

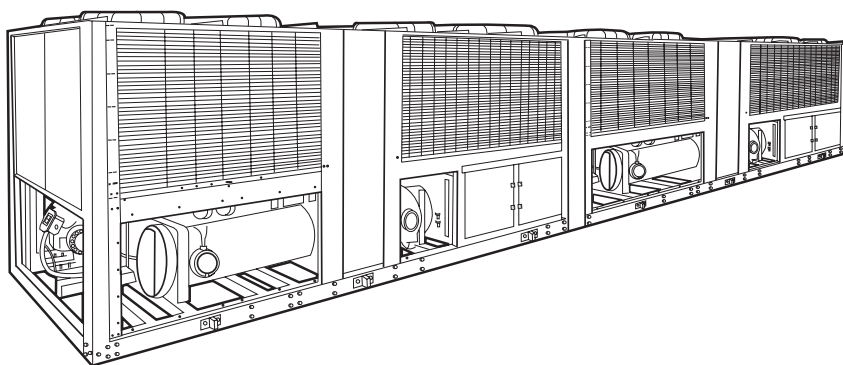
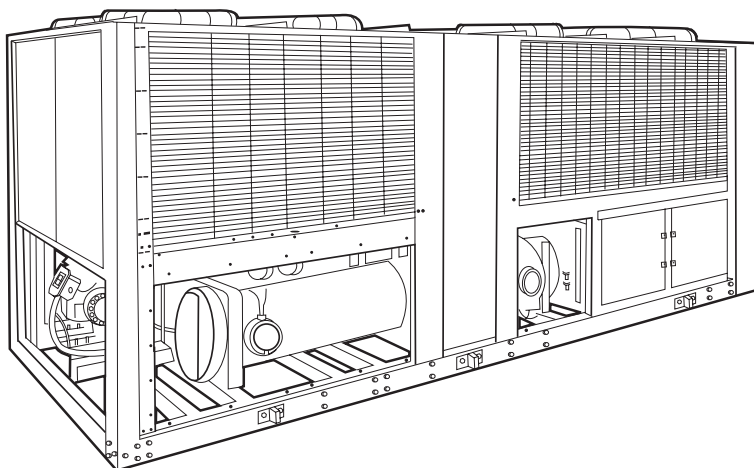


Product Data

30GUN,GUR Air-Cooled Reciprocating Liquid Chillers (HFC-134a) with *ComfortLink*[™] Controls 50/60 Hz

Nominal Capacities: 25 to 280 Tons
88 to 985 kW

ComfortLink[™]



Features/Benefits

***ComfortLink* control**

Your link to a world of simple and easy to use air-cooled chillers that offer outstanding performance and value. The 30GUN,GUR 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 complement the standard features, linking you to a world of carefree comfort. The 30GUN,GUR 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 30GUN,GUR 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 30GUN,GUR 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 30GUN,GUR 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 thermostat. 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 (60 Hz 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 30GUN,GUR 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 10.4 EER) and part load operation (IPLVs up to 14.3). 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 thermostatic 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 30GUN,GUR 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 60 Hz) is factory run tested at full load. Individual components are also tested at many levels to assure that only the

best parts make it into 30GUN,GUR chillers. Long life and reliability are also a function of design. 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 among 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 McMinnville, Tennessee (U.S.A.) plant is an ISO 9002/BS 5750 part 2 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.
- Full load factory run tested.
- Wide range of sizes available from stock.
- History of proven performance and reliability.

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Model number nomenclature



30GU – Air-Cooled Liquid Chiller with HFC-134a	N – Across-The-Line Start with <i>ComfortLink™</i> Controls	130	-	E	C	9	2	3	--
Compressor Start N – Across-The-Line Start with <i>ComfortLink™</i> Controls R – Part-Wind Start with <i>ComfortLink</i> Controls				Options -- – NOTE: Contact your Carrier representative for details on available factory-installed options.					
Unit Sizes* 040 070 110 190 255 330 045 080 130 210 270 360 050 090 150 230 290 390 060 100 170 245 315 420				Packaging 1 – Domestic 3 – Export					
Module Designation (230-420 Unit Sizes Only)* A B				Series V-Ph-Hz 1 – 575-3-60 2 – 380-3-60† 5 – 208/230-3-60 6 – 460-3-60 9 – 380/415-3-50†					
Convenience Group Options - – Standard Marquee Display E – Standard Marquee Display with Energy Management Option S – Service Option with Navigator Display				Condenser Coil Options - – Copper Tube, Aluminum Fins C – Copper Tube, Copper Fins E – E-Coated Aluminum Fin/Copper Tube F – E-Coated Copper Fin/Copper Tube K – Copper Tube, Pre-Coated Aluminum Fins					

*UNIT SIZES AND MODULAR COMBINATIONS

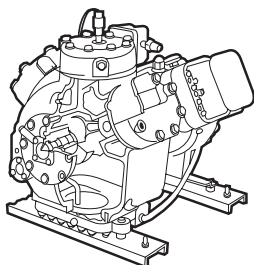
UNIT MODEL 30GUN,GUR	TOTAL UNIT		SECTION A UNIT 30GUN,GUR	SECTION B UNIT 30GUN,GUR
	Nominal Tons	kW		
040	25	88	—	—
045	28	98	—	—
050	34	120	—	—
060	40	141	—	—
070	48	169	—	—
080	55	193	—	—
090	50	211	—	—
100	70	246	—	—
110	75	264	—	—
130**	85	299	—	—
150**	100	352	—	—
170**	110	387	—	—
190**	120	422	—	—
210**	140	492	—	—
230**	155	545	150	080
245**	160	563	150	090
255**	170	598	150	100
270**	180	633	170	100
290**	195	686	190	110
315**	215	756	210	110
330**	220	774	170	170
360**	240/230††	844/809††	190	190/170††
390**	260	914	210	190
420**	280	985	210	210

†Export only — Not for U.S. domestic sale.

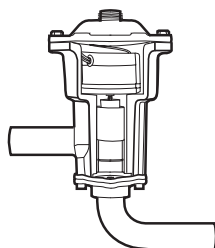
**Requires special order. Contact factory.

††60-Hz units/50-Hz units.

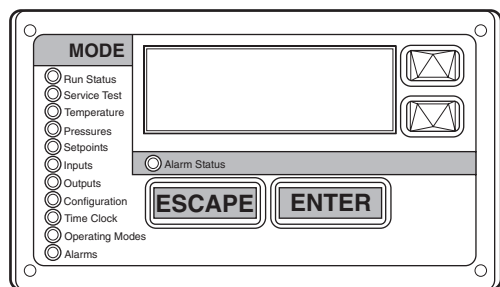
Features/Benefits (cont)



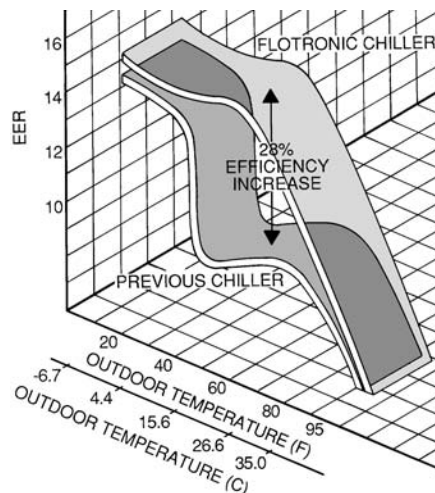
06E COMPRESSOR



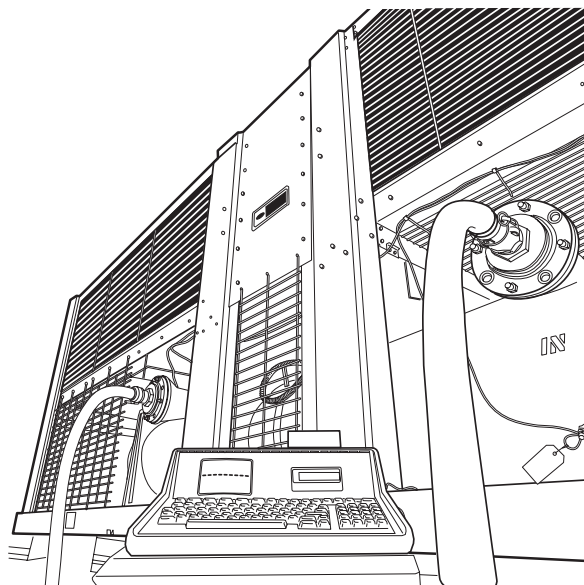
ELECTRONIC EXPANSION VALVE (EXV)



STANDARD MARQUEE DISPLAY



**PART-LOAD EFFICIENCY
28% GAIN**



FACTORY SERVICE TEST

Quality Assurance



Certificate No FM 21837

Approvals:

ISO 9002

EN 29002

BS5750 PART 2

ANSI/ASQC Q92

Performance Assurance



Certified in accordance with the ARI Water-Chilling Packages using the Vapor Compression Cycle Program, which is based on ARI Standard 550/590 (60 Hz only, up to 200.1 tons).

Physical data



60 Hz ENGLISH

30GUN,GUR UNIT SIZE	040	045	050	060	070	080	090	100	110
SYSTEM MODULES	—	—	—	—	—	—	—	—	—
APPROX OPERATING WEIGHT (lb)									
Cu-Al	3550	3681	3856	4740	5028	6630	7015	8610	8660
Cu-Cu	3838	3969	4289	5157	5656	7355	7740	9560	9610
REFRIGERANT									
Type									
Charge, Total/Over Clear Glass (lb)									
Ckt A	53/16	53/16	68/17	67/19	96/20	102/20	102/20	129/25	129/25
Ckt B	60/15	60/15	79/16	76/21	96/20	102/20	102/20	129/25	129/25
COMPRESSORS									
Speed (rpm)									
06E* (Qty) Ckt A	(1) 250	(1) 250	(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) 250	(1) 265	(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	4	4	6	8	8	8
Capacity (%)									
Ckt A	50.0	42.4	47.6	43.3	50.0	56.0	47.0	50.0	54.0
Ckt B	50.0	57.6	52.4	56.7	50.0	44.0	53.0	50.0	46.0
Minimum Capacity Step (%)	25.0	21.2	31.7	28.8	33.3	22.0	18.0	15.0	14.0
CONDENSER FANS									
Standard									
Fan Speed (rpm)									
No. Blades...Dia. (in.)									
No. Fans...Hp/kW (each)									
Total Airflow (cfm)	4...1/0.746	4...1/0.746	4...1/0.746	6...1/0.746	6...1/0.746	6...1/0.746	6...1/0.746	8...1/0.746	8...1/0.746
High Static	35,000	35,000	34,000	52,000	51,000	57,000	57,000	76,000	76,000
Fan Speed (rpm)									
No. Blades...Dia. (in.)									
No. Fans...Hp/kW (each)									
Total Airflow (cfm)**	4...5/3.73	4...5/3.73	4...5/3.73	6...5/3.73	6...5/3.73	6...5/3.73	6...5/3.73	8...5/3.73	8...5/3.73
CONDENSER COILS	40,000	40,000	40,000	60,000	60,000	60,000	60,000	80,000	80,000
Fins/in.	17	17	17	17	17	17	17	17	17
No. Rows (Ckt A or B)	2	2	3	2	3	3	3	3	3
Face Area, Ckt A and B Total (sq ft)	80.5	80.5	80.5	116.7	116.7	128.3	128.3	168.0	168.0
Max Working Pressure Refrigerant (psig)									
COOLER									
Weight (empty, lb)	485	545	545	620	620	745	745	860	860
No. Refrigerant Circuits									
Net Water Volume, includes nozzles (gal.)	10.9	13.5	13.5	18.0	18.0	24.5	24.5	30.3	30.3
Max Working Pressure Refrigerant Side (psig)	278	278	278	278	278	278	278	278	278
Max Working Pressure Fluid Side (psig)	300	300	300	300	300	300	300	300	300
FLUID CONNECTIONS (in.)									
Inlet and Outlet	3	3	3	4	4	4	4	5	5
Drain (NPT)									

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.
 †See Controls, Operation and Troubleshooting book for recommended oil.
 **Based on rated external static pressure of 0.4 or 1.0 in. wg as appropriate.
 NOTE: Facing the compressors, Circuit A is on the right and Circuit B is on the left.

Physical data (cont)



60 Hz ENGLISH (cont)

30GUN,GUR UNIT SIZE	130	150	170	190	210	230
SYSTEM MODULES						
APPROX OPERATING WEIGHT (lb)						
Cu-Al	10,046	10,481	11,293	12,676	13,380	17,111
Cu-Cu	11,318	11,753	12,565	14,195	14,899	19,108
REFRIGERANT						
Type						
Charge, Total/Over Clear Glass (lb)						
Ckt A	162/33.5	162/39	162/46	190/32	190/40	102/20
Ckt B	162/33.5	162/39	162/46	190/32	190/40	102/20
COMPRESSORS						
Speed (rpm)						
06E* (Qty) Ckt A	(1) 275, (1) 299	(3) 265	(3) 275	(1) 265, (1) 275, (1) 299	(3) 265, (1) 275, (1) 299	(1) 250, (1) 275
(Qty) Ckt B	(1) 275, (1) 299	(2) 299	(3) 275	(1) 265, (1) 275, (1) 299	(1) 275, (2) 299	(1) 299
Oil Charge (Compressor/pt)				250/14.0, 265/19.0, 275/19.0, 299/19.0		
No. Capacity Control Steps	8	10	12	6	7	6
Capacity (%)						
Ckt A	50	50	50	50	50	56
Ckt B	50	50	50	50	50	44
Minimum Capacity Step (%)	14	11	11	14	12	22
CONDENSER FANS						
Standard						
Fan Speed (rpm)	1140	1140	1140	1140	1140	1140
No. Blades...Dia. (in.)	4...30	4...30	4...30	4...30	4...30	4...30
No. Fans...Hp/kW (each)	10...1/0.746	10...1/0.746	10...1/0.746	12...1/0.746	10...1/0.746	6...1/0.746
Total Airflow (cfm)	100,000	100,000	100,000	120,000	100,000	57,000
High Static						
Fan Speed (rpm)	1740	1740	1740	1740	1740	1740
No. Blades...Dia. (in.)	12...30	12...30	12...30	12...30	12...30	12...30
No. Fans...Hp/kW (each)	10...5/3.73	10...5/3.73	10...5/3.73	12...5/3.73	10...5/3.73	6...5/3.73
Total Airflow (cfm)**	100,000	100,000	100,000	120,000	100,000	60,000
CONDENSER COILS						
Fins/in.	17	17	17	17	17	17
No. Rows (Ckt A or B)	3	3	3	3	3	3
Face Area, Ckt A and B Total (sq ft)	225.1	225.1	225.1	268.9	225.1	128.3
Max Working Pressure Refrigerant (psig)	450	450	450	450	450	450
COOLER						
Weight (empty, lb)	1320	1320	1630	1865	1320	745
No. Refrigerant Circuits	2	2	2	2	2	2
Net Water Volume, includes nozzles (gal.)	52.0	52.0	61.0	70.4	52.0	24.5
Max Working Pressure Refrigerant Side (psig)	278	278	278	278	278	278
Max Working Pressure Fluid Side (psig)	300	300	300	300	300	300
FLUID CONNECTIONS (in.)						
Inlet and Outlet	6	6	6	6	6	4
Drain (NPT)						

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.

†See Controls, Operation and Troubleshooting book for recommended oil.

**Based on rated external static pressure of 0.4 or 1.0 in. wg as appropriate.

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

60 Hz ENGLISH (cont)

30GUN,GUR UNIT SIZE		245		255		270	
SYSTEM MODULES		A	B	Total	A	B	Total
APPROX OPERATING WEIGHT (lb)							
Cu-Al		10,481	7015	17,496	10,481	8610	19,091
Cu-Cu		11,753	7740	19,493	11,753	9560	21,313
REFRIGERANT							
Type							
Charge, Total/Over Clear Glass (lb)							
Ckt A		162/39	102/20	—/—	162/39	129/25	—/—
Ckt B		162/39	102/20	—/—	162/39	129/25	—/—
COMPRESSORS							
Speed (rpm)							
06E* (Qty) Ckt A		(3) 265	(1) 265, (1) 250	—	(3) 265	(1) 265, (1) 275	—
(Qty) Ckt B		(2) 299	(2) 265	—	(2) 299	(1) 265, (1) 275	—
Oil Charge† (Compressor/pt)							
No. Capacity Control Steps		10	8	—	10	8	—
Capacity (%)		50	47	—	50	50	—
Ckt A		50	53	—	50	50	—
Ckt B		11	18	—	11	15	—
CONDENSER FANS							
Minimum Capacity Step (%)							
Standard							
Fan Speed (rpm)		1140	1140	—	1140	1140	—
No. Blades...Dia. (in.)		4...30	4...30	—	4...30	4...30	—
No. Fans...Hp/kW (each)		10...1/0.746	6...1/0.746	16...1/0.746	10...1/0.746	8...1/0.746	18...1/0.746
Total Airflow (cfm)		100,000	57,000	157,000	100,000	76,000	176,000
High Static							
Fan Speed (rpm)		1740	1740	—	1740	1740	—
No. Blades...Dia. (in.)		12...30	12...30	—	12...30	12...30	—
No. Fans...Hp/kW (each)		10...5/3.73	6...5/3.73	16...5/3.73	10...5/3.73	8...5/3.73	18...5/3.73
Total Airflow (cfm)**		100,000	60,000	160,000	100,000	80,000	180,000
CONDENSER COILS							
Fins/in.		17	17	—	17	17	—
No. Rows (Ckt A or B)		3	3	—	3	3	—
Face Area, Ckt A and B Total (sq ft)		225.1	128.3	353.4	225.1	168.0	393.1
Max Working Pressure Refrigerant (psig)		450	450	—	450	450	—
COOLER							
Weight (empty, lb)		1320	745	2065	1320	860	2180
No. Refrigerant Circuits		2	2	4	2	2	4
Net Water Volume, includes nozzles (gal.)		52.0	24.5	76.5	52.0	30.3	82.3
Max Working Pressure Refrigerant Side (psig)		278	278	—	278	278	—
Max Working Pressure Fluid Side (psig)		300	300	—	300	300	—
FLUID CONNECTIONS (in.)							
Inlet and Outlet		6	4	—	6	5	—
Drain (NPT)		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.
†See Controls, Operation and Troubleshooting book for recommended oil.
**Based on rated external static pressure of 0.4 or 1.0 in. wg as appropriate.
NOTE: Facing the compressors, Circuit A is on the right and Circuit B is on the left.

Physical data (cont)



60 Hz ENGLISH (cont)

30GUN, GUR UNIT SIZE		290			315			330		
SYSTEM MODULES		A	B	Total	A	B	Total	A	B	Total
APPROX OPERATING WEIGHT (lb)										
Cu-Al	Charge, Total Over Clear Glass (lb)	12,676	8660	21,336	13,380	8660	22,040	11,293	8660	22,586
	Cu-Cu	14,195	9610	23,805	14,899	9610	24,509	12,565	9610	25,130
REFRIGERANT		R-134a								
Type Charge, Total Over Clear Glass (lb)		190/32	129/25	—/—	190/40	129/25	—/—	162/46	129/25	—/—
Ckt A		190/32	129/25	—/—	190/40	129/25	—/—	162/46	129/25	—/—
Ckt B		190/32	129/25	—/—	190/40	129/25	—/—	162/46	129/25	—/—
COMPRESSORS		Reciprocating, Semi-Hermetic								
Speed (rpm)		(1) 265, (1) 275, (1) 299	(1) 265, (1) 299	—	(1) 265, (1) 275	(1) 265, (1) 299	—	(3) 275	(1) 265, (1) 299	—
06E* (Qty) Ckt A		(1) 265, (1) 275, (1) 299	(1) 265, (1) 299	—	(1) 265, (1) 275	(1) 265, (1) 299	—	(3) 275	(1) 265, (1) 299	—
Oil Charge (lb)		(1) 265, (1) 275, (1) 299	(1) 265, (1) 299	—	(1) 265, (1) 275	(1) 265, (1) 299	—	(3) 275	(1) 265, (1) 299	—
No. Capacity Control Steps		6	8	—	7	8	—	12	8	—
Capacity (%)		50	54	—	50	54	—	50	54	—
Ckt A		50	46	—	50	46	—	50	46	—
Ckt B		14	14	—	12	14	—	11	14	—
Minimum Capacity Step (%)		—	—	—	—	—	—	—	—	—
CONDENSER FANS		Propeller, Direct Drive								
Standard		1140	1140	—	1140	1140	—	1140	1140	—
Fan Speed (rpm)		4...30	4...30	—	4...30	4...30	—	4...30	4...30	—
No. Blades...Dia. (in.)		12...1/0.746	8...1/0.746	20...1/0.746	12...1/0.746	8...1/0.746	20...1/0.746	10...1/0.746	8...1/0.746	20...1/0.746
No. Fans...Hp/kW (each)		120,000	76,000	196,000	120,000	76,000	196,000	100,000	76,000	200,000
Total Airflow (cfm)		—	—	—	—	—	—	—	—	—
High Static		1740	1740	—	1740	1740	—	1740	1740	—
Fan Speed (rpm)		12...30	12...30	—	12...30	12...30	—	12...30	12...30	—
No. Blades...Dia. (in.)		12...5/3.73	8...5/3.73	20...5/3.73	12...5/3.73	8...5/3.73	20...5/3.73	10...5/3.73	8...5/3.73	20...5/3.73
No. Fans...Hp/kW (each)		120,000	80,000	200,000	120,000	80,000	200,000	100,000	80,000	200,000
Total Airflow (cfm)**		—	—	—	—	—	—	—	—	—
CONDENSER COILS		3/8-in. OD, Vertical and Horizontal, Plate Fin, Enhanced Copper Tubing								
Fins/in.		17	17	—	17	17	—	17	17	—
No. Rows (Ckt A or B)		3	3	—	3	3	—	3	3	—
Face Area, Ckt A and B Total (sq ft)		268.9	168.0	436.9	268.9	168.0	436.9	225.1	168.0	450.2
Max Working Pressure Refrigerant (psig)		450	450	—	450	450	—	450	450	—
COOLER		One Per Module...Direct Expansion, Shell and Tube								
Weight (empty, lb)		1630	860	2490	1865	860	2725	1630	860	3260
No. Refrigerant Circuits		2	2	4	2	2	4	2	2	4
Net Water Volume, Includes nozzles (gal.)		61.0	30.3	91.3	70.4	30.3	100.7	61.0	30.3	122.0
Max Working Pressure Refrigerant Side (psig)		278	278	—	278	278	—	278	278	—
Max Working Pressure Fluid Side (psig)		300	300	—	300	300	—	300	300	—
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 — Aluminum Fins Condenser Coil
 Cu-Cu — Copper Tubing — Copper Fins Condenser Coil
 OD — Outside Diameter

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

† See Controls, Operation and Troubleshooting book for recommended oil.

** Based on rated external static pressure of 0.4 or 1.0 in. wg as appropriate.

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

60 Hz ENGLISH (cont)

30GUN, GUR UNIT SIZE				360				390				420			
SYSTEM MODULES				A	B	Total	A	B	Total	A	B	Total	A	B	Total
APPROX OPERATING WEIGHT (lb)															
Cu-AI				12,676	12,676	25,352	13,380	12,676	26,056	13,380	13,380	26,760	13,380	13,380	26,760
Cu-Cu				14,195	14,195	28,390	14,899	14,195	29,094	14,899	14,899	29,798	14,899	14,899	29,798
REFRIGERANT															
Type Charge, Total/Over Clear Glass (lb)															
Ckt A				190/32	190/32	—/—	190/40	190/32	—/—	190/40	190/40	—/—	190/40	190/40	—/—
Ckt B				190/32	190/32	—/—	190/40	190/32	—/—	190/40	190/40	—/—	190/40	190/40	—/—
COMPRESSORS															
Speed (rpm)															
06E* (Qty) Ckt A				(1) 265, (1) 275, (1) 299	(1) 265, (1) 275, (1) 299	—	(3) 265, (1) 275, (1) 299	(1) 265, (1) 275, (1) 299	—	(3) 265, (1) 275, (1) 299	(3) 265, (1) 275, (1) 299	—	(3) 265, (1) 275, (1) 299	(3) 265, (1) 275, (1) 299	—
(Qty) Ckt B				(1) 265, (1) 275, (1) 299	(1) 265, (1) 275, (1) 299	—	(1) 275, (2) 299	(1) 265, (1) 275, (1) 299	—	(1) 275, (2) 299	(1) 275, (2) 299	—	(1) 275, (2) 299	(1) 275, (2) 299	—
Oil Charge (Compressor/pt)															
No. Capacity Control Steps				6	6	—	7	6	—	7	7	—	7	7	—
Capacity (%)															
Ckt A				50	50	—	50	50	—	50	50	—	50	50	—
Ckt B				50	50	—	50	50	—	50	50	—	50	50	—
Minimum Capacity Step (%)				14	14	—	12	14	—	12	12	—	12	12	—
CONDENSER FANS															
Standard															
Fan Speed (rpm)				1140	1140	—	1140	1140	—	1140	1140	—	1140	1140	—
No. Blades...Dia. (in.)				4...30	4...30	—	4...30	4...30	—	4...30	4...30	—	4...30	4...30	—
No. Fans...Hp/kW (each)				12...1/0.746	12...1/0.746	24...1/0.746	12...1/0.746	12...1/0.746	24...1/0.746	12...1/0.746	12...1/0.746	24...1/0.746	12...1/0.746	12...1/0.746	24...1/0.746
Total Airflow (cfm)				120,000	120,000	240,000	120,000	120,000	240,000	120,000	120,000	240,000	120,000	120,000	240,000
High Static															
Fan Speed (rpm)				1740	1740	—	1740	1740	—	1740	1740	—	1740	1740	—
No. Blades...Dia. (in.)				12...30	12...30	—	12...30	12...30	—	12...30	12...30	—	12...30	12...30	—
No. Fans...Hp/kW (each)				12...5/3.73	12...5/3.73	24...5/3.73	12...5/3.73	12...5/3.73	24...5/3.73	12...5/3.73	12...5/3.73	24...5/3.73	12...5/3.73	12...5/3.73	24...5/3.73
Total Airflow (cfm)**				120,000	120,000	240,000	120,000	120,000	240,000	120,000	120,000	240,000	120,000	120,000	240,000
CONDENSER COILS															
Fins/in.				17	17	—	17	17	—	17	17	—	17	17	—
No. Rows (Ckt A or B)				3	3	—	3	3	—	3	3	—	3	3	—
Face Area, Ckt A and B Total (sq ft)				268.9	268.9	537.8	268.9	268.9	537.8	268.9	268.9	537.8	268.9	268.9	537.8
Max Working Pressure Refrigerant (psig)				450	450	—	450	450	—	450	450	—	450	450	—
COOLER															
Weight (empty, lb)				1630	1630	3260	1865	1630	3495	1865	1865	3730	1865	1865	3730
No. Refrigerant Circuits				2	2	4	2	2	4	2	2	4	2	2	4
Net Water Volume, includes nozzles (gal.)				61.0	61.0	122	70.4	61.0	131.4	70.4	70.4	140.8	70.4	70.4	140.8
Max Working Pressure Refrigerant Side (psig)				278	278	—	278	278	—	278	278	—	278	278	—
Max Working Pressure Fluid Side (psig)				300	300	—	300	300	—	300	300	—	300	300	—
FLUID CONNECTIONS (in.)															
Inlet and Outlet				6	6	—	6	6	—	6	6	—	6	6	—
Drain (NPT)				3/4	3/4	—	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.
†See Controls, Operation and Troubleshooting book for recommended oil.
**Based on rated external static pressure of 0.4 or 1.0 in. wg as appropriate.
NOTE: Facing the compressors, Circuit A is on the right and Circuit B is on the left.

Physical data (cont)



60 Hz SI

30GUN, GUR UNIT SIZE	040	045	050	060	070	080	090	100	110
SYSTEM MODULES	—	—	—	—	—	—	—	—	—
APPROX OPERATING WEIGHT (kg)									
Cu-Al	1610	1669	1749	2150	2280	3013	3189	3914	3935
Cu-Cu	1741	1800	1945	2339	2565	3343	3518	4346	4368
REFRIGERANT									
Type									
Charge, Total/Over Clear Glass (kg)									
Ckt A	24.0/7.2	24.0/7.2	30.8/7.7	30.4/8.6	43.5/9.0	46.3/9.0	46.3/9.0	58.5/11.5	48.5/11.5
Ckt B	27.2/6.8	27.0/7.2	35.8/7.2	34.5/9.5	43.5/9.0	46.3/9.0	46.3/9.0	58.5/11.5	58.5/11.5
COMPRESSORS									
Speed (r/s)									
06E* (Qty) Ckt A	(1) 250	(1) 250	(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) 250	(1) 265	(1) 275	(1) 299	(1) 299	(1) 299	(2) 265	(1) 265, (1) 275	(1) 265, (1) 275
Oil Charge† (Compressor/L)									
No. Capacity Control Steps	4	4	4	4	4	6	8	8	8
Capacity (%)									
Ckt A	50.0	42.4	47.6	43.3	50.0	56.0	47.0	50.0	54.0
Ckt B	50.0	57.6	52.4	56.7	50.0	44.0	53.0	50.0	46.0
Minimum Capacity Step (%)	25.0	21.2	31.7	28.8	33.3	22.0	18.0	15.0	14.0
CONDENSER FANS									
Standard									
Fan Speed (r/s)									
No. Blades...Dia. (mm)									
No. Fans...kW (each)	4...0.746	4...0.746	4...0.746	6...0.746	6...0.746	6...0.746	6...0.746	8...0.746	8...0.746
Total Airflow (L/s)	16,517	16,517	16,045	25,540	24,068	26,898	26,898	35,864	35,864
High Static									
Fan Speed (r/s)									
No. Blades...Dia. (mm)									
No. Fans...kW (each)	4...3.73	4...3.73	4...3.73	6...3.73	6...3.73	6...3.73	6...3.73	8...3.73	8...3.73
Total Airflow (L/s)**	18,876	18,876	18,876	28,315	28,315	28,315	28,315	37,750	37,750
CONDENSER COILS									
Fins/in.									
No. Rows (Ckt A or B)	669	669	669	669	669	669	669	669	669
Face Area, Ckt A and B Total (sq m)	2	2	3	2	3	3	3	3	3
Max Working Pressure Refrigerant (kPa)	7.48	7.48	7.48	10.84	10.84	11.92	11.92	15.61	15.61
COOLER									
Weight (empty, kg)									
No. Refrigerant Circuits	220	248	248	282	282	338	338	391	391
Net Water Volume, includes nozzles (L)	41.3	51.1	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	1916	1916
Max Working Pressure Fluid Side (kPa)	2068	2068	2068	2068	2068	2068	2068	2068	2068
FLUID CONNECTIONS (in.)									
Inlet and Outlet	3	3	3	4	4	4	4	5	5
Drain (NPT)									

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.
†See Controls, Operation and Troubleshooting book for recommended oil.
**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.

60 Hz, SI (cont)

30GUN,GUR UNIT SIZE	130	150	170	190	210	230
SYSTEM MODULES	—	—	—	—	—	—
APPROX OPERATING WEIGHT (kg)						
Cu-Al	4566	4754	5133	5761	6081	3013
Cu-Cu	5144	5342	5711	6452	6772	3343
REFRIGERANT						
Type						
Charge, Total/Over Clear Glass (kg)						
Ckt A	73.5/16.1	73.5/18.0	73.5/21.1	86.2/14.8	86.2/18.3	46.3/9.0
Ckt B	73.5/16.1	73.5/18.0	73.5/21.1	86.2/14.8	86.2/18.3	46.3/9.0
COMPRESSORS						
Speed (r/s)						
06E* (Qty) Ckt A	(1) 275, (1) 299	(3) 265	(3) 275	(1) 265, (1) 275, (1) 299	(3) 265, (1) 275	(1) 250, (1) 275
(Qty) Ckt B	(1) 275, (1) 299	(2) 299	(3) 275	(1) 265, (1) 275, (1) 299	(1) 275, (2) 299	(1) 299
Oil Charge (Compressor/L)				250/6.6, 265/9.0, 275/9.0, 299/9.0		
No. Capacity Control Steps	8	10	12	6	7	6
Capacity (%)						
Ckt A	50	50	50	50	50	56
Ckt B	50	50	50	50	50	44
Minimum Capacity Step (%)	14	11	11	14	12	22
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...0.746	10...0.746	10...0.746	12...0.746	10...0.746	6...0.746
Total Airflow (L/s)	47,190	47,190	47,190	56,630	47,190	26,898
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	10...3.73	10...3.73	12...3.73	10...3.73	6...3.73
Total Airflow (L/s)**	47,190	47,190	47,190	56,630	47,190	28,315
CONDENSER COILS						
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	20.91	20.91	24.98	20.91	11.92
Max Working Pressure Refrigerant (kPa)	3103	3103	3103	3103	3103	3103
COOLER						
Weight (empty, kg)	600	600	741	741	848	938
No. Refrigerant Circuits	2	2	2	2	2	2
Net Water Volume, includes nozzles (L)	196.8	196.8	230.9	230.9	266.5	92.7
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.)						
Inlet and Outlet	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.

†See Controls, Operation and Troubleshooting book for recommended oil.

**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)



60 Hz, SI (cont)

30GUN,GUR UNIT SIZE			245			255			270		
SYSTEM MODULES			A	B	Total	A	B	Total	A	B	Total
APPROX OPERATING WEIGHT (kg)											
Cu-Al			4754	3189	7943	4754	3914	8668	5133	3914	9047
Cu-Cu			5342	3518	8860	5342	4346	9688	5711	4346	10,057
REFRIGERANT			R-134a								
Type											
Charge, Total/Over Clear Glass (kg)			73.5/18.0	46.3/9.0	—/—	73.5/18.0	58.5/11.5	—/—	73.5/21.1	58.5/11.5	—/—
Ckt A			73.5/18.0	46.3/9.0	—/—	73.5/18.0	58.5/11.5	—/—	73.5/21.1	58.5/11.5	—/—
Ckt B			—	—	—	—	—	—	—	—	—
COMPRESSORS			Reciprocating, Semi-Hermetic								
Speed (r/s)			29.2								
06E* (Qty) Ckt A			(3) 265	(1) 265, (1) 250	—	(3) 265	(1) 265, (1) 275	—	(3) 275	(1) 265, (1) 275	—
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			—	—	—	—	—	—	—	—	—
Capacity (%)			10	8	—	10	250/6.6, 265/9.0, 275/9.0, 239/9.0	—	12	8	—
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			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)			10...0.746	6...0.746	16...0.746	10...0.746	8...0.746	18...0.746	10...0.746	8...0.746	18...0.746
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/in.			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.
 †See Controls, Operation and Troubleshooting book for recommended oil.
 **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.

60 Hz, SI (cont)

30GUN, GUR UNIT SIZE			290			315			330		
SYSTEM MODULES			A	B	Total	A	B	Total	A	B	Total
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 Charge, Total/Over Clear Glass (kg)			R-134a								
Ckt A			86.2/14.8	58.5/11.5	—/—	86.2/18.3	58.5/11.5	—/—	73.5/21.1	73.5/21.1	—/—
Ckt B			86.2/14.8	58.5/11.5	—/—	86.2/18.3	58.5/11.5	—/—	73.5/21.1	73.5/21.1	—/—
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	—
06E* (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	8	—	7	8	—	12	12	—
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...0.746	8...0.746	20...0.746	12...0.746	8...0.746	20...0.746	10...0.746	10...0.746	20...0.746
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	40.59	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-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.
†See Controls, Operation and Troubleshooting book for recommended oil.
**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)



60 Hz, SI (cont)

30GUN, GUR UNIT SIZE		360			390			420		
SYSTEM MODULES		A	B	Total	A	B	Total	A	B	Total
APPROX OPERATING WEIGHT (kg)										
REFRIGERANT	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
Type Charge, Total/Over Clear Glass (kg)										
COMPRESSORS	Ckt A	86.2/14.8	86.2/14.8	—/—	86.2/18.3	86.2/14.8	—/—	86.2/18.3	86.2/18.3	—/—
	Ckt B	86.2/14.8	86.2/14.8	—/—	86.2/18.3	86.2/14.8	—/—	86.2/18.3	86.2/18.3	—/—
Speed (r/s)										
06E* (Qty) Ckt A	(1) 265, (1) 275, (1) 299	(1) 265, (1) 275, (1) 299	(1) 265, (1) 275, (1) 299	—	(3) 265, (1) 275, (1) 299	(1) 265, (1) 275, (1) 299	—	(3) 265, (1) 275, (1) 299	(3) 265, (1) 275, (1) 299	—
	(1) 265, (1) 275, (1) 299	(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	6	—	7	6	—	—	7	—
	50	50	50	—	50	50	—	50	50	—
Capacity (%)	50	50	50	—	50	50	—	50	50	—
	14	14	14	—	12	14	—	12	12	—
Minimum Capacity Step (%)										
CONDENSER FANS										
Standard										
Fan Speed (r/s)	19.0	19.0	19.0	—	19.0	19.0	—	19.0	19.0	—
	4..762	4..762	4..762	—	4..762	4..762	—	4..762	4..762	—
No. Blades..Dia. (mm)	12...0.746	12...0.746	12...0.746	24...0.746	12...0.746	12...0.746	24...0.746	12...0.746	12...0.746	24...0.746
	56,630	56,630	56,630	113,260	56,630	56,630	113,260	56,630	56,630	113,260
Total Airflow (L/s)										
High Static	29.0	29.0	29.0	—	29.0	29.0	—	29.0	29.0	—
	12...762	12...762	12...762	24...3.73	12...762	12...762	24...3.73	12...762	12...762	24...3.73
No. Blades..Dia. (mm)	12...3.73	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
	56,630	56,630	56,630	113,260	56,630	56,630	113,260	56,630	56,630	113,260
Total Airflow (L/s)*										
CONDENSER COILS										
Fins/m	669	669	669	—	669	669	—	669	669	—
	3	3	3	—	3	3	—	3	3	—
No. Rows (Ckt A or B)	24.98	24.98	24.98	49.96	24.98	24.98	49.96	24.98	24.98	49.96
	3103	3103	3103	—	3103	3103	—	3103	3103	—
Face Area, Ckt A and B Total (sq m)										
Max Working Pressure Refrigerant (kPa)	—	—	—	—	—	—	—	—	—	—
	—	—	—	—	—	—	—	—	—	—
COOLER										
Weight (empty, kg)	741	741	741	1482	848	741	1589	848	848	1696
	2	2	2	4	2	2	4	2	2	4
No. Refrigerant Circuits	230.9	230.9	230.9	461.8	266.5	230.9	497.4	266.5	266.5	533.0
	1916	1916	1916	—	1916	1916	—	1916	1916	—
Net Water Volume, Includes nozzles (L)	2068	2068	2068	—	2068	2068	—	2068	2068	—
	—	—	—	—	—	—	—	—	—	—
Max Working Pressure Refrigerant Side (kPa)	—	—	—	—	—	—	—	—	—	—
	—	—	—	—	—	—	—	—	—	—
Max Working Pressure Fluid Side (kPa)	—	—	—	—	—	—	—	—	—	—
	—	—	—	—	—	—	—	—	—	—
FLUID CONNECTIONS (in.)										
Inlet and Outlet	6	6	6	—	6	6	—	6	6	—
	3/4	3/4	3/4	—	3/4	3/4	—	3/4	3/4	—
Drain (NPT)										
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.
†See Controls, Operation and Troubleshooting book for recommended oil.
**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.

50 Hz, ENGLISH

30GUN, GUR UNIT SIZE	040	045	050	060	070	080	090	100	110
SYSTEM MODULES	—	—	—	—	—	—	—	—	—
APPROX OPERATING WEIGHT (lb)									
Cu-Al	3550	3736	3916	4780	5453	6720	7135	8710	8840
Cu-Cu	3878	4024	4329	5197	6081	7445	7860	9660	9790
REFRIGERANT									
Type									
Charge, Total/Over Clear Glass (lb)									
Ckt A	53/16	53/16	68/17	67/19	96/20	102/20	102/20	129/25	129/25
Ckt B	60/15	60/16	79/16	76/21	96/20	102/20	102/20	129/25	129/25
COMPRESSORS									
Speed (rpm)									
06E* (Qty) Ckt A	(1) 250	(1) 265	(1) 275	(1) 299	(1) 265, (1) 265	(1) 265, (1) 299	(1) 265, (1) 299	(1) 265, (1) 299	(2) 299
06E* (Qty) Ckt B	(1) 265	(1) 275	(1) 299	(1) 299	(1) 299	(1) 299	(1) 265, (1) 275	(1) 265, (1) 299	(2) 299
Oil Charge (Compressor/pt)					250/14.0, 265/19.0, 275/19.0, 299/19.0				
No. Capacity Control Steps	4	4	4	4	4	6	8	8	8
Capacity (%)									
Ckt A	42.4	47.6	43.3	50.0	58.0	62.0	54.0	50.0	50.0
Ckt B	57.6	52.4	56.7	50.0	42.0	38.0	46.0	50.0	50.0
Minimum Capacity Step (%)	21.2	31.7	28.8	33.3	19.3	16.0	14.0	13.0	17.0
CONDENSER FANS									
Standard									
Fan Speed (rpm)									
No. Blades...Dia. (in.)									
No. Fans...Hp/kW (each)	4...1/0.746	4...1/0.746	4...1/0.746	6...1/0.746	6...1/0.746	6...1/0.746	6...1/0.746	8...1/0.746	8...1/0.746
Total Airflow (cfm)	35,000	35,000	34,000	52,000	51,000	57,000	57,000	76,000	76,000
High Static									
Fan Speed (rpm)									
No. Blades...Dia. (in.)									
No. Fans...Hp/kW (each)	4...5/3.73	4...5/3.73	4...5/3.73	6...5/3.73	6...5/3.73	6...5/3.73	6...5/3.73	8...5/3.73	8...5/3.73
Total Airflow (cfm)**	40,000	40,000	40,000	60,000	60,000	60,000	60,000	80,000	80,000
CONDENSER COILS									
Fins/in.	17	17	17	17	17	17	17	17	17
No. Rows (Ckt A or B)	2	2	3	2	3	3	3	3	3
Face Area, Ckt A and B Total (sq ft)	80.5	80.5	80.5	116.7	116.7	128.3	128.3	168.0	68.0
Max Working Pressure Refrigerant (psig)									
COOLER									
Weight (empty, lb)	485	545	545	620	620	745	745	860	860
No. Refrigerant Circuits	2								
Net Water Volume, includes nozzles (gal.)	10.9	13.5	13.5	18.0	18.0	24.5	24.5	30.3	30.3
Max Working Pressure Refrigerant Side (psig)	278	278	278	278	278	278	278	278	278
Max Working Pressure Fluid Side (psig)	300	300	300	300	300	300	300	300	300
FLUID CONNECTIONS (in.)									
Inlet and Outlet	3	3	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.
†See Controls. Operation and Troubleshooting book for recommended oil.
**Based on rated external static pressure of 0.4 or 1.0 in. wg as appropriate.
NOTE: Facing the compressors, Circuit A is on the right and Circuit B is on the left.

Physical data (cont)



50 Hz, ENGLISH (cont)

30GUN,GUR UNIT SIZE	130	150	170	190	210	230	B	Total
SYSTEM MODULES								
APPROX OPERATING WEIGHT (lb)								
Cu-Al	10,511	10,676	11,443	12,906	13,545	10,676	6720	17,396
Cu-Cu	11,783	11,948	12,715	14,425	15,064	11,948	7445	19,393
REFRIGERANT								
Type								
Charge, Total/Over Clear Glass (lb)								
Ckt A	162/34	162/39	162/46	190/32	190/40	162/39	102/20	—/—
Ckt B	162/34	162/39	162/46	190/32	190/40	162/39	102/20	—/—
COMPRESSORS								
Speed (rpm)								
06E* (Qty) Ckt A	(1) 265, (2) 275	(3) 299	(2) 275, (1) 299	(3) 299	(2) 265, (1) 299	(3) 299	(1) 265, (1) 299	—
06E* (Qty) Ckt B	(2) 299	(2) 299	(1) 275, (2) 299	(3) 299	(3) 299	(2) 299	(1) 299	—
Oil Charge† (Compressor/pt)				265/19.0, 275/19.0, 299/19.0	7	10	6	—
No. Capacity Control Steps	10	10	12	6	7	10	6	—
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								
Standard								
Fan Speed (rpm)	950	950	950	950	950	950	950	—
No. Blades...Dia. (in.)	6...30	6...30	6...30	6...30	6...30	6...30	6...30	—
No. Fans...Hp/kW (each)	10...1/0.746	10...1/0.746	10...1/0.746	12...1/0.746	12...1/0.746	10...1/0.746	6...1/0.746	16...1/0.746
Total Airflow (cfm)	100,000	100,000	100,000	120,000	120,000	100,000	57,000	157,000
High Static								
Fan Speed (rpm)	1445	1445	1445	1445	1445	1445	1445	—
No. Blades...Dia. (in.)	12...30	12...30	12...30	12...30	12...30	12...30	12...30	—
No. Fans...Hp/kW (each)	10...5/3.73	10...5/3.73	10...5/3.73	12...5/3.73	12...5/3.73	10...5/3.73	6...5/3.73	16...5/3.73
Total Airflow (cfm)**	100,000	100,000	100,000	120,000	120,000	100,000	60,000	160,000
CONDENSER COILS								
Fins/in.	17	17	17	17	17	17	17	—
No. Rows (Ckt A or B)	3	3	3	3	3	3	3	—
Face Area, Ckt A and B Total (sq ft)	225.1	225.1	225.1	268.9	268.9	225.1	128.3	353.4
Max Working Pressure Refrigerant (psig)	450	450	450	450	450	450	450	—
COOLER								
Weight (empty, lb)	1320	1320	1630	1630	1865	1320	745	2065
No. Refrigerant Circuits	2	2	2	2	2	2	2	4
Net Water Volume, includes nozzles (gal.)	52.0	52.0	61.0	61.0	70.4	52.0	24.5	76.5
Max Working Pressure Refrigerant Side (psig)	278	278	278	278	278	278	278	—
Max Working Pressure Fluid Side (psig)	300	300	300	300	300	300	300	—
FLUID CONNECTIONS (in.)								
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.

†See Controls, Operation and Troubleshooting book for recommended oil.

**Based on rated external static pressure of 0.4 or 1.0 in. wg as appropriate.

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

50 Hz, ENGLISH (cont)

30GUN, GUR UNIT SIZE			245			255			270		
SYSTEM MODULES			A	B	Total	A	B	Total	A	B	Total
APPROX OPERATING WEIGHT (lb)											
Cu-Al			10,676	7135	17,811	10,676	8710	19,386	11,443	8710	20,153
Cu-Cu			11,948	7860	19,808	11,948	9660	21,608	12,715	9660	22,375
REFRIGERANT											
Type											
Charge, Total/Over Clear Glass (lb)											
Ckt A			162/39	102/20	—/—	162/39	129/25	—/—	162/46	129/25	—/—
Ckt B			162/39	102/20	—/—	162/39	129/25	—/—	162/46	129/25	—/—
COMPRESSORS											
Speed (rpm)											
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/pt)											
No. Capacity Control Steps			10	8	—	10	8	—	12	8	—
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 (rpm)			950	950	—	950	950	—	950	950	—
No. Blades...Dia. (in.)			6...30	6...30	—	6...30	6...30	—	6...30	6...30	—
No. Fans...Hp/kW (each)			10...1/0.746	6...1/0.746	16...1/0.746	10...1/0.746	8...1/0.746	18...1/0.746	10...1/0.746	8...1/0.746	18...1/0.746
Total Airflow (cfm)			100,000	57,000	157,000	100,000	76,000	176,000	100,000	76,000	176,000
High Static											
Fan Speed (rpm)			1445	1445	—	1445	1445	—	1445	1445	—
No. Blades...Dia. (in.)			12...30	12...30	—	12...30	12...30	—	12...30	12...30	—
No. Fans...Hp/kW (each)			10...5/3.73	6...5/3.73	16...5/3.73	10...5/3.73	8...5/3.73	8...5/3.73	10...5/3.73	8...5/3.73	18...5/3.73
Total Airflow (cfm)**			100,000	60,000	160,000	100,000	80,000	180,000	100,000	80,000	180,000
CONDENSER COILS											
Fins/in.			17	17	—	17	17	—	17	17	—
No. Rows (Ckt A or B)			3	3	—	3	3	—	3	3	—
Face Area, Ckt A and B Total (sq ft)			225.1	128.3	353.4	225.1	168.0	393.1	225.1	168.0	393.1
Max Working Pressure Refrigerant (psig)			450	450	—	450	450	—	450	450	—
COOLER											
Weight (empty, lb)			1320	745	2065	1320	860	2180	1630	860	2490
No. Refrigerant Circuits			2	2	4	2	2	4	2	2	4
Net Water Volume, includes nozzles (gal.)			52.0	24.5	76.5	52.0	30.3	82.3	61.0	30.3	91.3
Max Working Pressure Refrigerant Side (psig)			278	278	—	278	278	—	278	278	—
Max Working Pressure Fluid Side (psig)			300	300	—	300	300	—	300	300	—
FLUID CONNECTIONS (in.)											
Inlet and Outlet											
Drain (NPT)			6 3/4	4 3/4	—	6 3/4	5 3/4	—	6 3/4	5 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.
†See Controls, Operation and Troubleshooting book for recommended oil.
**Based on rated external static pressure of 0.4 or 1.0 in. wg as appropriate.
NOTE: Facing the compressors, Circuit A is on the right and Circuit B is on the left.

Physical data (cont)



50 Hz, ENGLISH (cont)

30GUN, GUR UNIT SIZE			290			315			330		
SYSTEM MODULES			A	B	Total	A	B	Total	A	B	Total
APPROX OPERATING WEIGHT (lb)											
Cu-Al			12,906	8840	21,746	13,545	8840	22,385	11,443	11,443	22,886
Cu-Cu			14,425	9790	24,215	15,064	9790	24,854	12,715	12,715	25,430
REFRIGERANT											
Type											
Charge, Total/Over Clear Glass (lb)											
Ckt A			190/32	129/25	—/—	190/40	129/25	—/—	162/46	162/46	—/—
Ckt B			190/32	129/25	—/—	190/40	129/25	—/—	162/46	162/46	—/—
COMPRESSORS											
Speed (rpm)											
06E* (Qty) Ckt A			(3) 299	(2) 299	—	(2) 265, (2) 299	(2) 299	—	(2) 275, (1) 299	(2) 275, (1) 299	—
06E* (Qty) Ckt B			(3) 299	(2) 299	—	(3) 299	(2) 299	—	(1) 275, (2) 299	(1) 275, (2) 299	—
Oil Charge (Compressor/pt)											
No. Capacity Control Steps			6	8	—	7	8	—	12	12	—
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 (rpm)			950	950	—	950	950	—	950	950	—
No. Blades...Dia. (in.)			6...30	6...30	—	6...30	6...30	—	6...30	6...30	—
No. Fans...Hp/kW (each)			12...1/0.746	8...1/0.746	20...1/0.746	12...1/0.746	8...1/0.746	20...1/0.746	10...1/0.746	10...1/0.746	20...1/0.746
Total Airflow (cfm)			120,000	76,000	196,000	120,000	76,000	196,000	100,000	100,000	200,000
High Static											
Fan Speed (rpm)			1445	1445	—	1445	1445	—	1445	1445	—
No. Blades...Dia. (in.)			12...30	12...30	—	12...30	12...30	—	12...30	12...30	—
No. Fans...Hp/kW (each)			12...5/3.73	8...5/3.73	20...5/3.73	12...5/3.73	8...5/3.73	20...5/3.73	10...5/3.73	10...5/3.73	20...5/3.73
Total Airflow (cfm)**			120,000	80,000	200,000	120,000	80,000	200,000	100,000	100,000	200,000
CONDENSER COILS											
Fins/in.			17	17	—	17	17	—	17	17	—
No. Rows (Ckt A or B)			3	3	—	3	3	—	3	3	—
Face Area, Ckt A and B Total (sq ft)			268.9	168.0	436.9	268.9	168.0	436.9	225.1	225.1	450.2
Max Working Pressure Refrigerant (psig)			450	450	—	450	450	—	450	450	—
COOLER											
Weight (empty, lb)			1630	860	2490	1865	860	2725	1630	1630	3260
No. Refrigerant Circuits			2	2	4	2	2	4	2	2	4
Net Water Volume, includes nozzles (gal.)			61.0	30.3	91.3	70.4	30.3	100.7	61.0	61.0	122.0
Max Working Pressure Refrigerant Side (psig)			278	278	—	278	278	—	278	278	—
Max Working Pressure Fluid Side (psig)			300	300	—	300	300	—	300	300	—
FLUID CONNECTIONS (in.)											
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 — Aluminum Fins Condenser Coil
Cu-Cu — Copper Tubing — Copper Fins Condenser Coil
OD — Outside Diameter

*06E250 compressors have 4 cylinders; all others have 6.
†See Controls, Operation and Troubleshooting book for recommended oil.
**Based on rated external static pressure of 0.4 or 1.0 in. wg as appropriate.
NOTE: Facing the compressors, Circuit A is on the right and Circuit B is on the left.

50 Hz, ENGLISH (cont)

30GUN, GUR UNIT SIZE				360				390				420			
SYSTEM MODULES				A	B	Total		A	B	Total		A	B	Total	
APPROX OPERATING WEIGHT (lb)															
Cu-Al				12,906	11,443	24,349		13,545	12,906	26,451		13,545	13,545	27,090	
Cu-Cu				14,425	12,715	27,140		15,064	14,425	29,489		15,064	15,064	30,128	
REFRIGERANT															
Type															
Charge, Total/Over Clear Glass (lb)															
Ckt A				190/32	162/46	—/—		190/40	190/32	—/—		190/40	190/40	—/—	
Ckt B				190/32	162/46	—/—		190/40	190/32	—/—		190/40	190/40	—/—	
COMPRESSORS															
Speed (rpm)															
06E* (Qty) Ckt A				(3) 299	(2) 275, (1) 299	—		(2) 265, (2) 299	(3) 299	—		(2) 265, (2) 299	(3) 299	—	
06E* (Qty) Ckt B				(3) 299	(1) 275, (2) 299	—		(3) 299	(3) 299	—		(3) 299	(3) 299	—	
Oil Charge (Compressor/pt)															
No. Capacity Control Steps				6	12	—		7	265/19.0, 275/19.0, 299/19.0	6		7	7	—	
Capacity (%)															
Ckt A				50	48	—		52	50	—		52	52	—	
Ckt B				50	52	—		48	50	—		48	48	—	
Minimum Capacity Step (%)				17	19	—		10	17	—		10	10	—	
CONDENSER FANS															
Standard															
Fan Speed (rpm)				950	950	—		950	950	—		950	950	—	
No. Blades...Dia. (in.)				6...30	6...30	—		6...30	6...30	—		6...30	6...30	—	
No. Fans...Hp/kW (each)				12...1/0.746	12...1/0.746	24...1/0.746		12...1/0.746	12...1/0.746	24...1/0.746		12...1/0.746	12...1/0.746	24...1/0.746	
Total Airflow (cfm)				120,000	100,000	220,000		120,000	120,000	240,000		120,000	120,000	240,000	
High Static															
Fan Speed (rpm)				1445	1445	—		1445	1445	—		1445	1445	—	
No. Blades...Dia. (in.)				12...30	12...30	—		12...30	12...30	—		12...30	12...30	—	
No. Fans...Hp/kW (each)				12...5/3.73	12...5/3.73	24...5/3.73		12...5/3.73	12...5/3.73	24...5/3.73		12...5/3.73	12...5/3.73	24...5/3.73	
Total Airflow (cfm)**				120,000	100,000	220,000		120,000	120,000	240,000		120,000	120,000	240,000	
CONDENSER COILS															
Fins/in.				17	17	—		17	17	—		17	17	—	
No. Rows (Ckt A or B)				3	3	—		3	3	—		3	3	—	
Face Area, Ckt A and B Total (sq ft)				268.9	225.1	494.0		268.9	268.9	537.8		268.9	268.9	537.8	
Max Working Pressure Refrigerant (psig)				450	450	—		450	450	—		450	450	—	
COOLER															
Weight (empty, lb)				1630	1630	3260		1865	1630	3495		1865	1865	3730	
No. Refrigerant Circuits				2	2	4		2	2	4		2	2	4	
Net Water Volume, includes nozzles (gal.)				61.0	61.0	122		70.4	61.0	131.4		70.4	70.4	140.8	
Max Working Pressure Refrigerant Side (psig)				278	278	—		278	278	—		278	278	—	
Max Working Pressure Fluid Side (psig)				300	300	—		300	300	—		300	300	—	
FLUID CONNECTIONS (in.)															
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.
†See Controls, Operation and Troubleshooting book for recommended oil.
**Based on rated external static pressure of 0.4 or 1.0 in. wg as appropriate.
NOTE: Facing the compressors, Circuit A is on the right and Circuit B is on the left.

Physical data (cont)



50 Hz, SI

30GUN, GUR UNIT SIZE	040	045	050	060	070	080	090	100	110
SYSTEM MODULES	—	—	—	—	—	—	—	—	—
APPROX OPERATING WEIGHT (kg)									
Cu-Al	1628	1694	1776	2168	2473	3055	3243	3960	4018
Cu-Cu	1759	1825	1972	2357	2758	3384	3573	4390	4450
REFRIGERANT									
Type									
Charge, Total/Over Clear Glass (kg)									
Ckt A	24.0/7.2	24.0/7.2	30.8/7.7	30.4/8.6	43.5/9.0	46.3/9.0	46.3/9.0	58.5/11.5	58.5/11.5
Ckt B	27.2/6.8	27.0/7.2	35.8/7.2	34.5/9.5	43.5/9.0	46.3/9.0	46.3/9.0	58.5/11.5	58.5/11.5
COMPRESSORS									
Speed (r/s)									
06E* (Qty) Ckt A	24.2	(1) 265	(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) 265	(1) 275	(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	4	4	4	6	8	8	8
Capacity (%)									
Ckt A	42.4	47.6	43.3	50.0	58.0	62.0	54.0	50.0	50.0
Ckt B	57.6	52.4	56.7	50.0	42.0	38.0	46.0	50.0	50.0
Minimum Capacity Step (%)	21.2	31.7	28.8	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...0.746	4...0.746	4...0.746	6...0.746	6...0.746	6...0.746	6...0.746	8...0.746	8...0.746
High Static	16,517	16,517	16,045	25,540	24,068	26,898	26,898	35,864	35,864
Fan Speed (r/s)									
No. Blades...Dia. (mm)					24.1				
No. Fans...kW (each)					12...762				
Total Airflow (L/s)**	4...3.73	4...3.73	4...3.73	6...3.73	6...3.73	6...3.73	6...3.73	8...3.73	8...3.73
CONDENSER COILS	18,876	18,876	18,876	28,315	28,315	28,315	28,315	37,750	37,750
Fins/in.									
No. Rows (Ckt A or B)	669	669	669	669	669	669	669	669	669
Face Area, Ckt A and B Total (sq m)	2	2	3	2	3	3	3	3	3
Max Working Pressure Refrigerant (kPa)	7.48	7.48	7.48	10.84	10.84	11.92	11.92	15.61	15.61
COOLER									
Weight (empty, kg)									
No. Refrigerant Circuits	220	248	248	282	282	338	338	391	391
Net Water Volume, includes nozzles (L)	41.3	51.1	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	1916	1916
Max Working Pressure Fluid Side (kPa)	2068	2068	2068	2068	2068	2068	2068	2068	2068
FLUID CONNECTIONS (in.)									
Inlet and Outlet	3	3	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.

†See Controls, Operation and Troubleshooting book for recommended oil.

**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.

50 Hz, SI (cont)

30GUN, GUR UNIT SIZE	130	150	170	190	210	230	Total
SYSTEM MODULES	—	—	—	—	—	—	—
APPROX OPERATING WEIGHT (kg)							
Cu-Al	4778	4852	5201	5866	6156	3055	7907
Cu-Cu	5335	5430	5779	6556	6847	3384	8814
REFRIGERANT							
Type							
Charge, Total/Over Clear Glass (kg)							
Ckt A	73.5/16.1	73.5/18.0	73.5/21.1	86.2/14.8	86.2/18.3	46.3/9.0	—/—
Ckt B	73.5/16.7	73.5/18.0	73.5/21.1	86.2/14.8	86.2/18.3	46.3/9.0	—/—
COMPRESSORS							
Speed (r/s)							
06E* (Qty) Ckt A	(1) 265, (2) 275	(3) 299	(2) 275, (1) 299	(3) 299	(2) 265, (1) 299	(1) 265, (1) 299	—/—
06E* (Qty) Ckt B	(2) 299	(2) 299	(1) 275, (2) 299	(3) 299	(3) 299	(1) 299	—/—
Oil Charge (Compressor/L)				265/9.0, 275/9.0, 299/9.0			—
No. Capacity Control Steps	10	10	12	6	7	6	—
Capacity (%)							
Ckt A	52	60	48	50	52	62	—
Ckt B	48	40	52	50	48	38	—
Minimum Capacity Step (%)	10	13	10	17	10	16	—
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...0.746	10...0.746	10...0.746	12...0.746	10...0.746	6...0.746	16...0.746
Total Airflow (L/s)	47,190	47,190	47,190	56,630	56,630	26,898	74,088
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	10...3.73	10...3.73	12...3.73	10...3.73	6...3.73	16...3.73
Total Airflow (L/s)**	47,190	47,190	47,190	56,630	56,630	28,315	75,505
CONDENSER COILS							
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	20.91	20.91	24.98	20.91	11.92	32.83
Max Working Pressure Refrigerant (kPa)	3103	3103	3103	3103	3103	3103	—
COOLER							
Weight (empty, kg)	600	600	741	741	848	338	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	92.7	290.5
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.)							
Inlet and Outlet	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.

†See Controls, Operation and Troubleshooting book for recommended oil.

**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, SI (cont)

30GUN,GUR UNIT SIZE			245			255			270		
SYSTEM MODULES			A	B	Total	A	B	Total	A	B	Total
APPROX OPERATING WEIGHT (kg)											
Cu-Al			4852	3243	8095	4852	3960	8812	5201	3960	9161
Cu-Cu			5430	4390	9003	5430	4390	9820	5779	4390	10,169
REFRIGERANT											
Type Charge, Total/Over Clear Glass (kg)											
Ckt A			73.5/18.0	46.3/9.0	—/—	73.5/18.0	58.5/11.5	—/—	73.5/21.1	58.5/11.5	—/—
Ckt B			73.5/18.0	46.3/9.0	—/—	73.5/18.0	58.5/11.5	—/—	73.5/21.1	58.5/11.5	—/—
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			10	8	—	10	8	—	12	8	—
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...0.746	6...0.746	16...0.746	10...0.746	8...0.746	18...0.746	10...0.746	8...0.746	18...0.746
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											
Fins/in.			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											
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.)											
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.
 †See Controls, Operation and Troubleshooting book for recommended oil.
 **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.

50 Hz, SI (cont)

30GUN, GUR UNIT SIZE		290			315			330		
SYSTEM MODULES		A	B	Total	A	B	Total	A	B	Total
APPROX OPERATING WEIGHT (kg)										
Cu-Al		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		86.2/14.8	58.5/11.5	—/—	86.2/18.3	58.5/11.5	—/—	73.5/21.1	73.5/21.1	—/—
Ckt B		86.2/14.8	58.5/11.5	—/—	86.2/18.3	58.5/11.5	—/—	73.5/21.1	73.5/21.1	—/—
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)										
No. Capacity Control Steps		6	8	—	7	8	—	12	12	—
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... 0.746	8...0.746	20...0.746	12...0.746	8...0.746	20...0.746	10...0.746	10...0.746	20...0.746
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										
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										
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.)										
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 — Aluminum Fins Condenser Coil
Cu-Cu — Copper Tubing — Copper Fins Condenser Coil
OD — Outside Diameter

*06E250 compressors have 4 cylinders; all others have 6.
†See Controls, Operation and Troubleshooting book for recommended oil.
**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, SI (cont)

30GUN, GUR UNIT SIZE			360			390			420		
SYSTEM MODULES			A	B	Total	A	B	Total	A	B	Total
APPROX OPERATING WEIGHT (kg)											
Cu-AI			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			86.2/14.8	73.5/21.1	—/—	86.2/18.3	86.2/14.8	—/—	86.2/18.3	86.2/18.3	—/—
Ckt B			86.2/14.8	73.5/21.1	—/—	86.2/18.3	86.2/14.8	—/—	86.2/18.3	86.2/18.3	—/—
COMPRESSORS											
Speed (r/s)											
06E* (Qty) Ckt A			(3) 299	(2) 275, (1) 299	—	(2) 265, (2) 299	(3) 299	—	(2) 265, (2) 299	(3) 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	12	—	7	265/9.0, 275/9.0, 299/9.0	—	7	7	—
Capacity (%)											
Ckt A			50	48	—	52	50	—	52	52	—
Ckt B			50	52	—	48	50	—	48	48	—
Minimum Capacity Step (%)			17	19	—	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...0.746	12...0.746	24...0.746	12...0.746	12...0.746	24...0.746	12...0.746	12...0.746	24...0.746
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	47,190	103,820	56,630	56,630	113,260	56,630	56,630	113,260
CONDENSER COILS											
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											
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.)											
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-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.

†See Controls, Operation and Troubleshooting book for recommended oil.

**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



Thermostatic expansion valves (TXV) (Sizes 040-110) and liquid line solenoid valves (LLSV) replace the EXV, related controls, and part-load energy savings related to the EXV function. Minimum operating ambient temperature for TXV-equipped units with standard head pressure control is 35 F (1.7 C). Contact your Carrier representative for details on operation at temperatures below 35 F (1.7 C).

Hot gas bypass option allows additional capacity reduction for unit operation below the minimum step of unloading. It is available on all size 040-070 units. Also available as a field-installed accessory.

NOTE: Accessory unloaders (where available) further reduce minimum capacity step and provide a more efficient alternative to hot gas bypass in light load situations.

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.) Also available as a field-installed accessory.

Low-ambient Motormaster® III head-pressure control allows unit operation to -20 F (-29 C) on all unit sizes. Also available as a field-installed accessory.

Enviro-Shield™ condenser coil options are available to match coil protection to site conditions for optimum durability. See the table below and refer to the Application Data section for selection guidance. Consult your Carrier representative for further information.

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

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

Non-fused electrical disconnect is factory installed for all voltages. For 040-070 sizes, disconnect is a “thru-the-door” type. For 080-110 and 230B-315B sizes, disconnect is a “thru-the-door” type except for 208/230-3-60 units where the disconnect mounts below the control box. For 130-210, 230A-420A, and 330B-420B sizes, disconnect mounts on the center panel on the cooler side of the chiller.

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

Control transformer is sized to supply the needs of the control circuit. Also available as a field-installed accessory.

Energy Management Module (EMM) is used for 4 to 20 mA leaving fluid temperature reset, cooling set point reset, 4 to 20 mA demand limit and two-step demand limit. Temperature reset lets the unit reset the leaving fluid temperature to a higher temperature during low load conditions. Temperature reset can also be accomplished based on return fluid, outdoor air or space temperature. (The EMM option is not required when using entering-water, outdoor-air, or space temperature for temperature reset. These types of reset are available with the main board. However, an accessory thermistor is required for outdoor air and/or space temperature reset.) Demand limiting allows the unit capacity to be limited during periods of peak energy usage. Demand limit requires an external 4- to 20-mA signal or a 2-step remote pair of dry contacts. Both the 4- to 20-mA and 2-step demand limit percentage values are adjustable. This is also available as a field-installed accessory.

Service Option includes the Energy Management Module (described above) plus a GFCI convenience outlet (60 Hz only), remote service connection port, and handheld *ComfortLink™* Navigator display module. 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.

CONDENSER COIL OPTION RECOMMENDATIONS

COPPER-TUBE COILS WITH ENVIRO-SHIELD™ OPTIONS*	ENVIRONMENT				
	Standard	Mild Coastal	Severe Coastal	Industrial	Combined Industrial/Coastal
AL Fins (Standard Coils)	X				
CU Fins		X			
AL Fins, E-Coating				X	
CU Fins, E-Coating			X		X
AL Fins, Pre-Coated		X			

LEGEND

AL — Aluminum
CU — Copper

*See page 44 for further details.

Field-installed accessories



Ground current protection includes an electronic sensor that monitors all phases of the 3-phase power supply to the compressor. At the first sign of a short to ground, the sensor shuts down the compressor to prevent contamination of the refrigerant system. This protection is an accessory for 040-060 and 070 (60 Hz) sizes only (standard on 070 [50 Hz] and all 080-210 sizes [50/60 Hz]).

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

The accessory package includes sensor, control, and installation hardware. A Motormaster III control is required for each circuit. For 60-Hz units, factory-installed fan motors compatible with the Motormaster III control require no motor change-out. The 50-Hz units require 2 HD52AK652 speed control rated motors for each compressor for unit sizes 040-210. In 575-v applications, 4 transformers must be field-supplied. Also available as a factory-installed option.

Sound reduction kit consists of a specially designed system of fans and acoustic enclosures for reducing sound levels without compromising chiller performance. No fan motor change is required, and the fan system is compatible with Motormaster III head-pressure control. This accessory is sold in sets of 2 kits per package.

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

Additional electric suction cutoff unloader(s) can be field-installed on all sizes. For installation on 080-110, 130 (60 Hz), and 230B-315B sizes, the compressor expansion board (CXB) accessory is required for operation of more than 1 unloader per circuit. All other models have the CXB factory installed. The following additional unloaders are supported:

UNITS 30GUN,GUR	ADDITIONAL UNLOADERS
040-070	None on Compressor A1, One on Compressor B1 (CXB not required).
080-110, 130 (60 Hz), 230B-315B	One on Compressor A1, One on Compressor B1 (CXB required).
150-210, 230A-315A, 330-420	One on Compressor A1, One on Compressor B1 (CXB not required).

Unloader(s) (when available) further reduce minimum capacity step and provide a more efficient alternative to hot gas bypass.

Compressor expansion board is an additional circuit board used in multiple compressor units. This accessory may be required when installing additional unloaders.

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

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

Oil pressure switch package includes 2 oil pressure switches for unit. The switch mounts on lead compressor in each refrigerant circuit. This is an accessory for sizes 040-060, 070 [60 Hz]; standard on sizes 070 [50 Hz], 040-070 brine units, and 080-420.

Hot gas bypass package, for field installation on 080 to 420 sizes, includes solenoid control valves and a hot gas bypass valve. Piping and electrical connections are made easy by factory-provided piping stubs and electrical terminal blocks. Also available as a factory-installed option (040-070 sizes only).

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

Control transformer is sized to supply the needs of the control circuit, sourcing power from the main unit power connection. Also available as a factory-installed option.

Chilled fluid flow switch accessory is available for field installation (all sizes).

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

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

Energy Management Module (EMM) is used for 4 to 20 mA leaving fluid temperature reset, cooling set point reset, 4 to 20 mA demand limit and two-step demand limit. Temperature reset lets the unit reset the leaving fluid temperature to a higher temperature during low load conditions. Temperature reset can also be accomplished based on return fluid, outdoor air or space temperature. (The EMM option is not required when using entering-water, outdoor-air, or space temperature for temperature reset. These types of reset are available with the main board. However, an accessory thermistor is required for outdoor air and/or space temperature reset.) Demand limiting allows the unit capacity to be limited during periods of peak energy usage. Demand limit requires an external 4 to 20 mA signal or a 2-step remote pair of dry contacts. Both the 4 to 20 mA and 2-step demand limit percentage values are adjustable. Also available as a factory-installed option.

Trim kit accessory is available for field installation between 2 unit modules. The kit contains sheet metal pieces and all necessary mounting hardware.

Thermistor accessory is available for field installation (all sizes).

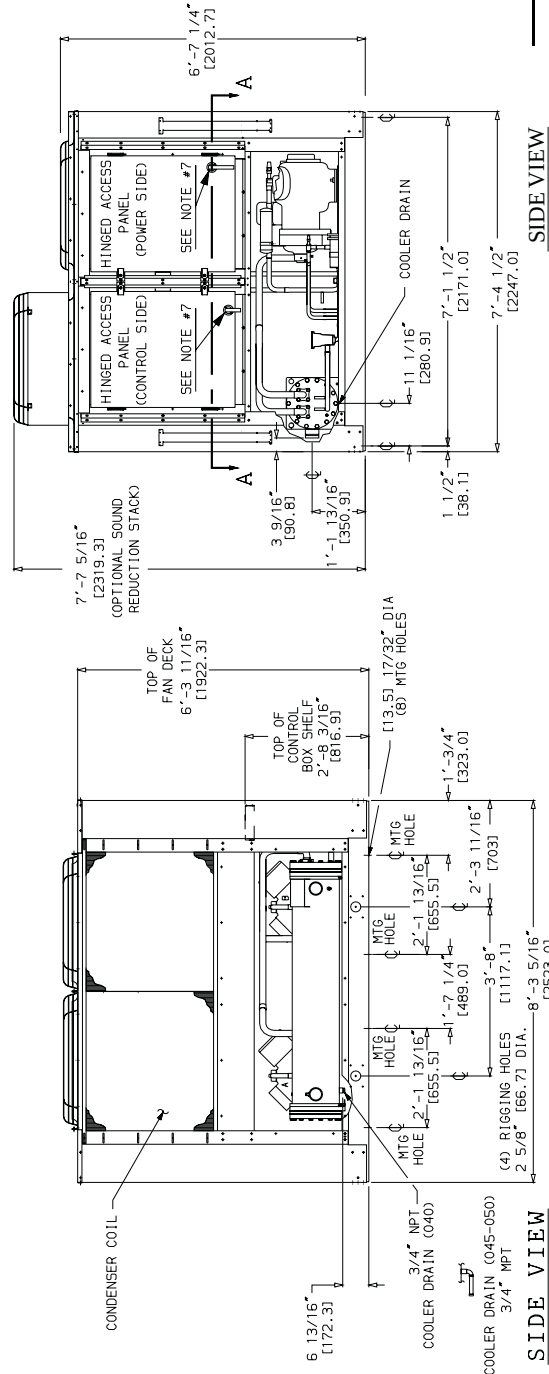
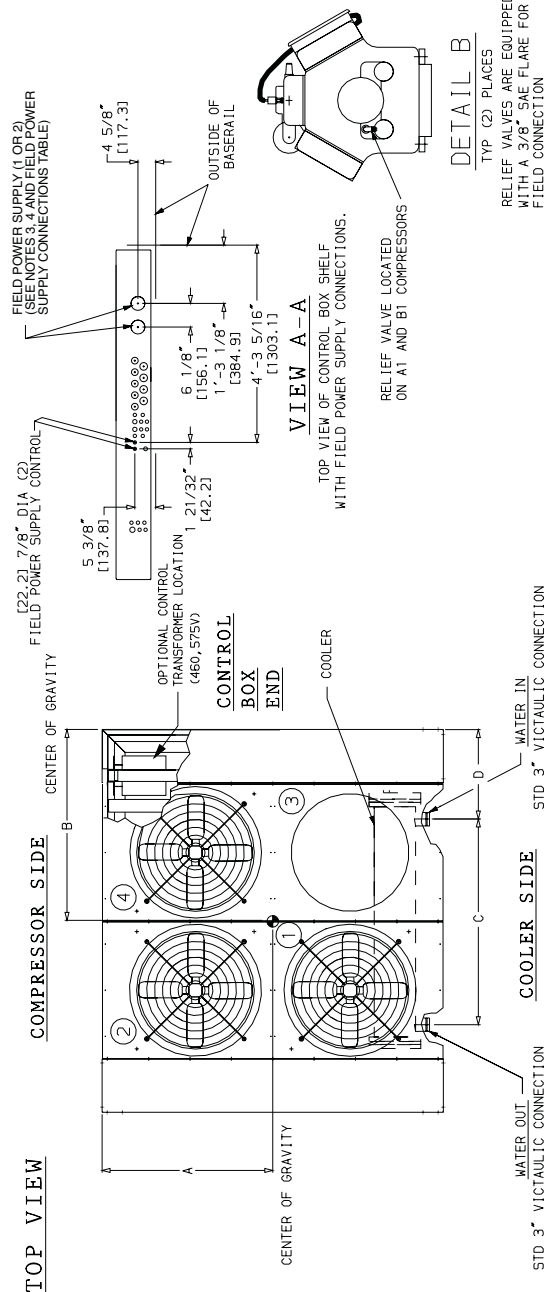
Base unit dimensions — 30GUN, GUR040-050



UNIT 30GUN, GUR	DIMENSIONS — ft.-in. [mm]			
	A	B	C	D
040	3-5 11/16 [1059]	3-10 13/16 [1189]	4-5 1/2 [1359]	1-11 1/8 [587.5]
040C	3-5 7/8 [1064]	3-11 13/16 [1194]	4-5 1/2 [1359]	1-11 1/8 [587.5]
045	3-6 1/16 [1069]	3-10 13/16 [1189]	5-5 1/2 [1663]	1-59/16 [436.6]
045C	3-6 3/16 [1072]	3-11 [1194]	5-5 1/2 [1663]	1-59/16 [436.6]
050	3-5 7/8 [1064]	3-11 [1194]	5-5 1/2 [1663]	1-59/16 [436.6]
050C	3-6 [1067]	3-11 3/16 [1199]	5-5 1/2 [1663]	1-59/16 [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. (50.8 mm) diameter holes are recommended for parallel conductors on 040 and 045 (208/230 volt) units.
- One 3/8 in. (92.1 mm) diameter hole is recommended for single entry power on 050 (208/230 volt) units.
- Mounting holes may be used to mount unit to concrete pad. They are not recommended for spring isolator location.
- If spring isolators are used, a perimeter support channel between the unit and the isolators is recommended.
- 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

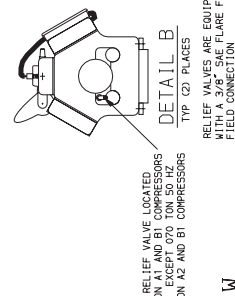
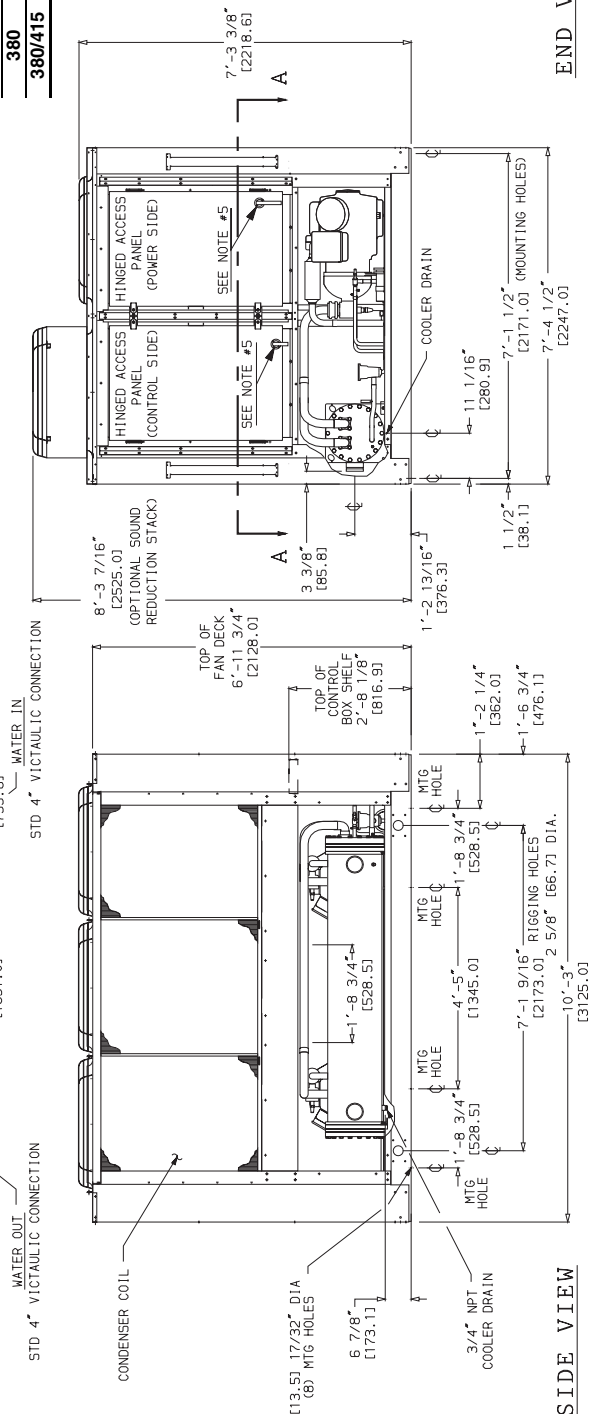
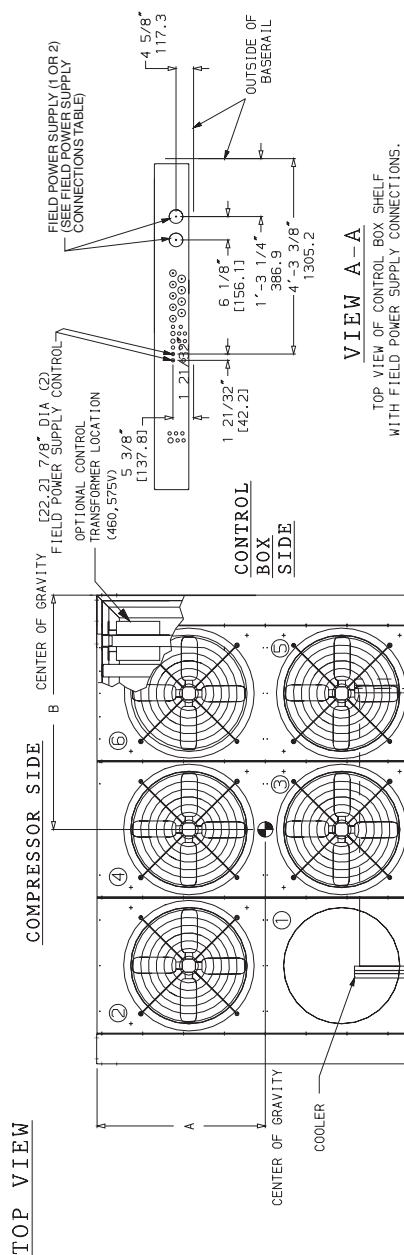
VOLTAGE	UNIT 30GUN, GUR	Hz	DIAMETER — in. [mm]	QTY.
208/230	040, 045	60	3 [92.0]	1
	050	60	2 [63.5]	2
460	040-050	60	2 [63.5]	1
575	040-050	60	2 [63.5]	1
380	040-050	60	2 [63.5]	1
380/415	040, 045	50	2 [63.5]	1
	050	50	3 [92.0]	1

NOTES:

- NOTES:
1. Dimensions in [] are in mm.
 2. Unit must have clearances for airflow as follows:
 - 2.1 Top — Do not restrict in any way.
 - 2.2 Ends — [1524 mm] 5 ft
 - 2.3 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. 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 30GUN, GUR	Hz	DIAMETER — in. [mm]	QTY.
208/230	060	60	2 1/2 [63.5]	2
	070	60	3 5/8 [92.0]	2
	060	60	2 1/2 [63.5]	1
460	070	60	3 5/8 [92.0]	1
	060,070	60	2 1/2 [63.5]	1
575	060,070	60	3 5/8 [92.0]	1
380	060,070	60	3 5/8 [92.0]	1
380/415	060,070	50	3 5/8 [92.0]	1



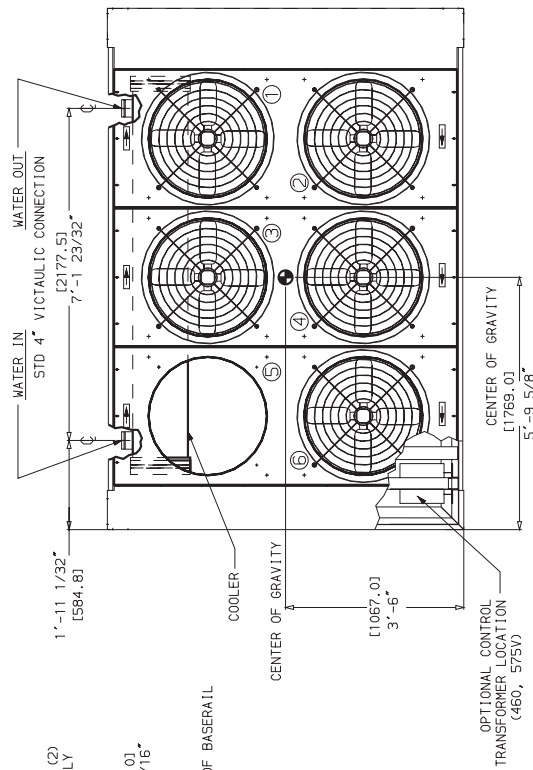
END VIEW

Base unit dimensions — 30GUN,GUR080



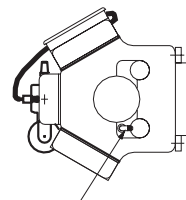
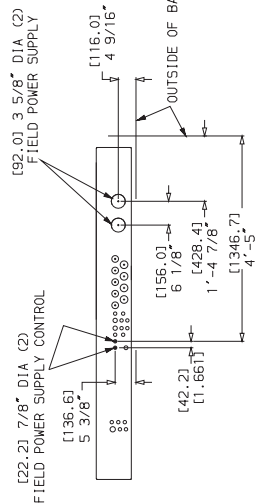
NOTES:

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. 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 380/415 v (50 Hz). For 208/230 v (60 Hz), non-fused disconnect mounted underneath control box.
6. Size 080 is also Module B for size 230.



VIEW A-A

TOP VIEW OF CONTROL BOX SHELF
WITH FIELD POWER SUPPLY CONNECTIONS



TOP VIEW

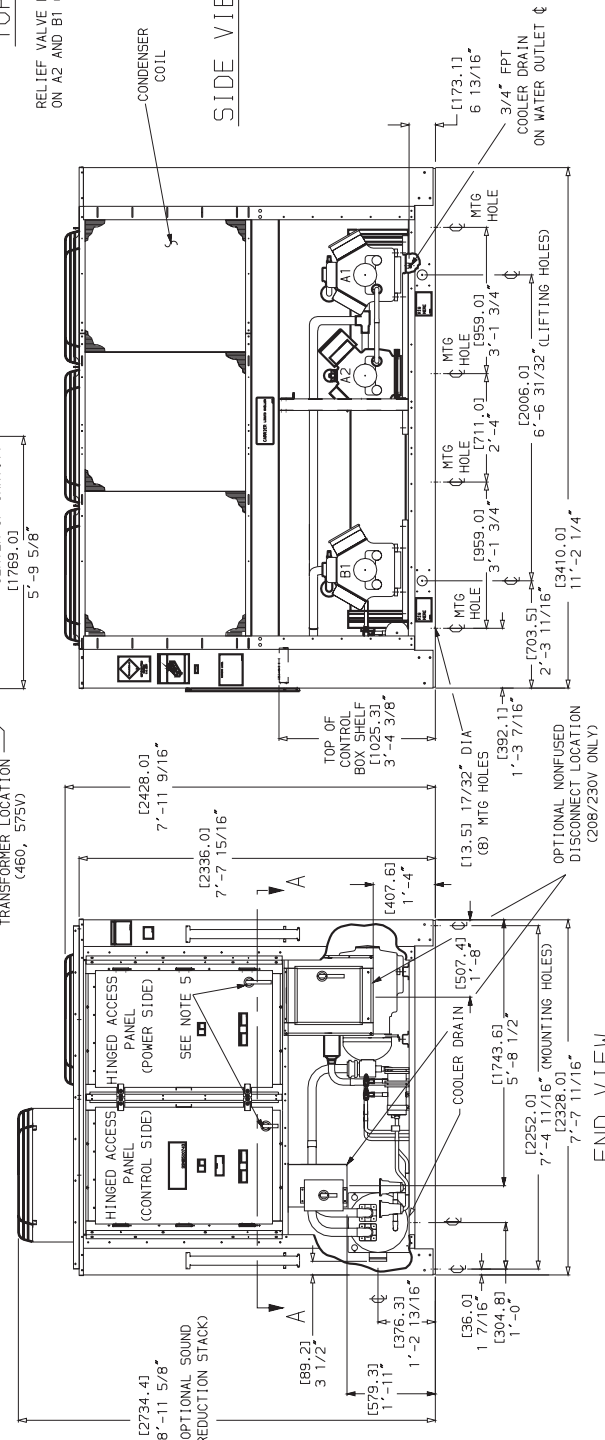
RELIEF VALVE LOCATED
ON A2 AND B1 COMPRESSORS

DETAIL B

TYP (2) PLACES

RELIEF VALVES ARE EQUIPPED
WITH A 3/8\" SAE FLARE FOR
FIELD CONNECTION

SIDE VIEW



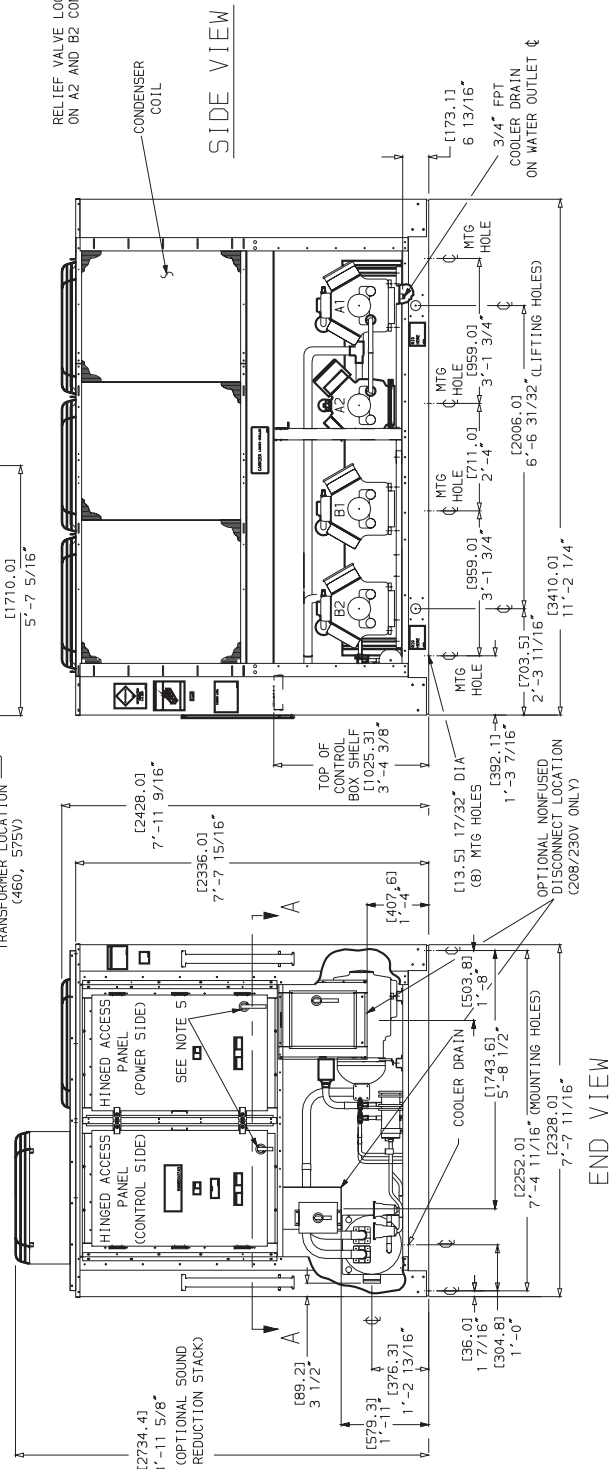
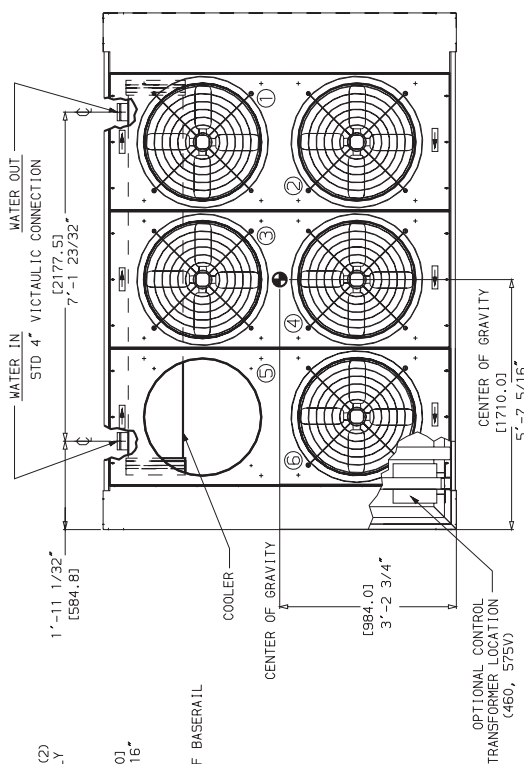
END VIEW

Base unit dimensions — 30GUN,GUR090



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. 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 380/415 v (50 Hz). For 208/230 v (60 Hz), non-fused disconnect mounted underneath control box.
6. Size 090 is also Module B for size 245.

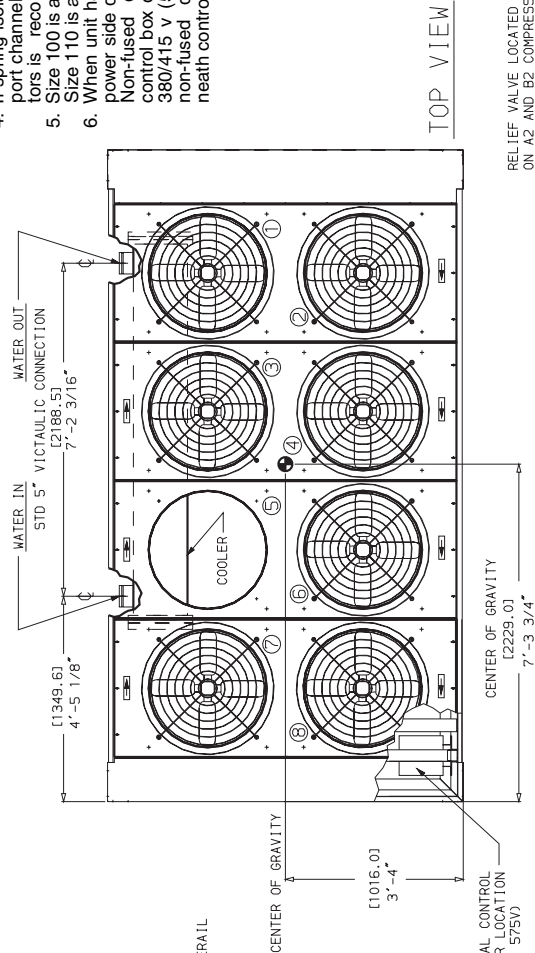


Base unit dimensions — 30GUN, GUR100, 110

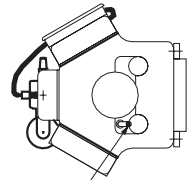


NOTES:

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. Size 100 is also Module B for Size 255, 270.
 6. Size 110 is also Module B for Size 290, 315.
- 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 380/415 v (50 Hz). For 208/230 v (60 Hz), non-fused disconnect is mounted underneath control box.



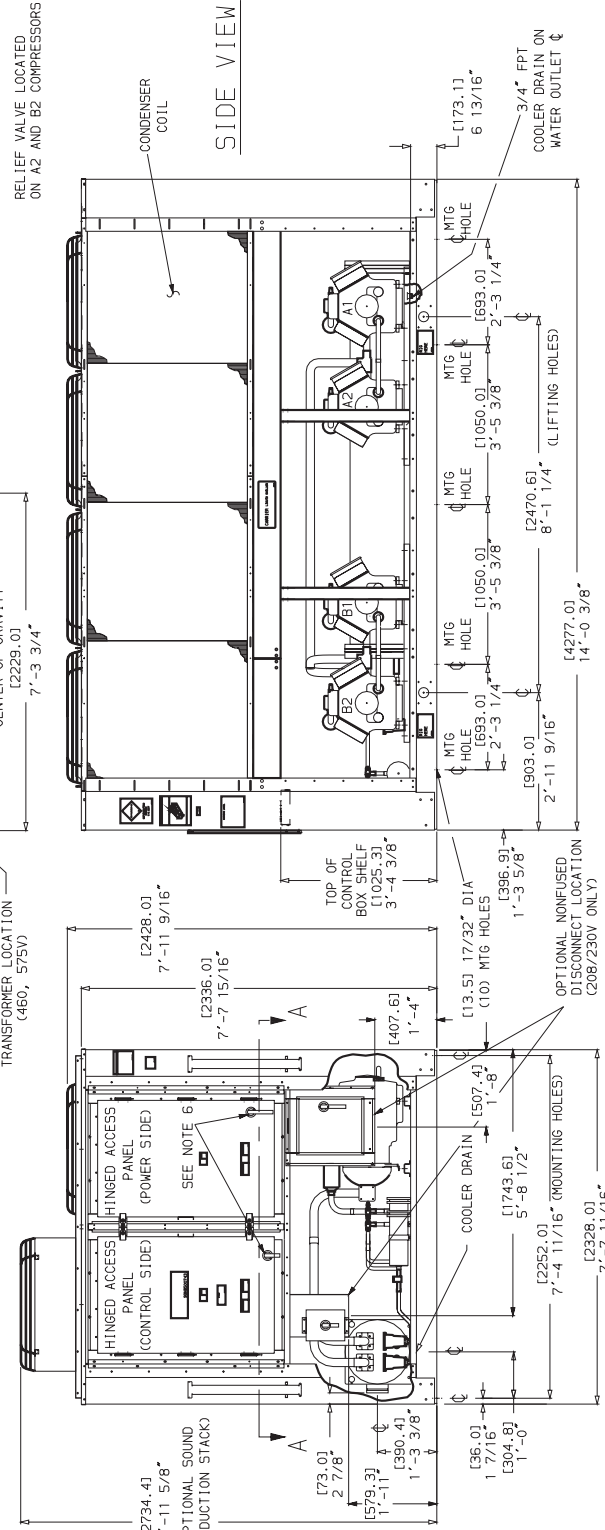
TOP VIEW



DETAIL B

TYP (2) PLACES

RELIEF VALVES ARE EQUIPPED WITH A 3/8" SAE FLARE FOR FIELD CONNECTION

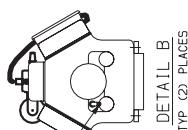


Base unit dimensions — 30GUN, GUR130-170



UNIT 30GUN, GUR	DIMENSIONS — ft-in. [mm]			
	A	B	C	D
130	9-4 1/2 [2858]	4-1 1/8 [1267]	1-43/4 [425]	0-9 1/2 [242]
150	9-4 [2849]	4-2 1/2 [1283]	1-43/4 [425]	0-9 1/2 [242]
170	9-4 1/8 [2865]	4-2 1/2 [1283]	1-55/8 [448]	0-85/8 [219]

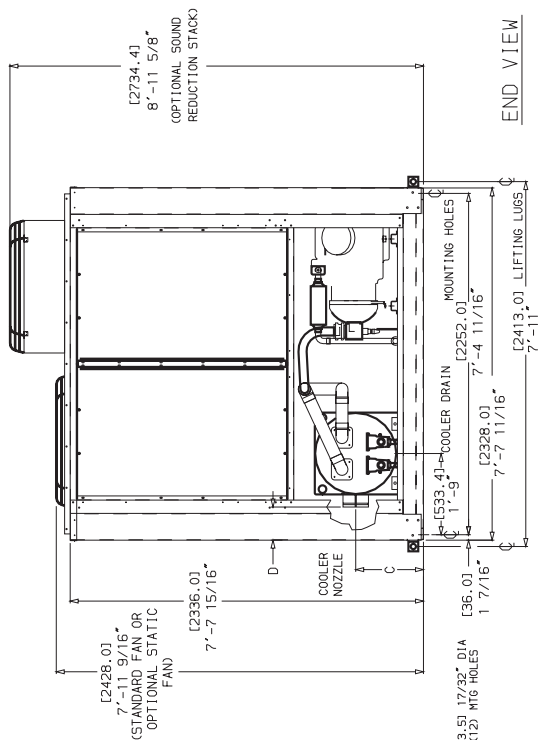
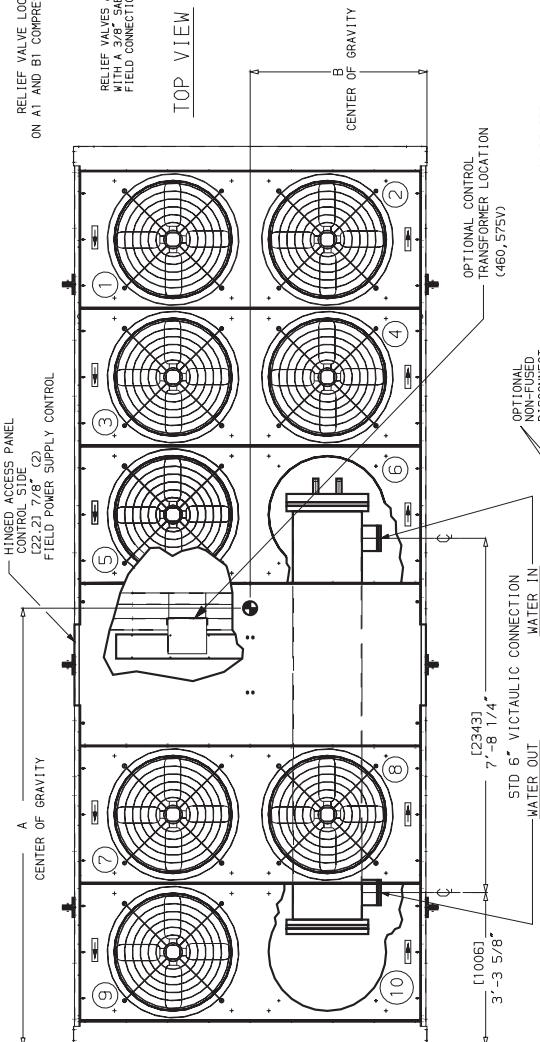
- NOTES:**
- Dimensions in [] are in mm.
 - Unit must have clearances for airflow as follows:
Top — Do not restrict in any way.
Ends — [1524 mm] 5 ft
Sides — [1829 mm] 6 ft
 - Mounting holes may be used to mount unit to concrete pad. They are not recommended for spring isolator location.
 - If spring isolators are used, a perimeter support channel between the unit and the isolators is recommended.
 - Size 150 is also Module A for size 230, 245, 255.
Size 170 is also Module A for size 270, 330.
Size 170 is also Module B for size 330, 360 (50 Hz).
 - 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 380/415 v (50 Hz). For 208/230 v (60 Hz), non-fused disconnect mounted underneath control box.



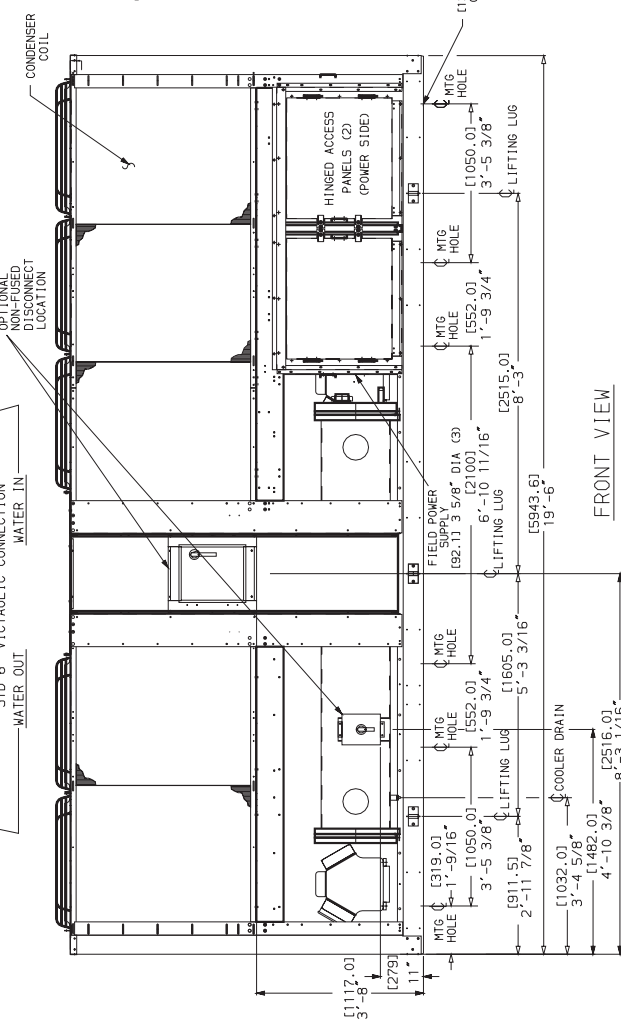
RELIEF VALVE LOCATED
ON A1 AND B1 COMPRESSORS

RELIEF VALVES ARE EQUIPPED
WITH A 3/8" SAE FLARE FOR
FIELD CONNECTION

TOP VIEW



END VIEW



FRONT VIEW

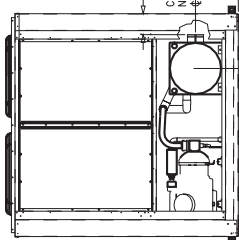
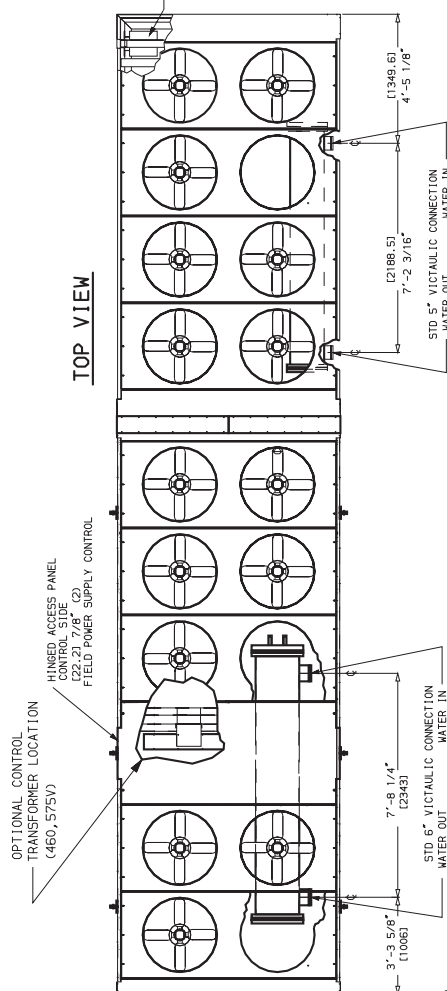
1. Dimensions in [] are in mm.
2. Top unit must have clearances for airflow as follows:
 - Unit — Do not restrict in any way.
 - Ends — [1524 mm] 5 ft
 - Sides — [1829 mm] 6 ft
3. Mounting holes may be used to mount unit to concrete pad. They are not recommended for spring isolator location.
4. If spring isolators are used, a perimeter support channel between the unit and the isolators is recommended.
5. Size 190 is also Module A for size 280, 360.
Size 190 is also Module B for size 360 (60 Hz), 390.
Size 210 is also Module A for size 315, 390, 420.
Size 210 is also Module B for size 420.
6. When unit has non-used disconnect option, power side door opens in opposite direction. Non-used disconnect option mounted in control box on 380, 460, 575 v (60 Hz) and 380/415 v (50 Hz). For 208/230 v (60 Hz), non-used disconnect mounted underneath control box.



--- [19.0] 3 3/4" APPROX. BETWEEN CORNER POSTS

16. 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 380/415 v (50 Hz). For 208/230 v (60-Hz), non-fused disconnect mounted underneath control box.

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

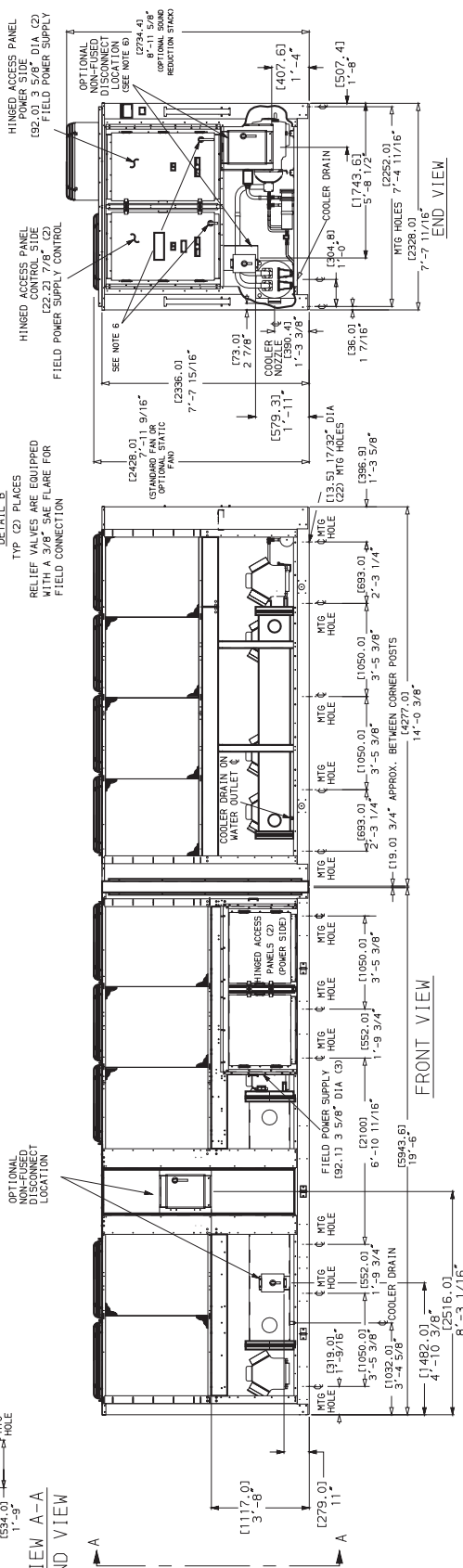


VIEW A-A
END VIEW



RELIEF VALVE LOCATED

RELIEF VALVES ARE EQUIPPED WITH A 3/8" SAE FLARE FIELD CONNECTION



3. Mounting holes may be used to mount unit to concrete pad.
4. They are not recommended for spring isolator location.
5. If spring isolators are used, a perimeter support channel between the unit and the isolators is recommended.
6. Unit shipped in 2 pieces.
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 380/415 v (50 Hz). For 208/230 v (60 Hz), non-fused disconnect mounted underneath control box.

TOP VIEW

OPTIONAL CONTROL TRANSFORMER LOCATION (460, 575V)

HINDED ACCESS PANEL (22-21 7/8" CD) FIELD POWER SUPPLY CONTROL

OPTIONAL DISCONNECT LOCATION

COOLER NOZZLE

VIEW A-A

END VIEW

COOLER DRAIN WATER OUT

STD 6" VICTALIC CONNECTION

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WATER OUT

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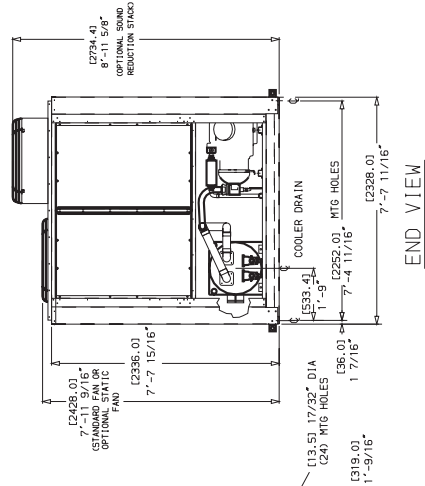
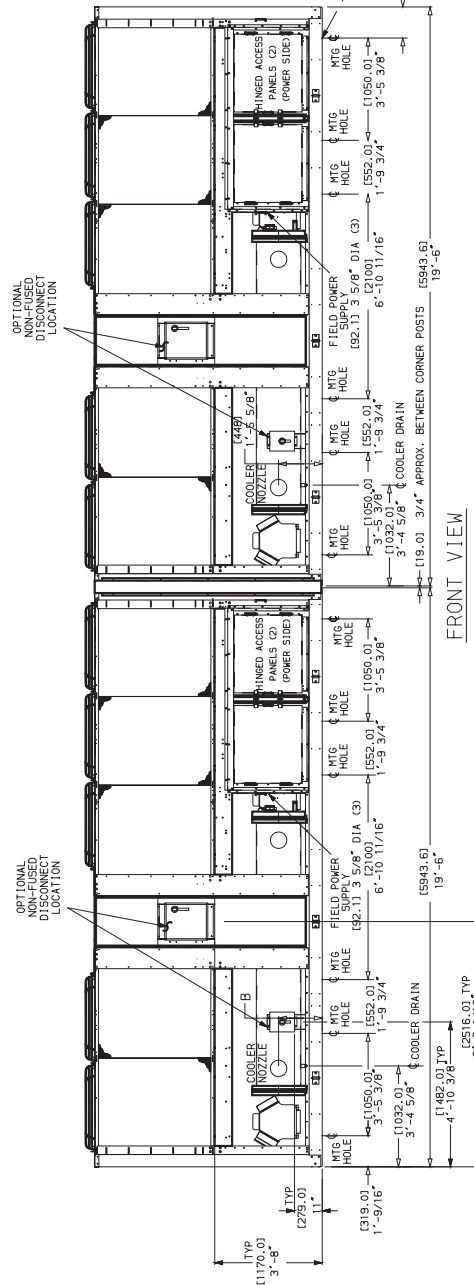
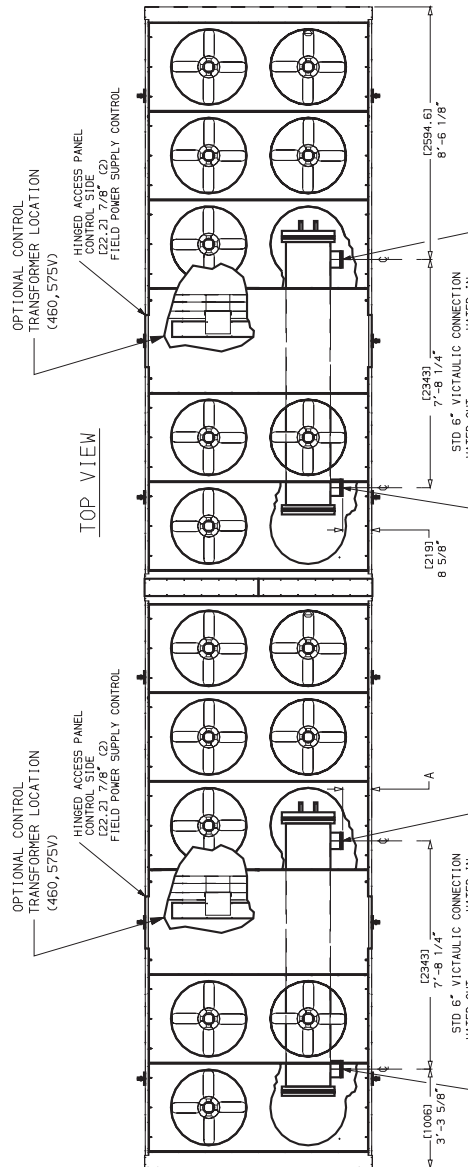
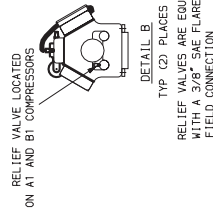
Base unit dimensions — 30GUN,GUR330



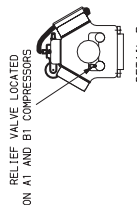
NOTES:

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.
6. When units have non-fused disconnect option, power side door opens in opposite direction. Non-fused disconnect option mounted in control box on 380, 480, 575 v (60 Hz) and 380/415 v (50 Hz). For 208/230 v (60 Hz), non-fused disconnect mounted underneath control box.

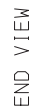
UNIT 30GUN,GUR	DIMENSIONS — ft-in. [mm]	
	A	B
330	0-9 1/2 [242]	1-5 5/8 [448]



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 isolators 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.
6. When unit has non-used disconnect option, power side door opens in opposite direction. Non-used disconnect option mounted in control box on 380/415 v (50 Hz).



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



FRONT VIEW

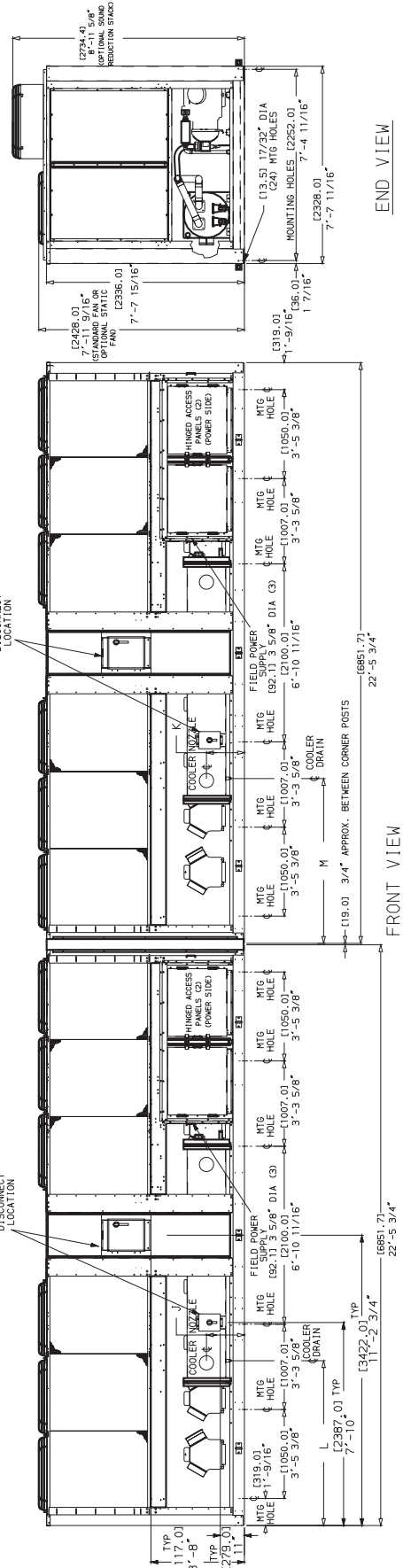
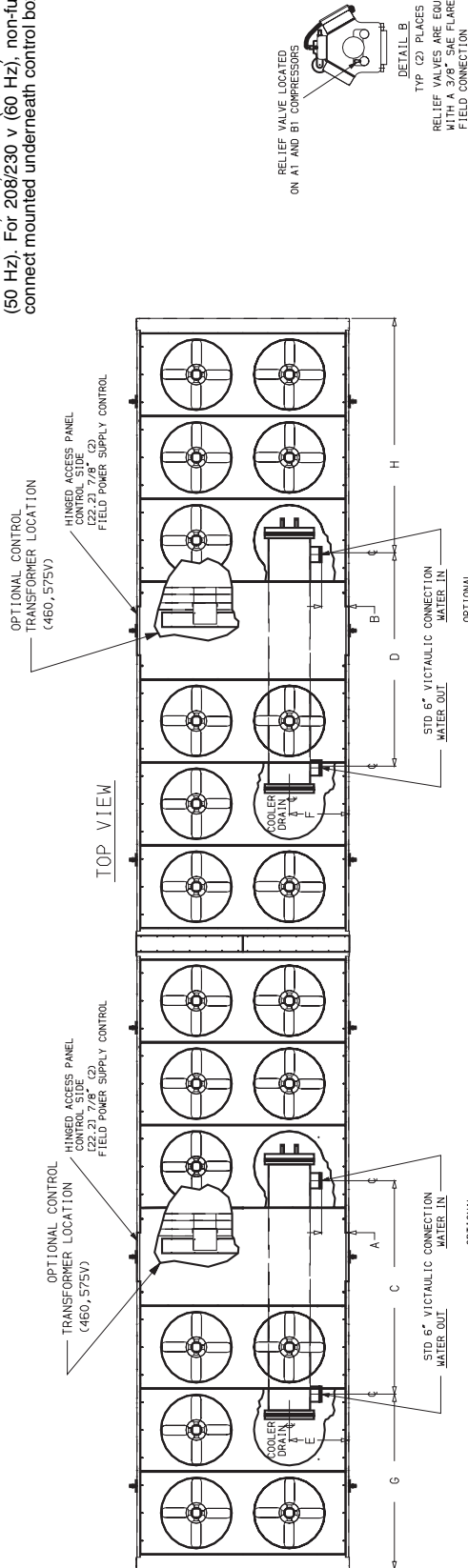
Base unit dimensions — 30GUN, GUR360 (60 Hz), 390, 420



- 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 380/415 v (50 Hz). For 208/230 v (60 Hz), non-fused disconnect mounted underneath control box.

DIMENSIONS — ft.-in. [mm]

UNIT	A	B	C	D	E	F	G	H	J	K	L	M
30GUN, GUR												
360 (60 Hz)	0-8 ⁵ / ₈ [219]	0-8 ⁵ / ₈ [219]	7-8 ¹ / ₄ [2343]	7-8 ¹ / ₄ [2343]	1-10 ⁷ / ₁₆ [570]	1-10 ⁷ / ₁₆ [570]	6-37 ¹ / ₈ [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]	0-8 ⁵ / ₈ [219]	8-2 ³ / ₁₆ [2504]	7-8 ¹ / ₄ [2343]	2-2 ³ / ₁₆ [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 [1942]	6-4 ¹ / ₂ [1942]
420	0-9 ¹ / ₂ [242]	0-9 ¹ / ₂ [242]	8-2 ³ / ₁₆ [2504]	8-2 ³ / ₁₆ [2504]	2-2 ³ / ₁₆ [620]	1-10 ⁷ / ₁₆ [570]	5-11 ¹ / ₂ [1816]	8-3 ¹ / ₁₆ [2532]	1-6 ⁷ / ₁₆ [468]	1-6 ⁷ / ₁₆ [468]	5-11 ¹ / ₂ [1942]	6-4 ¹ / ₂ [1942]



END VIEW

FRONT VIEW

Application data



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 30GUN, GUR 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 38 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 37.9 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.)

Medium temperature brine application

Application of chiller for brine duty within the 37.9 to 15 F (3.3 to -9.4 C) range is possible by ordering the proper factory-installed brine option. For ratings below 38 F (3.3 C) LCWT, contact your local Carrier representative.

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 49.

**MINIMUM COOLER FLUID FLOW RATES
AND MINIMUM LOOP VOLUME —
UNIT SIZES 040-210**

UNIT SIZE	MINIMUM COOLER FLOW RATE		MINIMUM LOOP VOLUME	
	Gpm	L/s	Gal	L
040	37	2.3	108	408
045	38	2.4	125	472
050	38	2.4	151	572
060	48	3.0	190	719
070	48	3.0	218	823
080	60	3.8	246	930
090	60	3.8	262	992
100	73	4.6	299	1131
110	73	4.6	323	1222
130	101	6.4	375	1419
150	101	6.4	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:

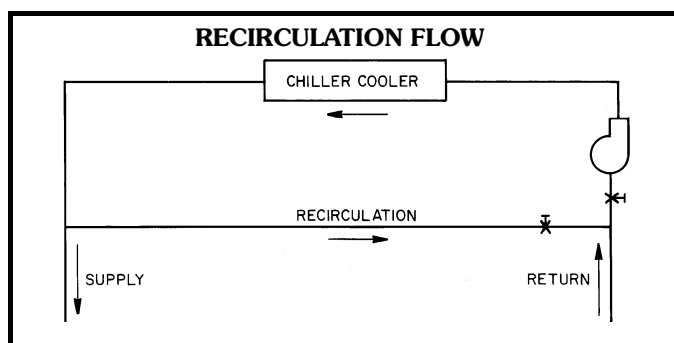
1. Minimum flow based on 1.0 fps (0.30 m/s) velocity in cooler without special cooler baffling.
2. Minimum Loop Volumes: Gallons = V x ARI Cap. (tons)
Liters = N x ARI Cap. (kW)

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

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.

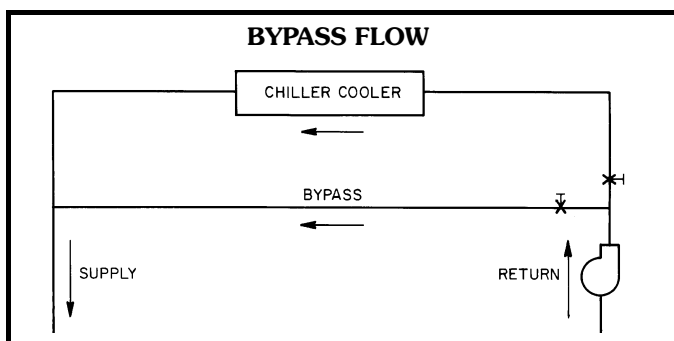
NOTE: Recirculation flow is shown below.



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.

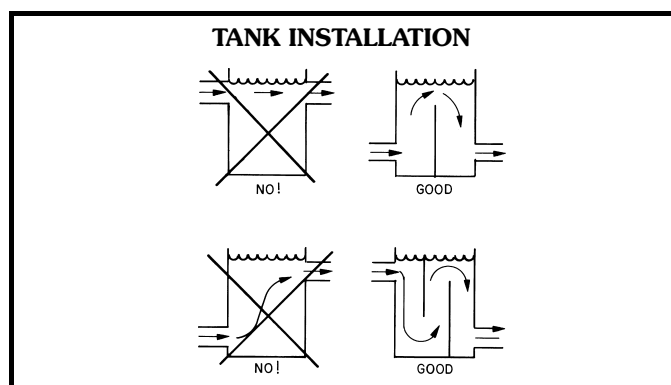


Variable cooler flow rates — Variable rates may be applied to standard chiller. Unit will, however, attempt to maintain a constant leaving chilled fluid temperature. In such cases, minimum flow must be in excess of minimum flow given in Minimum Cooler Fluid Flow Rates and Minimum Loop Volume table, and 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 30GUN210 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 (or brine) 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 $.00010 \text{ ft}^2 \cdot \text{hr} \cdot ^\circ\text{F}/\text{Btu}$ ($.000018 \text{ m}^2 \cdot ^\circ\text{C}/\text{W}$). As fouling factor is increased, unit capacity decreases and compressor power increases. Standard ratings should be corrected using following multipliers:

FOULING FACTOR		CAPACITY MULTIPLIER	COMPRESSOR POWER MULTIPLIER
English ($\text{ft}^2 \cdot \text{hr} \cdot ^\circ\text{F}/\text{Btu}$)	SI ($\text{m}^2 \cdot ^\circ\text{C}/\text{W}$)		
.00025	.000044	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 or other suitable brine.

Even though unit cooler is equipped with insulation and an electric heater that helps prevent freeze-up, it does not protect fluid piping external to unit 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 42.

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 30GUN,GUR chillers at ambient temperatures up to 125 F (52 C) at nominal voltage. In some cases, where return water temperature is expected to exceed 60 F (15.5 C), an accessory kit may be required.

Low ambient temperature operation

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

0° F (–18 C) for EXV units

35° F (1.7 C) for 30GUN,GUR040-110 TXV units

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

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

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

Antifreeze solution — Inhibited ethylene glycol or other suitable corrosion-resistant anti-freeze solution must be field supplied and installed in all units for unit operation below 32 F (0° C). Solution must be added to fluid loop to protect loop down to 15° F (8° C) below minimum operating ambient temperature. 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. 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 (page 43) at –10 F; read that 40% concentration of inhibited ethylene glycol is required to prevent crystals from forming in solution.

Consider the 30GUN330 unit from the Selection Procedure example on page 49 (refer to correction curves at 40% solution).

Correct unit capacity — On the capacity correction curve in chart on page 43, read 0.95.

$$\begin{aligned}\text{Corrected capacity} &= \text{correction factor} \times \text{determined capacity} \\ &= 0.95 \times 221.2 \text{ tons} \\ &= 210.1 \text{ tons}\end{aligned}$$

Correct cooler water flow — On the cooler flow correction curve (page 43), read 1.15.

Cooler water flow (at corrected capacity)

$$\begin{aligned}&= \frac{24 \times \text{corrected cap. in tons}}{\text{temperature rise } F} = \text{U.S. gpm} \\ &= \frac{24 \times 210.1}{14^{\circ}} = 360.2 \text{ U.S. gpm}\end{aligned}$$

$$\begin{aligned}\text{Cooler water flow (40\% solution)} &= 360.2 \times 1.15 \\ &= 414.3 \text{ U.S. gpm}\end{aligned}$$

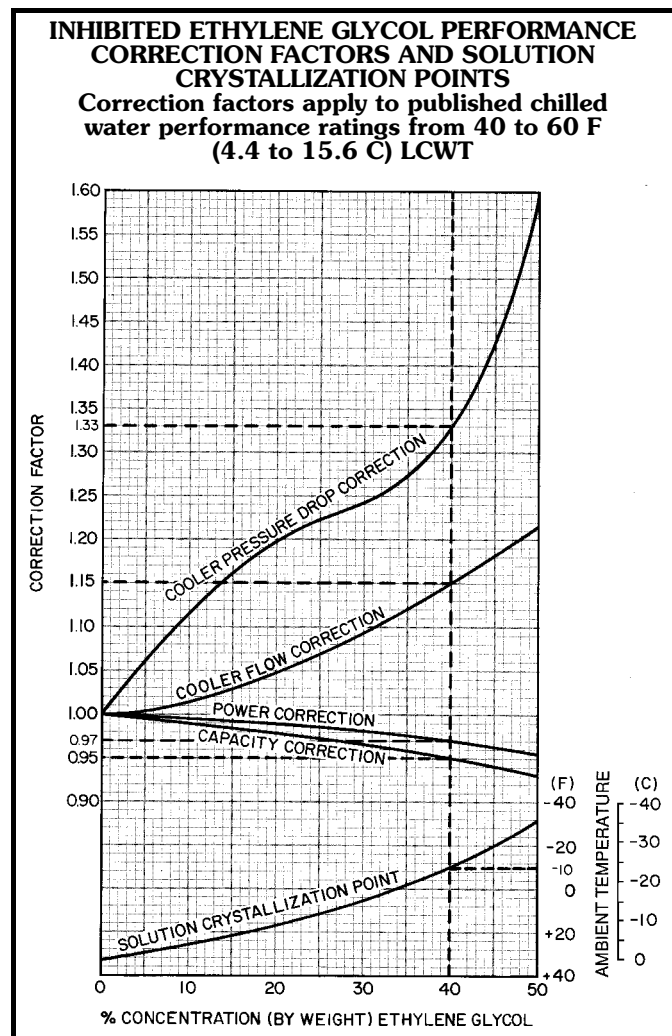
Correct cooler pressure drop — On cooler pressure drop correction curve on this page, read 1.33.

On Cooler Fluid Pressure Drop curve (page 48), for 207.1 (1/2 x 414.3) gpm, read pressure drop = 3.5 ft water gage (per module). The pressure drop for 40% solution = 3.5 x 1.33 = 4.7 ft water per module.

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

Power input from Selection Procedure example = 220.6 kW.

Corrected power input = $220.6 \times 0.97 = 214.1$ kW



Example: SI — 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 30GUN330 unit selected from the Selection Procedure example (refer to correction curves at 40% solution).

Correct unit capacity — On capacity correction curve on this page, read 0.95.

Corrected capacity = correction factor $\times$ determined capacity
 $= 0.95 \times 754.8$
 $= 717.1$ kW

Correct cooler water flow — On cooler flow correction curve (at left), read 1.15 correction factor.

Cooler water flow (at corrected capacity)

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

$$= \frac{0.239 \times 717.1}{7.8^{\circ}} = 22.0 \text{ L/s}$$

Cooler water flow (40% solution) = 22.0×1.15
 $= 25.3$ L/s

Correct cooler pressure drop — On Cooler Fluid Pressure Drop correction curve (below), read 1.33.

On Cooler Pressure Drop Curve (page 48), for $12.6 (1/2 \times 25.3)$ L/s, read pressure drop of 8 kPa per module. The pressure drop for 40% solution = $8 \times 1.33 = 10.64$ kPa per module.

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

Power input from Selection Procedure example = 217.1 kW.

Corrected power input = $217.1 \times 0.97 = 210.6$ 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.

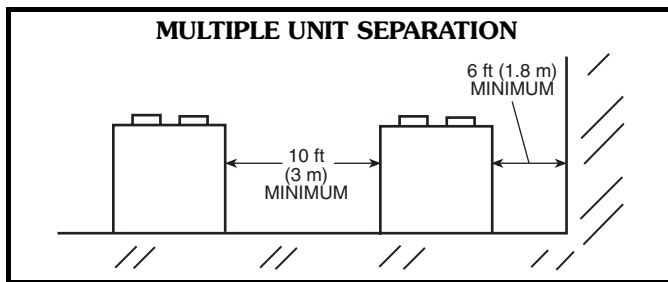
It is also recommended that 2 smaller chillers be installed where operation at minimum load is critical. The operation of a smaller chiller loaded to a greater percentage over minimum is preferred to operating a single chiller at or near its minimum recommended value.

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 standby 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 40 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 predetermined 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 30GUN, GUR 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 64-67) 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™)

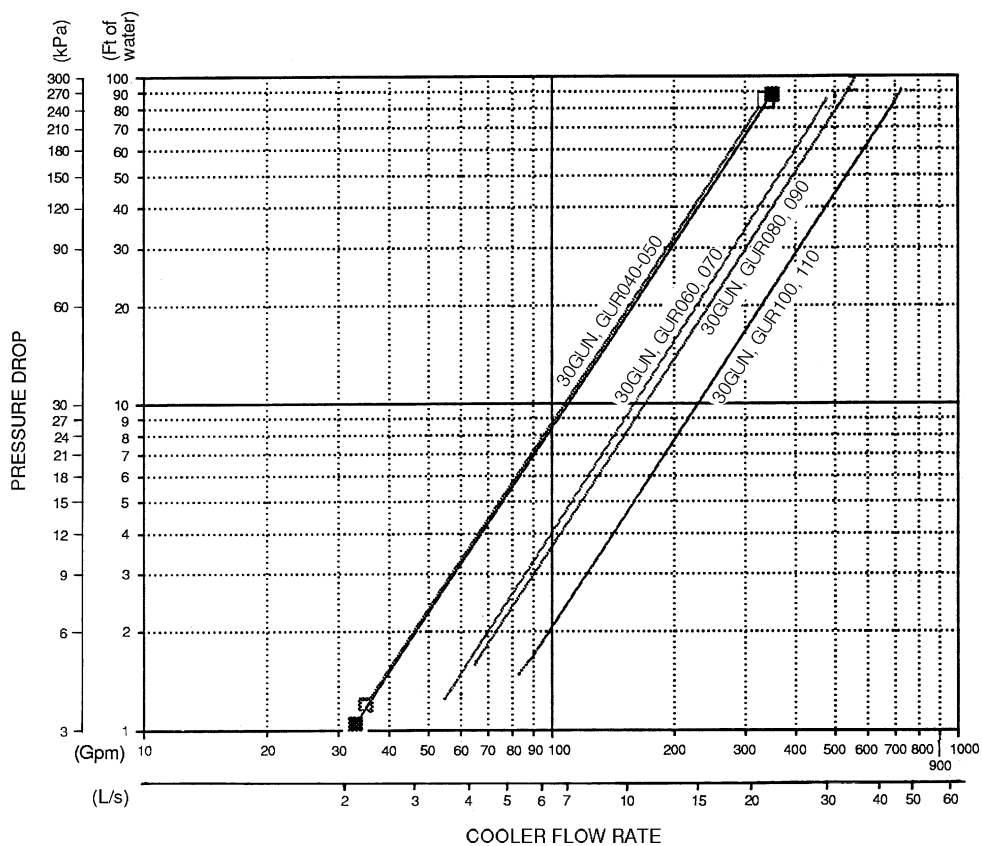
Pre-coated aluminum-fin coils have a durable epoxy-phenolic coating applied to the fin prior to the fin stamping process to provide protection in mildly corrosive coastal environments. Pre-coated coils have an inert barrier between the aluminum fin and copper tube. This barrier electrically disconnects 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 bi-metallic 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 airborne contaminants. In moderate seacoast environments, copper-fin coils have extended life compared to standard or pre-coated aluminum-fin coils.

E-coated aluminum-fin coils have an extremely flexible and durable epoxy coating uniformly applied to all coil surfaces. Unlike brittle phenolic dip and bake coatings, E-coat provides superior protection with unmatched flexibility, edge coverage, metal adhesion, thermal performance and most importantly, corrosion resistance. E-coated coils provide this protection since all coil surfaces are completely encapsulated from environmental contamination. Specify E-coated aluminum-fin coils for industrial environments with high levels of air pollution. This option also provides better protection compared to standard or pre-coated aluminum-fin coils in industrial environments.

E-coated copper-fin coils have the same flexible and durable epoxy coating as E-coated aluminum-fin coils. However, this option combines the natural salt and environmental resistance of all-copper construction with the highest level of corrosion protection. Specify E-coated copper-fin coils in the harshest combination of coastal and industrial environments.

COOLER FLUID PRESSURE DROP CURVES — 30GUN,GUR040-110 **ENGLISH AND SI**



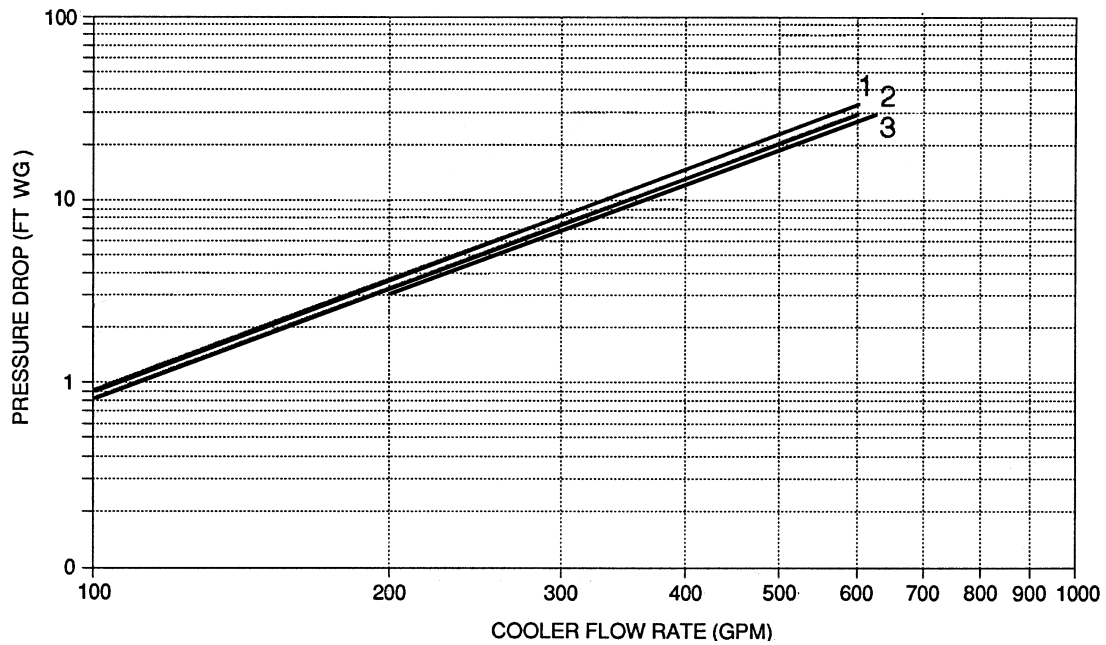
LEGEND

- — 040
- — 045,050

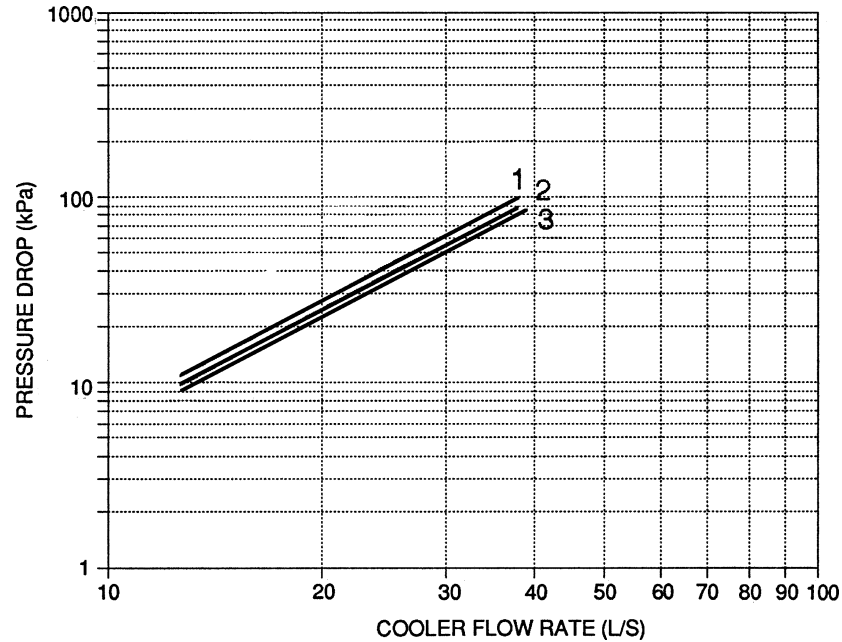
NOTE: Ft of water = 2.31 x change in psig.

COOLER FLUID PRESSURE DROP CURVES — 30GUN,GUR130-210

ENGLISH



SI

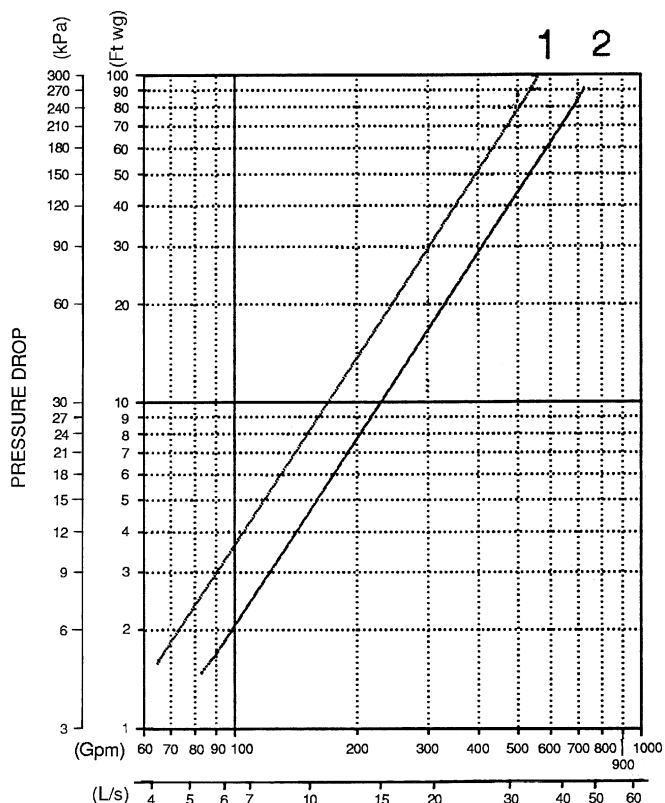


COOLER PRESSURE DROP KEY

- 1 — 30GUN,GUR130,150
- 2 — 30GUN,GUR170,190
- 3 — 30GUN,GUR210

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

COOLER FLUID PRESSURE DROP CURVES — 30GUN,GUR230B-315B **ENGLISH AND SI**



COOLER FLOW RATE

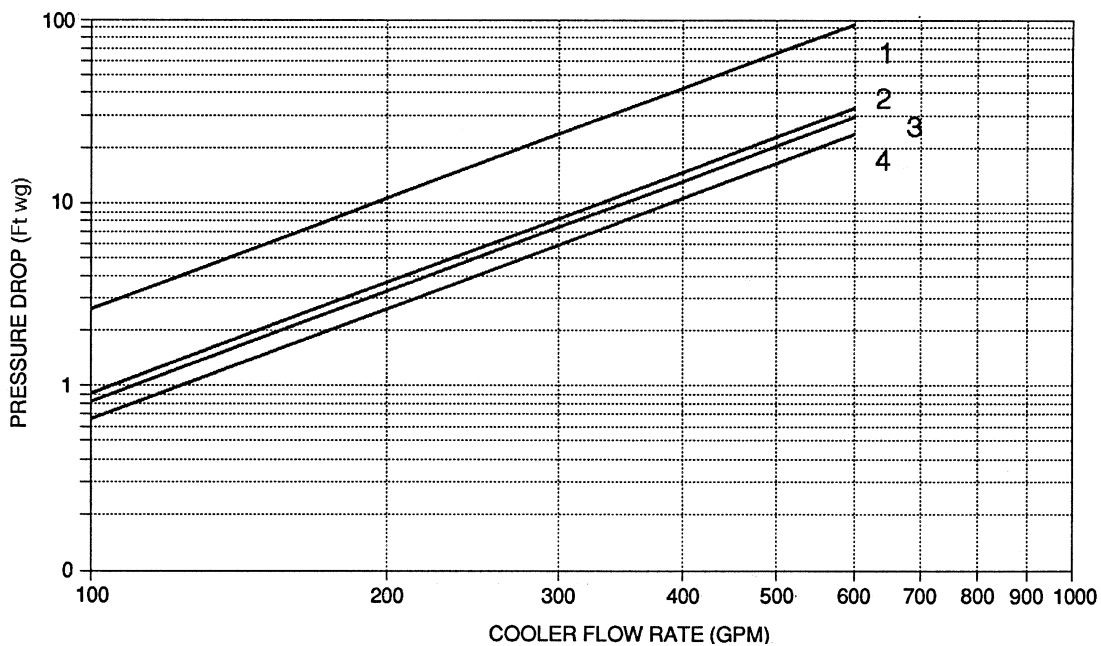
COOLER PRESSURE DROP KEY

- 1** Module B — 30GUN,GUR230,245
- 2** Module B — 30GUN,GUR255,290,315

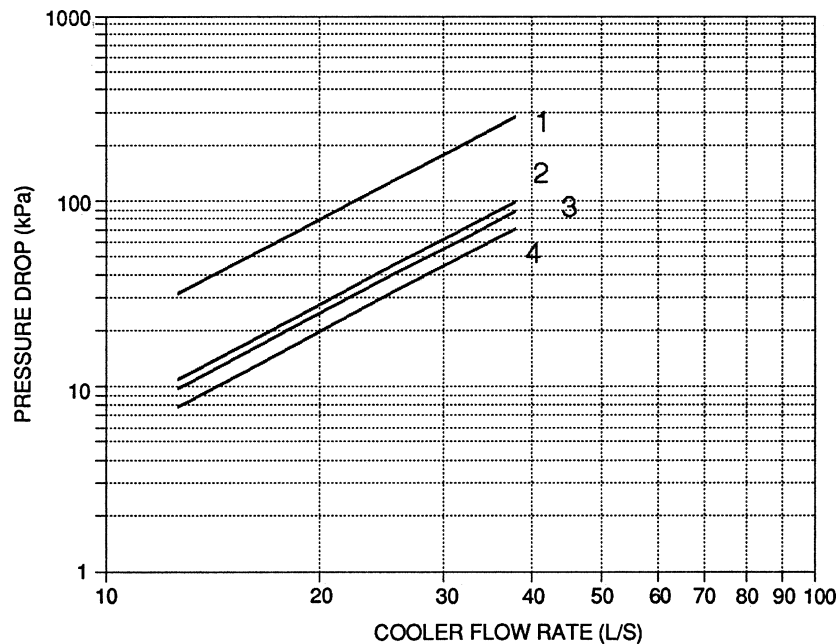
NOTE: Ft of water = 2.31 x change in psig.

COOLER FLUID PRESSURE DROP CURVES — 30GUN,GUR230A-255A, 270A/B-420A/B

ENGLISH



SI



COOLER PRESSURE DROP KEY

- 1 Module B — 30GUN,GUR270
- 2 Module A — 30GUN,GUR230-255
- 3 Module A — 30GUN,GUR270,330
Module B — 30GUN,GUR330,360 (50 Hz)
- 4 Module A — 30GUN,GUR290,315,360 (50 or 60 Hz), 390, and 420
Module B — 30GUN,GUR360 (60 Hz), 390, and 420

Selection procedure — English (60 Hz)



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

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

Capacity required 220 tons
Leaving chilled water temperature (LCWT) . . . 45 F
Cooler water temperature rise 14 F
Condenser entering-air temperature (CEAT) . . 95 F
Loop volume 1000 gal.
Electrical Power 460-3-60

Ratings are based on 10° F rise and are suitable for a temperature rise range from 5 F to 15 F without adjustment. In this case, however, greater accuracy is desired.

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

Enter LCWT correction curve (page 63) at 14° F and read a correction of 0.3° F. Corrected LCWT is, therefore, 45 + 0.3 = 45.3° F.

III Determine capacity, unit size, and power input.

Enter Cooling Capacities table at given CEAT and LCWT — respectively, 95 F and 45 F. In this case, for a 30GUN,GUR330 the capacity is 220.2 tons, and power input is 220 kW. Interpolate between

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

Values are:

Capacity 221.2 tons
Power input 220.6 kW

IV Calculate corrected cooler water flow.

$$\text{Water flow} = \frac{24 \times \text{corr cap. in tons}}{\text{temperature rise } ^\circ \text{F}} = \text{U.S. gpm}$$
$$= \frac{24 \times 221.2}{14} = 379.2 \text{ U.S. gpm}$$

V Calculate the cooler pressure drop.

Enter Cooler Fluid Pressure Drop curve (page 48) at corrected flow rate proportional to the capacity of each of the 2 modules. In this selection, with two equal size modules, enter at $\frac{1}{2}$ the corrected flow rate ($\frac{1}{2} \times 379.2 = 189.6$ gpm) and read, for 30GUN,GUR330, a pressure drop of 3 ft (per module) of water.

VI Check loop volume and cooler water flow rate.

Minimum loop volume, from application data, is 975 gal. for 30GUN,GUR330. Therefore, given volume of 1000 gal. is satisfactory. Minimum water flow rate, from application data, is 135 gpm (per module) for 30GUN,GUR330. Flow rate of 189.6 gpm (per module) is well above minimum required.

Selection procedure — SI (60 Hz)

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

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

Capacity required 775 kW
Leaving chilled water temperature (LCWT) . . . 6° C
Cooler water temperature rise 7.8° C
Condenser entering-air temperature (CEAT). . 35 C
Loop volume 3785 L
Electrical Power 460-3-60

Ratings are based on 6° C rise and are suitable for a temperature rise range from 2.8° C to 8.3° C without adjustment. In this case, however, greater accuracy is desired.

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

Enter LCWT correction curve (page 63) at 7.8 C and read a correction of 0.14° C. Corrected LCWT is, therefore, 6 + 0.14 = 6.14 C.

III Determine capacity, unit size, and power input.

Enter Cooling Capacities table at given CEAT and LCWT — respectively, 35 C and 6 C. In this case, 746.5 kW is delivered by a 30GUN,GUR330. Interpolate between 6 C and 7 C to find the determined

capacity and power input at corrected LCWT (6.14° C).

Values are:

Capacity 754.8 kW
Power input 217.1 kW

IV Calculate corrected cooler water flow.

$$\text{Water flow} = \frac{0.239 \times \text{corr cap. in kW}}{\text{temperature rise } ^\circ \text{C}} = \text{L/s}$$
$$= \frac{0.239 \times 754.8}{7.8} = 23.1 \text{ L/s}$$

V Calculate cooler pressure drop.

Enter Cooler Fluid Pressure Drop curve (page 48) at corrected flow rate proportional to the capacity of each of the 2 modules. In this selection, with 2 equal sized modules, enter at $\frac{1}{2}$ the corrected flow rate ($\frac{1}{2} \times 23.1 = 11.55$ L/s) and read, for 30GUN,GUR330, a pressure drop of 8 kPa (per module).

VI Check loop volume and cooler water flow rate.

Minimum loop volume, from application data, is 3715 L for 30GUN,GUR330. Therefore, given volume of 3785 L is satisfactory. Minimum water flow rate, from application data, is 8.5 L/s (per module) for 30GUN,GUR330. Flow rate of 11.55 L/s (per module) is well above minimum required.

Performance data



ARI* STANDARD RATINGS — 60 Hz

UNIT 30GUN,GUR	CAPACITY		COMPRESSOR POWER INPUT (kW)	FAN POWER (kW)	COOLER WATER PRESSURE DROP		EER	COP	IPLV
	Tons	kW			ft water	kPa			
040	24.0	84.5	23.6	6.2	2.7	8.1	9.7	2.84	10.8
045	27.0	95.0	27.6	6.2	3.7	11.0	9.6	2.82	10.9
050	33.8	119.0	33.8	6.2	5.6	16.8	10.2	2.98	12.1
060	43.2	151.8	44.0	9.3	6.0	17.8	9.7	2.84	11.6
070	49.9	175.5	52.2	9.3	7.9	23.4	9.7	2.85	11.4
080	56.2	197.6	57.7	9.4	5.6	16.7	10.0	2.94	12.2
090	58.4	205.4	58.7	9.4	6.0	18.0	6.0	3.01	13.4
100	67.0	235.6	65.2	12.7	4.3	12.9	10.3	3.02	12.6
110	72.5	254.9	74.7	12.7	5.1	15.1	10.0	2.92	12.3
130	82.9	291.7	85.5	15.4	3.2	9.5	9.9	2.89	12.0
150	95.6	336.1	99.3	15.5	4.2	12.5	10.0	2.93	12.4
170	108.5	381.7	109.2	15.5	5.7	17.0	10.4	3.06	13.9
190	118.7	417.6	119.2	18.6	6.8	20.2	10.3	3.03	13.7
210	137.3	482.8	141.9	18.5	7.2	21.4	10.3	3.01	13.5
230	151.8	533.7	157.0	24.9	5.6	16.7	10.0	2.93	12.1
245	154.0	541.5	158.1	24.8	6.0	18.0	10.1	2.96	12.6
255	162.6	571.7	164.6	28.1	4.3	12.9	10.1	2.97	12.3
270	175.6	617.4	174.4	28.2	5.7	17.0	10.4	3.05	13.1
290	191.2	672.5	193.9	31.3	6.8	20.2	10.2	2.99	13.0
315	209.8	737.8	216.6	31.2	7.2	21.4	10.2	2.98	12.9
330	216.9	762.9	218.3	30.9	5.7	17.0	10.4	3.06	13.9
360	237.5	835.2	238.4	37.1	6.8	20.2	10.3	3.03	13.7
390	256.0	900.4	261.1	37.1	7.2	21.4	10.3	3.02	13.4
420	274.5	965.4	283.8	37.1	7.2	21.4	10.3	3.01	13.5

ARI* STANDARD RATINGS — 50 Hz

UNIT 30GUN,GUR	CAPACITY		COMPRESSOR POWER INPUT (kW)	FAN POWER (kW)	COOLER WATER PRESSURE DROP		EER	COP	IPLV
	Tons	kW			ft water	kPa			
040	23.4	82.3	23.0	6.2	2.6	7.7	9.6	2.82	10.7
045	28.1	98.9	28.5	6.2	4.0	11.9	9.7	2.85	11.4
050	34.9	122.7	36.6	6.2	6.0	17.9	9.8	2.86	12.0
060	41.3	145.1	43.4	9.3	5.5	16.3	9.4	2.75	10.6
070	47.2	166.0	47.7	9.3	7.1	21.1	9.9	2.91	11.9
080	55.6	195.5	56.7	9.4	5.5	16.4	10.1	2.96	12.1
090	62.2	218.8	64.4	9.4	6.8	20.3	10.1	2.97	13.5
100	68.0	239.0	69.6	12.7	4.5	13.3	9.9	2.91	12.4
110	76.1	267.6	83.4	12.7	5.6	16.6	9.5	2.78	11.3
130	84.3	296.5	86.8	15.5	3.3	9.8	9.9	2.90	12.2
150	99.8	351.0	109.6	15.5	4.7	13.9	9.6	2.81	12.4
170	109.5	385.1	114.9	15.4	5.8	17.3	10.1	2.96	14.3
190	124.0	436.1	133.0	18.5	7.4	22.0	9.8	2.88	12.9
210	137.9	484.9	146.0	18.5	7.2	21.6	10.1	2.95	13.7
230	155.4	546.5	166.3	24.9	5.5	16.4	9.8	2.86	12.1
245	162.0	569.8	174.0	24.8	6.8	20.3	9.8	2.87	12.6
255	167.7	589.8	179.2	28.1	4.7	13.9	9.7	2.84	12.2
270	177.4	623.9	184.4	28.2	5.8	17.3	10.0	2.94	13.3
290	200.1	703.6	216.4	31.3	7.4	22.0	9.7	2.84	12.1
315	214.0	752.5	229.4	31.3	7.2	21.6	9.8	2.89	12.6
330	219.0	770.2	229.7	30.9	5.8	17.3	10.1	2.96	14.3
360	233.5	821.2	247.9	34.0	7.4	22.0	9.9	2.91	13.3
390	261.9	921.1	279.0	37.1	7.4	22.0	9.9	2.91	13.1
420	275.8	969.9	292.0	37.1	7.2	21.6	10.1	2.95	13.7

LEGEND

- COP** — Coefficient of Performance (Capacity [kW] ÷ Input Power [kW])
EER — Energy Efficiency Ratio (Capacity [Btu/h] ÷ Input Power [W])
IPLV — Integrated Part-Load Value

*Air Conditioning and Refrigeration Institute (U.S.A.).

NOTES:

- Rated in accordance with ARI Standard 550/590-98 at standard rating conditions.
- 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)
- 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.

- All data in this table is rated in accordance with ARI Standard 550/590 as represented in the Packaged Chiller Selection Program (E-Cat) Version 2.20.



60 Hz Only

Certified in accordance with the ARI Water-Chiller Packages using the Vapor Compression Cycle Certification program, which is based on ARI Standard 550/590. (Up to 200.1 tons.)

Performance data — English



COOLING CAPACITIES — 60 Hz

LCWT (F)	UNIT SIZE 30GUN,GUR	CONDENSER ENTERING-AIR TEMPERATURE (F)														
		85			95			105			115			125		
		Cap. (Tons)	Input kW	Cooler Flow Rate (Gpm)	Cap. (Tons)	Input kW	Cooler Flow Rate (Gpm)	Cap. (Tons)	Input kW	Cooler Flow Rate (Gpm)	Cap. (Tons)	Input kW	Cooler Flow Rate (Gpm)	Cap. (Tons)	Input kW	Cooler Flow Rate (Gpm)
40.0	040	23.7	21.5	56.8	22.5	22.9	53.7	21.2	24.1	50.7	19.9	25.2	47.5	18.5	26.3	44.3
	045	26.6	25.0	63.7	24.3	26.1	58.2	22.1	26.9	52.8	19.8	27.4	47.5	17.7	27.6	42.3
	050	33.3	30.5	79.8	31.1	32.4	74.5	28.9	34.0	69.1	26.6	35.3	63.8	24.3	36.3	58.3
	060	42.4	40.0	101.4	39.7	42.3	95.1	37.1	44.3	88.7	34.4	46.1	82.3	31.7	47.6	75.8
	070	49.0	47.5	117.2	45.9	50.0	110.0	42.9	52.2	102.7	39.9	54.1	95.5	36.8	55.8	88.2
	080	55.1	52.4	132.0	51.6	55.2	123.5	48.0	57.7	115.0	44.4	59.8	106.4	40.8	61.6	97.7
	090	57.7	53.3	138.1	53.5	56.1	128.2	49.4	58.3	118.2	45.2	60.1	108.2	41.0	61.4	98.2
	100	65.6	58.8	157.1	61.2	62.3	146.5	56.7	65.3	135.7	52.1	67.7	124.6	47.4	69.6	113.5
	110	71.0	67.7	170.0	66.2	71.2	158.6	61.4	74.2	147.0	56.5	76.6	135.2	51.6	78.5	123.5
	130	81.2	77.6	194.5	76.8	82.2	183.8	72.2	86.4	172.8	67.5	90.2	161.7	62.8	93.5	150.3
	150	94.1	90.3	225.3	88.8	95.4	212.5	83.3	100.0	199.4	77.7	104.1	186.1	72.1	107.6	172.6
	170	105.8	98.2	253.3	100.1	104.6	239.6	94.1	110.4	225.3	87.9	115.5	210.4	81.6	120.0	195.3
	190	116.1	108.0	277.9	109.5	114.1	262.2	102.8	119.6	246.1	96.0	124.5	229.8	89.0	128.7	213.1
	210	134.9	128.9	323.0	125.8	135.0	301.2	116.4	140.1	278.6	107.1	144.3	256.5	97.7	147.3	233.8
	230	149.2	142.7	357.3	140.4	150.6	336.1	131.3	157.7	314.3	122.2	163.9	292.5	112.9	169.2	270.3
	245	151.8	143.6	363.3	142.3	151.5	340.7	132.7	158.3	317.6	123.0	164.2	294.3	113.1	169.0	270.8
	255	159.7	149.1	382.4	150.0	157.8	359.0	139.9	165.3	335.0	129.8	171.8	310.7	119.5	177.1	286.0
	270	171.4	157.0	410.4	161.3	166.9	386.1	150.8	175.7	361.0	140.0	183.3	335.1	129.0	189.5	308.9
	290	187.1	175.7	448.0	175.8	185.3	420.8	164.2	193.8	393.1	152.5	201.1	365.1	140.6	207.2	336.6
	315	206.0	196.6	493.0	192.0	206.3	459.7	177.8	214.3	425.6	163.6	220.9	391.7	149.2	225.8	357.2
	330	211.6	196.4	506.6	200.1	209.2	479.1	188.2	220.7	450.5	175.8	230.9	420.7	163.1	239.9	390.5
	360	232.2	216.0	555.9	219.0	228.2	524.4	205.6	239.2	492.2	192.0	249.0	459.6	178.0	257.4	426.2
	390	251.0	236.9	600.9	235.3	249.2	563.4	219.2	259.7	524.8	203.1	268.8	486.3	186.6	276.0	446.8
	420	269.8	257.8	645.9	251.4	270.0	601.9	232.7	280.1	557.0	214.2	288.5	512.7	195.3	294.7	467.5
42.0	040	24.5	21.8	58.7	23.2	23.2	55.6	21.9	24.5	52.5	20.6	25.7	49.3	19.2	26.8	46.0
	045	28.0	25.7	67.1	25.6	26.8	61.4	23.3	27.7	55.8	21.0	28.3	50.3	18.7	28.6	44.9
	050	34.7	31.1	83.1	32.5	33.1	77.8	30.2	34.8	72.2	27.9	36.2	66.8	25.5	37.3	61.1
	060	44.1	40.7	105.7	41.4	43.2	99.2	38.7	45.3	92.7	35.9	47.2	86.0	33.1	48.8	79.3
	070	51.0	48.5	122.2	47.9	51.1	114.7	44.7	53.4	107.2	41.6	55.4	99.7	38.5	57.2	92.2
	080	57.5	53.5	137.7	53.9	56.5	129.0	50.2	59.1	120.2	46.5	61.4	111.4	42.8	63.3	102.5
	090	60.2	54.5	144.1	56.0	57.4	134.0	51.7	59.9	123.8	47.4	61.8	113.6	43.1	63.2	103.3
	100	68.6	60.0	164.3	64.0	63.8	153.4	59.4	67.0	142.4	54.7	69.6	131.0	49.9	71.7	119.6
	110	74.2	69.2	177.8	69.3	73.0	166.1	64.3	76.2	154.1	59.3	78.8	142.1	54.3	80.9	130.0
	130	84.4	79.0	202.2	79.8	83.8	191.3	75.1	88.2	180.0	70.4	92.2	168.6	65.5	95.8	156.9
	150	97.6	92.0	233.7	92.2	97.4	220.8	86.6	102.2	207.4	81.0	106.5	193.9	75.2	110.3	180.0
	170	110.3	100.3	264.1	104.2	106.9	249.6	98.1	113.0	235.1	91.8	118.4	220.0	85.3	123.2	204.3
	190	120.9	110.3	289.6	114.1	116.6	273.4	107.2	122.5	256.9	100.3	127.7	240.2	93.1	132.2	223.1
	210	140.8	131.9	337.4	131.5	138.5	315.0	121.8	143.9	291.9	112.3	148.4	269.0	102.7	151.9	246.0
	230	155.0	145.5	371.4	146.0	153.8	349.9	136.8	161.3	327.6	127.4	167.9	305.3	117.9	173.6	282.5
	245	157.7	146.5	377.9	148.1	154.8	354.9	138.3	162.0	331.2	128.4	168.3	307.5	118.3	173.5	283.4
	255	166.2	152.1	398.1	156.2	161.2	374.3	146.0	169.2	349.7	135.7	176.2	325.0	125.1	182.0	299.7
	270	178.9	160.3	428.5	168.3	170.7	403.1	157.5	180.0	377.4	146.6	188.1	351.1	135.2	194.9	323.9
	290	195.1	179.5	467.4	183.4	189.6	439.4	171.6	198.6	411.0	159.6	206.5	382.3	147.4	213.1	353.1
	315	215.1	201.2	515.2	200.8	211.4	481.0	186.2	220.0	446.0	171.6	227.2	411.1	156.9	232.8	376.0
	330	220.4	200.5	528.1	208.4	213.7	499.3	196.2	225.9	470.0	183.6	236.8	439.8	170.5	246.4	408.5
	360	241.8	220.6	579.2	228.2	233.3	546.7	214.4	244.9	513.7	200.5	255.3	480.2	186.2	264.5	446.1
	390	261.7	242.2	626.9	245.5	255.1	588.2	229.1	266.4	548.8	212.5	276.1	509.2	195.8	284.2	469.0
	420	281.6	263.9	674.7	262.8	276.8	629.5	243.7	287.7	583.7	224.6	296.8	538.0	205.3	303.9	491.9
44.0	040	25.3	22.1	60.7	24.0	23.6	57.6	22.7	25.0	54.4	21.3	26.2	51.1	19.9	27.4	47.8
	045	29.5	26.3	70.7	27.0	27.6	64.8	24.6	28.5	59.0	22.2	29.2	53.2	19.9	29.6	47.6
	050	36.1	31.7	86.6	33.8	33.8	81.1	31.5	35.6	75.5	29.1	37.1	69.9	26.7	38.3	64.0
	060	45.9	41.5	110.1	43.2	44.0	103.5	40.3	46.3	96.7	37.5	48.3	89.9	34.6	50.1	83.0
	070	53.0	49.5	127.1	49.9	52.2	119.6	46.6	54.6	111.8	43.4	56.7	104.0	40.2	58.7	96.3
	080	59.9	54.6	143.6	56.2	57.7	134.7	52.4	60.5	125.6	48.6	62.9	116.5	44.8	65.0	107.3
	090	62.7	55.6	150.4	58.4	58.7	140.0	54.1	61.4	129.6	49.7	63.5	119.1	45.3	65.1	108.5
	100	71.7	61.3	171.8	67.0	65.2	160.6	62.2	68.7	149.2	57.4	71.5	137.7	52.5	73.8	125.9
	110	77.5	70.8	185.8	72.5	74.7	173.8	67.4	78.1	161.5	62.2	81.0	149.2	57.0	83.3	136.7
	130	87.6	80.4	209.9	82.9	85.5	198.8	78.2	90.1	187.4	73.3	94.3	175.6	68.3	98.2	163.7
	150	101.1	93.8	242.4	95.6	99.3	229.1	90.0	104.4	215.7	84.1	109.0	201.7	78.3	113.0	187.7
	170	114.5	102.2	274.5	108.5	109.2	260.2	102.2	115.5	244.9	95.8	121.3	229.5	89.1	126.5	213.5
	190	125.6	112.6	301.2	118.7	119.2	284.6	111.8	125.4	268.0	104.6	130.9	250.6	97.3	135.8	233.2
	210	146.9	135.0	352.0	137.3	141.9	329.1	127.5	147.7	305.6	117.6	152.6	282.0	107.8	156.5	258.3
	230	161.1	148.4	386.1	151.8	157.0	363.8	142.4	164.9	341.3	132.7	171.9	318.2	123.1	178.0	295.0
	245	163.9	149.4	392.8	154.0	158.1	369.1	144.0	165.8	345.3	133.8	172.5	320.8	123.6	178.1	296.2
	255	172.8	155.0	414.2	162.6	164.6	389.7	152.2	173.1	364.9	141.5	180.5	339.3	130.8	186.9	313.6
	270	186.2	163.5	446.4	175.6	174.4	420.8	164.4	184.2	394.1	153.1	192.9	367.1	141.6	200.3	339.4
	290	203.2	183.3	487.0	191.2	193.9	458.4	179.2	203.5	429.5	166.8	211.9	399.8	154.3	219.1	369.9
	315	224.4	205.8	537.9	209.8	216.6	502.9	194.9	225.9	467.2	179.9	233.6	431.2	164.8	239.8	395.0
	330	229.0	204.4	548.9	216.9											

Performance data — English (cont)



COOLING CAPACITIES — 60 Hz (cont)

LCWT (F)	UNIT SIZE 30GUN,GUR	CONDENSER ENTERING-AIR TEMPERATURE (F)														
		85			95			105			115			125		
		Cap. (Tons)	Input kW	Cooler Flow Rate (Gpm)	Cap. (Tons)	Input kW	Cooler Flow Rate (Gpm)	Cap. (Tons)	Input kW	Cooler Flow Rate (Gpm)	Cap. (Tons)	Input kW	Cooler Flow Rate (Gpm)	Cap. (Tons)	Input kW	Cooler Flow Rate (Gpm)
45.0	040	25.7	22.3	61.7	24.4	23.8	58.6	23.1	25.2	55.3	21.7	26.4	52.0	20.3	27.6	48.7
	045	30.2	26.6	72.5	27.7	27.9	66.5	25.3	28.9	60.6	22.8	29.6	54.7	20.4	30.1	49.0
	050	36.8	32.0	88.3	34.5	34.1	82.8	32.2	36.0	77.1	29.8	37.6	71.4	27.3	38.9	65.5
	060	46.8	41.9	112.3	44.0	44.5	105.6	41.2	46.8	98.8	38.3	48.9	91.9	35.4	50.7	84.9
	070	54.1	49.9	129.6	50.9	52.7	122.0	47.6	55.2	114.1	44.3	57.4	106.3	41.0	59.4	98.4
	080	61.2	55.1	146.6	57.4	58.3	137.6	53.5	61.2	128.4	49.7	63.7	119.1	45.8	65.8	109.8
	090	64.0	56.2	153.5	59.7	59.4	143.1	55.3	62.1	132.5	50.8	64.4	121.9	46.4	66.1	111.2
	100	73.3	61.9	175.7	68.5	65.9	164.2	63.7	69.5	152.7	58.8	72.5	141.0	53.8	74.9	129.1
	110	79.2	71.5	189.9	74.1	75.6	177.7	68.9	79.1	165.3	63.7	82.1	152.7	58.4	84.5	140.1
	130	89.2	81.2	213.8	84.5	86.3	202.7	79.7	91.1	191.1	74.7	95.4	179.2	69.7	99.3	167.1
	150	103.0	94.6	247.0	97.3	100.3	233.4	91.7	105.5	219.8	85.8	110.2	205.8	79.8	114.4	191.5
	170	116.8	103.2	280.0	110.6	110.3	265.3	104.2	116.8	250.0	97.8	122.8	234.4	91.0	128.1	218.3
	190	128.2	113.7	307.3	121.1	120.5	290.4	114.0	126.8	273.4	106.8	132.5	256.0	99.4	137.5	238.3
	210	149.9	136.6	359.5	140.2	143.6	336.3	130.3	149.7	312.5	120.4	154.8	288.6	110.4	158.9	264.7
	230	164.2	149.8	393.6	154.7	158.6	370.9	145.2	166.7	348.2	135.5	173.9	324.9	125.6	180.2	301.2
	245	167.0	150.8	400.5	157.0	159.7	376.4	146.9	167.7	352.3	136.7	174.6	327.7	126.2	180.4	302.6
	255	176.2	156.5	422.5	165.8	166.3	397.6	155.3	175.0	372.5	144.6	182.7	346.8	133.7	189.3	320.5
	270	190.0	165.1	455.6	179.2	176.3	429.6	167.9	186.3	402.7	156.5	195.3	375.3	144.9	203.0	347.4
	290	207.4	185.2	497.3	195.2	196.1	468.1	183.0	205.9	438.7	170.5	214.6	408.7	157.8	222.0	378.4
	315	229.1	208.1	549.4	214.3	219.2	513.9	199.3	228.8	477.8	184.1	236.9	441.3	168.8	243.4	404.8
46.0	330	233.5	206.4	559.8	221.2	220.6	530.5	208.5	233.7	500.0	195.5	245.5	468.7	182.0	256.2	436.5
	360	256.1	227.4	614.2	242.2	241.0	580.8	228.0	253.5	546.8	213.5	264.9	512.0	198.8	275.0	476.6
	390	278.0	250.3	666.6	261.3	264.1	626.6	244.4	276.4	585.9	227.1	287.2	544.6	209.8	296.4	503.0
	420	299.8	273.2	718.9	280.4	287.3	672.4	260.6	299.3	625.0	240.7	309.5	577.2	220.7	317.7	529.3
	040	26.1	22.4	62.7	24.8	24.0	59.5	23.5	25.4	56.3	22.1	26.7	52.9	20.7	27.9	49.5
	045	31.0	27.0	74.4	28.5	28.3	68.3	25.9	29.3	62.2	23.5	30.1	56.3	21.0	30.6	50.4
	050	37.6	32.3	90.1	35.2	34.5	84.5	32.8	36.4	78.8	30.4	38.0	73.0	27.9	39.4	67.0
	060	47.8	42.3	114.6	44.9	44.9	107.8	42.0	47.3	100.8	39.1	49.5	93.8	36.2	51.3	86.7
	070	55.1	50.4	132.2	51.9	53.2	124.4	48.6	55.8	116.6	45.2	58.1	108.5	41.9	60.1	100.5
	080	62.4	55.7	149.7	58.6	59.0	140.5	54.7	61.9	131.1	50.7	64.5	121.7	46.8	66.7	112.3
	090	65.3	56.8	156.7	60.9	60.1	146.1	56.5	62.9	135.5	52.0	65.2	124.7	47.5	67.0	113.9
	100	74.8	62.5	179.4	70.0	66.7	167.9	65.1	70.3	156.2	60.2	73.4	144.4	55.1	76.0	132.3
	110	80.9	72.3	194.0	75.7	76.5	181.6	70.5	80.1	169.1	65.2	83.2	156.4	59.8	85.7	143.6
	130	90.8	81.9	217.8	86.1	87.1	206.4	81.2	92.0	194.8	76.2	96.5	182.9	71.1	100.5	170.5
	150	104.8	95.5	251.4	99.1	101.3	237.7	93.4	106.6	223.9	87.5	111.4	209.8	81.5	115.7	195.4
	170	119.0	104.2	285.4	112.8	111.5	270.6	106.4	118.2	255.3	99.8	124.3	239.4	93.0	129.7	223.1
	190	130.5	114.8	313.1	123.6	121.8	296.4	116.3	128.2	278.9	109.0	134.1	261.4	101.5	139.3	243.5
	210	153.2	138.3	367.5	143.2	145.4	343.5	133.2	151.6	319.5	123.2	156.9	295.5	113.0	161.2	271.0
	230	167.2	151.2	401.1	157.7	160.3	378.1	148.0	168.5	355.1	138.2	175.9	331.5	128.3	182.4	307.7
	245	170.1	152.3	408.1	160.0	161.4	383.8	149.8	169.5	359.4	139.4	176.6	334.5	128.9	182.7	309.3
	255	179.6	158.0	430.8	169.1	168.0	405.6	158.5	176.9	380.2	147.6	184.9	354.1	136.6	191.7	327.7
	270	193.8	166.7	464.8	182.9	178.2	438.6	171.5	188.5	411.5	160.0	197.7	383.7	148.1	205.7	355.3
48.0	290	211.4	187.1	507.1	199.3	198.3	478.0	186.8	208.3	448.0	174.2	217.3	417.8	161.3	225.0	387.0
	315	234.1	210.6	561.5	218.9	221.8	525.2	203.7	231.7	488.6	188.4	240.1	451.8	172.8	246.9	414.5
	330	237.9	208.3	570.7	225.6	222.9	541.1	212.8	236.3	510.4	199.5	248.5	478.6	185.9	259.4	446.0
	360	260.9	229.6	625.9	247.1	243.7	592.8	232.6	256.4	557.9	217.9	268.1	522.8	203.0	278.6	486.9
	390	283.8	253.2	680.8	266.8	267.2	639.9	249.5	279.8	598.4	232.2	291.0	556.9	214.5	300.5	514.5
	420	306.4	276.6	734.9	286.4	290.8	687.0	266.4	303.2	639.0	246.3	313.8	590.7	225.9	322.3	541.9
	040	27.0	22.7	64.8	25.6	24.3	61.5	24.3	25.8	58.2	22.8	27.2	54.8	21.4	28.4	51.3
	045	32.6	27.6	78.2	29.9	29.0	71.8	27.3	30.2	65.6	24.7	31.0	59.4	22.2	31.6	53.3
	050	39.0	32.9	93.7	36.6	35.2	87.9	34.2	37.2	82.1	31.7	38.9	76.2	29.2	40.4	70.1
	060	49.7	43.1	119.2	46.7	45.8	112.2	43.8	48.3	105.1	40.8	50.6	97.9	37.7	52.6	90.6
	070	57.3	51.4	137.4	53.9	54.3	129.4	50.6	57.0	121.3	47.1	59.4	113.0	43.7	61.6	104.8
	080	64.9	56.8	155.8	61.0	60.2	146.4	57.0	63.3	136.8	53.0	66.1	127.2	48.9	68.4	117.3
	090	68.0	58.0	163.2	63.5	61.4	152.4	58.9	64.4	141.5	54.3	66.9	130.4	49.7	68.9	119.3
	100	78.0	63.7	187.2	73.1	68.1	175.5	68.1	72.0	163.4	63.0	75.3	151.3	57.9	78.1	138.9
	110	84.3	73.8	202.4	79.1	78.2	189.7	73.7	82.1	176.8	68.2	85.4	163.8	62.7	88.2	150.6
	130	94.1	83.3	225.9	89.3	88.8	214.3	84.3	93.8	202.3	79.2	98.5	190.2	74.0	102.8	177.5
	150	108.4	97.2	260.2	102.7	103.3	246.6	96.8	108.8	232.3	90.9	113.9	218.1	84.7	118.5	203.4
	170	123.5	106.2	296.5	117.1	113.7	281.1	110.6	120.8	265.5	103.9	127.2	249.3	96.9	133.0	232.6
	190	135.4	117.1	324.9	128.4	124.4	308.2	121.0	131.1	290.4	113.5	137.3	272.4	105.8	142.8	254.0
	210	159.6	141.5	383.0	149.3	148.9	358.3	139.0	155.5	333.6	128.7	161.2	309.0	118.3	165.8	283.9
	230	173.4	154.0	416.1	163.7	163.5	392.9	153.8	172.1	369.1	143.9	180.0	345.2	133.6	186.9	320.7
	245	176.4	155.2	423.4	166.2	164.7	398.9	155.7	173.2	373.7	145.2	180.8	348.5	134.5	187.4	322.7
	255	186.4	160.9	447.4	175.8	171.4	422.0	164.9	180.8	395.7	153.9	189.2	369.3	142.6	196.6	342.2
	270	201.6	169.9	483.7	190.3	181.8	456.6	178.7	192.7	428.9	166.9	202.5	400.5	154.7	211.1	371.4
	290	219.7	190.9	527.4	207.5	202.7	497.9	194.7	213.2	467.2	181.7	222.7	436.2	168.6	231.0	404.6
	315	243.9	215.3	585.5	228.3	227.1	548.0	212.7	237.5	510.4	197.0	246.6	472.7	181.0	254.0	434.5
	330	247.0	212.4	592.9	234.2	227.5	562.2	221.3	241.5	531.0	207.7	254.3	498.5	193.8	265.9	465.0
	360	270.8	234.1	649.9	256.6	248.8	615.9	242.0	262.2	580.7	227.0	274.6	544.7	211.7	285.7	5



COOLING CAPACITIES — 60 Hz (cont)

LCWT (F)	UNIT SIZE 30GUN,GUR	CONDENSER ENTERING-AIR TEMPERATURE (F)														
		85			95			105			115			125		
		Cap. (Tons)	Input kW	Cooler Flow Rate (Gpm)	Cap. (Tons)	Input kW	Cooler Flow Rate (Gpm)	Cap. (Tons)	Input kW	Cooler Flow Rate (Gpm)	Cap. (Tons)	Input kW	Cooler Flow Rate (Gpm)	Cap. (Tons)	Input kW	Cooler Flow Rate (Gpm)
50.0	040	27.8	23.0	66.8	26.5	24.7	63.5	25.1	26.2	60.2	23.6	27.6	56.7	22.1	29.0	53.1
	045	34.2	28.3	82.1	31.5	29.8	75.5	28.8	31.0	69.0	26.1	32.0	62.6	23.5	32.6	56.4
	050	40.5	33.5	97.3	38.1	35.9	91.5	35.6	38.0	85.5	33.0	39.8	79.3	30.5	41.4	73.2
	060	51.6	43.8	123.9	48.6	46.7	116.7	45.6	49.4	109.4	42.5	51.7	102.0	39.3	53.8	94.5
	070	59.5	52.4	142.8	56.0	55.4	134.5	52.5	58.2	126.1	49.1	60.8	117.8	45.5	63.0	109.2
	080	67.5	58.0	162.1	63.5	61.5	152.4	59.4	64.7	142.5	55.2	67.6	132.6	51.0	70.2	122.5
	090	70.7	59.1	169.8	66.1	62.8	158.8	61.5	65.9	147.6	56.8	68.6	136.3	52.0	70.8	124.9
	100	81.3	64.9	195.1	76.2	69.5	183.1	71.1	73.6	170.8	65.9	77.2	158.3	60.6	80.2	145.6
	110	87.9	75.4	211.0	82.5	80.0	198.0	76.9	84.1	184.8	71.4	87.6	171.3	65.7	90.6	157.8
	130	97.6	84.8	234.3	92.6	90.4	222.2	87.5	95.7	210.0	82.3	100.6	197.6	77.0	105.2	184.8
	150	112.2	98.9	269.3	106.3	105.2	255.3	100.3	111.0	240.9	94.3	116.4	226.3	88.0	121.2	211.4
	170	128.2	108.2	307.7	121.7	116.0	292.2	115.0	123.4	276.0	108.0	130.1	259.4	100.9	136.3	242.3
	190	140.4	119.3	337.0	133.2	127.0	319.9	125.8	134.1	302.1	118.1	140.5	283.5	110.3	146.4	264.9
	210	166.1	144.7	398.9	155.7	152.6	373.8	145.1	159.5	348.4	134.4	165.4	322.7	123.8	170.6	297.2
	230	179.7	156.9	431.4	169.8	166.7	407.7	159.7	175.8	383.4	149.5	184.0	358.9	139.1	191.4	333.9
	245	182.9	158.1	439.1	172.4	168.0	414.0	161.8	177.0	388.4	151.0	185.0	362.6	140.1	192.0	336.3
	255	193.4	163.9	464.4	182.5	174.8	438.3	171.4	184.7	411.6	160.2	193.6	384.6	148.7	201.4	357.0
	270	209.5	173.1	502.9	197.9	185.6	475.2	186.1	197.0	446.8	173.9	207.3	417.7	161.5	216.5	387.9
	290	228.2	194.7	548.0	215.7	207.0	517.9	202.8	218.1	486.9	189.4	228.1	454.8	176.0	237.1	422.7
55.0	040	30.0	23.8	72.1	28.6	25.6	68.7	27.1	27.2	65.1	25.6	28.8	61.4	23.5	29.8	56.4
	045	38.5	29.9	92.4	35.5	31.7	85.3	32.5	33.1	78.2	29.6	34.3	71.2	26.8	35.2	64.4
	050	44.4	35.0	106.8	41.9	37.6	100.6	39.2	40.0	94.3	36.6	42.1	87.9	33.8	43.9	81.3
	060	56.6	45.8	136.1	53.4	49.0	128.4	50.2	51.9	120.7	46.6	54.4	112.0	43.1	56.6	103.5
	070	65.1	54.8	156.5	61.5	58.2	147.8	57.7	61.3	138.8	54.0	64.1	129.9	49.3	65.9	118.5
	080	74.2	60.8	178.4	69.9	64.7	168.0	65.0	68.1	156.3	59.7	70.7	143.5	54.4	72.9	130.8
	090	77.8	62.1	187.0	72.8	66.1	175.0	67.4	69.4	161.9	62.0	72.2	149.0	56.4	74.3	135.6
	100	89.8	68.0	215.8	84.5	73.1	203.0	79.0	77.8	190.0	73.5	82.0	176.7	67.5	85.3	162.2
	110	97.0	79.3	233.0	91.2	84.4	219.2	85.4	89.1	205.3	79.5	93.2	191.0	73.5	96.8	176.6
	130	106.2	88.4	255.3	101.0	94.6	242.7	95.7	100.4	230.0	90.1	105.9	216.6	84.5	111.0	203.1
	150	121.7	103.2	292.4	115.6	110.2	277.9	109.4	116.6	263.1	103.1	122.6	247.7	96.4	128.0	231.8
	170	140.0	113.2	336.5	133.2	121.8	320.1	126.1	129.9	303.2	117.9	136.9	283.4	107.6	141.7	258.7
	190	153.4	125.1	368.8	145.7	133.5	350.3	137.9	141.3	331.5	129.9	148.6	312.3	121.5	155.3	291.9
	210	183.2	153.0	440.2	172.1	161.8	413.7	160.7	169.5	386.1	149.1	176.2	358.2	136.2	181.0	327.3
	230	195.9	164.0	470.9	185.5	174.9	446.0	174.5	184.7	419.3	162.7	193.3	391.2	150.9	200.9	362.6
	245	199.5	165.3	479.4	188.4	176.3	452.9	176.8	186.0	425.0	165.0	194.8	396.5	152.8	202.3	367.3
	255	211.4	171.2	508.2	200.1	183.3	480.9	188.5	194.4	453.0	176.6	204.5	424.4	163.8	213.3	393.8
	270	229.8	181.2	552.3	217.6	195.0	523.1	205.2	207.7	493.1	191.4	218.9	460.0	175.1	227.0	420.8
	290	250.4	204.3	601.8	237.0	217.9	569.5	223.3	230.4	536.8	209.4	241.8	503.3	194.9	252.1	468.5
60.0	040	32.2	24.5	77.6	30.6	26.4	73.7	28.3	27.8	68.2	25.9	28.9	62.3	23.5	29.8	56.6
	045	38.8	30.0	93.3	35.8	31.8	86.1	32.8	33.3	79.0	29.9	34.4	72.0	27.1	35.3	65.1
	050	47.7	36.1	114.8	44.3	38.6	106.5	40.8	40.7	98.1	37.3	42.4	89.7	33.9	43.8	81.5
	060	59.8	47.0	143.9	55.6	49.9	133.7	51.4	52.5	123.6	47.2	54.7	113.6	43.1	56.6	103.6
	070	68.9	56.2	165.7	63.9	59.2	153.7	59.0	61.8	141.9	54.2	64.0	130.3	49.4	65.9	118.9
	080	76.1	61.5	183.1	70.7	65.0	170.0	65.2	68.1	156.9	59.9	70.8	144.1	54.6	72.9	131.3
	090	81.5	63.5	196.0	75.2	67.2	180.8	68.9	70.2	165.7	62.7	72.6	150.8	56.6	74.3	136.0
	100	95.4	69.8	229.4	88.4	74.7	212.7	81.4	78.9	195.8	74.5	82.4	179.1	67.6	85.2	162.5
	110	105.6	82.7	254.0	97.8	87.4	235.2	90.0	91.5	216.6	82.3	94.9	198.1	74.7	97.5	179.8
	130	115.2	92.0	277.2	109.8	98.7	264.2	104.0	105.0	250.1	96.1	109.7	231.3	87.8	113.4	211.2
	150	131.6	107.6	316.5	125.3	115.1	301.4	117.0	121.0	281.4	107.0	125.1	257.4	97.1	128.4	233.7
	170	149.1	116.9	358.6	138.8	124.5	333.9	128.5	131.2	309.2	118.2	137.0	284.4	107.9	141.7	259.5
	190	166.9	130.9	401.5	157.5	139.3	378.9	145.8	145.6	350.6	133.6	150.9	321.5	121.6	155.1	292.6
	210	191.8	157.0	461.4	177.9	164.7	427.9	163.8	171.2	394.1	150.1	176.7	361.1	136.5	181.0	328.4
	230	207.7	169.1	499.6	195.9	180.2	471.3	182.2	189.1	438.4	166.9	195.9	401.4	151.7	201.4	365.0
	245	213.0	171.1	512.5	200.4	182.3	482.2	185.9	191.1	447.1	169.7	197.7	408.1	153.7	202.7	369.7
	255	226.9	177.4	545.9	213.7	189.8	514.1	198.4	199.8	477.2	181.4	207.6	436.5	164.7	213.6	396.2
	270	244.4	186.7	587.9	227.2	199.2	546.6	209.9	210.1	504.9	192.7	219.4	463.5	175.5	227.0	422.1
	290	272.5	213.6	655.5	255.3	226.8	614.1	235.8	237.1	567.2	216.0	245.8	519.5	196.4	252.7	472.4
60.0	315	297.4	239.6	715.4	275.6	252.1	663.1	253.9	262.7	610.7	232.4	271.6	559.2	211.2	278.6	508.2
	330	298.1	233.8	717.1	277.6	249.1	667.8	257.0	262.4	618.3	236.4	273.9	568.7	215.8	283.5	519.1
	360	333.8	261.9	803.1	315.0	278.6	757.8	291.5	291.2	701.2	267.3	301.8	642.9	243.3	310.3	585.3
	390	358.9	288.0	863.3	335.4	304.0	806.8	309.6	316.8	744.7	283.7	327.6	682.6	258.2	336.2	621.0
	420	383.6	313.9	922.8	355.7	329.4	855.7	327.7	342.4	788.2	300.2	353.4	722.2	273.0	362.1	656.8

See Legend on page 63.

Performance data — English (cont)



COOLING CAPACITIES — 50 Hz

LCWT (F)	UNIT SIZE 30GUN,GUR	CONDENSER ENTERING-AIR TEMPERATURE (F)														
		85			95			105			115			125		
		Cap. (Tons)	Input kW	Cooler Flow Rate (Gpm)	Cap. (Tons)	Input kW	Cooler Flow Rate (Gpm)	Cap. (Tons)	Input kW	Cooler Flow Rate (Gpm)	Cap. (Tons)	Input kW	Cooler Flow Rate (Gpm)	Cap. (Tons)	Input kW	Cooler Flow Rate (Gpm)
40.0	040	23.2	20.9	55.4	21.9	22.2	52.3	20.6	23.4	49.2	19.2	24.5	45.9	17.8	25.4	42.7
	045	27.7	25.8	66.3	25.8	27.3	61.8	23.9	28.5	57.3	22.0	29.5	52.6	20.0	30.3	47.9
	050	34.3	33.3	82.0	32.1	35.1	76.9	30.0	36.7	71.8	27.8	38.1	66.6	25.7	39.3	61.4
	060	40.5	39.6	97.0	37.9	41.6	90.8	35.4	43.3	84.7	32.8	44.8	78.5	30.2	46.1	72.3
	070	46.5	43.4	111.4	43.4	45.7	103.9	40.2	47.6	96.3	37.1	49.2	88.7	33.9	50.5	81.1
	080	54.6	51.6	130.8	51.0	54.1	122.1	47.4	56.3	113.4	43.7	58.1	104.7	40.1	59.6	95.9
	090	61.3	58.4	146.7	57.2	61.5	137.0	53.1	64.0	127.0	48.9	66.1	117.0	44.7	67.8	107.0
	100	66.6	63.2	159.4	62.0	66.3	148.5	57.5	68.9	137.6	52.9	71.0	126.7	48.3	72.7	115.7
	110	74.4	76.1	178.0	69.7	79.4	166.7	64.9	82.4	155.4	60.2	85.0	144.2	55.4	87.2	132.7
	130	82.7	78.8	198.0	78.1	83.4	186.9	73.3	87.6	175.4	68.4	91.3	163.8	63.5	94.5	152.0
	150	98.0	100.2	234.6	92.8	105.3	222.2	87.6	110.1	209.6	82.2	114.5	196.8	76.8	118.6	183.9
	170	107.0	104.0	256.0	101.0	109.9	241.8	95.0	115.2	227.4	88.8	119.9	212.6	82.4	124.1	197.3
	190	121.1	121.1	289.8	114.4	127.1	273.9	107.8	132.7	258.2	101.0	137.8	241.8	94.2	142.4	225.4
	210	135.3	133.1	324.0	126.3	138.8	302.3	117.2	143.7	280.5	108.1	147.8	258.8	99.0	151.0	237.1
	230	152.6	151.8	365.4	143.8	159.5	344.3	135.0	166.4	323.1	126.0	172.7	301.5	116.9	178.2	279.8
	245	159.3	158.6	381.4	150.0	166.8	359.1	140.6	174.1	336.5	131.1	180.7	313.8	121.5	186.4	290.9
	255	164.5	163.3	393.9	154.8	171.6	370.6	145.0	179.0	347.2	135.1	185.5	323.4	125.1	191.2	299.6
	270	173.5	167.2	415.3	163.0	176.1	390.3	152.4	184.0	364.9	141.7	190.9	339.2	130.7	196.7	312.9
	290	195.4	197.2	467.8	184.1	206.5	440.6	172.8	215.1	413.6	161.2	222.7	385.9	149.6	229.5	358.2
	315	209.7	209.1	502.1	196.0	218.2	469.1	182.1	226.1	436.0	168.3	232.8	402.9	154.5	238.2	369.8
	330	213.9	208.1	512.1	202.1	219.7	483.7	189.9	230.3	454.7	177.6	239.9	425.2	164.8	248.2	394.6
	360	228.0	225.2	545.8	215.4	237.0	515.7	202.8	247.9	485.5	189.8	257.7	454.4	176.6	266.5	422.7
	390	256.5	254.2	613.9	240.7	265.9	576.2	225.0	276.4	538.5	209.1	285.5	500.6	193.2	293.4	462.4
	420	270.7	266.1	648.0	252.6	277.6	604.6	234.4	287.4	561.1	216.2	295.6	517.6	198.1	302.1	474.1
42.0	040	23.9	21.2	57.4	22.6	22.6	54.2	21.3	23.9	51.0	19.9	25.0	47.7	18.5	26.0	44.4
	045	28.9	26.3	69.2	27.0	27.9	64.6	25.0	29.2	59.9	23.0	30.3	55.1	21.0	31.1	50.3
	050	35.7	34.0	85.4	33.5	35.9	80.3	31.3	37.6	75.0	29.1	39.0	69.7	26.8	40.3	64.3
	060	42.2	40.4	101.2	39.6	42.5	94.8	36.9	44.3	88.5	34.3	46.0	82.1	31.6	47.4	75.7
	070	48.5	44.3	116.1	45.3	46.7	108.5	42.1	48.8	100.7	38.8	50.5	92.9	35.5	51.9	85.1
	080	57.0	52.8	136.6	53.3	55.4	127.6	49.5	57.7	118.6	45.8	59.7	109.7	42.0	61.3	100.6
	090	63.9	59.7	153.0	59.7	62.9	143.0	55.5	65.7	132.9	51.2	68.0	122.6	46.9	69.8	112.3
	100	69.6	64.7	166.7	64.9	67.9	155.6	60.3	70.7	144.4	55.6	73.0	133.1	50.9	74.9	121.9
	110	77.7	77.9	186.1	72.8	81.4	174.5	67.9	84.6	162.8	63.1	87.3	151.0	58.2	89.7	139.4
	130	85.9	80.3	205.8	81.2	85.1	194.4	76.3	89.5	182.7	71.3	93.4	170.8	66.3	96.9	158.8
	150	101.6	102.1	243.3	96.3	107.5	230.7	90.9	112.5	217.8	85.4	117.1	204.7	79.9	121.4	191.4
	170	111.2	106.2	266.4	105.2	112.4	252.1	99.0	117.9	237.2	92.7	123.0	222.0	86.2	127.6	206.6
	190	126.0	123.8	301.7	119.1	130.0	285.3	112.3	135.9	269.0	105.4	141.3	252.5	98.3	146.1	235.5
	210	141.3	136.3	338.6	132.0	142.4	316.2	122.7	147.6	293.8	113.3	152.0	271.4	104.0	155.6	249.0
	230	158.6	154.8	379.9	149.6	162.9	358.3	140.5	170.2	336.5	131.2	176.8	314.4	121.9	182.7	292.1
	245	165.4	161.8	396.3	156.0	170.4	373.6	146.3	178.1	350.5	136.6	185.1	327.2	126.8	191.2	303.7
	255	171.1	166.7	410.0	161.2	175.4	386.2	151.2	183.2	362.1	141.0	190.2	337.7	130.7	196.3	313.2
	270	180.8	170.9	433.1	170.1	180.2	407.6	159.3	188.6	381.5	148.2	196.0	355.1	137.1	202.4	328.3
	290	203.6	201.6	487.8	191.9	211.4	459.7	180.2	220.4	431.8	168.5	228.6	403.6	156.5	235.8	374.8
	315	219.0	214.2	524.7	204.8	223.8	490.7	190.6	232.2	456.6	176.4	239.3	422.5	162.1	245.3	388.4
	330	222.4	212.5	532.9	210.4	224.7	504.1	198.0	235.9	474.4	185.4	246.0	444.1	172.5	255.1	413.2
	360	237.2	230.0	568.2	224.3	242.4	537.4	211.3	253.8	506.2	198.1	264.3	474.6	184.5	273.7	442.1
	390	267.3	260.1	640.3	251.1	272.4	601.6	234.9	283.4	562.8	218.6	293.2	523.8	202.2	301.7	484.5
	420	282.7	272.7	677.2	264.0	284.7	632.5	245.3	295.2	587.7	226.6	304.0	542.8	207.9	311.2	498.1
44.0	040	24.7	21.5	59.3	23.4	23.0	56.1	22.1	24.3	52.9	20.6	25.5	49.5	19.2	26.6	46.1
	045	30.1	26.9	72.2	28.1	28.5	67.4	26.1	29.9	62.6	24.1	31.1	57.8	22.0	32.0	52.8
	050	37.1	34.7	89.0	34.9	36.6	83.7	32.6	38.4	78.3	30.3	40.0	72.7	28.0	41.4	67.2
	060	44.0	41.3	105.5	41.3	43.4	98.9	38.5	45.4	92.3	35.8	47.1	85.8	33.0	48.6	79.2
	070	50.5	45.2	121.0	47.2	47.7	113.2	43.9	49.9	105.2	40.5	51.8	97.2	37.2	53.3	89.2
	080	59.4	53.9	142.5	55.6	56.7	133.2	51.7	59.1	124.0	47.9	61.2	114.7	44.0	63.0	105.5
	090	66.5	61.0	159.4	62.2	64.4	149.2	57.9	67.3	138.7	53.5	69.7	128.2	49.1	71.8	117.6
	100	72.7	66.1	174.3	68.0	69.6	162.9	63.1	72.5	151.3	58.3	75.1	139.7	53.5	77.1	128.1
	110	81.1	79.7	194.3	76.1	83.4	182.4	71.0	86.8	170.3	66.0	89.7	158.2	61.0	92.3	146.1
	130	89.1	81.8	213.6	84.3	86.8	202.1	79.4	91.4	190.3	74.3	95.6	178.0	69.1	99.3	165.6
	150	105.2	104.0	252.2	99.8	106.6	239.3	94.3	114.9	226.1	88.7	119.8	212.7	83.0	124.3	199.1
	170	115.6	108.5	277.2	109.5	114.9	262.5	103.1	120.7	247.3	96.7	126.1	231.7	90.0	130.9	215.8
	190	130.9	126.4	313.7	124.0	133.0	297.3	116.9	139.0	280.2	109.8	144.7	263.1	102.5	149.9	245.8
	210	147.6	139.7	353.8	137.9	146.0	330.5	128.3	151.5	307.5	118.6	156.3	284.3	109.0	160.2	261.2
	230	164.6	157.9	394.6	155.4	166.3	372.5	146.0	174.0	350.1	136.6	181.0	327.5	127.0	187.3	304.6
	245	171.7	165.0	411.5	162.0	174.0	388.4	152.2	182.2	364.9	142.2	189.5	340.9	132.1	196.0	316.7
	255	177.9	170.1	426.4	167.7	179.2	402.1	157.4	187.4	377.4	147.0	194.8	352.4	136.5	201.4	327.1
	270	188.3	174.6	451.5	177.4	184.4	425.3	166.2	193.3	398.5	154.9	201.1	371.4	143.4	208.0	343.8
	290	211.9	206.1	508.0	200.1	216.4	479.6	187.9	225.8	450.5	175.8	234.4	421.3	163.5	242.2	391.8
	315	228.7	219.4	548.2	214.0	229.4	512.9	199.3	238.3	477.8	184.6	246.0	442.6	169.9	252.5	407.3
	330	231.3	216.9	554.4	219.0	229.7	525.0	206.3	241.5							



COOLING CAPACITIES — 50 Hz (cont)

LCWT (F)	UNIT SIZE 30GUN,GUR	CONDENSER ENTERING-AIR TEMPERATURE (F)														
		85			95			105			115			125		
		Cap. (Tons)	Input kW	Cooler Flow Rate (Gpm)	Cap. (Tons)	Input kW	Cooler Flow Rate (Gpm)	Cap. (Tons)	Input kW	Cooler Flow Rate (Gpm)	Cap. (Tons)	Input kW	Cooler Flow Rate (Gpm)	Cap. (Tons)	Input kW	Cooler Flow Rate (Gpm)
45.0	040	25.1	21.7	60.3	23.8	23.2	57.1	22.4	24.5	53.8	21.0	25.8	50.4	19.6	26.8	47.0
	045	30.7	27.1	73.7	28.7	28.8	68.9	26.7	30.3	64.0	24.6	31.5	59.1	22.6	32.5	54.1
	050	37.8	35.0	90.8	35.6	37.0	85.4	33.3	38.9	79.9	31.0	40.5	74.4	28.7	41.9	68.7
	060	44.9	41.7	107.6	42.1	43.9	101.0	39.3	45.9	94.3	36.6	47.7	87.7	33.8	49.2	81.0
	070	51.5	45.6	123.5	48.2	48.2	115.6	44.8	50.5	107.5	41.5	52.4	99.4	38.1	54.0	91.2
	080	60.7	54.5	145.4	56.8	57.3	136.1	52.8	59.9	126.7	48.9	62.0	117.3	45.0	63.9	107.9
	090	67.8	61.6	162.6	63.5	65.1	152.2	59.1	68.1	141.8	54.7	70.7	131.1	50.2	72.7	120.3
	100	74.3	66.9	178.2	69.5	70.4	166.5	64.6	73.5	154.8	59.7	76.1	143.1	54.8	78.3	131.3
	110	82.8	80.6	198.5	77.7	84.4	186.4	72.6	87.9	174.1	67.5	90.9	161.8	62.4	93.6	149.5
	130	90.8	82.5	217.6	85.9	87.7	206.0	80.9	92.4	194.0	75.8	96.6	181.7	70.5	100.5	169.1
	150	107.0	105.0	256.6	101.6	110.7	243.6	96.0	116.1	230.3	90.4	121.1	216.8	84.6	125.7	203.0
	170	117.9	109.6	282.7	111.7	116.1	267.8	105.2	122.1	252.4	98.7	127.6	236.6	91.9	132.6	220.5
	190	133.2	127.7	319.4	126.4	134.5	303.1	119.2	140.6	285.9	112.0	146.5	268.6	104.7	151.9	251.1
	210	150.7	141.4	361.4	140.9	147.8	337.8	131.1	153.5	314.4	121.3	158.4	290.9	111.5	162.5	267.5
	230	167.7	159.5	402.1	158.3	168.1	379.7	148.9	175.9	357.0	139.3	183.1	334.1	129.6	189.6	310.9
	245	174.8	166.6	419.3	165.1	175.8	395.8	155.2	184.2	372.1	145.1	191.7	347.8	134.8	198.5	323.4
	255	181.3	171.8	434.7	171.0	181.1	410.1	160.6	189.5	385.1	150.1	197.1	359.8	139.4	203.9	334.2
	270	192.2	176.4	460.8	181.1	186.5	434.3	169.8	195.6	407.2	158.3	203.7	379.6	146.7	210.9	351.7
	290	216.0	208.3	518.0	204.1	218.9	489.4	191.8	228.5	460.0	179.5	237.4	430.4	167.1	245.5	400.7
	315	233.5	222.0	560.0	218.6	232.3	524.2	203.7	241.4	488.5	188.8	249.4	452.8	173.9	256.1	417.0
	330	235.8	219.2	565.4	223.3	232.2	535.6	210.5	244.3	504.7	197.3	255.3	473.2	183.9	265.3	441.0
	360	251.1	237.3	602.1	238.1	250.6	570.9	224.5	262.8	538.2	210.7	274.1	505.2	196.7	284.5	471.6
	390	284.0	269.1	681.1	267.3	282.3	640.9	250.3	294.2	600.2	233.3	304.9	559.5	216.2	314.4	518.4
	420	301.4	282.7	722.8	281.8	292.6	675.6	262.2	307.1	628.8	242.6	316.9	581.9	223.1	325.1	534.9
46.0	040	25.6	21.9	61.3	24.2	23.4	58.1	22.8	24.7	54.7	21.4	26.0	51.4	19.9	27.1	47.8
	045	31.3	27.4	75.2	29.3	29.1	70.3	27.3	30.6	65.4	25.2	31.9	60.4	23.1	32.9	55.3
	050	38.6	35.3	92.6	36.3	37.4	87.1	34.0	39.3	81.6	31.7	41.0	76.0	29.3	42.4	70.2
	060	45.8	42.1	109.8	43.0	44.4	103.1	40.2	46.4	96.3	37.3	48.2	89.5	34.5	49.8	82.8
	070	52.5	46.1	126.0	49.2	48.8	118.0	45.8	51.1	109.9	42.4	53.1	101.7	38.9	54.7	93.4
	080	61.9	55.1	148.5	57.9	58.0	139.0	54.0	60.6	129.5	50.0	62.8	119.9	46.0	64.7	110.4
	090	69.2	62.3	166.0	64.8	65.8	155.4	60.3	68.9	144.7	55.8	71.6	133.9	51.3	73.7	123.0
	100	75.9	67.6	182.0	71.0	71.2	170.3	66.1	74.4	158.5	61.1	77.1	146.5	56.1	79.4	134.5
	110	84.5	81.5	202.7	79.4	85.4	190.4	74.2	89.0	177.9	69.0	92.1	165.5	63.8	94.9	153.0
	130	92.4	83.3	221.7	87.5	88.5	209.9	82.5	93.4	197.8	77.3	97.7	185.3	72.0	101.7	172.7
	150	108.9	106.0	261.1	103.4	111.8	248.0	97.8	117.3	234.5	92.1	122.4	220.8	86.2	127.1	206.9
	170	120.1	110.7	288.2	113.9	117.4	273.1	107.4	123.5	257.5	100.7	129.2	241.5	93.9	134.3	225.2
	190	135.7	129.0	325.5	128.8	135.9	309.0	121.5	142.2	291.5	114.3	148.2	274.1	106.9	153.8	256.4
	210	153.9	143.1	369.1	144.0	149.7	345.4	134.0	155.5	321.4	124.1	160.6	297.6	114.1	164.9	273.8
	230	170.8	161.0	409.6	161.3	169.8	387.0	151.8	177.8	364.0	142.1	185.2	340.8	132.3	191.9	317.3
	245	178.1	168.2	427.2	168.2	177.6	403.4	158.1	186.2	379.3	147.9	193.9	354.8	137.6	200.9	330.0
	255	184.7	173.5	443.1	174.4	183.0	418.2	163.8	191.7	392.9	153.1	199.5	367.3	142.3	206.5	341.4
	270	196.0	178.3	470.2	184.8	188.6	443.3	173.4	197.9	415.9	161.8	206.3	388.0	150.0	213.7	359.7
	290	220.2	210.5	528.1	208.2	221.3	499.3	195.7	231.2	469.5	183.3	240.4	439.6	170.7	248.7	409.4
	315	238.4	224.6	571.9	223.4	235.2	535.9	208.2	244.5	499.4	193.1	252.7	463.1	177.9	259.7	426.8
	330	240.3	221.4	576.4	227.7	234.8	546.2	214.7	247.1	515.0	201.4	258.4	483.1	187.8	268.7	450.4
	360	255.8	239.7	613.7	242.7	253.3	582.1	228.9	265.8	549.0	215.0	277.4	515.7	200.8	288.1	481.6
	390	289.7	272.1	694.9	272.8	285.6	654.5	255.6	297.8	613.0	238.3	308.8	571.6	221.0	318.6	530.0
	420	307.8	286.1	738.3	288.0	299.4	690.9	268.0	311.1	642.8	248.1	321.2	595.2	228.3	329.7	547.5
48.0	040	26.4	22.2	63.3	25.0	23.7	60.0	23.6	25.2	56.6	22.2	26.5	53.2	20.7	27.7	49.7
	045	32.6	28.0	78.3	30.5	29.8	73.3	28.4	31.3	68.3	26.3	32.7	63.1	24.2	33.8	58.0
	050	40.1	36.0	96.2	37.7	38.2	90.6	35.4	40.2	85.0	33.0	41.9	79.2	30.6	43.5	73.3
	060	47.6	43.0	114.3	44.7	45.3	107.4	41.8	47.5	100.4	38.9	49.4	93.4	36.0	51.1	86.4
	070	54.6	47.0	131.1	51.2	49.8	122.9	47.7	52.2	114.6	44.2	54.4	106.2	40.7	56.1	97.6
	080	64.4	56.2	154.6	60.4	59.3	144.9	56.3	62.0	135.1	52.2	64.4	125.3	48.1	66.5	115.4
	090	72.0	63.6	172.8	67.5	67.3	162.0	62.9	70.6	150.9	58.3	73.4	139.8	53.6	75.7	128.7
	100	79.1	69.1	190.0	74.1	72.9	177.9	69.1	76.3	165.7	63.9	79.2	153.4	58.8	81.6	141.1
	110	88.0	83.4	211.2	82.7	87.5	198.6	77.4	91.2	185.8	72.1	94.5	173.0	66.7	97.5	160.1
	130	95.9	84.8	230.0	90.8	90.2	217.8	85.6	95.3	205.5	80.4	99.9	192.9	74.9	104.1	179.8
	150	112.6	107.9	270.3	107.0	114.0	256.8	101.3	119.7	243.1	95.5	125.0	229.1	89.5	130.0	214.8
	170	124.7	113.0	299.4	118.3	119.9	283.9	111.6	126.4	267.9	104.8	132.3	251.6	97.8	137.8	234.8
	190	140.7	131.6	337.8	133.6	138.8	320.7	126.4	145.5	303.3	118.8	151.8	285.2	111.2	157.6	266.9
	210	160.3	146.5	384.8	150.2	153.4	360.4	140.0	159.6	335.9	129.7	165.0	311.2	119.4	169.6	286.6
	230	177.0	164.1	424.9	167.4	173.3	401.7	157.6	181.7	378.2	147.7	189.4	354.4	137.6	196.5	330.2
	245	184.6	171.5	443.0	174.5	181.3	418.8	164.2	190.2	394.1	153.7	198.4	368.9	143.2	205.8	343.6
	255	191.7	177.0	460.2	181.1	186.8	434.7	170.3	195.9	408.8	159.4	204.2	382.5	148.3	211.6	355.9
	270	203.9	182.0	489.3	192.4	192.8	461.8	180.7	202.6	433.6	168.7	211.5	405.0	156.6	219.4	375.9
	290	228.8	214.9	549.0	216.4	226.3	519.3	203.8	236.8	489.2	190.9	246.3	458.2	177.9	255.1	427.0
	315	248.4	229.8	596.1	233.0	241.0	559.1	217.4	250.9	521.8	201.8	259.5	484.2	186.1	26	

Performance data — English (cont)



COOLING CAPACITIES — 50 Hz (cont)

LCWT (F)	UNIT SIZE 30GUN,GUR	CONDENSER ENTERING-AIR TEMPERATURE (F)														
		85			95			105			115			125		
		Cap. (Tons)	Input kW	Cooler Flow Rate (Gpm)	Cap. (Tons)	Input kW	Cooler Flow Rate (Gpm)	Cap. (Tons)	Input kW	Cooler Flow Rate (Gpm)	Cap. (Tons)	Input kW	Cooler Flow Rate (Gpm)	Cap. (Tons)	Input kW	Cooler Flow Rate (Gpm)
50.0	040	27.2	22.5	65.3	25.8	24.1	62.0	24.4	25.6	58.6	22.9	27.0	55.1	21.4	28.2	51.5
	045	33.9	28.5	81.4	31.8	30.4	76.3	29.6	32.1	71.2	27.4	33.5	65.9	25.2	34.7	60.5
	050	41.6	36.7	99.9	39.2	39.0	94.2	36.8	41.0	88.4	34.3	42.9	82.4	31.8	44.5	76.5
	060	49.5	43.8	118.9	46.6	46.3	111.8	43.5	48.5	104.6	40.6	50.5	97.4	37.6	52.3	90.2
	070	56.8	47.9	136.3	53.3	50.8	127.9	49.7	53.4	119.4	46.1	55.7	110.8	42.5	57.6	102.1
	080	67.0	57.4	161.0	62.9	60.6	151.0	58.7	63.5	140.9	54.5	66.0	130.7	50.2	68.2	120.6
	090	74.8	64.9	179.6	70.2	68.8	168.5	65.5	72.2	157.3	60.8	75.2	145.9	56.0	77.8	134.5
	100	82.5	70.6	198.1	77.4	74.6	185.7	72.1	78.2	173.2	66.9	81.3	160.6	61.6	83.9	147.9
	110	91.6	85.2	219.9	86.2	89.5	206.9	80.8	93.5	193.9	75.3	97.0	180.7	69.7	100.1	167.3
	130	99.2	86.3	238.3	94.1	92.0	225.9	88.8	97.2	213.3	83.5	102.1	200.4	77.9	106.5	187.1
	150	116.4	109.9	279.5	110.7	116.1	265.8	104.9	122.1	251.8	98.9	127.7	237.5	92.8	132.9	222.8
	170	129.4	115.2	310.7	122.7	122.4	294.7	116.0	129.2	278.5	109.0	135.4	261.7	101.9	141.2	244.6
	190	146.0	134.3	350.5	138.6	141.8	332.8	131.2	148.8	315.0	123.6	155.3	296.7	115.7	161.5	277.9
	210	166.9	149.9	400.8	156.5	157.2	375.8	146.0	163.7	350.6	135.5	169.5	325.3	124.8	174.3	299.7
	230	183.4	167.3	440.5	173.6	176.8	416.8	163.5	185.6	392.7	153.4	193.7	368.2	143.0	201.1	343.4
	245	191.2	174.8	459.1	180.9	184.9	434.3	170.4	194.3	409.1	159.7	202.9	383.4	148.8	210.7	357.4
	255	198.9	180.4	477.5	188.0	190.7	451.5	177.0	200.2	424.9	165.8	208.9	398.0	154.4	216.8	370.7
	270	211.9	185.8	508.8	200.1	197.0	480.4	188.1	207.3	451.7	175.9	216.7	422.3	163.4	225.1	392.4
	290	237.6	219.5	570.6	224.9	231.3	539.9	211.9	242.3	508.9	198.8	252.3	477.3	185.4	261.7	445.3
	315	258.6	235.2	620.9	242.7	246.8	582.8	226.8	257.2	544.6	210.7	266.5	506.0	194.5	274.5	467.1
330	258.8	230.5	621.4	245.5	244.9	589.5	232.0	258.4	557.1	218.0	270.9	523.5	203.7	282.4	489.1	
360	275.4	249.5	661.3	261.4	264.2	627.6	247.2	278.0	593.5	232.6	290.8	558.4	217.6	302.7	522.5	
390	313.0	284.3	751.6	295.3	299.1	708.9	277.3	312.6	665.8	259.0	324.8	621.9	240.5	335.8	577.5	
420	333.9	299.8	801.7	313.0	314.4	751.6	292.0	327.5	701.2	270.9	338.9	650.6	249.6	348.7	599.4	
55.0	040	29.3	23.3	70.5	27.9	25.0	67.1	26.4	26.7	63.5	24.9	28.2	59.9	23.0	29.3	55.2
	045	37.3	29.9	89.6	35.0	32.0	84.2	32.7	33.8	78.7	30.4	35.5	73.1	27.9	36.7	67.0
	050	45.6	38.4	109.6	43.1	40.9	103.5	40.5	43.2	97.3	37.9	45.3	91.0	35.2	47.2	84.5
	060	54.4	46.0	130.7	51.2	48.7	123.0	48.0	51.2	115.4	44.8	53.5	107.7	41.0	55.0	98.6
	070	62.3	50.1	149.7	58.6	53.4	140.9	54.9	56.3	131.9	51.1	58.9	122.7	47.0	61.0	112.9
	080	73.2	60.2	176.0	68.4	63.6	164.5	63.5	66.5	152.7	58.7	69.1	141.1	53.8	71.2	129.4
	090	82.1	68.2	197.3	77.2	72.6	185.6	72.4	76.5	173.9	66.5	79.3	159.9	60.4	81.3	145.1
	100	91.1	74.3	219.0	85.7	78.8	205.9	80.1	82.9	192.6	74.5	86.5	179.1	68.7	89.4	165.0
	110	101.0	90.0	242.7	95.2	94.8	228.8	89.3	99.2	214.6	83.4	103.2	200.5	77.5	106.9	186.2
	130	108.1	90.0	259.7	102.7	96.2	246.8	97.1	102.1	233.5	91.5	107.5	219.8	85.6	112.5	205.8
	150	126.2	114.8	303.4	120.3	121.7	289.0	114.1	128.2	274.3	107.1	133.9	257.3	99.3	138.7	238.8
	170	141.3	120.9	339.7	134.4	128.9	323.0	127.3	136.4	305.8	119.1	142.8	286.2	109.1	147.4	262.3
	190	159.4	141.1	383.0	151.6	149.3	364.3	143.6	150.7	345.2	135.6	164.4	325.9	127.2	171.2	305.6
	210	184.0	158.7	442.2	172.8	166.8	415.4	161.6	174.2	388.4	150.4	180.8	361.5	137.6	185.3	330.6
	230	199.5	175.0	479.5	188.7	185.2	453.5	177.7	194.7	427.0	165.8	203.0	398.5	153.2	209.9	368.2
	245	208.3	183.1	500.7	197.5	194.2	474.7	186.5	204.7	448.3	173.6	213.2	417.2	159.7	220.1	383.8
	255	217.4	189.2	522.6	205.9	200.5	495.0	194.2	211.1	466.9	181.6	220.4	436.5	168.0	228.2	403.8
	270	232.6	195.3	559.0	220.1	207.7	529.1	207.4	219.2	498.4	193.6	229.3	465.3	177.8	236.9	427.3
	290	260.4	231.2	625.8	246.8	244.1	593.2	232.9	256.2	559.9	219.0	267.6	526.4	204.6	278.1	491.8
	315	285.0	248.8	685.1	268.1	261.7	644.3	251.0	273.4	603.2	233.9	284.1	562.1	215.0	292.2	516.9
330	282.8	241.9	679.7	268.8	257.8	646.1	254.5	272.7	611.7	238.1	285.7	572.4	218.3	294.8	524.6	
360	300.7	262.1	722.8	286.0	278.2	687.4	270.9	293.4	651.0	254.6	307.2	612.0	236.3	318.7	567.9	
390	343.4	299.9	825.4	324.5	316.2	779.9	305.4	331.3	734.0	286.1	345.3	687.5	264.7	356.5	636.2	
420	367.9	317.5	884.3	345.7	333.7	830.8	323.2	348.4	776.8	300.8	361.6	722.9	275.1	370.5	661.2	
60.0	040	31.5	24.0	75.9	29.9	25.9	72.0	27.9	27.4	67.2	25.5	28.5	61.3	23.0	29.3	55.4
	045	39.4	30.7	94.9	36.6	32.6	88.0	33.7	34.3	81.1	30.8	35.7	74.1	28.0	36.8	67.3
	050	49.3	40.0	118.7	45.8	42.2	110.3	42.4	44.3	102.0	39.0	46.0	93.7	35.5	47.4	85.5
	060	57.3	47.1	137.9	53.2	49.5	127.9	49.1	51.7	118.1	45.1	53.5	108.4	41.1	55.1	99.0
	070	67.0	51.9	161.3	62.4	55.0	150.1	57.4	57.6	138.0	52.4	59.6	126.0	47.5	61.3	114.3
	080	76.0	61.5	182.9	70.4	64.6	169.4	64.8	67.2	156.0	59.4	69.4	142.8	54.0	71.2	129.9
	090	85.7	69.6	206.1	79.3	73.4	190.8	73.0	76.7	175.6	66.7	79.3	160.5	60.5	81.3	145.6
	100	97.6	76.9	234.7	90.3	80.9	217.3	83.2	84.4	200.0	76.1	87.3	183.0	69.1	89.6	166.1
	110	110.4	94.7	265.5	102.8	99.1	247.2	94.9	102.7	228.2	87.1	105.9	209.5	79.4	108.5	191.1
	130	117.2	93.7	281.9	111.6	100.5	268.5	105.4	106.7	253.4	98.0	111.7	235.8	89.5	115.4	215.3
	150	135.4	119.4	325.8	127.7	126.1	307.1	119.8	132.2	288.2	112.0	137.8	269.3	104.0	143.0	250.2
	170	151.1	125.5	363.5	141.0	132.4	339.3	130.4	138.3	313.7	119.8	143.3	288.3	109.4	147.5	263.1
	190	173.2	148.1	416.7	165.1	156.9	397.2	154.5	163.8	371.6	141.9	168.9	341.5	129.6	173.1	311.8
	210	192.8	163.0	463.8	178.8	170.0	430.1	165.0	176.1	396.8	151.3	181.2	364.0	137.9	185.3	331.6
	230	211.5	180.9	508.7	198.1	190.6	476.5	184.7	199.4	444.2	171.3	207.3	412.1	158.0	214.3	380.1
	245	221.1	189.1	531.9	207.0	199.5	497.9	192.8	208.8	463.8	178.7	217.1	429.8	164.5	224.4	395.8
	255	233.0	196.3	560.6	218.0	207.0	524.4	203.0	216.6	488.2	188.0	225.2	452.3	173.1	232.6	416.4
	270	248.7	202.4	598.3	231.4	213.4	556.6	213.5	222.7	513.7	195.9	230.6	471.2	178.5	237.0	429.3
	290	283.6	242.8	682.2	267.9	256.0	644.4	249.3	266.6	599.8	229.0	274.7	550.9	209.1	281.6	502.9
	315	303.2	257.7	729.4	281.6	269.1	677.4	259.8	278.8	625.0	238.4	287.1	573.4	217.3	293.8	522.7
330	302.2	251.0														

Performance data — SI



COOLING CAPACITIES — 60 Hz

LCWT (C)	UNIT SIZE 30GUN,GUR	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)
4	040	82.0	21.5	3.3	78.0	22.7	3.1	74.0	23.8	2.9	69.8	24.9	2.8	65.7	25.8	2.6
	045	91.1	24.9	3.6	83.9	25.8	3.3	76.8	26.5	3.1	69.9	27.0	2.8	63.0	27.2	2.5
	050	114.7	30.5	4.6	107.9	32.2	4.3	100.8	33.6	4.0	93.8	34.8	3.7	86.6	35.7	3.4
	060	145.9	39.9	5.8	137.6	41.9	5.5	129.3	43.8	5.1	120.9	45.4	4.8	112.4	46.7	4.5
	070	168.7	47.5	6.7	159.2	49.6	6.3	149.7	51.6	6.0	140.2	53.3	5.6	130.8	54.9	5.2
	080	190.1	52.3	7.6	179.0	54.8	7.1	167.8	57.0	6.7	156.5	58.9	6.2	145.2	60.6	5.8
	090	198.6	53.2	7.9	185.7	55.6	7.4	172.6	57.7	6.9	159.5	59.3	6.3	146.4	60.5	5.8
	100	226.0	58.8	9.0	212.1	61.9	8.4	197.9	64.5	7.9	183.4	66.7	7.3	168.9	68.5	6.7
	110	244.6	67.6	9.7	229.6	70.7	9.1	214.4	73.3	8.5	199.0	75.5	7.9	183.6	77.3	7.3
	130	280.1	77.5	11.1	266.1	81.6	10.6	251.6	85.3	10.0	237.1	88.7	9.4	222.3	91.7	8.8
	150	324.5	90.2	12.9	307.4	94.7	12.2	290.2	98.7	11.5	273.0	102.4	10.9	255.4	105.6	10.2
	170	365.1	98.2	14.5	347.0	103.8	13.8	328.4	109.0	13.1	308.8	113.5	12.3	289.2	117.6	11.5
	190	400.5	107.8	15.9	379.8	113.2	15.1	358.7	118.1	14.3	337.4	122.5	13.4	315.6	126.4	12.5
	210	465.2	128.6	18.5	436.4	134.0	17.3	407.1	138.5	16.2	378.0	142.4	15.0	348.3	145.2	13.8
	230	514.6	142.5	20.5	486.4	149.5	19.3	458.0	155.7	18.2	429.6	161.3	17.1	400.6	166.1	15.9
	245	523.1	143.4	20.8	493.1	150.3	19.6	462.8	156.4	18.4	432.6	161.6	17.2	401.9	166.1	16.0
	255	550.5	149.0	21.9	519.5	156.5	20.7	488.0	163.2	19.4	456.5	169.1	18.1	424.3	174.0	16.9
	270	591.1	157.0	23.5	559.0	165.7	22.2	526.3	173.5	20.9	492.4	180.3	19.6	458.2	186.1	18.2
	290	645.2	175.4	25.6	609.4	183.9	24.2	573.1	191.4	22.8	536.4	198.0	21.3	499.2	203.6	19.8
	315	709.9	196.2	28.2	665.9	204.7	26.5	621.4	211.9	24.7	577.1	217.9	22.9	531.9	222.5	21.1
	330	730.3	196.4	29.0	693.9	207.6	27.6	656.4	217.8	26.1	617.6	227.0	24.6	578.2	235.2	23.0
	360	801.0	215.7	31.8	759.5	226.5	30.2	717.4	236.2	28.5	674.6	245.0	26.8	631.1	252.7	25.1
	390	865.5	236.4	34.4	816.1	247.2	32.4	765.8	256.7	30.4	715.3	264.8	28.4	663.8	271.6	26.4
	420	930.1	257.2	37.0	872.3	267.9	34.7	813.8	277.0	32.4	755.8	284.6	30.0	696.6	290.5	27.7
5	040	84.5	21.8	3.4	80.4	23.1	3.2	76.3	24.2	3.0	72.2	25.3	2.9	67.9	26.3	2.7
	045	95.5	25.5	3.8	88.1	26.5	3.5	80.7	27.2	3.2	73.5	27.8	2.9	66.5	28.1	2.6
	050	119.1	31.1	4.7	112.1	32.8	4.5	104.8	34.3	4.2	97.8	35.6	3.9	90.3	36.6	3.6
	060	151.4	40.6	6.0	142.9	42.7	5.7	134.4	44.7	5.3	125.7	46.3	5.0	117.0	47.8	4.7
	070	175.2	48.3	7.0	165.3	50.6	6.6	155.5	52.6	6.2	145.7	54.5	5.8	136.0	56.1	5.4
	080	197.5	53.3	7.9	186.1	55.9	7.4	174.6	58.3	6.9	163.0	60.3	6.5	151.4	62.1	6.0
	090	206.5	54.3	8.2	193.2	56.8	7.7	179.9	59.0	7.2	166.5	60.8	6.6	153.0	62.1	6.1
	100	235.3	59.9	9.4	221.1	63.2	8.8	206.6	66.0	8.2	191.8	68.4	7.6	176.9	70.3	7.0
	110	254.7	69.0	10.1	239.3	72.2	9.5	223.7	75.1	8.9	208.0	77.4	8.3	192.2	79.4	7.6
	130	289.9	78.8	11.5	275.6	83.0	11.0	260.9	86.9	10.4	246.0	90.5	9.8	230.9	93.7	9.2
	150	335.5	91.8	13.3	318.3	96.4	12.7	300.8	100.7	12.0	283.2	104.5	11.3	265.2	108.0	10.6
	170	378.9	100.0	15.1	359.9	105.8	14.3	340.9	111.2	13.6	321.3	116.1	12.8	300.9	120.4	12.0
	190	415.1	109.9	16.5	394.3	115.5	15.7	372.6	120.7	14.8	350.8	125.3	14.0	328.6	129.4	13.1
	210	483.9	131.5	19.3	454.6	137.1	18.1	424.3	141.9	16.9	394.5	146.0	15.7	364.3	149.3	14.5
	230	532.9	145.1	21.2	504.4	152.4	20.1	475.4	158.9	18.9	446.2	164.8	17.8	416.6	170.0	16.6
	245	541.9	146.0	21.6	511.6	153.3	20.4	480.7	159.7	19.1	449.7	165.3	17.9	418.2	170.1	16.6
	255	570.8	151.7	22.7	539.4	159.6	21.5	507.3	166.7	20.2	475.0	172.9	18.9	442.1	178.3	17.6
	270	614.2	160.0	24.4	581.0	169.0	23.1	547.5	177.3	21.8	513.2	184.5	20.4	477.8	190.7	19.0
	290	669.8	178.9	26.6	633.6	187.8	25.2	596.3	195.7	23.7	558.8	202.7	22.2	520.8	208.8	20.7
	315	738.5	200.5	29.4	693.8	209.4	27.6	648.0	217.0	25.8	602.5	223.5	24.0	556.5	228.6	22.1
	330	757.5	200.0	30.1	719.8	211.7	28.6	681.6	222.4	27.1	642.4	232.2	25.6	601.7	240.9	23.9
	360	830.3	219.8	33.0	788.4	231.1	31.4	745.2	241.3	29.6	701.5	250.6	27.9	657.0	258.8	26.1
	390	899.0	241.4	35.8	848.8	252.6	33.8	797.0	262.6	31.7	745.2	271.3	29.6	692.8	278.7	27.6
	420	967.8	262.9	38.5	908.5	274.1	36.1	848.5	283.8	33.8	788.8	292.0	31.4	728.7	298.6	29.0
6	040	87.0	22.1	3.5	82.9	23.4	3.3	78.7	24.6	3.1	74.5	25.7	3.0	70.2	26.7	2.8
	045	100.0	26.1	4.0	92.3	27.1	3.7	84.8	28.0	3.4	77.3	28.6	3.1	70.0	29.0	2.8
	050	123.5	31.6	4.9	116.3	33.4	4.6	109.1	35.0	4.3	101.7	36.4	4.0	94.2	37.5	3.7
	060	157.0	41.3	6.2	148.3	43.6	5.9	139.6	45.6	5.6	130.7	47.3	5.2	121.8	48.9	4.8
	070	181.5	49.2	7.2	171.4	51.5	6.8	161.4	53.7	6.4	151.4	55.6	6.0	141.3	57.3	5.6
	080	205.0	54.3	8.2	193.3	57.1	7.7	181.6	59.5	7.2	169.7	61.7	6.8	157.8	63.5	6.3
	090	214.4	55.3	8.5	200.9	58.0	8.0	187.3	60.4	7.5	173.6	62.3	6.9	159.9	63.8	6.4
	100	244.8	61.0	9.7	230.2	64.5	9.2	215.4	67.5	8.6	200.4	70.1	8.0	185.1	72.1	7.4
	110	264.9	70.4	10.5	249.2	73.8	9.9	233.2	76.8	9.3	217.1	79.4	8.6	200.9	81.5	8.0
	130	299.8	80.1	11.9	285.3	84.5	11.4	270.5	88.6	10.8	255.1	92.3	10.2	239.7	95.8	9.5
	150	346.5	93.3	13.8	329.2	98.2	13.1	311.6	102.7	12.4	293.5	106.7	11.7	275.0	110.3	10.9
	170	392.6	101.9	15.6	373.3	107.9	14.9	353.9	113.6	14.1	333.7	118.7	13.3	313.0	123.3	12.5
	190	430.4	112.0	17.1	408.5	117.8	16.3	386.7	123.2	15.4	364.4	128.1	14.5	341.8	132.5	13.6
	210	502.8	134.2	20.0	472.8	140.2	18.8	442.2	145.4	17.6	411.3	149.7	16.4	380.7	153.3	15.2
	230	551.5	147.7	22.0	522.5	155.3	20.8	493.1	162.2	19.6	463.2	168.4	18.4	432.8	173.8	17.2
	245	560.9	148.7	22.3	530.1	156.2	21.1	498.9	163.0	19.9	467.1	169.0	18.6	434.9	174.1	17.3
	255	591.3	154.4	23.5	559.4	162.7	22.3	526.9	170.2	21.0	493.8	176.8	19.7	460.1	182.5	18.3
	270	637.4	162.9	25.4	603.6	172.4	24.0	569.3	181.1	22.7	534.1	188.7	21.3	498.0	195.4	19.8
	290	695.3	182.4	27.7	657.7	191.6	26.2	619.9	200.0	24.7	581.5	207.5	23.1	542.7	214.0	21.6
	315	767.7	204.6	30.6	721.9	214.0	28.7	675.4	222.2	26.9	628.4	229.1	25.0	581.6	234.8	23.2
	330	784.9	203.7	31.2	746.5	215.8	29.7	707.5	227.1	28.2	667.2	237.3	26.6	625.8	246.5	24.9
	360	860.7	224.0	34.3	817.2	235.6	32.5	773.4	246.4	30.8	728.8	256.2	29.0	683.4	265.0	27.2
	390	933.2	246.2	3												

Performance data — SI (cont)



COOLING CAPACITIES — 60 Hz (cont)

LCWT (C)	UNIT SIZE 30GUN,GUR	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	040	89.6	22.4	3.6	85.4	23.7	3.4	81.2	25.0	3.2	76.9	26.1	3.1	72.4	27.2	2.9
	045	104.7	26.7	4.2	96.8	27.8	3.9	89.0	28.7	3.5	81.3	29.4	3.2	73.7	29.8	2.9
	050	128.0	32.2	5.1	120.7	34.0	4.8	113.3	35.7	4.5	105.8	37.1	4.2	98.1	38.4	3.9
	060	162.7	42.0	6.5	153.9	44.4	6.1	144.9	46.5	5.8	135.8	48.3	5.4	126.7	50.0	5.0
	070	187.9	50.1	7.5	177.9	52.5	7.1	167.4	54.7	6.7	157.1	56.8	6.3	146.8	58.6	5.8
	080	212.7	55.3	8.5	200.8	58.2	8.0	188.7	60.7	7.5	176.5	63.0	7.0	164.2	65.0	6.5
	090	222.6	56.4	8.9	208.8	59.3	8.3	194.9	61.7	7.8	180.9	63.8	7.2	166.8	65.4	6.6
	100	254.5	62.2	10.1	239.6	65.8	9.5	224.5	69.0	8.9	209.1	71.7	8.3	193.4	74.0	7.7
	110	275.4	71.8	11.0	259.3	75.4	10.3	243.0	78.6	9.7	226.5	81.3	9.0	209.9	83.6	8.4
	130	309.9	81.4	12.3	295.2	86.0	11.8	280.1	90.3	11.2	264.4	94.2	10.5	248.6	97.8	9.9
	150	357.8	94.9	14.3	340.1	100.0	13.5	322.2	104.6	12.8	303.8	108.9	12.1	285.2	112.7	11.4
	170	406.2	103.6	16.2	387.0	110.0	15.4	366.7	115.8	14.6	346.4	121.2	13.8	325.4	126.2	13.0
	190	445.5	114.1	17.7	423.5	120.1	16.9	401.3	125.8	16.0	378.3	130.9	15.1	355.1	135.6	14.1
	210	522.0	137.1	20.8	491.3	143.3	19.6	460.0	148.8	18.3	428.6	153.4	17.1	397.0	157.3	15.8
	230	570.5	150.2	22.7	540.8	158.1	21.5	510.8	165.4	20.3	480.2	171.9	19.1	449.4	177.7	17.9
	245	580.3	151.3	23.1	548.8	159.2	21.9	517.1	166.3	20.6	484.7	172.6	19.3	452.0	178.1	18.0
	255	612.3	157.1	24.4	579.7	165.7	23.1	546.6	173.6	21.8	512.8	180.6	20.4	478.7	186.7	19.1
	270	660.9	165.8	26.3	626.8	175.8	25.0	591.3	184.8	23.6	555.4	192.9	22.1	518.8	200.1	20.7
	290	720.9	185.8	28.7	682.8	195.5	27.2	644.3	204.3	25.7	604.8	212.2	24.1	565.0	219.2	22.5
	315	797.4	208.8	31.8	750.6	218.7	29.9	703.0	227.3	28.0	655.0	234.7	26.1	606.9	240.9	24.2
	330	812.3	207.2	32.4	774.0	220.0	30.8	733.6	231.7	29.2	692.6	242.4	27.6	650.5	252.2	25.9
	360	890.7	228.1	35.5	847.0	240.3	33.7	802.4	251.6	32.0	756.6	261.8	30.1	710.2	271.1	28.3
	390	967.6	251.1	38.5	914.8	263.5	36.4	861.3	274.5	34.3	807.1	284.4	32.1	752.1	292.9	30.0
	420	1044.0	274.2	41.6	982.5	286.6	39.1	919.9	297.5	36.6	857.1	306.9	34.1	794.0	314.7	31.6
8	040	92.2	22.7	3.7	88.0	24.0	3.5	83.7	25.3	3.3	79.3	26.5	3.2	74.8	27.7	3.0
	045	109.5	27.3	4.4	101.3	28.5	4.0	93.3	29.5	3.7	85.3	30.2	3.4	77.5	30.7	3.1
	050	132.6	32.7	5.3	125.1	34.6	5.0	117.5	36.4	4.7	109.9	37.9	4.4	102.1	39.2	4.1
	060	168.6	42.8	6.7	159.6	45.2	6.4	150.4	47.4	6.0	141.1	49.3	5.6	131.7	51.1	5.2
	070	194.6	51.0	7.8	184.1	53.5	7.3	173.8	55.8	6.9	163.0	57.9	6.5	152.4	59.9	6.1
	080	220.6	56.4	8.8	208.3	59.3	8.3	195.9	62.0	7.8	183.4	64.4	7.3	170.8	66.5	6.8
	090	230.9	57.5	9.2	216.8	60.5	8.6	202.6	63.1	8.1	188.3	65.3	7.5	174.0	67.0	6.9
	100	264.6	63.3	10.5	249.2	67.1	9.9	233.7	70.4	9.3	218.0	73.4	8.7	202.1	75.9	8.1
	110	286.1	73.2	11.4	269.6	77.0	10.7	252.9	80.3	10.1	236.1	83.2	9.4	219.0	85.7	8.7
	130	320.3	82.7	12.8	305.2	87.5	12.2	289.8	91.9	11.5	274.0	96.0	10.9	257.7	99.8	10.3
	150	369.4	96.5	14.7	351.2	101.7	14.0	332.9	106.6	13.3	314.5	111.1	12.5	295.2	115.0	11.8
	170	420.3	105.4	16.7	400.8	112.0	16.0	380.3	118.2	15.2	359.4	123.8	14.3	337.8	129.0	13.5
	190	460.8	116.1	18.4	438.8	122.5	17.5	415.6	128.3	16.6	392.7	133.8	15.7	368.8	138.7	14.7
	210	542.3	140.0	21.6	510.3	146.5	20.3	478.3	152.2	19.1	446.4	157.2	17.8	413.9	161.4	16.5
	230	590.0	152.9	23.5	559.6	161.1	22.3	528.9	168.6	21.1	497.9	175.5	19.8	466.0	181.6	18.6
	245	600.3	154.0	23.9	568.0	162.2	22.6	535.5	169.6	21.3	502.8	176.3	20.0	469.1	182.1	18.7
	255	634.1	159.8	25.3	600.5	168.8	23.9	566.6	177.0	22.6	532.4	184.4	21.2	497.2	190.9	19.8
	270	684.9	168.7	27.3	650.2	179.1	25.9	614.0	188.6	24.5	577.3	197.2	23.0	539.7	204.8	21.5
	290	747.0	189.3	29.8	708.4	199.4	28.2	668.6	208.6	26.6	628.8	217.0	25.1	587.9	224.4	23.4
	315	828.4	213.2	33.0	779.9	223.4	31.1	731.2	232.5	29.1	682.4	240.5	27.2	632.9	247.1	25.2
	330	840.5	210.9	33.5	801.2	224.0	31.9	760.5	236.3	30.3	718.5	247.6	28.6	675.4	257.9	26.9
	360	921.4	232.2	36.7	877.6	245.0	35.0	831.4	256.7	33.1	785.2	267.5	31.3	737.6	277.3	29.4
	390	1003.7	256.2	40.0	949.2	269.0	37.8	894.0	280.5	35.6	838.9	291.0	33.4	782.8	300.1	31.2
	420	1084.5	280.1	43.2	1020.6	293.0	40.7	956.7	304.4	38.1	892.5	314.4	35.6	827.7	322.8	33.0
9	040	94.8	22.9	3.8	90.6	24.4	3.6	86.2	25.7	3.4	81.7	27.0	3.3	77.1	28.1	3.1
	045	114.5	27.9	4.6	106.0	29.1	4.2	97.7	30.2	3.9	89.5	31.0	3.6	81.5	31.6	3.2
	050	137.2	33.2	5.5	129.7	35.3	5.2	121.9	37.1	4.9	114.0	38.7	4.5	106.1	40.1	4.2
	060	174.6	43.5	7.0	165.3	46.0	6.6	155.9	48.3	6.2	146.4	50.3	5.8	136.7	52.2	5.5
	070	201.3	51.8	8.0	190.6	54.5	7.6	179.9	56.9	7.2	169.2	59.1	6.7	158.1	61.1	6.3
	080	228.6	57.4	9.1	216.1	60.5	8.6	203.4	63.3	8.1	190.5	65.8	7.6	177.6	68.0	7.1
	090	239.3	58.5	9.5	225.0	61.7	9.0	210.5	64.4	8.4	195.9	66.8	7.8	181.3	68.7	7.2
	100	274.7	64.4	11.0	259.2	68.4	10.3	243.2	71.9	9.7	227.1	75.0	9.1	210.8	77.7	8.4
	110	297.1	74.6	11.8	280.2	78.5	11.2	263.1	82.1	10.5	245.8	85.2	9.8	228.4	87.8	9.1
	130	330.8	84.1	13.2	315.4	89.0	12.6	299.6	93.6	11.9	283.6	97.9	11.3	267.1	101.9	10.7
	150	380.9	98.1	15.2	362.8	103.5	14.5	343.9	108.5	13.7	325.1	113.2	13.0	305.9	117.5	12.2
	170	434.8	107.3	17.3	414.3	114.1	16.5	393.8	120.4	15.7	372.4	126.4	14.8	350.5	131.8	14.0
	190	476.6	118.2	19.0	454.2	124.8	18.1	430.7	130.9	17.2	407.1	136.6	16.2	383.0	141.8	15.3
	210	562.6	143.0	22.4	530.1	149.7	21.1	497.4	155.8	19.8	464.1	161.0	18.5	431.3	165.5	17.2
	230	609.5	155.4	24.3	578.9	164.0	23.1	547.3	171.8	21.8	515.7	179.0	20.6	483.5	185.5	19.3
	245	620.2	156.6	24.7	587.8	165.2	23.4	554.5	173.0	22.1	521.1	180.0	20.8	487.2	186.2	19.4
	255	655.6	162.5	26.1	621.9	171.9	24.8	587.1	180.5	23.4	552.2	188.3	22.0	516.7	195.2	20.6
	270	709.6	171.7	28.3	673.5	182.5	26.9	637.0	192.4	25.4	599.5	201.4	23.9	561.2	209.5	22.4
	290	773.6	192.8	30.8	734.4	203.4	29.3	693.8	213.0	27.7	652.9	221.8	26.0	611.4	229.6	24.4
	315	859.6	217.5	34.3	810.3	228.3	32.3	760.5	237.8	30.3	710.0	246.2	28.3	659.8	253.4	26.3
	330	869.5	214.5	34.7	828.7	228.2	33.0	787.6	240.9	31.4	744.7	252.7	29.7	700.8	263.6	27.9
	360	953.0	236.4	38.0	907.9	249.6	36.2	861.4	261.8	34.3	814.0	273.1	32.5	765.8	283.6	30.5
	390	1039.4	261.2	41.4	984.4											

COOLING CAPACITIES — 60 Hz (cont)

LCWT (C)	UNIT SIZE 30GUN,GUR	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)
10	040	97.5	23.2	3.9	93.2	24.7	3.7	88.7	26.1	3.5	84.2	27.4	3.4	79.5	28.6	3.2
	045	119.6	28.5	4.8	110.9	29.8	4.4	102.3	31.0	4.1	93.9	31.8	3.7	85.5	32.5	3.4
	050	142.0	33.8	5.7	134.3	35.9	5.4	126.4	37.8	5.0	118.2	39.5	4.7	110.3	41.0	4.4
	060	180.7	44.2	7.2	171.2	46.8	6.8	161.6	49.2	6.4	151.8	51.3	6.1	141.9	53.3	5.7
	070	208.2	52.7	8.3	197.3	55.5	7.9	186.3	58.0	7.4	175.3	60.3	7.0	164.0	62.4	6.5
	080	236.8	58.4	9.4	223.9	61.6	8.9	210.9	64.5	8.4	197.8	67.2	7.9	184.6	69.6	7.4
	090	247.9	59.6	9.9	233.3	62.9	9.3	218.6	65.8	8.7	203.7	68.3	8.1	188.7	70.4	7.5
	100	285.0	65.5	11.4	269.1	69.7	10.7	252.8	73.4	10.1	236.4	76.7	9.4	219.7	79.6	8.8
	110	308.1	76.0	12.3	291.0	80.1	11.6	273.5	83.9	10.9	255.8	87.1	10.2	238.0	90.0	9.5
	130	341.6	85.4	13.6	325.7	90.5	13.0	309.7	95.2	12.4	293.3	99.7	11.7	276.5	103.9	11.0
	150	392.7	99.6	15.7	374.1	105.3	14.9	355.2	110.5	14.2	336.1	115.4	13.4	316.4	119.9	12.6
	170	449.4	109.1	17.9	428.8	116.2	17.1	407.5	122.8	16.3	385.7	129.0	15.4	363.5	134.7	14.5
	190	492.1	120.2	19.6	469.5	127.2	18.7	446.1	133.5	17.8	421.5	139.4	16.8	397.0	144.9	15.8
	210	583.3	145.9	23.3	550.1	153.0	21.9	516.3	159.3	20.6	482.5	164.8	19.2	448.7	169.6	17.9
	230	629.5	158.1	25.1	598.1	166.9	23.9	566.1	175.1	22.6	533.8	182.6	21.3	501.0	189.5	20.0
	245	640.6	159.2	25.6	607.5	168.2	24.2	573.7	176.3	22.9	539.7	183.7	21.5	505.1	190.2	20.1
	255	677.7	165.2	27.0	643.3	174.9	25.7	608.0	183.9	24.3	572.5	192.1	22.8	536.1	199.4	21.4
	270	734.5	174.6	29.3	697.8	185.8	27.8	660.3	196.2	26.3	622.0	205.6	24.8	583.2	214.3	23.3
	290	800.3	196.2	31.9	760.5	207.3	30.3	719.7	217.4	28.7	677.4	226.5	27.0	635.0	234.9	25.3
	315	891.4	221.8	35.6	841.0	233.1	33.5	789.9	243.1	31.5	738.3	251.9	29.4	686.8	259.6	27.4
13	040	105.8	24.1	4.2	101.2	25.7	4.0	96.6	27.2	3.9	91.6	28.6	3.7	85.0	29.6	3.4
	045	135.0	30.2	5.4	125.7	31.8	5.0	116.4	33.1	4.6	107.2	34.2	4.3	98.0	35.1	3.9
	050	156.8	35.4	6.3	148.6	37.8	5.9	140.3	39.9	5.6	131.8	41.9	5.3	122.4	43.5	4.9
	060	199.8	46.3	8.0	189.6	49.2	7.6	178.8	51.8	7.1	167.4	54.1	6.7	155.5	56.0	6.2
	070	229.6	55.4	9.2	218.1	58.4	8.7	206.2	61.2	8.2	193.4	63.6	7.7	178.4	65.4	7.1
	080	262.3	61.5	10.5	247.2	64.9	9.9	230.8	67.8	9.2	213.8	70.2	8.5	197.1	72.3	7.9
	090	274.5	62.8	11.0	257.4	66.3	10.3	240.3	69.3	9.6	223.2	72.0	8.9	204.9	73.8	8.2
	100	317.5	68.9	12.7	300.4	73.5	12.0	283.1	77.8	11.3	265.1	81.6	10.6	244.3	84.4	9.8
	110	342.7	80.3	13.7	324.4	84.9	13.0	305.8	89.2	12.2	287.1	93.0	11.5	267.7	96.3	10.7
	130	374.4	89.3	15.0	357.8	94.9	14.3	341.0	100.3	13.6	323.4	105.3	12.9	305.5	110.0	12.2
	150	428.7	104.3	17.1	409.6	110.6	16.4	389.8	116.5	15.6	369.5	121.9	14.8	349.0	127.1	13.9
	170	494.4	114.7	19.7	472.6	122.4	18.9	450.1	129.8	18.0	422.6	135.9	16.9	389.5	140.4	15.6
	190	541.5	126.5	21.6	517.4	134.1	20.7	492.3	141.3	19.7	466.9	148.0	18.6	440.3	154.2	17.6
	210	647.9	155.0	25.9	612.8	163.0	24.5	576.6	170.1	23.0	536.4	175.6	21.4	493.4	179.8	19.7
	230	691.1	165.9	27.6	656.8	175.5	26.2	620.5	184.3	24.8	583.3	192.2	23.3	546.1	199.4	21.8
	245	703.2	167.1	28.1	667.0	176.9	26.6	630.1	185.8	25.2	592.7	193.9	23.7	553.9	200.9	22.1
	255	746.1	173.2	29.8	710.0	184.2	28.4	672.9	194.3	26.9	634.6	203.5	25.3	593.4	211.5	23.7
	270	811.7	183.5	32.4	773.0	196.0	30.9	733.2	207.6	29.3	687.7	217.6	27.5	633.8	224.8	25.3
	290	884.2	206.8	35.3	841.8	219.1	33.6	798.1	230.5	31.9	754.0	241.0	30.1	708.0	250.5	28.3
16	040	114.3	24.9	4.6	108.4	26.4	4.3	100.6	27.6	4.0	92.9	28.7	3.7	85.3	29.6	3.4
	045	135.4	30.2	5.4	126.0	31.8	5.0	116.6	33.1	4.7	107.4	34.2	4.3	98.3	35.1	3.9
	050	166.9	36.3	6.7	155.8	38.6	6.2	144.8	40.5	5.8	133.8	42.1	5.3	122.8	43.5	4.9
	060	209.1	47.3	8.4	195.7	49.9	7.8	182.4	52.2	7.3	169.1	54.3	6.8	156.0	56.0	6.2
	070	240.7	56.6	9.6	225.0	59.2	9.0	209.4	61.6	8.4	194.1	63.6	7.8	179.0	65.4	7.2
	080	266.0	61.9	10.6	248.8	65.1	9.9	231.6	67.8	9.3	214.5	70.3	8.6	197.7	72.3	7.9
	090	284.6	63.9	11.4	264.6	67.2	10.6	244.7	69.9	9.8	225.0	72.1	9.0	205.5	73.8	8.2
	100	333.3	70.3	13.3	311.3	74.7	12.4	288.9	78.5	11.5	267.0	81.8	10.7	245.1	84.5	9.8
	110	369.0	83.2	14.7	344.2	87.4	13.8	319.6	91.2	12.8	295.2	94.3	11.8	271.0	96.8	10.8
	130	408.8	93.3	16.3	391.5	99.4	15.6	371.0	104.8	14.8	344.4	108.9	13.8	317.9	112.4	12.7
	150	466.7	109.1	18.7	446.6	115.9	17.8	415.3	120.5	16.6	383.6	124.4	15.3	352.2	127.5	14.1
	170	521.2	117.7	20.8	488.7	124.5	19.5	456.0	130.6	18.2	423.3	135.9	16.9	390.6	140.4	15.6
	190	590.1	132.5	23.6	556.0	139.4	22.2	517.3	145.1	20.7	478.9	149.9	19.1	440.8	154.0	17.6
	210	670.3	157.8	26.8	625.4	164.6	25.0	581.5	170.6	23.2	538.0	175.7	21.5	494.8	179.9	19.8
	230	732.7	171.1	29.3	695.3	180.9	27.8	646.9	188.3	25.9	598.1	194.7	23.9	550.0	199.9	22.0
	245	751.3	173.1	30.0	711.2	183.1	28.4	660.0	190.4	26.4	608.6	196.5	24.3	557.7	201.4	22.3
	255	800.0	179.5	32.0	757.9	190.6	30.3	704.3	199.0	28.1	650.6	206.2	26.0	597.3	212.0	23.9
	270	854.5	188.0	34.1	799.9	199.2	32.0	745.0	209.1	29.8	690.3	217.7	27.6	635.7	224.9	25.4
	290	959.0	215.7	38.3	900.2	226.8	36.0	837.0	236.2	33.4	774.1	244.2	30.9	711.8	250.8	28.4
	315	1039.2	241.0	41.5	969.6	252.1	38.8	901.2	261.8	36.0	833.2	270.0	33.3	765.8	276.7	30.6
19	040	1042.4	235.4	41.7	977.3	249.0	39.1	912.1	261.2	36.5	846.7	271.8	33.8	781.3	280.9	31.2
	045	1180.2	265.0	47.2	1112.0	278.8	44.4	1034.6	290.1	41.3	957.8	299.9	38.3	881.6	308.0	35.2
	050	1260.4	290.3	50.4	1181.4	304.0	47.2	1098.9	315.7	43.9	1016.8	325.6	40.6	935.6	333.9	37.4
	060	1340.5	315.6	53.6	1250.8	329.2	50.0	1163.1	341.2	46.5	1075.9	351.4	43.0	989.6	359.8	39.5
	070															
	080															

See Legend on page 63.

Performance data — SI (cont)



COOLING CAPACITIES — 50 Hz

LCWT (C)	UNIT SIZE 30GUN,GUR	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)
4	040	80.0	20.9	3.2	76.0	22.1	3.0	71.8	23.2	2.9	67.6	24.1	2.7	63.3	25.0	2.5
	045	95.4	25.8	3.8	89.4	27.0	3.6	83.5	28.2	3.3	77.4	29.1	3.1	71.2	29.7	2.8
	050	118.0	33.3	4.7	111.3	34.8	4.4	104.7	36.3	4.2	97.9	37.5	3.9	91.1	38.6	3.6
	060	139.5	39.5	5.5	131.5	41.3	5.2	123.4	42.8	4.9	115.3	44.2	4.6	107.2	45.3	4.3
	070	160.1	43.3	6.4	150.3	45.3	6.0	140.3	47.0	5.6	130.4	48.5	5.2	120.4	49.7	4.8
	080	188.4	51.5	7.5	177.0	53.7	7.0	165.6	55.7	6.6	154.1	57.3	6.1	142.6	58.7	5.7
	090	211.3	58.3	8.4	198.5	61.0	7.9	185.4	63.3	7.4	172.3	65.2	6.8	159.2	66.7	6.3
	100	229.2	63.1	9.1	215.0	65.7	8.5	200.7	68.1	8.0	186.4	70.0	7.4	172.0	71.5	6.8
	110	256.3	75.9	10.2	241.5	78.8	9.6	226.7	81.4	9.0	211.9	83.8	8.4	197.0	85.8	7.8
	130	285.0	78.7	11.3	270.3	82.8	10.7	255.4	86.4	10.2	240.2	89.8	9.6	224.9	92.7	8.9
	150	338.1	99.9	13.4	321.8	104.5	12.8	305.4	108.8	12.1	288.8	112.7	11.5	271.8	116.4	10.8
	170	368.9	103.9	14.7	350.3	109.0	13.9	331.3	113.7	13.2	312.0	118.0	12.4	291.9	121.8	11.6
	190	417.5	120.8	16.6	396.8	126.1	15.8	376.2	131.1	15.0	354.8	135.6	14.1	333.4	139.8	13.3
	210	466.8	132.7	18.6	438.4	137.8	17.4	409.9	142.1	16.3	381.4	145.8	15.2	352.9	148.9	14.0
	230	526.4	151.5	20.9	498.9	158.2	19.8	470.9	164.4	18.7	442.9	170.0	17.6	414.4	175.0	16.5
	245	549.4	158.3	21.8	520.3	165.5	20.7	490.8	172.0	19.5	461.1	177.9	18.3	431.0	183.1	17.1
	255	567.2	163.0	22.5	536.7	170.2	21.3	506.0	176.8	20.1	475.1	182.7	18.9	443.8	187.9	17.6
	270	598.0	166.9	23.8	565.2	174.7	22.5	531.9	181.8	21.1	498.3	188.0	19.8	463.9	193.3	18.4
	290	673.8	196.7	26.8	638.3	204.9	25.4	602.9	212.6	24.0	566.7	219.4	22.5	530.4	225.5	21.1
	315	723.2	208.6	28.8	680.0	216.6	27.0	636.6	223.6	25.3	593.2	229.6	23.6	549.9	234.6	21.9
	330	737.8	207.8	29.3	700.6	218.0	27.9	662.7	227.5	26.3	624.0	236.0	24.8	584.0	243.5	23.2
	360	786.5	224.7	31.3	747.1	235.1	29.7	707.6	244.8	28.1	666.8	253.6	26.5	625.4	261.5	24.9
	390	884.5	253.5	35.2	835.2	263.9	33.2	785.8	273.2	31.2	736.2	281.4	29.3	686.2	288.6	27.3
	420	933.7	265.5	37.1	876.7	275.5	34.9	819.7	284.2	32.6	762.8	291.7	30.3	705.8	297.8	28.1
5	040	82.5	21.2	3.3	78.4	22.4	3.1	74.2	23.6	3.0	69.9	24.6	2.8	65.5	25.5	2.6
	045	99.1	26.3	3.9	93.0	27.6	3.7	86.9	28.8	3.5	80.6	29.7	3.2	74.4	30.5	3.0
	050	122.4	33.9	4.9	115.7	35.5	4.6	108.8	37.0	4.3	101.8	38.3	4.1	94.9	39.5	3.8
	060	144.9	40.3	5.8	136.6	42.1	5.4	128.3	43.7	5.1	120.0	45.2	4.8	111.7	46.4	4.4
	070	166.2	44.1	6.6	156.2	46.3	6.2	146.1	48.1	5.8	135.8	49.6	5.4	125.7	50.9	5.0
	080	195.7	52.6	7.8	184.0	54.9	7.3	172.4	56.9	6.9	160.6	58.7	6.4	148.8	60.2	5.9
	090	219.3	59.5	8.7	206.3	62.3	8.2	193.0	64.7	7.7	179.5	66.8	7.1	166.1	68.5	6.6
	100	238.8	64.4	9.5	224.1	67.2	8.9	209.4	69.7	8.3	194.8	71.8	7.8	180.1	73.5	7.2
	110	266.6	77.5	10.6	251.4	80.6	10.0	236.2	83.4	9.4	220.9	85.8	8.8	205.7	88.0	8.2
	130	295.0	80.1	11.7	280.2	84.3	11.1	264.8	88.2	10.5	249.4	91.6	9.9	233.7	94.8	9.3
	150	349.3	101.7	13.9	332.8	106.4	13.2	315.9	110.9	12.6	298.8	115.0	11.9	281.5	118.8	11.2
	170	382.5	105.9	15.2	363.5	111.3	14.5	344.1	116.2	13.7	324.3	120.7	12.9	303.9	124.7	12.1
	190	432.8	123.2	17.2	411.6	128.7	16.4	390.2	133.9	15.5	368.5	138.7	14.7	346.6	143.1	13.8
	210	485.6	135.7	19.3	456.4	141.0	18.2	427.1	145.6	17.0	397.8	149.6	15.8	368.6	152.9	14.7
	230	545.0	154.3	21.7	516.8	161.3	20.6	488.3	167.8	19.4	459.4	173.7	18.3	430.3	179.0	17.1
	245	568.7	161.2	22.6	539.1	168.7	21.4	508.7	175.6	20.2	478.4	181.8	19.0	447.6	187.3	17.8
	255	587.9	166.1	23.4	556.8	173.7	22.2	525.3	180.5	20.9	493.5	186.8	19.6	461.5	192.3	18.4
	270	621.1	170.3	24.7	587.5	178.5	23.4	553.5	185.9	22.0	519.0	192.5	20.6	483.8	198.2	19.2
	290	699.4	200.7	27.8	663.0	209.3	26.4	626.4	217.3	24.9	589.5	224.5	23.5	552.2	231.1	22.0
	315	752.3	213.2	29.9	707.9	221.5	28.2	663.3	229.0	26.4	618.7	235.4	24.6	574.2	240.9	22.8
	330	765.0	211.8	30.4	727.0	222.5	28.9	688.2	232.4	27.4	648.6	241.4	25.8	608.1	249.5	24.2
	360	815.3	229.1	32.4	775.1	240.0	30.8	734.3	250.1	29.2	692.8	259.4	27.6	650.4	267.8	25.9
	390	918.7	258.9	36.6	867.9	269.7	34.5	817.2	279.5	32.5	766.3	288.2	30.5	715.1	295.9	28.5
	420	971.1	271.4	38.6	912.7	281.9	36.3	854.2	291.2	34.0	795.6	299.1	31.7	737.2	305.8	29.3
6	040	85.0	21.5	3.4	80.8	22.8	3.2	76.6	24.0	3.0	72.2	25.0	2.9	67.7	26.0	2.7
	045	102.8	26.8	4.1	96.7	28.2	3.8	90.4	29.4	3.6	84.1	30.5	3.3	77.6	31.3	3.1
	050	126.9	34.5	5.1	120.0	36.2	4.8	113.0	37.8	4.5	105.8	39.2	4.2	98.7	40.4	3.9
	060	150.3	41.0	6.0	141.8	42.9	5.6	133.3	44.6	5.3	124.8	46.1	5.0	116.2	47.5	4.6
	070	172.5	45.0	6.9	162.3	47.2	6.5	151.9	49.1	6.0	141.4	50.7	5.6	131.0	52.1	5.2
	080	203.2	53.6	8.1	191.2	56.0	7.6	179.2	58.2	7.1	167.2	60.1	6.7	155.1	61.7	6.2
	090	227.6	60.7	9.1	214.2	63.6	8.5	200.7	66.2	8.0	186.9	68.4	7.4	173.1	70.2	6.9
	100	248.4	65.7	9.9	233.6	68.7	9.3	218.4	71.3	8.7	203.4	73.6	8.1	188.3	75.4	7.5
	110	277.2	79.1	11.0	261.5	82.4	10.4	245.9	85.3	9.8	230.2	87.9	9.2	214.6	90.3	8.5
	130	305.1	81.4	12.1	290.1	85.9	11.5	274.4	89.9	10.9	258.7	93.5	10.3	242.6	96.9	9.7
	150	360.7	103.5	14.4	343.8	108.4	13.7	326.7	113.0	13.0	309.3	117.3	12.3	291.5	121.3	11.6
	170	396.3	107.9	15.8	376.9	113.5	15.0	357.1	118.7	14.2	336.9	123.4	13.4	316.3	127.8	12.6
	190	448.3	125.6	17.8	426.5	131.3	17.0	404.5	136.7	16.1	382.7	141.8	15.2	360.0	146.4	14.3
	210	504.7	138.7	20.1	474.8	144.2	18.9	444.7	149.1	17.7	414.6	153.3	16.5	384.6	156.9	15.3
	230	563.9	157.1	22.4	535.0	164.4	21.3	505.9	171.2	20.1	476.5	177.4	19.0	446.6	183.0	17.8
	245	588.2	164.1	23.4	558.0	172.0	22.2	527.1	179.1	21.0	496.1	185.7	19.8	464.7	191.5	18.5
	255	608.9	169.2	24.2	577.2	177.1	23.0	545.1	184.3	21.7	512.6	190.9	20.4	479.7	196.7	19.1
	270	644.6	173.6	25.7	610.3	182.2	24.3	575.4	190.0	22.9	540.1	197.0	21.5	504.4	203.2	20.1
	290	725.4	204.7	28.9	688.1	213.7	27.4	650.4	222.0	25.9	612.9	229.7	24.4	574.5	236.6	22.9
	315	782.0	217.8	31.1	736.4	226.6	29.3	690.7	234.4	27.5	644.9	241.3	25.7	599.1	247.2	23.8
	330	792.7	215.8	31.6	753.8	227.0	30.0	714.1	237.3	28.4	673.7	246.8	26.8	632.5	255.5	25.2
	360	844.6	233.5	33.6	803.4	244.8	32.0	761.5	255.4	30.3	719.5	265.2	28.6	676.2	274.1	26.9
	390	953.2	264.3	37.9	901.2	275.5	35.9									

COOLING CAPACITIES — 50 Hz (cont)

LCWT (C)	UNIT SIZE 30GUN,GUR	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	040	87.5	21.8	3.5	83.3	23.1	3.3	79.0	24.3	3.1	74.6	25.5	3.0	70.0	26.4	2.8
	045	106.7	27.2	4.2	100.4	28.7	4.0	94.0	30.0	3.7	87.5	31.2	3.5	81.0	32.1	3.2
	050	131.5	35.1	5.2	124.5	36.9	5.0	117.3	38.6	4.7	110.0	40.0	4.4	102.6	41.3	4.1
	060	155.9	41.8	6.2	147.2	43.8	5.9	138.4	45.5	5.5	129.7	47.1	5.2	120.9	48.6	4.8
	070	178.9	45.8	7.1	168.4	48.1	6.7	157.9	50.1	6.3	147.2	51.9	5.9	136.5	53.4	5.4
	080	210.9	54.7	8.4	198.6	57.2	7.9	186.3	59.5	7.4	173.9	61.4	6.9	161.6	63.2	6.4
	090	235.9	61.8	9.4	222.2	64.9	8.8	208.4	67.6	8.3	194.4	70.0	7.7	180.2	71.9	7.2
	100	258.3	67.1	10.3	243.0	70.2	9.7	227.6	73.0	9.1	212.1	75.4	8.4	196.6	77.4	7.8
	110	287.9	80.8	11.5	272.0	84.2	10.8	255.8	87.3	10.2	239.7	90.1	9.5	223.5	92.5	8.9
	130	315.4	82.8	12.6	300.1	87.4	12.0	284.4	91.6	11.3	268.1	95.4	10.7	251.8	98.9	10.0
	150	372.2	105.2	14.8	355.0	110.3	14.1	337.6	115.1	13.4	319.8	119.6	12.7	301.7	123.8	12.0
	170	410.1	109.9	16.3	390.5	115.8	15.6	370.3	121.2	14.7	349.6	126.1	13.9	328.5	130.7	13.1
	190	463.7	128.0	18.5	442.1	134.0	17.6	419.4	139.6	16.7	396.7	144.9	15.8	373.9	149.8	14.9
	210	524.7	141.7	20.9	493.6	147.5	19.7	462.7	152.6	18.4	431.8	157.1	17.2	401.0	161.0	16.0
	230	583.1	159.9	23.2	553.6	167.5	22.1	523.8	174.6	20.9	493.7	181.1	19.7	463.3	187.0	18.5
	245	608.0	167.1	24.2	577.2	175.2	23.0	545.8	182.7	21.7	514.1	189.6	20.5	482.1	195.8	19.2
	255	630.4	172.3	25.1	597.9	180.5	23.8	565.1	188.1	22.5	531.9	195.0	21.2	498.3	201.2	19.8
	270	668.3	177.0	26.6	633.5	185.9	25.2	597.8	194.1	23.8	561.7	201.5	22.4	525.1	208.1	20.9
	290	751.7	208.8	29.9	714.0	218.2	28.4	675.2	226.9	26.9	636.4	234.9	25.3	597.4	242.3	23.8
	315	812.7	222.5	32.4	765.6	231.7	30.5	718.6	239.9	28.6	671.6	247.2	26.7	624.5	253.5	24.9
	330	820.3	219.9	32.7	781.1	231.5	31.1	740.5	242.3	29.5	699.2	252.3	27.9	657.1	261.4	26.2
	360	873.8	238.0	34.8	832.6	249.8	33.2	789.6	260.7	31.5	746.3	271.0	29.7	702.4	280.5	28.0
	390	988.9	269.8	39.4	935.6	281.5	37.3	882.0	292.2	35.1	828.5	302.0	33.0	774.6	310.7	30.9
	420	1049.4	283.5	41.8	987.2	295.0	39.3	925.5	305.3	36.9	863.7	314.3	34.4	801.9	322.0	31.9
8	040	90.1	22.1	3.6	85.8	23.5	3.4	81.4	24.7	3.2	77.0	25.9	3.1	72.4	26.9	2.9
	045	110.6	27.7	4.4	104.2	29.3	4.2	97.6	30.7	3.9	91.0	31.8	3.6	84.3	32.8	3.4
	050	136.2	35.7	5.4	129.0	37.6	5.1	121.6	39.3	4.8	114.2	40.9	4.6	106.7	42.3	4.3
	060	161.6	42.6	6.4	152.6	44.6	6.1	143.7	46.5	5.7	134.6	48.1	5.4	125.6	49.7	5.0
	070	185.3	46.6	7.4	174.7	49.0	7.0	163.9	51.2	6.5	153.1	53.0	6.1	142.0	54.6	5.7
	080	218.8	55.7	8.7	206.2	58.4	8.2	193.5	60.7	7.7	180.8	62.8	7.2	168.1	64.7	6.7
	090	244.6	63.0	9.7	230.4	66.2	9.2	216.3	69.1	8.6	202.0	71.6	8.0	187.5	73.7	7.5
	100	268.5	68.4	10.7	252.8	71.7	10.1	237.1	74.6	9.4	221.1	77.2	8.8	205.2	79.4	8.2
	110	298.8	82.4	11.9	282.5	86.0	11.3	266.1	89.3	10.6	249.4	92.2	9.9	232.8	94.8	9.3
	130	325.9	84.2	13.0	310.2	88.9	12.4	294.3	93.3	11.7	277.9	97.4	11.1	261.1	101.0	10.4
	150	383.8	107.0	15.3	366.4	112.3	14.6	348.6	117.3	13.9	330.5	121.9	13.2	312.0	126.4	12.4
	170	424.4	112.0	16.9	404.4	118.0	16.1	383.7	123.7	15.3	362.6	128.9	14.4	341.0	133.7	13.6
	190	479.3	130.4	19.1	457.3	136.7	18.2	434.8	142.5	17.3	411.0	147.9	16.4	387.6	153.1	15.4
	210	544.7	144.8	21.7	513.2	150.9	20.5	481.2	156.2	19.2	449.4	161.0	17.9	417.7	165.1	16.6
	230	602.6	162.7	24.0	572.6	170.6	22.8	542.1	178.0	21.6	511.3	184.8	20.4	480.1	191.0	19.1
	245	628.4	170.0	25.0	596.9	178.5	23.8	565.0	186.3	22.5	532.4	193.5	21.2	499.7	200.1	19.9
	255	652.2	175.4	26.0	619.1	183.9	24.7	585.5	191.9	23.3	551.6	199.1	22.0	517.2	205.7	20.6
	270	692.8	180.4	27.6	657.1	189.7	26.2	620.7	198.3	24.7	583.7	206.1	23.3	546.2	213.1	21.8
	290	778.0	212.8	31.0	739.8	222.7	29.5	700.8	231.8	27.9	660.4	240.1	26.3	620.4	247.9	24.7
	315	843.6	227.3	33.6	795.8	236.9	31.7	747.2	245.5	29.8	698.9	253.2	27.9	650.5	259.9	25.9
	330	848.9	223.9	33.8	808.8	236.1	32.2	767.4	247.3	30.6	725.2	257.8	28.9	682.1	267.4	27.2
	360	903.7	242.3	36.0	861.8	254.7	34.3	818.5	266.2	32.6	773.6	276.8	30.8	728.6	286.8	29.0
	390	1024.2	275.2	40.8	970.7	287.6	38.7	915.4	298.7	36.5	860.6	308.9	34.3	805.2	318.2	32.1
	420	1089.4	289.6	43.4	1026.3	301.7	40.9	962.3	312.5	38.3	898.9	322.0	35.8	835.4	330.2	33.3
9	040	92.7	22.4	3.7	88.4	23.8	3.5	83.9	25.1	3.3	79.4	26.3	3.2	74.7	27.4	3.0
	045	114.6	28.2	4.6	108.1	29.9	4.3	101.4	31.3	4.0	94.6	32.5	3.8	87.8	33.6	3.5
	050	140.9	36.3	5.6	133.5	38.3	5.3	126.0	40.1	5.0	118.5	41.7	4.7	110.7	43.2	4.4
	060	167.5	43.3	6.7	158.2	45.5	6.3	149.0	47.4	5.9	139.8	49.2	5.6	130.6	50.8	5.2
	070	192.0	47.4	7.7	181.1	49.9	7.2	170.1	52.2	6.8	159.0	54.2	6.3	147.9	55.9	5.9
	080	226.9	56.8	9.0	213.9	59.5	8.5	200.9	62.0	8.0	187.9	64.3	7.5	174.8	66.2	7.0
	090	253.4	64.2	10.1	239.0	67.6	9.5	224.4	70.6	8.9	209.8	73.2	8.4	195.1	75.5	7.8
	100	278.7	69.7	11.1	262.8	73.2	10.5	246.6	76.3	9.8	230.5	79.0	9.2	214.0	81.3	8.5
	110	309.9	84.1	12.4	293.2	87.8	11.7	276.2	91.2	11.0	259.3	94.3	10.3	242.2	97.1	9.7
	130	336.8	85.5	13.4	320.6	90.5	12.8	304.3	95.0	12.1	287.7	99.3	11.5	270.5	103.1	10.8
	150	395.7	108.8	15.8	377.9	114.2	15.1	359.8	119.4	14.3	341.3	124.3	13.6	322.5	128.9	12.9
	170	439.0	114.0	17.5	418.5	120.3	16.7	397.4	126.2	15.8	375.8	131.6	15.0	353.7	136.7	14.1
	190	495.5	132.8	19.8	472.8	139.3	18.9	449.7	145.4	17.9	426.1	151.1	17.0	401.8	156.5	16.0
	210	565.2	147.9	22.5	532.8	154.2	21.2	500.3	159.9	19.9	467.4	164.9	18.6	434.8	169.3	17.3
	230	622.5	165.5	24.8	591.8	173.8	23.6	560.7	181.4	22.4	529.2	188.5	21.1	497.3	195.1	19.8
	245	649.0	173.0	25.9	616.9	181.8	24.6	584.3	190.0	23.3	551.2	197.5	22.0	517.7	204.4	20.6
	255	674.4	178.5	26.9	640.6	187.4	25.5	606.3	195.7	24.2	571.6	203.3	22.8	536.5	210.2	21.4
	270	717.6	183.8	28.6	681.2	193.5	27.2	643.9	202.5	25.7	606.1	210.6	24.2	567.7	218.0	22.6
	290	805.5	216.9	32.1	766.1	227.2	30.5	726.0	236.6	28.9	685.4	245.5	27.3	644.0	253.7	25.7
	315	875.3	232.1	34.9	826.3	242.1	32.9	776.8	251.2	31.0	726.8	259.3	29.0	677.1	266.4	27.0
	330	877.9	228.1	35.0	837.1	240.6	33.4	794.8	252.3	31.7	751.6	263.3	30.0	707.5	273.4	28.2
	360	934.4	246.8	37.3	891.4	259.6	35.5	847.1	271.6	33.8	801.8	282.8	32.0			

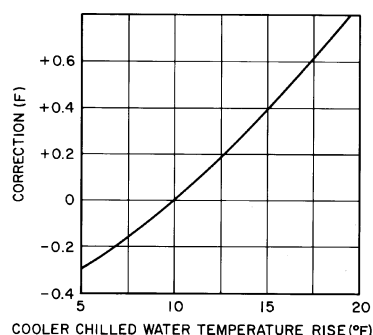
Performance data — SI (cont)



COOLING CAPACITIES — 50 Hz (cont)

LCWT (C)	UNIT SIZE 30GUN,GUR	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)
10	040	95.3	22.7	3.8	90.9	24.1	3.6	86.4	25.5	3.4	81.8	26.7	3.3	77.1	27.9	3.1
	045	118.7	28.7	4.7	112.0	30.4	4.5	105.2	31.9	4.2	98.3	33.3	3.9	91.2	34.4	3.6
	050	145.8	37.0	5.8	138.2	39.0	5.5	130.5	40.9	5.2	122.7	42.6	4.9	114.8	44.1	4.6
	060	173.3	44.1	6.9	164.0	46.3	6.5	154.5	48.3	6.2	145.0	50.2	5.8	135.6	51.9	5.4
	070	198.7	48.2	7.9	187.6	50.8	7.5	176.4	53.2	7.0	165.1	55.3	6.6	153.7	57.1	6.1
	080	235.1	57.8	9.4	221.8	60.7	8.8	208.5	63.3	8.3	195.1	65.7	7.8	181.7	67.7	7.2
	090	262.3	65.4	10.5	247.7	68.9	9.9	232.9	72.1	9.3	217.7	74.8	8.7	202.8	77.3	8.1
	100	289.4	71.1	11.5	272.9	74.7	10.9	256.5	78.0	10.2	239.8	80.8	9.6	223.0	83.3	8.9
	110	321.2	85.8	12.8	304.1	89.7	12.1	287.0	93.3	11.4	269.5	96.5	10.7	251.9	99.5	10.0
	130	347.4	86.9	13.9	331.2	92.0	13.2	314.5	96.7	12.5	297.6	101.2	11.9	280.3	105.3	11.2
	150	407.7	110.5	16.3	389.6	116.2	15.5	371.1	121.5	14.8	352.3	126.6	14.1	333.1	131.4	13.3
	170	453.7	116.1	18.1	432.9	122.6	17.3	411.3	128.7	16.4	389.2	134.4	15.5	366.6	139.7	14.6
	190	511.9	135.2	20.4	488.5	141.9	19.5	464.9	148.3	18.5	440.9	154.3	17.6	415.9	159.9	16.6
	210	586.1	151.1	23.4	552.9	157.6	22.1	519.6	163.6	20.7	486.2	168.9	19.4	452.3	173.5	18.0
	230	642.7	168.4	25.6	611.4	176.9	24.4	579.6	184.9	23.1	547.4	192.3	21.8	514.8	199.2	20.5
	245	669.9	176.0	26.7	637.2	185.1	25.4	604.0	193.6	24.1	570.2	201.5	22.7	535.9	208.7	21.4
	255	696.9	181.6	27.8	662.5	190.9	26.4	627.5	199.5	25.0	592.0	207.5	23.6	556.1	214.8	22.2
	270	743.0	187.2	29.6	705.8	197.3	28.2	667.6	206.7	26.6	628.9	215.2	25.1	589.6	223.0	23.5
	290	833.4	221.0	33.2	792.6	231.6	31.6	751.9	241.6	30.0	710.3	250.8	28.3	667.8	259.3	26.6
	315	907.6	236.9	36.2	857.2	247.4	34.2	806.7	256.9	32.2	755.7	265.4	30.1	704.2	272.9	28.1
	330	907.5	232.2	36.2	865.8	245.2	34.5	822.6	257.4	32.8	778.4	268.8	31.0	733.3	279.4	29.2
	360	965.6	251.3	38.5	921.4	264.5	36.8	876.2	277.0	34.9	830.1	288.7	33.1	782.6	299.6	31.2
	390	1098.2	286.3	43.8	1041.9	299.7	41.6	985.0	311.9	39.3	926.9	323.1	37.0	868.4	333.4	34.6
	420	1172.1	302.1	46.8	1105.8	315.3	44.1	1039.2	327.2	41.5	972.3	337.7	38.8	904.6	346.9	36.1
13	040	103.5	23.5	4.1	98.9	25.1	3.9	94.2	26.6	3.8	89.4	28.0	3.6	83.4	29.1	3.3
	045	131.5	30.2	5.2	124.3	32.1	5.0	117.1	33.8	4.7	109.7	35.4	4.4	101.1	36.5	4.0
	050	160.9	38.9	6.4	152.8	41.1	6.1	144.6	43.2	5.8	136.3	45.2	5.4	127.8	46.9	5.1
	060	191.9	46.4	7.7	181.8	48.9	7.3	171.6	51.2	6.9	161.0	53.2	6.4	148.5	54.6	5.9
	070	219.7	50.7	8.8	208.0	53.6	8.3	196.1	56.3	7.8	183.9	58.7	7.3	170.6	60.6	6.8
	080	257.5	60.8	10.3	242.0	63.8	9.7	226.5	66.5	9.0	211.3	68.9	8.4	195.1	70.7	7.8
	090	290.0	69.1	11.6	274.5	73.0	11.0	258.1	76.4	10.3	238.5	78.8	9.5	218.9	80.8	8.7
	100	322.1	75.2	12.9	304.7	79.3	12.2	287.0	83.0	11.5	269.2	86.4	10.8	250.0	89.0	10.0
	110	357.0	91.1	14.3	338.4	95.4	13.5	319.7	99.4	12.8	301.0	103.2	12.0	281.9	106.6	11.3
	130	380.9	91.0	15.2	363.8	96.6	14.5	346.3	101.9	13.8	328.3	106.9	13.1	309.8	111.6	12.4
	150	444.7	116.0	17.8	425.9	122.2	17.0	406.4	128.1	16.2	383.5	133.2	15.3	358.9	137.7	14.3
	170	499.0	122.3	19.9	477.0	129.5	19.0	454.3	136.4	18.1	426.9	142.0	17.0	395.0	146.3	15.8
	190	562.6	142.7	22.5	537.9	150.1	21.5	512.4	157.1	20.5	487.0	163.9	19.4	460.4	170.2	18.4
	210	650.8	160.7	26.0	615.2	168.1	24.6	579.4	174.8	23.1	540.7	180.2	21.6	498.1	184.1	19.9
	230	702.2	176.7	28.0	668.0	186.0	26.7	633.0	194.6	25.3	594.8	202.1	23.7	554.0	208.4	22.1
	245	734.7	185.0	29.3	700.4	195.2	28.0	664.6	204.5	26.5	621.9	212.0	24.8	577.8	218.5	23.1
	255	767.0	191.2	30.6	730.7	201.5	29.2	693.5	211.1	27.7	652.7	219.6	26.1	608.9	226.7	24.3
	270	821.5	197.6	32.8	781.7	208.9	31.2	741.3	219.4	29.6	696.1	228.4	27.8	645.0	235.3	25.8
	290	919.7	233.8	36.7	876.5	245.5	35.0	832.1	256.5	33.2	788.1	267.1	31.5	742.5	276.8	29.6
	315	1008.0	251.9	40.2	953.9	263.5	38.1	899.3	274.3	35.9	841.9	283.4	33.6	780.1	290.7	31.2
	330	998.4	244.7	39.9	953.9	259.1	38.1	908.5	272.7	36.3	853.7	284.1	34.1	789.9	292.5	31.5
	360	1061.7	265.0	42.4	1014.8	279.6	40.5	966.7	293.5	38.6	913.9	305.9	36.5	855.4	316.5	34.2
	390	1213.6	303.5	48.5	1153.3	318.2	46.1	1092.2	332.0	43.6	1028.0	344.2	41.0	958.7	354.5	38.3
	420	1301.5	321.5	52.0	1230.4	336.2	49.1	1158.8	349.6	46.3	1081.4	360.4	43.2	996.1	368.3	39.8
16	040	112.1	24.4	4.5	106.1	26.0	4.2	99.2	27.3	4.0	91.4	28.3	3.7	83.6	29.1	3.3
	045	137.9	30.9	5.5	128.8	32.6	5.1	119.6	34.1	4.8	110.5	35.4	4.4	101.4	36.5	4.1
	050	172.4	40.2	6.9	161.4	42.2	6.4	150.4	44.1	6.0	139.5	45.7	5.6	128.7	47.0	5.1
	060	200.3	47.4	8.0	187.2	49.5	7.5	174.3	51.5	7.0	161.5	53.2	6.5	148.9	54.6	6.0
	070	235.7	52.4	9.4	219.6	55.0	8.8	203.7	57.3	8.1	187.9	59.3	7.5	172.3	60.8	6.9
	080	265.7	61.8	10.6	247.8	64.6	9.9	230.2	67.0	9.2	212.8	69.0	8.5	195.7	70.8	7.8
	090	299.4	70.1	12.0	279.2	73.4	11.2	259.1	76.4	10.4	239.2	78.8	9.6	219.5	80.8	8.8
	100	341.0	77.3	13.6	318.0	80.9	12.7	295.2	84.1	11.8	272.7	86.8	10.9	250.5	89.0	10.0
	110	387.2	95.3	15.5	361.7	99.1	14.5	336.7	102.4	13.5	311.9	105.3	12.5	287.6	107.7	11.5
	130	415.7	95.0	16.6	397.8	101.2	15.9	375.9	106.5	15.0	351.8	111.0	14.1	324.2	114.4	13.0
	150	476.9	120.6	19.1	452.0	126.6	18.1	427.2	132.2	17.1	402.2	137.4	16.1	377.0	142.2	15.1
	170	530.4	126.5	21.2	496.4	132.5	19.8	462.7	137.7	18.5	429.2	142.4	17.2	396.0	146.3	15.8
	190	615.5	150.3	24.6	585.2	157.6	23.4	548.1	163.3	21.9	508.4	167.9	20.3	469.1	171.9	18.7
	210	673.7	163.7	26.9	629.3	170.0	25.2	585.4	175.5	23.4	542.2	180.3	21.7	499.3	184.2	20.0
	230	742.6	182.4	29.7	699.9	191.2	28.0	657.4	199.2	26.3	615.1	206.4	24.6	572.8	213.0	22.9
	245	776.3	190.7	31.0	731.2	200.0	29.2	686.3	208.6	27.4	641.5	216.2	25.6	596.5	223.0	23.8
	255	817.9	197.9	32.7	770.0	207.5	30.8	722.4	216.3	28.9	674.9	224.2	27.0	627.5	231.2	25.1
	270	871.4	203.8	34.8	814.4	213.4	32.5	757.9	221.8	30.3	701.9	229.1	28.1	646.4	235.3	25.8
	290	1002.6	245.6	40.1	947.0	256.7	37.8	884.8	265.7	35.4	820.3	273.2	32.8	756.7	279.7	30.2
	315	1060.9	259.0	42.4	991.1	269.1	39.6	922.1	277.9	36.9	854.1	285.5	34.1	786.9	291.9	31.4
	330	1060.4	253.0	42.4	992.9	264.9	39.7	925.4	275.5	37.0	858.4	284.7	34.3	792.0	292.6	31.7
	360	1145.8	276.8	45.8	1081.7	290.1	43.2	1010.8	301.0	40.4	937.6	310.3	37.5	865.		

LCWT CORRECTION (ENGLISH)



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

LEGEND

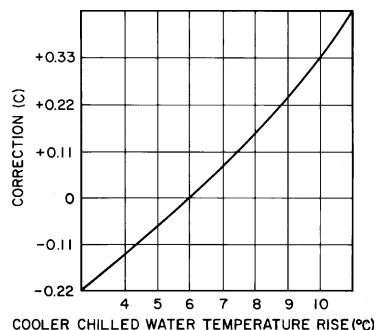
Cap. — Cooling Capacities kW of Refrigeration
kW — Compressor Power Input
LCWT — Leaving Chilled Water Temperature (F)

NOTES:

- All ratings are based on:
 - A cooler water temperature rise of 10° F. When greater accuracy is desired, correct design LCWT, before entering rating tables, by reference to the LCWT correction curve.
 - A fouling factor of 0.00010 in the cooler.
 - Refrigerant 134a.
- When a corrected LCWT is used, cooler pressure drop must also be corrected for new LCWT:
 - Enter rating table for corrected LCWT. By interpolation, determine corrected capacity (tons) and power input (kW) to compressor at its rated voltage.
 - Calculate corrected flow rate through the cooler:

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

LCWT CORRECTION (SI)



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

LEGEND

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

NOTES:

- All ratings are based on:
 - A cooler water temperature rise of 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.
 - Refrigerant 134a.
- When a corrected LCWT is used, cooler pressure drop must also be corrected for new LCWT:
 - Enter rating table for corrected LCWT. By interpolation, determine corrected capacity (kW) and power input (kW) to compressor at its rated voltage.
 - Calculate corrected flow rate through the cooler:

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

UNIT ELECTRICAL DATA, 30GUN,GUR040-210 (R-134a)

UNIT 30GUN, GUR	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			
040	208/230-60	187	253	151.1	151.1	200	200	363.6	250.6	175	175	185.3	185.3	225	225	397.8	284.8	200	200	115-60	30	
	460-60	414	506	77.2	72.7	100	90	183.1	124.1	90	80	90.2	85.7	110	110	196.1	137.1	100	100	115-60	30	
	575-60	518	633	66.9	65.8	90	80	135.3	95.8	80	80	74.1	73.0	90	90	142.5	103.0	90	80	115-60	30	
	380-60	342	418	80.6	76.1	100	100	201.5	136.5	90	90	94.6	90.1	110	110	215.5	150.5	110	100	230-60	15	
	380/415-50	342	440	85.8	82.1	110	110	215.5	144.5	100	100	101.4	97.7	125	125	231.1	160.1	125	110	230-50	15	
045	208/230-60	187	253	165.5	165.5	225	225	425.6	287.6	200	200	199.7	199.7	250	250	459.8	321.8	225	225	115-60	30	
	460-60	414	506	84.4	80.7	110	110	214.1	143.1	100	90	97.4	93.7	125	125	227.1	156.1	110	110	115-60	30	
	575-60	518	633	73.3	72.1	100	100	157.3	108.8	90	80	80.5	79.3	100	100	164.5	116.0	90	90	115-60	30	
	380-60	342	418	87.8	84.1	110	110	235.5	157.5	100	100	101.8	98.1	125	125	249.5	171.5	125	110	230-60	15	
	380/415-50	342	440	102.7	103.0	125	125	271.2	180.9	125	125	118.3	118.6	150	150	286.8	196.5	150	150	230-50	15	
050	208/230-60	187	253	202.7	202.7	250	250	538.1	360.1	225	225	236.9	236.9	300	300	572.3	394.3	300	300	115-60	30	
	460-60	414	506	101.3	101.6	125	125	269.8	179.5	125	125	114.3	114.6	150	150	282.8	192.5	150	150	115-60	30	
	575-60	518	633	88.0	83.4	110	110	206.4	139.8	100	100	95.2	90.6	125	110	213.6	147.0	110	100	115-60	30	
	380-60	342	418	107.1	105.0	150	125	297.2	196.9	125	125	121.1	119.0	150	150	311.2	210.9	150	150	230-60	15	
	380/415-50	342	440	133.3	129.0	175	175	362.2	241.5	150	150	148.9	144.6	200	200	377.8	257.1	175	175	230-50	15	
060	208/230-60	187	253	270.2	270.2	350	350	735.9	491.9	300	300	320.4	320.4	400	400	786.1	542.1	350	350	115-60	30	
	460-60	414	506	138.5	134.2	175	175	367.4	246.7	175	150	157.5	153.2	200	200	386.4	265.7	175	175	115-60	30	
	575-60	518	633	115.4	109.8	150	150	300.9	199.7	150	125	126.2	120.6	150	150	311.7	210.5	150	150	115-60	30	
	380-60	342	418	167.4	167.6	225	225	450.9	298.3	200	200	188.4	188.6	250	250	471.9	319.3	225	225	230-60	15	
	380/415-50	342	440	157.4	147.3	200	200	386.3	259.8	175	175	180.8	170.7	225	225	409.7	283.2	200	200	230-50	15	
070	208/230-60	187	253	297.1	297.1	400	400	762.8	518.8	350	350	347.3	347.3	450	450	813.0	569.0	400	400	115-60	30	
	460-60	414	506	155.8	145.7	200	200	384.7	258.2	175	175	174.8	164.7	225	200	403.7	277.2	200	200	115-60	30	
	575-60	518	633	125.7	121.4	150	150	311.2	211.3	150	150	136.5	132.2	175	175	322.0	222.1	150	150	115-60	30	
	380-60	342	418	200.7	202.1	250	250	484.2	332.8	225	225	221.7	223.1	300	300	505.2	353.8	250	250	230-60	15	
	380/415-50	342	440	165.7	157.5	225	200	394.6	270.0	200	175	189.1	180.9	250	225	418.0	293.4	225	200	230-50	15	
080	208/230-60	187	253	326.6	326.6	400	400	792.3	548.3	300	400	376.8	376.8	450	450	842.5	598.5	450	450	115-60	30	
	460-60	414	506	167.4	161.1	225	200	396.3	273.6	200	200	186.4	180.1	225	225	415.3	292.6	225	200	115-60	30	
	575-60	518	633	139.1	133.0	175	175	324.6	222.9	175	150	149.9	143.8	175	175	335.4	233.7	175	175	115-60	30	
	380-60	342	418	196.3	194.5	250	250	479.8	325.2	225	225	217.3	215.5	250	250	500.8	346.2	250	250	230-60	15	
	380/415-50	342	440	192.0	180.6	250	225	420.9	293.1	225	200	215.4	204.0	250	250	444.3	316.5	250	225	230-50	15	
090	208/230-60	187	253	314.5	314.5	350	350	574.6	436.6	350	350	364.7	364.7	400	400	624.8	486.8	400	400	115-60	30	
	460-60	414	506	160.2	153.9	175	175	289.9	216.3	175	175	179.2	172.9	200	200	308.9	235.3	200	200	115-60	30	
	575-60	518	633	137.7	135.3	150	150	221.7	172.0	150	150	148.5	146.1	175	150	232.5	182.8	175	175	115-60	30	
	380-60	342	418	164.8	158.5	175	175	312.5	231.9	175	175	185.8	179.5	200	200	333.5	252.9	200	200	230-60	15	
	380/415-50	342	440	209.3	202.4	250	250	438.2	314.9	225	225	232.7	225.8	250	250	461.6	338.3	250	250	230-50	15	
100	208/230-60	187	253	385.5	385.5	450	450	720.9	542.9	450	450	451.7	451.7	500	500	787.1	609.1	500	500	115-60	30	
	460-60	414	506	192.7	180.2	225	225	361.2	270.9	225	225	217.7	218.0	250	250	386.2	295.9	250	250	115-60	30	
	575-60	518	633	166.9	158.0	200	175	285.3	214.9	200	175	181.3	172.9	200	200	299.7	229.3	200	200	115-60	30	
	380-60	342	418	202.8	198.8	225	225	392.9	290.7	225	225	230.8	226.8	250	250	420.9	318.7	250	250	230-60	15	
	380/415-50	342	440	233.4	220.7	250	250	462.3	333.2	250	250	264.6	251.9	300	300	493.5	364.4	300	300	230-50	15	
110	208/230-60	187	253	419.2	419.2	500	500	884.9	640.9	450	450	485.4	485.4	600	600	951.1	707.1	600	600	115-60	30	
	460-60	414	506	214.3	207.4	250	250	443.2	319.9	250	225	239.3	232.4	300	250	468.2	344.9	300	250	115-60	30	
	575-60	518	633	179.8	173.0	225	200	365.3	262.9	200	200	194.2	187.4	225	225	379.7	277.3	225	200	115-60	30	
	380-60	342	418	244.4	242.0	300	300	527.9	372.7	300	300	272.4	270.0	350	300	555.9	400.7	300	300	230-60	15	
	380/415-50	342	440	286.0	266.9	300	300	514.9	379.4	350	300	317.2	298.1	350	350	546.1	410.6	350	350	230-50	15	
130	208/230-60	187	253	498.3	498.3	600	600	964.0	720.0	600	600	582.7	582.7	700	700	1048.4	804.4	700	700	115-60	30	
	460-60	414	506	255.2	247.7	300	300	484.1	360.2	300	300	287.2	279.7	300	300	516.1	392.2	300	300	115-60	30	
	575-60	518	633	212.3	201.6	250	225	397.8	291.5	225	225	230.3	219.6	250	250	415.8	309.5	250	250	115-60	30	
	380-60	342	418	307.3	307.5	350	350	590.8	438.2	350	350	342.3	342.5	400	400	625.8	473.2	400	400	230-60	15	
	380/415-50	342	440	292.8	284.0	350	300	521.7	396.5	350	300	331.8	323.0	350	350	560.7	435.5	350	350	230-50	15	
150	208/230-60	187	253	525.0	525.0	600	600	990.7	746.7	600	600	609.4	609.4	700	700	1075.1	831.1	700	700	115-60	30	
	460-60	414	506	271.8	257.8	300	300	500.7	370.3	300	300	303.8	289.8	350	300	532.7	402.3	350	300	115-60	30	
	575-60	518	633	225.7	219.6	250	250	411.2	309.5	250	250	243.7	237.6	250	250	429.2	327.5	250	250	115-60	30	
	380-60	342	418	320.1	317.6	350	350	603.6	448.3	350	350	355.1	352.6	400	400	638.6	483.3	400	400	230-60	15	
	380/415-50	342	440	353.7	330.1	400	350	582.6	442.6	400	350	392.7	369.1	450	400	621.6	481.6	450	400	230-50	15	
170	208/230-60	187	253																			



UNIT ELECTRICAL DATA, 30GUN,GUR230-420 (R-134a)

UNIT 30GUN, GUR	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		
230A	208/230-60	187	253	525.0	525.0	600	600	990.7	746.7	600	600	609.4	609.4	700	700	1075.1	831.1	700	700	115-60	30
	460-60	414	506	271.8	257.8	300	300	500.7	370.3	300	300	303.8	289.8	350	300	532.7	402.3	350	300	115-60	30
	575-60	518	633	225.7	219.6	250	250	411.2	309.5	250	250	243.7	237.6	250	250	429.2	327.5	250	250	115-60	30
	380-60	342	418	320.1	317.6	350	350	603.6	448.3	350	350	355.1	352.6	400	400	638.6	483.3	400	400	230-60	15
	380/415-50	342	440	353.7	330.1	400	350	582.6	442.6	400	350	392.7	369.1	450	400	621.6	481.6	450	400	230-50	15
245A	208/230-60	187	253	525.0	525.0	600	600	990.7	746.7	600	600	609.4	609.4	700	700	1075.1	831.1	700	700	115-60	30
	460-60	414	506	271.8	257.8	300	300	500.7	370.3	300	300	303.8	289.8	350	300	532.7	402.3	350	300	115-60	30
	575-60	518	633	225.7	219.6	250	250	411.2	309.5	250	250	243.7	237.6	250	250	429.2	327.5	250	250	115-60	30
	380-60	342	418	320.1	317.6	350	350	603.6	448.3	350	350	355.1	352.6	400	400	638.6	483.3	400	400	230-60	15
	380/415-50	342	440	353.7	330.1	400	350	582.6	442.6	400	350	392.7	369.1	450	400	621.6	481.6	450	400	230-50	15
255A	208/230-60	187	253	525.0	525.0	600	600	990.7	746.7	600	600	609.4	609.4	700	700	1075.1	831.1	700	700	115-60	30
	460-60	414	506	271.8	257.8	300	300	500.7	370.3	300	300	303.8	289.8	350	300	532.7	402.3	350	300	115-60	30
	575-60	518	633	225.7	219.6	250	250	411.2	309.5	250	250	243.7	237.6	250	250	429.2	327.5	250	250	115-60	30
	380-60	342	418	320.1	317.6	350	350	603.6	448.3	350	350	355.1	352.6	400	400	638.6	483.3	400	400	230-60	15
	380/415-50	342	440	353.7	330.1	400	350	582.6	442.6	400	350	392.7	369.1	450	400	621.6	481.6	450	400	230-50	15
270A	208/230-60	187	253	614.7	614.7	700	700	950.1	772.1	700	700	699.1	699.1	800	800	1034.5	856.5	800	800	115-60	30
	460-60	414	506	303.5	311.6	350	350	472.0	389.5	350	350	335.5	343.6	350	350	504.0	421.5	350	350	115-60	30
	575-60	518	633	262.1	242.1	300	250	380.5	298.5	300	250	280.1	260.1	300	300	398.5	316.5	300	300	115-60	30
	380-60	342	418	323.4	319.6	350	350	513.5	411.5	350	350	358.4	354.6	400	350	548.5	446.5	400	350	230-60	15
	380/415-50	342	440	362.7	352.0	400	400	591.6	464.5	400	400	401.7	391.0	450	400	630.6	503.5	450	400	230-50	15
290A	208/230-60	187	253	647.3	647.3	700	700	1113.0	869.0	700	700	747.7	747.7	800	800	1213.4	969.4	800	800	115-60	30
	460-60	414	506	331.0	320.9	350	350	559.9	433.4	350	350	369.0	358.9	400	400	597.9	471.4	400	400	115-60	30
	575-60	518	633	276.7	264.8	300	300	462.2	354.7	300	300	298.3	286.4	300	300	483.8	376.3	300	300	115-60	30
	380-60	342	418	384.3	381.9	450	450	667.8	512.6	450	450	426.3	423.9	500	500	709.8	554.6	450	450	230-60	15
	380/415-50	342	440	421.4	393.3	450	400	650.3	505.8	450	400	468.2	440.1	500	450	697.1	552.6	500	450	230-50	15
315A	208/230-60	187	253	715.2	715.2	800	800	1180.9	936.9	800	800	815.0	815.0	1000	1000	1280.7	1036.7	1000	1000	115-60	30
	460-60	414	506	365.6	354.2	400	400	594.5	466.7	400	400	403.6	392.2	450	400	632.5	504.7	450	400	115-60	30
	575-60	518	633	305.5	293.0	350	300	491.0	382.9	350	300	327.1	314.6	350	350	512.6	404.5	350	350	115-60	30
	380-60	342	418	418.9	415.2	450	450	702.4	545.9	450	450	460.9	457.2	500	500	744.4	587.9	500	500	230-60	15
	380/415-50	342	440	429.7	403.5	450	450	658.6	516.0	450	450	476.5	450.3	500	500	705.4	562.8	500	500	230-50	15
330A	208/230-60	187	253	614.7	614.7	700	700	950.1	772.1	700	700	699.1	699.1	800	800	1034.5	856.5	800	800	115-60	30
	460-60	414	506	303.5	311.6	350	350	472.0	389.5	350	350	335.5	343.6	350	350	504.0	421.5	350	350	115-60	30
	575-60	518	633	262.1	242.1	300	250	380.5	298.5	300	250	280.1	260.1	300	300	398.5	316.5	300	300	115-60	30
	380-60	342	418	323.4	319.6	350	350	513.5	411.5	350	350	358.4	354.6	400	350	548.5	446.5	400	350	230-60	15
	380/415-50	342	440	362.7	352.0	400	400	591.6	464.5	400	400	401.7	391.0	450	400	630.6	503.5	450	400	230-50	15
360A	208/230-60	187	253	647.3	647.3	700	700	1113.0	869.0	700	700	747.7	747.7	800	800	1213.4	969.4	800	800	115-60	30
	460-60	414	506	331.0	320.9	350	350	559.9	433.4	350	350	369.0	358.9	400	400	597.9	471.4	400	400	115-60	30
	575-60	518	633	276.7	264.8	300	300	462.2	354.7	300	300	298.3	286.4	300	300	483.8	376.3	300	300	115-60	30
	380-60	342	418	384.3	381.9	450	450	667.8	512.6	450	450	426.3	423.9	500	500	709.8	554.6	450	450	230-60	15
	380/415-50	342	440	421.4	393.3	450	400	650.3	505.8	450	400	468.2	440.1	500	450	697.1	552.6	500	450	230-50	15
390A	208/230-60	187	253	715.2	715.2	800	800	1180.9	936.9	800	800	815.0	815.0	1000	1000	1280.7	1036.7	1000	1000	115-60	30
	460-60	414	506	365.6	354.2	400	400	594.5	466.7	400	400	403.6	392.2	450	400	632.5	504.7	450	400	115-60	30
	575-60	518	633	305.5	293.0	350	300	491.0	382.9	350	300	327.1	314.6	350	350	512.6	404.5	350	350	115-60	30
	380-60	342	418	418.9	415.2	450	450	702.4	545.9	450	450	460.9	457.2	500	500	744.4	587.9	500	500	230-60	15
	380/415-50	342	440	429.7	403.5	450	450	658.6	516.0	450	450	476.5	450.3	500	500	705.4	562.8	500	500	230-50	15
420A	208/230-60	187	253	715.2	715.2	800	800	1180.9	936.9	800	800	815.0	815.0	1000	1000	1280.7	1036.7	1000	1000	115-60	30
	460-60	414	506	365.6	354.2	400	400	594.5	466.7	400	400	403.6	392.2	450	400	632.5	504.7	450	400	115-60	30
	575-60	518	633	305.5	293.0	350	300	491.0	382.9	350	300	327.1	314.6	350	350	512.6	404.5	350	350	115-60	30
	380-60	342	418	418.9	415.2	450	450	702.4	545.9	450	450	460.9	457.2	500	500	744.4	587.9	500	500	230-60	15
	380/415-50	342	440	429.7	403.5	450	450	658.6	516.0	450	450	476.5	450.3	500	500	705.4	562.8	500	500	230-50	15

See legend and notes on page 67.

Electrical data (cont)



UNIT ELECTRICAL DATA, 30GUN, GUR230-420 (R-134a) (cont)

UNIT 30GUN, GUR	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			
230B	208/230-60	187	253	326.6	326.6	400	400	792.3	548.3	400	400	376.8	376.8	450	450	842.5	598.5	450	450	115-60	30	
	460-60	414	506	167.4	161.1	225	200	396.3	273.6	200	200	186.4	180.1	225	225	415.3	292.6	225	200	115-60	30	
	575-60	518	633	139.1	133.0	175	175	324.6	222.9	175	150	149.9	143.8	175	175	335.4	233.7	175	175	115-60	30	
	380-60	342	418	196.3	194.5	250	250	479.8	325.2	225	225	217.3	215.5	250	250	500.8	346.2	250	250	230-60	15	
	380/415-50	342	440	192.0	180.6	250	225	420.9	293.1	225	200	215.4	204.0	250	250	444.3	316.5	250	225	230-50	15	
245B	208/230-60	187	253	314.5	314.5	350	350	574.6	436.6	350	350	364.7	364.7	400	400	624.8	486.8	400	400	115-60	30	
	460-60	414	506	160.2	153.9	175	175	289.9	216.3	175	175	179.2	172.9	200	200	308.9	235.3	200	200	115-60	30	
	575-60	518	633	137.7	135.3	150	150	221.7	172.0	150	150	148.5	146.1	175	150	232.5	182.8	175	175	115-60	30	
	380-60	342	418	164.8	158.5	175	175	312.5	231.9	175	175	185.8	179.5	200	200	333.5	252.9	200	200	230-60	15	
	380/415-50	342	440	209.3	202.4	250	250	438.2	314.9	225	225	232.7	225.8	250	250	461.6	338.3	250	250	230-50	15	
255B	208/230-60	187	253	385.5	385.5	450	450	720.9	542.9	450	450	451.7	451.7	500	500	787.1	609.1	500	500	115-60	30	
	460-60	414	506	192.7	193.0	225	225	361.2	270.9	225	225	217.7	218.0	250	250	386.2	295.9	250	250	115-60	30	
	575-60	518	633	166.9	158.5	200	175	285.3	214.9	200	175	181.3	172.9	200	200	299.7	229.3	200	200	115-60	30	
	380-60	342	418	202.8	198.8	225	225	392.9	290.7	225	225	230.8	226.8	250	250	420.9	318.7	250	250	230-60	15	
	380/415-50	342	440	233.4	220.7	250	250	462.3	333.2	250	250	264.6	251.9	300	300	493.5	364.4	300	300	230-50	15	
270B	208/230-60	187	253	385.5	385.5	450	450	720.9	542.9	450	450	451.7	451.7	500	500	787.1	609.1	500	500	115-60	30	
	460-60	414	506	192.7	193.0	225	225	361.2	270.9	225	225	217.7	218.0	250	250	386.2	295.9	250	250	115-60	30	
	575-60	518	633	166.9	158.5	200	175	285.3	214.9	200	175	181.3	172.9	200	200	299.7	229.3	200	200	115-60	30	
	380-60	342	418	202.8	198.8	225	225	392.9	290.7	225	225	230.8	226.8	250	250	420.9	318.7	250	250	230-60	15	
	380/415-50	342	440	233.4	220.7	250	250	462.3	333.2	250	250	264.6	251.9	300	300	493.5	364.4	300	300	230-50	15	
290B	208/230-60	187	253	419.2	419.2	500	500	884.9	640.9	450	450	485.4	485.4	600	600	951.1	707.1	600	600	115-60	30	
	460-60	414	506	214.3	207.4	250	250	443.2	319.9	250	225	239.3	232.4	300	250	468.2	344.9	300	250	115-60	30	
	575-60	518	633	179.8	173.0	225	200	365.3	262.9	200	200	194.2	187.4	225	225	379.7	277.3	225	200	115-60	30	
	380-60	342	418	244.4	242.0	300	300	527.9	372.7	300	300	272.4	270.0	350	300	555.9	400.7	300	300	230-60	15	
	380/415-50	342	440	286.0	266.9	300	300	514.9	379.4	350	300	317.2	298.1	350	350	546.1	410.6	350	350	230-50	15	
315B	208/230-60	187	253	419.2	419.2	500	500	884.9	640.9	450	450	485.4	485.4	600	600	951.1	707.1	600	600	115-60	30	
	460-60	414	506	214.3	207.4	250	250	443.2	319.9	250	225	239.3	232.4	300	250	468.2	344.9	300	250	115-60	30	
	575-60	518	633	179.8	173.0	225	200	365.3	262.9	200	200	194.2	187.4	225	225	379.7	277.3	225	200	115-60	30	
	380-60	342	418	244.4	242.0	300	300	527.9	372.7	300	300	272.4	270.0	350	300	555.9	400.7	300	300	230-60	15	
	380/415-50	342	440	286.0	266.9	300	300	514.9	379.4	350	300	317.2	298.1	350	350	546.1	410.6	350	350	230-50	15	
330B	208/230-60	187	253	614.7	614.7	700	700	950.1	772.1	700	700	699.1	699.1	800	800	1034.5	856.5	800	800	115-60	30	
	460-60	414	506	303.5	311.6	350	350	472.0	389.5	350	350	335.5	343.6	350	350	504.0	421.5	350	350	115-60	30	
	575-60	518	633	262.1	242.1	300	250	380.5	298.5	300	250	280.1	260.1	300	300	398.5	316.5	300	300	115-60	30	
	380-60	342	418	323.4	319.6	350	350	513.5	411.5	350	350	358.4	354.6	400	350	548.5	446.5	400	350	230-60	15	
	380/415-50	342	440	362.7	352.0	400	400	591.6	464.5	400	400	401.7	391.0	450	400	630.6	503.5	450	400	230-50	15	
360B	208/230-60	187	253	647.3	647.3	700	700	1113.0	869.0	700	700	747.7	747.7	800	800	1213.4	969.4	800	800	115-60	30	
	460-60	414	506	331.0	320.9	350	350	559.9	433.4	350	350	369.0	358.9	400	400	597.9	471.4	400	400	115-60	30	
	575-60	518	633	276.7	264.8	300	300	462.2	354.7	300	300	298.3	286.4	300	300	483.8	376.3	300	300	115-60	30	
	380-60	342	418	384.3	381.9	450	450	667.8	512.6	450	450	426.3	423.9	500	500	709.8	554.6	450	450	230-60	15	
	380/415-50	342	440	362.7	352.0	400	400	591.6	464.5	400	400	401.7	391.0	450	400	630.6	503.5	450	400	230-50	15	
390B	208/230-60	187	253	647.3	647.3	700	700	1113.0	869.0	700	700	747.7	747.7	800	800	1213.4	969.4	800	800	115-60	30	
	460-60	414	506	331.0	320.9	350	350	559.9	433.4	350	350	369.0	358.9	400	400	597.9	471.4	400	400	115-60	30	
	575-60	518	633	276.7	264.8	300	300	462.2	354.7	300	300	298.3	286.4	300	300	483.8	376.3	300	300	115-60	30	
	380-60	342	418	384.3	381.9	450	450	667.8	512.6	450	450	426.3	423.9	500	500	709.8	554.6	450	450	230-60	15	
	380/415-50	342	440	421.4	393.3	450	400	650.3	505.8	450	400	468.2	440.1	500	450	697.1	552.6	500	450	230-50	15	
420B	208/230-60	187	253	715.2	715.2	800	800	1180.9	936.9	800	800	815.0	815.0	1000	1000	1280.7	1036.7	1000	1000	115-60	30	
	460-60	414	506	365.6	354.2	400	400	594.5	466.7	400	400	403.6	392.2	450	400	632.5	504.7	450	400	115-60	30	
	575-60	518	633	305.5	293.0	350	300	491.0	382.9	350	300	327.1	314.6	350	350	512.6	404.5	350	350	115-60	30	
	380-60	342	418	418.9	415.2	450	450	702.4	545.9	450	450	460.9	457.2	500	500	744.4	587.9	500	500	230-60	15	
	380/415-50	342	440	429.7	403.5	450	450	658.6	516.0	450	450	476.5	450.3	500	500	705.4	562.8	500	500	230-50	15	

See legend and notes on page 67.

LEGEND AND NOTES FOR UNIT ELECTRICAL DATA TABLES

LEGEND

FLA	— Full Load Amps (Fan Motors)
ICF	— Maximum Instantaneous Current Flow during starting (the point in the starting sequence where the sum of the LRA for the starting compressor, plus the total RLA for all running compressors, plus the total FLA for all running fan motors is maximum)
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:

1. 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.
2. The unit control circuit power (115 v, single-phase for 208/230-, 460-, and 575-v units; 230 v, single-phase for all other voltages) must be supplied from a separate source through a field-supplied disconnect. The control circuit transformer accessory may be applied to power from primary unit power.
3. Crankcase and cooler heaters are wired into the control circuit so they are always operable as long as the control circuit power supply disconnect is on, even if any safety device is open, and the unit ON/OFF switch is in the OFF position.

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

UNIT SIZE 30GUN,GUR	VOLTAGE	TERMINAL BLOCKS	PARALLEL CONDUCTORS
040 to 070	208/230	1	3 (040, 045), 6 (050-070)
	460	1	3
	575	1	3
	380	1	3
	380/415	1	3
080 to 110 230B to 315B	208/230	1	6
	460	1	3
	575	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
	575	2	6
	380	2	6
	380/415	2	6

5. Maximum incoming wire size for each terminal block is 500 kcmil.
6. 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 (040-050), 4 (060,070), or 8 (080-420) cooler heaters, 210 watts each.

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 1½ to 3 minutes after the call for cooling. The lead circuit can be specifically designated or randomly selected by the controls, depending on how the unit is field configured. A field configuration is also available to determine if the unit should stage up both circuits equally or load one circuit completely before bringing on the other.

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.

Thermostatic expansion valve (TXV, 040-110 sizes only)

If installed, the TXV also controls refrigerant flow to the cooler for different operating conditions. An equalization line and temperature controlled sensing bulb are used to maintain a fixed setting of superheated refrigerant leaving the cooler.

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 FIOP (factory-installed option) or 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), to be installed in the field, 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.

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

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 040-070). Safety is bypassed on start-up for 2 minutes.

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

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

Controls (cont)



Ground current safety — Safety opens on sensing a current-to-ground in compressor windings in excess of 2.5 amps (accessory on sizes 040-060 and 070 [60 Hz]).

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.

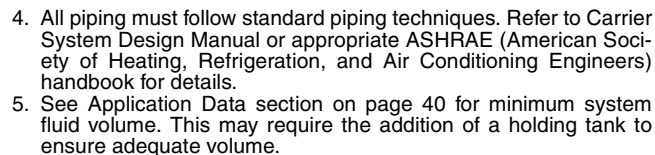
Diagnostics

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 30GUN,GUR 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 are set to U.S.A. central time zone 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.



Guide specifications



Reciprocating Air-Cooled Liquid Chiller

HVAC Guide Specifications

Size Range: **25 to 2810 Tons (88 to 985 kW)**

Nominal

Carrier Model Number: **30GUN,GUR**

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, and HFC-134a refrigerant.

1.02 QUALITY ASSURANCE

- A. Unit shall be rated in accordance with ARI Standard 550/590-98 (U.S.A.).
- B. Unit construction shall be designed to conform to ASHRAE 15 latest revision safety standard, NEC (U.S.A.), and ASME (U.S.A.) applicable codes.
- C. Unit shall have UL (U.S.A.) or CSA (Canada) approvals (60 Hz).
- D. Unit shall be manufactured in a facility registered to ISO 9002/BS5750, Part 2 (International Standards Organization) manufacturing quality standard.
- E. Unit operation shall be fully tested at the factory.

1.03 DELIVERY, STORAGE, AND HANDLING

- A. Unit shall be stored and handled per unit manufacturer's recommendations.
- B. Unit controls shall be capable of withstanding 150 F (66 C) storage temperature in the control compartment for an indefinite period of time.

Part 2 — Products

2.01 EQUIPMENT

A. General:

Factory-assembled, single-piece, air-cooled liquid chiller (to size 210). Contained within the unit cabinet shall be all factory wiring, piping, controls, refrigerant charge (R-134a), 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 prepainted finish.
3. Cabinet shall be capable of withstanding 500-hour salt spray test in accordance with the ASTM B-117 standard (U.S.A.).

C. Fans:

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

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

D. Compressors:

1. Reciprocating semi-hermetic type only.

2. Each equipped with an automatically reversible oil pump, operating oil charge, suction and discharge shutoff valves, and an insert-type factory-sized crankcase heater to control oil dilution.
3. Each mounted on spring vibration isolators with an isolation efficiency of no less than 95%.
4. Speed shall not exceed 1750 rpm (29.2 r/s).
5. Cycles per hour per compressor shall not exceed 6.

E. Cooler:

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

F. Condenser:

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

G. Refrigeration Components:

Refrigerant circuit components shall include hot gas muffler, high side pressure switch, liquid line shutoff valves, suction and discharge shutoff valves, filter drier, moisture-indicating sight glass, stepper motor actuated electronic expansion valve (EXV) or thermostatic expansion valve (TXV), and complete operating charge of refrigerant R-134a 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, cooler

- saturation 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 unloader required for 040-070 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 (0.6° C) per minute to prevent excessive demand spikes (charges) at start-up.
 - 5) Seven-day time scheduling.
2. Safeties:
- a. Unit shall be equipped with thermistors and transducers or potentiometers and all necessary components in conjunction with the control system to provide the unit with the following protections:
- 1) Loss of refrigerant charge protection.
 - 2) Low fluid flow protection.
 - 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 (size 080-420 units).
 - 8) To prevent the formation of acids, ground current protection for each compressor shall shut down compressor when no more than 2.5 supply amps are measured (sizes 080-420 and 070, 50 Hz).
- b. Compressors shall be equipped with the following manual-reset type protections:
- 1) Pressure overload.
 - 2) Electrical overload through the use of definite-purpose contactors and calibrated, ambient compensated, magnetic trip circuit breakers. Circuit breakers shall open all 3 phases in the event of an overload in any one phase (single-phasing condition).
- c. Fan motors shall have inherent overcurrent protection.
3. Diagnostics:
- a. 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 C to 52 C).
 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 (sizes 040-210) or four refrigerant circuits (sizes 230-420) shall be provided to protect against loss of total capacity.
 5. Unit shall operate without special controls down to an ambient temperature of 0° F (–18 C).
 6. Unit shall have automatic lead-lag feature to automatically alternate the lead circuit to ensure even compressor wear. Accessory unloader required on size 040-070 units, standard for all other units.
- 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. (Except speed control motors.)
 3. Fan motors are totally enclosed, air-over (TEAO) type in accordance with IP-55 (50-Hz only).
- K. Electrical Requirements:
1. Each unit (sizes 040-210) or module's (sizes 230-420) primary electrical power supply (3-phase) shall be connected to a single location.
 2. Each unit (sizes 040-210) or module's (sizes 230-420) control power (single-phase) shall be connected to a separate entry point.
 3. 60-Hz units (except 380 v) require 115-v control circuit power; 50-Hz and 380-v, 60-Hz units require 230-v control circuit power.

Guide specifications (cont)



L. Special Features:

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

* 1. Low Ambient Temperature Operation:

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

2. Unloaders:

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

3. Cooler Heater:

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

* 4. Optional Condenser Coil Materials:

a. Pre-coated aluminum-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 coil shall be constructed of copper fins mechanically bonded to copper tubes and copper tube sheets. Galvanized steel tube sheets shall not be acceptable. 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 environments.

- c. E-coated aluminum-fin coils shall have a flexible epoxy polymer coating uniformly applied to all coil surface areas without material bridging between fins. Coating process shall ensure complete coil encapsulation. Color shall be

high gloss black with gloss — 60° of 65-90% per ASTM D523-89. Uniform dry film thickness from 0.8 to 1.2 mil on all surface areas including fin edges. Superior hardness characteristics of 2H per ASTM D3363-92A and cross hatch adhesion of 4B-5B per ASTM D3359-93. Impact resistance shall be up to 160 in./lbs. (ASTM D2794-93). Humidity and water immersion resistance shall be up to minimum 1000 and 250 hours respectively (ASTM D2247-92 and ASTM D870-92). Corrosion durability shall be confirmed through testing to no less than 1000 hours salt spray per ASTM B117-90. Coil construction shall be aluminum fins mechanically bonded to copper tubes.

- d. E-coated copper-fin coil shall have a flexible epoxy polymer coating uniformly applied to all coil surface areas without material bridging between fins. Coating process shall ensure complete coil encapsulation. Color shall be high gloss black with gloss — 60° of 65-90% per ASTM D523-89. Uniform dry film thickness from 0.8 to 1.2 mil on all surface areas including fin edges. Superior hardness characteristics of 2H per ASTM D3363-92A and cross hatch adhesion of 4B-5B per ASTM D3359-93. Impact resistance shall be up to 160 in./lbs. (ASTM D2794-93). Humidity and water immersion resistance shall be up to minimum 1000 and 250 hours respectively (ASTM D2247-92 and ASTM D870-92). Corrosion durability shall be confirmed through testing to no less than 1000 hours salt spray per ASTM B117-90. Coil construction shall be copper-fins mechanically bonded to copper tubes with copper tube sheets. Galvanized steel tube sheets shall not be acceptable. A polymer strip shall prevent coil assembly from contacting sheet metal coil pan to maintain coating integrity and minimize corrosion potential between the coil and pan.

* 5. Hot Gas Bypass:

Hot gas bypass allows the unit to operate at lower capacity levels than standard. Available as a factory-installed option for 040-070 sizes and as a field-installed accessory for 080-420 sizes.

6. Security Condenser Grilles:

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

7. Hail Guard:

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

- * 8. Part-Wind Start:
Shall be factory installed to reduce compressor inrush current.
- * 9. Brine Units:
Unit shall be factory-equipped to operate down to 15 F (–9 C) leaving chilled fluid temperature.
- 10. Flow Switch:
A chilled fluid flow switch shall be field-installed for low fluid flow detection.
- * 11. Control Transformer:
A transformer shall be factory- or field-installed to permit single-point power connection combining unit primary electrical power supply with control power supply (115 v).
- 12. Ground current compressor protection:
Protection shall be standard with sizes 080-420 and 070 (50 Hz), accessory with all other sizes.
- * 13. TXV Option (30GUN, GUR040-110 unit):
Unit shall have factory-installed thermostatic expansion valves (TXVs) instead of EXVs. Unit shall be capable of starting and running fully loaded at outdoor temperatures from 35 to 125 F (1° to 52 C) without special control or field provisions.
- 14. Pressure Gages:
Unit shall be field-equipped with suction and discharge pressure gages with manual shutoff valves.
- 15. Sound Reduction Option:
Unit shall have a factory-installed sound reduction package that will reduce system noise without compromising performance.
- * 16. Sound Reduction Kit:
Unit shall be field-equipped with kit to reduce system noise without compromising performance.
- 17. Oil Pressure Switch:
Unit shall be equipped with an oil pressure safety switch to protect compressor against loss of lubrication (accessory for sizes 040-060, 070 [60 Hz]; standard on sizes 070 [50 Hz], 040-070 brine units, and 080-420).
- * 18. 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).
- 19. Non-Fused Electrical Disconnect:
Factory installed for all voltages. For 040-070 sizes, disconnect is a “thru-the-door” type. For 080-110 and 230B-315B sizes, disconnect is a “thru-the-door” type except for 208/230-3-60 units where the disconnect mounts below the control box. For 130-210, 230A-420A, and 330B-420B sizes, disconnect mounts on the center panel on the cooler side of the chiller.
- 20. Convenience Outlet:
Kit provides a 115-v, GFCI female receptacle to be field mounted in control box. Receptacle shall be powered by unit control circuit.
- 21. Remote Cooler Mounting:
Kit shall provide valves and EXV cable to permit operation of cooler from a remote location (up to 75 ft [23 m] away from base unit).
- 22. Unit Control Display Access Door:
Kit contains door and necessary mounting hardware to permit control module access without opening or removing control box panels.
- 23. Compressor Expansion Board:
Shall include accessory compressor expansion board for use with multiple compressor unit.
- 24. Trim Kit:
Accessory shall contain material and necessary mounting hardware for field installation.
- 25. Energy Management Module:
Shall be factory- or field-installed and capable of 4 to 20 mA leaving fluid temperature reset, cooling set point reset, 4 to 20 mA demand limit, and 2-step demand limit.
- 26. Service Option:
Shall be factory-installed and include Energy Management Module plus GFCI convenience outlet (60 Hz only), remote service connection port, and hand-held expanded display module.
- 27. Accessory Thermistor:
Accessory thermistor to measure temperature of outdoor air or remote space, ordered separately and installed in ductwork external to unit.



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Manufacturer reserves the right to discontinue, or change at any time, specifications or designs without notice and without incurring obligations.

Book 2
Tab 5c

New

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