



Advance Product Data

30HX076-271 Fluid-Cooled and Condenserless Chillers 50/60 Hz

75 to 260 Tons (265 to 915 kW)

Quality Assurance



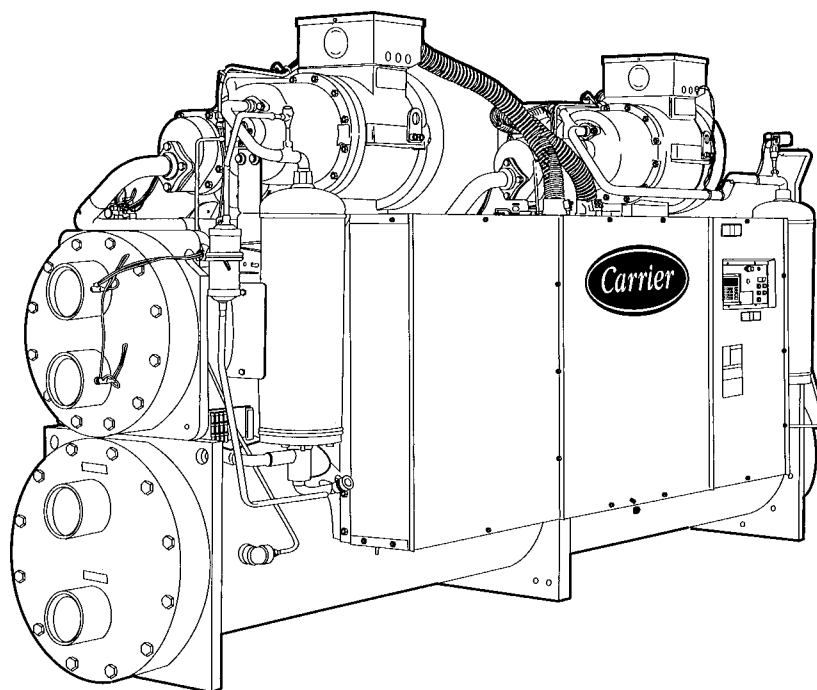
Approvals:

ISO 9002

EN 29002

BS5750 PART 2

ANSI/ASQC Q92



Fluid-cooled and condenserless chillers designed from the ground up to meet the needs of today and tomorrow, including:

- Fits through a standard door with no disassembly required
- Chlorine-free HFC-134a refrigerant
- Smooth compression using screw compressors
- Mechanically cleanable coolers and condensers (HXC)

Features/Benefits

Quality design and construction make the 30HXC (Fluid Cooled) and the 30HXA (Condenserless) units the preferred choice

Easy installation

The 30HX has a compact design that fits through a standard door opening and requires minimal indoor space. The 30HX is delivered as a complete package for easy installation. There are no extra controls, clocks, starters, or other items to install.

The 30HX also provides a single point electrical power entrance (using the accessory field-installed control transformer) and quick, easy piping using either welded or accessory victaulic-type clamp-on couplings for the cooler.

The 30HX 208/230-v and 460-v units are designed in accordance with UL (Underwriters' Laboratory, U S A) and the 575-v units are designed in accordance with CSA (Canadian Standards Association) to minimize electrical inspections.

A quick start-up is assured once installation is complete, since each 30HX unit is manufactured at an ISO 9002-listed manufacturing facility to guarantee quality. In addition, all units are tested under full load at the factory to provide reliable start-up

Easy to live with

The 30HX units have a quiet, low-vibration design featuring screw compressors.

Efficiency levels of the 30HX units exceed minimums established by ASHRAE (American Society of Heating and Refrigeration Engineers) and CSA for both full- and part-load operation, thus saving on operating costs through lower electrical

costs. All 30HX units are also ARI (Air Conditioning and Refrigeration Institute, U.S.A.) certified.

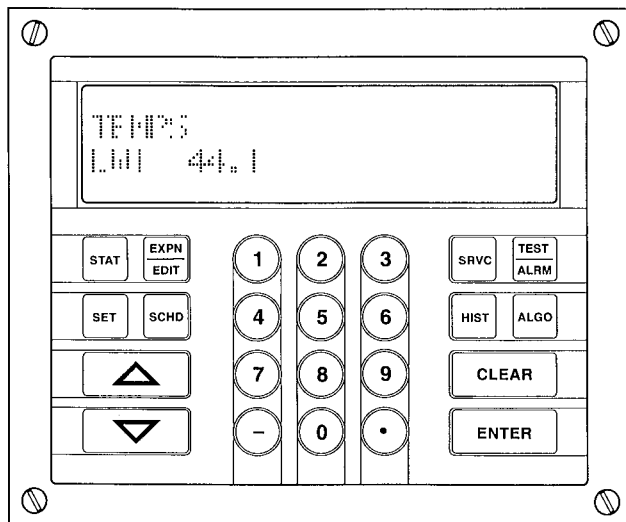
The 30HX controls are fully automatic. The leaving-fluid temperature is directly controlled, and the entering-fluid temperature is continuously monitored to detect load and flow changes. This combination provides the most precise temperature control available.

Dual, independent refrigerant circuits provide reliable, dependable cooling, and the 30HX units use medium-pressure HFC-134a refrigerant to minimize stress on the compressors and ensure a long life.

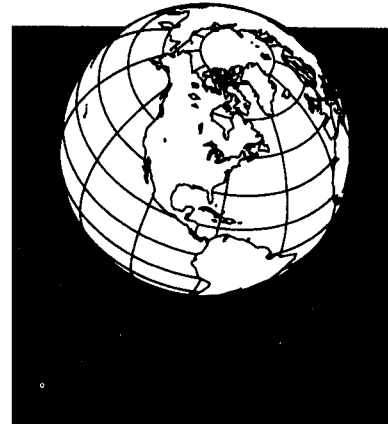
From a service standpoint, the 30HX units offers the following features:

- Use of HFC-134a refrigerant, which has no planned phase-out in its future
- Mechanically-cleanable cooler and condenser (30HXC units)
- Twin screw compressors which require no routine service or maintenance
- Easily accessed suction and discharge pressure and temperature information using either standard or accessory display module

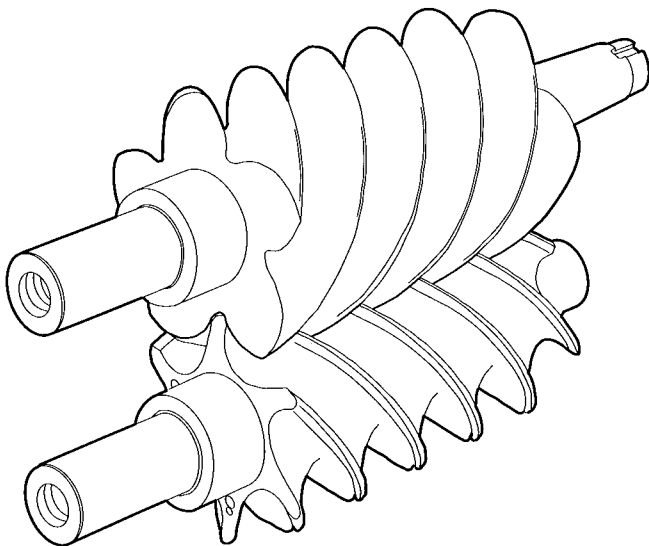
STANDARD DISPLAY MODULE



ENVIRONMENTAL LEADERSHIP



TWIN-SCREW COMPRESSOR DESIGN



HIGH-EFFICIENCY, CLEANABLE COOLER

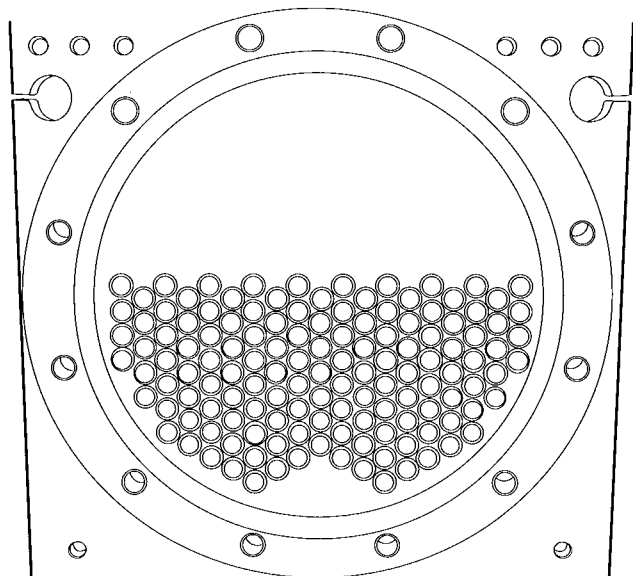
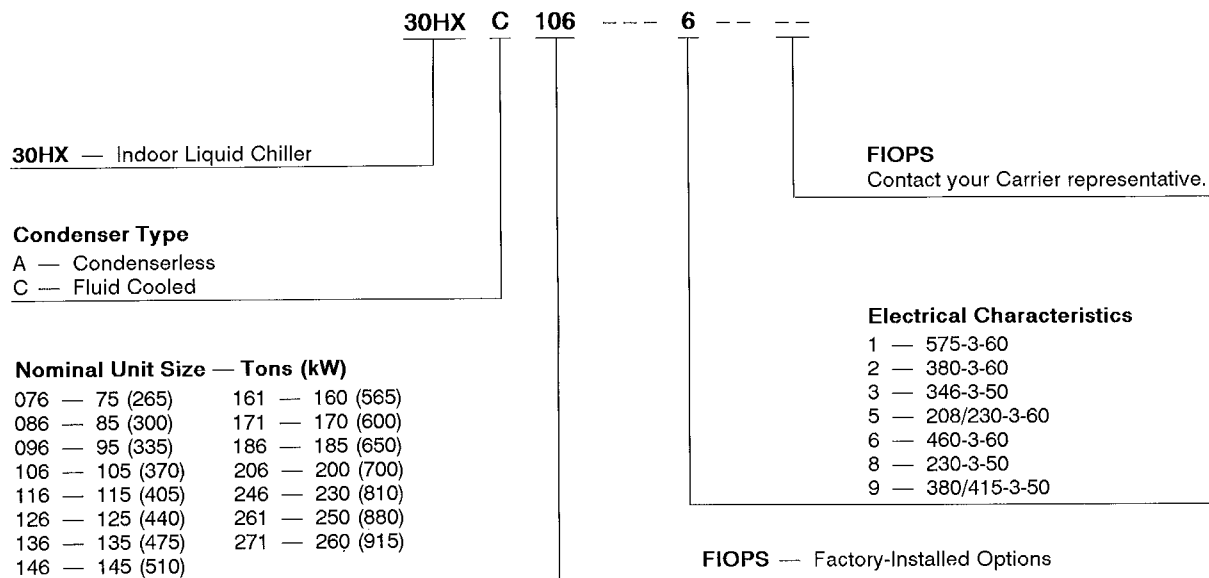


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Model number nomenclature



Physical data, English

UNIT SIZE	076	086	096	106	116	126	136	146	161
UNIT WEIGHT (lb)*									
Fluid Cooled	5700	5723	5855	6177	6415	6465	6688	6718	7452
Condenserless	4717	4744	4835	5151	5162	5205	5308	5333	5752
COMPRESSORS	Semi-Hermetic, Twin Screw								
Quantity	2	2	2	2	2	2	2	2	2
Nominal Capacity per Compressor (tons)	39/39	46/39	56/39	66/39	66/46	66/56	80/56	66/80	56/80
Economizer	No	No	No	No	No	No	No	No	Yes
No. Capacity Steps									
Standard	5	5	5	5	5	5	5	5	5
Optional	6	6	6	6	6	6	6	6	6
Minimum Step Capacity (%)									
Standard	20	20	20	20	20	20	20	20	20
Optional	10	10	10	10	10	10	10	10	10
REFRIGERANT	HFC-134a								
COOLER TYPE	Shell and Tube with Enhanced Copper Tubes								
Net Fluid Volume (gal)	17 0	17 0	19 0	22 6	21 4	21 4	24 0	24 0	28 5
Maximum Refrigerant Pressure (psig)	220	220	220	220	220	220	220	220	220
Maximum Fluid-Side Pressure (psig)	300	300	300	300	300	300	300	300	300
CONDENSER (Water Cooled)	Shell and Tube with Enhanced Copper Tubes								
Net Fluid Volume (gal)	16 8	16 8	18 3	18 3	23 9	23 9	27 5	27 5	30 6
Maximum Refrigerant Pressure (psig)	220	220	220	220	220	220	220	220	220
Maximum Water-Side Pressure (psig)	300	300	300	300	300	300	300	300	300
CONDENSERLESS									
Maximum Refrigerant Pressure (psig)	320	320	320	320	320	320	320	320	320

UNIT SIZE	171	186	206	246	261	271
UNIT WEIGHT (lb)*						
Fluid Cooled	7660	7854	10,457	10,914	10,944	11,006
Condenserless	5777	5946	7,509	7,686	7,701	7,716
COMPRESSORS	Semi-Hermetic, Twin Screw					
Quantity	2	2	3	3	3	3
Nominal Capacity per Compressor (tons)	66/80	80/80	66/39/80	80/56/80	80/66/80	80/80/80
Economizer	Yes	Yes	Yes	Yes	Yes	Yes
No. Capacity Steps						
Standard	5	5	7	7	7	7
Optional	6	6	9	9	9	9
Minimum Step Capacity (%)						
Standard	20	20	15	15	15	15
Optional	10	10	10	10	10	10
REFRIGERANT	HFC-134a					
COOLER TYPE	Shell and Tube with Enhanced Copper Tubes					
Net Fluid Volume (gal)	28 5	33 4	43 0	47 3	47 3	47 3
Maximum Refrigerant Pressure (psig)	220	220	220	220	220	220
Maximum Fluid-Side Pressure (psig)	300	300	300	300	300	300
CONDENSER (Water Cooled)	Shell and Tube with Enhanced Copper Tubes					
Net Fluid Volume (gal)	37 6	37 6	47 0	55 1	55 1	55 1
Maximum Refrigerant Pressure (psig)	220	220	220	220	220	220
Maximum Water-Side Pressure (psig)	300	300	300	300	300	300
CONDENSERLESS						
Maximum Refrigerant Pressure (psig)	320	320	320	320	320	320

*Weight includes weight of water or brine and refrigerant

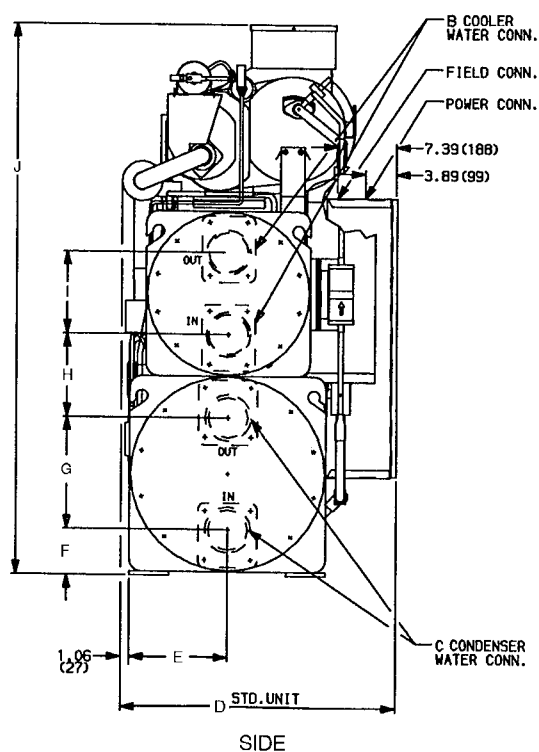
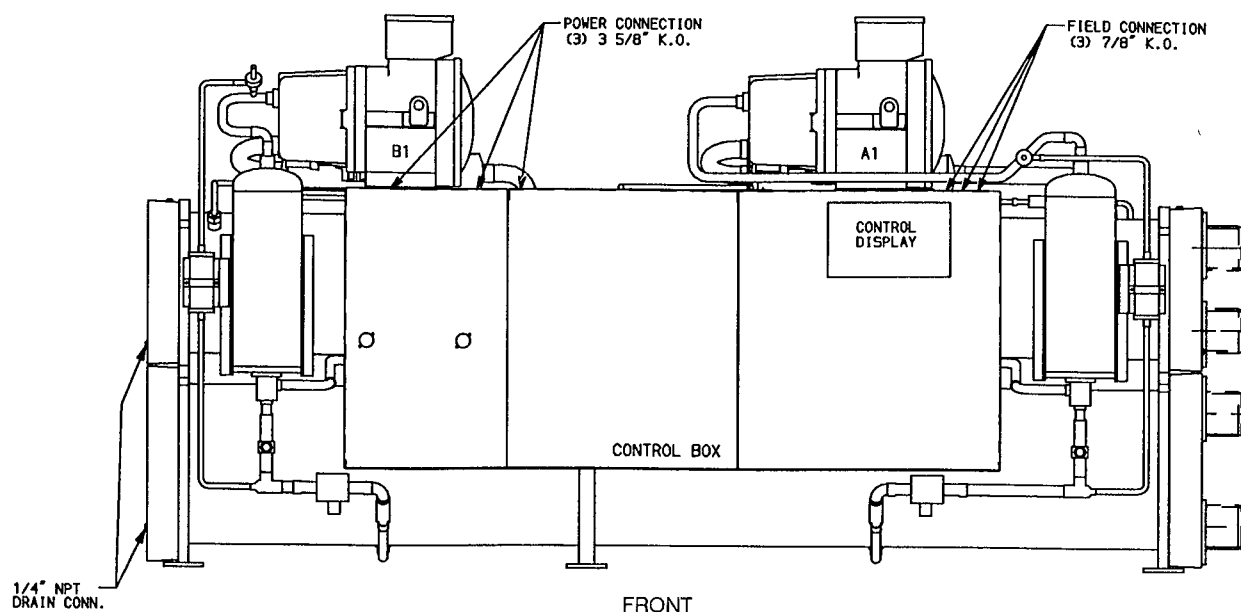
Physical data, SI

UNIT SIZE	076	086	096	106	116	126	136	146	161
UNIT WEIGHT (Kg)*									
Fluid Cooled	2586	2596	2656	2802	2910	2933	3034	3047	3380
Condenserless	2140	2152	2193	2336	2341	2361	2408	2419	2609
COMPRESSORS	Semi-Hermetic, Twin Screw								
Quantity	2	2	2	2	2	2	2	2	2
Nominal Capacity per Compressor (kW)	137/137	162/137	197/137	232/137	232/137	232/197	281/197	232/281	197/281
Economizer	No	No	No	No	No	No	No	No	Yes
No. Capacity Steps									
Standard	5	5	5	5	5	5	5	5	5
Optional	6	6	6	6	6	6	6	6	6
Minimum Step Capacity (%)									
Standard	20	20	20	20	20	20	20	20	20
Optional	10	10	10	10	10	10	10	10	10
REFRIGERANT	HFC-134a								
COOLER TYPE	Shell and Tube with Enhanced Copper Tubes								
Net Fluid Volume (L)	64.3	64.3	71.9	85.5	81.0	81.0	90.8	90.8	107.9
Maximum Refrigerant Pressure (kPa)	1517	1517	1517	1517	1517	1517	1517	1517	1517
Maximum Fluid-Side Pressure (kPa)	2068	2068	2068	2068	2068	2068	2068	2068	2068
CONDENSER (Water Cooled)	Shell and Tube with Enhanced Copper Tubes								
Net Fluid Volume (L)	63.6	63.6	69.3	69.3	90.5	90.5	104.1	104.1	115.8
Maximum Refrigerant Pressure (kPa)	1517	1517	1517	1517	1517	1517	1517	1517	1517
Maximum Water-Side Pressure (kPa)	2068	2068	2068	2068	2068	2068	2068	2068	2068
CONDENSERLESS									
Maximum Refrigerant Pressure (kPa)	2205	2205	2205	2205	2205	2205	2205	2205	2205

UNIT SIZE	071	086	206	246	261	271
UNIT WEIGHT (Kg)*						
Fluid Cooled	3476	3563	4743	4951	4964	4993
Condenserless	2620	2697	3406	3487	3493	3500
COMPRESSORS	Semi-Hermetic, Twin Screw					
Quantity	2	2	3	3	3	3
Nominal Capacity per Compressor (kW)	232/281	281/281	232/137/281	281/197/181	281/232/281	281/281/281
Economizer	Yes	Yes	Yes	Yes	Yes	Yes
No. Capacity Steps						
Standard	5	5	7	7	7	7
Optional	6	6	9	9	9	9
Minimum Step Capacity (%)						
Standard	20	20	15	15	15	15
Optional	10	10	10	10	10	10
REFRIGERANT	HFC-134a					
COOLER TYPE	Shell and Tube with Enhanced Copper Tubes					
Net Fluid Volume (L)	107.9	126.4	162.8	179.0	179.0	179.0
Maximum Refrigerant Pressure (kPa)	1517	1517	1517	1517	1517	1517
Maximum Fluid-Side Pressure (kPa)	2068	2068	2068	2068	2068	2068
CONDENSER (Water Cooled)	Shell and Tube with Enhanced Copper Tubes					
Net Fluid Volume (L)	142.3	142.3	177.9	208.6	208.6	208.6
Maximum Refrigerant Pressure (kPa)	1517	1517	1517	1517	1517	1517
Maximum Water-Side Pressure (kPa)	2068	2068	2068	2068	2068	2068
CONDENSERLESS						
Maximum Refrigerant Pressure (psig)	2205	2205	2205	2205	2205	2205

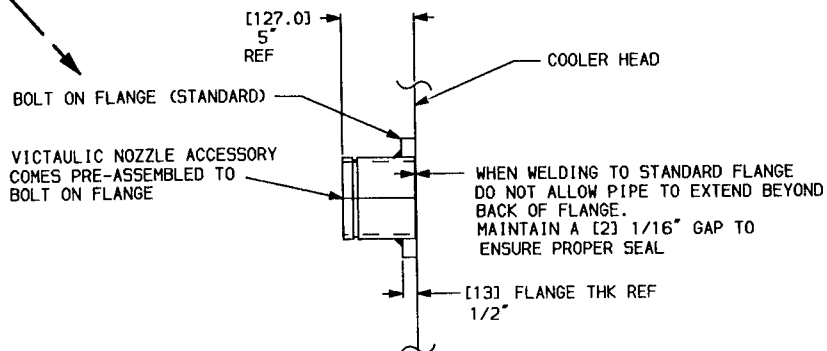
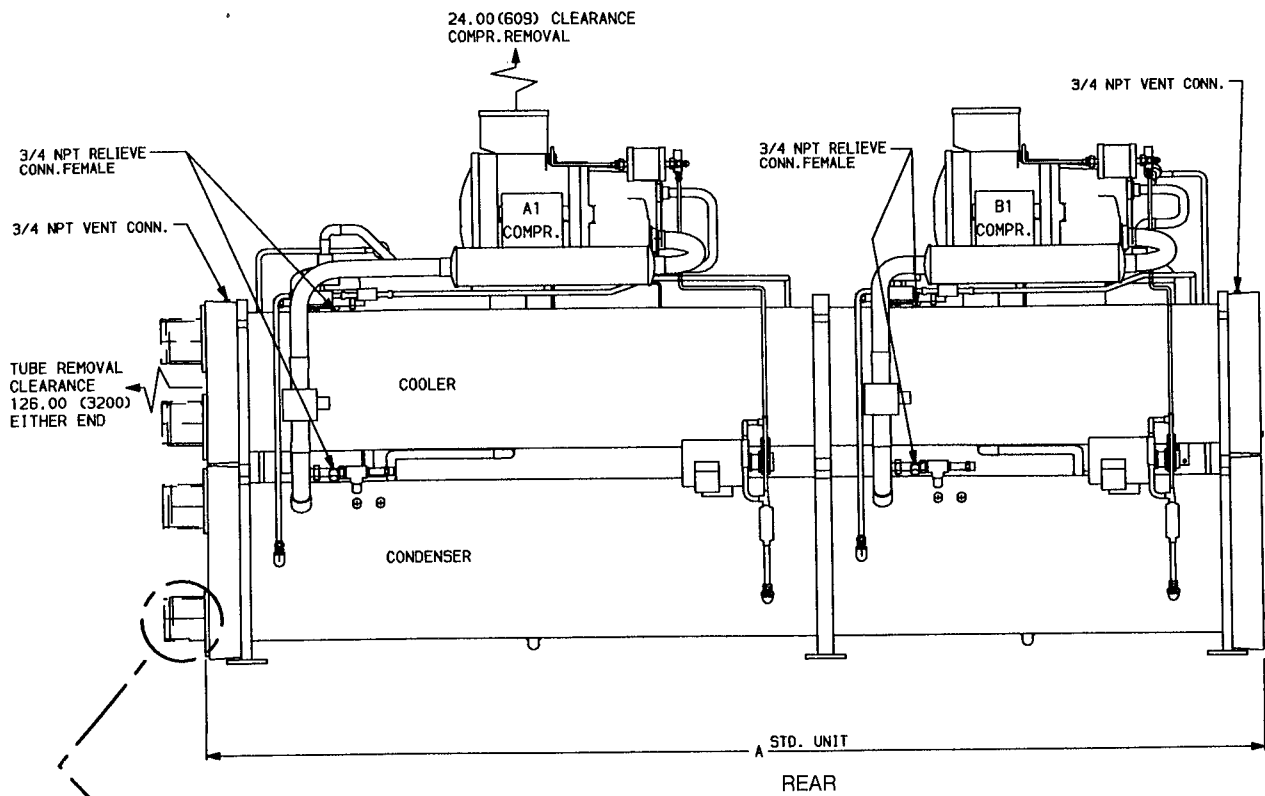
*Weight includes weight of water or brine and refrigerant

Base unit dimensions, 30HXC fluid-cooled units



DIMENSIONS — in. (mm)

UNIT 30HXC	A	B	C	D	E	F	G	H	I	J
076	102.12 (2594)	4 00 (102)	5 00 (127)	33.34 (847)	11 33 (288)	5 72 (145)	12.22 (310)	9 87 (251)	9 36 (238)	65 22 (1657)
086	102.12 (2594)	4 00 (102)	5 00 (127)	33 34 (847)	11 33 (288)	5 72 (145)	12 22 (310)	9 87 (251)	9.36 (238)	65 22 (1657)
096	102 12 (2594)	4 00 (102)	5.00 (127)	33 34 (847)	11 33 (288)	5 72 (145)	12 22 (310)	9 87 (251)	9 36 (238)	65 22 (1657)
106	102 12 (2594)	5.0 (127)	5.00 (127)	33.34 (847)	11 33 (288)	5.72 (145)	12.22 (310)	10 47 (266)	10 28 (261)	67 22 (1707)
116	132 56 (3367)	4 00 (102)	5 00 (127)	33 34 (847)	11.33 (288)	5 72 (145)	12 22 (310)	9 87 (251)	9 36 (238)	65.22 (1657)
126	132 56 (3367)	4 00 (102)	5 00 (127)	33 34 (847)	11 33 (288)	5.72 (145)	12.22 (310)	9 87 (251)	9 36 (238)	65 22 (1657)
136	132.56 (3367)	4 00 (102)	5 00 (127)	33 34 (847)	11.33 (288)	5 72 (145)	12 22 (310)	9 87 (251)	9 36 (238)	65.22 (1657)
146	132 56 (3367)	4.00 (102)	5.00 (127)	33.34 (847)	11 33 (288)	5 72 (145)	12 22 (310)	9.87 (251)	9.36 (238)	65 22 (1657)
161	132.56 (3367)	5 00 (127)	5 00 (127)	34.59 (879)	12 33 (313)	5.76 (146)	14 15 (359)	10 44 (265)	10 28 (261)	69 22 (1758)
171	132 56 (3367)	5 00 (127)	5.00 (127)	34.59 (879)	12 33 (313)	5 76 (146)	14 15 (359)	10 44 (265)	10 28 (261)	69 22 (1758)
186	132 56 (3367)	5 00 (127)	5.00 (127)	34 59 (879)	12 33 (313)	5 76 (146)	14 15 (359)	10.44 (265)	10 28 (261)	69 22 (1758)
206	148 56 (3773)	6 00 (152)	6 00 (152)	36 59 (929)	15 25 (387)	5 25 (133)	14 15 (359)	11 00 (279)	11 06 (281)	73 22 (1860)
246	148.56 (3773)	6.00 (152)	6 00 (152)	36 59 (929)	15 25 (387)	5 25 (133)	14.15 (359)	11 00 (279)	11 06 (281)	73 22 (1860)
261	148 56 (3773)	6 00 (152)	6.00 (152)	36 59 (929)	15 25 (387)	5 25 (133)	14.15 (359)	11.00 (279)	11 06 (281)	73 22 (1860)
271	148 56 (3773)	6.00 (152)	6 00 (152)	36.59 (929)	15.25 (387)	5 25 (133)	14 15 (359)	11 00 (279)	11 06 (281)	73 22 (1860)

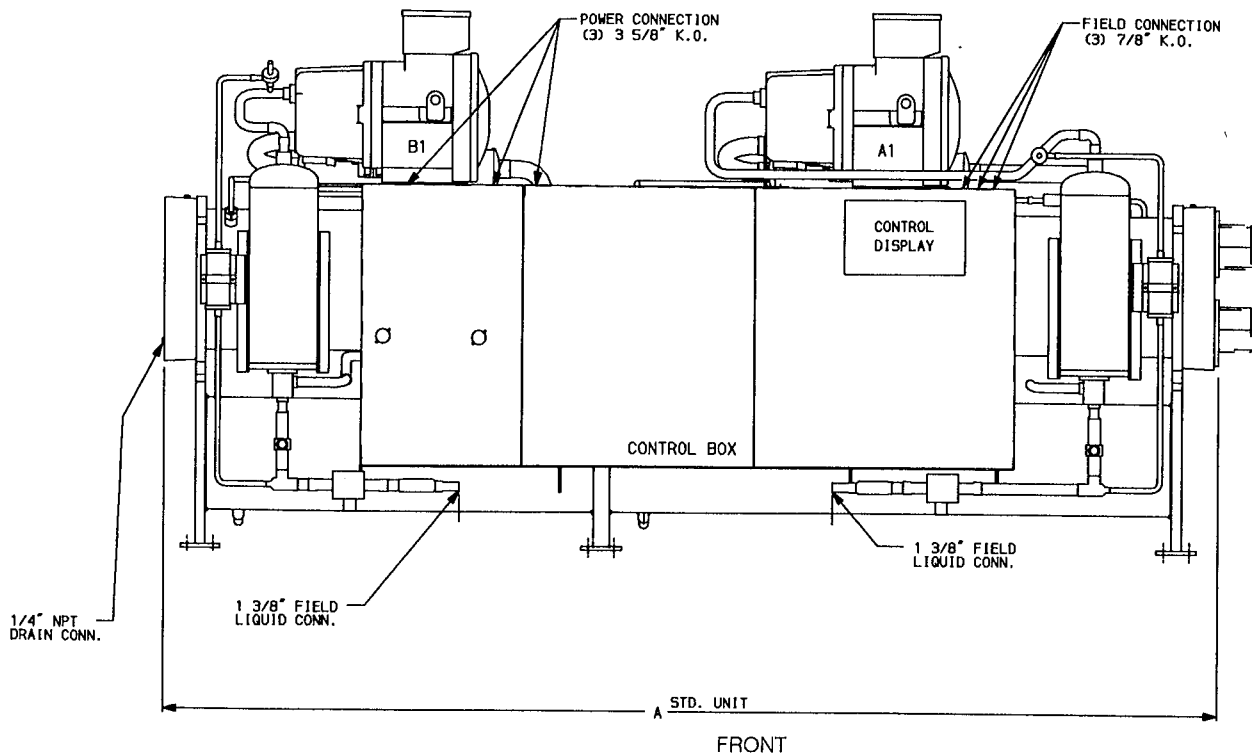


DETAIL "A"
NOZZLE ACCESSORY

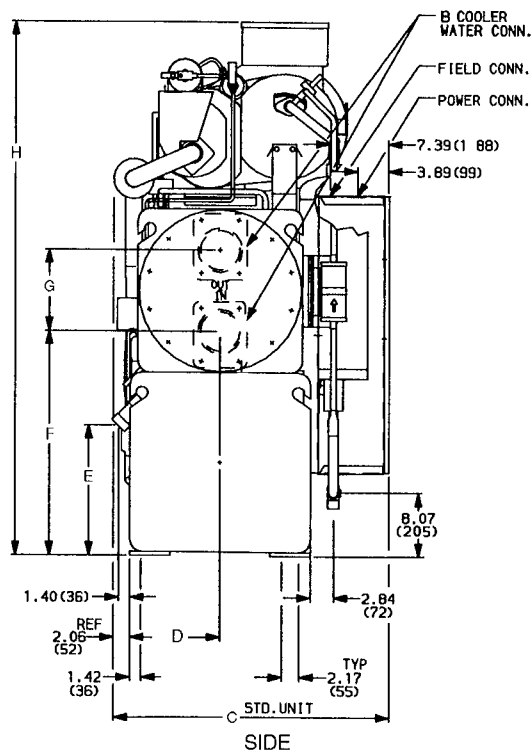
LEGEND
COMPR — Compressor
CONN — Connection
K.O. — Knockout
THK — Thickness

NOTE: Dimensions are in inches Dimensions in () are in mm

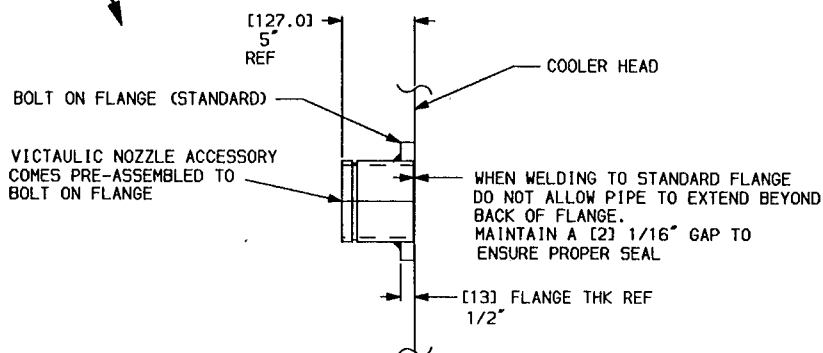
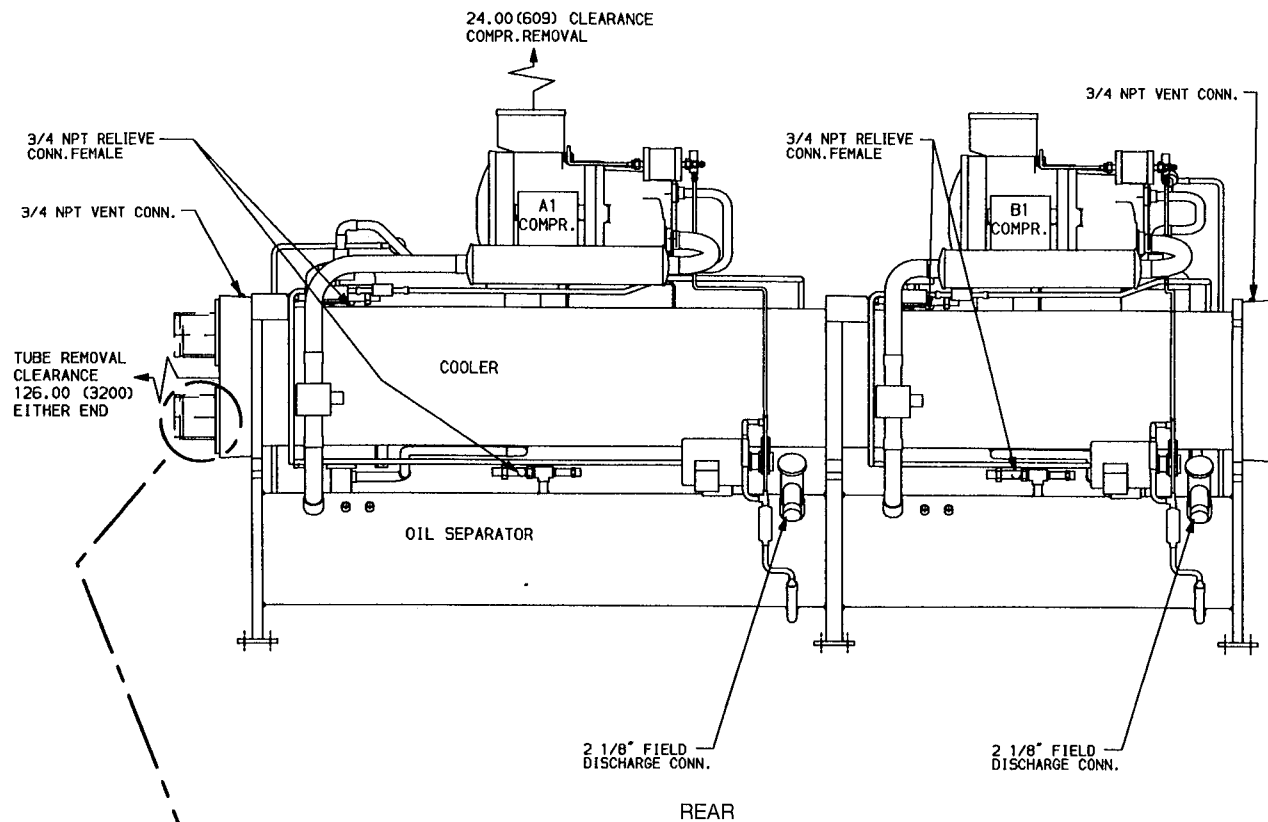
Base unit dimensions, 30HXA condenserless units



DIMENSIONS — in. (mm)



UNIT 30HXA	A	B	C	D	E	F	G	H
076	102.12 (2594)	4.00 (102)	33.34 (847)	11.33 (288)	16.50 (419)	27.81 (706)	9.36 (238)	65.22 (1657)
086	102.12 (2594)	4.00 (102)	33.34 (847)	11.33 (288)	16.50 (419)	27.81 (706)	9.36 (238)	65.22 (1657)
096	102.12 (2594)	4.00 (102)	33.34 (847)	11.33 (288)	16.50 (419)	27.81 (706)	9.36 (238)	65.22 (1657)
106	102.12 (2594)	5.00 (127)	33.34 (847)	11.33 (288)	16.50 (419)	28.41 (721)	10.28 (261)	67.22 (1707)
116	132.56 (3367)	4.00 (102)	33.34 (847)	11.33 (288)	16.50 (419)	27.81 (706)	9.36 (238)	65.22 (1657)
126	132.56 (3367)	4.00 (102)	33.34 (847)	11.33 (288)	16.50 (419)	27.81 (706)	9.36 (238)	65.22 (1657)
136	132.56 (3367)	4.00 (102)	33.34 (847)	11.33 (288)	16.50 (419)	27.81 (706)	9.36 (238)	65.22 (1657)
146	132.56 (3367)	4.00 (102)	33.34 (847)	11.33 (288)	16.50 (419)	27.81 (706)	9.36 (238)	65.22 (1657)
161	132.56 (3367)	5.00 (127)	34.59 (879)	11.33 (288)	16.50 (419)	28.35 (720)	10.28 (261)	67.25 (1708)
171	132.56 (3367)	5.00 (127)	34.59 (879)	11.33 (288)	16.50 (419)	28.35 (720)	10.28 (261)	67.25 (1708)
186	132.56 (3367)	5.00 (127)	34.59 (879)	11.33 (288)	16.50 (419)	28.35 (720)	10.28 (261)	67.25 (1708)
206	148.56 (3773)	6.00 (152)	36.59 (929)	12.00 (305)	21.44 (545)	30.35 (771)	11.06 (281)	73.22 (1860)
246	148.56 (3773)	6.00 (152)	36.59 (929)	12.00 (305)	21.44 (545)	30.35 (771)	11.06 (281)	73.22 (1860)
261	148.56 (3773)	6.00 (152)	36.59 (929)	12.00 (305)	21.44 (545)	30.35 (771)	11.06 (281)	73.22 (1860)
271	148.56 (3773)	6.00 (152)	36.59 (929)	12.00 (305)	21.44 (545)	30.35 (771)	11.06 (281)	73.22 (1860)



DETAIL "A"
NOZZLE ACCESSORY

LEGEND

COMPR — Compressor
CONN — Connection
K.O. — Knockout
THK — Thickness

NOTE: Dimensions are in inches Dimensions in () are in mm

Options and accessories

ITEM	FACTORY- INSTALLED OPTION	FIELD- INSTALLED ACCESSORY
Wye-Delta Start	X	
Medium Temperature Brine	X	
Low Temperature Brine	X	
Non-Fused Disconnect	X	
Minus-One-Pass Cooler	X	
Minus-One-Pass Condenser (HXC Only)	X	
Suction Service Valve	X	
Nitrogen Charge	X	
Expanded Display		X
Control Power Transformer		X
Minimum Load Control	X	X
Sound Reduction Enclosure		X
Vibration Isolation		X
Victaulic Connection		X
Temperature Reset Sensor		X
Chilled Fluid Flow Switch		X

Factory-installed options

Wye-delta start — Generally, Wye-delta start is not required when using multiple compressors since the starting current is generally less than with one larger compressor using Wye-delta start. However, Wye-delta start is available as a factory-installed option

Suction service valve — The suction service valve provides easy access to the suction side of the unit to facilitate service requirements.

Medium temperature brine — The medium brine option permits supply liquid temperatures to be set to a minimum of 15 F (–9.4 C). Refrigeration circuit components, such as the expansion device, are modified at the factory to correct for the lower refrigeration flow rates.

Low temperature brine — The low brine option permits supply liquid temperatures to be set to a minimum of 0° F (–18 C). Refrigeration circuit components, such as the expansion device, are modified at the factory to correct for the lower refrigeration flow rates.

Non-fused disconnect — This disconnect will provide disconnect capability for main unit power located at the unit.

Minus-one-pass cooler — In special applications, such as high flow, low temperature rise, or reduced cooler pressure drop requirement, the factory-installed, minus-one-pass cooler option will reduce the cooler pressure drop.

Minus-one-pass condenser (30HXC) — In special applications, such as high flow, low temperature rise, or reduced condenser pressure drop requirement, the factory-installed minus-one-pass condenser option will reduce the condenser pressure drop.

Minimum load control — This option allows additional capacity reduction for unit operation below the minimum step of unloading (down to 10% of the minimum unit capacity). This is also available as a field-installed accessory.

Nitrogen charge — The unit is shipped charged with nitrogen instead of refrigerant to simplify installation in applications which require the unit to be disassembled prior to installation.

Field-installed accessories

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

Minimum load control — This accessory allows additional capacity reduction for unit operation below the minimum step of unloading (down to 10% of the minimum unit capacity). This is also available as a factory-installed option.

Sound reduction enclosure — This kit contains a sound enclosure which covers the entire unit to muffle compressor noise

Vibration isolation — Rubber isolators are field installed to reduce vibration transmission from the compressor through the floor and into the conditioned space.

Expanded display — This accessory kit contains an indoor-mounted, remote, 40 characters per line, 16 line display panel for remote unit diagnostics

Victaulic connection — The kit contains a victaulic-type cooler connection to replace the standard weld-type connection.

Temperature reset sensor — This accessory sensor provides temperature reset capability from either the occupied space or outdoor-air temperature.

NOTE: Temperature reset capability using return temperature is standard.

Chilled fluid flow switch — This accessory is available for field installation and provides loss of flow protection for the 30HX chillers. Loss of flow protection is required for all 30HX chillers.

Application data

UNIT OPERATING RANGES

ITEM	MINIMUM	MAXIMUM
Cooler Leaving Fluid Temperature*	40 F (5 C)	60 F (15 C)
Cooler Entering Fluid Temperature†	45 F (7.2 C)	70 F (21 C)
Cooler Flow Rates		
076	105 gpm (6.6 L/s)	—
086,096	125 gpm (7.9 L/s)	
106-126	155 gpm (9.8 L/s)	
136	200 gpm (12.6 L/s)	
146	210 gpm (13.2 L/s)	
161,171	240 gpm (15.1 L/s)	
186	270 gpm (17.0 L/s)	
216	312 gpm (19.7 L/s)	
236-286	345 gpm (21.8 L/s)	
Condenser Flow Rates		
076,086	105 gpm (6.6 L/s)	—
096,106	135 gpm (8.5 L/s)	
116,126	170 gpm (10.7 L/s)	
136,146	195 gpm (12.3 L/s)	
161	235 gpm (14.8 L/s)	
171,186	255 gpm (16.1 L/s)	
216	305 gpm (19.2 L/s)	
236-286	345 gpm (21.8 L/s)	
Cooler Loop Volume	2 gal/ton (2 L/kW)	—
Condenser Fluid Operating Temperature	70 F (21 C) Entering Fluid	105 F (41 C) Leaving Fluid
Condenserless Saturated Discharge Temperature at Design Conditions	105 F (40 C)	135 F (57 C)

*For applications requiring operation at less than 40 F (5 C), the units require the use of anti-freeze and may require one of the optional brine units. Contact your local Carrier representative for more information.

†For applications requiring operations at less than 45 F (7.2 C), contact your local Carrier representative for unit selection using the Carrier electronic catalog.

Application data (cont)

CONVERSION TABLE

METRIC TECH	X	=	ENGLISH UNIT	X	=	SI UNIT
Acceleration						
m/s ²				1 0		m/s ²
m/s ²	3 281		ft/s ²	0 3048		m/s ²
Area						
cm ²			100			mm ²
cm ²	0 1550		in ²	645 2		mm ²
m ²			1 0			m ²
m ²	10.76		ft ²	0 09290		m ²
Energy						
kcal			4.187			kJ
kcal	3.968		Btu	1.055		kJ
kgf m			9 807			J
kgf m	7 233		ft-lbf	1.356		J
kW-h			3.600			MJ
kW-h	3412		Btu	1.055 x 10 ⁻³		MJ
Torque or Bending Moment Conversion Factors						
kgf m	9.807					N m
kgf m	86 80		lb _f in	0 1130		N m
kgf m	7 233		lb _f ft	1.356		N m
Force						
kgf			9.807			N
kgf	2 205		lb _f	4 448		N
Length						
μm			1 0			μm
μm	39.37		micro-inch	0 0254		μm
mm			1 0			mm
mm	0.03937		in	25 4		mm
mm	0.003281		ft	304.8		mm
m			1.0			m
m	3.281		ft	0.3048		m
m	1.094		yd	0 9144		m
Mass						
g			1 0			g
g	0 03527		oz	28 35		g
kg			1 0			kg
kg	2 205		lb	0 4536		kg
tonne, Mg			1 0			tonne, Mg
tonne, Mg	1.102		U.S. ton (2000 lb)	0 9072		tonne, Mg
Mass/Time						
kg/h			0.0002778			kg/s
kg/h	0.03674		lb/min	0 00756		kg/s
Mass/Volume						
kg/dm ³ , kg/L			1000			kg/m ³
kg/dm ³ , kg/L	62 43		lb/ft ³	16 02		kg/m ³
Power						
kcal/h			1 163			W
kcal/h	3.968		Btu/h	0 2931		W
HP metric			0.7355			kW
HP metric	0.9863		HP(550 $\frac{ft \cdot lb}{s}$)	0.7457		kW
Mcal/h			1 163			kW
Mcal/h	0 3307		Ton refr	3 517		kW
Pressure						
mm w.g. 4°C			0 009806			kPa
mm w.g. 4°C	0.03937		in H ₂ O 39 2°F	0 2491		kPa
mm Hg 0°C			0 1333			kPa
mm Hg 0°C	0 03937		in Hg 32°F	3 386		kPa
kgf/cm ²			98 07			kPa
kgf/cm ²	14 22		psi	6 895		kPa
mH ₂ O	3.281		ft H ₂ O	2 989		kPa
Specific Enthalpy						
kcal/kg			4 187			kJ/kg
kcal/kg	1 800		Btu/lb	2 326		kJ/kg

PREFIXES		
M	MEGA	10 ⁶
k	KILO	10 ³
d	DECI	10 ⁻¹
c	CENTI	10 ⁻²
m	MILLI	10 ⁻³
μ	MICRO	10 ⁻⁶

METRIC TECH	X	=	ENGLISH UNIT	X	=	SI UNIT
Specific Heat						
kcal/kg °C				4 187		kJ/kg °C
kcal/kg °C	1 0		Btu/lb °F	4 187		kJ/kg °C
Steam Rate						
kg/kW h			1 0			kg/kW-h
kg/kW-h	1 644		lb/h HP	0 6083		kg/kW-h
kg/Mcal			0 8598			kg/kW-h
kg/Mcal	6.666		lb/h Ton	0 1290		kg/kW-h
Temperature Interval						
°C				1 0		K
°C	1.8		°F	0 5556		°C
Thermal Conductivity						
kcal/m-h °C			1.163			W/m °C
kcal/m-h °C	8 064		Btu-in/ft ² h °F	0 1442		W/m °C
kcal/m h °C	0 6720		Btu-ft/ft ² h °F	1.731		W/m °C
Thermal Resistance						
m ² °C h/kcal			0.8598			m ² °C/W
m ² °C h/kcal	4 882		ft ² h °F/Btu	0 1761		m ² °C/W
Heat Transfer Coeff.						
kcal/m ² h °C			1.163			W/m ² °C
kcal/m ² h °C	0 2048		Btu/ft ² h °F	5.678		W/m ² °C
Velocity						
m/s			1.0			m/s
m/s	3 281		ft/s	0.3048		m/s
m/s	196.9		ft/min	0.00508		m/s
Viscosity						
cP			1 0			mPa-s
cP	2 089x10 ⁻⁵		lb _f -s/ft ²	47880.		mPa-s
cSt			1.0			mm ² /s
cSt	1.076x10 ⁻⁵		ft ² /s	92903		mm ² /s
Volume						
mm ³			1 0x10 ⁻⁶			L
mm ³	6 102x10 ⁻⁵		in ³	0.01639		L
L			1 0			L
L	0 03531		ft ³	28 32		L
m ³			1.0			m ³
m ³	1 308		yd ³	0 7646		m ³
L	0 2642		U.S. gal	3 785		L
L	2.113		U.S. pint	0 4732		L
mL, cm ³			1 0			mL
mL, cm ³	0 03381		U.S. oz	29 57		mL
Volume/Time						
m ³ /h			0.2778			L/s
m ³ /h	0 5886		ft ³ /min	0 4719		L/s
m ³ /h	4 403		U.S. gal/min	0.06309		L/s
L/h			2 778x10 ⁻⁴			L/s
L/h	4 403x10 ⁻³		U.S. gal/min	0 06309		L/s
(m ³ /h)/						
(1000 kcal/h)	1.780		cfm/ton	0 1342		L/s • kW

METRIC TECH	CONVERSION FACTOR	=	ENGLISH UNIT	CONVERSION FACTOR	=	SI UNIT
Temperature						
°C				°C+273 15		K
°C	(°C x 1 8) + 32		°F	(°F - 32) ÷ 1.8		°C

UNITS			
m	METER	cP	CENTIPOISE
cal	CALORIE	cSt	CENTISTOKE
kg	KILOGRAM (mass)	HP metric =	(PS, CV, ch) METRIC
kgf	KILOGRAM-FORCE		HORSEPOWER
kp	KILOGRAM FORCE	mm w g	MILLIMETERS
L	LITER	mm CE	WATER GAUGE
°C	DEGREES CELSIUS	mm Hg	MILLIMETERS
K	KELVIN		WATER GAUGE
W	WATT	mm CE	MILLIMETERS
Pa	PASCAL		MERCURY
J	JOULE	tonne =	1000 kg
N	NEWTON	kcal =	fg FRIGORIE
h	HOUR	bar =	100 kPa

Selection procedure

Carrier's electronic selection program provides quick, easy computer selection of Carrier chillers. It considers specific temperature and flow requirements and other factors, such as fouling and altitude correction. It will also select an air-cooled condenser with the condenserless 30HXA unit to match the required conditions. To select a 30HXC water-cooled chiller manually for your particular application, follow the procedure below.

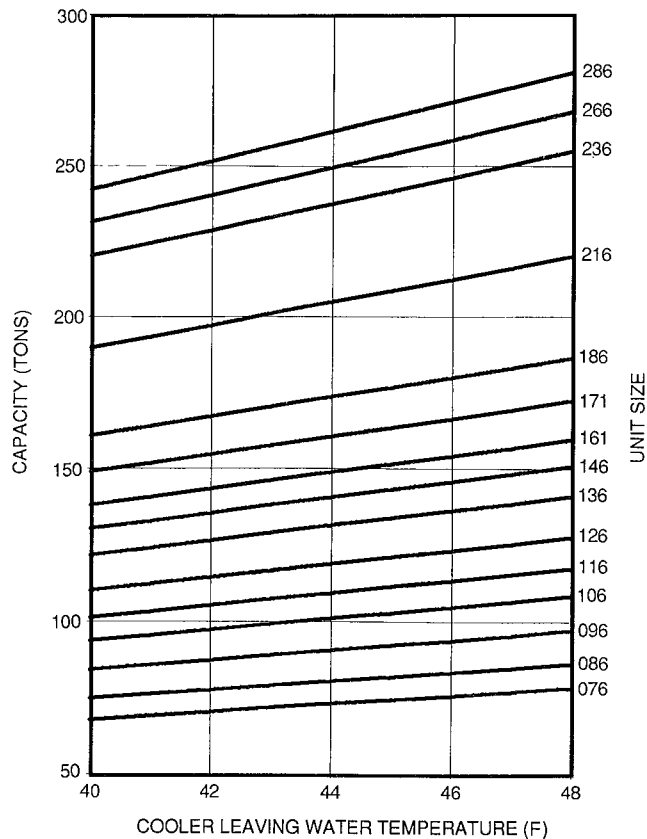
The Cooling Capacity graphs on pages 14 and 15 show the unit capacity at 85 F (29.4 C) condenser entering water temperature and 95 F (35 C) condenser leaving water temperature at various cooler leaving water temperature conditions (for estimation purposes only).

To select the appropriate chiller size:

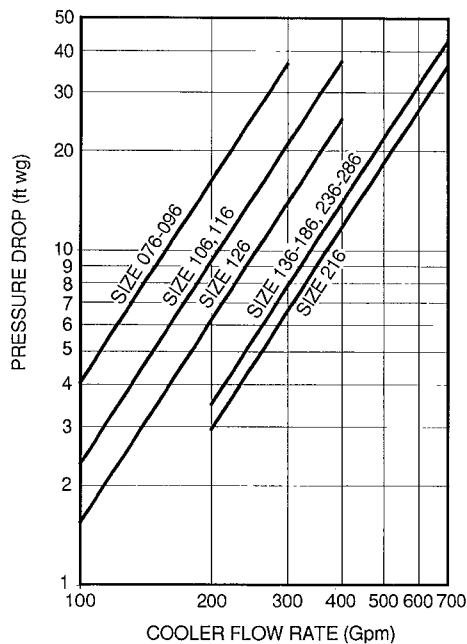
1. Review the Application Data section on page 11 to ensure the chiller will be operating within achievable parameters.
2. Plot the design capacity required at the design leaving water temperature on the Cooling Capacity graphs on pages 14 and 15.
3. Select the chiller identified by the nearest unit capacity line.
4. See graphs on pages 14 and 15 for cooler pressure drop of the selected chiller.

Performance data, English

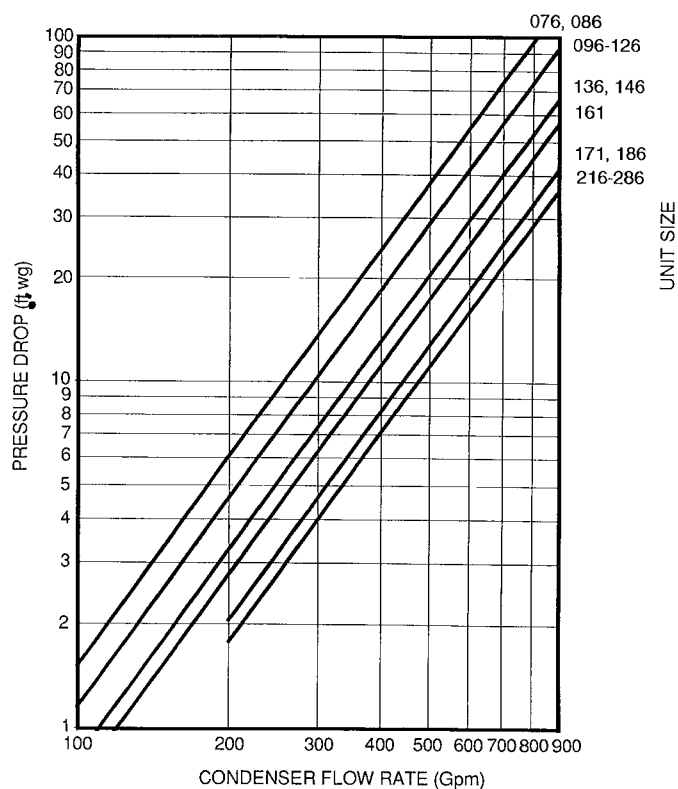
COOLING CAPACITY



COOLER PRESSURE DROP

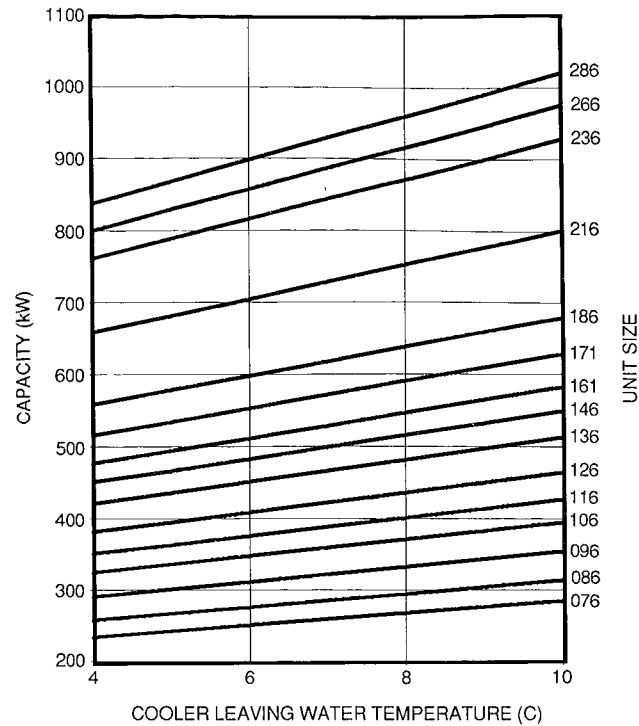


CONDENSER PRESSURE DROP

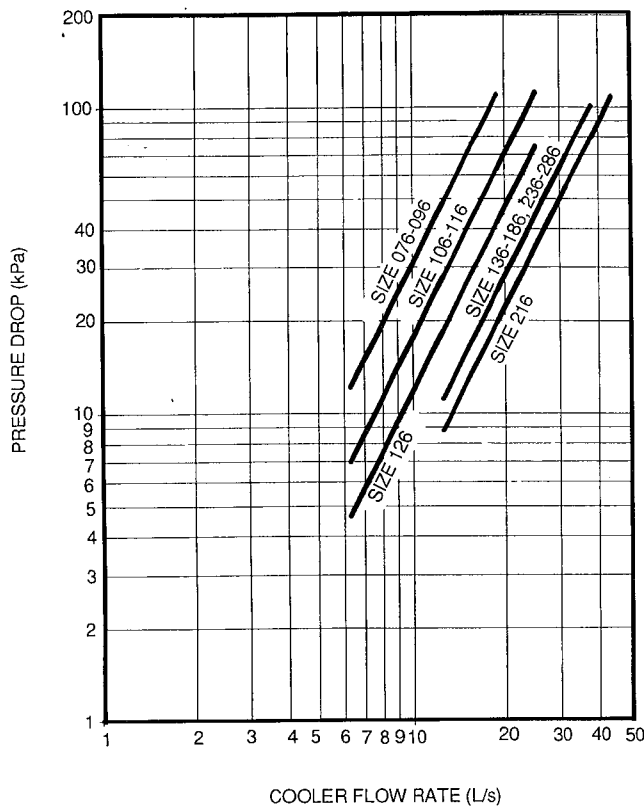


Performance data, SI

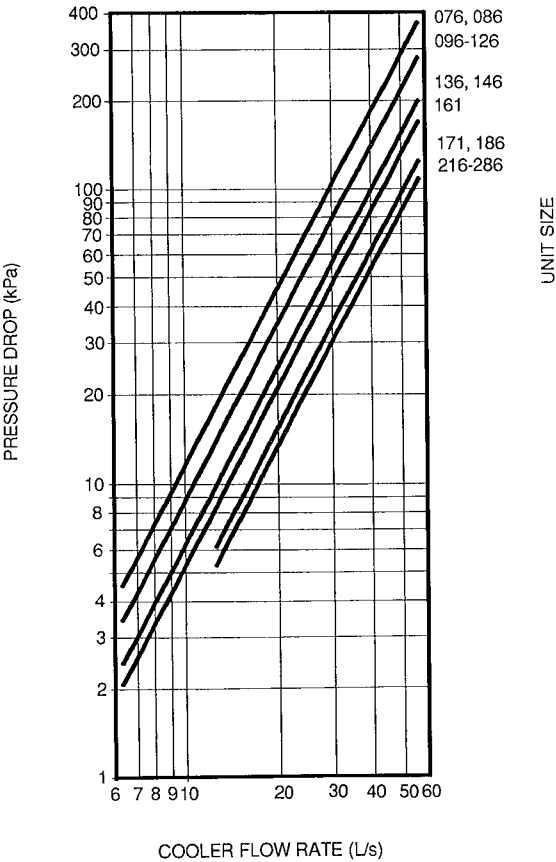
COOLING CAPACITY



COOLER PRESSURE DROP



CONDENSER PRESSURE DROP



Electrical data — 30HXC fluid-cooled units*

UNIT 30HXC	VOLTAGE			POWER CIRCUIT			CONTROL CIRCUIT		
	Nameplate	Supplied		MCA	MOCP	Recommended Fuse Size	Voltage	MCA	MOCP
		Min	Max						
076	208/230-3-60	187	253	133/133	225	175/175	115-1-60	15	15
	460-3-60	414	506	109	150	125	115-1-60		
	575-3-60	518	633	87	125	100	115-1-60		
	380-3-60	342	418	131	175	150	230-1-60		
	230-3-50	207	253	124/124	200/200	150/150	230-1-50		
	346-3-50	325	380	148	200	175	230-1-50		
	380/415-3-50	342	440	128	175	150	230-1-50		
086	208/230-3-60	187	253	159/133	250/225	200/175	115-1-60	15	15
	460-3-60	414	506	120	175	150	115-1-60		
	575-3-60	518	633	96	125	125	115-1-60		
	380-3-60	342	418	146	200	175	230-1-60		
	230-3-50	207	253	148/124	250/200	200/150	230-1-50		
	346-3-50	325	380	164	225	200	230-1-50		
	380/415-3-50	342	440	142	200	175	230-1-50		
096	208/230-3-60	187	253	217/133	350/225	300/175	115-1-60	15	15
	460-3-60	414	506	146	225	175	115-1-60		
	575-3-60	518	633	123	175	150	115-1-60		
	380-3-60	342	418	177	250	225	230-1-60		
	230-3-50	207	253	201/124	350/200	250/150	230-1-50		
	346-3-50	325	380	200	300	250	230-1-50		
	380/415-3-50	342	440	173	250	200	230-1-50		
106	208/230-3-60	187	253	259/133	450/225	350/175	115-1-60	15	15
	460-3-60	414	506	162	250	200	115-1-60		
	575-3-60	518	633	129	200	150	115-1-60		
	380-3-60	342	418	195	300	225	230-1-60		
	230-3-50	207	253	233/124	400/200	300/150	230-1-50		
	346-3-50	325	380	220	300	300	230-1-50		
	380/415-3-50	342	440	191	250	225	230-1-50		
116	208/230-3-60	187	253	251/159	450/250	350/200	115-1-60	15	15
	460-3-60	414	506	171	250	200	115-1-60		
	575-3-60	518	633	137	200	175	115-1-60		
	380-3-60	342	418	207	300	250	230-1-60		
	230-3-50	207	253	233/148	400/250	300/200	230-1-50		
	346-3-50	325	380	233	350	300	230-1-50		
	380/415-3-50	342	440	202	300	250	230-1-50		
126	208/230-3-60	187	253	251/217	450/350	350/300	115-1-60	15	15
	460-3-60	414	506	192	250	225	115-1-60		
	575-3-60	518	633	153	225	175	115-1-60		
	380-3-60	342	418	232	300	300	230-1-60		
	230-3-50	207	253	233/201	400/350	300/250	230-1-50		
	346-3-50	325	380	262	350	300	230-1-50		
	380/415-3-50	342	440	226	300	300	230-1-50		
136	208/230-3-60	187	253	292/217	500/350	400/300	115-1-60	15	15
	460-3-60	414	506	210	300	250	115-1-60		
	575-3-60	518	633	173	250	250	115-1-60		
	380-3-60	342	418	255	350	300	230-1-60		
	230-3-50	207	253	271/201	450/350	350/250	230-1-50		
	346-3-50	325	380	287	400	350	230-1-50		
	380/415-3-50	342	440	248	350	300	230-1-50		
146	208/230-3-60	187	253	292/251	500/450	400/350	115-1-60	15	15
	460-3-60	414	506	223	300	250	115-1-60		
	575-3-60	518	633	178	250	200	115-1-60		
	380-3-60	342	418	269	350	350	230-1-60		
	230-3-50	207	253	271/233	450/450	350/300	230-1-50		
	346-3-50	325	380	304	400	350	230-1-50		
	380/415-3-50	342	440	263	450	300	230-1-50		

EGEND

- MCA** — Minimum Circuit Ampacity (for wire sizing)
MOCP — Maximum Overcurrent Protection
RLA — Rated Load Amps

*Refer to Carrier's electronic catalog for the most current electrical data.

NOTES.

- 1 Main power must be supplied from a field-supplied fused electrical service with a (factory- or field-installed) disconnect located in sight from the unit
- 2 Control circuit power must be supplied from a separate source through a field-supplied disconnect. The control circuit accessory transformer may be applied to power from the main unit power supply
- 3 Maximum incoming wire size for each terminal block is 500 kcmil

- 4 Maximum allowable phase imbalance is: voltage, 2%; amps, 5%
- 5 Units with one MCA value have one main terminal block. Units with 2 MCA values require multiple conductors.
- 6 Use copper conductors only.
- 7 The MOCP is calculated as follows.

MOCP = (2 25) (largest RLA) + the sum of the other RLAs. Size the fuse one size down from the result. The RLAs are listed on the unit nameplate.

The recommended fuse size in amps is calculated as follows:

RFA = (1 50) (largest RLA) + the sum of the other RLAs. Size the fuse one size up from the result. The RLAs are listed on the unit nameplate

UNIT 30HXC	VOLTAGE			POWER CIRCUIT			CONTROL CIRCUIT		
	Nameplate	Supplied		MCA	MOCP	Recommended Fuse Size	Voltage	MCA	MOCP
161	208/230-3-60	187	253	319/234	500/400	400/300	115-1-60	15	15
	460-3-60	414	506	229	300	300	115-1-60		
	575-3-60	518	633	183	250	225	115-1-60		
	380-3-60	342	418	277	400	350	230-1-60		
	230-3-50	207	253	296/217	500/350	400/300	230-1-50		
	346-3-50	325	380	312	450	350	230-1-50		
	380/415-3-50	342	440	270	400	300	230-1-50		
171	208/230-3-60	187	253	273/319	450/500	350/400	115-1-60	15	15
	460-3-60	414	506	243	350	300	115-1-60		
	575-3-60	518	633	194	250	225	115-1-60		
	380-3-60	342	418	294	400	350	230-1-60		
	230-3-50	207	253	253/296	450/500	350/400	230-1-50		
	346-3-50	325	380	168/196	300/350	225/250	230-1-50		
	380/415-3-50	342	440	286	400	350	230-1-50		
186	208/230-3-60	187	253	319/319	500/500	400/400	115-1-60	15	15
	460-3-60	414	506	259	350	300	115-1-60		
	575-3-60	518	633	208	300	250	115-1-60		
	380-3-60	342	418	174/174	300/300	225/225	230-1-60		
	230-3-50	207	253	296/296	500/500	400/400	230-1-50		
	346-3-50	325	380	196/196	350/350	250/250	230-1-50		
	380/415-3-50	342	440	306	400	350	230-1-50		
206	208/230-3-60	187	253	391/319	600/500	450/400	115-1-60	15	15
	460-3-60	414	506	296	400	350	115-1-60		
	575-3-60	518	633	237	300	300	115-1-60		
	380-3-60	342	418	358	450	400	230-1-60		
	230-3-50	207	253	363/296	500/500	450/400	230-1-50		
	346-3-50	325	380	404	500	450	230-1-50		
	380/415-3-50	342	440	349	450	400	230-1-50		
246	208/230-3-60	187	253	506/319	700/500	600/400	115-1-60	15	15
	460-3-60	414	506	344	450	400	115-1-60		
	575-3-60	518	633	275	350	300	115-1-60		
	380-3-60	342	418	416	500	500	230-1-60		
	230-3-50	207	253	380/296	600/500	450/400	230-1-50		
	346-3-50	325	380	296/196	450/350	350/250	230-1-50		
	380/415-3-50	342	440	406	500	450	230-1-50		
261	208/230-3-60	187	253	537/319	700/500	700/400	115-1-60	15	15
	460-3-60	414	506	358	450	400	115-1-60		
	575-3-60	518	633	286	350	350	115-1-60		
	380-3-60	342	418	433	500	500	230-1-60		
	230-3-50	207	253	498/296	600/500	600/400	230-1-50		
	346-3-50	325	380	331/196	450/350	400/250	230-1-50		
	380/415-3-50	342	440	422	500	500	230-1-50		
271	208/230-3-60	187	253	573/319	800/500	700/400	115-1-60	15	15
	460-3-60	414	506	374	450	450	115-1-60		
	575-3-60	518	633	300	350	350	115-1-60		
	380-3-60	342	418	314/174	450/300	350/225	230-1-60		
	230-3-50	207	253	532/296	600/500	600/400	230-1-50		
	346-3-50	325	380	353/196	500/350	400/250	230-1-50		
	380/415-3-50	342	440	442	500	500	230-1-50		

LEGEND

MCA — Minimum Circuit Ampacity (for wire sizing)
MOCP — Maximum Overcurrent Protection
RLA — Rated Load Amps

*Refer to Carrier's electronic catalog for the most current electrical data

NOTES

- 1 Main power must be supplied from a field-supplied fused electrical service with a (factory- or field-installed) disconnect located in sight from the unit
- 2 Control circuit power must be supplied from a separate source through a field-supplied disconnect. The control circuit accessory transformer may be applied to power from the main unit power supply
- 3 Maximum incoming wire size for each terminal block is 500 kcmil

4. Maximum allowable phase imbalance is: voltage, 2%; amps, 5%.
5. Units with one MCA value have one main terminal block. Units with 2 MCA values require multiple conductors
6. Use copper conductors only
7. The MOCP is calculated as follows:

$MOCP = (2.25) (\text{largest RLA}) + \text{the sum of the other RLAs}$ Size the fuse one size down from the result. The RLAs are listed on the unit nameplate

The recommended fuse size in amps is calculated as follows

$RFA = (1.50) (\text{largest RLA}) + \text{the sum of the other RLAs}$ Size the fuse one size up from the result. The RLAs are listed on the unit nameplate

Electrical data — 30HXA condenserless units*

UNIT 30HXA	VOLTAGE			POWER CIRCUIT			CONTROL CIRCUIT		
	Nameplate	Supplied		MCA	MOCP	Recommended Fuse Size	Voltage	MCA	MOCP
		Min	Max						
076	208/230-3-60	187	253	183/183	300/300	225/225	115-1-60	15	15
	460-3-60	414	506	149	200	175	115-1-60		
	575-3-60	518	633	119	150	150	115-1-60		
	380-3-60	342	418	181	250	225	230-1-60		
	230-3-50	207	253	170/170	300/300	225/225	230-1-50		
	346-3-50	325	380	203	250	250	230-1-50		
	380/415-3-50	342	440	176	250	200	230-1-50		
086	208/230-3-60	187	253	206/183	350/300	250/225	115-1-60	15	15
	460-3-60	414	506	159	225	200	115-1-60		
	575-3-60	518	633	128	175	150	115-1-60		
	380-3-60	342	418	193	250	225	230-1-60		
	230-3-50	207	253	191/170	300/300	250/225	230-1-50		
	346-3-50	325	380	217	300	250	230-1-50		
	380/415-3-50	342	440	188	250	225	230-1-50		
096	208/230-3-60	187	253	237/183	400/300	300/225	115-1-60	15	15
	460-3-60	414	506	173	250	200	115-1-60		
	575-3-60	518	633	139	200	175	115-1-60		
	380-3-60	342	418	210	300	250	230-1-60		
	230-3-50	207	253	220/170	350/300	300/225	230-1-50		
	346-3-50	325	380	236	350	300	230-1-50		
	380/415-3-50	342	440	204	300	250	230-1-50		
106	208/230-3-60	187	253	279/183	500/300	350/225	115-1-60	15	15
	460-3-60	414	506	192	250	225	115-1-60		
	575-3-60	518	633	154	225	175	115-1-60		
	380-3-60	342	418	233	350	300	230-1-60		
	230-3-50	207	253	259/170	450/300	350/225	230-1-50		
	346-3-50	325	380	262	400	300	230-1-50		
	380/415-3-50	342	440	227	300	300	230-1-50		
116	208/230-3-60	187	253	279/206	500/350	350/250	115-1-60	15	15
	460-3-60	414	506	201	300	250	115-1-60		
	575-3-60	518	633	161	225	200	115-1-60		
	380-3-60	342	418	243	350	300	230-1-60		
	230-3-50	207	253	259/191	450/300	350/250	230-1-50		
	346-3-50	325	380	274	400	350	230-1-50		
	380/415-3-50	342	440	237	350	300	230-1-50		
126	208/230-3-60	187	253	279/237	500/400	350/300	115-1-60	15	15
	460-3-60	414	506	212	300	250	115-1-60		
	575-3-60	518	633	169	250	200	115-1-60		
	380-3-60	342	418	256	350	300	230-1-60		
	230-3-50	207	253	259/220	450/350	350/300	230-1-50		
	346-3-50	325	380	289	400	350	230-1-50		
	380/415-3-50	342	440	250	350	300	230-1-50		
136	208/230-3-60	187	253	332/237	500/400	600/300	115-1-60	15	15
	460-3-60	414	506	236	350	350	115-1-60		
	575-3-60	518	633	189	250	300	115-1-60		
	380-3-60	342	418	285	400	400	230-1-60		
	230-3-50	207	253	308/220	500/350	400/300	230-1-50		
	346-3-50	325	380	321	450	450	230-1-50		
	380/415-3-50	342	440	278	400	400	230-1-50		
146	208/230-3-60	187	253	332/279	500/500	400/350	115-1-60	15	15
	460-3-60	414	506	251	350	300	115-1-60		
	575-3-60	518	633	201	250	250	115-1-60		
	380-3-60	342	418	304	400	350	230-1-60		
	230-3-50	207	253	308/259	500/450	400/350	230-1-50		
	346-3-50	325	380	342	500	400	230-1-50		
	380/415-3-50	342	440	296	400	350	230-1-50		

LEGEND

MCA — Minimum Circuit Ampacity (for wire sizing)

MOCP — Maximum Overcurrent Protection

*Refer to Carrier's electronic catalog for the most current electrical data

NOTES:

1. Main power must be supplied from a field-supplied fused electrical service with a (factory- or field-installed) disconnect located in sight from the unit
2. Control circuit power must be supplied from a separate source through a field-supplied disconnect. The control circuit accessory transformer may be applied to power from the main unit power supply
3. Maximum incoming wire size for each terminal block is 500 kcmil

4. Maximum allowable phase imbalance is: voltage, 2%; amps, 5%
5. Units with one MCA value have one main terminal block. Units with 2 MCA values require multiple conductors
6. Use copper conductors only
7. The MOCP is calculated as follows

MOCP = (2 25) (largest RLA) + the sum of the other RLAs. Size the fuse one size down from the result. The RLAs are listed on the unit nameplate

The recommended fuse size in amps is calculated as follows:

RFA = (1 50) (largest RLA) + the sum of the other RLAs. Size the fuse one size up from the result. The RLAs are listed on the unit nameplate

UNIT 30HXA	VOLTAGE			POWER CIRCUIT			CONTROL CIRCUIT		
	Nameplate	Supplied		MCA	MOCP	Recommended Fuse Size	Voltage	MCA	MOCP
161	208/230-3-60	187	253	424/271	700/450	600/350	115-1-60	15	15
	460-3-60	414	506	290	400	350	115-1-60		
	575-3-60	518	633	232	350	300	115-1-60		
	380-3-60	342	418	351	500	400	230-1-60		
	230-3-50	207	253	393/251	700/450	500/350	230-1-50		
	346-3-50	325	380	395	600	500	230-1-50		
	380/415-3-50	342	440	342	500	400	230-1-50		
171	208/230-3-60	187	253	342/424	500/700	400/600	115-1-60	15	15
	460-3-60	414	506	309	450	350	115-1-60		
	575-3-60	518	633	247	350	300	115-1-60		
	380-3-60	342	418	374	500	400	230-1-60		
	230-3-50	207	253	301/393	500/700	400/500	230-1-50		
	346-3-50	325	380	200/262	350/450	250/350	230-1-50		
	380/415-3-50	342	440	365	500	400	230-1-50		
186	208/230-3-60	187	253	424/424	700/700	600/600	115-1-60	15	15
	460-3-60	414	506	345	450	400	115-1-60		
	575-3-60	518	633	276	350	350	115-1-60		
	380-3-60	342	418	232	400	300/300	230-1-60		
	230-3-50	207	253	393/393	700/700	500/500	230-1-50		
	346-3-50	325	380	262	450	350/350	230-1-50		
	380/415-3-50	342	440	407	500	450	230-1-50		
206	208/230-3-60	187	253	487/424	700/700	600/600	115-1-60	15	15
	460-3-60	414	506	383	500	450	115-1-60		
	575-3-60	518	633	306	400	350	115-1-60		
	380-3-60	342	418	266/232	450/400	350	230-1-60		
	230-3-50	207	253	452/393	600/700	600/500	230-1-50		
	346-3-50	325	380	300/262	500/450	350/300	230-1-50		
	380/415-3-50	342	440	260/226	400/400	300/300	230-1-50		
246	208/230-3-60	187	253	641/424	800/700	800/600	115-1-60	15	15
	460-3-60	414	506	443	500	500	115-1-60		
	575-3-60	518	633	354	450	400	115-1-60		
	380-3-60	342	418	351/232	500/400	400/300	230-1-60		
	230-3-50	207	253	595/393	800/700	700/500	230-1-50		
	346-3-50	325	380	395/262	600/450	450/350	230-1-50		
	380/415-3-50	342	440	342/226	500/400	400/300	230-1-50		
261	208/230-3-60	187	253	684/424	1000/700	800/600	115-1-60	15	15
	460-3-60	414	506	309/192	450/300	350/250	115-1-60		
	575-3-60	518	633	247/153	350/250	300/200	115-1-60		
	380-3-60	342	418	351/232	500/400	450/300	230-1-60		
	230-3-50	207	253	595/393	800/700	800/500	230-1-50		
	346-3-50	325	380	395/262	600/450	500/350	230-1-50		
	380/415-3-50	342	440	342/226	500/400	450/300	230-1-50		
271	208/230-3-60	187	253	763/424	1000/700	1000/600	115-1-60	15	15
	460-3-60	414	506	345/192	450/300	400/250	115-1-60		
	575-3-60	518	633	276/153	350/250	350/200	115-1-60		
	380-3-60	342	418	418/232	600/400	500/300	230-1-60		
	230-3-50	207	253	708/393	1000/700	800/500	230-1-50		
	346-3-50	325	380	471/262	600/450	600/350	230-1-50		
	380/415-3-50	342	440	407/226	500/400	500/300	230-1-50		

LEGEND

MCA — Minimum Circuit Ampacity (for wire sizing)
MOCP — Maximum Overcurrent Protection

*Refer to Carrier's electronic catalog for the most current electrical data

NOTES:

- 1 Main power must be supplied from a field-supplied fused electrical service with a (factory- or field-installed) disconnect located in sight from the unit.
2. Control circuit power must be supplied from a separate source through a field-supplied disconnect. The control circuit accessory transformer may be applied to power from the main unit power supply
- 3 Maximum incoming wire size for each terminal block is 500 kcmil.

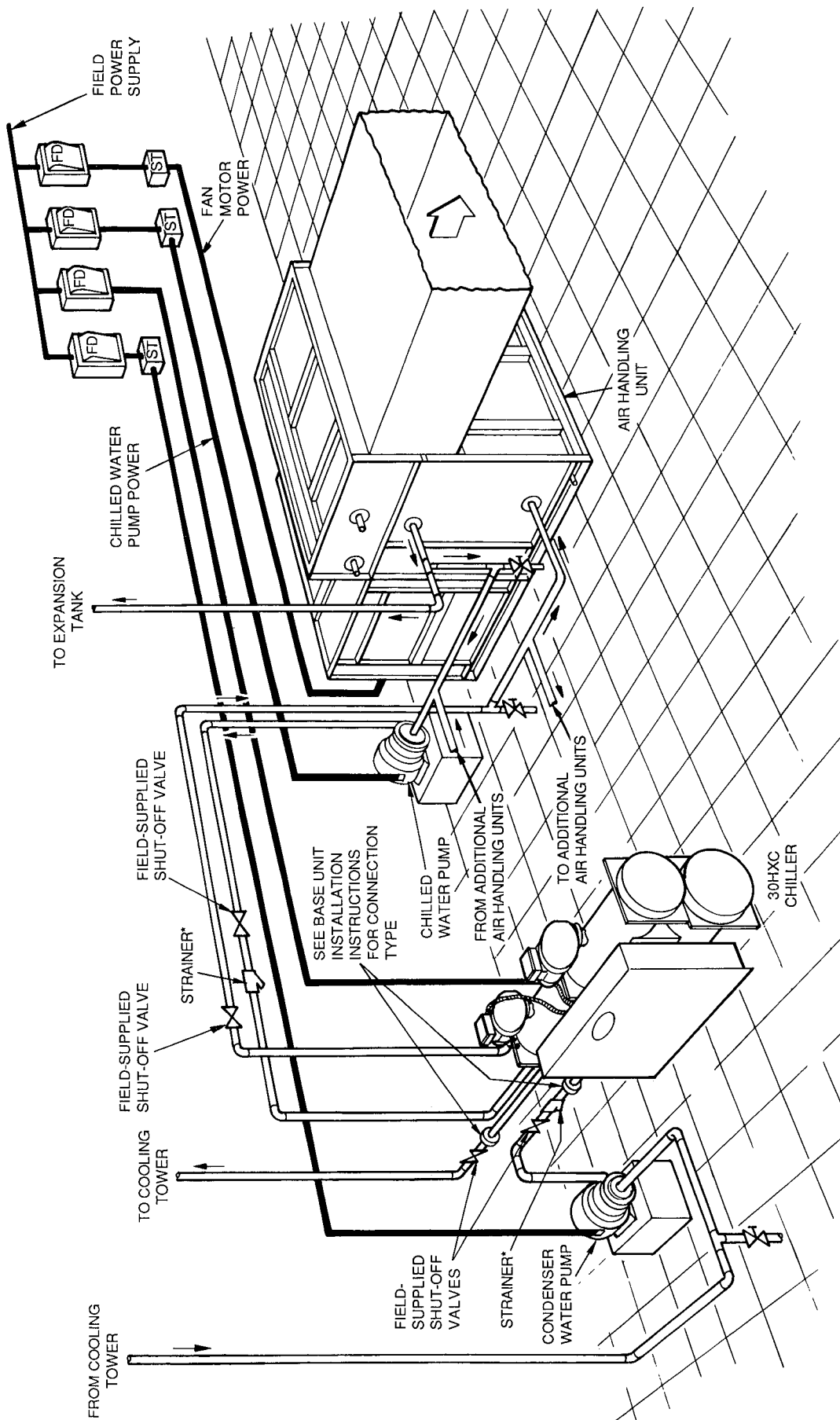
- 4 Maximum allowable phase imbalance is. voltage, 2%; amps, 5%
- 5 Units with one MCA value have one main terminal block. Units with 2 MCA values require multiple conductors.
- 6 Use copper conductors only.
- 7 The MOCP is calculated as follows:

MOCP = (2 25) (largest RLA) + the sum of the other RLAs. Size the fuse one size down from the result. The RLAs are listed on the unit nameplate

The recommended fuse size in amps is calculated as follows:

RFA = (1 50) (largest RLA) + the sum of the other RLAs. Size the fuse one size up from the result. The RLAs are listed on the unit nameplate

Typical piping



LEGEND

Airflow Through Air-Handling Unit
 Power Wiring
 Chilled Fluid Piping
 Starter
 Field-Supplied Disconnect
 Field Supplied

- NOTES:**
1. Chiller must be installed levelly to maintain proper compressor oil return.
 2. Wiring and piping shown are general points-of-connection guides only and are not intended for a specific installation. Wiring and piping shown are for a quick overview of system and are not in accordance with recognized standards.
 3. All wiring must comply with applicable local and national codes.
 4. All piping must follow standard piping techniques. Refer to Carrier System Design Manual or appropriate ASHRAE (American Society of Heating, Refrigeration, and Air Conditioning Engineers) handbook for details.
 5. See Application Data section on page 11 for minimum cooler loop volume. This system may require the addition of a holding tank to ensure adequate volume.

Controls

The standard microprocessor-based control in the 30HX units provides the following functions:

- leaving fluid temperature control (using both entering and leaving fluid sensors)
- 7-day time sequence of both pump and chiller
- temperature reset from return fluid (standard) or from outdoor ambient (accessory), occupied space temperature (accessory), 4-20 mA signal (accessory), or via the optional Carrier Comfort Network (CCN)
- automatic compressor lead-lag switching based on compressor accumulated run times and number of cycles
- automatic temperature range across the cooler adjustment
- fully automatic control of the chiller components

A standard 2-line, 24-character per line display is used to accomplish the following (see figure below):

- set schedules and set points
- identify operating mode
- display current temperatures and pressures being used by the control for internal calculations
- identify abnormal (alarm or alert) conditions

An accessory 16-line, 40-character per line expanded display is also available (see figure below). This accessory displays the same information as the standard display, but has the advantage of being able to display multiple points simultaneously.

Sequence of operation

The control has a 44 F (6.2 C) leaving fluid temperature (LWT) set point as shipped from the factory. If temperature reset or demand limiting is in effect, this set point may change.

Start-up — The circulating pump is energized (either externally or by the internal timeclock). The chiller starts (If the flow switch is applied, the chiller will start after the flow has been proven. All 30HX chillers require loss of flow protection.) The compressor starts unloaded.

NOTE: Which compressor starts first is determined by the automatic lead/lag feature.

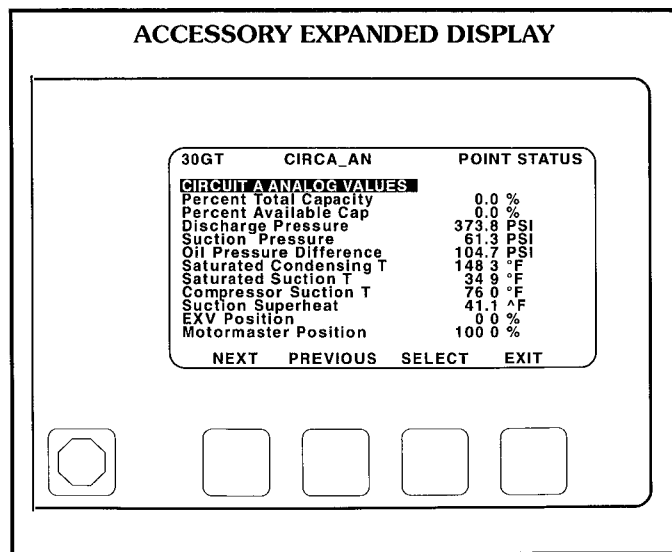
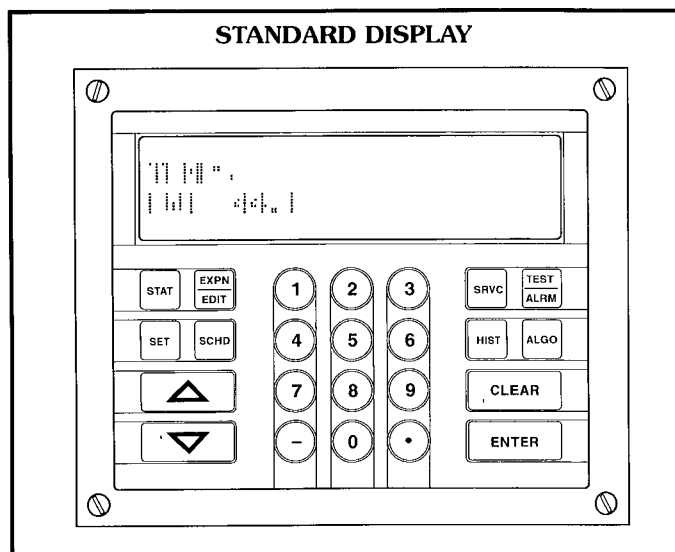
If the entering fluid temperature is 85 F (29 C) or higher, the maximum operating pressure (MOP) feature limits the suction to keep the chiller on line.

Normal operation — The entering fluid temperature sensor senses changes in entering fluid temperature to anticipate changes in the cooling load. Based on leaving fluid temperature, the control will add or delete capacity to maintain a constant leaving fluid temperature.

Transition to off — The chiller unloads once the “time-to-stop” signal has been given. This signal can be either internal or external.

Safeties — The 30HX control as shipped from the factory automatically deenergizes any active compressor that experiences any of the following:

- electrical overload
- thermal overload protection
- high pressure
- low oil pressure
- loss of refrigerant charge
- loss of phase protection
- reverse rotation (control prevents compressor start)
- voltage imbalance
- ground current
- low chilled fluid temperature



Guide specifications

Fluid-Cooled and Condenserless Liquid Chiller

HVAC Guide Specifications

Size Range: **75 to 260 Tons (265 to 915 kW)**

Nominal

Carrier Model Number: **30HXA — Condenserless**
30HXC — Fluid Cooled

Part 1 — General

1.01 SYSTEM DESCRIPTION

- A. Microprocessor controlled, fluid-cooled (30HXC) or condenserless (30HXA) liquid chiller utilizing screw compressors and electronic expansion valves

1.02 QUALITY ASSURANCE

- A Unit shall be rated in accordance with ARI Standard 590, latest revision (U.S.A.)
- B. Unit construction shall comply with ASHRAE 15 Safety Code, NEC, and ASME applicable codes (U.S.A. codes).
- C Unit shall be manufactured at an ISO 9002-listed facility.
- D Unit shall be fully tested (under full load) at the factory.

1.03 DELIVERY, STORAGE, AND HANDLING

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

Part 2 — Products

2.01 EQUIPMENT

A. General:

Factory assembled, single-piece, fluid-cooled (HXC) or condenserless (HXA) liquid chiller. Contained within the unit cabinet shall be all factory wiring, piping, controls, refrigerant charge (HFC-134a), and special features required prior to field start-up.

B Compressors:

- 1. Semi-hermetic twin-screw compressors with internal muffler and check valve.
- 2 Each compressor shall be equipped with a discharge shutoff valve

C. Cooler:

- 1 Shall be tested and stamped in accordance with ASME code (U.S.A.) for a refrigerant working-side pressure of 220 psig (1517 kPa) and a maximum fluid-side pressure of 300 psig (2068 kPa).
- 2. Shall be mechanically cleanable shell-and-tube type with removable heads.
- 3. Tubes shall be internally-enhanced, seamless-copper type, and shall be rolled into tube sheets
- 4 Shall be equipped with weld-on fluid connections.
- 5. Shell shall be insulated with 3/4-in. (19-mm) closed-cell, polyvinyl-chloride foam with a maximum K factor of 0.28

- 6. Shall have a cooler drain and vent

- 7. Design shall incorporate 2 independent refrigerant circuits.

D Condenser (HXC units):

- 1. Shall be tested and stamped in accordance with ASME Code (U.S.A.) for a refrigerant working-side pressure of 220 psig (1517 kPa) and a maximum water-side pressure of 300 psig (2068 kPa)
- 2. Shall be mechanically cleanable shell-and-tube type with removable heads
- 3 Tubes shall be internally-enhanced, seamless-copper type, and shall be rolled into tube sheets.
- 4. Shall be equipped with weld-on water connections.
- 5 Shell shall be insulated with 3/4-in. (19-mm) closed-cell, polyvinyl-chloride foam with a maximum K factor of 0.28.
- 6. Design shall incorporate 2 independent refrigerant circuits.

E. Refrigeration Components:

Refrigerant circuit components shall include oil separator, high and low side pressure relief devices, discharge and liquid line shutoff valves, filter drier, moisture indicating sight glass, expansion valve, refrigerant economizer (unit sizes 161-286), and complete operating charge of both refrigerant HFC-134a and compressor oil.

F. Controls, Safeties, and Diagnostics:

1. Controls:

- a. Unit controls shall include as a minimum: microprocessor, LOCAL/ENABLE-STOP switch, 2-line, 24-character per line diagnostic display with keypad.
- b. Shall be capable of performing the following functions:
 - 1) Automatic compressor lead/lag switching
 - 2) Capacity control based on leaving chilled fluid temperature with return fluid temperature sensing.
 - 3) Limit the chilled fluid temperature pulldown rate at start-up to an adjustable range of 0.2° F to 2 F (0.1° C to 1.1° C) per minute to prevent excessive demand spikes at start-up.
 - 4) Seven-day time scheduling of pump(s) and chiller(s).

2. Diagnostics:

- a. Display module shall be capable of displaying set points, time, system status (including temperatures, pressures, and percent loading), and any alarm or alert conditions.
- b. Control module, in conjunction with the microprocessor, shall be capable of displaying the output of a run test to verify operation of every switch, sensor, potentiometer, and compressor before chiller is started.

3. Safeties:

Unit shall be equipped with all necessary components, and in conjunction with the control system shall provide the unit with protection against the following:

- a. Loss of refrigerant charge.
- b. Reverse rotation.
- c. Low chilled fluid temperature.
- d. Low oil pressure (each compressor circuit).
- e. Voltage imbalance.
- f. Ground current.
- g. Thermal overload
- h. High pressure.
- i. Electrical overload.
- j. Loss of phase

G. Operating Characteristics:

Unit shall be capable of starting up with 95 F (35 C) entering fluid temperature to the cooler

H. Electrical Requirements:

1. Unit primary electrical power supply shall enter the unit at a single location (some units have multiple power poles).
2. Unit shall operate on 3-phase power at the voltage shown in the equipment schedule.
3. Control voltage shall be 115-v (domestic) or 230-v (export), single-phase, separate power supply.
4. Unit shall be shipped with factory control and power wiring installed.

I. Special Features:

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

- * 1. Wye-Delta Starter:
Unit shall have a factory-installed, Wye-Delta starter to minimize electrical inrush current.
- 2. Sound Reduction Enclosure:
Unit shall have field-installed sound reduction enclosure which covers the entire unit to muffle compressor noise.
- 3. Vibration Isolation:
Unit shall be supplied with rubber-in-shear vibration isolators for field installation.
- 4. Control Power Transformer:
Unit shall be supplied with a field installed transformer that will allow supply control circuit power from the main unit power supply
- 5. Non-Fused Disconnect:
Unit shall be supplied with factory-installed, non-fused electrical disconnect for main power supply.

6. Chilled Fluid Flow Switch:

Unit shall be supplied with field-installed differential pressure type proof-of-flow sensing switch.

7. Minus-One-Pass Condenser (HXC Units):

Unit shall be supplied with factory-installed feature allowing one less condenser pass than standard units to provide lower condenser pressure drop.

8. Minus-One-Pass Cooler:

Unit shall be supplied with factory-installed feature allowing one less cooler pass than standard units to provide lower cooler pressure drops (or single side piping installations).

9. Victaulic Connection:

Unit shall be supplied with victaulic-type cooler connections (field installed)

10. Expanded Display:

Unit shall be supplied with indoor-mounted, remote 40-character per line, 16-line display panel. Display is field installed.

11. Temperature Reset Sensor:

Unit shall reset leaving chilled fluid temperature based on outdoor ambient temperature or space temperature when this sensor is installed.

* 12. Medium Brine Option:

Unit shall be factory modified to start and operate at leaving chilled fluid temperatures of between 15 F (-9 C) and 40 F (5 C).

* 13. Low Brine Option:

Unit shall be factory modified to start and operate at leaving chilled fluid temperatures of between 0° F (-18 C) and 15 F (-9.4 C)

14. Suction Service Valve:

Unit shall have factory-installed isolation valve located between the cooler and compressor suction connections.

15. Minimum Load Control:

Unit shall be equipped with factory (or field) installed, microprocessor-controlled, minimum-load control that shall permit unit operation down to 10% capacity.

16. Nitrogen Charge:

Unit shall be shipped with a nitrogen charge instead of a refrigerant charge. This option shall simplify installation in applications requiring unit disassembly prior to installation.

