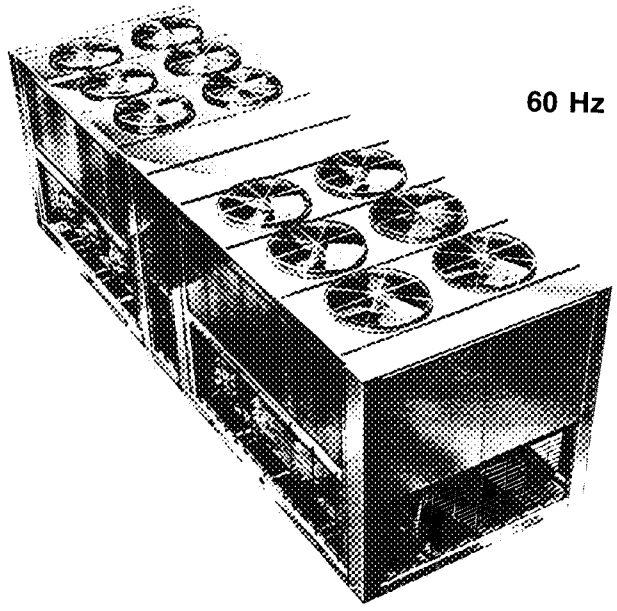
Carrier®
HEATING & COOLING

Packaged Air-Cooled Flotronic Liquid Chillers

30GB Series

40 - 200 Tons
140 - 703 kW



60 Hz

Product Data

Table of contents

Model number nomenclature

30GB - 040 - - - 6

30GB — Air-Cooled Outdoor Liquid Chiller

- 1 575-3-60
- 2* 380-3-60†
- 5 208/230-3-60
- 6 460-3-60

UNIT SIZE (approximates chiller capacity in tons)

040	070	100	150
045	075	110	175
055	090	125	200

*Export only — not for U S domestic sale
†Three-phase, 3-wire or 4-wire (with neutral), depending on model

Features

- Unit nominal capacities range from 40 to 200 tons (140 to 703 kW) to serve virtually any large commercial or institutional air conditioning need or industrial process cooling requirement.
- High-tech solid-state electronic control circuitry tested to U.S. Government Space Agency standards
- Microprocessor control maintains total control over chiller functions, permitting intelligent control of the refrigerant cycle
- Diagnostic module with digital display included to permit rapid troubleshooting just by pressing a button
- Electronic expansion valves (EXV) operate down to 15 psig (103 kPa) pressure differential. (Ordinary thermostatic expansion valve typically requires 100 psig [690 kPa] differential.) This reduces compressor motor power requirements and improves the unit EER.
- Flotronic chiller provides up to 28% efficiency improvement over standard 30GB chillers on an annual basis.
- Additional operating cost savings with precise multiple-step compressor capacity control.
- Multiple compressors and dual refrigerant circuits help to protect against the possibility of loss of total capacity.
- Semi-hermetic 06E compressors are serviceable in the field.
- Designed for outdoor installation to minimize required mechanical room space.
- Air-cooled condenser design saves condenser water and eliminates cooling tower.
- Domestic units will operate to 115 F (46 C). Export units rated for operation at outdoor temperatures to 125 F (52 C).
- Protection against freeze-up — low water temperature cutoff and electric heaters protect cooler.
- Available as standard with aluminum fins and copper tubes for normal applications, or with all-copper coils.

Physical data — 60 Hz

MODEL 30GB	040	045	055	070	075	090
APPROX OPER WT — lb (Kg)	3780 (1715)	4250 (1928)	4800 (2178)	6200 (2813)	6900 (3130) est	7522 (3412)
REFRIG CHG — lb (Kg)						
R-22 Ckt 1	40 (18.1)	38 (17 2)	65 (29.5)	106 (48 1)	122 (54 9)	110 (49 9)
R-22 Ckt 2	40 (18.1)	60 (27.2)	71 (32.2)	71 (32.2)	70 (31.3)	110 (49.9)
COMPRESSORS, Type...Rpm (r/s)	Reciprocating, Semi-Hermetic 1750 (29 2)					
06E* (No.) Ckt 1	(1) 2250	(1) 2250	(1) 6275	(2) 6275, A250	(2) F275, 6275	(2) F265
06E* (No.) Ckt 2	(1) A250	(1) F275	(1) F275	(1) F275	(1) F275	(2) F265
Capacity Control Steps	4	4	4	6	5	4
% Cap. Ckt 1	50	40	50	62 5	67	50
% Cap. Ckt 2	50	60	50	37 5	33	50
Minimum Step Capacity (%)	25	20	33 3	25	22 2	25
CONDENSER FANS — Type	Propeller, Direct Drive					
Fan Speed — Rpm (r/s)	1080 (18)	1080 (18)	1080 (18)	1140 (19)	1140 (19)	1140 (19)
No. Blades...Diameter — in. (mm)	4 26 (660)	4 .26 (660)	4 .26 (660)	3 30 (762)	4 30 (762)	4 .30 (762)
No. Fans...Total kW	4.. 1.28	6.. 1.92	6.. 1.92	6. 9 3	6. 9 3	8.. 12.4
Total Airflow — Cfm (L/s)	26,000 (12,269)	39,000 (18,404)	39,000 (18,404)	58,800 (27,748)	58,800 (27,748)	78,400 (36,997)
CONDENSER COILS — Type	Plate Fins (Aluminum†)					
Tubes (Copper), OD — in (mm)	⅜ (9.5)	½ (12 7)	½ (12 7)	½ (12 7)	½ (12 7)	½ (12 7)
Fins/in. (Fin pitch, mm)	17 0 (1 49)	17 5 (1 45)	15 5 (1 64)	15.5 (1 64)	13 5 (1 88)	13 5 (1 88)
No. Rows	3	2	3	3	4/3	3
Face Area ft² (m²) Ckt 1	38 33 (3 56)	43 125 (4 0)	57 5 (5 34)	95 83 (8 9)	80 6 (7 48)	80 6 (7 48)
Face Area ft² (m²) Ckt 2	38 33 (3 56)	71 875 (6 68)	57 5 (5 34)	57 5 (5 34)	40 4 (3 71)	80 6 (7 48)
Max. Working Press., Refrig psig (kPa)	450 (3103)					
COOLER — No. ...Type	One Direct Expansion, Shell and Tube					
Model 10HA400---	794	824	824	854	364	364
No. Refrigerant Circuits	2	2	2	2	2	2
Net Water Volume — Gal. (L) (includes nozzles)	15 4 (58 3)	17 7 (67 0)	17 7 (67 0)	23 6 (89 3)	21 7 (82 1)	21 7 (82 1)
Max. Working Press. — psig (kPa)	Refrigerant Side — 235 (1620); Water Side — 150 (1034)					
WATER CONNECTIONS	MPT				150 lb ASA Flat Face Flange	
Inlet and Outlet — in.	3	3	3	3	4	4
Drain — in. FPT	¾	¾	¾	¾	¾	¾

MODEL 30GB	100	110	125	150	175	200
APPROX OPER WT — lb (Kg)	8500 (3865)	10,445 (4738)	11,050 (5013)	14,000 (6396)	14,600 (6625)	15,100 (6850)
REFRIG CHG — lb (Kg)						
R-22 Ckt 1	130 (59.0)	155 (70.3)	170 (77.1)	230 (104.3)	230 (104.3)	230 (104.3)
R-22 Ckt 2	130 (59.0)	105 (47.6)	120 (54.4)	230 (104.3)	230 (104.3)	230 (104.3)
COMPRESSORS, Type Rpm (r/s)	Reciprocating, Semi-Hermetic 1750 (29 2)					
06E* (No.) Ckt 1	(2) F275	(3) F265	(3) F275	(3) F275	(4) F275	(4) F275
06E* (No.) Ckt 2	(2) F275	(2) F275	(2) F275	(3) F275	(3) F275	(4) F275
Capacity Control Steps	4	5	5	6	7	8
% Cap. Ckt 1	50	60	60	50	57	50
% Cap. Ckt 2	50	40	40	50	43	50
Minimum Step Capacity (%)	25	20	20	16.7	14.3	12.5
CONDENSER FANS — Type	Propeller, Direct Drive					
Fan Speed — Rpm (r/s)	1140 (19)	1140 (19)	1140 (19)	1140 (19)	1140 (19)	1140 (19)
No. Blades...Diameter — in. (mm)	4 .30 (762)	4 .30 (762)	4 30 (762)	4 30 (762)	4 . 30 (762)	4 . 30 (762)
No. Fans...Total kW	8.. 12.4	10. 15 5	10. 15 5	12.. 18.6	12.. 18.6	12.. 18.6
Total Airflow — Cfm (L/s)	78,400 (36,997)	98,000 (46,246)	98,000 (46,246)	117,600 (55,495)	117,600 (55,495)	117,600 (55,495)
CONDENSER COILS — Type	Plate Fins (Aluminum†)					
Tubes (Copper), OD — in. (mm)	½ (12 7)	½ (12 7)	½ (12 7)	½ (12 7)	½ (12 7)	½ (12 7)
Fins/in. (Fin pitch, mm)	13 5 (1 88)	13 5 (1 88)	13 5 (1 88)	13 5 (1 88)	13 5 (1 88)	13 5 (1 88)
No. Rows	4	3	4/3	4	4	4
Face Area ft² (m²) Ckt 1	80 6 (7 48)	121 0 (11 24)	121 0 (11.24)	121.0 (11 24)	121.0 (11.24)	121.0 (11.24)
Face Area ft² (m²) Ckt 2	80 6 (7 48)	81 0 (7 52)	81 0 (7 52)	121 0 (11 24)	121 0 (11 24)	121 0 (11 24)
Max. Working Press., Refrig psig (kPa)	450 (3103)					
COOLER — No. .. Type	One Direct Expansion, Shell and Tube					
Model 10HA400---	194	194	454	504	504	504
No. Refrigerant Circuits	2	2	2	2	2	2
Net Water Volume — Gal (L) (includes nozzles)	40 4 (152 9)	40 4 (152 9)	52 4 (198 3)	60 2 (227 9)	60 2 (227 9)	60 2 (227 9)
Max. Working Press. — psig (kPa)	Refrigerant Side — 235 (1620); Water Side — 150 (1034)					
WATER CONNECTIONS	150 lb ASA Flat Face Flange					
Inlet and Outlet — in.	5	5	6	6	6	6
Drain — in. FPT	¾	¾	¾	¾	¾	¾

*A or F prefix designates no unloader
2 or 6 prefix designates one electric unloader
6E-250 compressors have 4 cylinders, all others have 6
†Copper fins also available

Physical data — 60 Hz

MODEL 30GB	040	045	055	070	075	090
APPROX OPER WT — lb (Kg)	3780 (1715)	4250 (1928)	4800 (2178)	6200 (2813)	6900 (3130) est	7522 (3412)
REFRIG CHG — lb (Kg)						
R-22 Ckt 1	40 (18 1)	38 (17.2)	65 (29.5)	106 (48.1)	122 (54 9)	110 (49 9)
R-22 Ckt 2	40 (18.1)	60 (27.2)	71 (32.2)	71 (32.2)	70 (31.3)	110 (49.9)
COMPRESSORS, Type...Rpm (r/s)	Reciprocating, Semi-Hermetic 1750 (29 2)					
06E* (No.) Ckt 1	(1) 2250	(1) 2250	(1) 6275	(2) 6275, A250	(2) F275, 6275	(2) F265
06E* (No.) Ckt 2	(1) A250	(1) F275	(1) F275	(1) F275	(1) F275	(2) F265
Capacity Control Steps	4	4	4	6	5	4
% Cap. Ckt 1	50	40	50	62 5	67	50
% Cap. Ckt 2	50	60	50	37 5	33	50
Minimum Step Capacity (%)	25	20	33 3	25	22 2	25
CONDENSER FANS — Type	Propeller, Direct Drive					
Fan Speed — Rpm (r/s)	1080 (18)	1080 (18)	1080 (18)	1140 (19)	1140 (19)	1140 (19)
No. Blades...Diameter — in. (mm)	4 26 (660)	4 .26 (660)	4 .26 (660)	3 30 (762)	4 30 (762)	4 .30 (762)
No. Fans...Total kW	4...1.28	6.. 1.92	6.. 1.92	6. 9 3	6. 9 3	8.. 12.4
Total Airflow — Cfm (L/s)	26,000 (12,269)	39,000 (18,404)	39,000 (18,404)	58,800 (27,748)	58,800 (27,748)	78,400 (36,997)
CONDENSER COILS — Type	Plate Fins (Aluminum†)					
Tubes (Copper), OD — in. (mm)	⅜ (9.5)	½ (12 7)	½ (12 7)	½ (12 7)	½ (12 7)	½ (12 7)
Fins/in. (Fin pitch, mm)	17 0 (1 49)	17 5 (1 45)	15 5 (1 64)	15 5 (1 64)	13 5 (1 88)	13 5 (1 88)
No. Rows	3	2	3	3	4/3	3
Face Area ft² (m²) Ckt 1	38 33 (3 56)	43 125 (4 0)	57 5 (5 34)	95 83 (8 9)	80 6 (7 48)	80 6 (7 48)
Face Area ft² (m²) Ckt 2	38 33 (3 56)	71 875 (6 68)	57 5 (5 34)	57 5 (5 34)	40 4 (3 71)	80 6 (7 48)
Max. Working Press., Refrig psig (kPa)	450 (3103)					
COOLER — No. ...Type	One Direct Expansion, Shell and Tube					
Model 10HA400---	794	824	824	854	364	364
No. Refrigerant Circuits	2	2	2	2	2	2
Net Water Volume — Gal. (L) (includes nozzles)	15 4 (58 3)	17 7 (67 0)	17 7 (67 0)	23 6 (89 3)	21 7 (82 1)	21 7 (82 1)
Max Working Press. — psig (kPa)	Refrigerant Side — 235 (1620); Water Side — 150 (1034)					
WATER CONNECTIONS	MPT				150 lb ASA Flat Face Flange	
Inlet and Outlet — in.	3	3	3	3	4	4
Drain — in. FPT	¾	¾	¾	¾	¾	¾

MODEL 30GB	100	110	125	150	175	200
APPROX OPER WT — lb (Kg)	8500 (3865)	10,445 (4738)	11,050 (5013)	14,000 (6396)	14,600 (6625)	15,100 (6850)
REFRIG CHG — lb (Kg)						
R-22 Ckt 1	130 (59.0)	155 (70.3)	170 (77.1)	230 (104.3)	230 (104.3)	230 (104.3)
R-22 Ckt 2	130 (59.0)	105 (47.6)	120 (54.4)	230 (104.3)	230 (104.3)	230 (104.3)
COMPRESSORS, Type.. Rpm (r/s)	Reciprocating, Semi-Hermetic 1750 (29 2)					
06E* (No.) Ckt 1	(2) F275	(3) F265	(3) F275	(3) F275	(4) F275	(4) F275
06E* (No.) Ckt 2	(2) F275	(2) F275	(2) F275	(3) F275	(3) F275	(4) F275
Capacity Control Steps	4	5	5	6	7	8
% Cap. Ckt 1	50	60	60	50	57	50
% Cap. Ckt 2	50	40	40	50	43	50
Minimum Step Capacity (%)	25	20	20	16.7	14.3	12.5
CONDENSER FANS — Type	Propeller, Direct Drive					
Fan Speed — Rpm (r/s)	1140 (19)	1140 (19)	1140 (19)	1140 (19)	1140 (19)	1140 (19)
No. Blades...Diameter — in. (mm)	4 .30 (762)	4 30 (762)	4 . 30 (762)	4 30 (762)	4 . 30 (762)	4 . 30 (762)
No. Fans...Total kW	8.. 12.4	10. 15 5	10. 15 5	12.. 18.6	12.. 18.6	12.. 18.6
Total Airflow — Cfm (L/s)	78,400 (36,997)	98,000 (46,246)	98,000 (46,246)	117,600 (55,495)	117,600 (55,495)	117,600 (55,495)
CONDENSER COILS — Type	Plate Fins (Aluminum†)					
Tubes (Copper), OD — in. (mm)	½ (12 7)	½ (12 7)	½ (12 7)	½ (12 7)	½ (12 7)	½ (12 7)
Fins/in. (Fin pitch, mm)	13 5 (1 88)	13 5 (1 88)	13 5 (1 88)	13 5 (1 88)	13 5 (1 88)	13 5 (1 88)
No. Rows	4	3	4/3	4	4	4
Face Area ft² (m²) Ckt 1	80 6 (7 48)	121 0 (11 24)	121 0 (11.24)	121.0 (11 24)	121.0 (11 24)	121.0 (11.24)
Face Area ft² (m²) Ckt 2	80 6 (7 48)	81 0 (7 52)	81 0 (7 52)	121 0 (11 24)	121 0 (11 24)	121 0 (11 24)
Max. Working Press , Refrig psig (kPa)	450 (3103)					
COOLER — No. . .Type	One Direct Expansion, Shell and Tube					
Model 10HA400---	194	194	454	504	504	504
No. Refrigerant Circuits	2	2	2	2	2	2
Net Water Volume — Gal. (L) (includes nozzles)	40 4 (152 9)	40 4 (152 9)	52 4 (198 3)	60 2 (227 9)	60 2 (227 9)	60 2 (227 9)
Max. Working Press. — psig (kPa)	Refrigerant Side — 235 (1620); Water Side — 150 (1034)					
WATER CONNECTIONS	150 lb ASA Flat Face Flange					
Inlet and Outlet — in.	5	5	6	6	6	6
Drain — in. FPT	¾	¾	¾	¾	¾	¾

*A or F prefix designates no unloader
2 or 6 prefix designates one electric unloader
6E-250 compressors have 4 cylinders, all others have 6
†Copper fins also available

Accessories

- Demand limit control module (required for remote ON/OFF control)
- Leaving chilled water temperature reset accessory board
- Sensor kit assembly for outdoor or space temperature reset of chilled water temperature
- Ground current refrigeration circuit protection (30GB040-055; standard on larger sizes)
- Discharge and suction pressure gage panel (30GB040-070)
- Oil pressure switch package (30GB040-055; includes oil pressure switches [2] for unit. Standard on larger sizes)
- Capacity control: accessory electric suction cutoff unloader (not applicable to 30GB175 or 200)
- Motormaster® head pressure control (requires unit modification for low ambient operation)

Factory-installed option (FIOP)

Thermal expansion valves — For those situations where energy savings of the EXV are secondary and equipment first costs are most important With this option, the electronic expansion valve and controls related to the EXV function, head pressure control and its related part-load energy savings, are deleted from unit and are replaced by thermal expansion valves and liquid line solenoid valves Minimum operating ambient for FIOP TXV-equipped units without special head pressure controls is 32 F (0°C). Contact your Carrier representative for details on operation at temperatures below freezing. The FIOP model continues to have microprocessor features and diagnostic capability Standard accessories are useable

Application data

Leveling unit

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

While most outdoor locations are suitable for 30GB 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 temperature

1. *Maximum* leaving chilled water temperature (LCWT) for Model 30GB is 70 F (21 C) Unit can start and pull down with up to 95 F (35 C) entering water temperature due to MOP (maximum operating pressure) feature of the expansion valve. For sustained operation, it is recommended that entering water temperature not exceed 85 F (29.4 C).

2 *Minimum* LCWT for standard Model 30GB is 40 F (4.5 C). It is permissible to use a standard microprocessor-controlled Flotronic chiller (30GB040-200) with leaving water temperatures in the range of 34 F (1°C) to 39 9 F (4.4 C) only if a protective brine solution (20% antifreeze solution, or greater) is used and microprocessor dip switch is properly set. (See Controls and Troubleshooting book for further information.) Special order medium temperature brine units must be ordered for operation with leaving water temperatures in the range of 34 F (1°C) to 15 F (-9 C). For ratings below 40 F (4.5 C) LCWT, contact your local Carrier representative.

Application data (cont)

MINIMUM COOLER WATER FLOW RATES AND MINIMUM LOOP VOLUME

UNIT 30GB	MINIMUM FLOW (1)		PRESSURE DROP		MINIMUM VOLUME (2)	
	Gpm	L/s	ft of water	kPa	Gallons	Liters
040	56	3 5	4 4	13 2	110	414
045	67	4 2	3 8	11 4	136	513
055	67	4 2	3 8	11 4	157	594
070	76	4 8	3 1	9 3	206	780
075	95	6 0	3 1	9 3	230	871
090	95	6 0	3 1	9 3	272	1029
100	134	8 5	3 2	9 6	303	1147
110	134	8 5	3 2	9 6	338	1281
125	156	9 8	2 2	6 6	388	1469
150	192	12 1	2 3	6 9	475	1796
175	192	12 1	2 3	6 9	532	2013
200	192	12 1	2 3	6 9	593	2243

NOTES:
1 Minimum flow based on 1 5 fps (0 46 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	6 5
Low Ambient Unit Operation	6	6 5

Leaving water temperature reset

Accessory board* may be installed in 30GB chillers to provide reset of LCWT in constant water flow systems Reset reduces compressor power usage at part load when design LCWT is not necessary Humidity control should be considered since higher coil temperatures resulting from reset will reduce latent heat capacity. Three reset options are offered:

From return water temperature* — Increases LCWT temperature set point as return (or entering) water temperature decreases (indicating load decrease) Option may be used in any application where return water provides accurate load indication. Limitation of return water reset is. LCWT may only be reset to value of design *return* water temperature. Return reset is the simplest of 3 reset accessories available, as return water sensor is already installed.

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

From 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.

For details on applying a reset option, refer to 30GB Controls and Troubleshooting Instructions.

*Obtain ordering part numbers from current price pages.

Cooler flow range

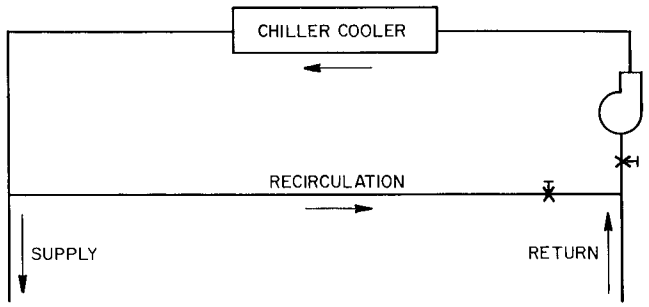
Ratings and performance data in this publication are for a cooling range of 10°F or 6°C. Flotronic chillers with microprocessor control may be operated at a different temperature range provided flow limits are not exceeded. For minimum flow rates, see Table High flow rate is limited by pressure drop that can be tolerated. If another range is used, apply LCWT correction as given in selection example

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

a. Multiple smaller chillers may be applied in series, each providing a portion of the design temperature range.

b Cooler water may be recirculated to raise flow rate. However, mixed temperature entering cooler must be maintained a minimum of at least 5°F (2.8°C) above the leaving chilled water temperature.

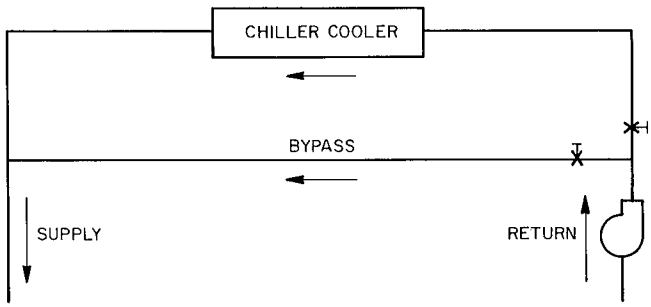
c Special cooler baffling is required to allow minimum flow rate to be reduced 12%.



Maximum cooler flow (>5 gpm/ton or <5 F range [>0.09 L/s • kW or <2.7 C range]) results in practical maximum pressure drop through cooler

a Return water may bypass the cooler to keep pressure drop through cooler within acceptable limits. This permits a higher ΔT with lower water flow through cooler and mixing after the cooler.

b Special cooler baffling is available by special order, to permit a cooler flow rate increase of 10%.

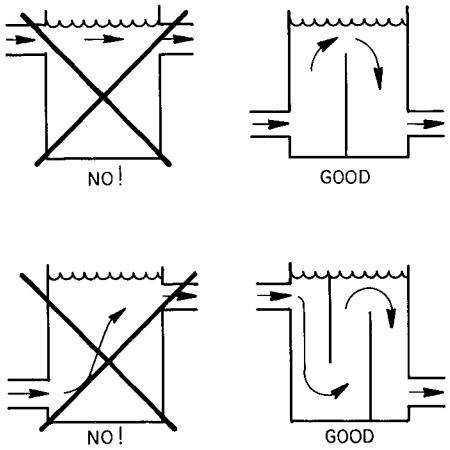


Variable cooler flow rates may be applied to a standard 30GB chiller Unit will, however, attempt to maintain a constant leaving chilled water temperature In such cases, minimum flow must be in excess of minimum flow given in Table and flow rate must change in steps of less than 10% per minute Apply 6 gallons per ton (6.5 liters per kW) water loop volume minimum if flow rate changes more rapidly

Water loop volume — In circulation must equal or exceed 3 gallons (11 4 liters) per nominal ton of cooling (3 25 liters per kW) for temperature stability and accuracy in normal air conditioning applications. (For example, a 30GB200 would require 600 gallons in circulation in system loop — see Table) For process jobs where accuracy is vital or for operation at ambient below 32 F (0°C) with low unit loading conditions, there should be from 6 to 10 gallons per ton (6.5 to 10.8 liters per kW) To achieve this volume, it is often necessary to install a tank in the loop Tank should be baffled to

Application data (cont)

insure that there is no stratification and that water (or brine) entering tank is adequately mixed with liquid in the tank



Cooler fouling factor used to calculate tabulated ratings was 0.0005 ft² • hr • °F/Btu (0 000088 m² • K/W) As fouling factor is increased, both unit capacity and compressor power decrease. Standard ratings should be corrected using following multipliers·

FOULING FACTOR		CAPACITY MULTIPLIER	COMPRESSOR POWER MULTIPLIER
ENGLISH (ft² • hr • °F/Btu)	SI (m² • K/W)		
0.0005	0.000088	1 00	1 00
0.001	0.000176	0 97	0 98
0.002	0.000352	0 91	0 91

Cooler protection in form of ethylene glycol (or other suitable brine) is recommended when operating in areas which experience temperatures below 32 F (0°C) to protect cooler should there be a loss of cooler heater power. Even though unit cooler is protected with insulation and an electric heater that protects the cooler down to 10 F (-12 C), it does not protect water piping external to unit. Use only antifreeze solutions approved for heat exchanger duty Use of automotive antifreezes is not recommended because of the fouling that can occur once their relatively short-lived inhibitor breaks down

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

Condenser

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

ALTITUDE		CAPACITY MULTIPLIER	COMPRESSOR POWER MULTIPLIER
ENGLISH (ft)	SI (m)		
0	0	1 00	1 00
2000	610	0 99	1 01
4000	1220	0 98	1 02
6000	1830	0 97	1 03
8000	2440	0 96	1 04
10000	3050	0 95	1 05

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

EXTERNAL STATIC RESISTANCE		CAPACITY MULTIPLIER	COMPRESSOR POWER MULTIPLIER
ENGLISH (in wg)	SI (Pa)		
0.0	0 0	1 00	1 00
0.1	25	0 986	1 01
0 2	50	0 968	1 03

High-ambient temperature — Standard 30GB chillers can operate to 115 F (46 C) ambient temperature. Standard export chillers can operate to 125 F (52 C) ambient temperature.

Low-ambient operation

Flotronic 30GB chillers with electronic expansion valves (EXV) will start and operate at ambients down to 0°F (-18 C) with following field provisions:

Wind baffles must be added for operation below 32 F (0°C)

⚠ WARNING

Operation at low ambient is not recommended if minimum load on chiller is below minimum step of unloading.

Protection against freeze-up — It is recommended that field-installed chilled water piping be protected at lower ambient temperatures by wrapping with field-supplied heating cable and covering with 2-in (50-mm) thick closed-cell insulation

Antifreeze solution must be added to water loop to protect loop down to 15 F (8 C) below minimum operating ambient temperature

For operation of EXV-equipped chillers below 0°F (-18 C) and for operation of TXV-equipped (factory-installed option) chillers below 32 F (0°C), down to -20 F (-29 C), the Carrier Motormaster® condenser head pressure control and its associated components must be added Consult your local Carrier representative for complete details

Provide sufficient volume in the chilled water loop — At least 6 gallons per ton of refrigeration (6 5 liters per kilowatt) is recommended minimum, provided there is a moderate system load.

Capacity Correction (Antifreeze)

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

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

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

Consider the 30GB175 unit from the Selection Procedure (Water) example (refer to correction curves at 40% solution)

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

Application data (cont)

Corrected capacity = 0.95 x determined capacity
= 0.95 x 184 1
= 174.9 tons

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

Chilled water flow (at corrected capacity)

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

$$= \frac{24 \times 174.9\,\text{tons}}{14\,\text{F}} = 299.8\ \text{U.S gpm}$$

Chilled water flow (40% solution) = 1 15 x 299 8
= 344 8 U S gpm

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

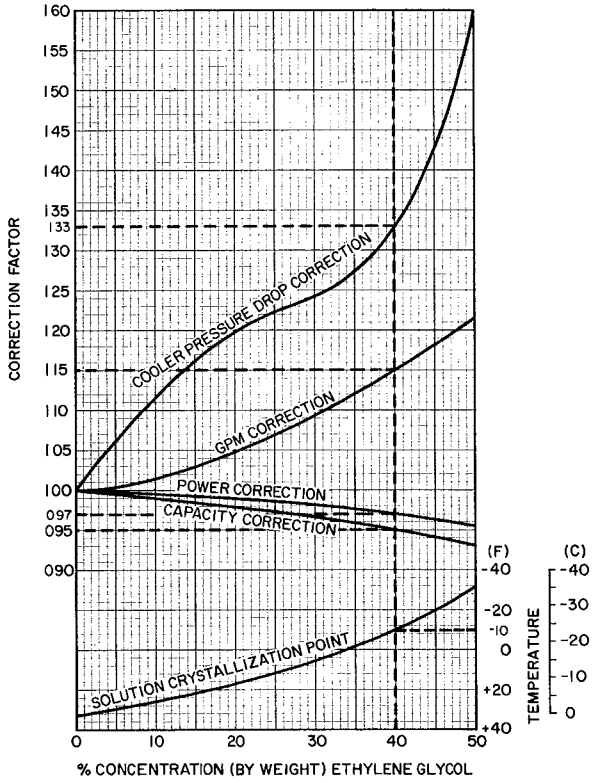
On cooler pressure drop curve, for 344.8 gpm, read PD = 7.0 ft water gage The pressure drop for 40% solution = 1.33 x 7.0 = 9 3 ft water.

Correct compressor power input (kW) — On power correction curve, read 0 97 correction factor at 40% EG concentration.

Power input from Selection Procedure example = 213.2 kW.

Corrected power input = 0.97 x 213 2 = 206.8 kW

ETHYLENE GLYCOL PERFORMANCE CORRECTION FACTORS AND SOLUTION CRYSTALLIZATION POINTS



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

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

Consider 30GB175 unit selected in the preceding example (refer to correction curves at 40% solution)

Correct unit capacity — On capacity correction curve read 0.95.

Corrected capacity = 0 95 x determined capacity
= 0 95 x 622 5
= 591.4 kW

Correct chilled water flow — On cooler flow correction curve, read 1 15

Chilled water flow (at corrected capacity)

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

$$= \frac{0\ 239 \times 591\ 4}{7\ 8} = 18\ 1\ \text{L/s}$$

Chilled water flow (40% solution) = 1.15 x 18.1
= 20 8 L/s

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

On cooler pressure drop curve, for 20.8 L/s, read PD = 19 4 kPa The pressure drop for 40% solution = 1 33 x 19.4 = 25.8 kPa.

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

Power input from Selection Procedure example = 208.3 kW.

Corrected power input = 0.97 x 208 3 = 202.1 kW.

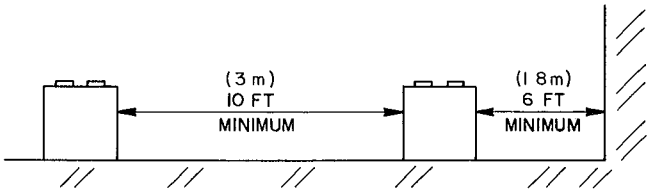
Oversizing chillers

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

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

Multiple chillers

Where chiller capacities greater than 200 tons (703 kW) are required, or where stand-by capability is desired, chillers may be installed in *parallel*. Units should be of equal size to ensure balanced water flows. Where a large temperature drop (>25 F [13.9 C]) is desired, chillers may be installed in *series*. Water temperature sensors need not be moved for multiple chiller operation. A 10-ft (3-m) separation is required between units for airflow, and a 6-ft (1.8-m) distance is required from units to obstructions See figure See Physical Data for service clearances.



MULTIPLE UNIT SEPARATION

Application data (cont)

Electrical/utility interests

Energy management — See 30GB Controls and Troubleshooting manual and accessory installation instructions for details

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

Load shedding must be done intelligently Demand may be limited on Model 30GB by resetting water temperature, or by using a demand limit accessory that unloads the chiller to a given predetermined percent of the load. Both features require signal from an intelligent central control Do not cycle demand limiter for less than 10 minutes on and 5 minutes off

Duty cycling cycles electrical loads at regular intervals regardless of need. This reduces electrical operating costs of a 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.

Time clock shutdown (or other controlled shutdown not associated with leaving chilled water temperature) requires use of accessory demand limit control module Second step of the demand limit control (0-50% of capacity) is set for 0 (zero) capacity This allows unit to go through a normal pumpout cycle at shutdown

Part-wind start

Not generally required on 30GB chillers due to use of multiple compressors allowing smaller electrical load increments, but is available if required. Maximum instantaneous current flow (see ICF in Electrical Data) should be used in determining need.

Vibration isolation

Compressors are spring isolated. External vibration isolation is not generally required

Hot gas bypass usage (units with TXV only)

Hot gas bypass usage, while frequently specified, is not normally recommended because it results in equipment being applied below its normal application range Before applying hot gas bypass, it is recommended that use of 2 machines be considered, including one that can be run at the system minimum load without addition of hot gas bypass In those instances where there is no alternative, it is recommended that the appropriate hot gas bypass package can be used with the factory option TXV unit

Medium temperature brine application — Application of 30GB outdoor chillers for brine duty within the 39 9 F to 34 F (4.4 C to 1°C) range is possible with proper field change of control configuration Application in the range 34 F to 15 F (1°C to -9 4 C) requires 30GB unit with factory modification

Selection procedure — English

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

Capacity required ..... 175 tons
Leaving chilled water temperature (LCWT)... 45 F
Chilled water temperature rise ..... 14 F
Condenser entering air temperature (CEAT) .. 95 F
Loop volume ..... 595 gallons

Ratings are based on 10 F rise and are suitable for rise 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 correction curve 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 rating table at given CEAT and LCWT — respectively 95 F and 45 F

Read down capacity column until the capacity nearest to but higher than specified required capacity is reached. In this case, 183.1 tons is delivered by a 30GB175 Interpolate between 45 F and 46 F to find determined capacity and power input at corrected LCWT (45.3 F). Values are

Capacity ..... 184.1 tons
Power input ..... 213.2 kW

IV Calculate corrected cooler water flow.

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

$$= \frac{24 \times 184.1}{14} = 315.6 \text{ U S. gpm}$$

V Calculate the cooler pressure drop.

Enter cooler pressure drop curve at the corrected flow rate (315.6 U.S. gpm) and read, for the 30GB175, a pressure drop of 5 9 ft of water.

VI Check loop volume and cooler water flow rate.

Minimum loop volume, from application data, is 532 gallons for 30GB175 Therefore, given volume of 595 gallons is satisfactory. Minimum water flow rate, from application data, is 192 gpm for 30GB175. Flow rate of 315.6 gpm is well above minimum required.

Selection procedure — SI

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

Capacity required ..... 600 kW
Leaving chilled water temperature (LCWT) .... 6 C
Chilled water temperature rise ..... 7 8 C
Condenser entering air temperature (CEAT) .. 35 C
Loop volume ..... 2250 L

Ratings are based on 6 C rise and are suitable for rise 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 correction curve at 7 8 C and read a correction of 0.17 C. Corrected LCWT is, therefore, 6 + 0 17 = 6.2 C

III Determine capacity, unit size and power input.

Enter rating table at given CEAT and LCWT — respectively 35 C and 6 C Read down the capacity column until the capacity nearest to but higher than the specified required capacity is reached In this case, 618 1 kW is delivered by a 30GB175 Interpolate between 6 C and 7 C to find the determined capacity and power input at corrected LCWT (6.2 C). Values are.

Capacity ..... 622.5 kW
Power input ..... 208 3 kW

IV Calculate corrected cooler water flow.

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

$$= \frac{0.239 \times 622.5}{7.8} = 19\ 1\ \text{L/s}$$

V Calculate cooler pressure drop.

Enter cooler pressure drop curve at corrected flow rate (19 1 L/s) and read, for 30GB175, a pressure drop of 16 8 kPa.

VI Check loop volume and cooler water flow rate.

Minimum loop volume, from application data, is 2013 L for 30GB175. Therefore, given volume of 2250 L is satisfactory. Minimum water flow rate, from application data, is 12.1 L/s for 30GB175. Flow rate of 19.1 L/s is well above minimum required.

Performance data

STANDARD RATINGS* — REFRIGERANT 22

UNIT 30GB	CAPACITY (tons)	CAPACITY (Btuh)	COMPRESSOR POWER INPUT (kW)	FAN POWER (kW)	COOLER WATER PRESSURE DROP (ft water)	ENERGY EFFICIENCY RATIO (EER)
040	36.8	441,600	39 4	1 28	10 8	10.9
045	45.8	549,600	49 7	1 92	9.5	10.6
055	53.1	637,200	60 0	1 92	12.6	10.3
070	69.6	835,200	78.1	9.30	14.0	9.6
075	77.7	932,400	89 2	9 30	10.7	9.5
090	92.5	1,110,000	105 5	12 4	15.0	9 4
100	102.3	1,227,600	117 1	12 4	9.8	9 5
110	114 7	1,376,400	135.8	15 5	12.2	9 1
125	131.2	1,574,400	150 3	15.5	8.8	9.5
150	160.6	1,927,200	180 7	18.6	8 4	9.7
175	179.6	2,155,200	210.1	18 6	10 4	9 4
200	199 6	2,395,200	239 2	18 6	12.8	9 3

*Per ARI Standard 590-81, Section 7.2.

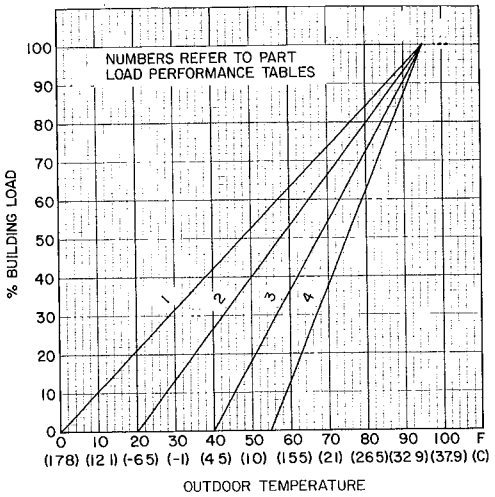
NOTE 95 F condenser entering air temperature, 54 F entering/44 F leaving cooler water, 0 0005 ft² • hr • °F/Btu cooler fouling allowance

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

Performance data (cont)

PART-LOAD EFFICIENCY (EXV UNITS ONLY)

BUILDING COOLING LOAD PROFILE



MINIMUM CAPACITY STEP (%)

MODEL 30GB	STANDARD UNIT*	STANDARD UNIT WITH ACCESSORY UNLOADER†
040	25	*25*
045	20	*20*
055	33	*33*
070	25	*25*
075	22	*22*
090	25	*17*
100	25	*17*
110	20	*13*
125	20	*13*
150	17	*11*
175	14	‡
200	13	‡

*Includes factory-furnished unloader where applicable
†With field-installed accessory unloader (*italics* step value unchanged)
‡Unloaders not available for 30GB175 and 200 units

NOTE See Table of Capacity Control Steps

1 ZERO LOAD AT 0°F (-17.8C) OUTDOOR TEMPERATURE

% SYSTEM FULL LOAD	OUTSIDE AMBIENT TEMP		UNIT EER											
			UNIT 30GB											
	F	(C)	040	045	055	070	075	090	100	110	125	150	175	200
100	95.0	35.0	10.9	10.6	10.3	9.6	9.5	9.4	9.5	9.1	9.5	9.7	9.4	9.3
90	85.5	29.8	11.6	11.7	11.7	11.1	12.1	12.0	12.1	11.6	12.1	12.3	12.0	11.8
80	76.0	24.3	13.3	12.8	12.8	12.5	14.6	14.5	14.6	14.0	14.6	14.9	14.5	14.3
70	66.5	19.0	14.1	13.8	13.8	13.9	17.1	17.1	17.2	16.5	17.2	17.5	17.0	16.7
60	57.0	13.9	16.2	15.0	15.0	15.7	19.7	19.6	19.7	18.9	19.7	20.1	19.5	19.2
50	47.5	8.5	21.2	17.7	17.7	18.0	22.2	22.1	22.2	21.3	22.3	22.6	22.1	21.7
40	38.0	3.1	23.6	21.3	21.4	19.6	24.7	24.6	24.8	23.8	24.8	25.2	24.6	24.2
30	28.5	-2.0	26.6	23.7	23.7	21.3	26.9	26.8	27.0	25.9	27.0	27.5	26.8	26.3

2 ZERO LOAD AT 20F (-6.5C) OUTDOOR TEMPERATURE

% SYSTEM FULL LOAD	OUTSIDE AMBIENT TEMP		UNIT EER											
			UNIT 30GB											
	F	(C)	040	045	055	070	075	090	100	110	125	150	175	200
100	95.0	35.0	10.9	10.6	10.3	9.6	9.5	9.4	9.5	9.1	9.5	9.7	9.4	9.3
90	87.5	30.9	11.3	11.3	11.4	10.8	11.5	11.5	11.5	11.1	11.6	11.8	11.5	11.3
80	80.0	26.5	12.6	12.1	12.2	11.9	13.5	13.5	13.6	13.0	13.6	13.8	13.0	13.2
70	72.5	22.3	13.2	12.8	13.0	12.9	15.5	15.5	15.6	14.9	15.6	15.8	15.4	15.2
60	65.0	18.2	14.4	13.8	13.7	14.2	17.5	17.5	17.6	16.8	17.6	17.9	17.4	17.1
50	57.5	14.0	17.0	15.5	16.1	15.8	19.5	19.4	19.6	18.8	19.6	19.9	19.4	19.1
40	50.0	10.0	20.7	17.2	18.5	17.2	21.5	21.4	21.6	20.7	21.6	22.0	21.4	21.0
30	42.5	5.9	22.7	18.9	20.3	18.6	23.5	23.4	23.6	22.6	23.6	24.0	23.4	23.0

3 ZERO LOAD AT 40F (4.4C) OUTDOOR TEMPERATURE

% SYSTEM FULL LOAD	OUTSIDE AMBIENT TEMP		UNIT EER											
			UNIT 30GB											
	F	(C)	040	045	055	070	075	090	100	110	125	150	175	200
100	95.0	35.0	10.9	10.6	10.3	9.6	9.5	9.4	9.5	9.1	9.5	9.7	9.4	9.3
90	89.5	31.9	11.0	11.0	11.2	10.5	11.0	11.0	11.0	10.6	11.0	11.2	10.9	10.8
80	84.0	28.9	11.6	11.6	11.6	11.3	12.5	12.4	12.5	12.0	12.5	12.7	12.4	12.2
70	78.5	25.8	12.5	12.0	12.1	12.1	14.0	13.9	14.0	13.4	14.0	14.2	13.9	13.6
60	73.0	22.8	13.1	12.7	12.5	12.8	15.4	15.9	15.5	14.8	15.5	15.8	15.4	15.1
50	67.5	19.7	14.8	13.5	13.8	13.7	16.9	16.9	17.0	16.3	17.0	17.3	16.8	16.5
40	62.0	16.7	17.0	14.7	15.8	14.9	18.4	18.3	18.4	17.7	18.5	18.8	18.3	18.0
30	56.5	13.6	18.8	15.9	17.1	16.0	19.9	19.8	19.9	19.1	20.0	20.3	19.8	19.4

4 ZERO LOAD AT 55F (12.5C) OUTDOOR TEMPERATURE

% SYSTEM FULL LOAD	OUTSIDE AMBIENT TEMP		UNIT EER											
			UNIT 30GB											
	F	(C)	040	045	055	070	075	090	100	110	125	150	175	200
100	95.0	35.0	10.9	10.6	10.3	9.6	9.5	9.4	9.5	9.1	9.5	9.7	9.4	9.3
90	91.0	32.8	10.8	10.8	10.8	10.3	10.6	10.5	10.6	10.2	10.6	10.8	10.5	10.3
80	87.0	30.6	11.4	11.1	11.2	10.9	11.7	11.6	11.7	11.2	11.7	11.9	11.6	11.4
70	83.0	28.3	11.8	11.2	11.4	11.4	12.7	12.7	12.8	12.2	12.8	13.0	12.6	12.4
60	79.0	26.1	12.3	11.5	11.6	11.8	13.8	13.7	13.8	13.3	13.8	14.1	13.7	13.5
50	75.0	23.9	13.6	11.9	12.2	12.4	14.9	14.8	14.9	14.3	14.9	15.2	14.8	14.5
40	71.0	21.7	14.4	12.6	13.4	13.1	15.9	15.9	15.0	15.3	16.0	16.2	15.8	15.6
30	67.0	19.3	15.7	13.5	14.5	13.9	17.0	16.9	17.0	16.3	17.0	17.3	16.9	16.6

NOTES:

1 Above efficiency ratings obtained at 54/44F (12.2/6.7C) cooler water; full load at 95F (35C)

2 The longer the time operating at low temperatures, the greater the difference in operating costs favoring a Flotronic unit over a standard TXV unit

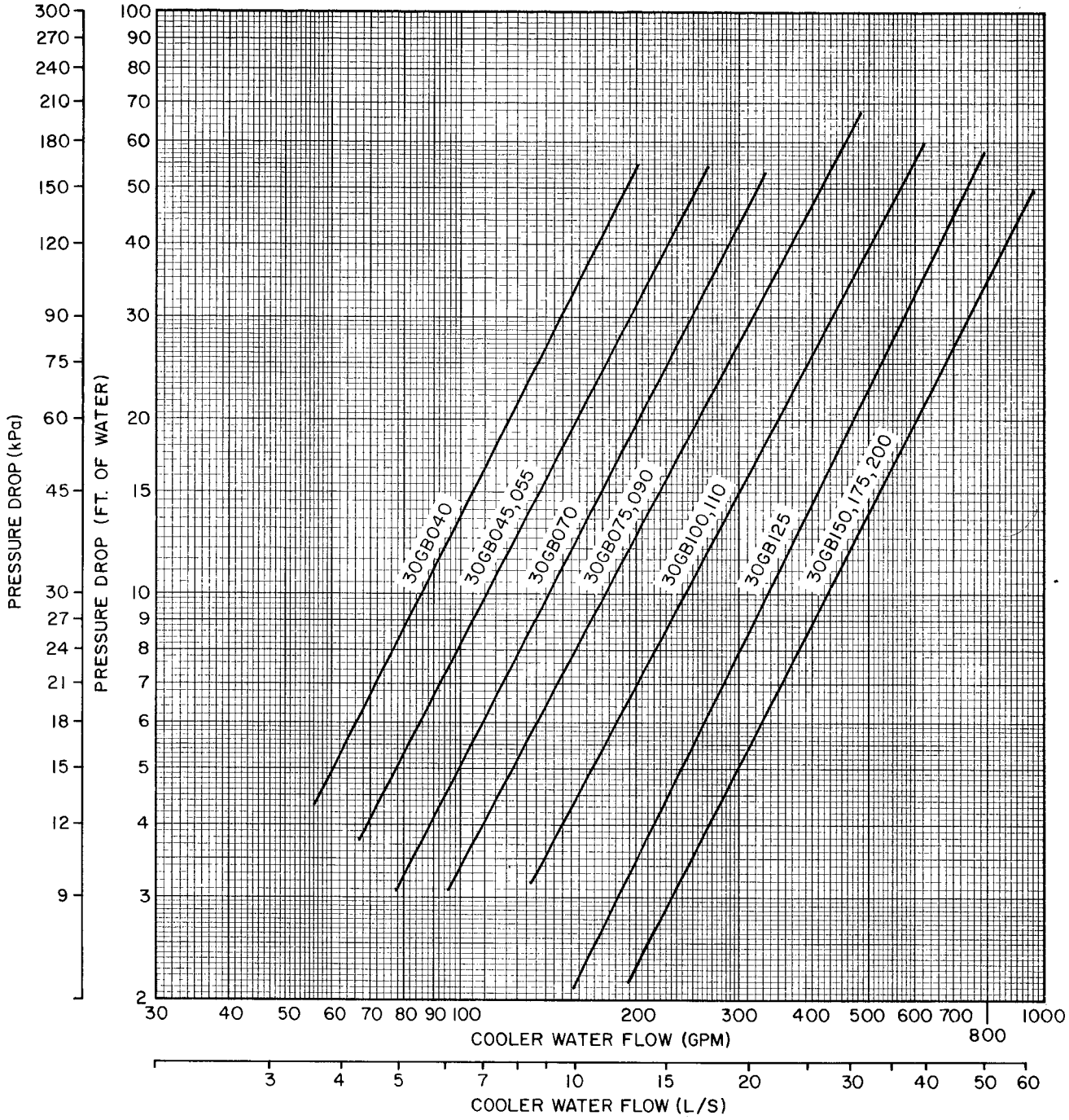
3 Contact your local Carrier representative for a computer analysis of operating costs

EER = Energy Efficiency Ratio

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

Performance data (cont)

TOTAL COOLER PRESSURE DROP (Water Side)



Performance data — 30GB040-090

COOLING CAPACITIES — ENGLISH

LCWT	UNIT 30GB	CONDENSER ENTERING AIR TEMPERATURE (F)											
		85				90				95			
		Cap.	kW	Cooler		Cap.	kW	Cooler		Cap.	kW	Cooler	
				Flow Rate	PD			Flow Rate	PD			Flow Rate	PD
40	040	36 3	35 6	86 7	10 5	35 1	36 7	83 8	9 8	33 8	37 7	80 8	9 2
	045	45 1	44 9	107 8	9 2	43 6	46 3	104 3	8 6	42 2	47 5	100 8	8 1
	055	52 2	54 5	124 8	12 2	50 7	56 0	121 1	11 5	49 0	57 4	117 3	10 8
	070	68 4	70 8	163 5	13 5	66 2	72 8	158 4	12 7	64 1	74 6	153 2	11 9
	075	76 2	81 0	182 2	10 3	74 0	83 2	176 8	9 7	71 7	85 2	171 3	9 1
	090	90 9	95.3	217.3	14.4	88.2	98.1	210.8	13.6	85.4	100.7	204 1	12.8
42	040	37 8	36 4	90 5	11 4	36 6	37 5	87 5	10 7	35 3	38 6	84 4	10 0
	045	47 0	45 9	112 4	10 0	45 5	47 3	108 8	9 4	44 0	48 6	105 2	8 8
	055	54 4	55 7	130 0	13 2	52 8	57 3	126 2	12 4	51 1	58 7	122 2	11 7
	070	71 2	72 3	170 4	14 6	69 0	74 4	165 1	13 8	66 8	76 4	159 8	12 9
	075	79 3	82 8	189 8	11 1	77 0	85 1	184 2	10 5	74 7	87 2	178 6	9 9
	090	94 6	97 5	226 3	15.6	91 7	100 3	219 5	14.7	88 9	103.1	212 8	13 9
44	040	39 4	37 1	94 2	12 3	38 1	38 3	91 2	11 6	36 8	39 5	88 1	10 8
	045	48 9	46 9	117 1	10 8	47 4	48 3	113 4	10 1	45 8	49 7	109 7	9 5
	055	56 5	56 9	135 3	14 2	54 9	58 5	131 4	13 4	53 2	60 1	127 3	12 7
	070	74 1	73 9	177 5	15 8	71 9	76 0	172 0	14 9	69 6	78 1	166 6	14 0
	075	82 5	84 6	197 4	12 0	80 1	87 0	191 7	11 3	77 7	89 2	186 0	10 7
	090	98.3	99.6	235.4	16.8	95.4	102.6	228.4	15.9	92.5	105.5	221.5	15.0
45	040	40 2	37 5	96 2	12 8	38 9	38 8	93 1	12 0	37 6	39 9	89 9	11 2
	045	49 9	47 4	119 5	11 2	48 3	48 8	115 8	10 5	46 8	50 2	112 0	9 9
	055	57 7	57 6	138 2	14 8	56 0	59 2	134 0	14 0	54 3	60 8	129 9	13 2
	070	75 6	74 6	181 1	16 4	73 3	76 8	175 6	15 5	71 0	78 9	170 1	14 6
	075	84 1	85 5	201 3	12 5	81 7	87 9	195 6	11 8	79 2	90 2	189 7	11 1
	090	100 2	100 7	240 0	17 5	97 3	103 8	233 0	16 5	94 4	106 7	225 9	15 5
46	040	41 0	37 9	98 2	13 3	39 7	39 2	95 0	12 5	38 3	40 3	91 8	11 7
	045	50 9	47 9	121 9	11 6	49 3	49 4	118 1	11 0	47 7	50 8	114 4	10 3
	055	58 7	58 1	140 7	15 3	57 1	59 9	136 7	14 5	55 3	61 4	132 5	13 7
	070	77 1	75 4	184 7	17 1	74 8	77 7	179 1	16 1	72 5	79 8	173 6	15 2
	075	85 7	86 4	205 2	12 9	83 3	88 9	199 4	12 2	80 8	91 2	193 5	11 5
	090	102 1	101 8	244 7	18 1	99 2	104 9	237 6	17 1	96 2	107 9	230 4	16 1
48	040	42 6	38 7	102 1	14 3	41 3	40 0	98 9	13 5	39 9	41 2	95 6	12 6
	045	52 9	48 9	126 8	12 6	51 3	50 4	123 0	11 8	49 7	51 9	119 1	11 1
	055	61 0	59 4	146 3	16 5	59 3	61 1	142 1	15 6	57 5	62 8	137 9	14 7
	070	80 0	77 0	191 8	18 4	77 7	79 3	186 3	17 4	75 4	81 6	180 7	16 4
	075	89 0	88 2	213 3	13 9	86 5	90 8	207 3	13 2	84 0	93 3	201 3	12 4
	090	106.0	104.0	254.1	19.5	103.0	107.3	246.9	18.4	100.0	110.4	239.6	17.4
50	040	44 3	39 5	106 1	15 4	42 9	40 8	102 9	14 5	41 5	42 1	99 5	13 7
	045	55 0	49 9	131 8	13 5	53 3	51 5	127 9	12 8	51 7	53 0	123 9	12 0
	055	63 3	60 6	151 8	17 7	61 6	62 5	147 6	16 8	59 7	64 2	143 2	15 9
	070	83 1	78 5	199 3	19 8	80 8	81 0	193 6	18 7	78 4	83 3	187 9	17 6
	075	92 3	90 1	221 4	15 0	89 8	92 8	215 3	14 2	87 2	95 4	209 1	13 4
	090	110 0	106 3	263 8	20 9	106 9	109 6	256 4	19 8	103.8	112.8	248 9	18.7
55	040	48 5	41 5	116 5	18 4	47 1	43 0	113 1	17 4	45 7	44 4	109 6	16 4
	045	60 3	52 4	144 8	16 2	58 6	54 2	140 7	15 3	56 9	55 9	136 5	14 5
	055	69 4	63 8	166 5	21 2	67 5	65 8	161 9	20 1	65 5	67 7	157 3	19 0
	070	91 1	82 6	218 6	23 6	88 6	85 3	212 6	22 4	86 1	87 9	206 5	21 2
	075	101 0	94 9	242 4	17 8	98 3	97 9	236 0	16 9	95 6	100 7	229 5	16 0
	090	120.2	112.0	288 6	24.9	117.0	115.7	280.9	23.6	113.7	119.2	272.8	22.3
60	040	51 8	43 1	124 4	20 9	50 1	44 5	120 3	19 6	48 3	45 8	116 1	18 3
	045	64 3	54 3	154 4	18 3	62 2	56 0	149 4	17 2	60 2	57 7	144 5	16 1
	055	74 7	66 6	179 3	24 4	72 5	68 7	174 2	23 1	70 4	70 7	169 0	21 8
	070	98 8	86 5	237 4	27 7	96 1	89 3	230 8	26 2	93 3	92 0	224 1	24 8
	075	106 9	98 3	256 8	19 9	104 0	101 3	249 8	18 9	101 1	104 2	242 9	17 9
	090	131 0	118 1	314 6	29 4	127 5	122 0	306 4	27 9	124 0	125 7	297 9	26 4

LEGEND

Cap. — Cooling Capacity Tons of Refrigeration
kW — Compressor Power Input
LCWT — Leaving Chilled Water Temperature (F)
PD — Pressure Drop (Ft of Water)
Flow Rate — U S Gpm

NOTES:

1 Ratings apply to units with electronic or thermal expansion valves

2 All ratings are based on:
- a A cooler chilled water temperature rise of 10 F When greater accuracy is desired, correct design LCWT, before entering rating tables, by reference to the LCWT correction curve
- b A fouling factor of 0 0005 in the cooler
- c Refrigerant 22

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

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

- c Enter cooler pressure drop curve at corrected flow rate and read pressure drop

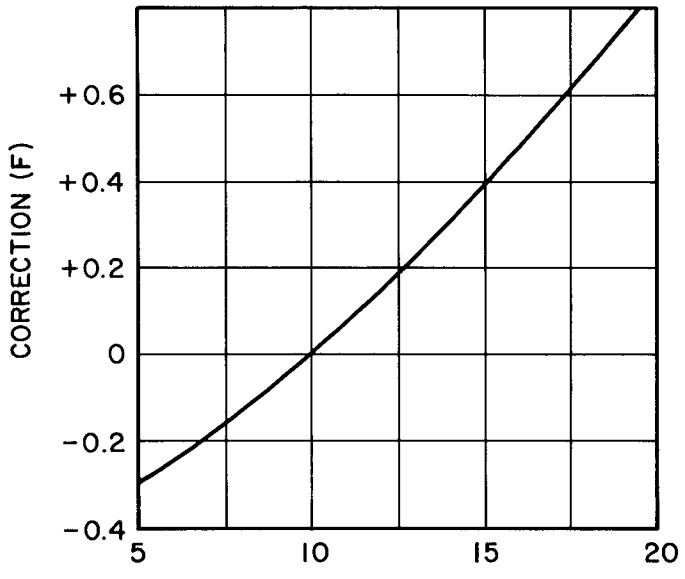
4 When chilled water temperature rise is less than 5° F, high flow rate will normally be accompanied by an excessive pressure drop In such cases, contact your Carrier representative for special selection of a cooler with wider baffle spacing

Performance data — 30GB040-090

COOLING CAPACITIES — ENGLISH (cont)

LCWT	UNIT 30GB	CONDENSER ENTERING AIR TEMPERATURE (F)											
		105				115				125 (Export Only)			
		Cap	kW	Cooler		Cap	kW	Cooler		Cap	kW	Cooler	
				Flow Rate	PD			Flow Rate	PD			Flow Rate	PD
40	040	31 2	39 5	74 7	7 9	28 7	41 1	68 6	6 7	26 1	42 2	62 3	5 6
	045	39 2	49 7	93 6	7 0	36 1	51 6	86 4	6 0	33 1	53 1	79 0	5 1
	055	45 8	59 9	109 4	9 5	42 4	62 1	101 5	8 2	39 1	63 8	93 5	7 0
	070	59 7	78 0	142 8	10 4	55 3	80 9	132 1	9 0	50 8	83 1	121 4	7 6
	075	67 0	88 9	160 1	8 0	62 2	92 0	148 8	7 0	57 5	94 5	137 4	6 0
	090	79 8	105 6	190 8	11 2	74 3	110 1	177 7	9 8	68 9	114 3	164 7	8 5
42	040	32 6	40 5	78 1	8 6	30 0	42 1	71 9	7 3	27 4	43 4	65 5	6 1
	045	40 9	50 9	97 9	7 6	37 8	52 9	90 4	6 6	34 7	54 5	82 9	5 6
	055	47 7	61 4	114 1	10 3	44 3	63 7	106 0	8 9	40 9	65 6	97 8	7 6
	070	62 4	79 9	149 2	11 3	57 8	83 0	138 3	9 8	53 2	85 4	127 3	8 4
	075	69 9	91 1	167 2	8 7	65 0	94 4	155 6	7 6	60 1	97 2	143 8	6 5
	090	83 2	108 2	199 1	12 2	77 6	113 0	185 5	10 6	72 0	117 3	172 3	9 2
44	040	34 1	41 4	81 7	9 4	31 4	43 2	75 3	8 0	28 7	44 6	68 7	6 7
	045	42 7	52 1	102 2	8 3	39 5	54 3	94 6	7 2	36 3	56 0	86 9	6 1
	055	49 7	62 8	119 0	11 1	46 3	65 3	110 7	9 7	42 7	67 3	102 3	8 3
	070	65 1	81 8	155 7	12 3	60 4	85 1	144 6	10 7	55 7	87 8	133 3	9 1
	075	72 8	93 3	174 3	9 4	67 9	96 8	162 4	8 2	62 8	99 8	150 4	7 1
	090	86 7	110 9	207 5	13 2	80 9	115 8	193 6	11 6	75 2	120 4	179 9	10 0
45	040	34 8	41 9	83 4	9 7	32 2	43 8	77 0	8 4	29 4	45 2	70 4	7 0
	045	43 6	52 8	104 4	8 6	40 4	55 0	96 7	7 5	37 1	56 8	89 0	6 4
	055	50 7	63 6	121 5	11 6	47 2	66 1	113 1	10 1	43 7	68 2	104 6	8 7
	070	66 4	82 8	159 0	12 8	61 7	86 2	147 8	11 1	56 9	89 0	136 4	9 5
	075	74 3	94 4	178 0	9 8	69 3	98 1	165 9	8 6	64 2	101 2	153 8	7 4
	090	88 5	112 2	211 8	13 7	82 6	117 2	197 7	12 0	76 8	122 0	183 8	10 5
46	040	35 6	42 4	85 2	10 2	32 9	44 3	78 7	8 7	30 1	45 8	72 0	7 4
	045	44 5	53 4	106 7	9 0	41 3	55 6	98 9	7 8	38 0	57 5	91 0	6 6
	055	51 8	64 3	124 0	12 0	48 2	67 0	115 5	10 5	44 6	69 1	106 9	9 0
	070	67 8	83 8	162 4	13 3	63 0	87 2	151 0	11 6	58 2	90 1	139 5	10 0
	075	75 8	95 5	181 6	10 2	70 8	99 3	169 5	8 9	65 6	102 5	157 2	7 7
	090	90 2	113 5	216 1	14 3	84 3	118 7	201 9	12 5	78 4	123 5	187 7	10 9
48	040	37 1	43 4	88 9	11 0	34 3	45 4	82 3	9 5	31 5	47 0	75 4	8 0
	045	46 4	54 6	111 2	9 8	43 1	57 0	103 3	8 5	39 7	59 0	95 2	7 2
	055	53 9	65 8	129 1	13 0	50 3	68 6	120 4	11 4	46 6	71 0	111 6	9 8
	070	70 6	85 7	169 2	14 4	65 7	89 4	157 6	12 6	60 8	92 5	145 7	10 8
	075	78 9	97 8	189 0	11 0	73 7	101 8	176 7	9 7	68 5	105 2	164 0	8 4
	090	93 8	116 2	224 9	15 4	87 7	121 6	210 2	13 5	81 7	126 6	195 7	11 8
50	040	38 7	44 4	92 7	11 9	35 8	46 5	85 9	10 3	32 9	48 3	78 9	8 8
	045	48 3	55 9	115 9	10 6	44 9	58 4	107 7	9 2	41 5	60 6	99 4	7 9
	055	56 0	67 4	134 4	14 0	52 3	70 3	125 5	12 3	48 5	72 8	116 4	10 6
	070	73 4	87 7	176 1	15 6	68 5	91 5	164 3	13 6	63 5	94 9	152 2	11 8
	075	82 0	100 0	196 6	11 9	76 7	104 3	184 0	10 5	71 3	107 9	171 1	9 1
	090	97 5	118 9	233 8	16 6	91 2	124 5	218 8	14 6	85 0	129 8	203 8	12 8
55	040	42 7	46 9	102 4	14 4	37 9	49 3	95 2	12 5	36 6	51 3	87 8	10 7
	045	53 3	59 0	128 0	12 8	49 7	61 9	119 3	11 2	46 0	64 4	110 5	9 6
	055	61 6	71 3	147 8	16 8	57 7	74 6	138 5	14 9	53 7	77 4	128 8	12 9
	070	80 9	92 7	194 1	18 8	75 6	97 0	181 5	16 5	70 3	100 9	168 7	14 3
	075	89 7	105 6	215 2	14 2	83 9	110 2	201 3	12 5	—	—	—	—
	090	107 0	125 7	256 7	19 9	100 4	132 0	241 0	17 6	—	—	—	—
60	040	44 8	48 3	107 7	15 9	41 3	50 4	99 2	13 6	37 7	52 3	90 7	11 4
	045	56 1	60 8	134 7	14 1	51 9	63 5	124 7	12 2	47 8	65 8	114 8	10 4
	055	66 1	74 4	158 8	19 3	61 5	77 5	147 7	16 8	—	—	—	—
	070	87 7	97 1	210 6	22 0	81 9	101 7	196 8	19 3	—	—	—	—
	075	95 2	109 5	228 6	15 9	89 2	114 4	214 2	14 0	—	—	—	—
	090	116 9	132 8	280 8	23 6	—	—	—	—	—	—	—	—

LCWT CORRECTION



Above 10 F, ADD correction to design LCWT, below 10 F, SUBTRACT

Performance data — 30GB100-200

COOLING CAPACITIES — ENGLISH

LCWT	UNIT 30GB	CONDENSER ENTERING AIR TEMPERATURE (F)											
		85				90				95			
		Cap.	kW	Cooler		Cap.	kW	Cooler		Cap.	kW	Cooler	
				Flow Rate	PD			Flow Rate	PD			Flow Rate	PD
40	100	100 6	106 5	240 5	9 5	97 8	109 5	233 8	9 0	95 0	112 3	227 0	8 5
	110	113 1	123 3	270 3	11 9	109 8	126 8	262 6	11 2	106 6	130 2	254 8	10 6
	125	129 1	136 7	308 7	8 5	125 3	140 3	299 5	8 0	121 4	143 8	290 3	7 5
	150	158 0	164 2	377 7	8 1	153 2	168 7	366 2	7 6	148 4	173 0	354 7	7 2
	175	176 7	191 3	422 3	10 1	171 5	196 2	410 0	9 5	166 3	200 9	397 6	9 0
	200	196.4	218.5	469.6	12.4	190.6	223.6	455.6	11.7	184.8	228.4	441.7	11.0
42	100	104 4	108 6	249 7	10 2	101 5	111 7	242 8	9 7	98 6	114 7	235 9	9 1
	110	117 2	125 8	280 4	12 7	113 9	129 5	272 6	12 1	110 6	133 0	264 6	11 4
	125	134 1	139 5	320 8	9 2	130 2	143 4	311 4	8 7	126 3	147 0	302 1	8 2
	150	164 2	167 6	392 9	8 8	159 3	172 4	381 1	8 3	154 4	176 9	369 4	7 8
	175	183 6	195 6	439 3	10 9	178 3	200 7	426 7	10 3	173 0	205 5	413 8	9 7
	200	204.0	223.4	488.0	13.3	198.0	228.8	473.7	12.6	192.1	233.8	459.5	11.9
44	100	108 2	110 7	258 9	10 9	105 3	114 0	252 0	10 4	102 3	117 1	244 9	9 8
	110	121 5	128 4	290 8	13 7	118 1	132 2	282 8	12 9	114 7	135 8	274 6	12 2
	125	139 3	142 5	333 4	10 0	135 3	146 5	323 8	9 4	131 2	150 3	314 1	8 8
	150	170 6	171 1	408 4	9 4	165 6	176 1	396 4	8 9	160 5	180 8	384 3	8 4
	175	190 6	199 8	456 3	11 7	185 2	205 2	443 3	11 1	179 7	210 1	430 2	10 4
	200	211.5	228.3	506.4	14.3	205.5	233.9	491.8	13.5	199.4	239.2	477.3	12.8
45	100	110 1	111 8	263 6	11 3	107 2	115 1	256 6	10 7	104 2	118 3	249 5	10 2
	110	123 6	129 7	296 0	14 1	120 2	133 5	287 9	13 4	116 8	137 2	279 7	12 7
	125	141 8	144 0	339 7	10 4	137 8	148 1	330 0	9 8	133 7	152 0	320 3	9 2
	150	174 0	172 9	416 6	9 8	168 8	178 0	404 2	9 3	163 7	182 8	392 0	8 7
	175	194 2	202 0	465 0	12 1	188 8	207 5	452 1	11 5	183 1	212 5	438 5	10 8
	200	215.5	230.8	515.9	14.9	209.3	236.5	501.2	14.0	203.2	241.9	486.6	13.3
46	100	112 0	112 9	268 3	11 7	109 1	116 3	261 3	11 1	106 1	119 5	254 1	10 5
	110	125 8	131 0	301 3	14 6	122 4	134 9	293 1	13 9	118 9	138 7	284 8	13 1
	125	144 5	145 5	346 0	10 8	140 4	149 6	336 2	10 1	136 3	153 6	326 4	9 5
	150	177 2	174 7	424 5	10 2	172 0	179 8	412 0	9 6	166 9	184 7	399 7	9 1
	175	197 7	204 1	473 6	12 6	192 2	209 6	460 3	11 9	186 5	214 9	446 8	11 2
	200	219.4	233.3	525.5	15.4	213.2	239.2	510.6	14.6	207.0	244.7	495.9	13.8
48	100	116 0	115 1	278 0	12 5	113 0	118 6	270 7	11 9	109 9	121 9	263 4	11 3
	110	130 2	133 6	311 9	15 6	126 7	137 6	303 6	14 8	123 2	141 6	295 2	14 1
	125	149 7	148 5	358 9	11 6	145 6	152 8	348 9	10 9	141 4	156 9	338 8	10 3
	150	183 8	178 2	440 4	10 9	178 6	183 6	427 9	10 3	173 3	188 7	415 3	9 8
	175	205 1	208 5	491 5	13 5	199 3	214 2	477 7	12 8	193 6	219 6	463 9	12 1
	200	227 4	238 4	545 0	16.5	221.1	244.5	529.8	15.6	214.8	250.3	514.7	14.8
50	100	120 0	117 3	287 7	13 4	116 9	120 9	280 3	12 7	113 8	124 4	272 9	12 1
	110	134 6	136 2	322 8	16 7	131 1	140 4	314 2	15 9	127 5	144 5	305 6	15 0
	125	155 0	151 5	371 8	12 4	150 9	156 0	361 7	11 8	146 6	160 3	351 5	11 1
	150	190 6	181 8	456 9	11 7	185 3	187 4	444 2	11 1	179 8	192 7	431 0	10 5
	175	212 5	212 9	509 6	14 5	206 7	218 8	495 5	13 7	200 8	224 5	481 4	13 0
	200	235.5	243.6	564.7	17.7	229.1	249.9	549.3	16.8	222.7	255.9	533.9	15.9
55	100	130 3	122 8	312 7	15 7	127 0	126 7	304 8	15 0	123 8	130 5	297 0	14 2
	110	146 1	142 9	350 6	19 6	142 3	147 4	341 6	18 6	138 6	151 9	332 6	17 7
	125	168 9	159 2	405 5	14 9	164 5	164 1	394 9	14 1	160 0	168 9	384 1	13 3
	150	208 1	191 0	499 6	14 0	202 6	197 1	486 2	13 2	196 9	202 9	472 6	12 5
	175	231 7	224 2	556 2	17 2	225 6	230 7	541 4	16 3	219 3	236 8	526 4	15 4
	200	256 6	257 0	615 8	20.9	250.0	263.9	600.0	19.9	243.1	270.3	583.5	18.8
60	100	140 9	128 4	338 4	18 3	137 6	132 7	330 5	17 5	134 2	136 8	322 3	16 7
	110	158 0	149 8	379 5	22 8	154 1	154 7	370 1	21 7	150 1	159 5	360 6	20 7
	125	183 4	167 2	440 6	17 6	178 8	172 6	429 5	16 7	174 1	177 7	418 1	15 8
	150	226 6	200 6	544 3	16 5	220 7	207 2	530 2	15 7	214 8	213 5	515 9	14 9
	175	251 7	236 0	604 6	20 2	245 4	243 0	589 6	19 2	238 8	249 7	573 6	18 2
	200	278 4	270 8	668 7	24 5	271 5	278 3	652.2	23.4	264.6	285.4	635.6	22.2

LEGEND

Cap. — Cooling Capacity Tons of Refrigeration
kW — Compressor Power Input
LCWT — Leaving Chilled Water Temperature (F)
PD — Pressure Drop (Ft of Water)
Flow Rate — U S Gpm

NOTES:

1 Ratings apply to units with electronic or thermal expansion valves

2 All ratings are based on:
- a A cooler chilled water temperature rise of 10 F When greater accuracy is desired, correct design LCWT, before entering rating tables, by reference to the LCWT correction curve
- b A fouling factor of 0 0005 in the cooler
- c Refrigerant 22

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

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

- c Enter cooler pressure drop curve at corrected flow rate and read pressure drop

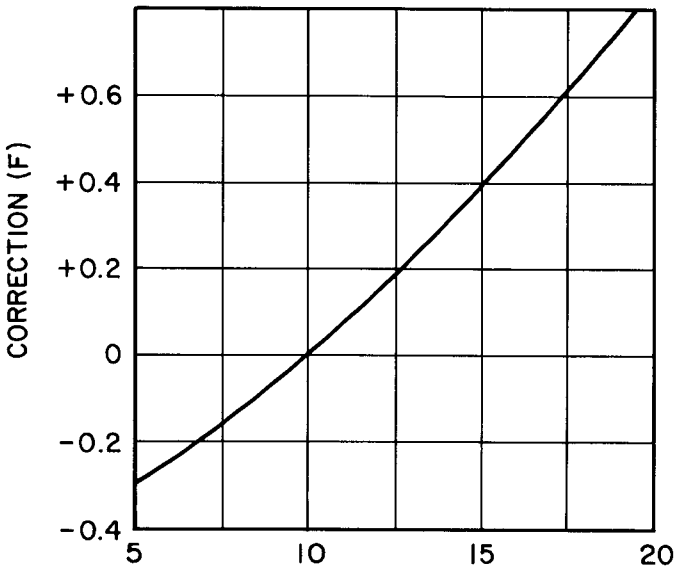
4 When chilled water temperature rise is less than 5°F, high flow rate will normally be accompanied by an excessive pressure drop In such cases, contact your Carrier representative for special selection of a cooler with wider baffle spacing

Performance data — 30GB100-200

COOLING CAPACITIES — ENGLISH (cont)

LCWT	UNIT 30GB	CONDENSER ENTERING AIR TEMPERATURE (F)											
		105				115				125 (Export Only)			
		Cap.	kW	Cooler		Cap	kW	Cooler		Cap	kW	Cooler	
				Flow Rate	PD			Flow Rate	PD			Flow Rate	PD
40	100	89 2	117 5	213 2	7 5	83 3	122 2	199 1	6 6	77 3	126 0	184 7	5 7
	110	100 1	136 5	239 2	9 4	93 5	142 2	223 5	8 2	86 9	147 3	207 6	7 1
	125	113 7	150 2	271 7	6 6	105 8	155 6	252 9	5 7	97 8	160 1	233 7	4 8
	150	138 7	180 6	331 4	6 3	128 8	187 3	307 9	5 5	118 8	192 7	284 1	4 7
	175	155 4	209 0	371 5	7 9	144 7	216 1	345 8	6 8	133 6	221 8	319 4	5 9
	200	173.0	237.0	413.5	9.7	161.0	244.4	385.0	8.4	149.0	250.4	356.2	7.2
42	100	92 7	120 2	221 7	8 1	86 7	125 0	207 3	7 1	80 5	129 2	192 7	6 2
	110	104 0	139 6	248 7	10 1	97 2	145 6	232 5	8 9	90 5	151 0	216 4	7 7
	125	118 3	153 7	283 1	7 1	110 3	159 6	263 8	6 2	102 1	164 4	244 2	5 3
	150	144 4	184 9	345 5	6 8	134 3	192 0	321 4	5 9	124 2	197 9	297 1	5 1
	175	161 9	214 1	387 2	8 5	150 8	221 6	360 8	7 4	139 5	227 7	333 6	6 4
	200	180.0	242 8	430 7	10 5	167 8	250 7	401 5	9 1	155 5	257 1	371 9	7 9
44	100	96 3	122 9	230 5	8 7	90 1	128 0	215 8	7 7	83 9	132 4	200 8	6 7
	110	107 9	142 7	258 3	10 9	101 1	149 0	241 9	9 6	94 1	154 7	225 4	8 4
	125	123 1	157 3	294 6	7 7	114 8	163 5	274 8	6 7	106 4	168 7	254 8	5 8
	150	150 4	189 3	360 0	7 4	140 1	196 8	335 3	6 4	129 7	203 1	310 4	5 6
	175	168 3	219 1	402 9	9 2	157 0	227 1	375 9	8 0	145 6	233 8	348 5	6 9
	200	187 3	248 8	448 3	11 3	174 8	257 1	418 5	9 9	162 2	264 0	388 2	8 6
45	100	98 1	124 2	235 0	9 1	91 9	129 4	220 0	8 0	85 6	134 0	204 9	7 0
	110	109 9	144 3	263 2	11 3	103 0	150 7	246 6	9 9	96 0	156 6	229 9	8 7
	125	125 5	159 1	300 5	8 1	117 1	165 4	280 4	7 0	108 7	170 9	260 2	6 0
	150	153 4	191 4	367 4	7 7	143 0	199 1	342 3	6 7	132 4	205 6	316 9	5 8
	175	171 6	221 7	411 0	9 6	160 2	229 9	383 6	8 4	148 6	236 9	355 9	7 2
	200	190 9	251 7	457 2	11 8	178 3	260 4	427 0	10 3	165 6	267 5	396 5	8 9
46	100	100 0	125 5	239 4	9 4	93 7	130 9	224 3	8 3	87 3	135 6	209 1	7 2
	110	111 9	145 9	268 1	11 7	104 9	152 5	251 4	10 3	97 9	158 5	234 4	9 0
	125	127 9	160 9	306 4	8 4	119 5	167 4	286 1	7 3	110 9	173 1	265 7	6 3
	150	156 5	193 6	374 8	8 0	145 9	201 6	349 4	7 0	135 2	208 3	323 8	6 0
	175	175 0	224 3	419 1	9 9	163 4	232 7	391 3	8 7	151 8	240 0	363 5	7 5
	200	194 7	254 8	466 4	12 2	181 9	263 6	435 7	10 7	169 0	271 0	404 8	9 3
48	100	103 6	128 2	248 4	10 1	97 2	133 9	233 1	8 9	90 7	138 9	217 5	7 8
	110	116 1	149 0	278 1	12 5	108 9	155 9	261 0	11 1	101 7	162 2	243 7	9 7
	125	132 9	164 6	318 4	9 1	124 2	171 5	297 7	7 9	115 4	177 3	276 6	6 8
	150	162 7	198 1	390 0	8 6	151 9	206 4	363 9	7 6	140 9	213 6	337 6	6 5
	175	181 9	229 6	435 9	10 7	169 9	238 4	407 2	9 4	—	—	—	—
	200	202.1	260.8	484.4	13 1	189.2	270.2	453 4	11.6	—	—	—	—
50	100	107 4	130 9	257 5	10 8	100 9	136 8	241 9	9 6	94 3	142 1	226 0	8 4
	110	120 2	152 2	288 3	13 4	112 9	159 4	270 8	11 9	105 5	166 0	252 9	10 4
	125	138 0	168 3	330 8	9 8	129 1	175 5	309 5	8 6	120 1	181 8	288 0	7 4
	150	169 0	202 5	405 2	9 3	157 9	211 3	378 6	8 2	146 7	218 9	351 7	7 1
	175	188 8	234 9	452 7	11 5	176 7	244 2	423 6	10 1	—	—	—	—
	200	209.8	266.9	502 9	14.1	196.5	276.7	471.1	12 5	—	—	—	—
55	100	117 1	137 7	281 1	12 8	110 3	144 3	264 8	11 4	103 4	150 3	248 1	10 1
	110	131 0	160 4	314 4	15 9	123 3	168 2	295 9	14 1	115 5	175 7	277 2	12 5
	125	150 9	177 7	362 3	11 8	141 6	185 7	339 8	10 4	—	—	—	—
	150	185 4	213 8	444 9	11 1	173 7	223 7	416 9	9 8	—	—	—	—
	175	206 8	248 4	496 5	13 8	194 1	258 8	465 8	12 2	—	—	—	—
	200	229.5	282.5	550.9	16.9	215.7	293.6	517 7	15.0	—	—	—	—
60	100	127 2	144 6	305 5	15 0	120 1	152 0	288 6	13 5	—	—	—	—
	110	142 2	168 6	341 5	18 6	134 1	177 3	322 1	16 6	—	—	—	—
	125	163 7	186 8	393 1	13 9	153 4	195 3	368 5	12 2	—	—	—	—
	150	202 6	225 4	486 6	13 3	189 6	235 8	455 4	11 7	—	—	—	—
	175	225 7	262 4	542 2	16 3	—	—	—	—	—	—	—	—
	200	250 2	298 7	601 1	20 0	—	—	—	—	—	—	—	—

LCWT CORRECTION



Above 10 F, ADD correction to design LCWT, below 10 F, SUBTRACT

Performance data — 30GB040-090

COOLING CAPACITIES — SI

LCWT	UNIT 30GB	CONDENSER ENTERING AIR TEMPERATURE (C)											
		25				30				35			
		Cap.	kW	Cooler		Cap.	kW	Cooler		Cap.	kW	Cooler	
				Flow Rate	PD			Flow Rate	PD			Flow Rate	PD
4.0	040	132 7	33 5	5 27	29 1	124 9	35 6	4 96	26 0	117 1	37 4	4 65	22 9
	045	164 4	42 4	6 53	25 4	155 2	44 9	6 16	22 7	146 1	47 1	5 80	20 2
	055	190 1	51 6	7 55	33 5	180 1	54 4	7 15	30 2	170 0	56 9	6 75	27 0
	070	248 7	66 9	9 87	37 1	235 4	70 6	9 34	33 4	221 8	74 0	8 81	29 8
	075	276 8	76 7	10 99	28 2	262 7	80 8	10 43	25 5	248 3	84 5	9 86	22 9
	090	330.7	90.0	13.13	39.6	313.2	95.1	12.43	35.7	295.9	99.8	11.75	32.0
5.0	040	137 6	34 2	5 46	31 3	129 8	36 3	5 16	28 0	121 8	38 2	4 84	24 8
	045	170 5	43 2	6 77	27 2	161 1	45 8	6 40	24 4	151 8	48 1	6 03	21 8
	055	197 0	52 6	7 83	35 9	186 7	55 5	7 42	32 4	176 4	58 1	7 01	29 1
	070	257 8	68 1	10 24	39 8	244 2	72 0	9 70	35 9	230 4	75 5	9 15	32 1
	075	286 6	78 2	11 39	30 2	272 4	82 4	10 82	27 3	257 7	86 3	10 24	24 6
	090	342.4	91.7	13 60	42.4	324 7	97.0	12.90	38.3	306.8	102.0	12.19	34.4
6.0	040	142 6	34 8	5 67	33 5	134 7	37 0	5 35	30 0	126 5	39 0	5 03	26 7
	045	176 7	44 0	7 02	29 2	167 2	46 6	6 65	26 3	157 6	49 1	6 26	23 4
	055	204 1	53 6	8 11	38 5	193 6	56 6	7 69	34 8	182 9	59 3	7 27	31 2
	070	267 1	69 4	10 62	42 7	253 1	73 4	10 06	38 5	239 1	77 1	9 50	34 5
	075	296 8	79 6	11 80	32 3	282 1	84 1	11 22	29 3	267 2	88 1	10 62	26 4
	090	354.5	93.5	14.09	45.4	336.4	99.0	13.37	41.1	318.1	104.1	12.65	36.9
7.0	040	147 7	35 4	5 88	35 9	139 6	37 7	5 55	32 2	131 3	39 8	5 22	28 7
	045	183 0	44 8	7 28	31 3	173 3	47 5	6 89	28 2	163 5	50 1	6 50	25 2
	055	211 1	54 6	8 40	41 1	200 5	57 7	7 97	37 2	189 6	60 5	7 54	33 5
	070	276 6	70 6	11 00	45 7	262 5	74 8	10 44	41 3	248 0	78 6	9 87	37 0
	075	307 1	81 1	12 22	34 5	292 2	85 7	11 62	31 4	277 0	89 9	11 02	28 3
	090	366 8	95.3	14 59	48 5	348 3	101 0	13 86	44 0	329.7	106 3	13 11	39.5
8.0	040	153 0	36 0	6 09	38 4	144 7	38 4	5 76	34 5	136 2	40 6	5 42	30 8
	045	189 5	45 6	7 54	33 5	179 6	48 4	7 15	30 2	169 6	51 1	6 75	27 1
	055	218 3	55 6	8 69	43 9	207 5	58 8	8 26	39 8	196 5	61 8	7 82	35 9
	070	286 2	71 9	11 39	48 8	271 8	76 2	10 82	44 2	257 2	80 2	10 23	39 7
	075	317 7	82 6	12 64	36 9	302 4	87 4	12 03	33 5	286 8	91 7	11 41	30 3
	090	379 5	97 1	15 10	51 9	360 5	103 0	14 35	47.0	341 5	108.5	13 59	42.4
9.0	040	158 2	36 7	6 30	41 0	149 9	39 1	5 97	37 0	141 2	41 4	5 62	33 0
	045	196 1	46 4	7 81	35 8	186 0	49 3	7 41	32 3	175 8	52 1	7 00	29 0
	055	225 7	56 6	8 99	46 9	214 7	59 9	8 55	42 6	203 4	63 0	8 10	38 4
	070	295 8	73 2	11 78	52 0	281 3	77 6	11 20	47 3	266 4	81 8	10 61	42 6
	075	328 4	84 1	13 08	39 3	312 8	89 1	12 45	35 8	296 9	93 6	11 82	32 4
	090	392.2	99.0	15.61	55.3	372.8	105.1	14.84	50.2	353.5	110.7	14.07	45.3
10.0	040	163 6	37 3	6 52	43 8	155 1	39 8	6 18	39 5	146 3	42 2	5 83	35 3
	045	202 9	47 2	8 08	38 2	192 6	50 2	7 67	34 6	182 1	53 1	7 25	31 1
	055	233 3	57 6	9 29	49 9	222 0	61 1	8 84	45 4	210 5	64 3	8 39	41 0
	070	305 8	74 4	12 18	55 5	291 0	79 1	11 59	50 5	275 8	83 4	10 99	45 5
	075	339 3	85 7	13 51	41 9	323 4	90 8	12 88	38 2	307 2	95 4	12 24	34 6
	090	405 2	100 9	16 14	58.9	385 4	107 1	15.35	53 5	365.6	112 9	14.56	48.4
13.0	040	180 5	39 3	7 20	52 9	171 5	42 1	6 84	48 0	162 2	44 6	6 47	43 1
	045	223 9	49 8	8 93	46 2	213 0	53 1	8 49	42 0	201 9	56 2	8 05	37 9
	055	256 7	60 8	10 24	60 1	244 8	64 6	9 76	54 9	232 6	68 1	9 27	49 8
	070	336 9	78 4	13 43	67 0	321 2	83 5	12 81	61 2	305 2	88 3	12 17	55 4
	075	373 1	90 4	14 88	50 4	355 4	95 9	14 17	45 9	337 5	100 9	13 46	41 6
	090	445 2	106 7	17 75	70 8	424 3	113 4	16 92	64.5	403.2	119.7	16.08	58.5
16.0	040	192 1	40 8	7 67	59 7	181 2	43 4	7 23	53 4	170 0	45 8	6 79	47 3
	045	237 6	51 4	9 48	51 9	224 8	54 7	8 97	46 7	211 9	57 7	8 46	41 7
	055	276 5	63 5	11 04	69 5	263 3	67 4	10 51	63 3	249 2	70 9	9 94	56 9
	070	366 5	82 2	14 63	78 9	349 0	87 5	13 93	71 8	331 2	92 5	13 22	65 0
	075	396 2	93 8	15 81	56 7	377 7	99 5	15 07	51 7	359 4	104 9	14 34	47 0
	090	487 3	112 8	19 45	84 3	465 3	120 1	18 57	77 2	442 5	126 9	17 66	70 1

LEGEND

Cap. — Cooling Capacity kW of Refrigeration
kW — Compressor Power Input
LCWT — Leaving Chilled Water Temperature (C)
PD — Pressure Drop (kPa of Water)
Flow Rate — L/s

NOTES:

1 Ratings apply to units with electronic or thermal expansion valves

2 All ratings are based on:
a A cooler chilled water temperature rise of 6° C When greater accuracy is desired, correct design LCWT, before entering rating tables, by reference to the LCWT correction curve
b A fouling factor of 0 000088 in the cooler
c Refrigerant 22

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

$$= \frac{0\,239 \times \text{capacity in kW}}{\text{temperature rise C}} = \text{L/s}$$

c Enter cooler pressure drop curve at corrected flow rate and read pressure drop

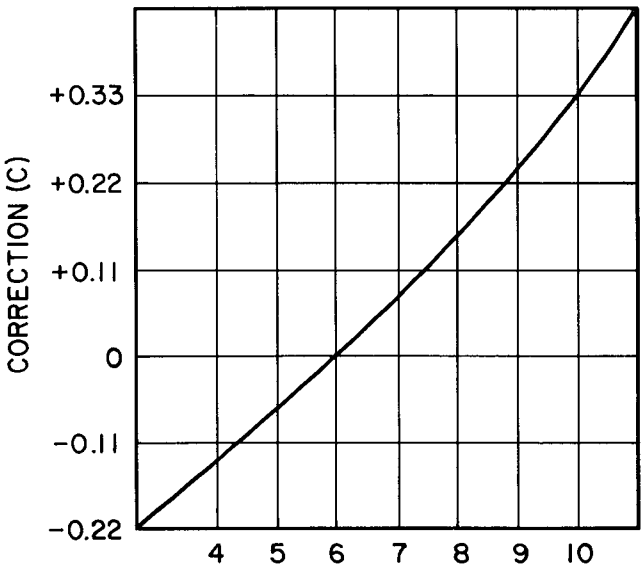
4 When chilled water temperature rise is less than 3° C, the high flow rate will normally be accompanied by an excessive pressure drop In such cases, contact your Carrier representative for special selection of a cooler with wider baffle spacing

Performance data — 30GB040-090

COOLING CAPACITIES — SI (cont)

LCWT	UNIT 30GB	CONDENSER ENTERING AIR TEMPERATURE (C)											
		40				45				50 (Export Only)			
		Cap.	kW	Cooler		Cap.	kW	Cooler		Cap.	kW	Cooler	
				Flow Rate	PD			Flow Rate	PD			Flow Rate	PD
4.0	040	109 1	39 0	4 33	20 0	101 0	40 4	4 01	17 3	92 8	41 5	3 68	14 7
	045	136 6	49 1	5 42	17 8	127 1	50 8	5 05	15 5	117 5	52 1	4 67	13 3
	055	159 7	59 2	6 34	24 0	149 3	61 1	5 93	21 1	138 9	62 7	5 51	18 4
	070	208 1	77 0	8 26	26 3	194 2	79 5	7 71	23 1	180 1	81 6	7 15	20 0
	075	233 6	87 7	9 27	20 3	218 7	90 5	8 68	17 9	203 7	92 9	8 09	15 6
	090	278 4	104 2	11 05	28 5	261 1	108 3	10.37	25.2	244.0	112.0	9.69	22.1
5.0	040	113 5	39 9	4 51	21 6	105 4	41 4	4 19	18 8	97 0	42 5	3 85	16 0
	045	142 1	50 2	5 65	19 2	132 4	51 9	5 26	16 8	122 6	53 4	4 87	14 5
	055	165 9	60 5	6 59	25 8	155 3	62 5	6 17	22 8	144 6	64 3	5 74	19 8
	070	216 4	78 7	8 60	28 4	202 2	81 4	8 03	24 9	187 8	83 7	7 46	21 7
	075	242 7	89 7	9 64	21 9	227 5	92 7	9 04	19 3	212 2	95 2	8 43	16 9
	090	289 0	106 5	11 48	30 6	271 3	110 7	10 78	27 1	253.8	114 7	10.08	23.9
6.0	040	118 0	40 7	4 69	23 4	109 8	42 3	4 36	20 3	101 3	43 6	4 03	17 4
	045	147 8	51 2	5 87	20 7	137 9	53 1	5 48	18 2	127 9	54 7	5 08	15 7
	055	172 1	61 8	6 84	27 8	161 4	64 0	6 41	24 5	150 4	65 8	5 98	21 4
	070	224 9	80 4	8 94	30 6	210 4	83 3	8 36	27 0	195 7	85 7	7 78	23 5
	075	251 9	91 7	10 01	23 6	236 4	94 8	9 40	20 9	220 8	97 5	8 78	18 3
	090	299 9	108 8	11 92	32 9	281 7	113 2	11 20	29 2	263 9	117 4	10 49	25 8
7 0	040	122 7	41 6	4 88	25 2	114 3	43 3	4 55	22 0	105 6	44 7	4 20	18 9
	045	153 5	52 3	6 11	22 3	143 4	54 3	5 70	19 6	133 2	56 1	5 30	17 0
	055	178 5	63 1	7 10	29 8	167 6	65 4	6 67	26 4	156 4	67 4	6 22	23 1
	070	233 5	82 1	9 29	33 0	218 6	85 2	8 70	29 1	203 7	87 8	8 10	25 4
	075	261 4	93 6	10 40	25 3	245 5	97 0	9 77	22 4	229 6	99 8	9 13	19 7
	090	311 1	111 2	12 37	35 4	292 3	115 8	11 63	31 4	274 1	120 1	10 90	27 7
8.0	040	127 5	42 5	5 07	27 1	118 8	44 2	4 73	23 7	110 0	45 7	4 38	20 4
	045	159 4	53 4	6 34	24 0	149 1	55 5	5 93	21 1	138 6	57 4	5 52	18 4
	055	185 2	64 4	7 37	32 0	173 9	66 9	6 92	28 4	162 5	69 0	6.47	24 9
	070	242 3	83 8	9 64	35 4	227 1	87 0	9 04	31 3	211 8	89 8	8 43	27 4
	075	271 0	95 6	10 78	27 2	254 8	99 1	10 14	24 1	238 5	102 2	9 49	21 3
	090	322.4	113.6	12.83	37.9	303.2	118.3	12.06	33.7	284.5	122.8	11.32	29.8
9.0	040	132 3	43 3	5 27	29 1	123 5	45 2	4 92	25 5	114 5	46 8	4 56	22 1
	045	165 4	54 5	6 58	25 8	154 8	56 8	6 17	22 7	144 2	58 7	5 74	19 8
	055	191 8	65 8	7 64	34 3	180 4	68 3	7 18	30 5	168 7	70 6	6 72	26 8
	070	251 2	85 6	10 00	38 0	235 8	88 9	9 39	33 7	220 2	91 9	8 77	29 5
	075	280 6	97 6	11 17	29 1	264 3	101 3	10 52	25 9	247 7	104 6	9 86	22 9
	090	333 9	116 0	13 29	40 6	314 4	120 9	12 52	36 2	295 1	125 6	11 75	32 0
10.0	040	137 2	44 2	5 47	31 3	128 2	46 2	5 11	27 5	119 1	47 8	4 74	23 8
	045	171 5	55 7	6 83	27 7	160 7	58 0	6 40	24 4	149 8	60 0	5 97	21 4
	055	198 8	67 1	7 92	36 7	187 0	69 8	7 45	32 7	175 1	72 2	6 97	28 8
	070	260 2	87 3	10 37	40 7	244 6	90 9	9 74	36 2	228 7	94 0	9 11	31 8
	075	290 6	99 7	11 57	31 1	273 8	103 5	10 91	27 8	257 0	106 9	10 24	24 6
	090	345 6	118 4	13 76	43 4	325 6	123 5	12 97	38 7	305 9	128.3	12.18	34.3
13.0	040	152 5	46 9	6 08	38 4	143 1	49 1	5 71	33 9	133 3	51 1	5 32	29 7
	045	190 6	59 1	7 60	34 0	179 1	61 7	7 14	30 2	167 5	64 1	6 68	26 5
	055	220 0	71 3	8 77	44 7	207 7	74 4	8 28	40 0	195 0	77 1	7 77	35 5
	070	288 7	92 6	11 51	49 8	272 2	96 7	10 85	44 5	255 2	100 3	10 18	39 3
	075	319 4	105 5	12 74	37 4	300 9	109 7	12 00	33 3	282 4	113 5	11 26	29 5
	090	381 7	125 7	15 22	52.6	360.8	131.5	14.39	47.2	—	—	—	—
16.0	040	159 0	48 0	6 34	41 6	147 8	50 0	5 90	36 2	136 7	51 8	5 45	31 1
	045	198 9	60 5	7 94	36 9	185 6	63 0	7 41	32 3	172 5	65 1	6 89	28 1
	055	234 5	74 1	9 36	50 6	219 5	76 9	8 76	44 6	204 6	79 4	8 17	39 0
	070	313 1	97 1	12 50	58 3	294 9	101 3	11 77	52 0	275 8	105 0	11 01	45 7
	075	340 6	109 8	13 59	42 4	321 5	114 3	12 83	37 9	—	—	—	—
	090	418 5	133 2	16 70	62 9	—	—	—	—	—	—	—	—

LCWT CORRECTION



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

Performance data — 30GB100-200

COOLING CAPACITIES — SI

LCWT	UNIT 30GB	CONDENSER ENTERING AIR TEMPERATURE (C)											
		25				30				35			
		Cap	kW	Cooler		Cap	kW	Cooler		Cap.	kW	Cooler	
				Flow Rate	PD			Flow Rate	PD			Flow Rate	PD
4.0	100	364 4	100 7	14 47	25 8	347 1	106 4	13 78	23 5	329 3	111 5	13 07	21 2
	110	410 2	116 6	16 28	32 4	390 0	123 1	15 48	29 4	369 6	129 1	14 67	26 5
	125	469 0	129 4	18 62	23 2	445 2	136 4	17 68	20 9	421 1	142 7	16 72	18 6
	150	574 3	155 3	22 80	22 3	544 4	163 9	21 61	20 1	514 2	171 6	20 42	18 0
	175	641 8	181 7	25 48	27 6	609 4	190 9	24 19	25 0	576 7	199 2	22 89	22 4
	200	713.3	208.0	28.32	33.9	677.2	217.8	26.88	30.6	640.7	226.6	25.44	27.5
5.0	100	376 5	102 4	14 96	27 5	358 8	108 3	14 25	25 1	340 7	113 6	13 53	22 7
	110	423 6	118 6	16 83	34 5	403 1	125 4	16 01	31 4	382 5	131 7	15 20	28 4
	125	485 2	131 8	19 28	24 9	460 9	139 0	18 31	22 4	436 3	145 6	17 33	20 1
	150	594 3	158 1	23 61	23 8	563 9	167 1	22 40	21 5	533 2	175 1	21 18	19 3
	175	664 2	185 1	26 39	29 5	630 6	194 6	25 05	26 7	596 8	203 3	23 71	24 0
	200	737.6	212.1	29.30	36.2	700.8	222.2	27.84	32.8	663.6	231.4	26.36	29.5
6.0	100	388 7	104 2	15 45	29 3	370 7	110 2	14 74	26 7	352 3	115 8	14 00	24 2
	110	437 2	120 7	17 38	36 7	416 4	127 7	16 55	33 4	395 4	134 3	15 72	30 3
	125	501 6	134 2	19 94	26 7	477 0	141 7	18 96	24 1	451 8	148 5	17 96	21 6
	150	615 2	161 0	24 45	25 5	583 9	170 2	23 21	23 0	552 5	178 6	21 96	20 7
	175	686 8	188 6	27 30	31 5	652 8	198 5	25 95	28 6	618 1	207 4	24 57	25 7
	200	761.8	216.1	30.29	38.6	724.4	226.7	28.80	35.0	687.1	236.2	27.31	31.6
7.0	100	401 0	105 9	15 95	31 1	382 8	112 2	15 23	28 5	364 1	117 9	14 48	25 8
	110	451 0	122 8	17 94	39 1	429 8	130 0	17 10	35 6	408 5	136 8	16 25	32 3
	125	518 3	136 6	20 61	28 6	493 1	144 4	19 61	25 8	467 6	151 5	18 60	23 2
	150	636 1	163 8	25 30	27 2	604 2	173 4	24 03	24 6	572 2	182 1	22 76	22 2
	175	709 5	192 1	28 22	33 6	674 9	202 3	26 84	30 5	639 9	211 7	25 45	27 5
	200	786.9	220.3	31.30	41.1	748.8	231.2	29.79	37.3	710.4	241.1	28.26	33.7
8.0	100	413 5	107 7	16 46	33 1	395 1	114 1	15 72	30 3	376 0	120 1	14 96	27 5
	110	465 1	125 0	18 51	41 5	443 5	132 4	17 65	37 8	421 8	139 4	16 78	34 4
	125	535 3	139 0	21 30	30 5	509 6	147 1	20 28	27 6	483 6	154 4	19 25	24 8
	150	657 1	166 7	26 15	29 0	625 3	176 7	24 88	26 4	592 3	185 7	23 57	23 7
	175	733 1	195 8	29 18	35 9	697 8	206 3	27 77	32 6	661 8	215 9	26 34	29 4
	200	812.5	224.5	32.33	43.8	774.2	235.9	30.81	39.9	734.6	246.0	29.24	36.0
9.0	100	426 5	109 5	16 98	35 1	407 6	116 1	16 23	32 2	388 2	122 3	15 46	29 3
	110	479 3	127 1	19 08	44 0	457 4	134 7	18 21	40 2	435 1	141 9	17 32	36 5
	125	552 5	141 5	22 00	32 6	526 3	149 8	20 96	29 5	499 9	157 4	19 90	26 6
	150	678 8	169 6	27 03	30 9	646 0	179 9	25 72	28 1	613 1	189 3	24 41	25 4
	175	756 9	199 4	30 14	38 2	720 8	210 3	28 70	34 7	684 4	220 3	27 25	31 4
	200	838.4	228.8	33.38	46.6	799.5	240.5	31.83	42.5	759.3	251.1	30.23	38.4
10.0	100	439 5	111 2	17 50	37 2	420 0	118 1	16 73	34 1	400 4	124 4	15 95	31 1
	110	493 8	129 3	19 67	46 6	471 5	137 1	18 78	42 7	448 9	144 6	17 88	38 8
	125	569 6	144 0	22 69	34 7	543 4	152 5	21 65	31 6	516 4	160 4	20 57	28 4
	150	700 9	172 6	27 92	32 9	667 5	183 2	26 59	30 0	633 6	192 9	25 23	27 1
	175	781 1	203 1	31 11	40 6	744 3	214 3	29 65	37 0	707 2	224 7	28 17	33 5
	200	864.8	233.2	34.45	49.5	825.2	245.3	32.87	45.2	784.8	256.3	31.26	41.0
13 0	100	479 4	116 7	19 11	44 1	458 9	124 1	18 30	40 6	438 3	131 1	17 48	37 1
	110	538 4	135 9	21 47	55 2	514 9	144 5	20 53	50 7	491 1	152 6	19 58	46 2
	125	623 8	151 7	24 87	41 9	595 7	161 0	23 75	38 1	567 3	169 7	22 62	34 5
	150	769 6	181 6	30 69	39 6	734 3	193 3	29 28	36 1	698 3	204 0	27 84	32 8
	175	856 1	214 4	34 14	48 6	817 1	226 6	32 58	44 4	777 9	238 1	31 02	40 4
	200	946.7	246.7	37.75	59.1	905.2	259.9	36.09	54.2	862.6	272.0	34.39	49.3
16.0	100	521 0	122 4	20 79	51 9	499 7	130 4	19 94	47 9	478 0	137 9	19 08	44 0
	110	584 8	142 8	23 34	64 8	559 9	152 0	22 34	59 6	534 9	160 8	21 35	54 6
	125	679 6	159 6	27 12	50 0	648 5	169 4	25 88	45 4	616 7	178 5	24 61	41 0
	150	842 2	191 2	33 61	47 2	803 7	203 6	32 07	43 1	763 3	214 9	30 46	39 0
	175	934 0	226 2	37 28	57 7	893 4	239 5	35 65	52 9	852 2	252 0	34 01	48 3
	200	—	260 9	41 18	69 9	988 3	275 1	39 44	64 3	943 6	288 2	37 66	58 8

LEGEND

Cap — Cooling Capacity kW of Refrigeration
kW — Compressor Power Input
LCWT — Leaving Chilled Water Temperature (C)
PD — Pressure Drop (kPa of Water)
Flow Rate — L/s

NOTES:

1 Ratings apply to units with electronic or thermal expansion valves

2 All ratings are based on:
- a A cooler chilled water temperature rise of 6° C When greater accuracy is desired, correct design LCWT, before entering rating tables, by reference to the LCWT correction curve
- b A fouling factor of 0 000088 in the cooler
- c Refrigerant 22

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

$$= \frac{0\ 239 \times \text{capacity in kW}}{\text{temperature rise C}} = \text{L/s}$$

- c Enter cooler pressure drop curve at corrected flow rate and read pressure drop

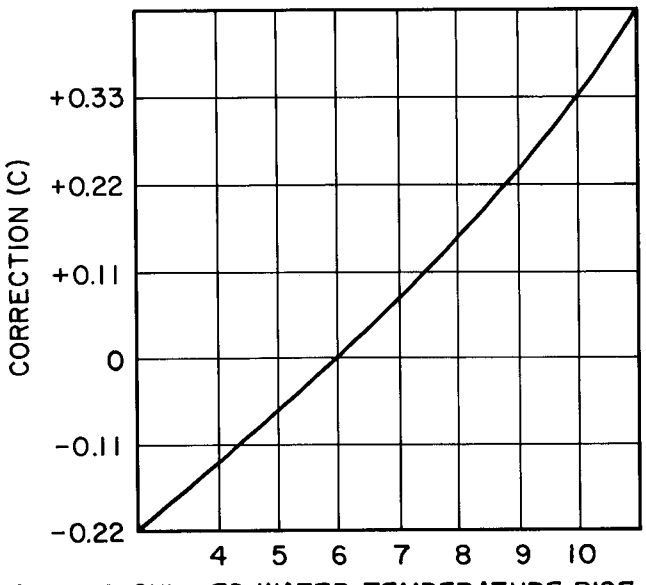
4 When chilled water temperature rise is less than 3° C, the high flow rate will normally be accompanied by an excessive pressure drop In such cases, contact your Carrier representative for special selection of a cooler with wider baffle spacing

Performance data — 30GB100-200

COOLING CAPACITIES — SI (cont)

LCWT	UNIT 30GB	CONDENSER ENTERING AIR TEMPERATURE (C)											
		40				45				50 (Export Only)			
		Cap.	kW	Cooler		Cap	kW	Cooler		Cap.	kW	Cooler	
				Flow Rate	PD			Flow Rate	PD			Flow Rate	PD
4.0	100	311 1	116 1	12 35	19 0	292 7	120 2	11 62	16 9	273 9	123 7	10 87	14 9
	110	349 2	134 8	13 86	23 8	328 5	139 8	13 04	21 1	307 9	144 5	12 22	18 6
	125	396 7	148 3	15 75	16 5	372 0	153 3	14 77	14 5	346 9	157 4	13 77	12 6
	150	484 0	178 4	19 22	16 0	453 1	184 4	17 99	14 1	421 8	189 4	16 75	12 2
	175	542 3	206 4	21 53	19 9	508 7	212 8	20 20	17 6	474 2	218 1	18 83	15 4
	200	603.6	234.1	23.96	24.5	566.2	240.8	22.48	21.7	528.3	246.3	20.97	18.9
5.0	100	322 2	118 4	12 80	20 4	303 5	122 8	12 06	18 2	284 2	126 5	11 29	16 0
	110	361 5	137 5	14 36	25 4	340 4	142 9	13 52	22 7	319 2	147 7	12 68	20 0
	125	411 4	151 5	16 34	17 8	386 2	156 7	15 34	15 7	360 6	161 1	14 33	13 6
	150	502 0	182 2	19 94	17 2	470 4	188 5	18 69	15 1	438 7	193 9	17 43	13 2
	175	562 5	210 9	22 35	21 4	528 3	217 7	20 99	19 0	492 8	223 3	19 58	16 6
	200	625.9	239.3	24.86	26.3	587.7	246.4	23.35	23.3	549.1	252.3	21.82	20.4
6.0	100	333 6	120 8	13 26	21 8	314 3	125 4	12 49	19 4	294 8	129 3	11 72	17 2
	110	373 9	140 3	14 87	27 2	352 4	145 9	14 01	24 3	330 8	151 0	13 15	21 5
	125	426 4	154 7	16 95	19 2	400 5	160 1	15 92	16 9	374 5	164 9	14 89	14 7
	150	520 9	186 1	20 71	18 5	488 4	192 7	19 42	16 3	456 1	198 5	18 13	14 3
	175	582 9	215 4	23 17	23 0	548 1	222 7	21 79	20 4	512 0	228 6	20 35	17 9
	200	648.6	244.6	25.78	28.2	609.7	252.1	24.24	25.0	570.3	258.3	22.67	22.0
7.0	100	345 0	123 2	13 72	23 3	325 4	127 9	12 94	20 8	305 5	132 2	12 15	18 4
	110	386 6	143 1	15 38	29 0	364 7	148 9	14 51	25 9	342 6	154 2	13 63	23 0
	125	441 6	157 9	17 56	20 6	415 2	163 6	16 51	18 2	388 7	168 7	15 46	15 9
	150	539 9	189 9	21 48	19 8	506 8	197 0	20 16	17 5	473 5	203 0	18 83	15 4
	175	603 8	220 0	24 02	24 6	568 2	227 6	22 60	21 9	531 9	234 1	21 16	19 2
	200	671.7	249.9	26.72	30.3	632.0	257.8	25.14	26.9	592.0	264.4	23.55	23.7
8.0	100	356 6	125 5	14 19	24 9	336 7	130 5	13 40	22 3	316 5	135 0	12 59	19 8
	110	399 5	145 9	15 90	30 9	377 2	152 0	15 01	27 7	354 6	157 5	14 11	24 6
	125	457 1	161 1	18 19	22 1	430 2	167 2	17 12	19 6	402 9	172 5	16 04	17 1
	150	559 2	193 8	22 25	21 2	525 6	201 2	20 92	18 8	491 5	207 6	19 56	16 5
	175	625 1	224 7	24 88	26 3	588 5	232 5	23 42	23 4	551 3	239 4	21 94	20 7
	200	695 6	255 3	27 68	32 4	654 9	263.6	26 06	28.8	614.0	270 6	24.43	25.4
9 0	100	368 4	127 9	14 67	26 5	348 1	133 1	13 86	23 8	327 6	137 8	13 04	21 1
	110	412 5	148 7	16 42	33 0	389 9	155 0	15 52	29 5	366 9	160 9	14 61	26 3
	125	473 0	164 4	18 83	23 8	445 5	170 7	17 74	21 0	417 6	176 3	16 63	18 4
	150	579 0	197 8	23 05	22 7	544 6	205 5	21 68	20 2	509 9	212 3	20 30	17 8
	175	647 1	229 4	25 76	28 2	609 5	237 6	24 27	25 1	571 7	244 8	22 76	22 2
	200	719.1	260.6	28.63	34.6	677.8	269.3	26.98	30.8	636.3	276.8	25.33	27.3
10 0	100	380 4	130 3	15 15	28 2	359 8	135 8	14 33	25 3	338 9	140 7	13 50	22 6
	110	425 8	151 6	16 96	35 1	402 9	158 2	16 05	31 5	379 4	164 2	15 11	28 1
	125	489 0	167 7	19 48	25 4	461 0	174 3	18 36	22 6	432 6	180 2	17 23	19 8
	150	599 4	201 8	23 87	24 3	564 1	209 9	22 47	21 6	528 6	216 9	21 05	19 1
	175	669 1	234 1	26 65	30 1	630 6	242 6	25 12	26 8	591 9	250 2	23 58	23 7
	200	743.4	266.1	29.61	36.9	701.4	275.1	27.94	33.0	659.2	283.1	26.26	29.3
13.0	100	417 4	137 6	16 64	33 8	395 9	143 7	15 79	30 5	373 9	149 3	14 91	27 3
	110	466 9	160 3	18 62	41 9	442 4	167 5	17 64	37 8	418 0	174 4	16 67	33 9
	125	538 3	177 7	21 47	31 0	509 1	185 2	20 30	27 7	479 0	191 9	19 10	24 5
	150	661 8	213 8	26 39	29 5	624 7	223 0	24 91	26 4	587 0	231 2	23 41	23 4
	175	738 2	248 6	29 43	36 5	697 6	258 3	27 82	32 7	—	—	—	—
	200	818.9	282.9	32.65	44.6	774.7	293.1	30.89	40.1	—	—	—	—
16.0	100	456 0	145 1	18 20	40 2	433 3	151 8	17 29	36 4	410 4	158 1	16 38	32 8
	110	509 7	169 2	20 34	49 8	483 9	177 1	19 31	45 0	—	—	—	—
	125	584 5	187 0	23 33	36 7	551 7	194 7	22 02	32 7	—	—	—	—
	150	722 8	225 4	28 85	35 1	681 1	234 9	27 18	31 3	—	—	—	—
	175	810 5	263 7	32 34	43 8	767 4	274 3	30 63	39 4	—	—	—	—
	200	898 3	300 3	35 85	53 5	852 3	311 8	34 01	48 3	—	—	—	—

LCWT CORRECTION



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

Performance data (cont)

CAPACITY CONTROL STEPS

UNIT 30GB	CONTROL STEPS	% DISPLACEMENT (Approximate)	LOADING SEQUENCE A (Note 1) Operating				LOADING SEQUENCE B (Note 1) Operating			
			No. of Compr	No. of Cyl	Compressor No. Circuit 1	Compressor No. Circuit 2	No. of Compr	No. of Cyl	Compressor No. Circuit 1	Compressor No. Circuit 2
040 Standard (One Unloader)	1	25 0	1	2	1*	—	—	—	—	—
	2	50 0	1	4	1	—	—	—	—	—
	3	75 0	2	6	1*	2	—	—	—	—
	4	100 0	2	8	1	2	—	—	—	—
040 Accessory Unloader Added to Compressor No. 2	1	25 0	1	2	1*	—	1	2	—	2*
	2	50 0	2	4	1*	2*	2	4	1*	2*
	3	75 0	2	6	1*	2	2	6	1	2*
	4	100 0	2	8	1	2	2	8	1	2
045 Standard (One Unloader)	1	20 0	1	2	1*	—	—	—	—	—
	2	40 0	1	4	1	—	—	—	—	—
	3	80 0	2	8	1*	2	—	—	—	—
	4	100 0	2	10	1	2	—	—	—	—
045 Accessory Unloader Added to Compressor No. 2	1	A 20 0 | B 40 0	1	2	1*	—	1	4	—	2*
	2	60 0	2	6	1*	2*	2	6	1*	2*
	3	80 0	2	8	1*	2	2	8	1	2*
	4	100 0	2	10	1	2	2	10	1	2
055 Standard (One Unloader)	1	33 3	1	4	1*	—	—	—	—	—
	2	50 0	1	6	1	—	—	—	—	—
	3	83 3	2	10	1*	2	—	—	—	—
	4	100 0	2	12	1	2	—	—	—	—
055 Accessory Unloader Added to Compressor No. 2	1	33 3	1	4	1*	—	1	4	—	2*
	2	66 7	2	8	1*	2*	2	8	1*	2*
	3	83 3	2	10	1*	2	2	10	1	2*
	4	100 0	2	12	1	2	2	12	1	2
070 Standard (One Unloader)	1	25 0	1	4	1*	—	—	—	—	—
	2	37 5	1	6	1	—	—	—	—	—
	3	62 5	2	10	1*	3	—	—	—	—
	4	75 0	2	12	1	3	—	—	—	—
	5	87 5	3	14	1*,2	3	—	—	—	—
	6	100.0	3	16	1,2	3	—	—	—	—
070 Accessory Unloader Added to Compressor No. 3	1	25 0	1	4	1*	—	1	4	—	3*
	2	50 0	2	8	1*	3*	2	8	1*	3*
	3	62 5	2	10	1*	3	2	10	1	3*
	4	75 0	2	12	1	3	2	12	1	3
	5	87 5	3	14	1*,2	3	3	14	1*,2	3
	6	100.0	3	16	1,2	3	3	16	1,2	3
075 Standard	1	22	1	4	1*	—	—	—	—	—
	2	33	1	6	1	—	—	—	—	—
	3	56	2	10	1*	3	—	—	—	—
	4	67	2	12	1	3	—	—	—	—
	5	89	3	16	1*,2	3	—	—	—	—
	6	100	3	18	1,2	3	—	—	—	—
075 Accessory Unloader Added to Compressor No. 3	1	22	1	4	1*	—	1	4	—	3*
	2	44	2	8	1*	3*	2	8	1*	3*
	3	56	2	10	1*	3	2	10	1	3*
	4	67	2	12	1	3	2	12	1	3
	5	89	3	16	1*,2	3	3	16	1*,2	3
	6	100	3	18	1,2	3	3	18	1,2	3
090,100 Standard	1	25	1	6	1	—	1	6	—	3
	2	50	2	12	1	3	2	12	1	3
	3	75	3	18	1,2	3	3	18	1	3,4
	4	100	4	24	1,2	3,4	4	24	1,2	3,4
090,100 Accessory Unloader Added to Compressor No. 1	1	17	1	4	1*	—	—	—	—	—
	2	25	1	6	1	—	—	—	—	—
	3	42	2	10	1*	3	—	—	—	—
	4	50	2	12	1	3	—	—	—	—
	5	67	3	16	1*,2	3	—	—	—	—
	6	75	3	18	1,2	3	—	—	—	—
	7	92	4	22	1*,2	3,4	—	—	—	—
	8	100	4	24	1,2	3,4	—	—	—	—
090,100 Accessory Unloaders Added to Compr No. 1 & 3	1	17	1	4	1*	—	1	4	—	3*
	2	33	2	8	1*	3*	2	8	1*	3*
	3	42	2	10	1*	3	2	10	1	3*
	4	50	2	12	1	3	2	12	1	3
	5	67	3	16	1*,2	3	3	16	1	3*,4
	6	75	3	18	1,2	3	3	18	1	3,4
	7	92	4	22	1*,2	3,4	4	22	1,2	3*,4
	8	100	4	24	1,2	3,4	4	24	1,2	3,4
110, 125 Standard	1	20	1	6	1	—	1	6	—	4
	2	40	2	12	1	4	2	12	1	4
	3	60	3	18	1,2	4	3	18	1	4,5
	4	80	4	24	1,2	4,5	4	24	1,2	4,5
	5	100	5	30	1,2,3	4,5	5	30	1,2,3	4,5
110, 125 Accessory Unloader Added to Compr No. 1	1	13	1	4	1*	—	—	—	—	—
	2	20	1	6	1	—	—	—	—	—
	3	33	2	10	1*	4	—	—	—	—
	4	40	2	12	1	4	—	—	—	—
	5	53	3	16	1*,2	4	—	—	—	—
	6	60	3	18	1,2	4	—	—	—	—
	7	73	4	22	1*,2	4,5	—	—	—	—
	8	80	4	24	1,2	4,5	—	—	—	—
	9	93	5	28	1*,2,3	4,5	—	—	—	—
	10	100	5	30	1,2,3	4,5	—	—	—	—

Performance data (cont)

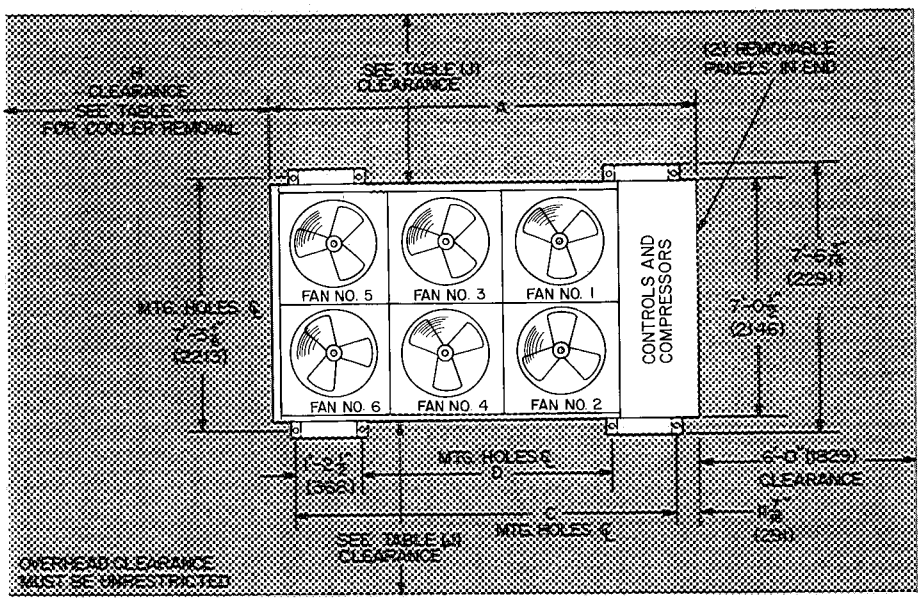
CAPACITY CONTROL STEPS (cont)

UNIT 30GB	CONTROL STEPS	% DISPLACEMENT (Approximate)	LOADING SEQUENCE A (Note 1)				LOADING SEQUENCE B (Note 1)			
			Operating				Operating			
			No. of Compr	No. of Cyl	Compressor No.		No. of Compr	No of Cyl	Compressor No.	
					Circuit 1	Circuit 2			Circuit 1	Circuit 2
110, 125 Accessory Unloaders Added to Compr No. 1 & 4	1	13	1	4	1*	—	1	4	—	4*
	2	27	2	8	1*	4*	2	8	1*	4*
	3	33	2	10	1*	4	2	10	1	4*
	4	40	2	12	1	4	2	12	1	4
	5	53	3	16	1*,2	4	3	16	1	4*,5
	6	60	3	18	1,2	4	3	18	1	4,5
	7	73	4	22	1*,2	4,5	4	22	1,2	4*,5
	8	80	4	24	1,2	4,5	4	24	1,2	4,5
	9	93	5	28	1*,2,3	4,5	5	28	1,2,3	4*,5
	10	100	5	30	1,2,3	4,5	5	30	1,2,3	4,5
150 Standard	1	17	1	6	1	—	1	6	—	4
	2	33	2	12	1	4	2	12	1	4
	3	50	3	18	1,2	4	3	18	1	4,5
	4	67	4	24	1,2	4,5	4	24	1,2	4,5
	5	83	5	30	1,2,3	4,5	5	30	1,2	4,5,6
	6	100	6	36	1,2,3	4,5,6	6	36	1,2,3	4,5,6
150 Accessory Unloader Added to Compr No. 1	1	11	1	4	1*	—	—	—	—	—
	2	17	1	6	1	—	—	—	—	—
	3	28	2	10	1*	4	—	—	—	—
	4	33	2	12	1	4	—	—	—	—
	5	44	3	16	1*,2	4	—	—	—	—
	6	50	3	18	1,2	4	—	—	—	—
	7	61	4	22	1*,2	4,5	—	—	—	—
	8	67	4	24	1,2	4,5	—	—	—	—
	9	78	5	28	1*,2,3	4,5	—	—	—	—
	10	83	5	30	1,2,3	4,5	—	—	—	—
	11	94	6	34	1*,2,3	4,5,6	—	—	—	—
	12	100	6	36	1,2,3	4,5,6	—	—	—	—
150 Accessory Unloaders Added to Compr No 1 & 4	1	11	1	4	1*	—	1	4	—	4*
	2	22	2	8	1*	4*	2	8	1*	4*
	3	28	2	10	1*	4	2	10	1	4*
	4	33	2	12	1	4	2	12	1	4
	5	44	3	16	1*,2	4	3	16	1	4*,5
	6	50	3	18	1,2	4	3	18	1	4,5
	7	61	4	22	1*,2	4,5	4	22	1,2	4*,5
	8	67	4	24	1,2	4,5	4	24	1,2	4,5
	9	78	5	28	1*,2,3	4,5	5	28	1,2	4*,5,6
	10	83	5	30	1,2,3	4,5	5	30	1,2	4,5,6
	11	94	6	34	1*,2,3	4,5,6	6	34	1,2,3	4*,5,6
	12	100	6	36	1,2,3	4,5,6	6	36	1,2,3	4,5,6
175 Standard (Note 3)	1	14	1	6	1	—	1	6	—	5
	2	29	2	12	1	5	2	12	1	5
	3	43	3	18	1,2	5	3	18	1	5,6
	4	57	4	24	1,2	5,6	4	24	1,2	5,6
	5	71	5	30	1,2,3	5,6	5	30	1,2	5,6,7
	6	86	6	36	1,2,3	5,6,7	6	36	1,2,3	5,6,7
	7	100	7	42	1,2,3,4	5,6,7	7	42	1,2,3,4	5,6,7
200 Standard (Note 3)	1	13	1	6	1	—	1	6	—	5
	2	25	2	12	1	5	2	12	1	5
	3	38	3	18	1,2	5	3	18	1	5,6
	4	50	4	24	1,2	5,6	4	24	1,2	5,6
	5	63	5	30	1,2,3	5,6	5	30	1,2	5,6,7
	6	75	6	36	1,2,3	5,6,7	6	36	1,2,3	5,6,7
	7	88	7	42	1,2,3,4	5,6,7	7	42	1,2,3	5,6,7,8
	8	100	8	48	1,2,3,4	5,6,7,8	8	48	1,2,3,4	5,6,7,8

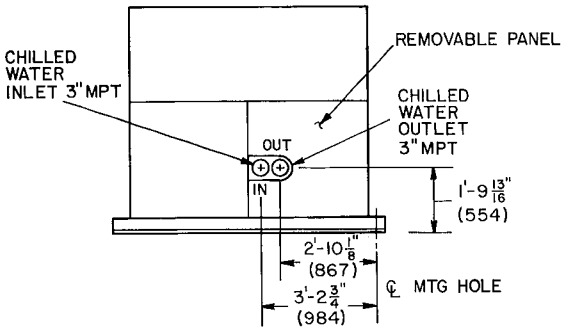
*Compressor unloaded

NOTES:
1 The microprocessor has a random number generator that selects loading sequence A or B, which in turn determines the compressor circuit that is energized first This evens out operating hours on each circuit over an extended period of time.
2 If unit operation is anticipated with system load below minimum unloaded capacity of chiller:
  a Consider using 2 smaller units in place of larger unit
  b Increase *water loop volume* to ensure adequate run time (see Application Data)
3 Accessory unloaders cannot be added to 30GB175 and 200 units

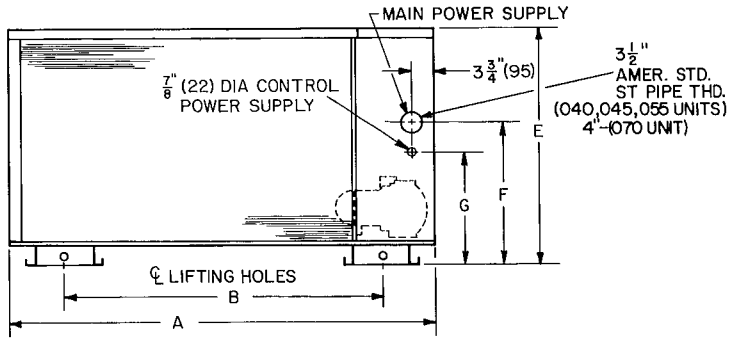
Dimensions (30GB040-070)



TOP VIEW



COOLER END VIEW



SIDE VIEW

Space for service and airflow

DIMENSIONS $\frac{\text{ft-in.}}{(\text{mm})}$

DIM	UNIT 30GB		
	040	045,055	070
A	11-10⅜ (3616)	13-7⅛ (4162)	
B	9-4⅞ (2867)	11-3 (3429)	
C	10-7⅜ (3235)	12-5½ (3797)	
D	8-2⅜ (2499)	10-0½ (3061)	
E	4-8 3/16 (1427)	5-8 3/32 (1730)	7-4⅛ (2238)
F	4-3 13/16 (1316)	5-3¾ (1619)	6-0 15/16 (1853)
G	3-6¾ (1086)	4-6⅝ (1387)	4-11¼ (1505)
H	7-5 (2261)	7-6 (2286)	10-4 (3150)
J	5-0 (1524)		7-0 (2134)

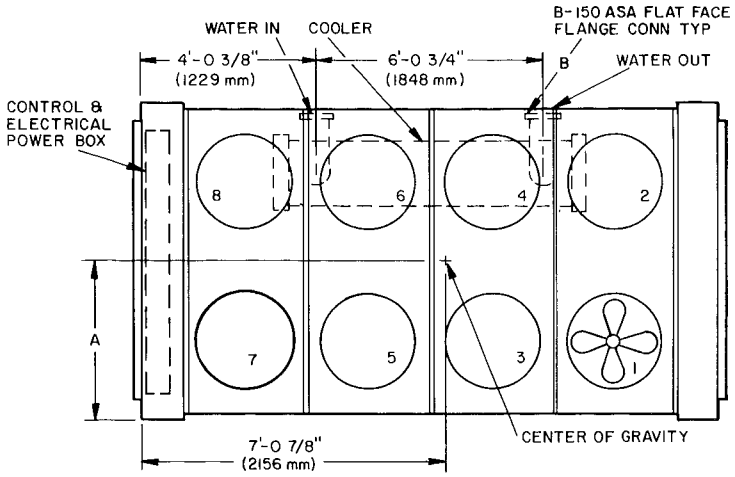
Dimensions (30GB075-100)

NOTE: Unit must have clearances as follows:
Top — Do not restrict in any way.
Ends — 3'-0" (1524 mm)
Sides — 6'-0" (1829 mm)

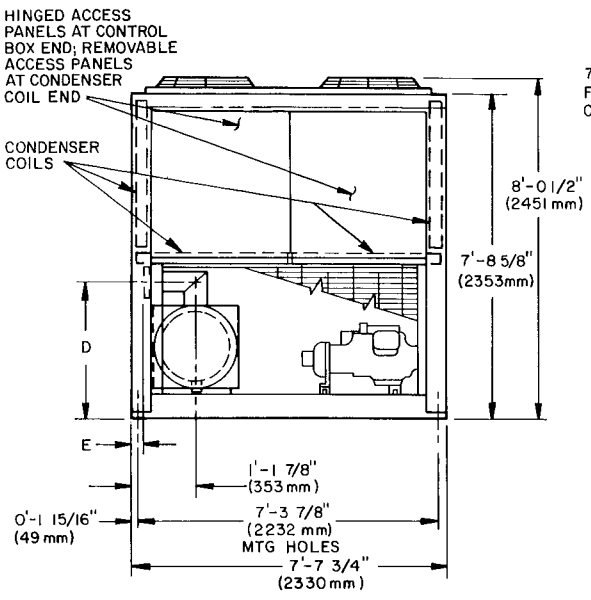
DIMENSIONS $\frac{\text{ft-in.}}{(\text{mm})}$

DIM	UNIT 30GB	
	075,090	100
A	3-5 15/16* (1065)	3-8 5/16 (1125)
B	0-4 (102)	0-5 (127)
C	0-6 7/16 (164)	0-6 3/8 (162)
D	2-2 3/16 (665)	2-4 15/16 (735)
E	0-1 1/8 (28)	0-1 13/16 (46)

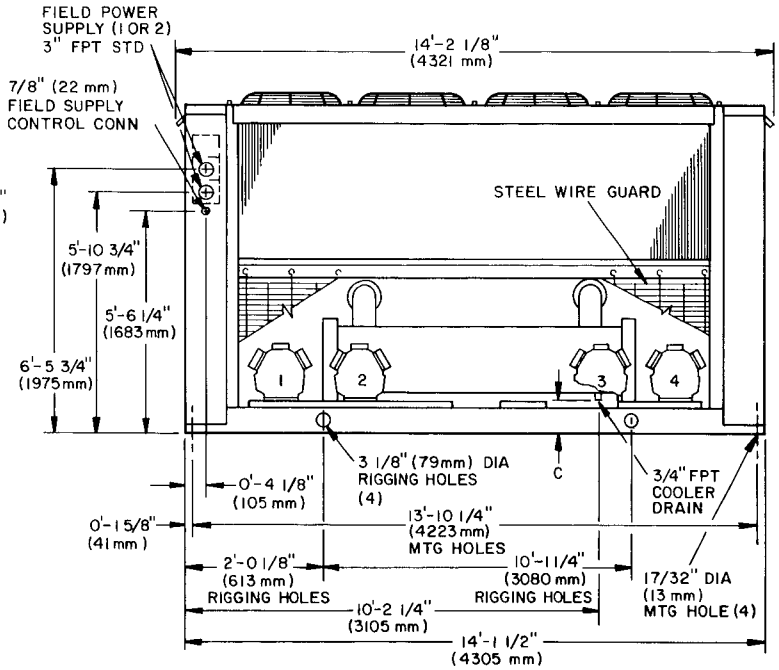
*090 only (see 075 below)



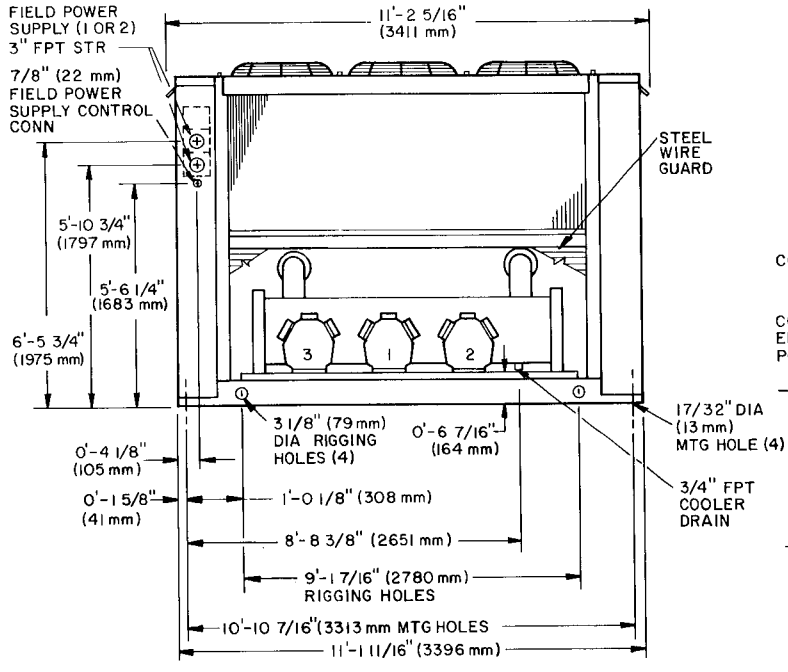
TOP VIEW (30GB090,100)



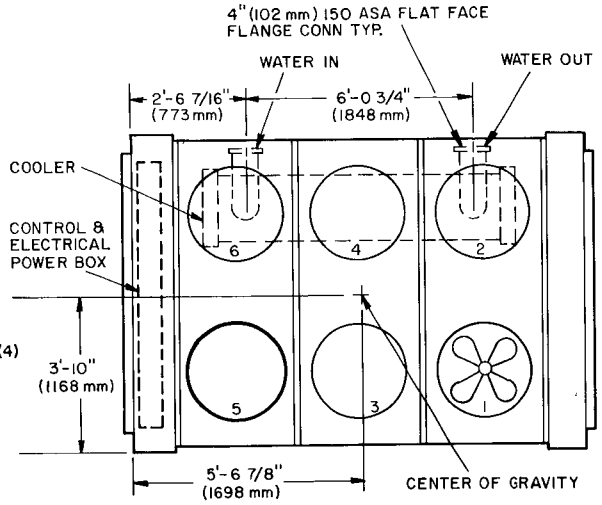
END VIEW (075,090,100)



SIDE VIEW (30GB090,100)

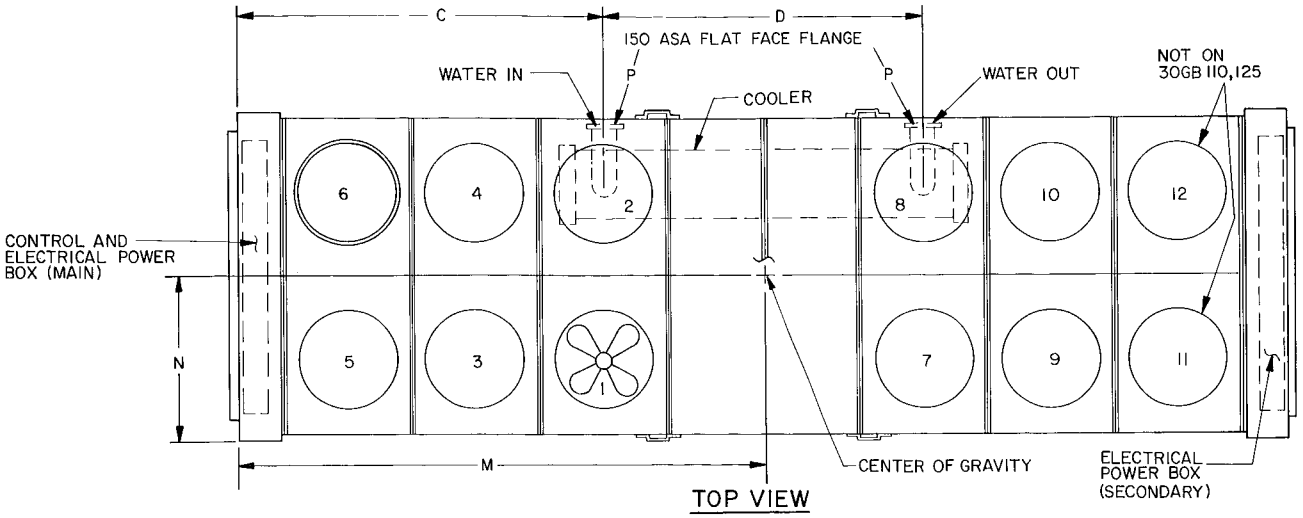


SIDE VIEW (30GB075)

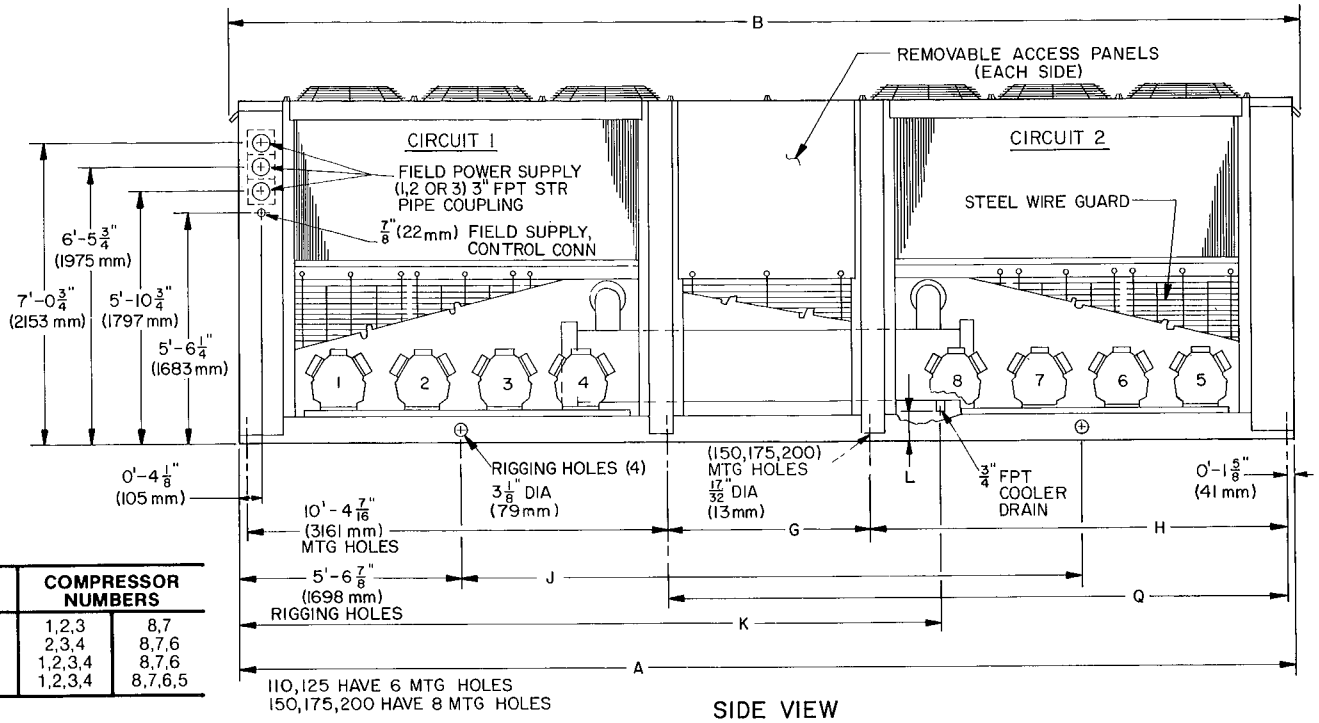


TOP VIEW (30GB075)

Dimensions (30GB110-200)

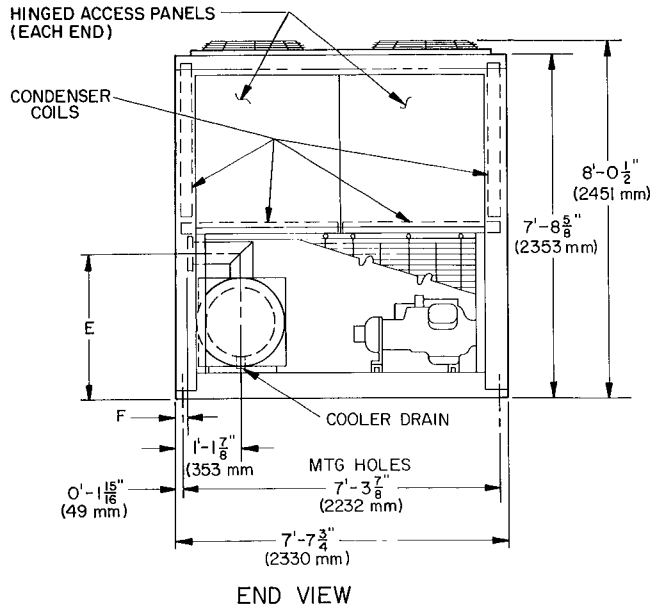


TOP VIEW



30GB SIZES	COMPRESSOR NUMBERS	
110, 125	1,2,3	8,7
150	2,3,4	8,7,6
175	1,2,3,4	8,7,6
200	1,2,3,4	8,7,6,5

SIDE VIEW



END VIEW

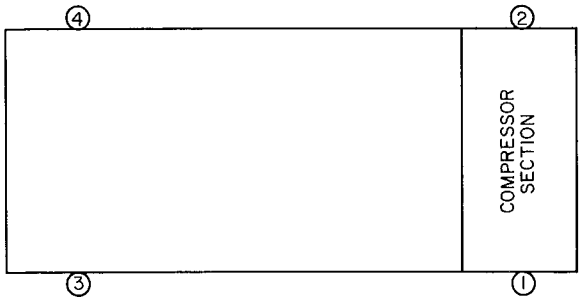
DIMENSIONS ft-in. / (mm)

DIM	UNIT 30GB					DIM.	UNIT 30GB				
	110	125	150	175	200		110	125	150	175	200
A	21-7 5/16 (6586)		24-7 1/8 (7496)			J	12-6 (3810)		13-5 7/16 (4100)		
B	21-7 15/16 (6602)		24-7 3/4 (7512)			K	15-2 1/16 (4625)	16-5 1/16 (5005)	16-5 (5004)		
C	9-0 3/16 (2748)	8-3 7/16 (2525)	8-5 1/4 (2572)			L	0-6 3/8 (162)		0-6 1/2 (165)		
D	6-0 3/4 (1848)	8-0 5/16 (2446)	7-8 1/2 (2350)			M	10-10 1/2 (3315)	10-6 1/4 (3207)	12-3 5/16 (3748)		
E	2-4 1/16 (735)	2-4 1/16 (716)	2-8 1/4 (819)			N	3-8 3/4 (1137)	3-6 3/4 (1086)	3-9 3/8 (1165)		
F	0-1 13/16 (46)	0-2 9/16 (65)	0-2 1/2 (64)			P	0-5 (127)	0-6 (152)	0-6 (152)		
G	—		3-7 (1092)			Q	10-11 5/8 (3343)		—		
H	—		10-4 1/16 (3161)								

NOTE: Unit must have clearances as follows:
Top — Do not restrict in any way
Ends — 3.0" (1524 mm)
Sides — 6.0" (1829 mm)

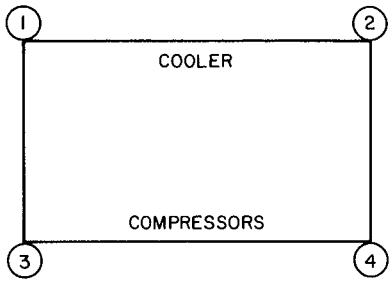
Mounting weights (approximate) lb (kg)

30GB040-070 WEIGHT DISTRIBUTION



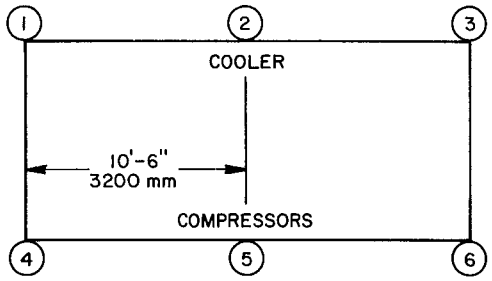
SUPPORT POINTS	UNIT 30GB			
	040	045	055	070
1	1255 (569)	1385 (628)	1528 (693)	1974 (895)
2	1255 (569)	1385 (628)	1528 (693)	1974 (895)
3	635 (288)	740 (336)	872 (396)	1126 (511)
4	635 (288)	740 (336)	872 (396)	1126 (511)

30GB075-100 WEIGHT DISTRIBUTION



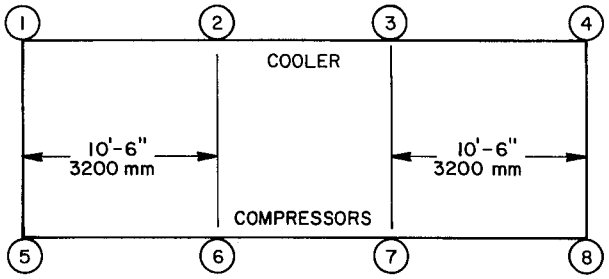
SUPPORT POINTS	UNIT 30GB		
	075	090	100
1	1840 (835)	1790 (814)	2088 (949)
2	1750 (794)	1790 (814)	2088 (949)
3	1700 (771)	1970 (895)	2172 (987)
4	1610 (730)	1970 (895)	2172 (987)

30GB110,125 WEIGHT DISTRIBUTION



SUPPORT POINTS	UNIT 30GB	
	110	125
1	1172 (533)	1430 (650)
2	2450 (1114)	2713 (1233)
3	1297 (590)	1394 (634)
4	1658 (754)	1697 (771)
5	2236 (1016)	2404 (1093)
6	1532 (696)	1412 (642)

30GB150-200 WEIGHT DISTRIBUTION



SUPPORT POINTS	UNIT 30GB		
	150	175	200
1	1261 (573)	1350 (614)	1350 (614)
2	2230 (1014)	2250 (1023)	2250 (1023)
3	2230 (1014)	2230 (1014)	2250 (1023)
4	1261 (573)	1261 (573)	1350 (614)
5	1353 (615)	1675 (761)	1675 (761)
6	2200 (1000)	2275 (1034)	2275 (1034)
7	2200 (1000)	2200 (1000)	2275 (1034)
8	1353 (615)	1353 (615)	1675 (761)

Electrical data — 60 Hz

30GB	UNIT						COMPRESSORS†						FAN MOTORS‡			
	Volts			MCA	MOPA (Fuse)	ICF	RLA (ea)		LRA (ea)		Total MTA		Total kW	FLA (each)	MTA (FCB)	Hp Ea. Fan (NEC)
	Nameplate	Supplied*					Compressor No.				CB No.					
		Min	Max				1	2	1	2	1	2				
040	208-230	187	254	187	250	429	76	76	345	345	106	106	1 28	4 6	21	0 43
	380	*342*	*418*	*104*	*125*	*240*	*39*	*39*	*191*	*191*	*54*	*54*	*1 28*	*4 6*	*21*	*0 43*
	460	414	508	89	125	213	36	36	173	173	50	50	1 28	2 3	14	0 43
	575	518	632	74	80	153	30	30	120	120	42	42	1.28	1.8	14	0.43
							1	**2**	**1**	**2**	**1**	**2**				
045	208-230	187	254	241	350	590	76	119	345	506	106	166	1 92	4 6	21	0 43
	380	*342*	*418*	*143*	*200*	*265*	*39*	*64*	*191*	*280*	*54*	*89*	*1 92*	*4 6*	*21*	*0 43*
	460	414	508	111	150	293	36	53	173	253	50	73	1 92	2 3	14	0 43
	575	518	632	93	100	209	30	45	120	176	42	63	1 92	1 8	14	0 43
							1	**2**	**1**	**2**	**1**	**2**				
055	208-230	187	254	284	400	633	119	119	506	506	166	166	1 92	4 6	21	0 43
	380	*342*	*418*	*168*	*250*	*354*	*64*	*64*	*280*	*280*	*89*	*89*	*1 92*	*4 6*	*21*	*0 43*
	460	414	508	128	175	310	53	53	253	253	73	73	1.92	2 3	14	0 43
	575	518	632	108	125	224	45	45	176	176	63	63	1.92	1.8	14	0.43
							1,3	**2**	**1,3**	**2**	**1,3**	**2**				
070	208-230	187	254	383	500	623	119	76	506	345	166	106	9 3	6 6	74	1 75
	380	*342*	*418*	*226*	*250*	*341*	*64*	*39*	*280*	*191*	*89*	*54*	*9 3*	*3 6*	*32*	*1 75*
	460	414	508	173	225	297	53	36	253	173	73	50	9 3	3 0	28	1 75
	575	518	632	146	150	225	45	30	176	120	63	42	9.3	2.4	22	1.75
							1,2	**3**	**1,2**	**3**	**1,2**	**3**				
075	208-230	187	254	397 1	500	766	110 0	110 0	506	506	154	154	9 3	6 6	74	1 75
	380	*342*	*418*	*226 4*	*250*	*428*	*63 0*	*63 0*	*280*	*280*	*89*	*89*	*9 3*	*3 6*	*37*	*1 75*
	460	414	508	187 3	225	376	52 1	52 1	253	253	73	73	9 3	3 0	28	1 75
	575	518	632	160.7	200	281	45.0	45.0	176	176	63	63	9.3	2.4	22	1.75
							1,2	**3,4**	**1,2**	**3,4**	**1,2**	**3,4**				
090	208-230	187	254	490 1	500	808	102 9	102 9	446	446	144	144	12 4	6 6	74	1 75
	380	*342*	*418*	*265 5*	*300*	*443*	*55 7*	*55 7*	*247*	*247*	*78*	*78*	*12 4*	*3 6*	*37*	*1 75*
	460	414	508	215 5	250	382	45 0	45 0	223	223	63	63	12 4	3 0	28	1 75
	575	518	632	204 0	250	314	43 5	43 5	164	164	61	61	12 4	2 4	22	1 75
							1,2	**3,4**	**1,2**	**3,4**	**1,2**	**3,4**				
100	208-230	187	254	520 3	600	889	110 0	110 0	506	506	154	154	12 4	6 6	74	1 75
	380	*342*	*418*	*296 6*	*350*	*498*	*63 0*	*63 0*	*280*	*280*	*88*	*88*	*12 4*	*3 6*	*37*	*1 75*
	460	414	508	245 4	300	434	52 1	52 1	253	253	73	73	12 4	3 0	28	1 75
	575	518	632	210.5	250	330	45.0	45.0	176	176	63	63	12.4	2.4	22	1.75
							1,2,3	**4,5**	**1,2,3**	**4,5**	**1,2,3**	**4,5**				
110	208-230	187	254	622 2	700	938	102 9	110 0	446	506	144	154	15 5	6 6	74	1 75
	380	*342*	*418*	*344 9*	*400*	*521*	*55 7*	*63 0*	*247*	*280*	*78*	*88*	*15 5*	*3 6*	*37*	*1 75*
	460	414	508	282 2	300	447	45 0	52 1	223	253	63	73	15 5	3 0	28	1 75
	575	518	632	255.8	300	376	43.5	45.0	164	176	61	63	15.5	2.4	22	1.75
							1,2,3	**4,5**	**1,2,3**	**4,5**	**1,2,3**	**4,5**				
125	208-230	187	254	643 5	700	1012	110 0	110 0	506	506	154	154	15 5	6 6	74	1 75
	380	*342*	*418*	*366 8*	*400*	*568*	*63 0*	*63 0*	*280*	*280*	*88*	*88*	*15 5*	*3 6*	*37*	*1 75*
	460	414	508	303 5	350	492	52 1	52 1	253	253	73	73	15 5	3 0	28	1 75
	575	518	632	260 3	300	380	45 0	45 0	176	176	63	63	15 5	2 4	22	1 75
							1,2,3	**4,5,6**	**1,2,3**	**4,5,6**	**1,2,3**	**4,5,6**				
150	208-230	187	253	767	1000	1136	110 0	110 0	506	506	154	154	18 6	6 6	74	1 75
	380	*342*	*418*	*437*	*500*	*638*	*63 0*	*63 0*	*280*	*280*	*88*	*88*	*18 6*	*3 6*	*37*	*1 75*
	460	414	508	362	450	550	52 0	52 0	253	253	73	73	18 6	3 0	28	1 75
	575	518	632	310	400	430	45 0	45 0	176	176	63	63	18 6	2 4	22	1 75
							1,2,3,4	**5,6,7**	**1,2,3,4**	**5,6,7**	**1,2,3,4**	**5,6,7**				
175	208-230	187	253	877	1000	1246	110 0	110 0	506	506	154	154	18 6	6 6	74	1 75
	208-230	*187*	*253*	*907*	*1000*	*1267*	*117 1*	*110 0*	*506*	*506*	*164*	*154*	*18 6*	*6 6*	*74*	*1 75*
	380	*342*	*418*	*500*	*500*	*701*	*63 0*	*63 0*	*280*	*280*	*88*	*88*	*18 6*	*3 6*	*37*	*1 75*
	460	414	508	414	500	602	52 0	52 0	253	253	73	73	18 6	3 0	28	1 75
	575	518	632	355	400	475	45.0	45.0	176	176	63	63	18.6	2.4	22	1.75
							1,2,3,4	**5,6,7,8**	**1,2,3,4**	**5,6,7,8**	**1,2,3,4**	**5,6,7,8**				
200	208-230	187	253	987	1200	1356	110 0	110 0	506	506	154	154	18 6	6 6	74	1 75
	208-230	*187*	*253*	*1045*	*1200*	*1405*	*117 1*	*117 1*	*506*	*506*	*164*	*164*	*18 6*	*6 6*	*74*	*1 75*
	380	*342*	*418*	*563*	*600*	*764*	*63 0*	*63 0*	*280*	*280*	*88*	*88*	*18 6*	*3 6*	*37*	*1 75*
	460	414	508	466	600	654	52 0	52 0	253	253	73	73	18 6	3 0	28	1 75
	575	518	632	400	450	520	45.0	45.0	176	176	63	63	18 6	2.4	22	1.75

Italics denote export unit (not for sale in U S A)

NOTE: As shipped, all units are 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

LEGEND

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

†30GB040,045,055 have 2 compressors; 30GB070 and 075 have 3 compressors; 30GB090 and 100 have 4 compressors; 30GB110 and 125 have 5 compressors; 30GB150 has 6 compressors; 30GB175 has 7 compressors; 30GB200 has 8 compressors
‡30GB040-055 fan motors single-phase; all others 3 phase
30GB040 through 100: one FCB for all fans
30GB110 through 200: one FCB for each circuit

GENERAL ELECTRICAL NOTES:

1 Unit listings are:
UL — Underwriters Laboratories: 30GB040 through 30GB070
ETL — ETL Testing Laboratories: 30GB075 through 30GB200

2 Electrical data based on unit conforming to ARI Standard 590, Section 8 1 *Maximum Loading Conditions* (115 F ambient at -10% voltage)

3 All units have single-location power connection to simplify field-power wiring Main power must be supplied from a field-supplied fused disconnect Unit must be properly grounded

4 Control circuit power must be supplied from a separate source through a field-supplied fused disconnect (See Note 12)

5 Crankcase and cooler heaters are wired into the control circuit so they are always operable as long as the control circuit power supply disconnect is on, even if any safety device is open or the unit ON-OFF switch is off

6 Heaters are wired ahead of the control circuit fuse; thus, they are protected by the overcurrent protective device in the control circuit power supply

Electrical data — 60 Hz (cont)

7 On 208-230/3/60 units:
30GB040,045,055 have one terminal block, with 3 conductors from the fused disconnect
30GB070-100 have 2 terminal blocks and require 6 parallel conductors from the fused disconnect
30GB110-200 have 3 terminal blocks and require 9 parallel conductors from the fused disconnect

8 On 380/3/60 units (export only):
30GB040,045,055 have one terminal block, with 4 conductors from fused disconnect
30GB070-100 have one terminal block, with 3 conductors from fused disconnect
30GB110-200 have 2 terminal blocks and require 6 parallel conductors from fused disconnect

9 On 460,575/3/60 units:
30GB040-125 have one terminal block, with 3 conductors from fused disconnect
30GB150-200 have 2 terminal blocks and require 6 parallel conductors from fused disconnect

10 Maximum incoming wire size for each terminal block is 500 MCM

11 The 208-230-volt 30GB200 units must have copper main power conductors to meet NEC requirements

12 Amperage required for control circuit is as follows:

UNIT 30GB	POWER SUPPLY	CONTROL CIRCUIT	
		Power	Amps
040-200	*380/3/60*	*230/1/60*	*15*
040-070	208-230/3/60, 460/3/60, 575/3/60	115/1/60	15
075,090,100			20
110,125			25
150,175,200			30

Italics denote export unit (not for sale in U S A)

13 Power draw of control circuits includes both crankcase heaters and cooler heaters Each compressor has a crankcase heater which draws 200 watts of power:
Cooler heaters:
040-070 — 360 watts — band heaters (360 watts total)
075-110 — 2 cable heaters (210 watts each)
125-200 — 4 cable heaters (210 watts each)

Controls

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

The microprocessor routine is started by switching control circuit ON-OFF circuit breaker switch to ON. (This switch is also used to reset microprocessor should any safety trip and also functions as circuit breaker for electronic processor and relay boards.)

When the switch is closed, a 2-minute initialization routine is begun. During this time, inputs are checked, EXV and internal constants are initialized and a **20** appears on display. If display button is pushed during this period, control goes into a 42-step Quick Test routine, normally used for a readiness check during start-up, or for service.

Microprocessor controls capacity of chiller by cycling compressors and unloaders on and off at a rate to satisfy actual dynamic load conditions. Control will maintain leaving water temperature set with dial on display board through intelligent cycling of compressors. Accuracy will depend on loop volume, loop flow rate, load, outside air temperature, number of stages, and particular stage being cycled off. No adjustment for cooling range or cooler flow rate is required, because the control automatically compensates for cooling range by measuring both return water temperature and leaving water temperature. This is referred to as *leaving water temperature control with return water temperature compensation*

The basic logic for determining when to add or remove a stage is a time band integration of deviation from set point plus rate of change of leaving water temperature. When leaving water temperature is close to set point and slowly moving closer, logic prevents addition of another stage. If leaving water temperature is less than 35 F (1 7 C) for water, or 6°F (21°C) below the set point for brine units, the unit is shut off until the water temperature goes 6°F (3.3°C) above the set point, to protect against freezing.

If 1°F/minute (0.6°C/minute) pulldown control has been selected (factory setting), no additional steps of capacity will be added as long as difference between leaving water temperature and set point is greater than 4°F (2 2°C) and rate of change in leaving water temperature is less than 1°F/minute (0.6°C/minute).

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

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

The control also performs other special functions when turning on or off. When a circuit is to be turned off, EXV is closed first and compressor is run for an additional 10 seconds to pump out refrigerant that was in the cooler. Again, at start-up, if compressor hasn't run in the last 15 minutes, EXV is held closed for 10 seconds while compressor runs to pump out any refrigerant that has

Controls (cont)

migrated to the cooler. The oil pressure switch is bypassed for one minute during start-up and for 45 seconds during normal operation.

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

T1	Cooler leaving chilled water temperature
T2	Cooler entering water (return temperature)
T3	Saturated condensing temperature — Circuit #1
T4	Saturated condensing temperature — Circuit #2
T5	Cooler saturation temperature — Circuit #1
T6	Cooler saturation temperature — Circuit #2
T7	Return gas temperature entering compressor cylinder — Circuit #1
T8	Return gas temperature entering compressor cylinder — Circuit #2
T10	Remote temperature sensor (accessory)

The microprocessor uses these temperatures to control capacity, fan cycling and electronic expansion valve (EXV) operation

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

The EXV is used to control superheat in compressor. Two thermistors in each circuit (T5 and T7/T6 and T8) are used to determine superheat. One thermistor (T5/T6) is located in cooler and other (T7/T8) in compressor after motor in the gas passage entering the cylinders. The EXV is controlled to maintain superheat entering pistons at approximately 15 F (8.3 C) to 20 F (11 1 C), which results in slightly superheated refrigerant leaving cooler.

Both on shutdown and start-up, unless compressor has run in last 15 minutes, compressor runs for 10 seconds, while EXV is closed and removes refrigerant from cooler. 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 water temperatures, up to 95 F (35 C), without overloading compressor. Another feature that is factory set (which may be eliminated in the field by repositioning a dip switch on the microprocessor) limits rate of pulldown to 1°F (0.6°C) per minute thereby reducing the kW demand on start-up

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

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

Compressor protection and control system (CPCS) (30GB070-200) — Compressor protection boards are used to control and protect compressors. One board is used for each compressor to control compressor contactor(s) and crankcase heater(s) in response to a command from microprocessor. The board also provides compressor ground current protection, shutting off compressor if a 2 to 3 ampere ground current is sensed by a toroid around the compressor power leads. A high-pressure protector and a discharge gas temperature protector are connected in series with CPCS board, so that if they open, compressor stops. Microprocessor senses this through feedback switch input.

The CPCS control system is standard on 30GB070-200 units and available as an accessory on 30GB040-055 units. The 30GB040-055 units are factory equipped with a control relay that operates same as CPCS except that ground current refrigerant circuit protection is not provided

Complete electronic control system contains several additional components

Relay board — Relay board, connected to microprocessor by a ribbon cable, drives all of 24-v, 115-v, or 230-v loads. Relays control compressors, fans, and unloaders, if used

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

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

CODE	STATUS
1. **0-12**	Capacity stage Number of stages in operation
2. **20-24**	Operating Mode
20	Initialization
21	Temperature Reset
22	Demand Limit
24	Pulldown Control
3. **51-87**	Overload Codes Alarm light/circuit energized. NOTE. These codes take priority.
51-58	Compressor fault
59,60	Loss of charge (circuit 1, circuit 2)
61	Low water flow
63,64	Low oil pressure (circuit 1, circuit 2)
65	Low water temperature
70	Illegal configuration
71-80	Thermistor failure
81-87	Reset/Set Point/Limit Failure

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

Control sequence

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

Start-up — After control circuit ON-OFF circuit breaker switched ON, prestart process takes place for 2 minutes, when microprocessor checks itself and waits for temperature to stabilize. First circuit to start may be no. 1 or no. 2, (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 water temperature decrease (start-up only) to 1°F (0.6 C) per minute.

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

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

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

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

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

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

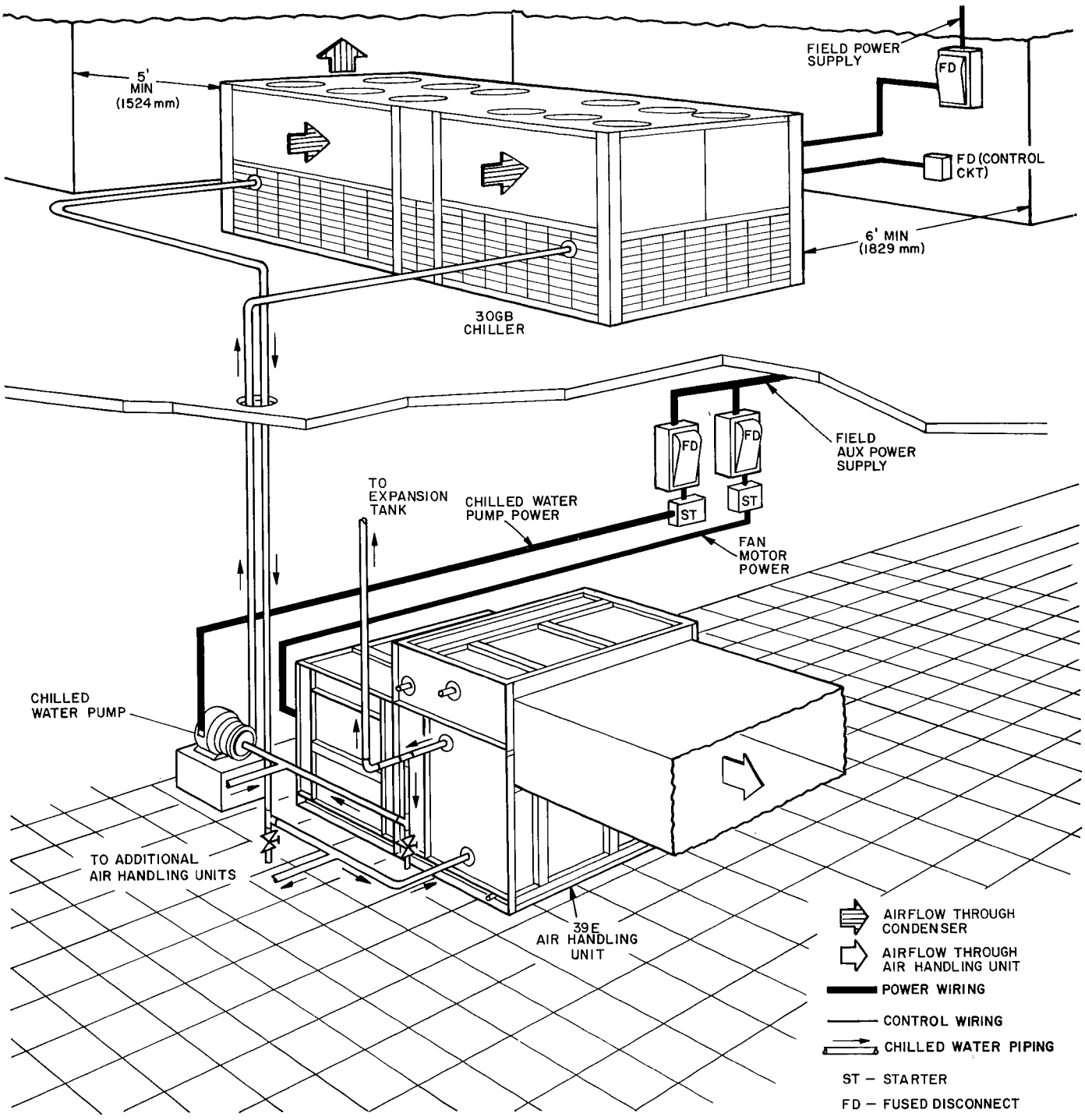
Electronic expansion valve and outdoor fan control — Expansion valve opens and closes on signal from microprocessor to maintain an approximate 20 F (11 C) refrigerant superheat entering the compressor cylinders. (The compressor motor increases the refrigerant superheat from the approximate 5 F [3 C]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

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

Safeties include: *Oil-pressure switch* cuts out if pressure differential is below minimum. Switch is bypassed on start-up for 45 seconds. *Loss-of-charge switch* cuts out if system pressure drops below minimum. *High-pressure switch* cuts out compressors if compressor discharge pressure increases to 395 psig (2724 kPa) (426 psig [2937 kPa] on overseas 30GB). *Discharge gas thermostat* opens when discharge gas temperature exceeds maximum 295 F (146 C) *Ground current safety* opens on sensing a current-to-ground in compressor windings in excess of 2.5 amps *Loss of flow protection* provided by temperature differences between entering and leaving water temperature sensors. Flow switch is not required. *Freeze-up protection* provided by leaving water temperature sensor if cooler temperature drops to 35 F (1.8 C) *Sensor failures* are detected by the microprocessor

Diagnostics — Microprocessor may be put through Quick Test (see Controls and Troubleshooting book) without additional equipment or tools Quick Test confirms microprocessor is functional, informs observer through LED display the condition of each sensor and switch in chiller, and allows observer to check for proper operation of fans and compressor(s).

Illustrative piping and wiring



NOTES:
1 30GB chiller must be installed *level* to maintain proper compressor oil return
2 Wiring and piping shown are general points-of-connection guides only and are not intended for a specific installation Wiring and piping shown are for a quick overview of system and not in accordance with recognized standards
3 All wiring must comply with applicable local and national codes
4 All piping must follow standard piping techniques Refer to Carrier System Design Manual or appropriate ASHRAE handbook for details
5 See *Application* data for minimum system water volume This may require the addition of a holding tank to ensure adequate volume

Guide specifications

1. GENERAL
   - 1.1 Furnish and install complete, factory-assembled air-cooled reciprocating liquid chiller units of the type, size and capacity shown on the equipment schedules. Unit shall be for outdoor use and rated in accordance with ARI Standard 590 latest edition
   - 1.2 Equipment schedules and specifications are based on Carrier Model 30GB_____.
   - 1.3 Reciprocating liquid chillers specified in this section are of the air-cooled single-piece unit packaged type
   - 1.4 Units shall be of the packaged air-cooled type as shown on the drawings and consist of a reciprocating compressor or multiples thereof, direct-expansion liquid cooler, air-cooled condenser and factory wiring and piping contained within the unit enclosure. Unit shall contain a complete operating charge of refrigerant R-22.
   - 1.5 Unit shall contain factory-installed diagnostic system, capable of indicating status of all safeties and energizing remote alarm
   - 1.6 Unit construction shall comply with ANSI B9.1 safety code, NEC (National Electrical Code) and ASME Code.
   - 1.7 Unit shall be capable of starting with up to 95 F (35 C) entering water temperature to the cooler.
   - 1.8 Unit shall control leaving water temperature ±_____ F (_____C) from design point.
   - 1.9 Unit shall be listed with UL or ETL.
2. UNIT CASING
   - 2.1 Unit shall be enclosed in a galvanized steel casing, zinc phosphatized, and coated with a baked enamel finish, capable of withstanding Federal Test Method Standard No. 141 (Method 6061) 500-hour salt spray test.
3. COMPRESSOR
   - 3.1 Each compressor shall be of the reciprocating serviceable hermetic type only, and shall be equipped with an automatically reversible oil pump, operating oil charge, suction and discharge shutoff valves, and shall be factory mounted on spring vibration isolators
   - 3.2 Compressor motor shall be cooled by suction gas passing around motor winding and shall be thermally protected. Manual restart shall be required after stoppage due to thermal and pressure overload.
   - 3.3 Each compressor shall be equipped with an insert type crankcase heater factory sized to control oil dilution during shutdown.
   - 3.4 Compressor speed shall not exceed 1750 rpm (29.2 rps).
4. COOLER
   - 4.1 Cooler shall be shell-and-tube type, with removable heads. Seamless copper tubes shall be rolled into tube sheets.
   - 4.2 Cooler shall be tested and stamped in accordance with ASME code for refrigerant side working pressure of 235 psig (1620 kPa) and a minimum waterside working pressure of 150 psig (1034 kPa).
   - 4.3 Shell shall be insulated with a minimum of 3/4-in. (19-mm) closed cell polyvinyl chloride (PVC) foam insulation of maximum K factor 0.28. Heaters along the shell, under the insulation, shall protect cooler against freeze-up down to 10 F (-12 C).
   - 4.4 Cooler shall have 2 independent direct-expansion refrigerant circuits for all models.
5. CONDENSER
   - 5 1 Air-cooled condenser coils shall have aluminum (copper) fins mechanically bonded to seamless copper tubes, cleaned, dehydrated, sealed, leak tested at 150 psig (1034 kPa) and pressure tested at 450 psig (3103 kPa)
   - 5.2 Condenser fans shall be propeller type with PVC-coated steel wire safety guards, balanced statically and dynamically and discharge vertically.
   - 5 3 Condenser fan motors shall have inherent overcurrent protection
6. REFRIGERANT COMPONENTS
   - 6.1 Refrigerant circuit components shall include hot-gas muffler, high side pressure relief device, liquid-line shutoff valve, replaceable-core filter drier, moisture indicating sight glass, and stepper motor actuated electronic expansion valve (or thermal expansion valve).
   - 6.2 Expansion valves shall have maximum operating pressure characteristics to limit inlet suction pressure.
   - 6.3 If unloaders are to be used, they shall be electrically actuated suction cutoff cylinder unloaders.
   - 6.4 The 30GB075-200 units shall include suction and discharge pressure gages with manual shutoff valves. For 30GB040-070 units, gages are available as accessories.
7. CHILLER CONTROLS
   - 7 1 Unit controls, including microprocessor, shall be factory mounted and wired in a weatherproof enclosure with hinged access doors for easy access The 30GB090-200 units shall have automatic lead-lag (available for 30GB040-075 with accessory unloader package). All units shall have pumpdown at beginning and end of every circuit cooling cycle, loss-of-charge protection, inherent low water flow protection, low chilled water temperature safety, low- and high-suction superheat protection for each circuit. Units 30GB070-200 shall have low oil pressure protection for each circuit, individual solid-state compressor protection board and ground current protection for each compressor (accessories for 30GB040-055). All units shall have low control voltage to unit, field power and control circuit terminal blocks, compressor and fan motor circuit breakers, control circuit breaker, ON/OFF switch, replaceable relay board, leaving chilled water set point board, and a diagnostic digital display module, a microprocessor board, a temperature reset board (accessory).
   - 7 2 Unit shall control capacity based upon leaving water temperature and will be compensated by return water temperature.

Guide specifications (cont)

7.3 *Capacity control* — Chillers shall have no less than 4 steps of control for Models 040-055, 090 and 100; 5 steps for Models 110, 125; 6 steps for Models 070, 075 and 150, 7 steps for Model 175 and 8 steps for Model 200.

7.4 For Models 070 through 200, electronic ground current sensing device shall be included for each compressor to monitor the compressor 3-phase power supply (available as accessory for 30GB040-055 units). It shall be activated when no more than 2 5 amps is measured to ground and shall deactivate the compressor to prevent formation of compressor contaminants.

8. ELECTRICAL REQUIREMENTS

8.1 Unit primary electrical power supply shall be connected at a single location on unit.

8.2 Unit shall be capable of operation on _____ volt, 3-phase, 60 cycle supply. Control voltage shall be provided by a separate single-phase power supply_____v. The unit (LRA) ICF shall not exceed _____ amps.

8.3 Each compressor motor shall be operated and protected against electrical overload by means of definite-purpose contactors and calibrated, ambient-compensated, magnetic-trip circuit breakers. The circuit breakers shall open all 3 phases in the event of overload in any one phase, single phasing or phase reversal and shall be manually reset.

8.4 Electrical requirements for unit for sizing of wiring and overcurrent protection devices shall be selected to allow unit operation at ARI Standard 590, Section 8.1. *Maximum Loading Conditions* (115 F ambient temperature at 10% under voltage).

9 WARRANTY

9 1 The manufacturer shall provide a one-year parts warranty on the compressors (with optional 4-year extension) and a one-year parts warranty on other unit components.

Specifiers note — Application of 30GB outdoor chillers for brine duty within the 39.9F to 34F (4.4C to 1°C) range is possible with proper field change of control configuration. Application in the range 34F to 15F (1°C to -9.4C) requires 30GB unit with factory modification.