



Advance Product Data

30HX075-185 Water-Cooled and Condenserless Chillers 50/60 Hz

75 to 185 Tons (265 to 650 kW)

Quality Assurance



Certificate No FM 21837

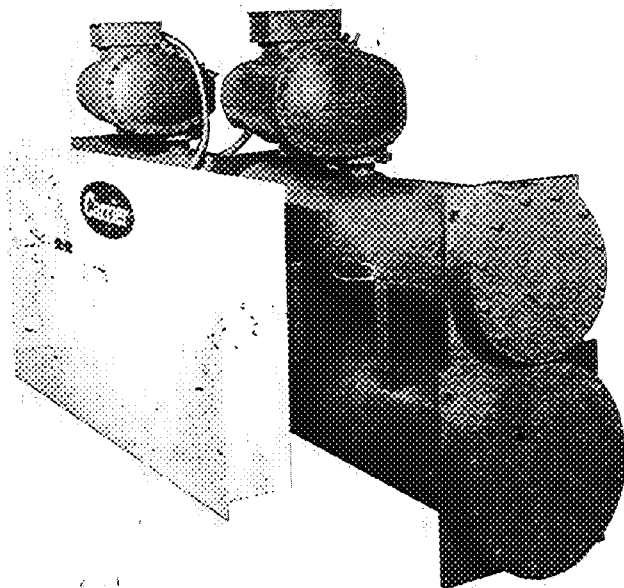
Approvals:

ISO 9002

EN 29002

BS5750 PART 2

ANSI/ASQC Q92



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

- Fits through a 36-in. (914-mm) door with no disassembly required
- Chlorine-free HFC-134a refrigerant
- Smooth rotary compression using screw compressors
- Mechanically cleanable coolers and condensers (HXC)

Features/Benefits

Quality design and construction make the 30HXC (Water 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 electrical entrance (using the optional factory-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

Easy to live with

The 30HX units have a quiet, low-vibration design featuring rotary compression using screw compressors and new aerocoustic fans that reduce sound levels and improve sound quality

The dual refrigerant circuits provide superior part-load performance, and the units exceed efficiency levels established by ASHRAE (American Society of Heating and Refrigeration

Engineers, U.S.A.) and CSA for both full- and part-load operation, thus saving on operating costs through lower electrical costs. In addition, all units are 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.

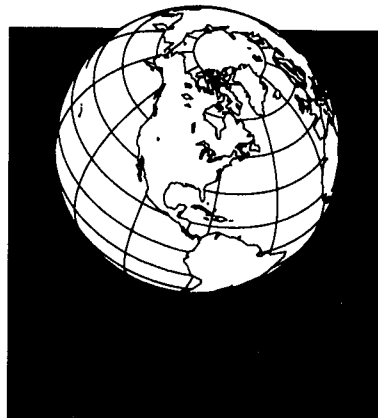
The 30HX units use medium-pressure HFC-134a refrigerant to minimize stress on the compressors and ensure a long life.

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

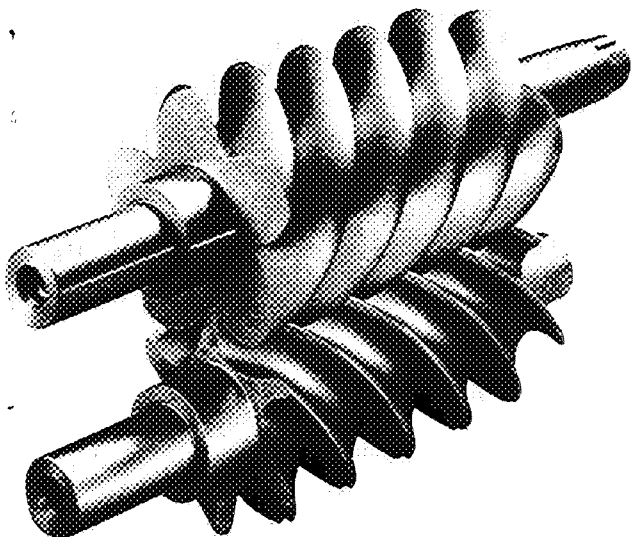
- Use of HFC-134a refrigerant, which has no planned phase-out in its future
- Mechanically-cleanable cooler and condenser (30HXC units)
- Twin screw compressors which require no routine service or maintenance
- Suction and discharge pressures and temperatures easily accessible using either standard or accessory display module



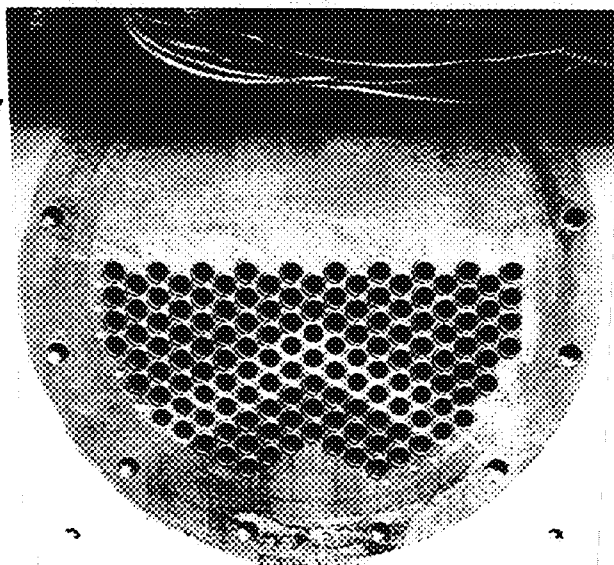
STANDARD DISPLAY MODULE



ENVIRONMENTAL LEADERSHIP



ROTARY COMPRESSOR TWIN-SCREW DESIGN

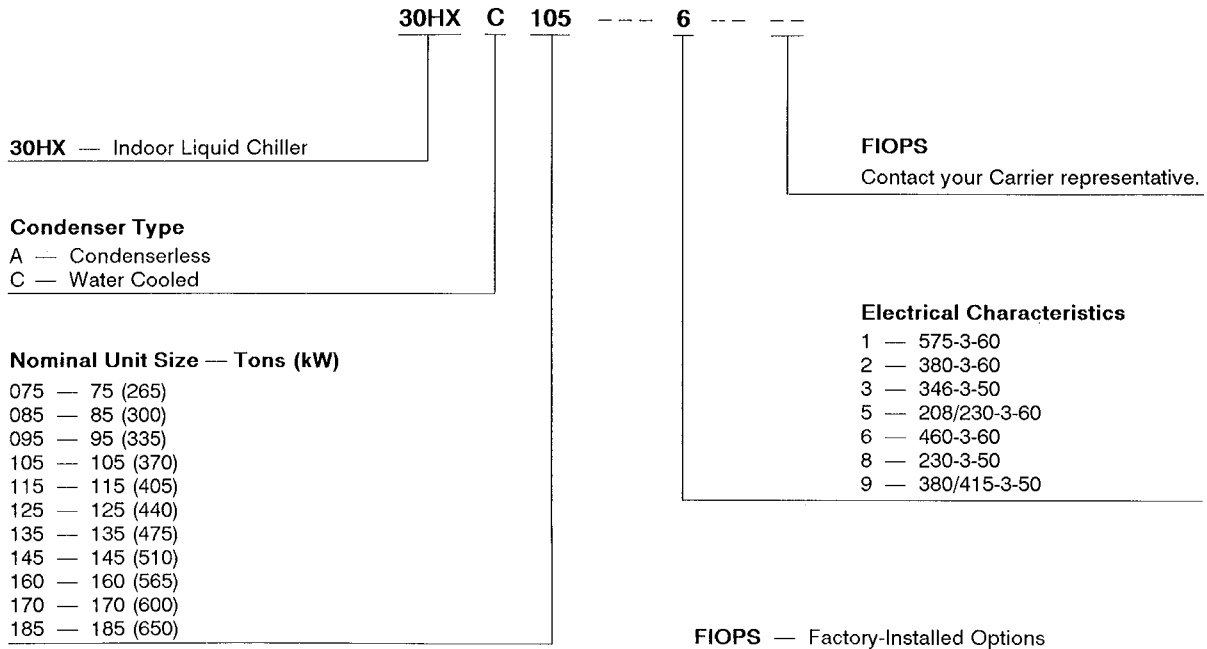


HIGH-EFFICIENCY, CLEANABLE COOLER

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Model number nomenclature



Physical data, English

UNIT SIZE	075	085	095	105	115	125	135	145	160	170	185
UNIT WEIGHT (lb)*											
Water Cooled	5767	5811	5853	6139	6153	6268	6383	6444	6867	7205	7363
Condenserless	4980	5010	5010	5248	5248	5163	5205	5205	5797	5876	5876
COMPRESSORS	Semi-Hermetic, Twin Screw										
Quantity	2	2	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	66/80	80/80
Economizer	No	No	No	No	No	No	No	No	Yes	Yes	Yes
No. Capacity Steps											
Standard	6	6	6	6	6	6	6	6	6	6	6
Optional	8	8	8	8	8	8	8	8	8	8	8
Minimum Step Capacity (%)											
Standard	20	20	20	20	20	20	20	20	20	20	20
Optional	10	10	10	10	10	10	10	10	10	10	10
REFRIGERANT	HFC-134a										
COOLER TYPE (Quantity)	Shell and Tube with Enhanced Copper Tubes (1)										
Maximum Refrigerant Pressure (psig)	220	220	220	220	220	220	220	220	220	220	220
Net Fluid Volume (gal)	18 0	20 6	20 6	24 0	24 0	29 0	29 0	27 5	32 0	32 0	38 6
Maximum Fluid-Side Pressure (psig)	300	300	300	300	300	300	300	300	300	300	300
CONDENSER (Water Cooled)	Shell and Tube with Enhanced Copper Tubes										
Net Fluid Volume (gal)	18 3	18 3	20 5	23 4	24 6	24 4	24 4	31 2	31 2	36 2	39 6
Maximum Refrigerant Pressure (psig)	220	220	220	220	220	220	220	220	220	220	220
Maximum Fluid-Side Pressure (psig)	300	300	300	300	300	300	300	300	300	300	300

*These weights do not include water and refrigerant They are for the unit only

Physical data, SI

UNIT SIZE	075	085	095	105	115	125	135	145	160	170	185
UNIT WEIGHT (Kg)*											
Water Cooled	2615	2635	2654	2784	2790	2843	2895	2922	3114	1907	3339
Condenserless	2259	2272	2272	2380	2380	2341	2361	2361	2629	2665	2665
COMPRESSORS	Semi-Hermetic, Twin Screw										
Quantity	2	2	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	232/281	281/281
Economizer	No	No	No	No	No	No	No	No	Yes	Yes	Yes
No. Capacity Steps											
Standard	6	6	6	6	6	6	6	6	6	6	6
Optional	8	8	8	8	8	8	8	8	8	8	8
Minimum Step Capacity (%)											
Standard	20	20	20	20	20	20	20	20	20	20	20
Optional	10	10	10	10	10	10	10	10	10	10	10
REFRIGERANT	HFC-134a										
COOLER TYPE (Quantity)	Shell and Tube with Enhanced Copper Tubes (1)										
Maximum Refrigerant Pressure (kPa)	1517	1517	1517	1517	1517	1517	1517	1517	1517	1517	1517
Net Fluid Volume (L)	68.0	78 0	78 8	90.8	90.8	109.7	109 7	104 1	121.1	121 1	146 2
Maximum Fluid-Side Pressure (kPa)	2068	2068	2068	2068	2068	2068	2068	2068	2068	2068	2068
CONDENSER (Water Cooled)	Shell and Tube with Enhanced Copper Tubes										
Net Fluid Volume (L)	69 4	69 4	77 7	88.5	93 3	92 5	92 5	118 0	118.0	137 2	149.9
Maximum Refrigerant Pressure (kPa)	1517	1517	1517	1517	1517	1517	1517	1517	1517	1517	1517
Maximum Fluid-Side Pressure (kPa)	2068	2068	2068	2068	2068	2068	2068	2068	2068	2068	2068

*These weights do not include water and refrigerant They are for the unit only.

Options and accessories

ITEM	FACTORY- INSTALLED OPTION	FIELD- INSTALLED ACCESSORY
Y-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	
Expanded Display	X	X
Control Power Transformer	X	X
Minimum Load Control	X	X
Sound Reduction Kit	X	X
Vibration Isolation		X
Victaulic Connection		X
Controls Module		X
Chilled Fluid Flow Switch		X

Factory-installed options

Y-delta start — Generally, Y-delta start is not required when using multiple compressors since the starting current is generally less than with one larger compressor using Y-delta start. However, Y-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

Control power transformer — The transformer is sized to supply the needs of the control circuit, sourcing power from the main unit power connection. This is also available as a field-installed accessory

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 — 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

Expanded display — This factory-installed option provides an indoor-mounted, remote, 40 characters per line, 16 line display panel for unit diagnostics. This is also available as a field-installed accessory.

Sound reduction kit — This kit contains a sound blanket to muffle compressor noise. This is also available as a field-installed accessory

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. This is also available as a factory-installed option.

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 kit — This kit contains a sound blanket to muffle compressor noise. This is also available as a factory-installed option.

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

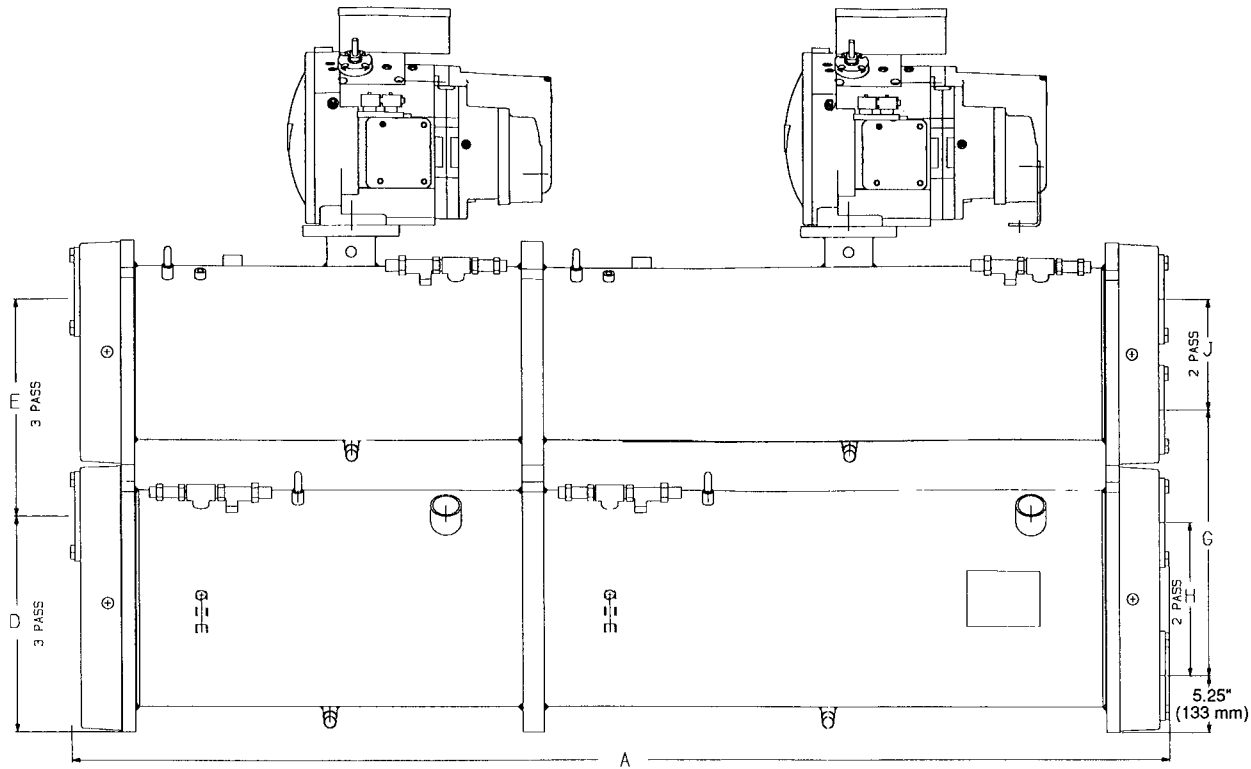
Expanded display — This accessory kit contains an indoor-mounted, remote, 40 characters per line, 16 line display panel for remote unit diagnostics. This is also available as a factory-installed option.

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

Controls module — The controls module permits additional unit functions from an external signal, such as temperature reset (from outdoor air, the occupied space, or from a 4-20 mA signal) and demand limiting (2 steps available using a 4-20 mA signal, each from 0 to 100%).

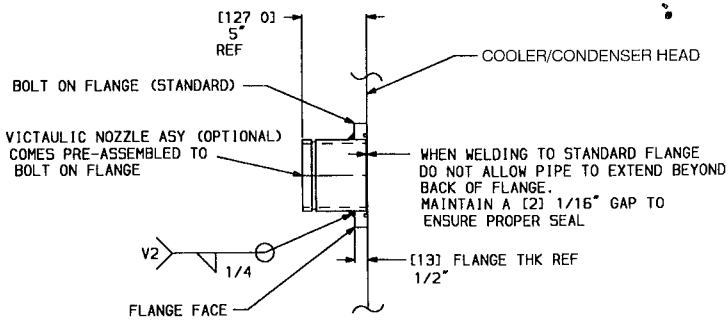
Chilled fluid flow switch — Although low fluid flow detection is provided by the unit internal control devices, this accessory is available for field installation

Base unit dimensions

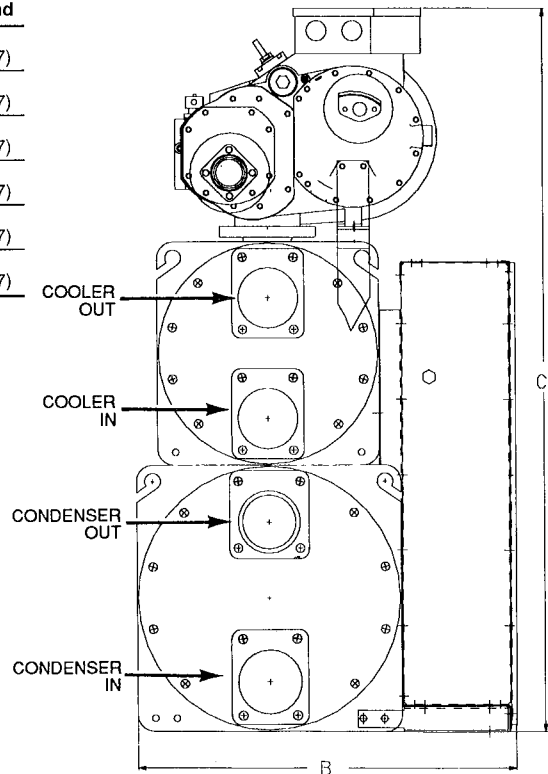


DIMENSIONS — in. (mm)

UNIT	A	B	C	D	E	G	H	J	NO. OF PASSES	NOZZLE SIZE	
										Cooler	Cond
30HX075-095	102.28 (2598)	33.28 (845)	63.08 (1602)	17.89 (454)	18.00 (457)	20.62 (524)	12.22 (310)	9.75 (248)	3	4 (102)	5 (127)
30HX105, 115	102.28 (2598)	33.28 (845)	65.08 (1653)	17.89 (454)	20.00 (457)	22.62 (575)	12.22 (310)	10.28 (261)	3	5 (127)	5 (127)
30HX125, 135	133.28 (3385)	33.28 (845)	63.08 (1602)	17.89 (454)	18.00 (457)	20.62 (524)	12.22 (310)	9.75 (248)	2	5 (127)	5 (127)
30HX145	133.28 (3385)	33.28 (845)	63.08 (1602)	17.89 (454)	18.00 (457)	20.62 (524)	12.22 (310)	9.75 (248)	2	5 (127)	5 (127)
30HX160	133.28 (3385)	33.28 (845)	65.08 (1653)	17.89 (454)	20.00 (508)	22.62 (575)	12.22 (310)	10.28 (261)	2	5 (127)	5 (127)
30HX170, 185	133.28 (3385)	35.28 (896)	67.08 (1704)	19.89 (505)	20.00 (508)	24.62 (625)	14.16 (360)	10.28 (261)	2	5 (127)	5 (127)



NOZZLE CONNECTIONS



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		—
075	70.2 gpm (4.43 L/s)	
085,095	88.8 gpm (5.60 L/s)	
105-125	99.1 gpm (6.25 L/s)	
135	115.6 gpm (7.29 L/s)	
145	123.9 gpm (7.82 L/s)	
160,170	150.7 gpm (9.51 L/s)	
185	175.5 gpm (11.07 L/s)	
Condenser Flow Rates		—
075,085	73.4 gpm (4.63 L/s)	
095	84.4 gpm (5.32 L/s)	
105,115	99.1 gpm (6.25 L/s)	
125	106.4 gpm (6.71 L/s)	
135	121.1 gpm (7.64 L/s)	
145,160	146.8 gpm (9.26 L/s)	
170	157.8 gpm (9.96 L/s)	
185	179.8 gpm (11.34 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 antifreeze 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 lb _f	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				1 0		kJ/kg °C
kcal/kg °C			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 ⁻¹		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
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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 HORSEPOWER
kgf	KILOGRAM-FORCE	mm w.g.	MILLIMETERS
kp	KILOGRAM FORCE	mm CE	MILLIMETERS
L	LITER	mm Hg	MILLIMETERS
°C	DEGREES CELSIUS		MILLIMETERS
K	KELVIN		MILLIMETERS
W	WATT		MILLIMETERS
Pa	PASCAL		MILLIMETERS
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 30HX unit to match the required conditions. To select a water-cooled chiller manually for your particular application, follow the procedure below.

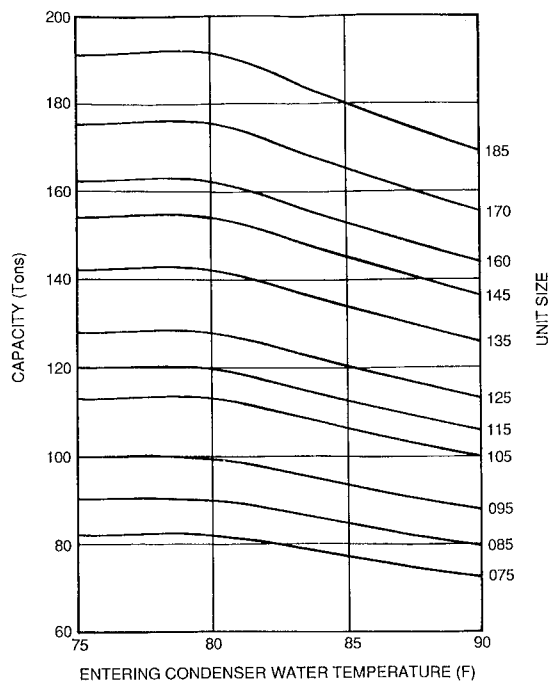
The Cooling Capacity graphs on pages 10 and 11 show the unit capacity at 44 F (6.7 C) leaving chilled fluid temperature at various design outdoor ambient conditions (for estimation purposes only).

To select the appropriate chiller size:

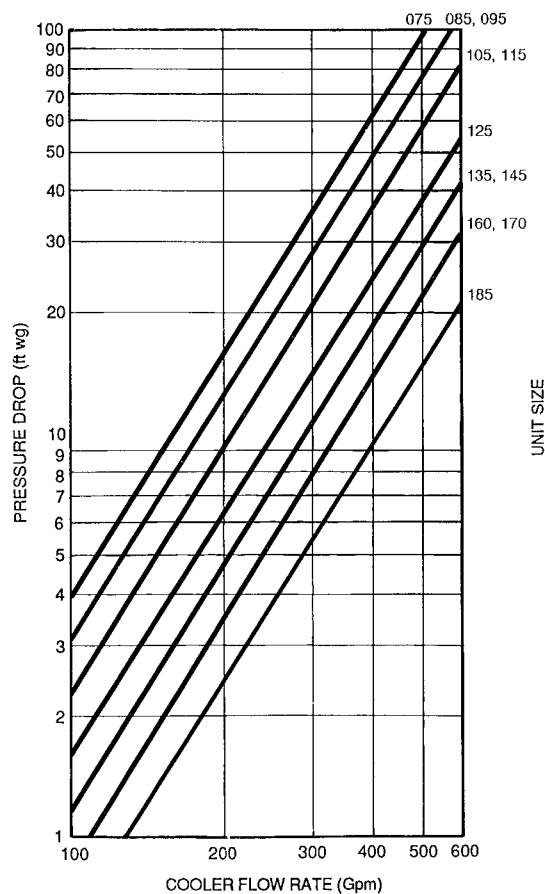
1. Review the Application Data section on page 7 to ensure the chiller will be operating within achievable parameters
2. Plot the design capacity required at the design entering-air temperature on the Cooling Capacity graphs on pages 10 and 11.
3. Select the chiller identified by the nearest unit capacity line
4. See graphs on pages 10 and 11 for cooler pressure drop of the selected chiller.

Performance data, English

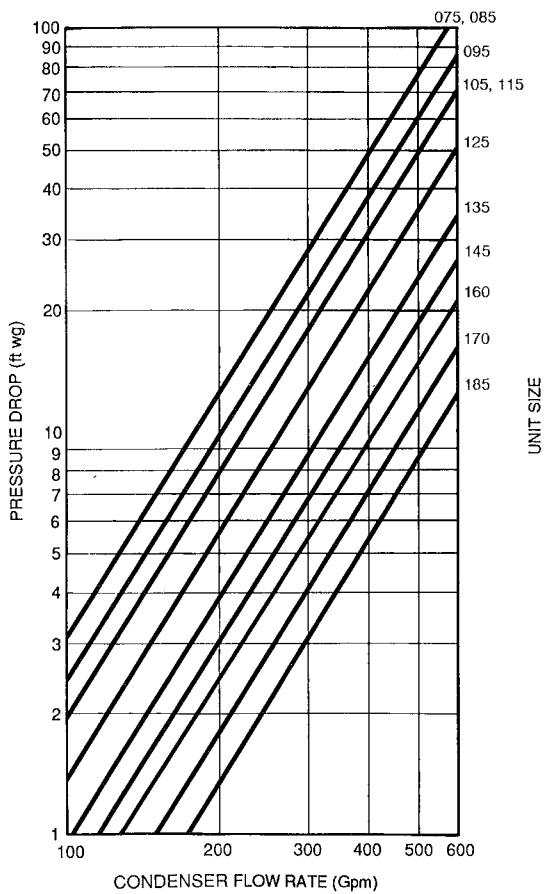
COOLING CAPACITY



COOLER PRESSURE DROP

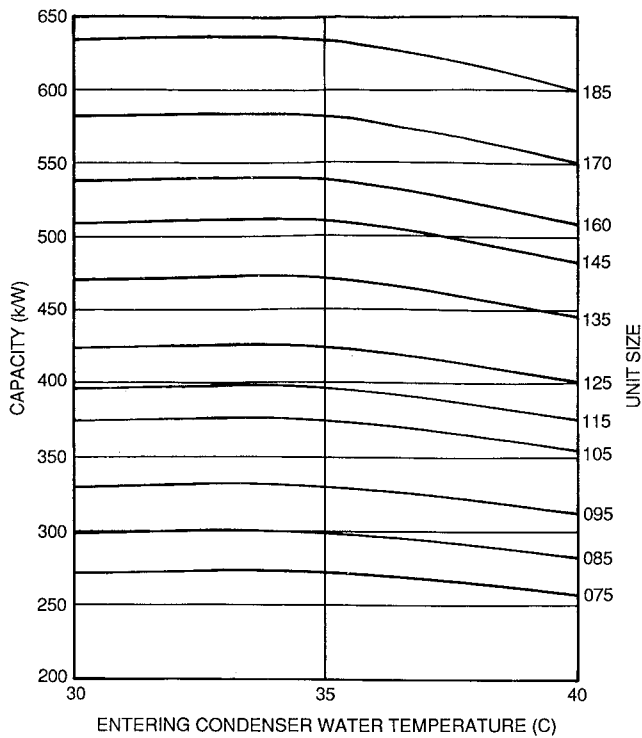


CONDENSER PRESSURE DROP

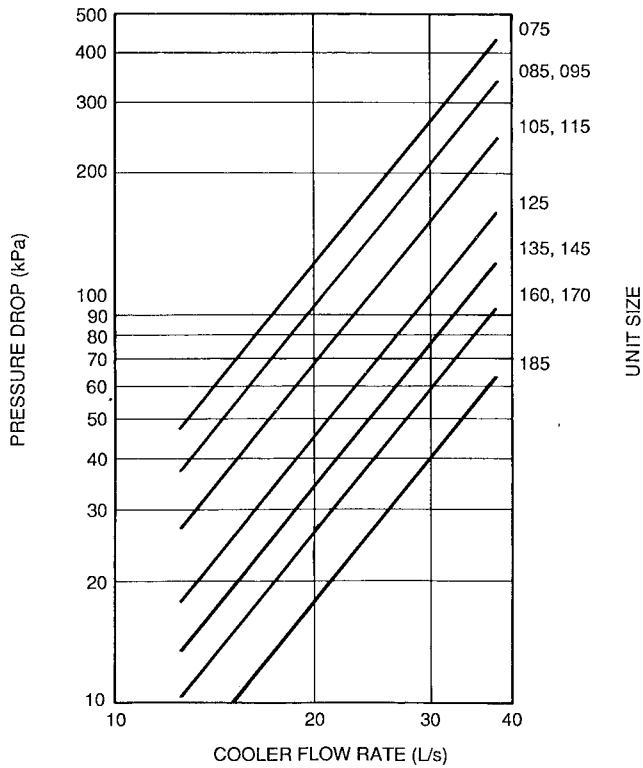


Performance data, SI

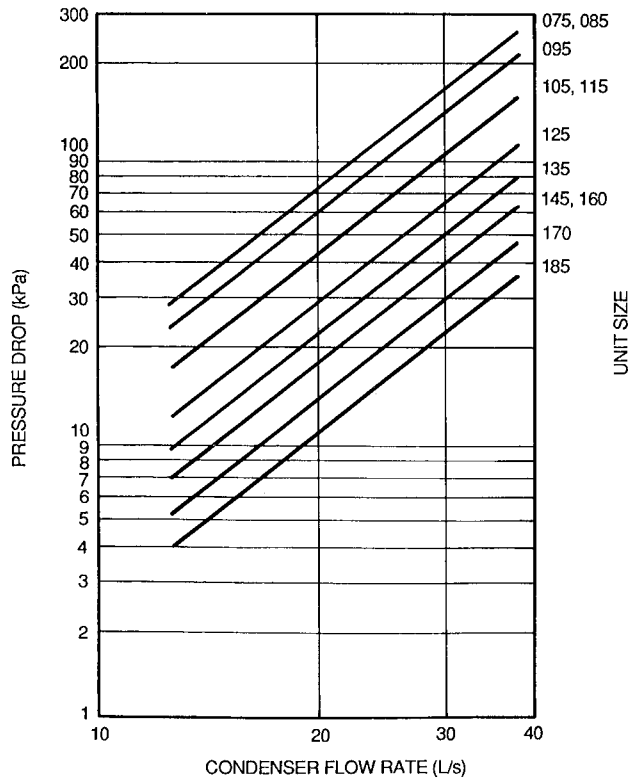
COOLING CAPACITY



COOLER PRESSURE DROP



CONDENSER PRESSURE DROP



Electrical data — 30HXA condenserless units*

UNIT 30HXA	VOLTAGE			POWER CIRCUIT		CONTROL CIRCUIT		
	Nameplate	Supplied		MCA	MOCP	Voltage	MCA	MOCP
		Min	Max					
075	208/230-3-60	187	253	220/220	350/350	115-1-60	30	30
	460-3-60	414	506	189	250	115-1-60	30	30
	575-3-60	518	633	151	200	115-1-60	30	30
	380-3-60	342	418	218	300	230-1-60	15	15
	230-3-50	207	253	204/204	350/350	230-1-50	15	15
	346-3-50	325	380	245	350	230-1-50	15	15
	380/415-3-50	342	440	212	300	230-1-50	15	15
085	208/230-3-60	187	253	250/220	450/350	115-1-60	30	30
	460-3-60	414	506	203	250	115-1-60	30	30
	575-3-60	518	633	162	225	115-1-60	30	30
	380-3-60	342	418	235	300	230-1-60	15	15
	230-3-50	207	253	235/204	400/350	230-1-50	15	15
	346-3-50	325	380	265	350	230-1-50	15	15
	380/415-3-50	342	440	229	300	230-1-50	15	15
095	208/230-3-60	187	253	286/220	500/350	115-1-60	30	30
	460-3-60	414	506	220	300	115-1-60	30	30
	575-3-60	518	633	176	250	115-1-60	30	30
	380-3-60	342	418	255	350	230-1-60	15	15
	230-3-50	207	253	274/204	450/350	230-1-50	15	15
	346-3-50	325	380	292	400	230-1-50	15	15
	380/415-3-50	342	440	252	350	230-1-50	15	15
105	208/230-3-60	187	253	336/220	600/350	115-1-60	30	30
	460-3-60	414	506	244	350	115-1-60	30	30
	575-3-60	518	633	195	250	115-1-60	30	30
	380-3-60	342	418	282	400	230-1-60	15	15
	230-3-50	207	253	333/204	500/350	230-1-50	15	15
	346-3-50	325	380	330	500	230-1-50	15	15
	380/415-3-50	342	440	285	400	230-1-50	15	15
115	208/230-3-60	187	253	336/250	600/450	115-1-60	30	30
	460-3-60	414	506	255	350	115-1-60	30	30
	575-3-60	518	633	204	300	115-1-60	30	30
	380-3-60	342	418	295	400	230-1-60	15	15
	230-3-50	207	253	333/235	500/400	230-1-50	15	15
	346-3-50	325	380	346	500	230-1-50	15	15
	380/415-3-50	342	440	299	450	230-1-50	15	15
125	208/230-3-60	187	253	336/286	600/500	115-1-60	30	30
	460-3-60	414	506	269	350	115-1-60	30	30
	575-3-60	518	633	215	300	115-1-60	30	30
	380-3-60	342	418	311	450	230-1-60	15	15
	230-3-50	207	253	333/274	500/450	230-1-50	15	15
	346-3-50	325	380	367	500	230-1-50	15	15
	380/415-3-50	342	440	317	450	230-1-50	15	15
135	208/230-3-60	187	253	336/286	600/500	115-1-60	30	30
	460-3-60	414	506	269	350	115-1-60	30	30
	575-3-60	518	633	215	300	115-1-60	30	30
	380-3-60	342	418	311	450	230-1-60	15	15
	230-3-50	207	253	332/274	500/450	230-1-50	15	15
	346-3-50	325	380	367	500	230-1-50	15	15
	380/415-3-50	342	440	317	450	230-1-50	15	15
145	208/230-3-60	187	253	336/336	600/600	115-1-60	30	30
	460-3-60	414	506	288	400	115-1-60	30	30
	575-3-60	518	633	230	300	115-1-60	30	30
	380-3-60	342	418	333	450	230-1-60	15	15
	230-3-50	207	253	333/333	500/500	230-1-50	15	15
	346-3-50	325	380	221/221	350/350	230-1-50	15	15
	380/415-3-50	342	440	344	450	230-1-50	15	15
160	208/230-3-60	187	253	336/250	600/450	115-1-60	30	30
	460-3-60	414	506	255	350	115-1-60	30	30
	575-3-60	518	633	204	300	115-1-60	30	30
	380-3-60	342	418	295	400	230-1-60	15	15
	230-3-50	207	253	333/235	500/400	230-1-50	15	15
	346-3-50	325	380	346	500	230-1-50	15	15
	380/415-3-50	342	440	299	450	230-1-50	15	15
170	208/230-3-60	187	253	336/286	600/500	115-1-60	30	30
	460-3-60	414	506	269	350	115-1-60	30	30
	575-3-60	518	633	215	300	115-1-60	30	30
	380-3-60	342	418	311	450	230-1-60	15	15
	230-3-50	207	253	333/274	500/450	230-1-50	15	15
	346-3-50	325	380	367	500	230-1-50	15	15
	380/415-3-50	342	440	317	450	230-1-50	15	15
185	208/230-3-60	187	253	336/336	600/600	115-1-60	30	30
	460-3-60	414	506	288	400	115-1-60	30	30
	575-3-60	518	633	230	300	115-1-60	30	30
	380-3-60	342	418	333	450	230-1-60	15	15
	230-3-50	207	253	333/333	500/500	230-1-50	15	15
	346-3-50	325	380	221/221	350/350	230-1-50	15	15
	380/415-3-50	342	440	344	450	230-1-50	15	15

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 All units have one main power block except the 208/230-v units, which have 2. The 208/230-v units have 6 parallel conductors (2 rows of 3), while all other units have 3 parallel conductors
- 6 —/— values indicate Circuit A/Circuit B
- 7 Use copper condensers only

Electrical data — 30HXC water-cooled units*

UNIT 30HXC	VOLTAGE			POWER CIRCUIT		CONTROL CIRCUIT		
	Nameplate	Supplied		MCA	MOCP	Voltage	MCA	MOCP
		Min	Max					
075	208/230-3-60	187	253	194/194	300/300	115-1-60	30	30
	460-3-60	414	506	167	225	115-1-60	30	30
	575-3-60	518	633	133	175	115-1-60	30	30
	380-3-60	342	418	194	250	230-1-60	15	15
	230-3-50	207	253	179/179	300/300	230-1-50	15	15
	346-3-50	325	380	214	300	230-1-50	15	15
	380/415-3-50	342	440	185	250	230-1-50	15	15
085	208/230-3-60	187	253	215/194	350/300	115-1-60	30	30
	460-3-60	414	506	177	250	115-1-60	30	30
	575-3-60	518	633	142	200	115-1-60	30	30
	380-3-60	342	418	205	250	230-1-60	15	15
	230-3-50	207	253	200/179	350/300	230-1-50	15	15
	346-3-50	325	380	228	300	230-1-50	15	15
	380/415-3-50	342	440	197	250	230-1-50	15	15
095	208/230-3-60	187	253	241/194	400/300	115-1-60	30	30
	460-3-60	414	506	189	250	115-1-60	30	30
	575-3-60	518	633	152	225	115-1-60	30	30
	380-3-60	342	418	219	300	230-1-60	15	15
	230-3-50	207	253	226/179	400/300	230-1-50	15	15
	346-3-50	325	380	245	350	230-1-50	15	15
	380/415-3-50	342	440	212	300	230-1-50	15	15
105	208/230-3-60	187	253	276/194	450/300	115-1-60	30	30
	460-3-60	414	506	205	300	115-1-60	30	30
	575-3-60	518	633	164	225	115-1-60	30	30
	380-3-60	342	418	237	350	230-1-60	15	15
	230-3-50	207	253	263/179	450/350	230-1-50	15	15
	346-3-50	325	380	270	400	230-1-50	15	15
	380/415-3-50	342	440	233	350	230-1-50	15	15
115	208/230-3-60	187	253	276/215	450/350	115-1-60	30	30
	460-3-60	414	506	213	300	115-1-60	30	30
	575-3-60	518	633	171	250	115-1-60	30	30
	380-3-60	342	418	246	350	230-1-60	15	15
	230-3-50	207	253	263/200	450/350	230-1-50	15	15
	346-3-50	325	380	281	400	230-1-50	15	15
	380/415-3-50	342	440	243	350	230-1-50	15	15
125	208/230-3-60	187	253	276/241	450/400	115-1-60	30	30
	460-3-60	414	506	223	300	115-1-60	30	30
	575-3-60	518	633	179	250	115-1-60	30	30
	380-3-60	342	418	257	350	230-1-60	15	15
	230-3-50	207	253	263/226	450/400	230-1-50	15	15
	346-3-50	325	380	295	400	230-1-50	15	15
	380/415-3-50	342	440	255	350	230-1-50	15	15
135	208/230-3-60	187	253	276/241	450/400	115-1-60	30	30
	460-3-60	414	506	223	300	115-1-60	30	30
	575-3-60	518	633	179	250	115-1-60	30	30
	380-3-60	342	418	257	350	230-1-60	15	15
	230-3-50	207	253	263/226	450/400	230-1-50	15	15
	346-3-50	325	380	295	400	230-1-50	15	15
	380/415-3-50	342	440	255	350	230-1-50	15	15
145	208/230-3-60	187	253	276/276	450/450	115-1-60	30	30
	460-3-60	414	506	236	300	115-1-60	30	30
	575-3-60	518	633	189	250	115-1-60	30	30
	380-3-60	342	418	272	350	230-1-60	15	15
	230-3-50	207	253	263/263	450/450	230-1-50	15	15
	346-3-50	325	380	315	450	230-1-50	15	15
	380/415-3-50	342	440	272	350	230-1-50	15	15
160	208/230-3-60	187	253	276/215	450/350	115-1-60	30	30
	460-3-60	414	506	213	300	115-1-60	30	30
	575-3-60	518	633	171	250	115-1-60	30	30
	380-3-60	342	418	246	350	230-1-60	15	15
	230-3-50	207	253	263/200	450/350	230-1-50	15	15
	346-3-50	325	380	281	400	230-1-50	15	15
	380/415-3-50	342	440	243	350	230-1-50	15	15
170	208/230-3-60	187	253	276/241	450/400	115-1-60	30	30
	460-3-60	414	506	223	300	115-1-60	30	30
	575-3-60	518	633	179	250	115-1-60	30	30
	380-3-60	342	418	257	350	230-1-60	15	15
	230-3-50	207	253	263/226	450/400	230-1-50	15	15
	346-3-50	325	380	295	400	230-1-50	15	15
	380/415-3-50	342	440	255	350	230-1-50	15	15
185	208/230-3-60	187	253	276/276	450/450	115-1-60	30	30
	460-3-60	414	506	236	300	115-1-60	30	30
	575-3-60	518	633	189	250	115-1-60	30	30
	380-3-60	342	418	272	350	230-1-60	15	15
	230-3-50	207	253	263/263	450/450	230-1-50	15	15
	346-3-50	325	380	315	450	230-1-50	15	15
	380/415-3-50	342	440	272	350	230-1-50	15	15

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

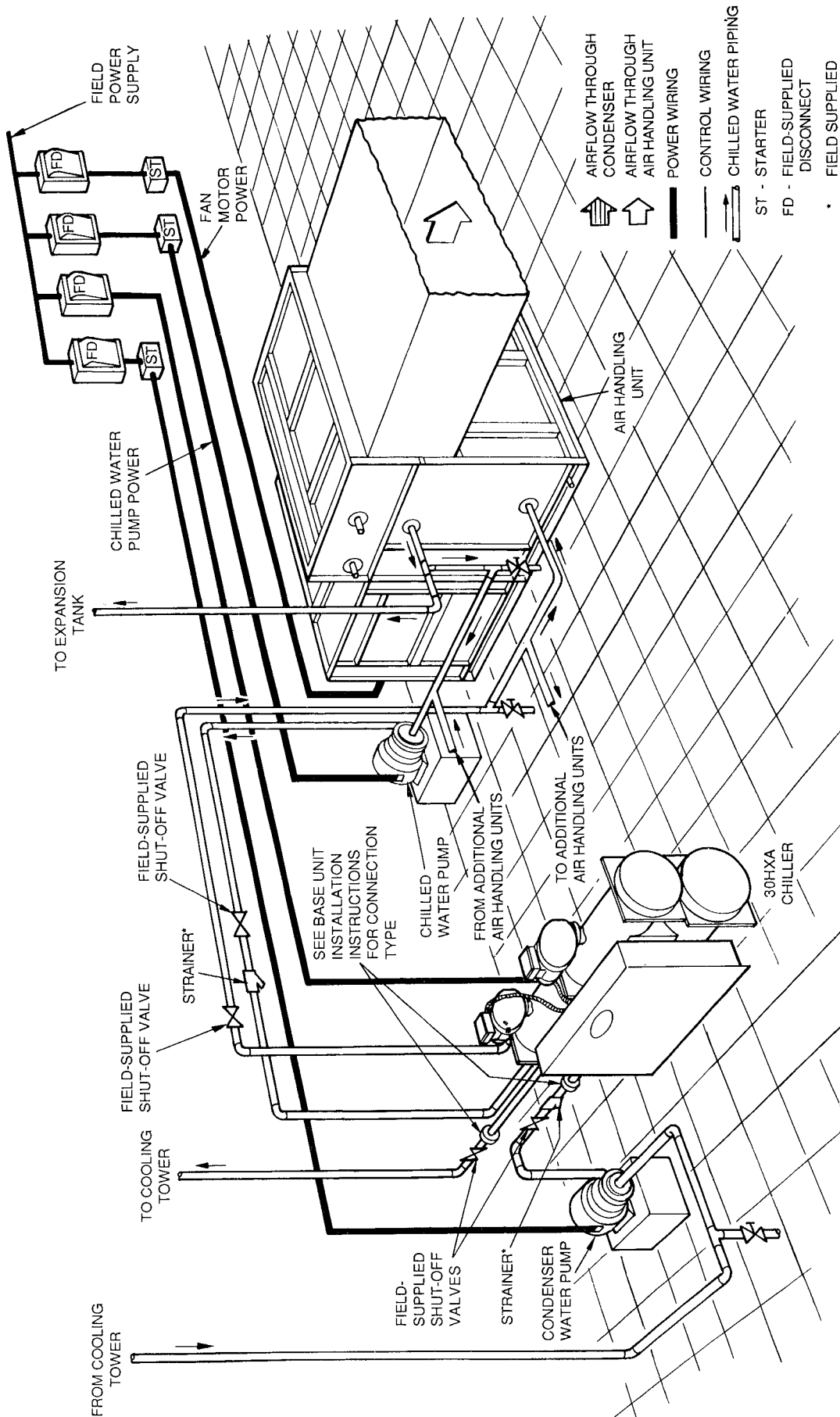
4 Maximum allowable phase imbalance is: voltage, 2%; amps, 5%

5 All units have one main power block except the 208/230-v units, which have 2 The 208/230-v units have 6 parallel conductors (2 rows of 3), while all other units have 3 parallel conductors

6 —/— values indicate Circuit A/Circuit B

7 Use copper condensers only

Typical piping



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 7 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 optional or 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 time clock). The chiller starts. (If the flow switch is applied, the chiller will start after the flow has been proven.) 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.

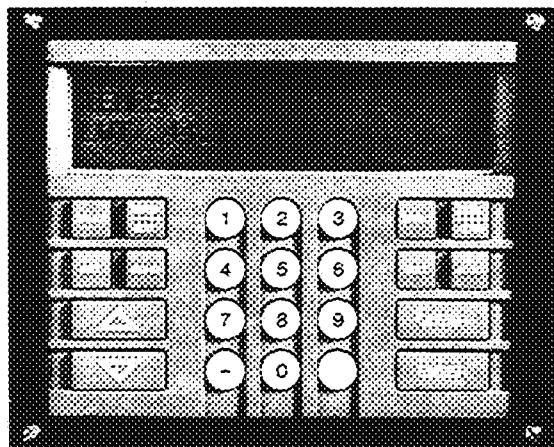
Normal operation — The entering fluid temperature sensor senses changes in entering fluid temperature to anticipate changes in the cooling load. Based on leaving fluid temperature, the control will add or delete capacity to maintain a constant leaving fluid temperature

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

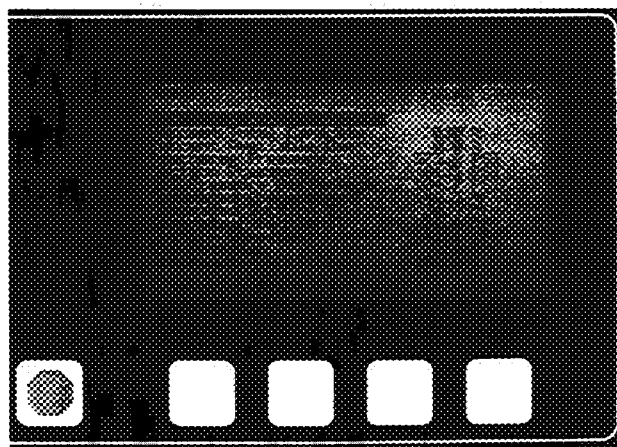
Safeties — The 30HX control as shipped from the factory automatically deenergizes any active compressor that experiences any of the following:

- electrical overload
- overtemperature
- high pressure
- low pressure
- loss of charge
- phase loss
- phase reversal (control prevents compressor start)
- voltage imbalance
- ground current
- loss of flow
- cooler freeze indication

STANDARD DISPLAY



OPTIONAL OR ACCESSORY EXPANDED DISPLAY



Guide specifications

Water-Cooled and Condenserless Liquid Chiller

HVAC Guide Specifications

Size Range **75 to 185 Tons (265 to 650 kW) Nominal**
Carrier Model Number. **30HXA — Condenserless**
30HXC — Water Cooled

Part 1 — General

1 01 SYSTEM DESCRIPTION

- A. Microprocessor controlled, water-cooled 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 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, water-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 minimum 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 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 Shall be equipped with electric heaters in the shell heads to protect against cooler freeze-up
- 7. Shall have a cooler drain and vent

- 8. 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 minimum 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 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, 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. micro-processor, 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 .1° F to 2 F (.05° 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 micro-processor, shall be capable of displaying the output of a run test to verify operation of every switch, sensor, potentiometer, fan, 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. Low fluid flow.
- c. Low chilled fluid temperature.
- d Low oil (each compressor circuit)
- e Voltage imbalance.
- f. Ground current
- g. Thermal overload.
- h Pressure overload.
- i Electrical overload
- j Single-phasing.

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 (208/230 v has 2 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. Y-Delta Starter

Unit shall have a factory-installed, Y-Delta starter to minimize electrical inrush current.

2. Sound Reduction Package.

Unit shall have field-installed sound reduction package that includes compressor enclosure.

3 Vibration Isolation.

Unit shall be supplied with rubber-in-shear vibration isolators for field installation.

4 Control Transformer

Unit shall be supplied with a field (or factory) 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 Kit:

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 can be either factory or field installed.

11. Temperature Reset:

Unit shall reset leaving chilled fluid temperature based on return fluid temperature, outdoor ambient temperature, space temperature, 4-20 mA external signal, or Carrier Comfort Network input

NOTE The accessory control module is necessary to provide this function

* 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 Demand Limit Control.

Unit shall be equipped with a 2-point demand limit control (from 0 to 100%), which shall be activated by a remote contact closure or a 4-20 mA signal

NOTE. The accessory control module is necessary to provide this function.

Carrier Corporation • Syracuse, New York 13221

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**UNITED
TECHNOLOGIES
CARRIER**

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

Book 2
Tab 5c

Page 20

Catalog No 523-029

Printed in U S A

PC 903

Form 30HX-1APD
Replaces: New