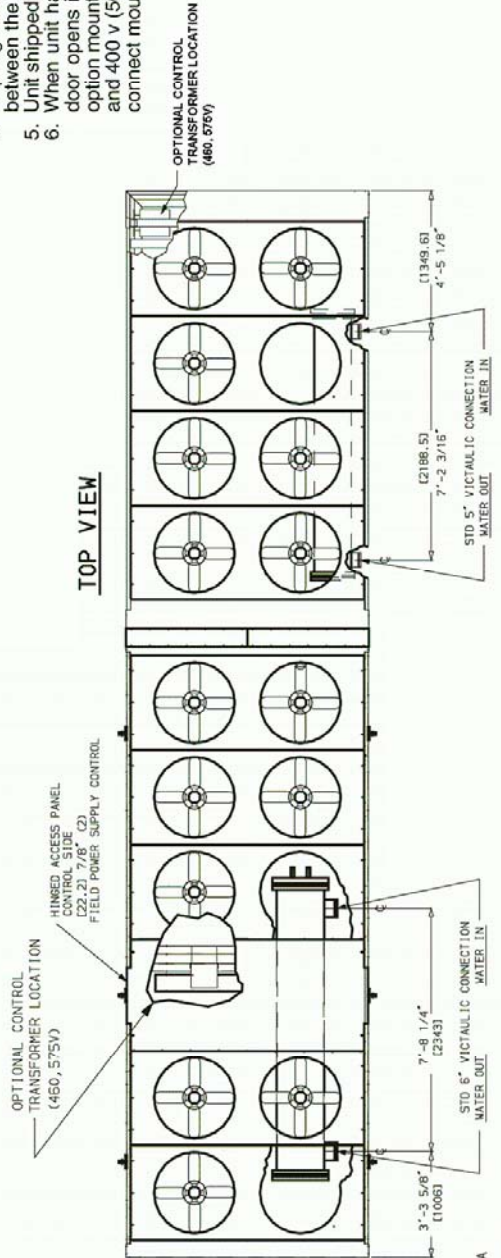


Base unit dimensions - 30GTN, GTR255, 270



- NOTES:**
- Dimensions in [] are in mm.
 - Unit must have clearances for airflow as follows:
 Top — Do not restrict in any way.
 Ends — [1524 mm] 5 ft
 Sides — [1829 mm] 6 ft
 - Mounting holes may be used to mount unit to concrete pad. They are not recommended for spring isolator location.
 - If spring isolators are used, a perimeter support channel between the unit and the isolators is recommended.
 - Unit shipped in 2 pieces.
 - When unit has non-fused disconnect option, power side door opens in opposite direction. Non-fused disconnect option mounted in control box on 380, 460, 575 v (60 Hz) and 400 v (50 Hz). For 208/230 v (60 Hz), non-fused disconnect mounted underneath control box.

UNIT	DIMENSIONS — ft.-in. [mm]	
	A	B
30GTN, GTR		
255	0-9 1/2 [241]	1-4 3/4 [425]
270	0-8 1/2 [216]	1-5 5/8 [448]

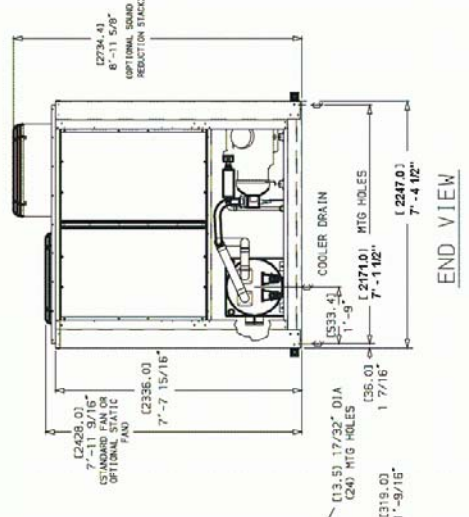
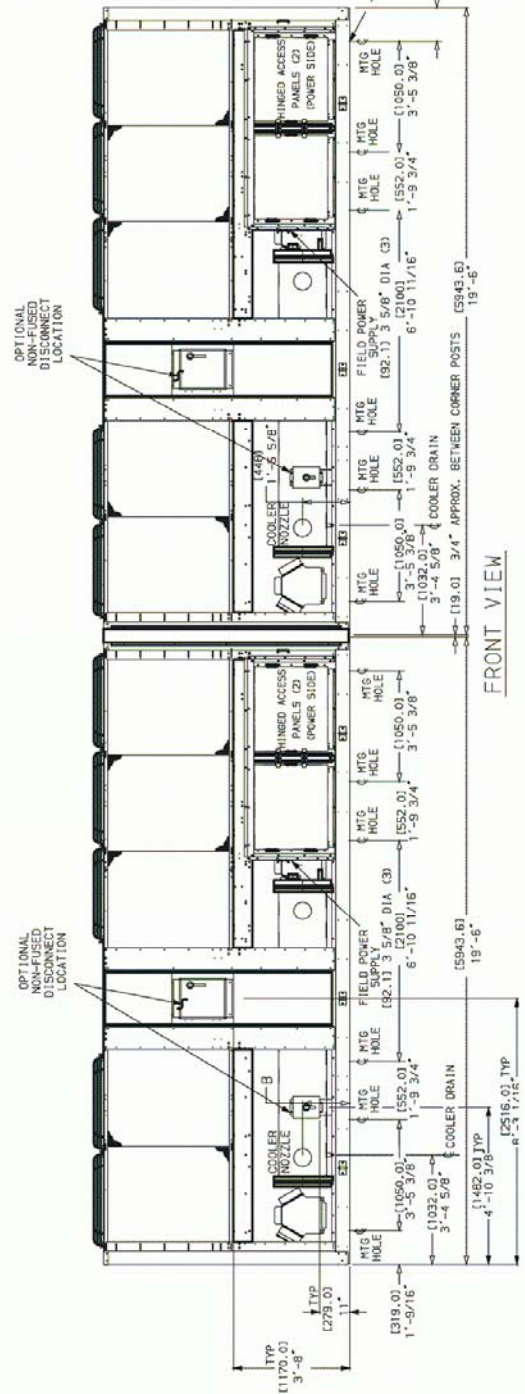
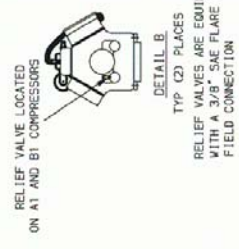
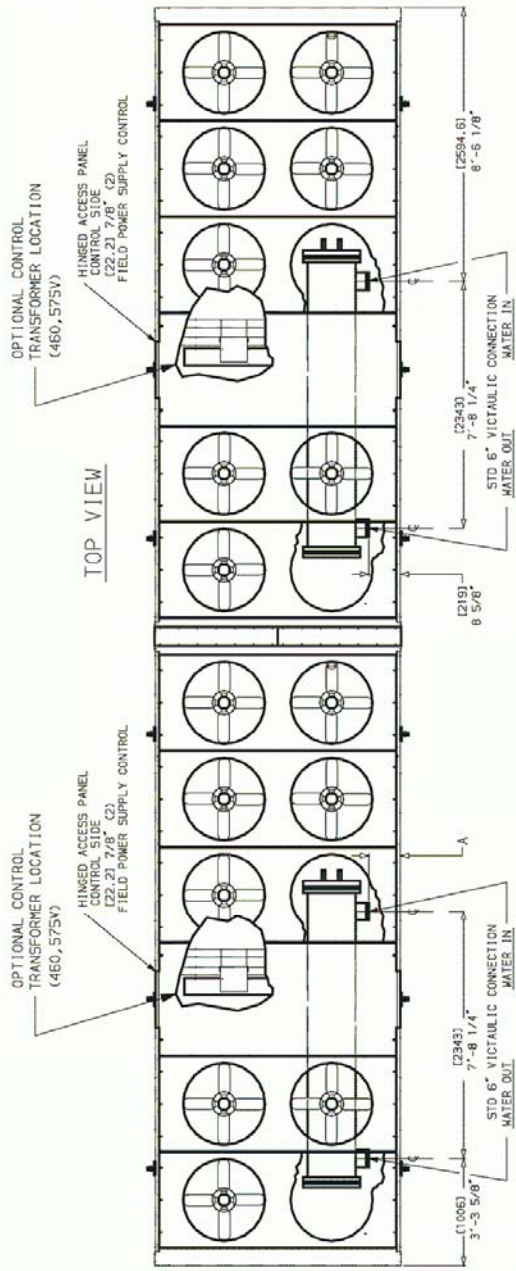


Base unit dimensions - 30GTN, GTR330



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

UNIT	DIMENSIONS — ft.-in. [mm]	
	A	B
30GTN,GTR	0-91/2 [242]	1-59/8 [448]



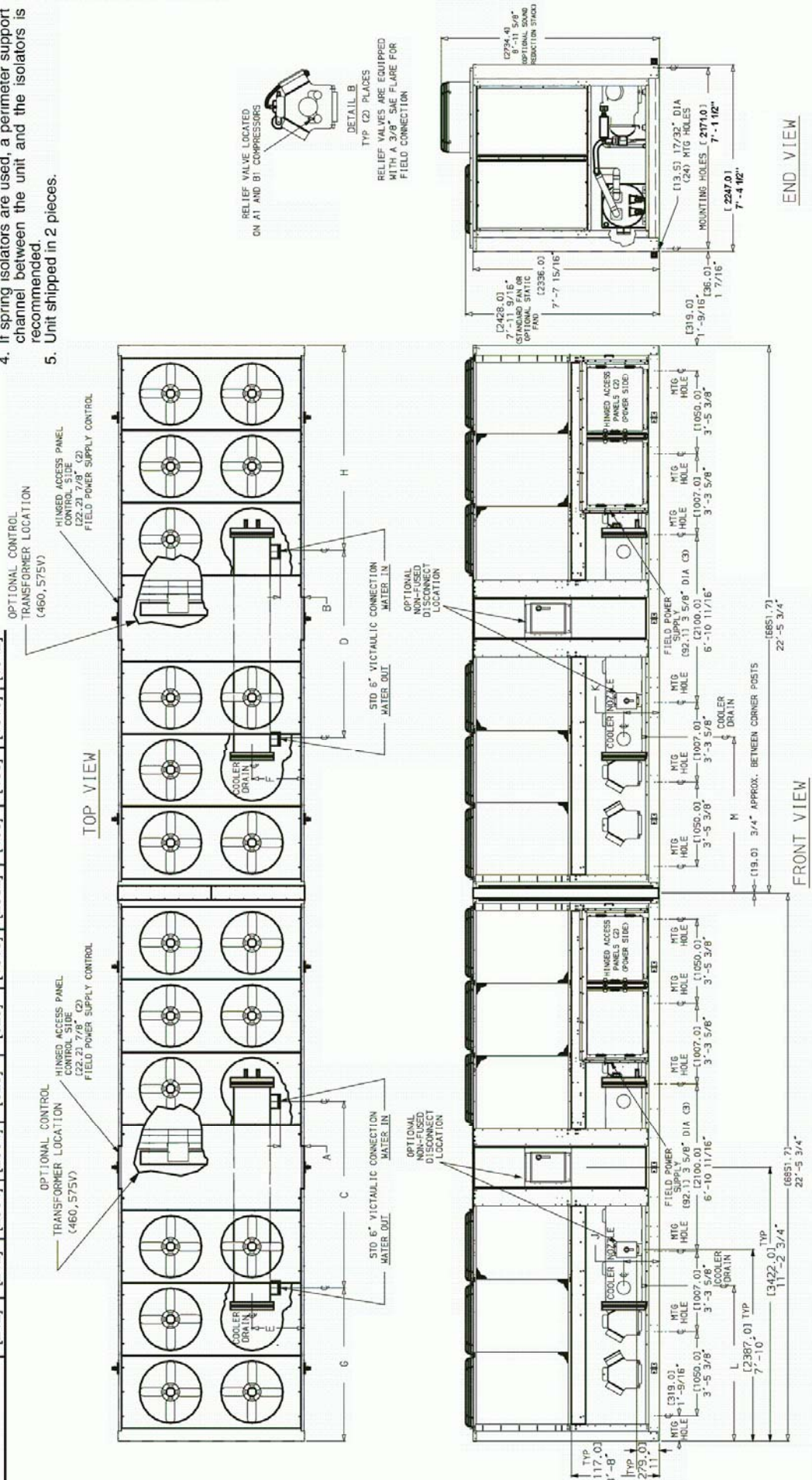
Base unit dimensions - 30GTN, GTR360 (60Hz), 390, 420



NOTES:

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

UNIT 30GTN, GTR	DIMENSIONS — ft-in. [mm]												
	A	B	C	D	E	F	G	H	J	K	L	M	
360 (60 Hz)	0-85/8 [219]	0-85/8 [219]	7-8 1/4 [2343]	7-8 1/4 [2343]	1-10 7/16 [570]	1-10 7/16 [570]	6-37/16 [1916]	8-6 1/16 [2593]	1-5 5/8 [448]	1-5 5/8 [448]	6-4 1/2 [1942]	5-11 1/2 [1816]	
390	0-9 1/2 [242]	0-85/8 [219]	8-2 9/16 [2504]	7-8 1/4 [2343]	2-2 9/8 [620]	1-10 7/16 [570]	5-11 1/2 [1816]	8-6 1/16 [2593]	1-6 7/16 [468]	1-5 5/8 [448]	5-11 1/2 [1816]	6-4 1/2 [1942]	
420	0-9 1/2 [242]	0-9 1/2 [242]	8-2 9/16 [2504]	8-2 9/16 [2504]	2-2 9/8 [620]	2-2 9/8 [620]	5-11 1/2 [1816]	8-3 1/16 [2532]	1-6 7/16 [468]	1-6 7/16 [468]	5-11 1/2 [1816]	6-4 1/2 [1942]	



Base unit dimensions - Mounting weights (approximate)



SIZES 050 - 110 *



UNIT SIZE 30GTN,GTR	CONDENSER COIL†	lb				kg			
		A	B	C	D	A	B	C	D
050	C-AL	1047	948	884	976	475	430	401	443
	C-C	1155	1057	992	1085	524	479	450	492
060	C-AL	1258	1130	1130	1113	570	512	505	562
	C-C	1362	1234	1217	1344	618	560	552	609
070	C-AL	1332	1212	1184	1301	604	550	537	590
	C-C	1489	1369	1340	1458	675	621	608	661
080	C-AL	1624	1690	1666	1650	738	768	757	750
	C-C	1797	1880	1847	1831	817	854	840	832
090	C-AL	1817	1793	1720	1685	826	815	782	766
	C-C	1997	1970	1893	1880	908	895	860	855
100	C-AL	2185	2185	2120	2120	993	993	964	964
	C-C	2420	2420	2360	2360	1100	1100	1073	1073
110	C-AL	2191	2217	2136	2116	996	1007	970	962
	C-C	2428	2454	2374	2354	1104	1115	1079	1070

LEGEND

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

* Points A, B, C, and D are located in the corners of the unit. See pages 16-20 for dimensions
 † Contact your local Carrier representative for more information on epoxy-coated and pre-coated aluminum fins.

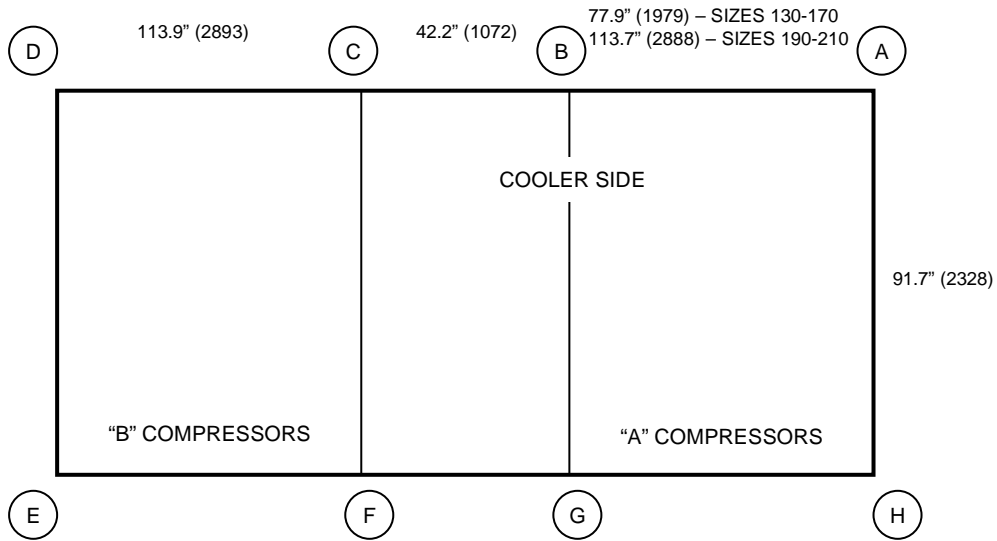
NOTE:

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

Base unit dimensions - Mounting weights (approximate)



SIZES 130 - 210



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

LEGEND

C-AL — Copper Tubing, Aluminum Fins

C-C — Copper Tubing, Copper Fins

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

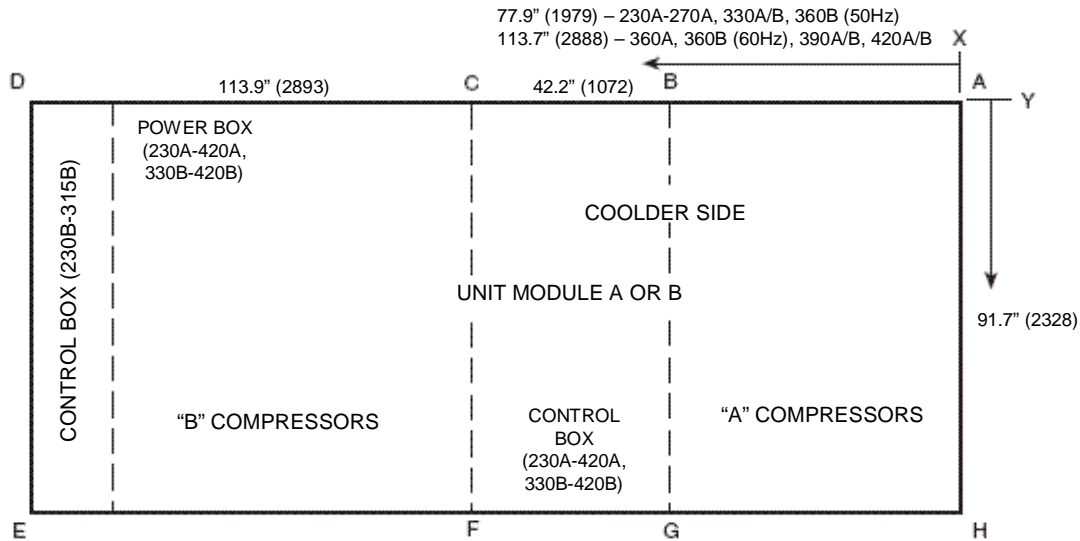
NOTES:

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

Base unit dimensions - Mounting weights (approximate)



SIZES 230 - 420



60Hz UNITS

UNIT SIZE 30GTN, GTR	CONDENSER COIL	KG							
		A	B	C	D	E	F	G	H
230A,245A,255A	C-AL	420	710	527	379	653	625	794	653
	C-C	478	768	585	436	285	711	880	740
230B	C-AL	757	-	-	750	738	-	-	768
	C-C	840	-	-	832	817	-	-	854
245B	C-AL	782	-	-	766	826	-	-	815
	C-C	860	-	-	855	908	-	-	895
255B,270B	C-AL	964	-	-	964	993	-	-	993
	C-C	1073	-	-	1073	1100	-	-	1100
270A,330A/B	C-AL	437	787	605	392	680	740	825	664
	C-C	495	845	663	450	767	826	912	751
290A,360A/B,390B	C-AL	611	882	815	505	629	817	787	715
	C-C	698	969	901	591	715	904	874	798
290B,315B	C-AL	970	-	-	962	996	-	-	1007
	C-C	1079	-	-	1070	1104	-	-	1115
315A,390A,420A/B	C-AL	625	967	850	509	639	384	925	725
	C-C	711	1053	937	595	725	925	1012	810

LEGEND

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

NOTES:

1. Dimensions in () are in millimeters.
2. If spring isolators are used, a perimeter support channel between the unit and the isolators is recommended.
3. For A-D and H-E dimensions on 230B-315B modules, see pages 18-20.

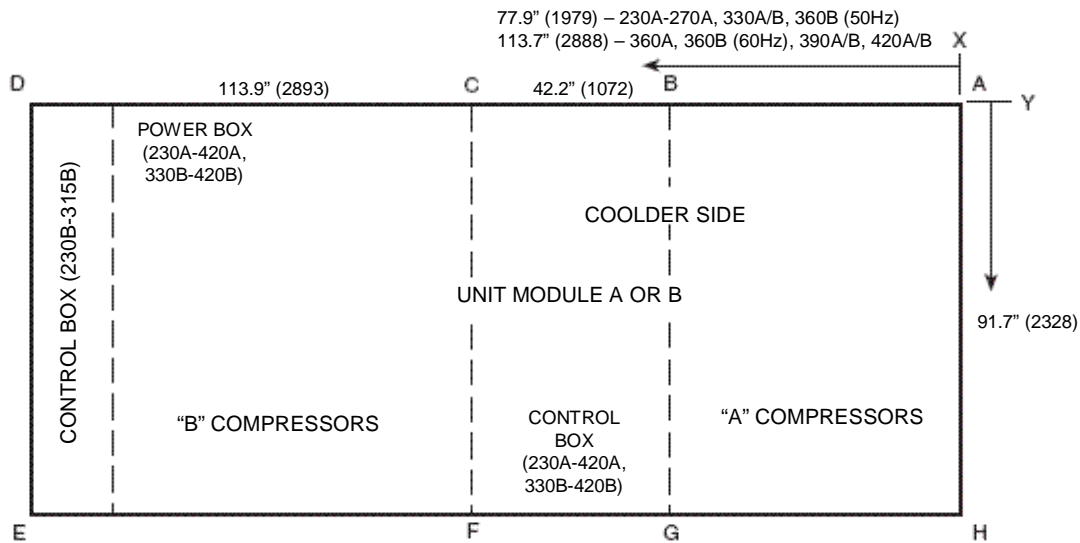
RIGGING CENTER OF GRAVITY 60Hz UNITS

UNIT SIZE 30GTN,GTR	230A,245A, 255A		230B		245B		255B,270B		270A,330A/B		290A,360A/B, 390B		290B,315B		315A,390A, 420A/B	
	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm
X Dimension	112 ¹ / ₈	2849	64 ⁵ / ₈	1642	66 ¹⁵ / ₁₆	1700	8 ¹¹ / ₁₆	2059	112 ¹³ / ₁₆	2865	136	3454	80 ⁵ / ₈	2048	135 ⁵ / ₈	3444
Y Dimension	50 ¹ / ₂	1283	49 ¹¹ / ₁₆	1261	52 ¹⁵ / ₁₆	1344	51 ¹¹ / ₁₆	1312	50 ¹ / ₂	1283	50 ¹ / ₂	1283	52 ³ / ₁₆	1326	50 ⁵ / ₈	1285

Base unit dimensions - Mounting weights (approximate)



SIZES 230 - 420



50Hz UNITS

UNIT SIZE 30GTN, GTR	CONDENSER COIL	KG							
		A	B	C	D	E	F	G	H
230A,245A,255A	C-AL	430	723	527	379	653	625	831	682
	C-C	486	781	585	437	740	711	918	769
230B	C-AL	764	—	—	755	750	—	—	786
	C-C	847	—	—	837	832	—	—	868
245B	C-AL	784	—	—	779	833	—	—	847
	C-C	867	—	—	863	915	—	—	927
255B,270B	C-AL	970	—	—	970	1010	—	—	1010
	C-C	1077	—	—	1077	1118	—	—	1118
270A,330A/B 360B	C-AL	437	792	612	397	694	760	840	666
	C-C	495	850	670	454	780	847	927	753
290A,360A,390B	C-AL	620	887	821	512	650	835	802	736
	C-C	707	974	907	598	736	922	977	823
290B,315B	C-AL	976	—	—	976	1032	—	—	1032
	C-C	1085	—	—	1085	1140	—	—	1140
315A,390A,420A/B	C-AL	628	977	852	512	650	845	955	734
	C-C	715	1064	940	599	736	931	1042	820

LEGEND

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

NOTES:

1. Dimensions in () are in millimeters.
2. If spring isolators are used, a perimeter support channel between the unit and the isolators is recommended.
3. For A-D and H-E dimensions on 230B-315B modules, see pages 18-20.

RIGGING CENTER OF GRAVITY 50Hz UNITS

UNIT SIZE 30GTN,GTR	230A,245A, 255A		230B		245B		255B,270B		270A,330A/B		290A,360A/B, 390B		290B,315B		315A,390A, 420A/B	
	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm
X Dimension	112 ¹ / ₈	2849	64 ⁵ / ₈	1642	66 ¹⁵ / ₁₆	1700	8 ¹¹ / ₁₆	2059	112 ¹³ / ₁₆	2865	136	3454	80 ⁵ / ₈	2048	135 ⁵ / ₈	3444
Y Dimension	50 ¹ / ₂	1283	49 ¹¹ / ₁₆	1261	52 ¹⁵ / ₁₆	1344	51 ¹¹ / ₁₆	1312	50 ¹ / ₂	1283	50 ¹ / ₂	1283	52 ³ / ₁₆	1326	50 ⁵ / ₈	1285

Leveling Unit

Unit must be level within 1/8-in. per ft when installed to ensure proper oil return to the compressors. While most outdoor locations are suitable for 30GTN, GTR units, the roof is a common site that presents a problem if roof has been pitched to aid in water removal. To assure proper oil return, be sure that unit is level, particularly in its major lengthwise dimension, as compressor oil return piping runs in that direction.

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

Cooler fluid temperature

1. *Maximum* leaving chilled fluid temperature (LCWT) for unit is 70°F (21°C). Unit can start and pull down with up to 95°F (35°C) entering-fluid temperature due to MOP (maximum operating pressure) feature of the TXV. For sustained operation, it is recommended that entering-fluid temperature not exceed 85 F (29.4°C).
2. *Minimum* LCWT for standard unit is 40°F (3.3°C). It is permissible to use a standard microprocessor-controlled ComfortLink™ chiller with leaving-fluid temperatures in the range of 34 to 39.9°F (1° to 3.28°C) only if a protective brine solution (20% anti-freeze solution, or greater) is used. (See Controls and Troubleshooting literature for further information.)

Leaving-fluid temperature reset

The Energy Management Module (EMM) is required for 4 to 20 mA reset of LCWT in constant fluid systems. Reset by return fluid, outdoor-air temperature, or space temperature does not require this option. Reset reduces compressor power usage at part load when design LCWT is not necessary. Humidity control should be considered since higher coil temperatures resulting from reset will reduce latent heat capacity. Three reset options are offered, based on the following:

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

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

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

For details on applying a reset option, refer to unit Controls and Troubleshooting literature. Obtain ordering part numbers for reset option from current price pages or contact your local Carrier representative.

Cooler flow range

Ratings and performance data in this publication are for a cooling temperature rise of 10°F (6°C), and are suitable for a range from 5 to 20°F (2.8 to 11.1°C) temperature rise without adjustment. The ComfortLink chillers may be operated using a different temperature range, provided flow limits are not exceeded. For minimum flow rates, see Minimum Cooler Fluid Flow Rates and Minimum Loop Volume table. High flow rate is limited by pressure drop that can be tolerated. If another temperature range is used, apply LCWT correction as given in Selection Procedure example on page 42.

MINIMUM COOLER FLUID FLOW RATES AND MINIMUM LOOP VOLUME — UNIT SIZES 050-210

UNIT SIZE	MINIMUM COOLER FLOW RATE		MINIMUM LOOP VOLUME	
	Gpm	L/s	Gal	L
050	38	2.4	151	572
060	48	3.0	190	719
070	48	3.0	218	823
080	60	3.8	246	930
090	60	3.8	262	992
100	73	4.6	299	1131
110	73	4.6	323	1222
130	101	6.4	375	1419
150	101	6.4	291	1624
170	135	8.5	486	1840
190	135	8.5	528	1998
210	219	13.8	603	2232

MINIMUM COOLER FLOW RATES AND MINIMUM LOOP VOLUME — UNIT SIZES 230-420

UNIT SIZE	MINIMUM COOLER FLOW RATE				MINIMUM LOOP VOLUME	
	Module A		Module B		Gallons	Liters
	Gpm	L/s	Gpm	L/s		
230	101	6.4	60	3.8	675	2550
245	101	6.4	60	3.8	690	2615
255	101	6.4	73	4.6	725	2750
270	135	8.5	73	4.6	780	2972
290	135	8.5	73	4.6	840	3179
315	219	13.8	73	4.6	900	3407
330	135	8.5	135	8.5	975	3715
360	135	8.5	135	8.5	1050	4001
390	219	13.8	135	8.5	1140	4343
420	219	13.8	219	13.8	1200	4572

LEGEND

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

NOTES:

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

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

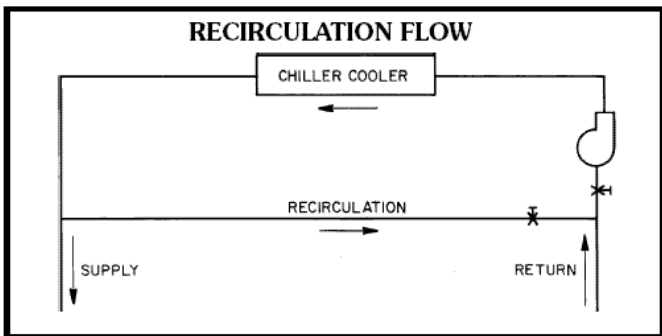
Application Data (cont)



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

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

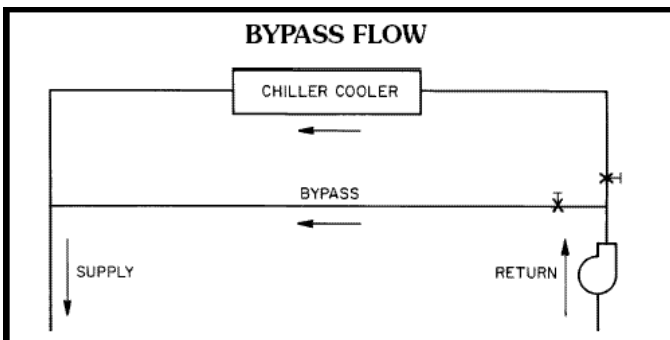
NOTE: Recirculation flow is shown below.



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

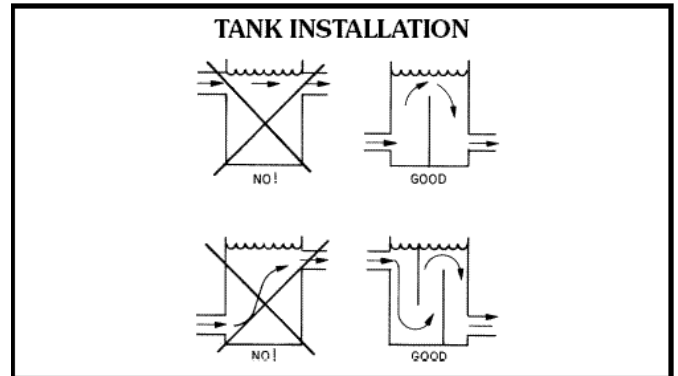
NOTE: Bypass flow is shown below.



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

Fluid loop volume — The volume in circulation must equal or exceed 3 gal. per nominal ton (3.25 L per kW) of cooling for temperature stability and accuracy in normal air-conditioning applications. (For example, a 30GTN210 would require 603 gal. [2232 L].) In process cooling applications, or for operation at ambient temperature below 32 F (0° C) with low loading conditions, there should be from 6 to 10 gal. per ton (6.5 to 10.8 L per kW). To achieve this volume, it is often necessary to install a tank in the loop. Tank should be baffled to ensure there is no stratification and that water entering tank is adequately mixed with liquid in the tank.

NOTE: Tank installation is shown below.



Cooler fouling factor — The fouling factor used to calculate tabulated ratings was .00010 $\text{ft}^2 \cdot \text{hr} \cdot ^\circ \text{F} / \text{Btu}$ (.000018 $\text{m}^2 \cdot ^\circ \text{C/W}$). As fouling factor is increased, unit capacity decreases and compressor power increases. Standard ratings should be corrected using following multipliers:

FOULING FACTOR		CAPACITY MULTIPLIER	COMPRESSOR POWER MULTIPLIER
English ($\text{ft}^2 \cdot \text{hr} \cdot ^\circ \text{F}/\text{Btu}$)	SI ($\text{m}^2 \cdot ^\circ \text{C}/\text{W}$)		
.00025	.000044	0.991	0.995
.00050	.000088	0.977	0.987
.00075	.000132	0.955	0.979
.00175	.000308	0.910	0.952

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

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

Draining cooler and outdoor piping is recommended if system is not to be used during freezing weather conditions. See Low Ambient Temperature Operation section page 35.

Application Data (cont)



Condenser

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

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

Condenser airflow — Airflow restrictions on units with standard fans will affect the unit capacity, condenser head pressure, and compressor power input. Correction factors to be applied for external static restrictions up to 0.2 in. wg (50 Pa) are as follows:

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

High-static fan options

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

High ambient temperature

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

Low ambient temperature operation

With certain field provisions as described below, units will start and operate down to:
0° F (-18° C) for EXV units

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

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

Wind baffles (field fabricated and installed) —

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

Antifreeze solution — Inhibited ethylene glycol or other suitable corrosion-resistant anti-freeze solution must be field supplied and installed in all units for unit operation below 32° F (0° C). Solution must be added to fluid loop to protect loop down to 15° F (8° C) below minimum operating ambient temperature. Concentration should be based on expected minimum temperature and either “Burst” or “Freeze” protection levels.

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

Freeze versus burst protection — If chiller operation is not required during winter/off season, lower glycol concentrations based on “burst” protection criteria may be considered. Often use of burst protection results in lower fluid costs and has less impact on chiller cooler capacity and flow rate. Consult glycol fluid manufacturers for burst protection recommendations and fluid specifications.

Capacity correction (antifreeze)

Inhibited ethylene glycol (or other suitable brine) should be used in installations where subfreezing temperatures are expected. Unit performance data must be corrected for the addition of inhibited ethylene glycol as shown in following example. Correction factors can be derived from curves in the Inhibited Ethylene Glycol Performance chart at right. Additional performance information on this and other fluids is available in Carrier's Electronic Catalog (E-CAT) software program. “Slush” and “Burst” concentration may also be considered for winter shutdown protection and unit operation is not required.

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

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

Consider the 30GTN110 unit from the Selection Procedure example on page 42 (refer to correction curves at 40% solution).

Correct unit capacity — On the capacity correction curve in chart on page 36, read 0.95.

$$\begin{aligned} \text{Corrected capacity} &= 0.95 \times \text{determined capacity} \\ &= 0.95 \times 112.6 \\ &= 107.0 \text{ tons} \end{aligned}$$

Correct cooler water flow — On the cooler flow correction curve on page 36, read 1.15.

Chilled water flow (at corrected capacity)

$$\begin{aligned} &= \frac{24 \times \text{corrected cap. In tons}}{\text{temperature rise } ^\circ\text{F}} = \text{U.S. gpm} \\ &= \frac{24 \times 107.0}{14^\circ} = 183.4 \text{ U.S. gpm} \end{aligned}$$

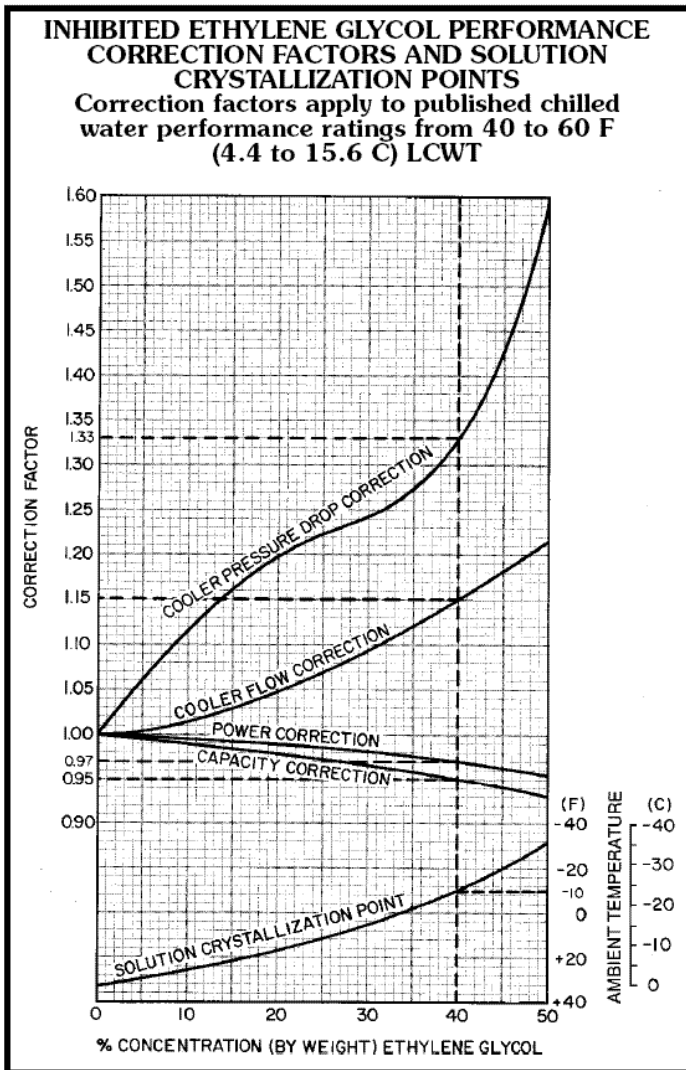
$$\begin{aligned} \text{Chilled water flow (40\% solution)} &= 1.15 \times 183.4 \\ &= 210.9 \text{ U.S. gpm} \end{aligned}$$

Correct cooler pressure drop — On cooler pressure drop correction curve on page 36, read 1.33.

On cooler pressure drop curve on page 38, for 210.9 gpm, read pressure drop = 8.1 ft water gage. The pressure drop for 40% solution = 1.33 x 8.1 = 10.8 ft water.

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

$$\begin{aligned} \text{Power input from Selection Procedure example} &= 126.1 \text{ kW} \\ \text{Corrected power input} &= 0.97 \times 126.1 = 122.3 \text{ kW} \end{aligned}$$



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

Enter the solution crystallization point curve above, at -23°C , read 40% concentration inhibited ethylene glycol is required to prevent crystals from forming in solution.

Consider 30GTN110 unit selected from the Selection Procedure example (refer to correction curves at 40% solution).

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

$$\begin{aligned} \text{Corrected capacity} &= 0.95 \times \text{determined capacity} \\ &= 0.95 \times 379.7 \\ &= 360.7 \text{ kW} \end{aligned}$$

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

Chilled water flow (at corrected capacity)

$$\begin{aligned} &= \frac{0.239 \times \text{corr. Cap in kW}}{\text{temperature rise } ^{\circ}\text{C}} = \text{L/S} \\ &= \frac{0.239 \times 360.7}{7.8^{\circ}} = 11.1 \text{ L/s} \end{aligned}$$

$$\begin{aligned} \text{Chilled water flow (40\% solution)} &= 1.15 \times 11.1 \\ &= 12.8 \text{ L/s} \end{aligned}$$

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

On cooler pressure drop curve on page 38, for 12.8 L/s, read pressure drop of 24 kPa. The pressure drop for 40% solution = $1.33 \times 24 = 31.92 \text{ kPa}$.

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

Power input from Selection Procedure example = 123.2 kW.

$$\text{Corrected power input} = 0.97 \times 123.2 = 119.5 \text{ kW}$$

Oversizing chillers

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

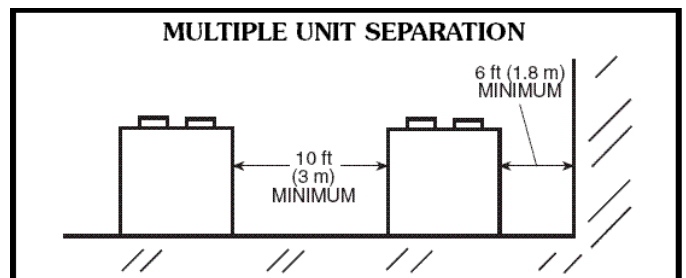
It is also recommended that 2 smaller chillers be installed where operation at minimum load is critical. The operation of a smaller chiller loaded to a greater percentage over minimum is preferred to operating a single chiller at or near its minimum recommended value.

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

Multiple chillers

Where chiller capacities greater than 210 tons (740 kW) are required, or where stand-by capability is desired, chillers may be installed in *parallel*. Units should be of equal size to ensure balanced fluid flows. Where a large temperature drop ($> 25^{\circ}\text{F}$ [13.9°C]) is desired, chillers may be installed in *series*. Fluid temperature sensors need not be moved for multiple chiller operation. A 10 ft (3 m) separation is required between units for airflow, and a 6 ft (1.8 m) distance is required from units to obstructions. See Multiple Unit Separation figure below. See Base Unit Dimensions section on pages 27-39 for service clearances.

Unit software is capable of controlling two units as a single plant. Refer to Controls, Start-Up, Operation, Service, and Troubleshooting guide for further details.



Electrical/utility interests

Energy management — Use of energy management practices can significantly reduce operating costs, especially during off-peak modes of operation. Demand limiting and temperature reset are 2 techniques for accomplishing efficient energy management. See Demand Limiting (also called load shedding) section below and Leaving-Fluid Temperature Reset section on page 33 for further details.

Demand limiting (also called load shedding) —

When a utility's demand for electricity exceeds a certain level, loads are shed to keep electricity demand below a prescribed maximum level. Typically, this happens on hot days when air conditioning is most needed. The Energy Management Module (EMM) can be added to accomplish this reduction.

Demand may be limited on unit by resetting fluid temperature, or by unloading the chiller to a given pre-determined percentage of the load. Demand limit may also be driven by an external 4 to 20 mA signal. These features require a signal from an intelligent central control. Do not cycle demand limiter for less than 10 minutes on and 5 minutes off.

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

Remote on-off control

Remote on-off control may be applied by hard-wired connection (see Controls and Troubleshooting literature) or by connection to a Carrier Comfort Network (CCN).

Part-wind start

This is not generally required on 30GTN,GTR chillers due to use of multiple compressors allowing smaller electrical load increments, but is available if required. Maximum instantaneous current flow (see ICF in Electrical Data table on pages 57-58) should be used in determining need.

Strainers

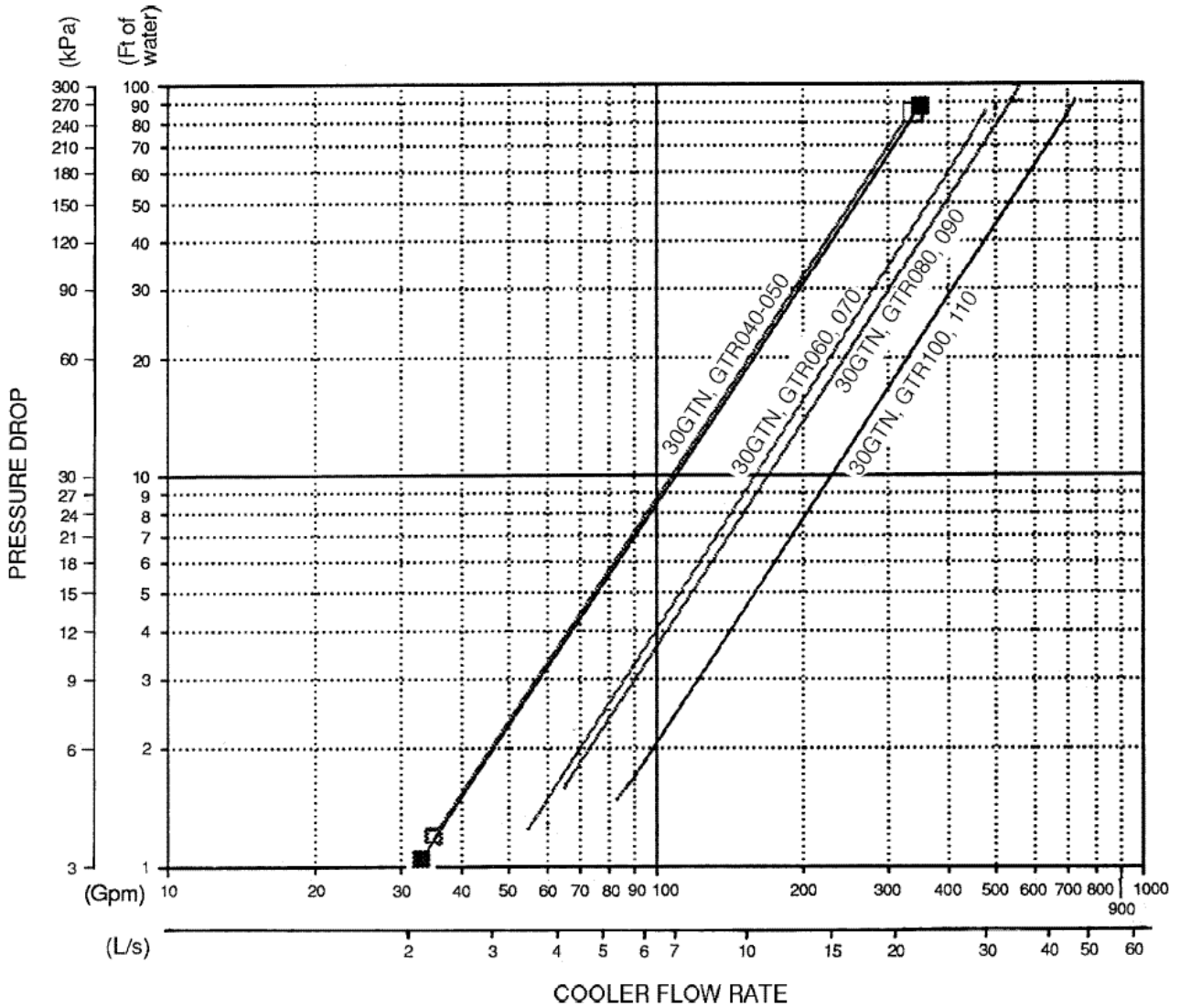
It is recommended that a strainer with a minimum of 20 mesh be installed in the cooler fluid inlet line, just ahead of and as close as possible to the cooler.

Condenser coil protection (*Enviro-Shield™*)

Pre-coated aluminum-fin coils have a durable epoxy-phenolic coating applied to the fin prior to the fin stamping process to provide protection in mildly corrosive coastal environments. Pre-coated coils have an inert barrier between the aluminum fin and copper tube. This barrier electrically disconnects the dissimilar metals to minimize the potential for galvanic corrosion. This economical option provides substantial corrosion protection beyond the standard uncoated coil construction.

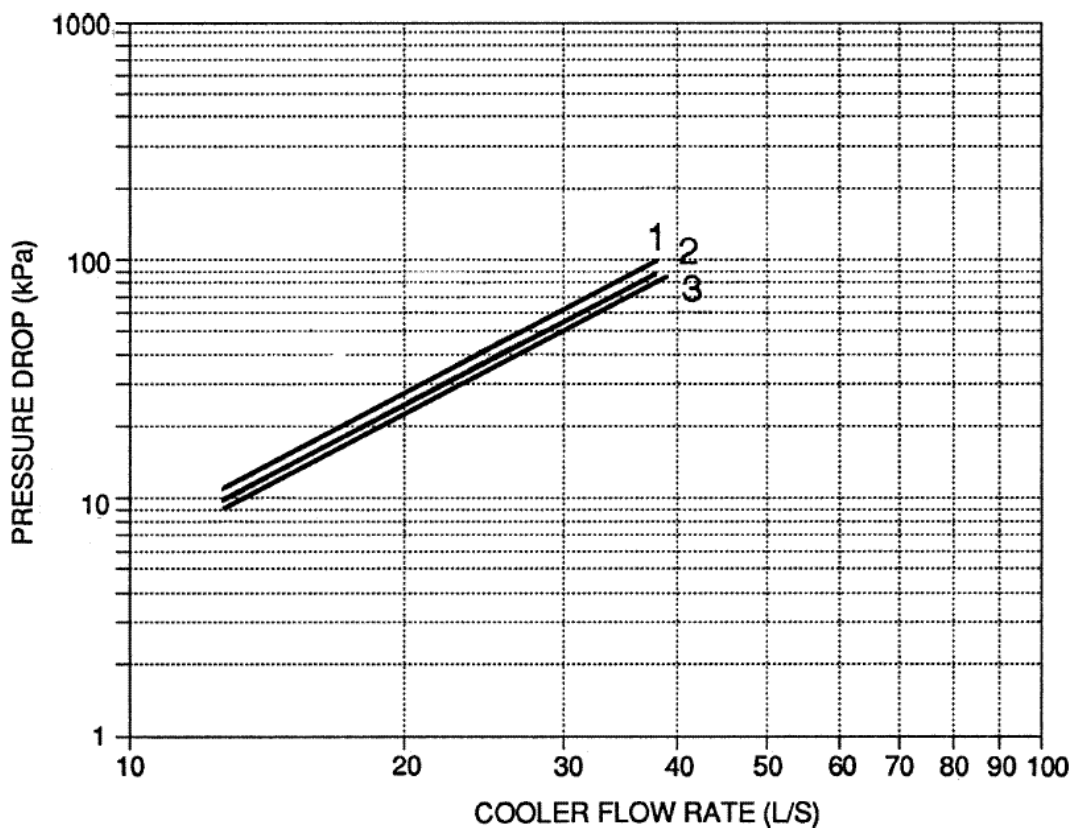
Copper-fin coils provide increased corrosion resistance in moderate coastal environments where industrial air pollution is not present. All copper coils eliminate bimetallic construction to eliminate the potential for galvanic corrosion. Application in industrial environments is not recommended due to potential attack from sulfur, sulfur oxide, nitrogen oxides, carbon and several other industrial air-borne contaminants. In moderate seacoast environments, copper-fin coils have extended life compared to standard or pre-coated aluminum-fin coils.

COOLER FLUID PRESSURE DROP CURVES (30GTN, GTR050-110)



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

**COOLER FLUID PRESSURE DROP CURVES
(30GTN,GTR130-210)**

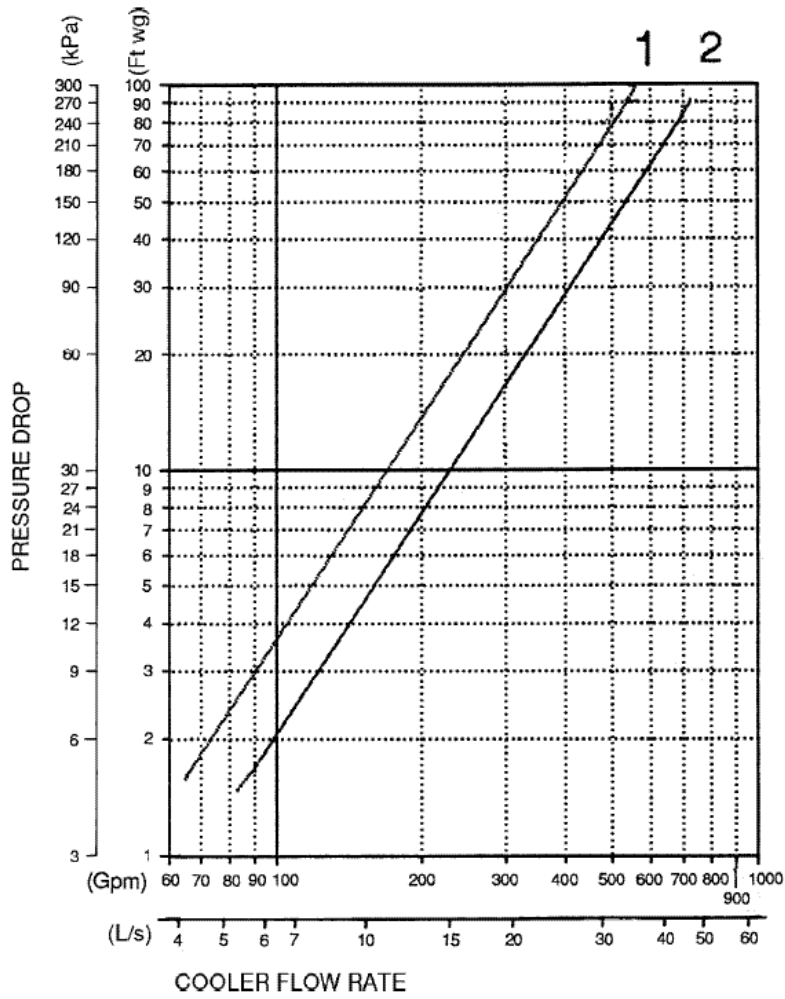


COOLER PRESSURE DROP KEY

- 1 — 30GTN,GTR130,150
- 2 — 30GTN,GTR170,190
- 3 — 30GTN,GTR210

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

**COOLER FLUID PRESSURE DROP CURVES
(30GTN, GTR230B, 245B, 255B, 290B, 315B)**

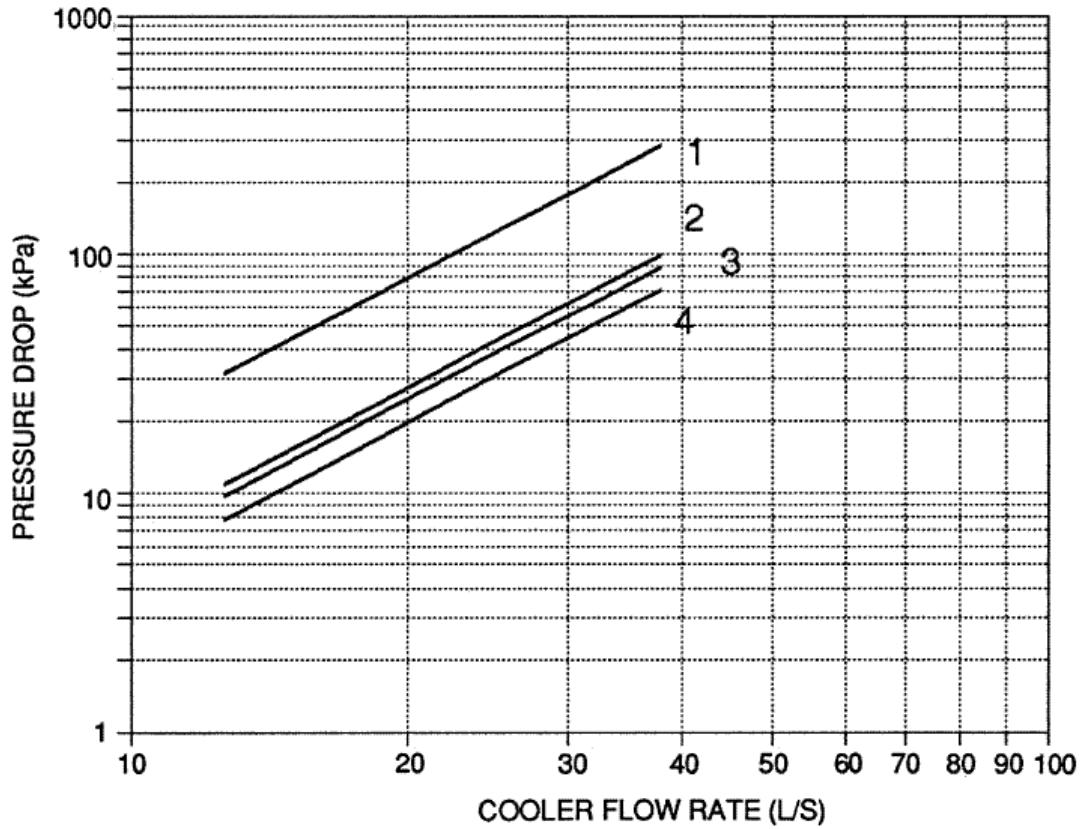


COOLER PRESSURE DROP KEY

- 1 Module B — 30GTN, GTR230, 245
- 2 Module B — 30GTN, GTR255, 290, 315

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

COOLER FLUID PRESSURE DROP CURVES (cont) 30GTN,GTR230A-420A, 270B, 330B-420B



COOLER PRESSURE DROP KEY

- 1 Module B — 30GTN,GTR270
- 2 Module A — 30GTN,GTR230-255
- 3 Module A — 30GTN,GTR270,330
Module B — 30GTN,GTR330,360 (50 Hz)
- 4 Module A — 30GTN,GTR290,315,360 (50 or 60 Hz), 390, and 420
Module B — 30GTN,GTR360 (60 Hz), 390, and 420

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

Selection procedure - (60Hz) (with 30GTN110 example)



NOTE:

The Carrier electronic catalogue provides quick, easy computer selection of Carrier chiller. The catalogue is available from your local Carrier representative.

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

- Capacity required 360 kW
- Leaving chilled water temperature (LCWT) 6 C
- Cooler water temperature rise 7.8° C
- Condenser entering air temperature (CEAT). 35 C
- Loop volume 1300 L

Ratings are based on 6°C rise and are suitable for a temperature rise range from 2.8°C to 11.1°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 43) at 7.8°C and read a correction of 0.14°C. Corrected LCWT is, therefore, 6 + 0.14 = 6.1°C.

III Determine capacity, unit size, and power input.

Enter Cooling Capacities table at given CEAT and LCWT — 35°C and 6°C, respectively. Read down capacity column until the capacity near-est to but higher than specified required capacity is reached. In this case, 373.6 kW is delivered by a 30GTN110. Interpolate between 6°F and 7°F to find the determined capacity and power input at cor-rected LCWT (6.1°C). Values are:

- Capacity 379.7 kW
- Power input 123.2 kW

IV Calculate corrected cooler water flow

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

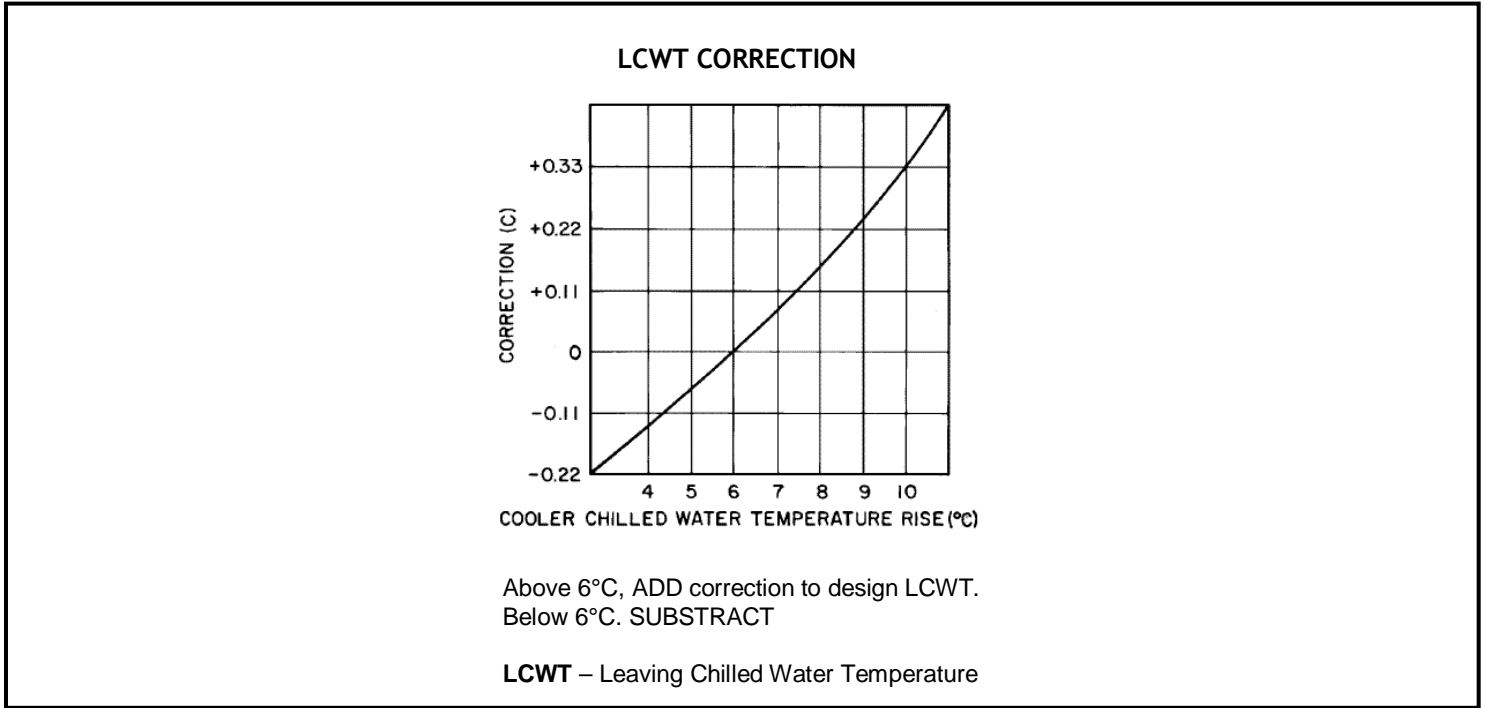
$$= \frac{0.239 \times 379.7}{7.8} = 11.6 \text{ L/s}$$

V Calculate cooler pressure drop.

Enter cooler pressure drop curve (page 38) at corrected flow rate (11.6 L/s) and read, for 30GTN110, a pressure drop of 16.9 kPa.

VI Check loop volume and cooler water flow rate.

Minimum loop volume, from application data, is 1222 L for 30GTN110. Therefore, given volume of 1300 L is satisfactory. Minimum water flow rate, from application data, is 4.6 L/s for 30GTN110. Flow rate of 11.6 L/s is well above minimum required.



Performance Data

STANDARD RATINGS - 60Hz

UNIT 30GTN,GTR	CAPACITY		COMPRESSOR POWER INPUT (kW)	FAN POWER (kW)	COOLER WATER PRESSURE DROP		EER	COP	IPLV
	Tons	kW			Ft water	kPa			
050	50.9	179.1	56.4	6.2	12.2	36.5	9.8	2.86	12.4
060	63.9	224.8	71.3	9.3	12.6	37.5	9.5	2.79	11.9
070	73.2	257.5	82.8	9.3	16.3	48.5	9.5	2.79	11.7
080	82.6	290.5	94.1	9.4	11.7	34.9	9.6	2.81	12.8
090	88.2	310.4	99.0	9.4	13.3	39.6	9.8	2.86	14.7
100	100.5	353.5	108.4	12.7	9.5	28.5	10.0	2.92	14.1
110	108.7	382.3	123.7	12.7	11.1	33.1	9.6	2.80	13.7
130	121.9	428.9	138.0	15.5	6.7	19.9	9.5	2.79	12.8
150	141.4	497.3	162.5	15.4	8.8	26.4	9.5	2.80	13.5
170	158.4	557.1	181.8	15.4	11.9	35.6	9.6	2.82	14.4
190	173.9	611.5	200.2	18.6	14.3	42.8	9.5	2.80	14.4
210	202.6	712.6	236.5	18.6	14.8	44.1	9.5	2.79	14.2
230	224.0	787.9	256.6	24.8	11.7	34.9	9.6	2.80	13.0
245	229.7	807.7	261.4	24.9	13.3	39.6	9.6	2.82	13.7
255	242.1	851.3	270.9	28.2	9.6	28.5	9.7	2.85	13.5
270	259.0	911.0	290.2	28.2	11.9	35.6	9.8	2.86	14.0
290	282.6	993.8	323.9	31.2	14.3	42.8	9.5	2.80	13.9
315	311.3	1094.9	360.2	31.2	14.8	44.1	9.5	2.80	13.8
330	316.8	1114.0	363.5	31.0	11.9	35.6	9.6	2.82	14.4
360	347.8	1223.0	400.4	37.1	14.3	42.8	9.5	2.80	14.4
390	376.8	1325.3	436.9	37.1	14.8	44.1	9.5	2.80	14.1
420	405.4	1425.7	473.1	37.1	14.8	44.2	9.5	2.79	14.2

See note on page 44.

Performance data (cont)



STANDARD RATINGS - 50Hz

UNIT 30GTN,GTR	CAPACITY		COMPRESSOR POWER INPUT (kW)	FAN POWER (kW)	COOLER WATER PRESSURE DROP		EER	COP	IPLV
	Tons	kW			Ft water	kPa			
050	51.7	181.7	59.7	6.2	12.6	37.5	9.4	2.76	11.9
060	60.7	213.6	69.2	9.3	11.4	34.0	9.3	2.72	11.0
070	71.0	249.6	78.3	9.3	15.3	45.7	9.7	2.85	13.2
080	81.8	287.6	91.8	9.4	11.5	34.3	9.7	2.84	13.3
090	91.4	321.5	106.2	9.4	14.2	42.4	9.5	2.78	14.6
100	101.1	355.5	113.4	12.7	9.7	28.8	9.6	2.82	13.9
110	112.1	394.1	134.8	12.7	11.8	35.2	9.1	2.67	12.0
130	124.4	437.6	141.1	15.5	6.9	20.7	9.5	2.79	13.5
150	145.9	512.9	176.2	15.5	9.6	28.6	9.1	2.68	13.3
170	159.5	560.8	187.5	15.5	12.1	36.1	9.4	2.76	14.9
190	181.2	637.4	214.4	18.5	15.5	46.4	9.3	2.74	13.8
210	202.7	712.8	239.3	18.6	14.8	44.1	9.4	2.76	14.7
230	227.6	800.6	268.0	24.9	11.5	34.3	9.3	2.73	13.0
245	237.3	834.4	282.4	24.9	14.2	42.4	9.3	2.72	13.6
255	247.0	868.8	289.7	28.1	9.7	28.8	9.3	2.73	13.3
270	260.7	916.7	301.0	28.1	12.1	36.1	9.5	2.79	14.2
290	293.4	1031.8	349.3	31.2	15.5	46.4	9.3	2.71	12.9
315	314.8	1107.1	374.2	31.3	14.8	44.1	9.3	2.73	13.5
330	318.9	1121.6	375.0	30.9	12.1	36.1	9.4	2.76	14.9
360	340.7	1198.2	401.9	34.0	15.5	46.4	9.4	2.75	14.0
390	383.9	1350.0	453.7	37.1	15.5	46.3	9.4	2.75	14.0
420	405.4	1425.7	478.7	37.1	14.8	44.1	9.4	2.76	14.7

LEGEND

COP — Coefficient of Performance (Capacity [kW] ÷ Input Power [kW])

EER — Energy Efficiency Ratio (Capacity [Btuh] ÷ Input Power [W])

IPLV — Integrated Part-Load Value

3. IPLV is a single number part-load efficiency value calculated from the system full-load efficiency values and corrected for a typical building air-conditioning application.

4. All data in this table is rated in accordance with the Packaged Chiller Selection Program (E-Cat) Version 1.0.

NOTES:

1.) Standard rating conditions are as follows:

Cooler Conditions:

Leaving water temperature: 44°F (6.7°C)

Entering water temperature: 54°F (12.2°C)

Fouling Factor: 0.00010 hr x sq ft x °F/Btu (0.000018 m² x °C/W)

Condenser Conditions:

Entering Air Temperature: 95°F (35°C)

Part Load Efficiency Data

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

Performance data (cont)



PART LOAD DATA, 60Hz UNITS PERCENT DISPLACEMENT - SEQUENCE A (Standard Unit)

CAPACITY STEPS	30GTN,GTR UNIT SIZE											
	050	060	070	080, 230B	090, 245B	100, 255B, 270B	110, 290B, 315B	130	150, 230A-255A	170, 270A, 330A/B	190, 290A, 360A/B, 390B	210, 315A, 390A, 420A/B
1	31	28	33	22	18	16	14	14	11	11	13	11
2	44	42	50	34	27	23	21	21	15	17	25	25
3	87	87	83	52	35	31	29	28	29	23	41	36
4	100	100	100	67	44	39	36	35	38	28	56	56
5	—	—	—	78	53	46	43	42	42	33	78	67
6	—	—	—	89	56	58	61	58	44	39	100	86
7	—	—	—	100	65	66	68	64	53	45	—	100
8	—	—	—	—	74	73	75	71	58	50	—	—
9	—	—	—	—	82	85	86	87	71	56	—	—
10	—	—	—	—	91	92	93	93	80	61	—	—
11	—	—	—	—	100	100	100	100	85	67	—	—
12	—	—	—	—	—	—	—	—	86	73	—	—
13	—	—	—	—	—	—	—	—	95	78	—	—
14	—	—	—	—	—	—	—	—	100	83	—	—
15	—	—	—	—	—	—	—	—	—	89	—	—
16	—	—	—	—	—	—	—	—	—	95	—	—
17	—	—	—	—	—	—	—	—	—	100	—	—

PERCENT DISPLACEMENT - SEQUENCE B (Standard Unit)

CAPACITY STEPS	30GTN,GTR UNIT SIZE											
	050	060	070	080, 230B	090, 245B	100, 255B, 270B	110, 290B, 315B	130	150, 230A-255A	170, 270A, 330A/B	190, 290A, 360A/B, 390B	210, 315A, 390A, 420A/B
1	—	—	—	30	18	16	14	14	18	11	13	14
2	—	—	—	44	27	23	21	21	27	17	25	25
3	—	—	—	52	35	31	29	28	29	23	41	44
4	—	—	—	63	44	39	36	35	33	28	56	56
5	—	—	—	78	53	46	43	42	42	33	78	75
6	—	—	—	85	62	58	53	58	55	39	100	86
7	—	—	—	100	71	66	60	64	60	45	—	100
8	—	—	—	—	80	73	67	71	69	50	—	—
9	—	—	—	—	82	85	86	87	71	56	—	—
10	—	—	—	—	91	92	93	93	75	61	—	—
11	—	—	—	—	100	100	100	100	85	67	—	—
12	—	—	—	—	—	—	—	—	86	73	—	—
13	—	—	—	—	—	—	—	—	91	78	—	—
14	—	—	—	—	—	—	—	—	100	83	—	—
15	—	—	—	—	—	—	—	—	—	89	—	—
16	—	—	—	—	—	—	—	—	—	95	—	—
17	—	—	—	—	—	—	—	—	—	100	—	—

NOTE: These capacity control steps may vary due to lag compressor sequencing.

PART LOAD DATA, 50Hz UNITS PERCENT DISPLACEMENT - SEQUENCE A (Standard Unit)

CAPACITY STEPS	30GTN,GTR UNIT SIZE											
	050	060	070	080, 230B	090, 245B	100, 255B, 270B	110, 290B, 315B	130	150, 230A-255A	170, 270A, 330A/B, 360B	190, 290A, 360A, 390B	210, 315A, 390A, 420A/B
1	28	33	19	17	14	13	17	10	13	9	17	9
2	42	50	27	25	21	20	25	14	20	14	22	26
3	87	83	65	42	29	26	33	26	26	19	50	35
4	100	100	73	54	36	33	42	35	33	23	67	51
5	—	—	92	62	43	40	50	39	40	28	83	67
6	—	—	100	79	61	57	58	44	46	33	100	84
7	—	—	—	92	68	63	67	53	53	37	—	100
8	—	—	—	100	75	70	75	57	60	42	—	—
9	—	—	—	—	86	87	83	69	66	52	—	—
10	—	—	—	—	93	93	92	78	73	57	—	—
11	—	—	—	—	100	100	100	82	80	61	—	—
12	—	—	—	—	—	—	—	87	86	72	—	—
13	—	—	—	—	—	—	—	96	93	76	—	—
14	—	—	—	—	—	—	—	100	100	81	—	—
15	—	—	—	—	—	—	—	—	—	91	—	—
16	—	—	—	—	—	—	—	—	—	96	—	—
17	—	—	—	—	—	—	—	—	—	100	—	—

PERCENT DISPLACEMENT - SEQUENCE B (Standard Unit)

CAPACITY STEPS	30GTN,GTR UNIT SIZE											
	050	060	070	080, 230B	090, 245B	100, 255B, 270B	110, 290B, 315B	130	150, 230A-255A	170, 270A, 330A/B, 360B	190, 290A, 360A, 390B	210, 315A, 390A, 420A/B
1	—	—	—	25	14	13	17	16	13	9	17	16
2	—	—	—	38	21	20	25	25	20	14	22	26
3	—	—	—	42	29	26	33	26	26	19	50	42
4	—	—	—	50	36	33	42	31	33	23	67	51
5	—	—	—	62	43	40	50	39	40	28	83	67
6	—	—	—	79	53	57	58	51	46	38	100	84
7	—	—	—	88	60	63	67	56	53	43	—	100
8	—	—	—	100	67	70	75	64	60	47	—	—
9	—	—	—	—	86	87	83	69	66	52	—	—
10	—	—	—	—	93	93	92	74	73	57	—	—
11	—	—	—	—	100	100	100	82	80	61	—	—
12	—	—	—	—	—	—	—	87	86	72	—	—
13	—	—	—	—	—	—	—	91	93	76	—	—
14	—	—	—	—	—	—	—	100	100	81	—	—
15	—	—	—	—	—	—	—	—	—	91	—	—
16	—	—	—	—	—	—	—	—	—	96	—	—
17	—	—	—	—	—	—	—	—	—	100	—	—

NOTE: These capacity control steps may vary due to lag compressor sequencing.

PART LOAD DATA, 60Hz UNITS PERCENT DISPLACEMENT - SEQUENCE A (With Accessory Unloading)

CAPACITY STEPS	30GTR,GTR UNIT SIZE											
	050	060	070	080, 230B	090, 245B	100, 255B, 270B	110, 290B, 315B	130	150, 230A-255A	170, 270A, 330A/B	190, 290A, 360A/B, 390B	210, 315A, 390A, 420A/B
1	31	28	33	11	9	8	7	8	6	6	9	8
2	44	42	50	22	18	16	14	14	11	11	13	11
3	69	67	67	34	27	23	21	21	15	17	18	17
4	87	87	83	41	35	31	29	22	24	17	21	22
5	100	100	100	55	44	39	36	28	33	23	25	25
6	—	—	—	67	53	46	43	35	38	28	33	28
7	—	—	—	78	56	50	47	42	42	33	37	33
8	—	—	—	89	65	58	54	44	49	34	41	36
9	—	—	—	100	74	66	61	51	53	39	49	48
10	—	—	—	—	82	73	68	58	58	45	53	52
11	—	—	—	—	91	77	75	64	66	50	56	56
12	—	—	—	—	100	85	79	71	75	51	71	59
13	—	—	—	—	—	92	86	73	80	56	74	63
14	—	—	—	—	—	100	93	80	85	61	78	67
15	—	—	—	—	—	—	100	87	91	67	93	78
16	—	—	—	—	—	—	—	93	95	67	96	83
17	—	—	—	—	—	—	—	100	100	73	100	86
18	—	—	—	—	—	—	—	—	—	78	—	92
19	—	—	—	—	—	—	—	—	—	83	—	97
20	—	—	—	—	—	—	—	—	—	84	—	100
21	—	—	—	—	—	—	—	—	—	89	—	—
22	—	—	—	—	—	—	—	—	—	95	—	—
23	—	—	—	—	—	—	—	—	—	100	—	—

PERCENT DISPLACEMENT - SEQUENCE B (With Accessory Unloading)

CAPACITY STEPS	30GTR,GTR UNIT SIZE											
	050	060	070	080, 230B	090, 245B	100, 255B, 270B	110, 290B, 315B	130	150, 230A-255A	170, 270A, 330A/B	190, 290A, 360A/B, 390B	210, 315A, 390A, 420A/B
1	38	38	33	15	9	8	7	8	9	6	9	9
2	56	58	50	30	18	16	14	14	18	11	13	14
3	69	67	66	44	27	23	21	21	27	17	18	17
4	82	80	83	48	35	31	29	22	33	17	21	21
5	100	100	100	63	44	39	36	28	42	23	25	25
6	—	—	—	78	53	46	43	35	46	28	33	37
7	—	—	—	85	62	50	46	42	51	33	37	40
8	—	—	—	100	71	58	53	44	60	34	41	44
9	—	—	—	—	80	66	60	51	69	39	49	48
10	—	—	—	—	82	73	67	58	75	45	53	51
11	—	—	—	—	91	77	72	64	86	50	56	56
12	—	—	—	—	100	85	79	71	91	51	71	67
13	—	—	—	—	—	92	86	73	100	56	74	71
14	—	—	—	—	—	100	93	80	—	61	78	75
15	—	—	—	—	—	—	100	87	—	67	93	78
16	—	—	—	—	—	—	—	93	—	67	96	82
17	—	—	—	—	—	—	—	100	—	73	100	86
18	—	—	—	—	—	—	—	—	—	78	—	92
19	—	—	—	—	—	—	—	—	—	83	—	96
20	—	—	—	—	—	—	—	—	—	84	—	100
21	—	—	—	—	—	—	—	—	—	89	—	—
22	—	—	—	—	—	—	—	—	—	95	—	—
23	—	—	—	—	—	—	—	—	—	100	—	—

NOTE: These capacity control steps may vary due to lag compressor sequencing.



PART LOAD DATA, 50Hz UNITS PERCENT DISPLACEMENT - SEQUENCE A (With Accessory Unloading)

CAPACITY STEPS	30GTN,GTR UNIT SIZE											
	050	060	070	080, 230B	090, 245B	100, 255B, 270B	110, 290B, 315B	130	150, 230A-255A	170, 270A, 330A/B, 360B	190, 290A, 360A, 390B	210, 315A, 390A, 420A/B
1	28	33	19	8	7	7	8	6	6	5	11	8
2	42	50	27	17	14	13	17	10	13	9	17	11
3	67	67	49	25	21	20	25	14	20	14	22	17
4	87	83	65	33	29	26	33	22	26	14	28	22
5	100	100	73	46	36	33	42	31	33	19	33	25
6	—	—	76	54	43	40	50	35	40	23	39	28
7	—	—	92	62	49	43	58	39	46	28	44	33
8	—	—	100	71	54	50	67	40	53	28	50	36
9	—	—	—	84	61	57	75	49	60	33	55	48
10	—	—	—	92	68	63	83	53	66	37	61	52
11	—	—	—	100	75	70	92	57	73	42	67	56
12	—	—	—	—	79	74	100	65	80	43	72	59
13	—	—	—	—	86	80	—	74	86	48	78	63
14	—	—	—	—	93	89	—	78	93	52	83	67
15	—	—	—	—	100	93	—	82	100	57	89	78
16	—	—	—	—	—	100	—	83	—	61	94	83
17	—	—	—	—	—	—	—	91	—	63	100	86
18	—	—	—	—	—	—	—	96	—	67	—	92
19	—	—	—	—	—	—	—	100	—	72	—	97
20	—	—	—	—	—	—	—	—	—	76	—	100
21	—	—	—	—	—	—	—	—	—	81	—	—
22	—	—	—	—	—	—	—	—	—	82	—	—
23	—	—	—	—	—	—	—	—	—	87	—	—
24	—	—	—	—	—	—	—	—	—	91	—	—
25	—	—	—	—	—	—	—	—	—	96	—	—
26	—	—	—	—	—	—	—	—	—	100	—	—

PERCENT DISPLACEMENT - SEQUENCE B (With Accessory Unloading)

CAPACITY STEPS	30GTN,GTR UNIT SIZE											
	050	060	070	080, 230B	090, 245B	100, 255B, 270B	110, 290B, 315B	130	150, 230A-255A	170, 270A, 330A/B, 360B	190, 290A, 360A, 390B	210, 315A, 390A, 420A/B
1	38	33	31	13	7	7	8	8	6	5	11	11
2	58	50	47	25	14	13	17	16	13	9	17	16
3	67	66	49	38	21	20	25	25	20	14	22	17
4	80	83	57	50	29	26	33	31	26	14	28	20
5	100	100	73	62	36	33	42	39	33	19	33	26
6	—	—	76	67	43	40	50	43	40	23	39	34
7	—	—	84	75	46	43	58	47	46	28	44	36
8	—	—	100	88	53	50	67	56	53	29	50	42
9	—	—	—	100	60	57	75	64	60	34	55	43
10	—	—	—	—	67	63	83	65	66	38	61	46
11	—	—	—	—	72	70	92	74	73	43	67	51
12	—	—	—	—	79	74	100	82	80	47	72	59
13	—	—	—	—	86	80	—	83	86	48	78	62
14	—	—	—	—	93	87	—	91	93	52	83	67
15	—	—	—	—	100	93	—	100	100	57	89	75
16	—	—	—	—	—	100	—	—	—	61	94	78
17	—	—	—	—	—	—	—	—	—	63	100	84
18	—	—	—	—	—	—	—	—	—	67	—	92
19	—	—	—	—	—	—	—	—	—	72	—	94
20	—	—	—	—	—	—	—	—	—	76	—	100
21	—	—	—	—	—	—	—	—	—	81	—	—
22	—	—	—	—	—	—	—	—	—	82	—	—
23	—	—	—	—	—	—	—	—	—	87	—	—
24	—	—	—	—	—	—	—	—	—	91	—	—
25	—	—	—	—	—	—	—	—	—	96	—	—
26	—	—	—	—	—	—	—	—	—	100	—	—

NOTE: These capacity control steps may vary due to lag compressor sequencing.

Performance data (cont)



COOLING CAPACITIES - 60Hz

LCWT (C)	UNIT SIZE 30GTN,GTR	CONDENSER ENTERING-AIR TEMPERATURE (C)														
		30			35			40			45			50		
		Cap. (kW)	Input kW	Cooler Flow Rate (L/s)	Cap. (kW)	Input kW	Cooler Flow Rate (L/s)	Cap. (kW)	Input kW	Cooler Flow Rate (L/s)	Cap. (kW)	Input kW	Cooler Flow Rate (L/s)	Cap. (kW)	Input kW	Cooler Flow Rate (L/s)
5	050	179.0	51.9	7.7	169.6	54.8	7.3	160.2	57.5	6.9	150.7	59.9	6.5	141.2	62.1	6.1
	060	224.0	65.8	9.6	213.0	69.3	9.1	201.8	72.5	8.7	190.7	75.5	8.2	179.4	78.2	7.7
	070	256.2	76.6	11.0	244.4	80.5	10.5	232.5	84.2	10.0	220.6	87.7	9.5	208.6	90.9	9.0
	080	289.9	86.9	12.5	274.9	91.2	11.8	259.7	95.2	11.2	244.4	98.8	10.5	229.1	102.1	9.8
	090	310.5	91.0	13.3	293.3	95.9	12.6	276.1	100.5	11.9	259.2	104.7	11.1	242.1	108.5	10.4
	100	352.2	99.6	15.1	333.4	105.1	14.3	314.5	110.3	13.5	295.6	114.9	12.7	276.5	119.1	11.9
	110	380.4	113.9	16.3	360.7	119.7	15.5	340.9	125.1	14.6	321.2	130.1	13.8	301.4	134.6	12.9
	130	426.1	127.4	18.3	407.5	134.2	17.5	388.6	140.7	16.7	369.3	146.8	15.9	349.7	152.4	15.0
	150	495.2	149.8	21.3	473.7	158.0	20.4	451.7	165.9	19.4	429.6	173.4	18.5	407.3	180.5	17.5
	170	553.6	167.5	23.8	527.1	176.1	22.6	500.7	184.0	21.5	473.8	191.4	20.4	446.3	197.9	19.2
	190	607.2	184.5	26.1	579.7	194.1	24.9	552.3	203.2	23.7	524.1	211.7	22.5	496.0	219.7	21.3
	210	710.9	218.7	30.5	673.3	228.4	28.9	636.1	237.3	27.3	598.7	245.4	25.7	561.1	252.8	24.1
	230	785.1	236.7	33.7	748.6	249.2	32.2	711.4	261.1	30.6	674.0	272.2	29.0	636.4	282.5	27.3
	245	805.7	240.8	34.6	767.0	253.9	33.0	727.9	266.3	31.3	688.8	278.0	29.6	649.4	289.0	27.9
	255	847.8	249.5	36.4	807.4	263.2	34.7	766.4	276.2	32.9	725.2	288.3	31.2	683.7	299.6	29.4
	270	906.2	267.1	38.9	860.8	281.3	37.0	815.3	294.3	35.0	769.3	306.3	33.1	722.6	317.0	31.0
	290	987.7	298.4	42.4	940.4	313.8	40.4	893.3	328.3	38.4	845.4	341.8	36.3	797.5	354.3	34.3
	315	1091.3	332.6	46.9	1034.0	348.1	44.4	977.1	362.4	42.0	920.0	375.5	39.5	862.6	387.4	37.1
	330	1107.1	335.0	47.6	1054.5	352.2	45.3	1001.8	368.2	43.0	947.7	382.8	40.7	892.6	395.9	38.3
	360	1214.4	369.0	52.2	1160.0	388.3	49.8	1104.9	406.5	47.5	1048.8	423.5	45.1	992.4	439.5	42.6
390	1319.1	403.4	56.7	1253.6	422.6	53.9	1188.8	440.7	51.1	1123.4	457.3	48.3	1057.6	472.7	45.4	
420	1421.9	437.4	61.1	1347.1	456.8	57.9	1272.9	474.8	54.7	1197.9	491.0	51.5	1122.8	505.7	48.2	
6	050	184.8	52.8	7.9	175.3	55.7	7.5	165.7	58.5	7.1	156.0	61.1	6.7	146.2	63.4	6.3
	060	231.2	66.8	9.9	220.0	70.5	9.5	208.7	73.8	9.0	197.2	76.9	8.5	185.7	79.7	8.0
	070	264.4	77.8	11.4	252.2	81.9	10.8	240.0	85.7	10.3	227.8	89.3	9.8	215.6	92.7	9.3
	080	299.5	88.4	12.9	284.2	93.0	12.2	268.7	97.1	11.6	253.1	100.9	10.9	237.4	104.3	10.2
	090	320.9	92.6	13.8	303.5	97.7	13.0	286.0	102.5	12.3	268.5	106.9	11.5	251.0	110.9	10.8
	100	364.8	101.3	15.7	345.5	107.1	14.9	326.1	112.4	14.0	306.7	117.3	13.2	287.2	121.7	12.3
	110	393.7	116.1	16.9	373.6	122.1	16.1	353.3	127.7	15.2	333.1	132.8	14.3	312.9	137.6	13.4
	130	439.4	129.4	18.9	420.3	136.5	18.1	400.8	143.2	17.2	381.3	149.5	16.4	361.3	155.4	15.5
	150	509.8	152.3	21.9	487.7	160.7	21.0	465.6	168.8	20.0	443.1	176.5	19.0	420.4	183.9	18.1
	170	571.6	170.5	24.6	545.2	179.5	23.4	518.0	187.8	22.3	490.1	195.3	21.1	462.3	202.3	19.9
	190	626.7	187.9	26.9	598.7	197.7	25.7	570.8	207.2	24.5	542.4	216.1	23.3	513.3	224.3	22.1
	210	734.7	223.2	31.6	697.1	233.3	30.0	658.7	242.5	28.3	620.2	250.9	26.7	582.1	258.7	25.0
	230	809.3	240.7	34.8	772.0	253.6	33.2	734.3	265.9	31.6	696.2	277.4	29.9	657.8	288.2	28.3
	245	830.6	244.9	35.7	791.3	258.4	34.0	751.6	271.3	32.3	711.6	283.4	30.6	671.4	294.8	28.9
	255	874.9	253.7	37.6	833.5	267.8	35.8	791.9	281.3	34.0	749.9	293.9	32.2	707.5	305.6	30.4
	270	936.7	271.9	40.3	890.9	286.6	38.3	844.3	300.3	36.3	796.8	312.6	34.3	749.4	324.0	32.2
	290	1020.4	303.9	43.9	972.3	319.8	41.8	924.1	334.8	39.7	875.5	348.9	37.6	826.1	361.9	35.5
	315	1128.5	339.3	48.5	1070.7	355.4	46.0	1012.0	370.2	43.5	953.3	383.8	41.0	895.0	396.3	38.5
	330	1142.7	341.0	49.1	1090.2	359.0	46.9	1036.0	375.6	44.5	980.7	390.8	42.2	924.8	404.6	39.8
	360	1253.6	375.7	53.9	1197.7	395.5	51.5	1142.0	414.4	49.1	1084.9	432.2	46.6	1027.1	448.8	44.2
390	1362.1	411.2	58.6	1297.1	431.3	55.8	1230.0	449.8	52.9	1162.9	467.1	50.0	1096.1	483.3	47.1	
420	1470.0	446.5	63.2	1394.3	466.6	59.9	1318.0	485.2	56.7	1241.1	502.1	53.4	1164.3	517.4	50.1	

See legend and notes on page 50.

COOLING CAPACITIES - 60Hz

LCWT (C)	UNIT SIZE 30GTN,GTR	CONDENSER ENTERING-AIR TEMPERATURE (C)														
		30			35			40			45			50		
		Cap. (kW)	Input kW	Cooler Flow Rate (L/s)	Cap. (kW)	Input kW	Cooler Flow Rate (L/s)	Cap. (kW)	Input kW	Cooler Flow Rate (L/s)	Cap. (kW)	Input kW	Cooler Flow Rate (L/s)	Cap. (kW)	Input kW	Cooler Flow Rate (L/s)
7	050	190.7	53.6	8.2	181.0	56.7	7.8	171.2	59.6	7.4	161.4	62.2	6.9	151.4	64.6	6.5
	060	238.6	67.9	10.3	227.2	71.7	9.8	215.6	75.2	9.3	204.0	78.4	8.8	192.2	81.3	8.3
	070	272.6	79.1	11.7	260.2	83.3	11.2	247.6	87.2	10.7	235.2	90.9	10.1	222.7	94.4	9.6
	080	309.2	90.0	13.3	293.7	94.7	12.6	277.9	99.0	12.0	261.9	102.9	11.3	246.0	106.5	10.6
	090	331.7	94.3	14.3	313.8	99.6	13.5	295.9	104.5	12.7	278.0	109.0	12.0	260.2	113.2	11.2
	100	377.5	103.1	16.2	357.8	109.1	15.4	337.9	114.6	14.5	318.1	119.7	13.7	298.2	124.3	12.8
	110	407.3	118.3	17.5	386.7	124.5	16.6	366.1	130.3	15.7	345.3	135.7	14.9	324.6	140.6	14.0
	130	452.6	131.4	19.5	433.2	138.8	18.6	413.5	145.7	17.8	393.3	152.2	16.9	373.1	158.3	16.0
	150	524.9	154.7	22.6	502.2	163.4	21.6	479.4	171.7	20.6	456.7	179.7	19.6	433.6	187.4	18.7
	170	589.5	173.6	25.4	563.0	182.9	24.2	535.5	191.5	23.0	507.4	199.5	21.8	478.7	206.7	20.6
	190	647.0	191.3	27.8	618.2	201.5	26.6	589.2	211.1	25.3	560.6	220.4	24.1	531.2	229.1	22.8
	210	759.9	227.8	32.7	720.6	238.2	31.0	681.6	247.7	29.3	642.3	256.5	27.6	603.5	264.7	26.0
	230	834.1	244.8	35.9	795.9	258.1	34.2	757.4	270.7	32.6	718.7	282.7	30.9	679.6	293.9	29.2
	245	856.6	249.1	36.8	815.9	262.9	35.1	775.4	276.2	33.3	734.8	288.8	31.6	693.8	300.6	29.8
	255	902.7	257.9	38.8	860.3	272.5	37.0	817.7	286.4	35.2	775.0	299.5	33.3	731.8	311.7	31.5
	270	967.3	276.7	41.6	921.1	292.0	39.6	873.7	306.2	37.6	825.7	319.2	35.5	776.8	331.0	33.4
	290	1054.3	309.6	45.3	1004.9	325.9	43.2	955.3	341.4	41.1	905.9	356.0	39.0	855.8	369.7	36.8
	315	1167.2	346.1	50.2	1107.3	362.6	47.6	1047.6	378.0	45.1	987.7	392.2	42.5	928.0	405.3	39.9
	330	1178.9	347.2	50.7	1125.9	365.8	48.4	1070.9	383.0	46.1	1015.1	399.0	43.7	957.5	413.4	41.2
	360	1293.6	382.6	55.6	1236.3	403.0	53.2	1179.1	422.4	50.7	1121.4	440.9	48.2	1062.7	458.2	45.7
390	1406.7	419.2	60.5	1339.8	439.8	57.6	1271.6	459.0	54.7	1203.3	477.1	51.8	1135.2	494.0	48.8	
420	1519.9	455.7	65.4	1441.7	476.4	62.0	1363.7	495.6	58.7	1285.4	513.2	55.3	1207.4	529.5	51.9	
8	050	196.8	54.5	8.5	186.9	57.7	8.0	176.9	60.6	7.6	166.8	63.4	7.2	156.7	65.9	6.7
	060	246.2	69.0	10.6	234.5	72.9	10.1	222.7	76.5	9.6	210.8	79.8	9.1	198.8	82.9	8.6
	070	281.0	80.4	12.1	268.3	84.7	11.5	255.6	88.8	11.0	242.9	92.7	10.5	229.9	96.2	9.9
	080	319.1	91.6	13.7	303.2	96.4	13.0	287.3	100.9	12.4	271.0	105.0	11.7	254.5	108.7	11.0
	090	342.5	96.0	14.7	324.2	101.4	14.0	306.0	106.5	13.2	287.7	111.2	12.4	269.3	115.6	11.6
	100	390.5	104.9	16.8	370.4	111.0	15.9	350.2	116.8	15.1	329.8	122.1	14.2	309.5	127.0	13.3
	110	421.0	120.4	18.1	400.0	126.9	17.2	379.0	132.9	16.3	357.8	138.5	15.4	336.5	143.7	14.5
	130	465.9	133.5	20.0	446.3	141.0	19.2	426.2	148.2	18.3	405.6	154.9	17.5	385.0	161.3	16.6
	150	540.0	157.2	23.2	517.1	166.1	22.3	493.7	174.7	21.2	470.4	182.9	20.2	447.1	190.8	19.2
	170	608.0	176.7	26.2	580.8	186.3	25.0	553.2	195.3	23.8	524.5	203.6	22.6	495.3	211.1	21.3
	190	666.6	194.7	28.7	637.8	205.2	27.4	608.4	215.2	26.2	578.9	224.8	24.9	549.2	233.8	23.6
	210	785.1	232.5	33.8	745.4	243.2	32.1	705.2	253.1	30.3	664.9	262.2	28.6	625.2	270.7	26.9
	230	859.1	248.8	37.0	820.4	262.5	35.3	780.9	275.6	33.6	741.4	288.0	31.9	701.6	299.6	30.2
	245	882.4	253.2	38.0	841.3	267.5	36.2	799.6	281.2	34.4	758.2	294.2	32.6	716.4	306.4	30.8
	255	930.7	262.1	40.1	887.8	277.2	38.2	844.1	291.6	36.3	800.4	305.1	34.4	756.5	317.8	32.6
	270	998.8	281.6	43.0	951.4	297.4	40.9	903.5	312.1	38.9	854.5	325.7	36.8	804.7	338.1	34.6
	290	1087.7	315.1	46.8	1037.8	332.1	44.7	987.3	348.1	42.5	936.7	363.3	40.3	885.7	377.4	38.1
	315	1206.1	352.9	51.9	1145.4	370.1	49.3	1084.2	386.0	46.7	1022.7	400.7	44.0	961.8	414.4	41.4
	330	1215.8	353.4	52.3	1161.4	372.6	50.0	1106.3	390.5	47.6	1049.0	407.1	45.1	990.9	422.3	42.6
	360	1333.4	389.3	57.4	1275.8	410.4	54.9	1217.0	430.4	52.4	1158.5	449.7	49.9	1098.6	467.6	47.3
390	1452.1	427.2	62.5	1383.9	448.6	59.6	1314.8	468.5	56.6	1244.5	487.1	53.6	1175.0	504.6	50.6	
420	1570.2	465.0	67.6	1490.9	486.5	64.2	1411.1	506.4	60.7	1330.5	524.6	57.3	1250.8	541.5	53.8	

LEGEND

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

NOTES:

- All ratings are based on:
 - A cooler water temperature rise of 6°C. When greater accuracy is desired, correct design LCWT, before entering rating tables, by reference to the LCWT correction curve.
 - A fouling factor of 0.000018 in the cooler.
 - R-22 refrigerant.
- When a corrected LCWT is used, cooler pressure drop must also be corrected for the new LCWT:
 - Enter rating table for corrected LCWT. By interpolation, determine corrected capacity (kW) and power input (kW) to compressor at its rated voltage.
- 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.

b. Calculate corrected flow rate through the cooler:

$$= \frac{0.239 \times \text{capacity in kW}}{\text{temperature rise } ^\circ\text{C}} = \text{L/S}$$

Performance data (cont)



COOLING CAPACITIES - 60Hz (cont)

LCWT (C)	UNIT SIZE 30GTN,GTR	CONDENSER ENTERING-AIR TEMPERATURE (C)															
		30			35			40			45			50			
		Cap. (kW)	Input kW	Cooler Flow Rate (L/s)	Cap. (kW)	Input kW	Cooler Flow Rate (L/s)	Cap. (kW)	Input kW	Cooler Flow Rate (L/s)	Cap. (kW)	Input kW	Cooler Flow Rate (L/s)	Cap. (kW)	Input kW	Cooler Flow Rate (L/s)	
7	050	202.9	55.3	8.7	192.8	58.6	8.3	182.7	61.7	7.9	172.4	64.6	7.4	162.1	67.2	7.0	
	060	253.9	70.1	10.9	241.9	74.1	10.4	229.9	77.8	9.9	217.8	81.3	9.4	205.5	84.5	8.8	
	070	289.5	81.7	12.5	276.5	86.2	11.9	263.5	90.4	11.3	250.5	94.3	10.8	237.5	98.1	10.2	
	080	329.3	93.2	14.2	313.1	98.2	13.5	296.7	102.8	12.8	280.2	107.1	12.1	263.4	111.0	11.3	
	090	353.4	97.7	15.2	334.8	103.3	14.4	316.2	108.5	13.6	297.6	113.5	12.8	278.8	118.0	12.0	
	100	403.6	106.7	17.4	383.2	113.0	16.5	362.5	119.0	15.6	341.8	124.5	14.7	320.7	129.6	13.8	
	110	435.1	122.6	18.7	413.6	129.3	17.8	392.2	135.5	16.9	370.6	141.4	16.0	348.8	146.8	15.0	
	130	479.7	135.6	20.7	459.4	143.3	19.8	439.2	150.7	18.9	418.4	157.7	18.0	397.3	164.3	17.1	
	150	555.2	159.7	23.9	532.0	168.8	22.9	508.4	177.7	21.9	484.4	186.2	20.9	460.5	194.3	19.8	
	9	170	626.6	179.8	27.0	599.1	189.7	25.8	570.8	199.0	24.6	542.1	207.7	23.3	512.4	215.6	22.1
		190	687.0	198.1	29.6	658.2	209.1	28.3	628.3	219.4	27.1	597.5	229.1	25.7	567.3	238.5	24.4
		210	810.7	237.2	34.9	770.2	248.3	33.2	729.0	258.5	31.4	688.0	268.0	29.6	—	—	—
		230	884.5	252.9	38.1	845.0	267.0	36.4	805.1	280.5	34.7	764.6	293.3	32.9	723.9	305.3	31.2
		245	908.6	257.4	39.1	866.8	272.1	37.3	824.6	286.3	35.5	782.0	299.6	33.7	739.3	312.3	31.8
		255	959.3	266.4	41.3	915.4	281.9	39.4	871.2	296.8	37.5	826.3	310.7	35.6	781.4	324.0	33.6
		270	1030.5	286.5	44.4	982.5	302.8	42.3	933.5	318.1	40.2	884.0	332.2	38.1	833.3	345.2	35.9
		290	1122.1	320.7	48.3	1071.8	338.3	46.1	1020.5	354.9	43.9	968.2	370.4	41.7	916.1	385.3	39.4
315		1245.8	359.8	53.6	1183.8	377.6	51.0	1121.3	394.0	48.3	1058.7	409.3	45.6	—	—	—	
330		1253.1	359.6	54.0	1198.0	379.5	51.6	1141.5	398.0	49.1	1084.2	415.3	46.7	1025.1	431.3	44.1	
360		1374.2	396.2	59.2	1316.2	418.0	56.7	1256.5	438.7	54.1	1195.9	458.3	51.5	1135.0	477.1	48.9	
390		1498.1	435.4	64.5	1428.2	457.4	61.5	1357.7	477.9	58.5	1286.4	497.2	55.4	—	—	—	
420	1621.5	474.5	69.8	1540.5	496.6	66.3	1458.6	517.1	62.8	1376.7	536.1	59.3	—	—	—		
10	050	209.2	56.2	9.0	198.9	59.6	8.6	188.5	62.8	8.1	178.1	65.7	7.7	167.5	68.5	7.2	
	060	261.7	71.2	11.3	249.5	75.3	10.7	237.3	79.2	10.2	224.9	82.8	9.7	212.3	86.1	9.1	
	070	298.2	83.0	12.8	285.0	87.6	12.3	271.8	91.9	11.7	258.5	96.0	11.1	245.0	99.9	10.6	
	080	339.7	94.8	14.6	323.0	100.0	13.9	306.3	104.8	13.2	289.5	109.2	12.5	272.4	113.3	11.7	
	090	364.6	99.4	15.7	345.6	105.2	14.9	326.4	110.6	14.1	307.4	115.7	13.2	288.4	120.4	12.4	
	100	417.1	108.4	18.0	396.2	115.1	17.1	375.0	121.2	16.2	353.9	127.0	15.2	332.2	132.2	14.3	
	110	449.4	124.9	19.4	427.5	131.7	18.4	405.5	138.2	17.5	383.6	144.2	16.5	361.4	149.9	15.6	
	130	493.5	137.6	21.3	473.1	145.6	20.4	452.2	153.2	19.5	431.2	160.4	18.6	409.7	167.3	17.6	
	150	570.6	162.2	24.6	547.1	171.6	23.6	523.1	180.7	22.5	499.0	189.4	21.5	474.3	197.8	20.4	
	170	645.6	183.0	27.8	617.5	193.2	26.6	588.8	202.8	25.4	559.8	211.8	24.1	529.5	220.1	22.8	
	190	707.8	201.5	30.5	677.9	212.8	29.2	648.1	223.5	27.9	617.0	233.6	26.6	585.8	243.3	25.2	
	210	836.5	242.0	36.0	795.4	253.4	34.3	753.4	263.9	32.5	712.0	273.9	30.7	—	—	—	
	230	910.3	257.0	39.2	870.1	271.6	37.5	829.4	285.5	35.7	788.5	298.7	34.0	746.8	311.1	32.2	
	245	935.2	261.6	40.3	892.7	276.7	38.4	849.6	291.3	36.6	806.4	305.1	34.7	762.8	318.2	32.9	
	255	988.0	270.7	42.6	943.5	286.7	40.6	898.4	302.0	38.7	853.0	316.5	36.7	807.0	330.1	34.8	
	270	1063.0	291.5	45.8	1013.9	308.3	43.7	964.1	324.1	41.5	913.8	338.8	39.4	862.2	352.4	37.1	
	290	1157.2	326.4	49.8	1105.4	344.5	47.6	1053.7	361.7	45.4	1000.6	377.8	43.1	947.2	393.1	40.8	
315	1285.9	366.9	55.4	1222.9	385.1	52.7	1158.9	402.1	49.9	1095.6	418.1	47.2	—	—	—		
330	1291.1	366.0	55.6	1235.0	386.4	53.2	1177.5	405.6	50.7	1119.5	423.6	48.2	1059.0	440.1	45.6		
360	1415.6	403.1	61.0	1356.0	425.6	58.4	1296.1	446.9	55.8	1234.0	467.2	53.2	1171.9	486.6	50.5		
390	1544.7	443.7	66.5	1473.8	466.3	63.5	1401.8	487.6	60.4	1330.3	507.8	57.3	—	—	—		
420	1673.4	484.1	72.1	1591.0	506.9	68.5	1507.4	528.0	64.9	1424.5	547.9	61.4	—	—	—		

See legend and notes on page 52.

Performance data (cont)



COOLING CAPACITIES - 60Hz (cont)

LCWT (C)	UNIT SIZE 30GTN,GTR	CONDENSER ENTERING-AIR TEMPERATURE (C)														
		30			35			40			45			50		
		Cap. (kW)	Input kW	Cooler Flow Rate (L/s)	Cap. (kW)	Input kW	Cooler Flow Rate (L/s)	Cap. (kW)	Input kW	Cooler Flow Rate (L/s)	Cap. (kW)	Input kW	Cooler Flow Rate (L/s)	Cap. (kW)	Input kW	Cooler Flow Rate (L/s)
13	050	228.5	58.9	9.9	217.6	62.6	9.4	206.7	66.1	8.9	195.7	69.3	8.4	184.3	72.3	7.9
	060	285.9	74.5	12.3	273.1	79.0	11.8	259.4	83.1	11.2	245.2	86.9	10.6	231.0	90.3	10.0
	070	325.1	87.0	14.0	311.1	92.0	13.4	297.0	96.7	12.8	282.4	101.0	12.2	265.0	104.5	11.4
	080	371.7	99.8	16.0	352.5	105.2	15.2	332.7	110.1	14.3	—	—	—	—	—	—
	090	398.8	104.6	17.2	377.5	110.7	16.3	355.6	116.2	15.3	334.0	121.5	14.4	312.2	126.2	13.5
	100	458.8	113.9	19.8	436.6	121.2	18.8	414.2	128.0	17.9	391.7	134.4	16.9	368.7	140.3	15.9
	110	493.8	131.7	21.3	470.6	139.2	20.3	447.2	146.3	19.3	423.5	153.0	18.3	399.9	159.3	17.2
	130	536.1	143.9	23.1	514.5	152.6	22.2	492.8	160.9	21.3	470.8	168.8	20.3	448.2	176.3	19.3
	150	617.8	169.8	26.6	593.2	180.0	25.6	568.2	189.8	24.5	542.8	199.3	23.4	517.4	208.5	22.3
	170	704.5	192.7	30.4	675.2	203.9	29.1	644.7	214.4	27.8	608.5	223.1	26.2	—	—	—
	190	771.3	212.1	33.3	740.1	224.3	31.9	708.2	236.1	30.5	676.8	247.3	29.2	—	—	—
	210	917.9	257.0	39.6	873.6	269.4	37.7	829.5	281.0	35.8	—	—	—	—	—	—
	230	989.6	269.6	42.7	945.7	285.1	40.8	900.9	299.8	38.8	—	—	—	—	—	—
	245	1016.7	274.5	43.8	970.7	290.6	41.9	923.8	306.0	39.8	876.9	320.8	37.8	829.7	334.8	35.8
	255	1076.9	283.8	46.4	1030.0	301.2	44.4	982.7	317.8	42.4	934.7	333.8	40.3	885.7	348.8	38.2
	270	1163.7	306.7	50.2	1112.1	325.1	48.0	1059.2	342.4	45.7	1000.4	357.5	43.1	—	—	—
	290	1265.1	343.8	54.6	1210.6	363.5	52.2	1155.4	382.4	49.8	1100.3	400.2	47.4	—	—	—
	315	1411.8	388.7	60.9	1344.1	408.6	58.0	1276.8	427.3	55.1	—	—	—	—	—	—
	330	1409.1	385.3	60.8	1350.3	407.7	58.2	1289.7	428.8	55.6	1217.0	446.2	52.5	—	—	—
	360	1543.0	424.3	66.5	1480.4	448.7	63.8	1416.9	472.1	61.1	1353.3	494.5	58.4	—	—	—
390	1690.2	469.3	72.9	1614.3	493.8	69.6	1538.5	517.2	66.3	—	—	—	—	—	—	
420	1835.8	514.1	79.2	1747.6	538.8	75.4	1659.7	562.1	71.6	—	—	—	—	—	—	
16	050	241.0	60.5	10.4	227.0	63.9	9.8	213.2	67.0	9.2	199.4	69.9	8.6	185.7	72.5	8.0
	060	295.7	75.7	12.8	279.6	79.9	12.1	263.4	83.7	11.4	247.5	87.2	10.7	231.5	90.3	10.0
	070	336.5	88.4	14.5	318.6	93.0	13.7	300.9	97.2	13.0	283.3	101.0	12.2	265.9	104.5	11.5
	080	376.2	100.4	16.2	355.1	105.5	15.3	334.0	110.1	14.4	—	—	—	—	—	—
	090	413.5	106.8	17.8	388.2	112.4	16.8	363.3	117.6	15.7	338.7	122.3	14.6	314.4	126.5	13.6
	100	481.6	116.8	20.8	453.6	123.5	19.6	425.7	129.8	18.4	398.2	135.4	17.2	370.7	140.5	16.0
	110	528.4	136.6	22.8	498.2	143.6	21.5	468.2	150.0	20.2	438.6	155.8	18.9	409.2	161.1	17.7
	130	580.7	150.3	25.1	558.4	159.7	24.1	530.9	167.8	22.9	499.1	174.5	21.5	467.4	180.7	20.2
	150	667.4	177.7	28.8	638.4	187.8	27.6	602.6	196.3	26.0	565.3	204.0	24.4	528.6	210.9	22.8
	170	733.8	197.2	31.7	692.9	206.8	29.9	651.7	215.5	28.1	610.3	223.2	26.3	—	—	—
	190	829.8	221.7	35.8	785.3	232.2	33.9	739.4	241.9	31.9	693.8	250.8	29.9	—	—	—
	210	942.3	261.0	40.7	889.9	272.0	38.4	837.7	282.2	36.2	—	—	—	—	—	—
	230	1043.6	278.1	45.0	993.5	293.3	42.9	936.7	306.5	40.4	—	—	—	—	—	—
	245	1080.9	284.4	46.7	1026.6	300.2	44.3	965.9	313.9	41.7	904.0	326.3	39.0	843.0	337.5	36.4
	255	1149.0	294.4	49.6	1091.9	311.3	47.1	1028.4	326.1	44.4	963.4	339.4	41.6	899.2	351.4	38.8
	270	1215.4	314.0	52.5	1146.5	330.4	49.5	1077.4	345.3	46.5	1008.5	358.6	43.5	—	—	—
	290	1358.2	358.3	58.6	1283.5	375.8	55.4	1207.6	391.9	52.1	1132.4	406.6	48.9	—	—	—
	315	1470.7	397.6	63.5	1388.0	415.6	59.9	1306.0	432.2	56.4	—	—	—	—	—	—
	330	1467.7	394.4	63.3	1385.7	413.6	59.8	1303.4	431.0	56.3	1220.6	446.4	52.7	—	—	—
	360	1659.6	443.4	71.6	1570.6	464.3	67.8	1478.8	483.8	63.8	1387.6	501.5	59.9	—	—	—
390	1772.3	482.7	76.5	1675.1	504.2	72.3	1577.1	524.1	68.1	—	—	—	—	—	—	
420	1884.7	521.9	81.3	1779.7	544.0	76.8	1675.5	564.4	72.3	—	—	—	—	—	—	

LEGEND

Cap. - Cooling Capacity (kW of Refrigeration)

kW - Compressor Power Input

LCWT - Leaving Chilled Water Temperature

NOTES:

1. All ratings are based on:

- A cooler water temperature rise of 6°C. When greater accuracy is desired, correct design LCWT, before entering rating tables, by reference to the LCWT correction curve.
- A fouling factor of 0.000018 in the cooler.
- R-22 refrigerant.

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

- Enter rating table for corrected LCWT. By interpolation, determine corrected capacity (kW) and power input (kW) to compressor at its rated voltage.

b. Calculate corrected flow rate through the cooler:

$$= \frac{0.239 \times \text{capacity in kW}}{\text{temperature rise } ^\circ\text{C}} = \text{L/S}$$

c. On Cooler Pressure Drop chart, on pages 38-41, enter cooler pressure drop curve at corrected flow rate and read pressure drop.

3. 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.

Performance data (cont)



COOLING CAPACITIES - 50Hz

LCWT (C)	UNIT SIZE 30GTN,GTR	CONDENSER ENTERING-AIR TEMPERATURE (C)														
		30			35			40			45			50		
		Cap. (kW)	Input kW	Cooler Flow Rate (L/s)	Cap. (kW)	Input kW	Cooler Flow Rate (L/s)	Cap. (kW)	Input kW	Cooler Flow Rate (L/s)	Cap. (kW)	Input kW	Cooler Flow Rate (L/s)	Cap. (kW)	Input kW	Cooler Flow Rate (L/s)
5	050	181.4	55.3	7.2	172.6	58.0	6.9	163.7	60.6	6.5	154.7	62.9	6.2	145.6	65.0	5.8
	060	213.0	64.1	8.5	202.8	67.2	8.1	192.5	70.2	7.7	182.3	73.0	7.3	172.1	75.5	6.8
	070	249.4	72.2	9.9	236.8	76.1	9.4	224.2	79.7	8.9	211.7	83.2	8.4	199.3	86.3	7.9
	080	287.5	84.9	11.4	273.1	89.1	10.9	258.5	93.0	10.3	244.3	96.7	9.7	230.0	100.0	9.1
	090	322.0	98.2	12.8	305.4	103.1	12.1	288.7	107.6	11.5	272.1	111.8	10.8	255.4	115.6	10.2
	100	354.8	104.8	14.1	336.6	110.0	13.4	318.7	114.9	12.7	300.9	119.4	12.0	283.0	123.7	11.3
	110	392.4	125.1	15.6	373.7	130.6	14.9	354.9	135.7	14.1	336.3	140.6	13.4	317.6	145.1	12.6
	130	435.8	130.3	17.3	416.3	137.3	16.6	396.6	143.9	15.8	376.6	150.1	15.0	356.5	155.9	14.2
	150	510.1	163.3	20.3	489.4	171.3	19.5	468.6	179.1	18.6	447.3	186.4	17.8	425.8	193.4	16.9
	170	557.7	173.3	22.2	532.8	181.8	21.2	507.5	189.8	20.2	481.9	197.3	19.2	455.5	204.2	18.1
	190	632.3	198.4	25.2	605.6	207.8	24.1	579.0	216.8	23.0	552.4	225.4	22.0	524.9	233.5	20.9
	210	712.5	222.1	28.3	676.8	231.7	26.9	641.3	240.5	25.5	605.8	248.8	24.1	570.1	256.3	22.7
	230	797.6	248.2	31.7	762.5	260.5	30.3	727.1	272.1	28.9	691.6	283.1	27.5	655.8	293.5	26.1
	245	832.2	261.4	33.1	794.7	274.4	31.6	757.3	286.6	30.1	719.4	298.2	28.6	681.2	309.0	27.1
	255	865.1	268.1	34.4	826.3	281.4	32.9	787.5	294.0	31.3	748.3	305.9	29.8	708.9	317.1	28.2
	270	912.7	278.0	36.3	869.7	291.8	34.6	826.5	304.8	32.9	782.9	316.8	31.1	738.6	327.9	29.4
	290	1025.0	323.5	40.8	979.7	338.4	39.0	934.4	352.6	37.2	889.0	366.0	35.4	842.7	378.6	33.5
	315	1105.0	347.3	44.0	1050.8	362.3	41.8	996.7	376.4	39.7	942.5	389.5	37.5	887.9	401.5	35.3
	330	1115.4	346.5	44.4	1065.6	363.6	42.4	1015.0	379.7	40.4	963.7	394.7	38.3	911.0	408.4	36.2
	360	1190.0	371.7	47.3	1138.4	389.6	45.3	1086.5	406.6	43.2	1034.2	422.7	41.1	980.4	437.7	39.0
390	1344.8	420.6	53.5	1282.8	439.5	51.0	1220.9	457.5	48.6	1158.4	474.3	46.1	1095.4	490.0	43.6	
420	1424.9	444.3	56.7	1353.7	463.3	53.9	1282.6	481.1	51.0	1211.7	497.6	48.2	1140.1	512.7	45.4	
6	050	187.2	56.2	7.5	178.2	59.1	7.1	169.1	61.7	6.7	160.0	64.1	6.4	150.7	66.3	6.0
	060	219.8	65.2	8.8	209.4	68.4	8.3	199.0	71.5	7.9	188.5	74.4	7.5	178.1	77.1	7.1
	070	257.4	73.4	10.2	244.7	77.4	9.7	231.8	81.2	9.2	219.0	84.8	8.7	206.3	88.1	8.2
	080	296.8	86.5	11.8	282.3	90.8	11.2	267.6	94.9	10.7	252.7	98.7	10.1	238.1	102.2	9.5
	090	332.8	100.0	13.2	315.5	105.1	12.6	298.5	109.7	11.9	281.5	114.1	11.2	264.4	118.1	10.5
	100	367.1	106.7	14.6	348.7	112.2	13.9	330.1	117.2	13.1	311.9	122.0	12.4	293.6	126.4	11.7
	110	405.7	127.6	16.2	386.6	133.3	15.4	367.5	138.6	14.6	348.2	143.6	13.9	329.0	148.3	13.1
	130	449.1	132.4	17.9	429.3	139.6	17.1	409.2	146.5	16.3	388.9	152.9	15.5	368.2	158.9	14.7
	150	524.8	166.0	20.9	503.6	174.3	20.0	482.3	182.2	19.2	460.9	189.8	18.3	438.9	197.1	17.5
	170	575.2	176.5	22.9	550.2	185.3	21.9	524.4	193.7	20.9	498.3	201.5	19.8	471.4	208.7	18.8
	190	652.0	202.2	26.0	625.1	211.8	24.9	597.7	221.0	23.8	570.5	230.0	22.7	542.7	238.5	21.6
	210	736.1	226.7	29.3	700.1	236.6	27.9	663.7	245.8	26.4	627.3	254.4	25.0	591.0	262.3	23.5
	230	821.5	252.5	32.7	785.9	265.1	31.3	749.9	277.1	29.9	713.6	288.5	28.4	677.0	299.3	27.0
	245	857.5	266.0	34.1	819.2	279.3	32.6	780.8	292.0	31.1	742.3	303.9	29.6	703.4	315.2	28.0
	255	892.1	272.8	35.5	852.5	286.5	33.9	812.7	299.5	32.4	773.0	311.9	30.8	732.7	323.5	29.2
	270	942.6	283.2	37.5	899.1	297.6	35.8	854.9	311.0	34.0	810.4	323.5	32.3	765.1	335.1	30.5
	290	1058.2	329.8	42.1	1012.0	345.1	40.3	965.5	359.7	38.4	919.2	373.7	36.6	872.1	386.9	34.7
	315	1142.0	354.3	45.5	1086.8	369.9	43.3	1031.5	384.5	41.1	976.0	398.1	38.9	920.4	410.7	36.6
	330	1150.5	352.9	45.8	1100.4	370.7	43.8	1048.9	387.3	41.8	996.5	402.9	39.7	942.8	417.3	37.5
	360	1227.3	378.6	48.9	1175.3	397.2	46.8	1122.1	414.7	44.7	1068.8	431.5	42.5	1014.1	447.2	40.4
390	1388.3	428.9	55.3	1325.6	448.6	52.8	1262.0	467.0	50.2	1198.1	484.5	47.7	1134.0	500.9	45.1	
420	1472.2	453.5	58.6	1400.1	473.2	55.7	1327.3	491.6	52.8	1254.7	508.7	49.9	1182.0	524.6	47.1	

See legend and notes on page 54.

COOLING CAPACITIES - 50Hz (cont)

LCWT (C)	UNIT SIZE 30GTN,GTR	CONDENSER ENTERING-AIR TEMPERATURE (C)														
		30			35			40			45			50		
		Cap. (kW)	Input kW	Cooler Flow Rate (L/s)	Cap. (kW)	Input kW	Cooler Flow Rate (L/s)	Cap. (kW)	Input kW	Cooler Flow Rate (L/s)	Cap. (kW)	Input kW	Cooler Flow Rate (L/s)	Cap. (kW)	Input kW	Cooler Flow Rate (L/s)
7	050	193.1	57.2	7.7	184.0	60.1	7.3	174.7	62.9	7.0	165.4	65.4	6.6	155.9	67.7	6.2
	060	226.9	66.3	9.0	216.2	69.7	8.6	205.5	72.9	8.2	194.8	75.8	7.8	184.1	78.6	7.3
	070	265.6	74.6	10.6	252.6	78.8	10.1	239.6	82.7	9.5	226.5	86.4	9.0	213.5	89.8	8.5
	080	306.6	88.1	12.2	291.4	92.5	11.6	276.6	96.8	11.0	261.5	100.7	10.4	246.3	104.3	9.8
	090	343.5	101.9	13.7	326.1	107.1	13.0	308.5	111.9	12.3	291.1	116.4	11.6	273.6	120.6	10.9
	100	379.7	108.7	15.1	360.7	114.3	14.4	342.0	119.6	13.6	323.1	124.5	12.9	304.4	129.1	12.1
	110	419.2	130.1	16.7	399.7	136.0	15.9	380.1	141.6	15.1	360.5	146.8	14.4	340.7	151.6	13.6
	130	462.6	134.5	18.4	442.6	142.0	17.6	422.1	149.0	16.8	401.4	155.7	16.0	380.1	161.9	15.1
	150	539.6	168.7	21.5	518.3	177.3	20.6	496.4	185.4	19.8	474.4	193.3	18.9	452.2	200.8	18.0
	170	593.4	179.7	23.6	567.9	188.9	22.6	541.6	197.5	21.6	515.0	205.6	20.5	487.6	213.1	19.4
	190	672.1	205.9	26.8	645.2	216.0	25.7	616.7	225.4	24.6	588.5	234.6	23.4	560.6	243.5	22.3
	210	760.6	231.4	30.3	723.7	241.6	28.8	686.5	251.1	27.3	649.3	260.0	25.9	—	—	—
	230	846.2	256.8	33.7	809.8	269.8	32.3	773.0	282.2	30.8	735.9	294.0	29.3	698.6	305.1	27.8
	245	883.1	270.6	35.2	844.5	284.4	33.6	804.9	297.4	32.1	765.5	309.7	30.5	725.8	321.4	28.9
	255	919.6	277.5	36.6	879.4	291.7	35.0	838.6	305.1	33.4	797.8	317.9	31.8	756.8	330.0	30.1
	270	973.4	288.5	38.8	928.9	303.3	37.0	883.9	317.2	35.2	838.4	330.2	33.4	792.2	342.3	31.6
	290	1091.3	336.0	43.5	1045.2	352.0	41.6	997.1	367.1	39.7	949.3	381.4	37.8	901.7	395.2	35.9
	315	1180.0	361.6	47.0	1123.6	377.7	44.8	1067.0	392.8	42.5	1010.1	406.9	40.2	—	—	—
	330	1186.7	359.4	47.3	1135.7	377.8	45.2	1083.2	395.1	43.1	1029.9	411.3	41.0	975.1	426.3	38.8
	360	1265.5	385.6	50.4	1213.0	404.9	48.3	1158.3	423.0	46.1	1103.4	440.2	44.0	1048.2	456.6	41.8
390	1432.8	437.4	57.1	1368.6	457.6	54.5	1304.2	476.8	51.9	1238.5	494.7	49.3	—	—	—	
420	1521.1	462.9	60.6	1447.4	483.3	57.7	1372.9	502.3	54.7	1298.6	520.0	51.7	—	—	—	
8	050	199.2	58.2	7.9	189.8	61.2	7.6	180.4	64.0	7.2	170.8	66.7	6.8	161.2	69.1	6.4
	060	234.0	67.4	9.3	223.1	70.9	8.9	212.2	74.2	8.5	201.3	77.3	8.0	190.3	80.1	7.6
	070	274.0	75.9	10.9	260.7	80.1	10.4	247.5	84.2	9.9	234.1	88.0	9.3	220.8	91.5	8.8
	080	316.5	89.6	12.6	301.1	94.3	12.0	285.6	98.6	11.4	270.4	102.7	10.8	255.0	106.5	10.2
	090	354.4	103.7	14.1	336.7	109.1	13.4	318.9	114.2	12.7	300.9	118.8	12.0	283.0	123.1	11.3
	100	392.7	110.8	15.6	373.3	116.6	14.9	354.0	122.0	14.1	334.8	127.1	13.3	315.4	131.9	12.6
	110	432.9	132.7	17.3	413.0	138.8	16.5	393.1	144.5	15.7	373.0	149.9	14.9	352.7	155.0	14.1
	130	476.3	136.7	19.0	455.9	144.4	18.2	435.2	151.7	17.3	414.1	158.5	16.5	392.6	165.1	15.6
	150	554.6	171.5	22.1	532.8	180.2	21.2	510.9	188.7	20.4	488.3	196.8	19.5	465.5	204.5	18.6
	170	611.8	183.0	24.4	585.8	192.5	23.3	559.1	201.4	22.3	531.9	209.8	21.2	504.0	217.7	20.1
	190	692.5	209.7	27.6	664.6	220.0	26.5	636.7	229.9	25.4	607.5	239.3	24.2	578.7	248.5	23.1
	210	785.5	236.2	31.3	747.4	246.7	29.8	709.7	256.5	28.3	671.7	265.7	26.8	—	—	—
	230	871.1	261.1	34.7	833.7	274.5	33.2	796.5	287.3	31.7	758.7	299.5	30.2	720.3	311.0	28.7
	245	909.0	275.2	36.2	869.4	289.4	34.6	829.8	302.9	33.1	789.2	315.6	31.5	748.6	327.7	29.8
	255	947.5	282.3	37.8	906.3	296.9	36.1	865.2	310.8	34.5	823.3	324.0	32.8	781.2	336.5	31.1
	270	1004.7	293.9	40.0	959.3	309.1	38.2	913.3	323.5	36.4	866.9	337.0	34.5	819.7	349.6	32.7
	290	1125.8	342.4	44.9	1078.0	358.9	43.0	1030.1	374.5	41.0	980.7	389.3	39.1	931.7	403.6	37.1
	315	1218.7	368.9	48.6	1160.7	385.5	46.3	1103.2	401.2	44.0	1045.0	415.8	41.6	—	—	—
	330	1223.5	366.0	48.8	1171.6	385.0	46.7	1118.1	402.9	44.6	1063.8	419.7	42.4	1008.3	435.4	40.2
	360	1304.2	392.7	52.0	1250.4	412.5	49.8	1195.8	431.4	47.7	1139.4	449.1	45.4	1082.6	466.1	43.1
390	1478.1	445.9	58.9	1412.1	466.8	56.3	1346.9	486.6	53.7	1279.8	505.2	51.0	—	—	—	
420	1571.0	472.4	62.6	1494.8	493.3	59.6	1419.5	513.1	56.6	1343.3	531.5	53.5	—	—	—	

LEGEND

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

NOTES:

- All ratings are based on:
 - A cooler water temperature rise of 6°C. When greater accuracy is desired, correct design LCWT, before entering rating tables, by reference to the LCWT correction curve.
 - A fouling factor of 0.000018 in the cooler.
 - R-22 refrigerant.
- When a corrected LCWT is used, cooler pressure drop must also be corrected for the new LCWT:
 - Enter rating table for corrected LCWT. By interpolation, determine corrected capacity (kW) and power input (kW) to compressor at its rated voltage.
- 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.

b. Calculate corrected flow rate through the cooler:

$$= \frac{0.239 \times \text{capacity in kW}}{\text{temperature rise } ^\circ\text{C}} = \text{L/S}$$

c. On Cooler Pressure Drop chart, on pages 38-41, enter cooler pressure drop curve at corrected flow rate and read pressure drop.

Performance data (cont)



COOLING CAPACITIES - 50Hz (cont)

LCWT (C)	UNIT SIZE 30GTN,GTR	CONDENSER ENTERING-AIR TEMPERATURE (C)														
		30			35			40			45			50		
		Cap. (kW)	Input kW	Cooler Flow Rate (L/s)	Cap. (kW)	Input kW	Cooler Flow Rate (L/s)	Cap. (kW)	Input kW	Cooler Flow Rate (L/s)	Cap. (kW)	Input kW	Cooler Flow Rate (L/s)	Cap. (kW)	Input kW	Cooler Flow Rate (L/s)
9	050	205.3	59.2	8.2	195.8	62.3	7.8	186.2	65.2	7.4	176.4	67.9	7.0	166.6	70.4	6.6
	060	241.3	68.5	9.6	230.1	72.1	9.2	219.0	75.5	8.7	207.8	78.7	8.3	196.6	81.7	7.8
	070	282.5	77.1	11.3	268.9	81.5	10.7	255.4	85.7	10.2	241.9	89.6	9.6	228.2	93.3	9.1
	080	326.5	91.2	13.0	310.8	96.0	12.4	294.9	100.5	11.8	279.2	104.7	11.1	263.6	108.7	10.5
	090	365.5	105.6	14.6	347.4	111.2	13.9	329.3	116.4	13.1	311.1	121.2	12.4	292.6	125.7	11.7
	100	405.7	112.8	16.2	386.0	118.8	15.4	366.1	124.4	14.6	346.5	129.7	13.8	326.8	134.7	13.0
	110	446.9	135.3	17.8	426.5	141.6	17.0	406.1	147.5	16.2	385.7	153.1	15.4	365.0	158.4	14.6
	130	490.1	138.8	19.5	469.3	146.7	18.7	448.4	154.2	17.9	427.0	161.4	17.0	405.1	168.1	16.2
	150	569.9	174.2	22.7	547.7	183.3	21.8	525.2	191.9	20.9	502.6	200.3	20.0	479.5	208.3	19.1
	170	630.4	186.4	25.1	604.0	196.1	24.1	576.8	205.4	23.0	549.1	214.1	21.9	520.7	222.2	20.8
	190	713.2	213.5	28.4	684.8	224.2	27.3	656.5	234.4	26.2	627.2	244.2	25.0	597.1	253.5	23.8
	210	810.9	241.1	32.3	772.0	251.8	30.8	733.1	262.0	29.2	694.5	271.5	27.7	—	—	—
	230	896.3	265.5	35.7	858.4	279.3	34.2	820.1	292.4	32.7	781.8	305.0	31.2	743.1	317.0	29.6
	245	935.3	279.9	37.3	895.1	294.4	35.7	854.5	308.3	34.1	813.7	321.5	32.4	772.1	334.0	30.8
	255	975.8	287.1	38.9	933.9	302.1	37.2	891.7	316.5	35.6	849.4	330.1	33.9	806.5	343.1	32.2
	270	1036.4	299.3	41.3	990.2	315.0	39.5	943.3	329.9	37.6	895.9	343.9	35.7	847.7	357.0	33.8
	290	1160.6	348.8	46.3	1111.6	365.8	44.3	1063.0	382.0	42.4	1013.2	397.4	40.4	962.4	412.0	38.4
	315	1258.1	376.4	50.2	1198.8	393.5	47.8	1139.7	409.6	45.4	1080.6	424.8	43.1	—	—	—
	330	1260.9	372.7	50.3	1208.0	392.3	48.2	1153.6	410.7	46.0	1098.3	428.1	43.8	1041.6	444.5	41.5
	360	1343.7	399.8	53.6	1288.8	420.3	51.4	1233.3	439.8	49.2	1176.4	458.2	46.9	1117.8	475.7	44.6
390	1524.2	454.6	60.8	1456.8	476.1	58.1	1390.0	496.6	55.4	1322.1	515.8	52.7	—	—	—	
420	1621.7	482.1	64.7	1543.9	503.7	61.6	1466.1	523.9	58.5	1389.0	543.1	55.4	—	—	—	
10	050	211.5	60.1	8.4	201.8	63.4	8.1	192.0	66.4	7.7	182.1	69.2	7.3	172.1	71.8	6.9
	060	248.8	69.7	9.9	237.4	73.4	9.5	225.9	76.9	9.0	214.5	80.2	8.6	203.0	83.3	8.1
	070	291.4	78.4	11.6	277.3	82.9	11.1	263.5	87.2	10.5	249.8	91.3	10.0	235.9	95.1	9.4
	080	336.5	92.8	13.4	320.6	97.8	12.8	304.6	102.4	12.1	288.4	106.7	11.5	272.3	110.8	10.9
	090	376.9	107.5	15.0	358.3	113.2	14.3	339.8	118.6	13.6	321.3	123.7	12.8	302.6	128.3	12.1
	100	419.1	114.9	16.7	398.9	121.1	15.9	378.7	126.9	15.1	358.6	132.4	14.3	338.4	137.5	13.5
	110	461.4	137.9	18.4	440.3	144.4	17.6	419.5	150.6	16.7	398.8	156.4	15.9	377.4	161.8	15.1
	130	504.5	141.0	20.1	483.1	149.1	19.3	461.7	156.9	18.4	440.0	164.2	17.6	417.9	171.2	16.7
	150	585.3	177.0	23.3	562.7	186.3	22.4	539.9	195.2	21.5	516.7	203.8	20.6	—	—	—
	170	649.4	189.7	25.9	622.1	199.8	24.8	594.8	209.3	23.7	566.6	218.3	22.6	537.9	226.9	21.5
	190	734.2	217.3	29.3	705.2	228.4	28.1	676.0	238.9	27.0	646.7	249.0	25.8	616.2	258.6	24.6
	210	836.7	246.0	33.4	797.0	257.1	31.8	757.2	267.5	30.2	717.4	277.4	28.6	—	—	—
	230	921.8	269.9	36.8	883.4	284.1	35.2	844.5	297.6	33.7	805.1	310.5	32.1	—	—	—
	245	962.2	284.5	38.4	921.1	299.5	36.7	879.7	313.8	35.1	838.0	327.5	33.4	—	—	—
	255	1004.6	292.0	40.1	961.9	307.5	38.4	918.9	322.2	36.7	875.5	336.3	34.9	—	—	—
	270	1068.9	304.8	42.6	1021.3	320.9	40.7	973.8	336.3	38.8	925.4	350.8	36.9	876.5	364.5	35.0
	290	1195.8	355.3	47.7	1145.7	372.8	45.7	1096.0	389.5	43.7	1045.6	405.4	41.7	994.0	420.5	39.6
	315	1298.3	384.0	51.8	1237.7	401.6	49.4	1177.3	418.2	47.0	1116.4	433.9	44.5	—	—	—
	330	1298.8	379.5	51.8	1244.3	399.5	49.6	1189.6	418.7	47.4	1133.2	436.7	45.2	1075.8	453.7	42.9
	360	1383.6	407.1	55.2	1327.3	428.1	52.9	1270.7	448.2	50.7	1213.3	467.3	48.4	1154.2	485.5	46.0
390	1571.0	463.4	62.7	1502.3	485.4	59.9	1433.7	506.6	57.2	1364.4	526.5	54.4	—	—	—	
420	1673.4	492.0	66.7	1593.9	514.2	63.6	1514.4	535.1	60.4	1434.8	554.7	57.2	—	—	—	

See legend and notes on page 56.

Performance data (cont)



COOLING CAPACITIES - 50Hz (cont)

LCWT (C)	UNIT SIZE 30GTN,GTR	CONDENSER ENTERING-AIR TEMPERATURE (C)														
		30			35			40			45			50		
		Cap. (kW)	Input kW	Cooler Flow Rate (L/s)	Cap. (kW)	Input kW	Cooler Flow Rate (L/s)	Cap. (kW)	Input kW	Cooler Flow Rate (L/s)	Cap. (kW)	Input kW	Cooler Flow Rate (L/s)	Cap. (kW)	Input kW	Cooler Flow Rate (L/s)
13	050	230.8	63.2	9.2	220.7	66.7	8.8	210.3	70.0	8.4	199.8	73.1	8.0	189.1	76.0	7.6
	060	271.8	73.2	10.9	259.8	77.2	10.4	247.6	81.1	9.9	234.7	84.4	9.4	220.3	87.3	8.8
	070	318.5	82.2	12.7	303.7	87.1	12.1	289.0	91.8	11.5	273.9	96.1	10.9	258.1	100.1	10.3
	080	363.7	97.2	14.5	345.6	102.3	13.8	327.3	107.1	13.1	309.3	111.6	12.3	291.1	115.6	11.6
	090	411.8	113.3	16.4	392.3	119.6	15.7	372.7	125.5	14.9	352.6	130.8	14.1	328.8	135.0	13.1
	100	460.6	121.3	18.4	438.9	128.0	17.5	417.5	134.4	16.7	396.1	140.5	15.8	374.5	146.1	15.0
	110	505.8	146.0	20.2	483.6	153.2	19.3	461.4	159.9	18.4	438.9	166.3	17.5	416.1	172.3	16.6
	130	547.9	147.5	21.9	525.8	156.3	21.0	503.3	164.8	20.1	480.4	172.9	19.2	456.8	180.5	18.2
	150	632.7	185.6	25.3	609.1	195.6	24.3	585.2	205.2	23.4	558.0	213.9	22.3	—	—	—
	170	707.1	199.9	28.2	678.4	210.8	27.1	649.6	221.3	25.9	615.7	230.2	24.6	—	—	—
	190	798.6	229.2	31.9	768.2	241.1	30.7	737.4	252.6	29.4	706.0	263.7	28.2	—	—	—
	210	917.1	261.4	36.6	874.8	273.4	34.9	832.6	284.6	33.2	785.3	294.2	31.4	—	—	—
	230	996.5	282.8	39.8	954.7	297.9	38.1	912.5	312.3	36.4	867.4	325.5	34.6	—	—	—
	245	1044.5	298.9	41.7	1001.4	315.2	40.0	957.8	330.7	38.2	910.6	344.7	36.4	—	—	—
	255	1093.6	306.9	43.7	1048.5	323.7	41.9	1003.0	339.7	40.1	954.3	354.5	38.1	—	—	—
	270	1167.9	321.3	46.6	1117.9	339.0	44.6	1067.5	355.8	42.6	1012.1	370.8	40.4	—	—	—
	290	1304.6	375.3	52.1	1252.1	394.3	50.0	1199.0	412.5	47.9	1145.4	430.1	45.7	—	—	—
	315	1423.1	407.5	56.8	1358.6	426.6	54.2	1294.2	444.6	51.7	1224.4	460.6	48.9	—	—	—
	330	1414.9	400.0	56.5	1357.5	421.8	54.2	1299.3	442.5	51.9	1231.4	460.4	49.2	—	—	—
	360	1506.0	429.2	60.1	1447.0	452.0	57.8	1387.0	473.8	55.4	1321.7	493.9	52.8	—	—	—
390	1716.0	490.6	68.5	1643.3	514.6	65.6	1570.3	537.2	62.7	1491.7	557.9	59.6	—	—	—	
420	1834.2	522.8	73.2	1749.6	546.8	69.9	1665.3	569.3	66.5	1570.6	588.4	62.7	—	—	—	
16	050	243.3	65.0	9.7	230.1	68.2	9.2	217.0	71.2	8.7	203.9	73.8	8.1	190.8	76.2	7.6
	060	279.6	74.2	11.2	264.8	77.9	10.6	250.1	81.3	10.0	235.5	84.5	9.4	221.0	87.4	8.8
	070	337.3	84.6	13.5	318.0	89.2	12.7	299.2	93.4	12.0	280.5	97.3	11.2	262.1	100.8	10.5
	080	373.3	98.7	14.9	352.6	103.5	14.1	332.1	107.9	13.3	311.9	112.0	12.5	291.9	115.7	11.7
	090	426.8	115.5	17.1	402.2	121.1	16.1	377.8	126.2	15.1	353.7	130.9	14.1	329.7	135.1	13.2
	100	484.0	124.5	19.3	456.8	130.7	18.3	430.0	136.4	17.2	403.5	141.7	16.1	377.4	146.5	15.1
	110	540.5	152.1	21.6	511.7	158.5	20.4	483.1	164.5	19.3	454.7	169.9	18.2	426.6	174.9	17.0
	130	592.8	154.2	23.7	568.6	163.4	22.7	540.7	171.7	21.6	512.2	179.4	20.5	479.2	185.6	19.2
	150	670.7	192.6	26.8	640.9	202.3	25.6	611.7	211.6	24.4	582.3	220.5	23.3	—	—	—
	170	738.1	205.2	29.5	698.1	214.5	27.9	658.1	222.9	26.3	618.2	230.6	24.7	—	—	—
	190	862.6	240.7	34.5	824.5	251.9	32.9	779.1	261.2	31.1	734.0	269.8	29.3	—	—	—
	210	937.5	264.6	37.5	887.0	275.3	35.5	837.1	285.2	33.5	—	—	—	—	—	—
	230	1043.9	291.3	41.7	993.5	305.8	39.7	943.8	319.6	37.7	894.2	332.5	35.7	—	—	—
	245	1097.5	308.1	43.9	1043.1	323.4	41.7	989.5	337.8	39.5	936.0	351.4	37.4	—	—	—
	255	1154.6	317.1	46.1	1097.8	333.0	43.9	1041.7	348.1	41.6	985.8	362.2	39.4	—	—	—
	270	1222.1	329.7	48.8	1154.9	345.2	46.2	1088.1	359.3	43.5	1021.7	372.2	40.8	—	—	—
	290	1403.2	392.8	56.1	1336.2	410.4	53.4	1262.2	425.7	50.4	1188.7	439.7	47.5	—	—	—
	315	1478.0	416.7	59.1	1398.7	433.8	55.9	1320.2	449.6	52.8	—	—	—	—	—	—
	330	1476.3	410.4	59.0	1396.2	428.9	55.8	1316.3	445.8	52.6	1236.4	461.1	49.4	—	—	—
	360	1600.8	445.9	64.0	1522.6	466.3	60.8	1437.2	484.1	57.4	1352.2	500.4	54.0	—	—	—
390	1800.4	505.3	72.0	1711.4	527.2	68.4	1616.1	546.5	64.6	—	—	—	—	—	—	
420	1874.9	529.1	74.9	1774.1	550.6	70.9	1674.2	570.4	66.9	—	—	—	—	—	—	

LEGEND

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

NOTES:

1. All ratings are based on:
 - a. A cooler water temperature rise of 6°C. When greater accuracy is desired, correct design LCWT, before entering rating tables, by reference to the LCWT correction curve.
 - b. A fouling factor of 0.000018 in the cooler.
 - c. R-22 refrigerant.
2. When a corrected LCWT is used, cooler pressure drop must also be corrected for the new LCWT:
 - a. Enter rating table for corrected LCWT. By interpolation, determine corrected capacity (kW) and power input (kW) to compressor at its rated voltage.
- b. Calculate corrected flow rate through the cooler:

$$= \frac{0.239 \times \text{capacity in kW}}{\text{temperature rise } ^\circ\text{C}} = \text{L/S}$$
- c. On Cooler Pressure Drop chart, on pages 38-41, enter cooler pressure drop curve at corrected flow rate and read pressure drop.
3. 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.



UNIT ELECTRICAL DATA 30GTN, GTR050-070

UNIT 30GTN , GTR	UNIT VOLTAGE			STANDARD CONDENSER FAN								HIGH STATIC CONDENSER FAN						CONTROL CIRCUIT					
	V-Hz (3 Ph)	Supplied		MCA		MOCP		ICF		Rec Fuse Size		MCA		MOCP		ICF		Rec Fuse Size		V-Hz (Single Ph)	Supplied		MCA and MOCP
		Min	Max	XL	PW	XL	PW	XL	PW	XL	PW	XL	PW	XL	PW	XL	PW	XL	PW		Min	Max	
050	208/230-60	187	253	246.9	246.9	350	350	619.9	417.9	300	300	281.1	281.1	350	350	654.1	452.1	350	350	115-60	104	127	30
	460-60	414	506	114.3	118.0	150	150	308.8	209.1	150	150	127.3	131.0	150	150	321.8	222.1	150	150	115-60	104	127	30
	380-60	342	418	126.9	127.8	175	175	341.1	228.5	150	150	140.9	141.8	175	175	355.1	242.5	175	175	230-60	198	254	15
	380/415-50	342	440	142.2	147.2	200	200	405.4	269.3	175	175	157.8	162.8	200	225	421.0	284.9	175	200	230-50	198	254	15
060	208/230-60	187	253	328.1	328.1	450	450	833.8	557.8	400	400	378.3	378.3	500	500	884.0	608.0	450	450	115-60	104	127	30
	460-60	414	506	147.4	152.4	200	200	410.6	274.5	175	175	166.4	171.4	225	225	429.6	293.5	200	200	115-60	104	127	30
	380-60	342	418	174.5	176.6	250	250	458.0	307.2	200	200	195.5	197.6	250	250	479.0	328.2	225	225	230-60	198	254	15
	380/415-50	342	440	167.6	173.2	225	225	430.8	295.3	200	200	191.0	196.6	250	250	454.2	318.7	225	225	230-50	198	254	15
070	208/230-60	187	253	369.1	369.1	500	500	874.8	598.8	450	450	419.3	419.3	500	500	925.0	649.0	500	500	115-60	104	127	30
	460-60	414	506	166.0	171.6	225	225	429.2	293.7	200	200	185.0	190.6	250	250	448.2	312.7	225	225	115-60	104	127	30
	380-60	342	418	200.7	202.3	250	250	484.2	332.9	225	225	221.7	223.3	300	300	505.2	353.9	250	250	230-60	198	254	15
	380/415-50	342	440	189.4	195.1	250	250	452.6	317.2	225	225	212.8	218.5	250	250	476.0	340.6	250	250	230-50	198	254	15

UNIT ELECTRICAL DATA 30GTN, GTR080-315B

UNIT 30GTN, GTR	UNIT VOLTAGE			STANDARD CONDENSER FAN								HIGH-STATIC CONDENSER FAN						CONTROL CIRCUIT			
	V-Hz (3 Ph)	Supplied		MCA		MOCP		ICF		Rec Fuse Size		MCA		MOCP		ICF		Rec Fuse Size		V-Hz (Single Ph)	MCA and MOCP
		Min	Max	XL	PW	XL	PW	XL	PW	XL	PW	XL	PW	XL	PW	XL	PW	XL	PW		
080	208/230-60	187	253	396.0	396.0	500	500	901.7	625.7	450	450	446.2	446.2	500	500	951.9	675.9	500	500	115-60	30
	460-60	414	506	182.0	185.7	225	250	445.2	307.8	200	225	201.0	204.7	250	250	464.2	326.8	225	225	115-60	30
	380-60	342	418	209.1	209.9	250	250	492.6	340.5	250	250	230.1	230.9	300	300	513.6	361.5	250	300	230-60	15
	380/415-50	342	440	211.2	218.1	250	250	474.4	340.2	250	250	234.6	241.5	250	300	497.8	363.6	300	300	230-50	15
090	208/230-60	187	253	396.8	396.8	450	450	730.7	552.7	450	450	447.0	447.0	500	500	780.9	602.9	500	500	115-60	30
	460-60	414	506	195.1	198.0	225	225	363.6	275.9	225	225	214.1	217.0	250	250	382.6	294.9	250	250	115-60	30
	380-60	342	418	205.9	202.6	250	225	396.0	294.5	225	225	226.9	223.6	250	250	417.0	315.5	250	250	230-60	15
	380/415-50	342	440	236.2	243.8	300	300	499.4	365.9	300	300	259.6	267.2	300	300	522.8	389.3	300	300	230-50	15
100	208/230-60	187	253	469.4	469.4	500	500	842.4	640.4	500	500	535.6	535.6	600	600	908.6	706.6	600	600	115-60	30
	460-60	414	506	217.9	224.8	250	250	412.4	315.9	250	250	242.9	249.8	250	250	437.4	340.9	300	300	115-60	30
	380-60	342	418	240.6	242.1	250	250	454.8	342.8	300	300	268.6	270.1	300	300	482.8	370.8	300	300	230-60	15
	380/415-50	342	440	261.6	269.8	300	300	524.8	391.9	300	300	292.8	301.0	350	350	556.0	423.1	350	350	230-50	15
110	208/230-60	187	253	520.7	520.7	600	600	1026.4	750.4	600	600	586.9	586.9	700	700	1092.6	816.6	700	700	115-60	30
	460-60	414	506	241.2	248.8	300	300	504.4	370.9	300	300	266.2	273.8	300	300	529.4	395.9	300	300	115-60	30
	380-60	342	418	273.3	274.2	350	350	556.8	404.8	300	300	301.3	302.2	350	350	584.8	432.8	350	350	230-60	15
	380/415-50	342	440	305.2	315.8	350	350	568.4	437.9	350	350	336.4	347.0	400	400	599.6	469.1	400	400	230-50	15
130	208/230-60	187	253	617.4	617.4	700	700	1118.3	842.3	700	700	701.8	701.8	800	800	1202.7	926.7	800	800	115-60	30
	460-60	414	506	271.8	271.8	300	300	535.0	397.0	300	300	303.8	303.8	350	350	567.0	429.0	350	350	115-60	30
	380-60	342	418	331.1	331.1	400	400	612.8	459.8	400	400	366.1	366.1	400	400	647.8	494.8	400	400	230-60	15
	380/415-50	342	440	319.9	319.9	350	350	583.0	445.0	350	350	358.9	358.9	400	400	622.0	484.0	400	400	230-50	15
150	208/230-60	187	253	671.4	671.4	800	800	1172.3	896.3	800	800	755.8	755.8	800	800	1256.7	980.7	800	800	115-60	30
	460-60	414	506	312.9	312.9	350	350	576.1	438.1	350	350	344.9	344.9	400	400	608.1	470.1	400	400	115-60	30
	380-60	342	418	359.9	359.9	400	400	641.6	488.6	400	400	394.9	394.9	450	450	676.6	523.6	450	450	230-60	15
	380/415-50	342	440	377.9	377.9	400	400	641.0	503.0	400	400	416.9	416.9	450	450	680.0	542.0	450	450	230-50	15
170	208/230-60	187	253	734.7	734.7	800	800	1106.1	904.1	800	800	819.1	819.1	1000	1000	1190.5	988.5	1000	1000	115-60	30
	460-60	414	506	323.5	323.5	350	350	518.0	417.0	350	350	355.5	355.5	400	400	550.0	449.0	400	400	115-60	30
	380-60	342	418	387.8	387.8	400	400	598.0	486.0	450	450	422.8	422.8	450	450	633.0	521.0	450	450	230-60	15
	380/415-50	342	440	387.3	387.3	450	450	650.4	512.4	450	450	426.3	426.3	450	450	689.4	551.4	450	450	230-50	15
190	208/230-60	187	253	810.2	810.2	1000	1000	1311.1	1035.1	1000	1000	910.6	910.6	1000	1000	1411.5	1135.5	1000	1000	115-60	30
	460-60	414	506	368.2	368.2	400	400	631.4	493.4	400	400	406.2	406.2	450	450	669.4	531.4	450	450	115-60	30
	380-60	342	418	432.5	432.5	500	500	714.2	561.2	500	500	474.5	474.5	500	500	756.2	603.2	500	500	230-60	15
	380/415-50	342	440	450.2	450.2	500	500	713.3	575.3	500	500	497.0	497.0	500	500	760.1	622.1	600	600	230-50	15
230B	208/230-60	187	253	396.0	396.0	500	500	901.7	625.7	450	450	446.2	446.2	500	500	951.9	675.9	500	500	115-60	30
	460-60	414	506	182.0	185.7	225	250	445.2	307.8	200	225	201.0	204.7	250	250	464.2	326.8	225	225	115-60	30
	380-60	342	418	209.1	209.9	250	250	492.6	340.5	250	250	230.1	230.9	300	300	513.6	361.5	250	300	230-60	15
	380/415-50	342	440	211.2	218.1	250	250	474.4	340.2	250	250	234.6	241.5	250	300	497.8	363.6	300	300	230-50	15
245B	208/230-60	187	253	396.8	396.8	450	450	730.7	552.7	450	450	447.0	447.0	500	500	780.9	602.9	500	500	115-60	30
	460-60	414	506	195.1	198.0	225	225	363.6	275.9	225	225	214.1	217.0	250	250	382.6</					

UNIT ELECTRICAL DATA 30GTN, GTR210-420B

UNIT 30GTN, GTR	UNIT VOLTAGE				STANDARD CONDENSER FAN								HIGH-STATIC CONDENSER FAN								CONTROL CIRCUIT	
	V-Hz (3 Ph)		Supplied		MCA		MOCP		ICF		Rec Fuse Size		MCA		MOCP		ICF		Rec Fuse Size		V-Hz (Single Ph)	MCA and MOCP
	Min	Max	XL	PW	XL	PW	XL	PW	XL	PW	XL	PW	XL	PW	XL	PW	XL	PW	XL	PW		
210	208/230-60	187	253	900.0	900.0	1000	1000	1400.9	1124.9	1000	1000	999.8	999.8	1000	1000	1500.7	1224.7	1200	1200	115-60	30	
	460-60	414	506	413.1	413.1	450	450	676.3	538.3	450	450	451.1	451.1	500	500	714.3	576.3	500	500	115-60	30	
	380-60	342	418	479.3	479.3	500	500	761.0	608.0	500	500	521.3	521.3	600	600	803.0	650.0	600	600	230-60	15	
	380/415-50	342	440	474.5	474.5	500	500	737.6	599.6	500	500	521.3	521.3	600	600	784.4	646.4	600	600	230-50	15	
230A	208/230-60	187	253	671.4	671.4	800	800	1172.3	896.3	800	800	755.8	755.8	800	800	1256.7	980.7	800	800	115-60	30	
	460-60	414	506	312.9	312.9	350	350	576.1	438.1	350	350	344.9	344.9	400	400	608.1	470.1	400	400	115-60	30	
	380-60	342	418	359.9	359.9	400	400	641.6	488.6	400	400	394.9	394.9	450	450	676.6	523.6	450	450	230-60	15	
	380/415-50	342	440	377.9	377.9	400	400	641.0	503.0	400	400	416.9	416.9	450	450	680.0	542.0	450	450	230-50	15	
245A	208/230-60	187	253	671.4	671.4	800	800	1172.3	896.3	800	800	755.8	755.8	800	800	1256.7	980.7	800	800	115-60	30	
	460-60	414	506	312.9	312.9	350	350	576.1	438.1	350	350	344.9	344.9	400	400	608.1	470.1	400	400	115-60	30	
	380-60	342	418	359.9	359.9	400	400	641.6	488.6	400	400	394.9	394.9	450	450	676.6	523.6	450	450	230-60	15	
	380/415-50	342	440	377.9	377.9	400	400	641.0	503.0	400	400	416.9	416.9	450	450	680.0	542.0	450	450	230-50	15	
255A	208/230-60	187	253	671.4	671.4	800	800	1172.3	896.3	800	800	755.8	755.8	800	800	1256.7	980.7	800	800	115-60	30	
	460-60	414	506	312.9	312.9	350	350	576.1	438.1	350	350	344.9	344.9	400	400	608.1	470.1	400	400	115-60	30	
	380-60	342	418	359.9	359.9	400	400	641.6	488.6	400	400	394.9	394.9	450	450	676.6	523.6	450	450	230-60	15	
	380/415-50	342	440	377.9	377.9	400	400	641.0	503.0	400	400	416.9	416.9	450	450	680.0	542.0	450	450	230-50	15	
270A	208/230-60	187	253	734.7	734.7	800	800	1106.1	904.1	800	800	819.1	819.1	1000	1000	1190.5	988.5	1000	1000	115-60	30	
	460-60	414	506	323.5	323.5	350	350	518.0	417.0	350	350	355.5	355.5	400	400	550.0	449.0	400	400	115-60	30	
	380-60	342	418	387.8	387.8	400	400	598.0	486.0	400	400	422.8	422.8	450	450	633.0	521.0	450	450	230-60	15	
	380/415-50	342	440	387.3	387.3	450	450	650.4	512.4	450	450	426.3	426.3	450	450	689.4	551.4	450	450	230-50	15	
290A	208/230-60	187	253	810.2	810.2	1000	1000	1311.1	1035.1	1000	1000	910.6	910.6	1000	1000	1411.5	1135.5	1000	1000	115-60	30	
	460-60	414	506	368.2	368.2	400	400	631.4	493.4	400	400	406.2	406.2	450	450	669.4	531.4	450	450	115-60	30	
	380-60	342	418	432.5	432.5	500	500	714.2	561.2	500	500	474.5	474.5	500	500	756.2	603.2	500	500	230-60	15	
	380/415-50	342	440	450.2	450.2	500	500	713.3	575.3	500	500	497.0	497.0	500	500	760.1	622.1	600	600	230-50	15	
315A	208/230-60	187	253	900.0	900.0	1000	1000	1400.9	1124.9	1000	1000	999.8	999.8	1000	1000	1500.7	1224.7	1200	1200	115-60	30	
	460-60	414	506	413.1	413.1	450	450	676.3	538.3	450	450	451.1	451.1	500	500	714.3	576.3	500	500	115-60	30	
	380-60	342	418	479.3	479.3	500	500	761.0	608.0	500	500	521.3	521.3	600	600	803.0	650.0	600	600	230-60	15	
	380/415-50	342	440	474.5	474.5	500	500	737.6	599.6	500	500	521.3	521.3	600	600	784.4	646.4	600	600	230-50	15	
330A	208/230-60	187	253	734.7	734.7	800	800	1106.1	904.1	800	800	819.1	819.1	1000	1000	1190.5	988.5	1000	1000	115-60	30	
	460-60	414	506	323.5	323.5	350	350	518.0	417.0	350	350	355.5	355.5	400	400	550.0	449.0	400	400	115-60	30	
	380-60	342	418	387.8	387.8	400	400	598.0	486.0	400	400	422.8	422.8	450	450	633.0	521.0	450	450	230-60	15	
	380/415-50	342	440	387.3	387.3	450	450	650.4	512.4	450	450	426.3	426.3	450	450	689.4	551.4	450	450	230-50	15	
330B	208/230-60	187	253	734.7	734.7	800	800	1106.1	904.1	800	800	819.1	819.1	1000	1000	1190.5	988.5	1000	1000	115-60	30	
	460-60	414	506	323.5	323.5	350	350	518.0	417.0	350	350	355.5	355.5	400	400	550.0	449.0	400	400	115-60	30	
	380-60	342	418	387.8	387.8	400	400	598.0	486.0	400	400	422.8	422.8	450	450	633.0	521.0	450	450	230-60	15	
	380/415-50	342	440	387.3	387.3	450	450	650.4	512.4	450	450	426.3	426.3	450	450	689.4	551.4	450	450	230-50	15	
360A	208/230-60	187	253	810.2	810.2	1000	1000	1311.1	1035.1	1000	1000	910.6	910.6	1000	1000	1411.5	1135.5	1000	1000	115-60	30	
	460-60	414	506	368.2	368.2	400	400	631.4	493.4	400	400	406.2	406.2	450	450	669.4	531.4	450	450	115-60	30	
	380-60	342	418	432.5	432.5	500	500	714.2	561.2	500	500	474.5	474.5	500	500	756.2	603.2	500	500	230-60	15	
	380/415-50	342	440	450.2	450.2	500	500	713.3	575.3	500	500	497.0	497.0	500	500	760.1	622.1	600	600	230-50	15	
360B	208/230-60	187	253	810.2	810.2	1000	1000	1311.1	1035.1	1000	1000	910.6	910.6	1000	1000	1411.5	1135.5	1000	1000	115-60	30	
	460-60	414	506	368.2	368.2	400	400	631.4	493.4	400	400	406.2	406.2	450	450	669.4	531.4	450	450	115-60	30	
	380-60	342	418	432.5	432.5	500	500	714.2	561.2	500	500	474.5	474.5	500	500	756.2	603.2	500	500	230-60	15	
	380/415-50	342	440	387.3	387.3	450	450	650.4	512.4	450	450	426.3	426.3	450	450	689.4	551.4	450	450	230-50	15	
390A	208/230-60	187	253	900.0	900.0	1000	1000	1400.9	1124.9	1000	1000	999.8	999.8	1000	1000	1500.7	1224.7	1200	1200	115-60	30	
	460-60	414	506	413.1	413.1	450	450	676.3	538.3	450	450	451.1	451.1	500	500	714.3	576.3	500	500	115-60	30	
	380-60	342	418	479.3	479.3	500	500	761.0	608.0	500	500	521.3	521.3	600	600	803.0	650.0	600	600	230-60	15	
	380/415-50	342	440	474.5	474.5	500	500	737.6	599.6	500	500	521.3	521.3	600	600	784.4	646.4	600	600	230-50	15	
390B	208/230-60	187	253	810.2	810.2	1000	1000	1311.1	1035.1	1000	1000	910.6	910.6	1000	1000	1411.5	1135.5	1000	1000	115-60	30	
	460-60	414	506	368.2	368.2	400	400	631.4	493.4	400	400	406.2	406.2	450	450	669.4	531.4	450	450	115-60	30	
	380-60	342	418	432.5	432.5	500	500	714.2	561.2	500	500	474.5	474.5	500	500	756.2	603.2	500	500	230-60	15	
	380/415-50	342	440	450.2	450.2	500	500	713.3	575.3	500	500	497.0	497.0	500	500	760.1	622.1	600	600	230-50	15	
420A	208/230-60	187	253	900.0	900.0	1000	1000	1400.9	1124.9													

LEGEND AND NOTES FOR UNIT ELECTRICAL DATA

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)
- LRA** — Locked Rotor Amps
- MCA** — Minimum Circuit Amps (for wire sizing) — complies with NEC Section 430-24
- MOCP** — Maximum Overcurrent Protective Device Amps
- NEC** — National Electrical Code, U.S.A.
- PW** — Part Wind Start
- Rec Fuse** — Recommended dual-element fuse amps: 150% of largest Size compressor RLA plus 100% of sum of remaining compressor RLAs. Size up to the next larger fuse size.
- RLA** — Rated Load Amps (Compressors)
- XL** — Across-the-Line Start

* 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%.

NOTES:

- All units/modules have single point primary power connection. (Each unit/module requires its own power supply.) Main power must be supplied from a field-supplied disconnect.
- The unit control circuit power (115 v, single-phase for 208/230-, 460-, and 575-v units; 230 v, single-phase for all other voltages) must be supplied from a separate source through a field-supplied disconnect. The control circuit transformer accessory may be applied to power from primary unit power.
- 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, and the unit ON/ OFF switch is in the OFF position.

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

UNIT SIZE 30GTN,GTR	VOLTAGE	TERMINAL BLOCKS	PARALLEL CONDUCTORS
050 to 070	208/230	1	6
	460	1	3
	380	1	3
	380/415	1	3
080 to 110 230B to 315B	208/230	1	6
	460	1	3
	380	1	3
	380/415	1	3
130 to 210, 230A to 315A 330A/B to 420A/B	208/230	3	9
	460	2	6
	380	2	6
	380/415	2	6

- Maximum incoming wire size for each terminal block is 500 kcmil.
- Power draw control circuits include both crankcase heaters and cooler heaters (where used). Each compressor has a crankcase heater which draws 180 watts of power.
Units ordered with cooler heater option have 2 (050), 4 (060, 070), or 8 (080-420) cooler heaters, 210 watts each.

CONTROL CIRCUIT

UNIT POWER	CONTROL POWER			MCA and MOCF
	V-Ph-Hz	Min	Max	
208/230-3-60	115-60	104	127	30
460-3-60	115-60	104	127	30
380-3-60	230-60	207	254	15
380/415-3-50	230-50	198	254	15

COMPRESSOR

UNIT SIZE 30GTN,GTR	NOMINAL VOLTAGE V-Ph-Hz	COMPRESSOR NUMBERS													
		A1		A2		A3		A4		B1		B2		B3	
		RLA	LRA	RLA	LRA	RLA	LRA	RLA	LRA	RLA	LRA	RLA	LRA	RLA	LRA
050-XL	208/230-3-60	89.7	446.0	—	—	—	—	—	—	106.4	608.0	—	—	—	—
	460-3-60	43.6	223.0	—	—	—	—	—	—	46.8	253.0	—	—	—	—
	380-3-60	45.5	247.0	—	—	—	—	—	—	52.6	280.0	—	—	—	—
	380/415-3-50	46.8	253.0	—	—	—	—	—	—	65.4	345.0	—	—	—	—
050-PW	208/230-3-60	89.7	268.0	—	—	—	—	—	—	106.4	304.0	—	—	—	—
	460-3-60	44.9	134.0	—	—	—	—	—	—	48.7	162.0	—	—	—	—
	380-3-60	44.9	148.0	—	—	—	—	—	—	53.8	168.0	—	—	—	—
	380/415-3-50	48.7	162.0	—	—	—	—	—	—	67.9	207.0	—	—	—	—
060-XL	208/230-3-60	106.4	608.0	—	—	—	—	—	—	147.4	690.0	—	—	—	—
	460-3-60	46.8	253.0	—	—	—	—	—	—	65.4	345.0	—	—	—	—
	380-3-60	52.6	280.0	—	—	—	—	—	—	78.8	382.0	—	—	—	—
	380/415-3-50	65.4	345.0	—	—	—	—	—	—	65.4	345.0	—	—	—	—
060-PW	208/230-3-60	106.4	304.0	—	—	—	—	—	—	147.4	414.0	—	—	—	—
	460-3-60	48.7	162.0	—	—	—	—	—	—	67.9	207.0	—	—	—	—
	380-3-60	53.8	168.0	—	—	—	—	—	—	79.5	230.0	—	—	—	—
	380/415-3-50	67.9	207.0	—	—	—	—	—	—	67.9	207.0	—	—	—	—
070-XL	208/230-3-60	147.4	690.0	—	—	—	—	—	—	147.4	690.0	—	—	—	—
	460-3-60	65.4	345.0	—	—	—	—	—	—	65.4	345.0	—	—	—	—
	380-3-60	78.8	382.0	—	—	—	—	—	—	78.8	382.0	—	—	—	—
	380/415-3-50	43.6	223.0	43.6	223.0	—	—	—	—	65.4	345.0	—	—	—	—
070-PW	208/230-3-60	147.4	414.0	—	—	—	—	—	—	147.4	414.0	—	—	—	—
	460-3-60	67.9	207.0	—	—	—	—	—	—	67.9	207.0	—	—	—	—
	380-3-60	79.5	230.0	—	—	—	—	—	—	79.5	230.0	—	—	—	—
	380/415-3-50	44.9	134.0	44.9	134.0	—	—	—	—	67.9	207.0	—	—	—	—
080-XL	208/230-3-60	106.4	506.0	67.9	345.0	—	—	—	—	147.4	690.0	—	—	—	—
	460-3-60	46.8	253.0	34.6	173.0	—	—	—	—	65.4	345.0	—	—	—	—
	380-3-60	52.6	280.0	34.6	191.0	—	—	—	—	78.8	382.0	—	—	—	—
	380/415-3-50	43.6	223.0	65.4	345.0	—	—	—	—	65.4	345.0	—	—	—	—
080-PW	208/230-3-60	106.4	304.0	67.9	207.0	—	—	—	—	147.4	414.0	—	—	—	—
	460-3-60	48.7	162.0	33.3	104.0	—	—	—	—	67.9	207.0	—	—	—	—
	380-3-60	53.8	168.0	33.3	115.0	—	—	—	—	79.5	230.0	—	—	—	—
	380/415-3-50	44.9	134.0	67.9	207.0	—	—	—	—	67.9	207.0	—	—	—	—
090-XL	208/230-3-60	89.7	446.0	67.9	345.0	—	—	—	—	89.7	446.0	89.7	446.0	—	—
	460-3-60	43.6	223.0	34.6	173.0	—	—	—	—	43.6	223.0	43.6	223.0	—	—
	380-3-60	45.5	247.0	34.6	191.0	—	—	—	—	45.5	247.0	45.5	247.0	—	—
	380/415-3-50	43.6	223.0	65.4	345.0	—	—	—	—	43.6	223.0	43.6	223.0	—	—
090-PW	208/230-3-60	89.7	268.0	67.9	207.0	—	—	—	—	89.7	268.0	89.7	268.0	—	—
	460-3-60	44.9	134.0	33.3	104.0	—	—	—	—	44.9	134.0	44.9	134.0	—	—
	380-3-60	44.9	148.0	33.3	115.0	—	—	—	—	44.9	148.0	44.9	148.0	—	—
	380/415-3-50	44.9	134.0	67.9	207.0	—	—	—	—	44.9	134.0	44.9	134.0	—	—
100-XL	208/230-3-60	89.7	446.0	106.4	608.0	—	—	—	—	89.7	446.0	106.4	608.0	—	—
	460-3-60	43.6	223.0	46.8	253.0	—	—	—	—	43.6	223.0	46.8	253.0	—	—
	380-3-60	45.5	247.0	52.6	280.0	—	—	—	—	45.5	247.0	52.6	280.0	—	—
	380/415-3-50	43.6	223.0	65.4	345.0	—	—	—	—	43.6	223.0	65.4	345.0	—	—
100-PW	208/230-3-60	89.7	268.0	106.4	304.0	—	—	—	—	89.7	268.0	106.4	304.0	—	—
	460-3-60	44.9	134.0	48.7	162.0	—	—	—	—	44.9	134.0	48.7	162.0	—	—
	380-3-60	44.9	148.0	53.8	168.0	—	—	—	—	44.9	148.0	53.8	168.0	—	—
	380/415-3-50	44.9	134.0	67.9	207.0	—	—	—	—	44.9	134.0	67.9	207.0	—	—

See legend and notes on page 59.

COMPRESSOR (cont)

UNIT SIZE 30GTN,GTR	NOMINAL VOLTAGE V-Ph-Hz	COMPRESSOR NUMBERS													
		A1		A2		A3		A4		B1		B2		B3	
		RLA	LRA	RLA	LRA	RLA	LRA	RLA	LRA	RLA	LRA	RLA	LRA	RLA	LRA
110-XL	208/230-3-60	89.7	446.0	147.4	690.0	—	—	—	—	89.7	446.0	106.4	506.0	—	—
	460-3-60	43.6	223.0	65.4	345.0	—	—	—	—	43.6	223.0	46.8	253.0	—	—
	380-3-60	45.5	247.0	78.8	382.0	—	—	—	—	45.5	247.0	52.6	280.0	—	—
	380/415-3-50	65.4	345.0	65.4	345.0	—	—	—	—	65.4	345.0	65.4	345.0	—	—
110-PW	208/230-3-60	89.7	268.0	147.4	414.0	—	—	—	—	89.7	268.0	106.4	304.0	—	—
	460-3-60	44.9	134.0	67.9	207.0	—	—	—	—	44.9	134.0	48.7	162.0	—	—
	380-3-60	44.9	148.0	79.5	230.0	—	—	—	—	44.9	148.0	53.8	168.0	—	—
	380/415-3-50	67.9	207.0	67.9	207.0	—	—	—	—	67.9	207.0	67.9	207.0	—	—
130-XL	208/230-3-60	107.7	506.0	151.3	690.0	—	—	—	—	107.7	506.0	151.3	690.0	—	—
	460-3-60	46.8	253.0	65.4	345.0	—	—	—	—	46.8	253.0	65.4	345.0	—	—
	380-3-60	55.8	280.0	80.2	382.0	—	—	—	—	55.8	280.0	80.2	382.0	—	—
	380/415-3-50	44.9	223.0	46.8	253.0	46.8	253.0	—	—	65.5	345.0	65.5	345.0	—	—
130-PW	208/230-3-60	107.7	304.0	151.3	414.0	—	—	—	—	107.7	304.0	151.3	414.0	—	—
	460-3-60	46.8	152.0	65.4	207.0	—	—	—	—	46.8	152.0	65.4	207.0	—	—
	380-3-60	55.8	168.0	80.2	230.0	—	—	—	—	55.8	168.0	80.2	230.0	—	—
	380/415-3-50	44.9	134.0	46.8	152.0	46.8	152.0	—	—	65.5	207.0	65.5	207.0	—	—
150-XL	208/230-3-60	89.8	446.0	89.8	446.0	89.8	446.0	—	—	151.3	690.0	151.3	690.0	—	—
	460-3-60	44.9	223.0	44.9	223.0	44.9	223.0	—	—	65.4	345.0	65.4	345.0	—	—
	380-3-60	46.8	247.0	46.8	247.0	46.8	247.0	—	—	80.2	382.0	80.2	382.0	—	—
	380/415-3-50	65.5	345.0	65.5	345.0	65.5	345.0	—	—	65.5	345.0	65.5	345.0	—	—
150-PW	208/230-3-60	89.8	268.0	89.8	268.0	89.8	268.0	—	—	151.3	414.0	151.3	414.0	—	—
	460-3-60	44.9	134.0	44.9	134.0	44.9	134.0	—	—	65.4	207.0	65.4	207.0	—	—
	380-3-60	46.8	148.0	46.8	148.0	46.8	148.0	—	—	80.2	230.0	80.2	230.0	—	—
	380/415-3-50	65.5	207.0	65.5	207.0	65.5	207.0	—	—	65.5	207.0	65.5	207.0	—	—
170-XL	208/230-3-60	107.7	506.0	107.7	506.0	107.7	506.0	—	—	107.7	506.0	107.7	506.0	107.7	506.0
	460-3-60	46.8	253.0	46.8	253.0	46.8	253.0	—	—	46.8	253.0	46.8	253.0	46.8	253.0
	380-3-60	55.8	280.0	55.8	280.0	55.8	280.0	—	—	55.8	280.0	55.8	280.0	55.8	280.0
	380/415-3-50	46.8	253.0	46.8	253.0	65.5	345.0	—	—	46.8	253.0	65.5	345.0	65.5	345.0
170-PW	208/230-3-60	107.7	304.0	107.7	304.0	107.7	304.0	—	—	107.7	304.0	107.7	304.0	107.7	304.0
	460-3-60	46.8	152.0	46.8	152.0	46.8	152.0	—	—	46.8	152.0	46.8	152.0	46.8	152.0
	380-3-60	55.8	168.0	55.8	168.0	55.8	168.0	—	—	55.8	168.0	55.8	168.0	55.8	168.0
	380/415-3-50	46.8	152.0	46.8	152.0	65.5	207.0	—	—	46.8	152.0	65.5	207.0	65.5	207.0
190-XL	208/230-3-60	89.8	446.0	107.7	506.0	151.3	690.0	—	—	89.8	446.0	107.7	506.0	151.3	690.0
	460-3-60	44.9	223.0	46.8	253.0	65.4	345.0	—	—	44.9	223.0	46.8	253.0	65.4	345.0
	380-3-60	46.8	247.0	55.8	280.0	80.2	382.0	—	—	46.8	247.0	55.8	280.0	80.2	382.0
	380/415-3-50	65.5	345.0	65.5	345.0	65.5	345.0	—	—	65.5	345.0	65.5	345.0	65.5	345.0
190-PW	208/230-3-60	89.8	268.0	107.7	304.0	151.3	414.0	—	—	89.8	268.0	107.7	304.0	151.3	414.0
	460-3-60	44.9	134.0	46.8	152.0	65.4	207.0	—	—	44.9	134.0	46.8	152.0	65.4	207.0
	380-3-60	46.8	148.0	55.8	168.0	80.2	230.0	—	—	46.8	148.0	55.8	168.0	80.2	230.0
	380/415-3-50	65.5	207.0	65.5	207.0	65.5	207.0	—	—	65.5	207.0	65.5	207.0	65.5	207.0
210-XL	208/230-3-60	89.8	446.0	89.8	446.0	89.8	446.0	107.7	506	107.7	506.0	151.3	690.0	151.3	690.0
	460-3-60	44.9	223.0	44.9	223.0	44.9	223.0	46.8	253	46.8	253.0	65.4	345.0	65.4	345.0
	380-3-60	46.8	247.0	46.8	247.0	46.8	247.0	55.8	280	55.8	280.0	80.2	382.0	80.2	382.0
	380/415-3-50	44.9	223.0	44.9	223.0	65.5	345.0	65.5	345	65.5	345.0	65.5	345.0	65.5	345.0
210-PW	208/230-3-60	89.8	268.0	89.8	268.0	89.8	268.0	107.7	304	107.7	304.0	151.3	414.0	151.3	414.0
	460-3-60	44.9	134.0	44.9	134.0	44.9	134.0	46.8	152	46.8	152.0	65.4	207.0	65.4	207.0
	380-3-60	46.8	148.0	46.8	148.0	46.8	148.0	55.8	168	55.8	168.0	80.2	230.0	80.2	230.0
	380/415-3-50	44.9	134.0	44.9	134.0	65.5	207.0	65.5	207	65.5	207.0	65.5	207.0	65.5	207.0
230A-XL	208/230-3-60	89.8	446.0	89.8	446.0	89.8	446.0	—	—	151.3	690.0	151.3	690.0	—	—
	460-3-60	44.9	223.0	44.9	223.0	44.9	223.0	—	—	65.4	345.0	65.4	345.0	—	—
	380-3-60	46.8	247.0	46.8	247.0	46.8	247.0	—	—	80.2	382.0	80.2	382.0	—	—
	380/415-3-50	65.5	345.0	65.5	345.0	65.5	345.0	—	—	65.5	345.0	65.5	345.0	—	—
230A-PW	208/230-3-60	89.8	268.0	89.8	268.0	89.8	268.0	—	—	151.3	414.0	151.3	414.0	—	—
	460-3-60	44.9	134.0	44.9	134.0	44.9	134.0	—	—	65.4	207.0	65.4	207.0	—	—
	380-3-60	46.8	148.0	46.8	148.0	46.8	148.0	—	—	80.2	230.0	80.2	230.0	—	—
	380/415-3-50	65.5	207.0	65.5	207.0	65.5	207.0	—	—	65.5	207.0	65.5	207.0	—	—
245A-XL	208/230-3-60	89.8	446.0	89.8	446.0	89.8	446.0	—	—	151.3	690.0	151.3	690.0	—	—
	460-3-60	44.9	223.0	44.9	223.0	44.9	223.0	—	—	65.4	345.0	65.4	345.0	—	—
	380-3-60	46.8	247.0	46.8	247.0	46.8	247.0	—	—	80.2	382.0	80.2	382.0	—	—
	380/415-3-50	65.5	345.0	65.5	345.0	65.5	345.0	—	—	65.5	345.0	65.5	345.0	—	—
245A-PW	208/230-3-60	89.8	268.0	89.8	268.0	89.8	268.0	—	—	151.3	414.0	151.3	414.0	—	—
	460-3-60	44.9	134.0	44.9	134.0	44.9	134.0	—	—	65.4	207.0	65.4	207.0	—	—
	380-3-60	46.8	148.0	46.8	148.0	46.8	148.0	—	—	80.2	230.0	80.2	230.0	—	—
	380/415-3-50	65.5	207.0	65.5	207.0	65.5	207.0	—	—	65.5	207.0	65.5	207.0	—	—

See legend and notes on page 59.

COMPRESSOR (cont)

UNIT SIZE 30GTN,GTR	NOMINAL VOLTAGE V-Ph-Hz	COMPRESSOR NUMBERS													
		A1		A2		A3		A4		B1		B2		B3	
		RLA	LRA	RLA	LRA	RLA	LRA	RLA	LRA	RLA	LRA	RLA	LRA	RLA	LRA
255A-XL	208/230-3-60	89.8	446.0	89.8	446.0	89.8	446.0	—	—	151.3	690.0	151.3	690.0	—	—
	460-3-60	44.9	223.0	44.9	223.0	44.9	223.0	—	—	65.4	345.0	65.4	345.0	—	—
	380-3-60	46.8	247.0	46.8	247.0	46.8	247.0	—	—	80.2	382.0	80.2	382.0	—	—
	380/415-3-50	65.5	345.0	65.5	345.0	65.5	345.0	—	—	65.5	345.0	65.5	345.0	—	—
255A-PW	208/230-3-60	89.8	268.0	89.8	268.0	89.8	268.0	—	—	151.3	414.0	151.3	414.0	—	—
	460-3-60	44.9	134.0	44.9	134.0	44.9	134.0	—	—	65.4	207.0	65.4	207.0	—	—
	380-3-60	46.8	148.0	46.8	148.0	46.8	148.0	—	—	80.2	230.0	80.2	230.0	—	—
	380/415-3-50	65.5	207.0	65.5	207.0	65.5	207.0	—	—	65.5	207.0	65.5	207.0	—	—
270A-XL	208/230-3-60	107.7	506.0	107.7	506.0	107.7	506.0	—	—	107.7	506.0	107.7	506.0	107.7	506.0
	460-3-60	46.8	253.0	46.8	253.0	46.8	253.0	—	—	46.8	253.0	46.8	253.0	46.8	253.0
	380-3-60	55.8	280.0	55.8	280.0	55.8	280.0	—	—	55.8	280.0	55.8	280.0	55.8	280.0
	380/415-3-50	46.8	253.0	46.8	253.0	65.5	345.0	—	—	46.8	253.0	65.5	345.0	65.5	345.0
270A-PW	208/230-3-60	107.7	304.0	107.7	304.0	107.7	304.0	—	—	107.7	304.0	107.7	304.0	107.7	304.0
	460-3-60	46.8	152.0	46.8	152.0	46.8	152.0	—	—	46.8	152.0	46.8	152.0	46.8	152.0
	380-3-60	55.8	168.0	55.8	168.0	55.8	168.0	—	—	55.8	168.0	55.8	168.0	55.8	168.0
	380/415-3-50	46.8	152.0	46.8	152.0	65.5	207.0	—	—	46.8	152.0	65.5	207.0	65.5	207.0
290A-XL	208/230-3-60	89.8	446.0	107.7	506.0	151.3	690.0	—	—	89.8	446.0	107.7	506.0	151.3	690.0
	460-3-60	44.9	223.0	46.8	253.0	65.4	345.0	—	—	44.9	223.0	46.8	253.0	65.4	345.0
	380-3-60	46.8	247.0	55.8	280.0	80.2	382.0	—	—	46.8	247.0	55.8	280.0	80.2	382.0
	380/415-3-50	65.5	345.0	65.5	345.0	65.5	345.0	—	—	65.5	345.0	65.5	345.0	65.5	345.0
290A-PW	208/230-3-60	89.8	268.0	107.7	304.0	151.3	414.0	—	—	89.8	268.0	107.7	304.0	151.3	414.0
	460-3-60	44.9	134.0	46.8	152.0	65.4	207.0	—	—	44.9	134.0	46.8	152.0	65.4	207.0
	380-3-60	46.8	148.0	55.8	168.0	80.2	230.0	—	—	46.8	148.0	55.8	168.0	80.2	230.0
	380/415-3-50	65.5	207.0	65.5	207.0	65.5	207.0	—	—	65.5	207.0	65.5	207.0	65.5	207.0
315A-XL	208/230-3-60	89.8	446.0	89.8	446.0	89.8	446.0	107.7	506.0	107.7	506.0	151.3	690.0	151.3	690.0
	460-3-60	44.9	223.0	44.9	223.0	44.9	223.0	46.8	253.0	46.8	253.0	65.4	345.0	65.4	345.0
	380-3-60	46.8	247.0	46.8	247.0	46.8	247.0	55.8	280.0	55.8	280.0	80.2	382.0	80.2	382.0
	380/415-3-50	44.9	223.0	44.9	223.0	65.5	345.0	65.5	345.0	65.5	345.0	65.5	345.0	65.5	345.0
315A-PW	208/230-3-60	89.8	268.0	89.8	268.0	89.8	268.0	107.7	304.0	107.7	304.0	151.3	414.0	151.3	414.0
	460-3-60	44.9	134.0	44.9	134.0	44.9	134.0	46.8	152.0	46.8	152.0	65.4	207.0	65.4	207.0
	380-3-60	46.8	148.0	46.8	148.0	46.8	148.0	55.8	168.0	55.8	168.0	80.2	230.0	80.2	230.0
	380/415-3-50	44.9	134.0	44.9	134.0	65.5	207.0	65.5	207.0	65.5	207.0	65.5	207.0	65.5	207.0
330A-XL	208/230-3-60	107.7	506.0	107.7	506.0	107.7	506.0	—	—	107.7	506.0	107.7	506.0	107.7	506.0
	460-3-60	46.8	253.0	46.8	253.0	46.8	253.0	—	—	46.8	253.0	46.8	253.0	46.8	253.0
	380-3-60	55.8	280.0	55.8	280.0	55.8	280.0	—	—	55.8	280.0	55.8	280.0	55.8	280.0
	380/415-3-50	46.8	253.0	46.8	253.0	65.5	345.0	—	—	46.8	253.0	65.5	345.0	65.5	345.0
330A-PW	208/230-3-60	107.7	304.0	107.7	304.0	107.7	304.0	—	—	107.7	304.0	107.7	304.0	107.7	304.0
	460-3-60	46.8	152.0	46.8	152.0	46.8	152.0	—	—	46.8	152.0	46.8	152.0	46.8	152.0
	380-3-60	55.8	168.0	55.8	168.0	55.8	168.0	—	—	55.8	168.0	55.8	168.0	55.8	168.0
	380/415-3-50	46.8	152.0	46.8	152.0	65.5	207.0	—	—	46.8	152.0	65.5	207.0	65.5	207.0
360A-XL	208/230-3-60	89.8	446.0	107.7	506.0	151.3	690.0	—	—	89.8	446.0	107.7	506.0	151.3	690.0
	460-3-60	44.9	223.0	46.8	253.0	65.4	345.0	—	—	44.9	223.0	46.8	253.0	65.4	345.0
	380-3-60	46.8	247.0	55.8	280.0	80.2	382.0	—	—	46.8	247.0	55.8	280.0	80.2	382.0
	380/415-3-50	65.5	345.0	65.5	345.0	65.5	345.0	—	—	65.5	345.0	65.5	345.0	65.5	345.0
360A-PW	208/230-3-60	89.8	268.0	107.7	304.0	151.3	414.0	—	—	89.8	268.0	107.7	304.0	151.3	414.0
	460-3-60	44.9	134.0	46.8	152.0	65.4	207.0	—	—	44.9	134.0	46.8	152.0	65.4	207.0
	380-3-60	46.8	148.0	55.8	168.0	80.2	230.0	—	—	46.8	148.0	55.8	168.0	80.2	230.0
	380/415-3-50	65.5	207.0	65.5	207.0	65.5	207.0	—	—	65.5	207.0	65.5	207.0	65.5	207.0
390A-XL	208/230-3-60	89.8	446.0	89.8	446.0	89.8	446.0	107.7	506.0	107.7	506.0	151.3	690.0	151.3	690.0
	460-3-60	44.9	223.0	44.9	223.0	44.9	223.0	46.8	253.0	46.8	253.0	65.4	345.0	65.4	345.0
	380-3-60	46.8	247.0	46.8	247.0	46.8	247.0	55.8	280.0	55.8	280.0	80.2	382.0	80.2	382.0
	380/415-3-50	44.9	223.0	44.9	223.0	65.5	345.0	65.5	345.0	65.5	345.0	65.5	345.0	65.5	345.0
390A-PW	208/230-3-60	89.8	268.0	89.8	268.0	89.8	268.0	107.7	304.0	107.7	304.0	151.3	414.0	151.3	414.0
	460-3-60	44.9	134.0	44.9	134.0	44.9	134.0	46.8	152.0	46.8	152.0	65.4	207.0	65.4	207.0
	380-3-60	46.8	148.0	46.8	148.0	46.8	148.0	55.8	168.0	55.8	168.0	80.2	230.0	80.2	230.0
	380/415-3-50	44.9	134.0	44.9	134.0	65.5	207.0	65.5	207.0	65.5	207.0	65.5	207.0	65.5	207.0
420A-XL	208/230-3-60	89.8	446.0	89.8	446.0	89.8	446.0	107.7	506.0	107.7	506.0	151.3	690.0	151.3	690.0
	460-3-60	44.9	223.0	44.9	223.0	44.9	223.0	46.8	253.0	46.8	253.0	65.4	345.0	65.4	345.0
	380-3-60	46.8	247.0	46.8	247.0	46.8	247.0	55.8	280.0	55.8	280.0	80.2	382.0	80.2	382.0
	380/415-3-50	44.9	223.0	44.9	223.0	65.5	345.0	65.5	345.0	65.5	345.0	65.5	345.0	65.5	345.0
420A-PW	208/230-3-60	89.8	268.0	89.8	268.0	89.8	268.0	107.7	304.0	107.7	304.0	151.3	414.0	151.3	414.0
	460-3-60	44.9	134.0	44.9	134.0	44.9	134.0	46.8	152.0	46.8	152.0	65.4	207.0	65.4	207.0
	380-3-60	46.8	148.0	46.8	148.0	46.8	148.0	55.8	168.0	55.8	168.0	80.2	230.0	80.2	230.0
	380/415-3-50	44.9	134.0	44.9	134.0	65.5	207.0	65.5	207.0	65.5	207.0	65.5	207.0	65.5	207.0

See legend and notes on page 59.

COMPRESSOR (cont)

UNIT SIZE 30GTN,GTR	NOMINAL VOLTAGE V-Ph-Hz	COMPRESSOR NUMBERS													
		A1		A2		A3		A4		B1		B2		B3	
		RLA	LRA	RLA	LRA	RLA	LRA	RLA	LRA	RLA	LRA	RLA	LRA	RLA	LRA
230B-XL	208/230-3-60	106.4	506.0	67.9	345.0	—	—	—	—	147.4	690.0	—	—	—	—
	460-3-60	46.8	253.0	34.6	173.0	—	—	—	—	65.4	345.0	—	—	—	—
	380-3-60	52.6	280.0	34.6	191.0	—	—	—	—	78.8	382.0	—	—	—	—
	380/415-3-50	43.6	223.0	65.4	345.0	—	—	—	—	65.4	345.0	—	—	—	—
230B-PW	208/230-3-60	106.4	304.0	67.9	207.0	—	—	—	—	147.4	414.0	—	—	—	—
	460-3-60	48.7	162.0	33.3	104.0	—	—	—	—	67.9	207.0	—	—	—	—
	380-3-60	53.8	168.0	33.3	115.0	—	—	—	—	79.5	230.0	—	—	—	—
	380/415-3-50	44.9	134.0	67.9	207.0	—	—	—	—	67.9	207.0	—	—	—	—
245B-XL	208/230-3-60	89.7	446.0	67.9	345.0	—	—	—	—	89.7	446.0	89.7	446.0	—	—
	460-3-60	43.6	223.0	34.6	173.0	—	—	—	—	43.6	223.0	43.6	223.0	—	—
	380-3-60	45.5	247.0	34.6	191.0	—	—	—	—	45.5	247.0	45.5	247.0	—	—
	380/415-3-50	43.6	223.0	65.4	345.0	—	—	—	—	43.6	223.0	43.6	223.0	—	—
245B-PW	208/230-3-60	89.7	268.0	67.9	207.0	—	—	—	—	89.7	268.0	89.7	268.0	—	—
	460-3-60	44.9	134.0	33.3	104.0	—	—	—	—	44.9	134.0	44.9	134.0	—	—
	380-3-60	44.9	148.0	33.3	115.0	—	—	—	—	44.9	148.0	44.9	148.0	—	—
	380/415-3-50	44.9	134.0	67.9	207.0	—	—	—	—	44.9	134.0	44.9	134.0	—	—
255B-XL	208/230-3-60	89.7	446.0	106.4	608.0	—	—	—	—	89.7	446.0	106.4	608.0	—	—
	460-3-60	43.6	223.0	46.8	253.0	—	—	—	—	43.6	223.0	46.8	253.0	—	—
	380-3-60	45.5	247.0	52.6	280.0	—	—	—	—	45.5	247.0	52.6	280.0	—	—
	380/415-3-50	43.6	223.0	65.4	345.0	—	—	—	—	43.6	223.0	65.4	345.0	—	—
255B-PW	208/230-3-60	89.7	268.0	106.4	304.0	—	—	—	—	89.7	268.0	106.4	304.0	—	—
	460-3-60	44.9	134.0	48.7	162.0	—	—	—	—	44.9	134.0	48.7	162.0	—	—
	380-3-60	44.9	148.0	53.8	168.0	—	—	—	—	44.9	148.0	53.8	168.0	—	—
	380/415-3-50	44.9	134.0	67.9	207.0	—	—	—	—	44.9	134.0	67.9	207.0	—	—
270B-XL	208/230-3-60	89.7	446.0	106.4	608.0	—	—	—	—	89.7	446.0	106.4	608.0	—	—
	460-3-60	43.6	223.0	46.8	253.0	—	—	—	—	43.6	223.0	46.8	253.0	—	—
	380-3-60	45.5	247.0	52.6	280.0	—	—	—	—	45.5	247.0	52.6	280.0	—	—
	380/415-3-50	43.6	223.0	65.4	345.0	—	—	—	—	43.6	223.0	65.4	345.0	—	—
270B-PW	208/230-3-60	89.7	268.0	106.4	304.0	—	—	—	—	89.7	268.0	106.4	304.0	—	—
	460-3-60	44.9	134.0	48.7	162.0	—	—	—	—	44.9	134.0	48.7	162.0	—	—
	380-3-60	44.9	148.0	53.8	168.0	—	—	—	—	44.9	148.0	53.8	168.0	—	—
	380/415-3-50	44.9	134.0	67.9	207.0	—	—	—	—	44.9	134.0	67.9	207.0	—	—
290B-XL	208/230-3-60	89.7	446.0	147.4	690.0	—	—	—	—	89.7	446.0	106.4	506.0	—	—
	460-3-60	43.6	223.0	65.4	345.0	—	—	—	—	43.6	223.0	46.8	253.0	—	—
	380-3-60	45.5	247.0	78.8	382.0	—	—	—	—	45.5	247.0	52.6	280.0	—	—
	380/415-3-50	65.4	345.0	65.4	345.0	—	—	—	—	65.4	345.0	65.4	345.0	—	—
290B-PW	208/230-3-60	89.7	268.0	147.4	414.0	—	—	—	—	89.7	268.0	106.4	304.0	—	—
	460-3-60	44.9	134.0	67.9	207.0	—	—	—	—	44.9	134.0	48.7	162.0	—	—
	380-3-60	44.9	148.0	79.5	230.0	—	—	—	—	44.9	148.0	53.8	168.0	—	—
	380/415-3-50	67.9	207.0	67.9	207.0	—	—	—	—	67.9	207.0	67.9	207.0	—	—

See legend and notes on page 59.

COMPRESSOR (cont)

UNIT SIZE 30GTN,GTR	NOMINAL VOLTAGE V-Ph-Hz	COMPRESSOR NUMBERS													
		A1		A2		A3		A4		B1		B2		B3	
		RLA	LRA	RLA	LRA	RLA	LRA	RLA	LRA	RLA	LRA	RLA	LRA	RLA	LRA
330B-XL	208/230-3-60	107.7	506.0	107.7	506.0	107.7	506.0	—	—	107.7	506.0	107.7	506.0	107.7	506.0
	460-3-60	46.8	253.0	46.8	253.0	46.8	253.0	—	—	46.8	253.0	46.8	253.0	46.8	253.0
	380-3-60	55.8	280.0	55.8	280.0	55.8	280.0	—	—	55.8	280.0	55.8	280.0	55.8	280.0
	380/415-3-50	46.8	253.0	46.8	253.0	65.5	345.0	—	—	46.8	253.0	65.5	345.0	65.5	345.0
330B-PW	208/230-3-60	107.7	304.0	107.7	304.0	107.7	304.0	—	—	107.7	304.0	107.7	304.0	107.7	304.0
	460-3-60	46.8	152.0	46.8	152.0	46.8	152.0	—	—	46.8	152.0	46.8	152.0	46.8	152.0
	380-3-60	55.8	168.0	55.8	168.0	55.8	168.0	—	—	55.8	168.0	55.8	168.0	55.8	168.0
	380/415-3-50	46.8	152.0	46.8	152.0	65.5	207.0	—	—	46.8	152.0	65.5	207.0	65.5	207.0
360B-XL	208/230-3-60	89.8	446.0	107.7	506.0	151.3	690.0	—	—	89.8	446.0	107.7	506.0	151.3	690.0
	460-3-60	44.9	223.0	46.8	253.0	65.4	345.0	—	—	44.9	223.0	46.8	253.0	65.4	345.0
	380-3-60	46.8	247.0	55.8	280.0	80.2	382.0	—	—	46.8	247.0	55.8	280.0	80.2	382.0
	380/415-3-50	46.8	253.0	46.8	253.0	65.5	345.0	—	—	46.8	253.0	65.5	345.0	65.5	345.0
360B-PW	208/230-3-60	89.8	268.0	107.7	304.0	151.3	414.0	—	—	89.8	268.0	107.7	304.0	151.3	414.0
	460-3-60	44.9	134.0	46.8	152.0	65.4	207.0	—	—	44.9	134.0	46.8	152.0	65.4	207.0
	380-3-60	46.8	148.0	55.8	168.0	80.2	230.0	—	—	46.8	148.0	55.8	168.0	80.2	230.0
	380/415-3-50	46.8	152.0	46.8	152.0	65.5	207.0	—	—	46.8	152.0	65.5	207.0	65.5	207.0
390B-XL	208/230-3-60	89.8	446.0	107.7	506.0	151.3	690.0	—	—	89.8	446.0	107.7	506.0	151.3	690.0
	460-3-60	44.9	223.0	46.8	253.0	65.4	345.0	—	—	44.9	223.0	46.8	253.0	65.4	345.0
	380-3-60	46.8	247.0	55.8	280.0	80.2	382.0	—	—	46.8	247.0	55.8	280.0	80.2	382.0
	380/415-3-50	65.5	345.0	65.5	345.0	65.5	345.0	—	—	65.5	345.0	65.5	345.0	65.5	345.0
390B-PW	208/230-3-60	89.8	268.0	107.7	304.0	151.3	414.0	—	—	89.8	268.0	107.7	304.0	151.3	414.0
	460-3-60	44.9	134.0	46.8	152.0	65.4	207.0	—	—	44.9	134.0	46.8	152.0	65.4	207.0
	380-3-60	46.8	148.0	55.8	168.0	80.2	230.0	—	—	46.8	148.0	55.8	168.0	80.2	230.0
	380/415-3-50	65.5	207.0	65.5	207.0	65.5	207.0	—	—	65.5	207.0	65.5	207.0	65.5	207.0
420B-XL	208/230-3-60	89.8	446.0	89.8	446.0	89.8	446.0	107.7	506.0	107.7	506.0	151.3	690.0	151.3	690.0
	460-3-60	44.9	223.0	44.9	223.0	44.9	223.0	46.8	253.0	46.8	253.0	65.4	345.0	65.4	345.0
	380-3-60	46.8	247.0	46.8	247.0	46.8	247.0	55.8	280.0	55.8	280.0	80.2	382.0	80.2	382.0
	380/415-3-50	44.9	223.0	44.9	223.0	65.5	345.0	65.5	345.0	65.5	345.0	65.5	345.0	65.5	345.0
420B-PW	208/230-3-60	89.8	268.0	89.8	268.0	89.8	268.0	107.7	304.0	107.7	304.0	151.3	414.0	151.3	414.0
	460-3-60	44.9	134.0	44.9	134.0	44.9	134.0	46.8	152.0	46.8	152.0	65.4	207.0	65.4	207.0
	380-3-60	46.8	148.0	46.8	148.0	46.8	148.0	55.8	168.0	55.8	168.0	80.2	230.0	80.2	230.0
	380/415-3-50	44.9	134.0	44.9	134.0	65.5	207.0	65.5	207.0	65.5	207.0	65.5	207.0	65.5	207.0

See legend and notes on page 59.

CONDENSER FAN DATA

UNIT SIZE 30GTN,GTR	NOMINAL VOLTAGE (V-Ph-Hz)	STANDARD CONDENSER FAN		HIGH STATIC CONDENSER FANS	
		Total (Quantity)	(Quantity) FLA (ea)	Total (Quantity)	FLA (ea)
050	208/230-3-60	4	(2) 6.7, (2) 5.5	4	14.6
	460-3-60		(2) 3.3, (2) 2.8		6.3
	380-3-60		(4) 3.9		7.4
	380/415-3-50		(4) 3.4		7.3
060	208/230-3-60	6	(4) 6.7, (2) 5.5	6	14.6
	460-3-60		(4) 3.3, (2) 2.8		6.3
	380-3-60		(6) 3.9		7.4
	380/415-3-50		(6) 3.4		7.3
070	208/230-3-60	6	(4) 6.7, (2) 5.5	6	14.6
	460-3-60		(4) 3.3, (2) 2.8		6.3
	380-3-60		(6) 3.9		7.4
	380/415-3-50		(6) 3.4		7.3
080,090, 230B,245B	208/230-3-60	6	(4) 6.6, (2) 5.5	6	14.6
	460-3-60		(4) 3.3, (2) 2.8		6.3
	380-3-60		(6) 3.9		7.4
	380/415-3-50		(6) 3.4		7.3
100,110, 255B,270B, 290B,315B	208/230-3-60	8	(6) 6.6, (2) 5.5	8	14.6
	460-3-60		(6) 3.3, (2) 2.8		6.3
	380-3-60		(8) 3.9		7.4
	380/415-3-50		(8) 3.4		7.3
130-170 230A-270A, 330A/B,360B (50 Hz)	208/230-3-60	10	(6) 6.6, (4) 5.5	10	14.6
	460-3-60		(6) 3.3, (4) 2.8		6.3
	380-3-60		(10) 3.9		7.4
	380/415-3-50		(10) 3.4		7.3
190,210, 290A,315A, 360A/B (60 Hz), 360A (50 Hz), 390A/B,420A/B	208/230-3-60	12	(8) 6.6, (4) 5.5	12	14.6
	460-3-60		(8) 3.3, (4) 2.8		6.3
	380-3-60		(12) 3.9		7.4
	380/415-3-50		(12) 3.4		7.3

See legend and notes on page 59.

Microprocessor

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

The microprocessor routine is started by switching the Emergency ON-OFF circuit breaker switch (switch 2) to ON position.

When the unit receives a call for cooling (either from the internal control or CCN network command), the unit stages up in capacity to maintain the cooler fluid set point. The first compressor starts 1 1/2 to 3 minutes after the call for cooling. The lead circuit can be specifically designated or randomly selected by the controls, depending on how the unit is field configured. A field configuration is also available to determine if the unit should stage up both circuits equally or load one circuit completely before bringing on the other.

The *ComfortLink* microprocessor controls the capacity of the chiller by cycling compressors on and off at a rate to satisfy actual dynamic load conditions. The control maintains leaving-fluid temperature set point shown on scrolling marquee display board through intelligent cycling of compressors. Accuracy depends on loop volume, loop flow rate, load, outdoor-air temperature, number of stages, and particular stage being cycled off. No adjustment for cooling range or cooler flow rate is required, because the control automatically compensates for cooling range by measuring both return-fluid temperature and leaving-fluid temperature. This is referred to as *leaving-fluid temperature control with return-fluid temperature compensation*.

The basic logic for determining when to add or remove a stage is a time band integration of deviation from set point plus rate of change of leaving-fluid temperature. When leaving-fluid temperature is close to set point and slowly moving closer, logic prevents addition of another stage. If leaving-fluid temperature is less than 34 F° (1.1°C) for water, or 6°F (3.3°C) below the set point for brine units, the unit is shut off until the fluid temperature goes to 34°F (1.1°C) or to 6°F (3.3°C) above the set point to protect against freezing.

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

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

Lead/lag operation can be configured to balance compressor operating hours when set to automatic. When lead/lag operation is configured to automatic, a compressor wear factor is used to determine which circuit to start first by utilizing a combination of actual run hours and number of starts. Lag compressors in a circuit would also be started to maintain even wear factors. Either circuit can be set to always lead, if desired.

The control also performs other special functions when turning on or off. When a circuit is to be turned off, EXV or LLSV (TXV units) is closed first, and compressor is run until conditions are met to terminate pumpout to remove refrigerant that was in the cooler. At start-up, if a circuit has not run in the last 15 minutes, circuit is run to remove any refrigerant that has migrated to the cooler. The oil pressure switch is bypassed for 2 minutes during start-up and for 1 minute during normal operation.

Thermistors

Eight thermistors are used for temperature-sensing inputs to microprocessor. (A ninth [T9] and/or tenth [T10] may be used as a remote temperature sensor for optional LCWT reset.)

- T1 Cooler leaving chilled fluid temperature
- T2 Cooler entering fluid (return) temperature
- T3 Saturated condensing temperature — Circuit A
- T4 Saturated condensing temperature — Circuit B
- T5 Cooler saturation temperature — Circuit A
- T6 Cooler saturation temperature — Circuit B
- T7 Return gas temperature entering compressor cylinder — Circuit A
- T8 Return gas temperature entering compressor cylinder — Circuit B
- T9 Outdoor air temperature sensor (accessory)
- T10 Remote space temperature sensor (accessory)

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

Electronic expansion valve (EXV)

To control flow of refrigerant for different operating conditions, EXV piston moves up and down over slot orifices through which refrigerant flows to modulate size of opening. Piston is moved by a stepper motor through 1500 discrete steps. The piston is repositioned by the microprocessor every 3 seconds as required.

The EXV is used to control superheat in compressor. The difference between 2 thermistors (compressor return gas temperature minus cooler saturation temperature) is used to determine superheat. The EXV is controlled to maintain superheat entering pistons at approximately 29 F (16.1°C), which results in slightly superheated refrigerant leaving cooler.

The electronic control provides for a prepurge and pumpout cycle each time the lead compressor in a circuit is started or stopped. 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 55°F (12.8°C). This makes it possible to start unit at high fluid temperatures, up to 95°F (35°C), without overloading compressor. Another feature that is factory set (can be reconfigured in the field) limits rate of pulldown to 1° F (0.6°C) per minute, thereby reducing the kW demand on start-up.

Accessory controls

Demand can be further limited by keeping a selected number of compressors from turning on by utilizing demand limit control (the Energy Management Module is required for this function). This FLOP/accessory interfaces with microprocessor to control unit so that chiller's kW demand does not exceed its setting. It is activated from an external switch.

The standard *ComfortLink*[™] control is programmed to accept various accessory temperature reset options (based on return-fluid temperature, outdoor-air temperature, or space temperature), that reset the LCWT. An accessory thermistor (T9 or T10) is required if outdoor-air temperature or space temperature reset is selected. The Energy Management Module (EMM) is only required for temperature reset that is initiated by a 4 to 20 mA signal.

Ground current protection

The 080-210 and 070 (50 Hz) sizes have ground current protection that shuts off compressor(s) if a 2 to 3 amp ground current is sensed by a toroid around the compressor power leads.

30GTN,GTR *ComfortLink* controls with Scrolling Marquee display module

A standard four-digit alphanumeric display shows all of the *ComfortLink* control codes (with expandable clear language), plus set points, time of day, temperatures, pressures, and superheat. Additional information can be displayed all at once with the Navigator display.

Control sequence

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

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

Capacity control

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

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

Control features

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

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

Demand limit — If applied, limits the total power draw of unit to selected point by controlling number of operational compressors during periods of peak electrical demand. The Energy Management Module is required for either 2-stage or 4 to 20 mA demand limit.

Temperature reset — If applied, microprocessor compares either return fluid, space temperature, or outdoor-air temperature with the accessory board settings, and adjusts LCWT appropriately. The Energy Management Module can also be added for 4 to 20 mA reset.

Electronic expansion valve and condenser-fan control — The EXV opens and closes on signal from microprocessor to maintain an approximate 29°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.) Condenser fans (operated by microprocessor) run to as low an ambient as possible to maintain a minimum EXV pressure differential.

Abnormal conditions

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

Oil pressure safety — Safety cuts out if pressure differential is below minimum (accessory on sizes 050-070). Safety is bypassed on start-up for 2 minutes.

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

High-pressure cutout — Switch shuts down compressors if compressor discharge pressure increases to 426 psig (2918 kPa).

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

Compressor anti-cycling — This feature limits compressor cycling.

Loss of flow protection — Additional protection is provided by temperature differences between entering and leaving fluid temperature sensors if cooler temperature drops to 34°F (1.1°C). Proof of flow switches are recommended.

Sensor failures — Failures are detected by the microprocessor.

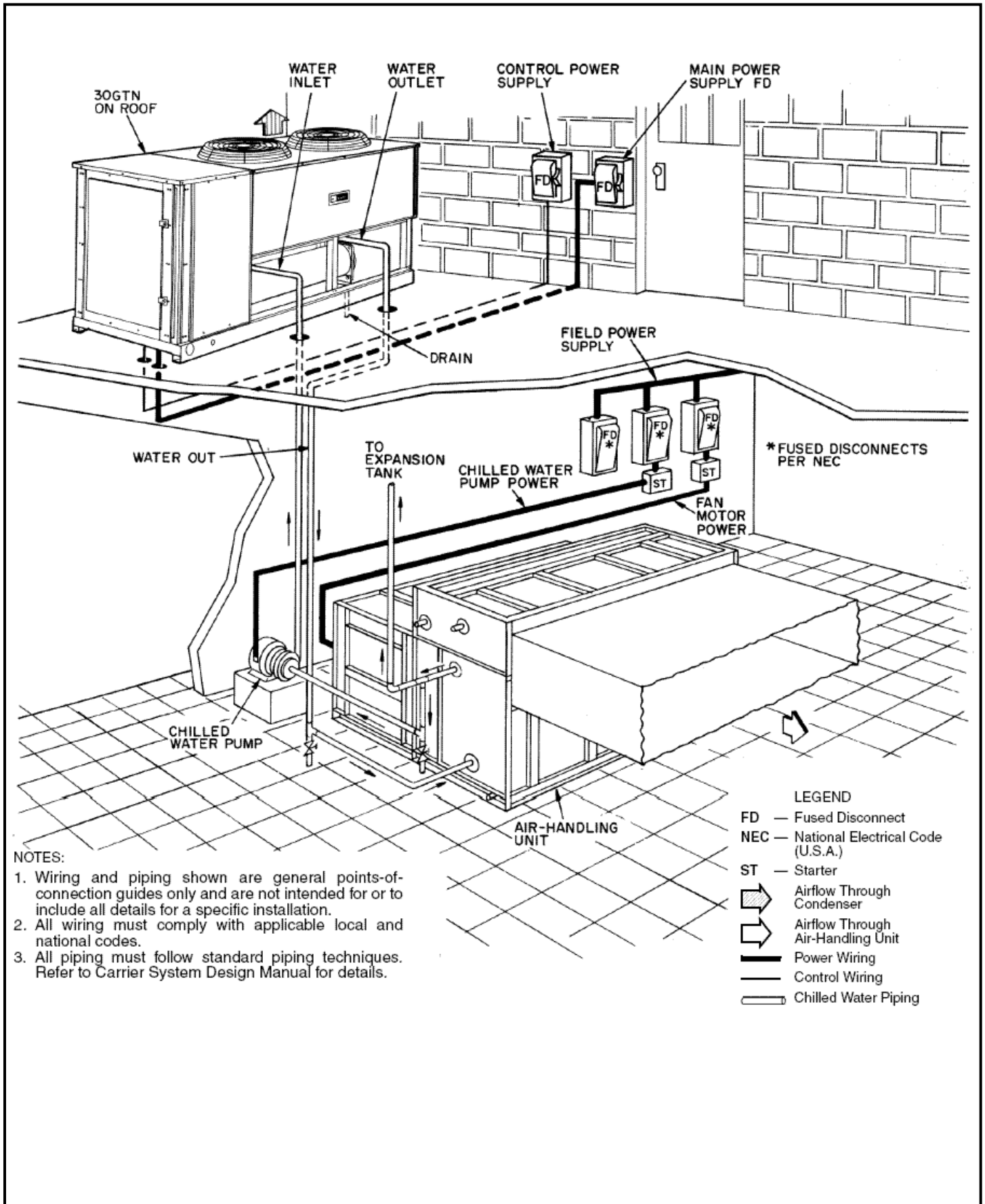
Diagnostics

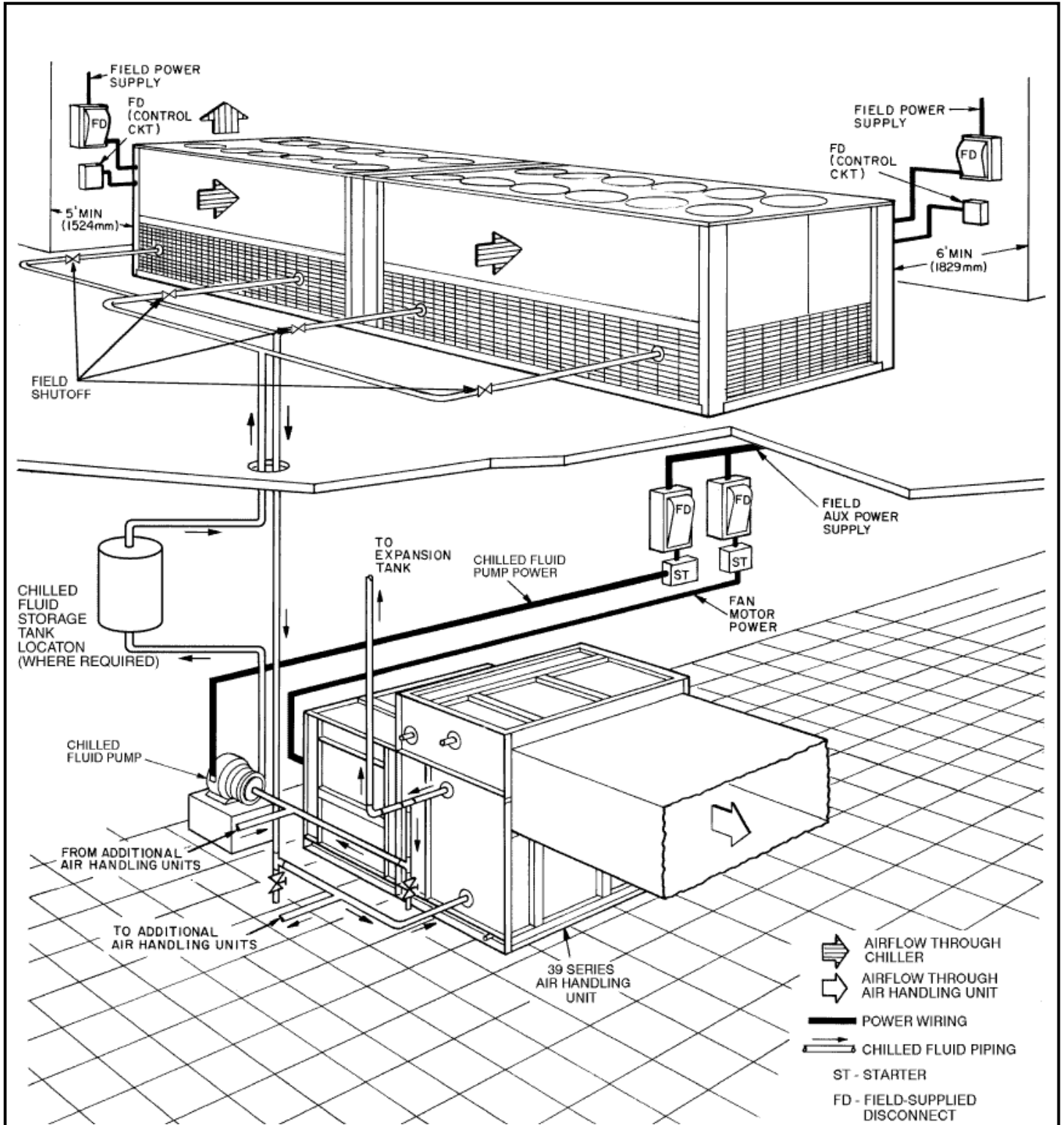
Microprocessor may be put through service test (see Controls, Start-Up, Operation, Service and Troubleshooting literature) without additional equipment or tools. Service test confirms microprocessor is functional, informs observer through display the condition of each sensor and switch in chiller, and allows observer to check for proper operation of fans and compressor(s).

Default settings

To facilitate quick start-ups, all 30GTN,GTR chillers with *ComfortLink™* controls are pre-configured with a default setting that assumes stand-alone operation supplying 44°F (6.7°C) chilled water.

Configuration setting will be based on any options or accessories included with the unit at the time of manufacturing. Date and time and will need reconfiguring based on location and local time zone. If operation based on occupancy scheduling is desired, this will also need to be set during installation .





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 section on page 44 for minimum system fluid volume. This may require the addition of a holding tank to ensure adequate volume.

Reciprocating Air-Cooled Liquid Chiller

HVAC Guide Specifications

Size Range: **50 to 410 Tons (179 to 1445 kW) Nominal**

Carrier Model Number: **30GTN,GTR**

Part 1 – General

1.01 SYSTEM DESCRIPTION

Easy-to-use, microprocessor-controlled air-cooled liquid chiller utilizing reciprocating compressors and long-stroke electronic expansion valves.

1.02 QUALITY ASSURANCE

A. Unit construction shall be designed to conform to ASHRAE 15 latest revision safety standard, NEC (U.S.A.), and ASME (U.S.A.) applicable codes.

B. Unit shall be manufactured in a facility registered to ISO 9001 (International Standards Organization) manufacturing quality standard.

C. Unit operation shall be fully tested at the factory.

1.03 DELIVERY, STORAGE AND HANDLING

A. Unit shall be stored and handled per unit manufacturer's recommendations.

B. Unit controls shall be capable of withstanding 150°F (66°C) storage temperature in the control compartment for an indefinite period of time.

Part 2 - Products

2.01 EQUIPMENT

A. General:

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

B. Unit Cabinet:

1. Frame shall be of heavy-gage galvanized steel members.
2. Cabinet shall be galvanized steel casing with a powder painted finish.
3. Cabinet shall be capable of withstanding 500-hour salt spray test in accordance with the ASTM-B117 standard.

C. Fans:

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

1. Permanently lubricated bearings.
2. Steel wire safety guards.
3. Statically and dynamically balanced fan blades.

D. Compressors:

1. Reciprocating semi-hermetic type only.
2. Each equipped with an automatically reversible oil pump, operating oil charge, suction and discharge shutoff valves, and an insert-type factory sized crankcase heater to control oil dilution.

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

E. Cooler:

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

F. Condenser:

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

G. Refrigeration Components:

Refrigerant circuit components shall include hot gas muffler, high side pressure switch, liquid line shutoff valves, suction and discharge shutoff valves, filter drier, moisture-indicating sight glass, stepper motor actuated electronic expansion valve (EXV), 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) Clear language, expandable, alpha numeric diagnostic display/set point panel.
 - 6) Thermistor installed to measure saturated condensing temperature, compressor return gas temperature, and cooler entering and leaving fluid temperatures.

- b. Unit controls shall be capable of performing the following functions
- 1) Automatic circuit lead/lag (accessory required for 050-070 sizes).
 - 2) Pumpout at beginning and end of every circuit cycle.
 - 3) Capacity control based on leaving chilled fluid temperature and compensated by rate of change of return-fluid temperature.
 - 4) Limiting of the chilled fluid temperature pulldown rate at start-up to 1°F (.56°C) per minute to prevent excessive demand spikes (charges) at start-up.
 - 5) Seven-day time schedule.
 - 6) Leaving chilled fluid temperature reset from return fluid, outdoor air temperature, space temperature, or 4 to 20 mA input.
 - 7) Demand limit control with 2-stage control (0 to 100% each) or through 4 to 20 mA input (0 to 100%).
2. Safeties:
- a. Unit shall be equipped with thermistors and all necessary components in conjunction with the control system to provide the unit with the following protections:
- 1) Loss of refrigerant charge protection.
 - 2) Low fluid flow detection.
 - 3) Low chilled fluid temperature protection.
 - 4) Low and high superheat protection.
 - 5) Low control voltage (to unit) protection.
 - 6) High pressure switch.
 - 7) Low oil protection for each compressor circuit (sizes 080-420).
 - 8) Ground current compressor protection (sizes 080-420 and 070, 50Hz).
- 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. The 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. Information included for display shall be:
- 1) Compressor lockout.
 - 2) Loss of charge.
 - 3) Low fluid flow.
 - 4) Low oil pressure.
 - 5) Cooler freeze protection.
 - 6) High or low suction superheat.
 - 7) Thermistor malfunction.
 - 8) Entering and leaving-fluid temperature.
 - 9) Evaporator and condenser pressure.
 - 10) Electronic expansion valve positions.
 - 11) All set points.
 - 12) Time of day.
- b. Display module, in conjunction with the microprocessor, must also be capable of displaying the output (results) of a service test. Service test shall verify operation of every switch, thermistor, fan, and compressor before chiller is started.
- I. Operating Characteristics:
1. Unit shall be capable of starting and running fully loaded at outdoor ambient temperatures from 0° F to 125 F (-18 to 52 C), without special controls.
 2. Unit shall be capable of starting up with 95 F (35 C) entering-fluid temperature to the cooler.
 3. Multi-step cooling capacity control shall be accomplished through the use of unloaders and compressor staging.
 4. Two refrigerant circuits shall be provided to protect against loss of total capacity.
 5. Unit shall have automatic lead/lag feature to automatically alternate the lead circuit to ensure even compressor wear.
- J. Motors:
1. Compressor motors shall be cooled by suction gas passing around motor windings.
 2. Condenser-fan motors shall be 3-phase type with permanently lubricated bearings and Class F insulation.
 3. Fan motors are totally enclosed, air-over (TEAO) type in accordance with IP-55 (50 Hz only).
- K. Electrical Requirements:
1. Unit primary electrical power supply (3-phase) shall be connected to a single location
 2. Unit shall be shipped with factory control and power wiring installed.
- L. Special features:
- Certain standard features are not applicable when the features designated by * are specified. For assistance in amending the specifications, your local Carrier Sales Office should be contacted
- *1. Low Ambient Temperature Operation:
Unit shall be capable of operating down to 0° F (-18 C) with the addition of antifreeze with suitable corrosion inhibitor in the evaporator circuit, and with the addition of field-fabricated and field-installed wind baffles. The wind baffles shall be installed when wind velocity greater than 5 mph (8 km/h) is anticipated, and ambient temperature is below 32 F (0° C).
2. Unloaders:
Electric suction cutoff unloaders shall be field-installed as required.
- *3. Cooler Heater:
Optional factory-installed heater shall protect cooler to -20°F (-29°C).

4. Optional Condenser Coil Materials:

- a. **Pre-coated Aluminium Fin Coils:**
Shall have a durable Epoxy-phenolic coating to provide protection in mildly corrosive coastal environments. Coating shall be applied to the aluminum fin stock prior to the fin stamping process to create an inert barrier between the aluminum fin and copper tube. Epoxy-phenolic barrier shall minimize galvanic action between dissimilar metals.
- b. **Copper-Fin Coils:**
Shall be constructed of copper fins mechanically bonded to copper tubes. A polymer strip shall prevent coil assembly from contacting sheet metal coil pan to minimize potential for galvanic corrosion between the coil and pan. All copper construction shall provide protection in moderate coastal applications.

5. 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.

*6. Part-Wind Start:

Shall be factory installed to reduce compressor inrush current.

7. Flow Switch:

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

8. Ground current compressor protection:

Protection shall be standard with sizes 080-420 and 070 (50Hz).

9. Pressure gages:

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

10. Oil Pressure Switch:

Unit shall be equipped with an oil pressure safety switch to protect compressor against loss of lubrication (accessory for sizes 050, 060, 070 [60Hz]; standard on sizes 070 [50Hz], 050-070 brine units, and 080-4200.

*11. High Static Fan:

Special condenser fans, motors, and mounts shall be factory installed allowing fans to generate 0.4 in. wg (0.10 kPa) and 1 in. wg (0.25 kPa) static pressure external to the chiller at nominal condenser airflow (cfm).

12. Compressor Expansion Board:

Shall include accessory compressor expansion board for use with multiple compressor unit.



Carrier International Sdn. Bhd. (3385-T)
Lot 4, Jalan P/6, 43650 Bandar Baru Bangi,
Selangor, Malaysia.
Tel: 03-8925 8001
Fax: 03-8925 3578