Product Data

AquaForce®
Fixed Speed Air-Cooled Liquid Chillers

80 to 500 Nominal Tons
(265 to 1740 Nominal kW)

30XA080-501
Fixed Speed Air-Cooled Liquid Chillers
with Optional Integrated Hydronic Pump Package

Features/Benefits

AquaForce® chillers were designed from the ground up to meet the efficiency demands of today and the future by providing premium air-cooled chiller packages for contractors, consulting engineers and building owners.

- Rotary screw compression
- R-134a HFC refrigerant
- Quiet AeroAcoustic™ fan system
- Novation® heat exchanger technology with microchannel coil
- Easy to use *Comfort*Link controls

AquaForce chillers' quiet operation make them ideal for sound sensitive applications

Great performance is delivered in a low sound unit that will be quiet enough for any application including hospitals, schools and other sites located in residential neighborhoods. In part load operation, such as cooler weather or night time duty, fewer fans operate. This results in even quieter operation.

Built in reliability

AquaForce chillers were developed under one of the most exacting qualification programs ever used for commercial chiller products. The compressors are virtually maintenance-free and protected by an auto-adaptive control that minimizes compressor wear. Operate AquaForce chillers year-round from –20°F (–29°C) to 125.6°F (52°C), with a combination of options and control methods. The following features are also provided to help ensure reliable performance:

Multiple independent circuits provide redundancy and greater reliability.

Electronic expansion valve (EXV) allows for precise control through all operating ranges.

Highly efficient, reliable chilled water circuit

AquaForce chillers provide a comprehensive chilled water circuit utilizing a high-efficiency shell-in-tube flooded cooler or an optional shell-in-tube DX (direct expansion) cooler. Units are equipped with a drainable cooler.

Electronic thermal-dispersion flow switch is included with the cooler. The switch is factory installed and tested and contains no moving parts for high reliability.

Optional integrated hydronic package is more than just a pump; it is an entire chilled water system, including:

- Single/dual pumps up to 15 hp and 140 ft head
- Available in constant speed or VFD configuration
- Strainer
- Start-up strainer (to be removed within 24 hours after chiller start-up)
- Flow regulator
- Freeze protection to –20°F (–29°C) (with freeze protection option)
- Heaters
- Required piping
- Pressure/temperature taps
- Isolation check valves for dual pump systems

The factory-installed and tested hydronic package provides faster, simpler and less expensive installation.

Environmentally balanced

Refrigerant R-134a enables the user to make a responsible choice in helping to preserve the environment. Refrigerant R-134a is an HFC refrigerant that does not contain ozone-layer damaging chlorine. This refrigerant is unaffected by the Montreal Protocol. It is a safe, non-toxic[1], efficient and environmentally balanced refrigerant.

Easy installation

A single chassis design (with the exception of the 30XA-501) provides a one-piece unit from 80 to 500 tons. The base rail is industrial-quality 7 ga for maximum structural integrity. The zinc-dipped galvanized frame (with Magni-coated screws) provides the best protection on the market for corrosion resistance. With such a structurally sound base, no perimeter base rail is needed.

*Comfort*Link controls for ease of use

The *Comfort*Link controls communicate in easy to understand English, making it as easy as possible to monitor and control each AquaForce chiller while accurately maintaining fluid temperatures. *Comfort*Link controls are available with French, Portuguese and Spanish as a standard configuration option.

Carrier's 30 Series chillers' *Comfort*Link controls provide features such as chilled water temperature reset, demand limiting, compressor wear minimization and protection, temperature and pressure displays and diagnostic functions. These controls result in higher chiller reliability, simplified training and more productive service calls with correspondingly lower operational and maintenance costs.

Two user interface options are available, the Touch Pilot™ display and the Navigator™ module. The Touch Pilot display is an easy to use touch screen display that provides simple navigation for configuration and control of AquaForce units.

Carrier's exclusive hand-held Navigator display provides convenience and powerful information in the palm of your hand. The Navigator display helps technicians to quickly diagnose problems and even prevent them from occurring. All AquaForce units are ready to be used with Carrier Comfort Network® (CCN) devices.

1. Under ASHRAE Standard 34-1992, R-134a is classified as an A1 refrigerant.

Table of contents

A BACnet[1] communication option is also available for the i-Vu® Open control system or a third-party BACnet building automation system.

Seismic certification

A seismic kit is available which will result in a unit SDS (seismic design acceleration parameter) level of 2.4.

Novation® heat exchanger technology

The Novation heat exchanger design with microchannel (MCHX) condenser coil is a robust, cost effective alternative to traditional coil design. These coils are offered coated or uncoated to match coil protection to site conditions. The e-coated version of this coil can withstand an 8000-hour salt spray test in accordance with ASTM (American Society for Testing and Materials) B-117 standard. The Carrier Electronic Catalog (E-CAT) can be used to determine whether corrosion protection is recommended for particular applications in coastal/marine environments.

Following the input of requested data, the E-CAT program output will advise the appropriate coil to be used. Other factors described in "Selection Guide: Environmental Corrosion Protection" catalog number 04-581061-01 must also be considered to determine if corrosion protection is required.

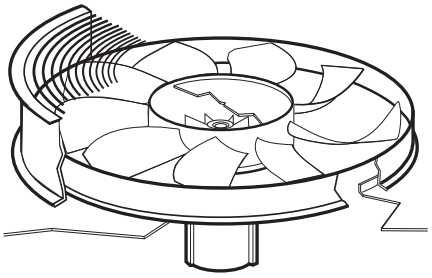
Microchannel coils are sturdier than other coil types, making them easier to clean without damage to the coil.

Due to the compact all-aluminum design, microchannel coils will reduce overall unit operating weight by 6 to 7%. The streamlined MCHX coil design reduces refrigerant charge by up to 30%.

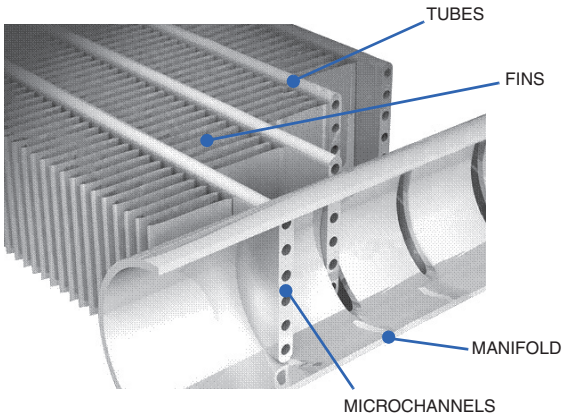
The coil is designed with rubber isolation around the powder painted coil frame to eliminate galvanic couples, which can cause corrosion due to dissimilar metals.

1. BACnet is a registered trademark of ASHRAE (American Society of Heating, Refrigerating, and Air-Conditioning Engineers).

TOUCH PILOT™ DISPLAY



LOW-NOISE AEROACOUSTIC FAN



NOVATION® HEAT EXCHANGER TECHNOLOGY WITH MICROCHANNEL CONDENSER COILS

Model number nomenclature

30XA 3 200 6 T - 0 - H - 3

30XA – AquaForce® Air-Cooled Chiller

Design Series

Unit Sizes*

080	102	140	182	240	282	350	501#
082	110	142	200	242	300	352	
090	112	160	202	260	302	401	
092	120	162	220	262	325	451	
100	122	180	222	280	327	476	

Voltage
2 – 380-3-60 **6** – 460-3-60

Condenser Coil/Ambient/Low Sound Options
- – Aluminum Fin/Copper Tube, High Ambient Temperature
0 – Copper Fin/Copper Tube, High Ambient Temperature
1 – Aluminum Pre-Coat Fin/Copper Tube, High Ambient Temperature
2 – Aluminum E-Coat Fin/Copper Tube, High Ambient Temperature
3 – Copper E-Coat Fin/Copper Tube, High Ambient Temperature
4 – Novation® Heat Exchanger (MCHX), High Ambient Temperature
5 – MCHX E-Coat, High Ambient Temperature
6 – Aluminum Fin/Copper Tube, High Ambient Temperature, Low Sound
7 – Copper Fin/Copper Tube, High Ambient Temperature, Low Sound
8 – Aluminum Pre-Coat Fin/Copper Tube, High Ambient Temperature, Low Sound
9 – Aluminum E-Coat Fin/Copper Tube, High Ambient Temperature, Low Sound
B – Copper E-Coat Fin/Copper Tube, High Ambient Temperature, Low Sound
C – MCHX, High Ambient Temperature, Low Sound
D – MCHX E-Coat, High Ambient Temperature, Low Sound
F – Aluminum Fin/Copper Tube, Standard Ambient Temperature, Low Sound
G – Copper Fin/Copper Tube, Standard Ambient Temperature, Low Sound
H – Aluminum Pre-Coat Fin/Copper Tube, Standard Ambient Temperature, Low Sound
J – Aluminum E-Coated Fin/Copper Tube, Standard Ambient Temperature, Low Sound
K – Copper E-Coat Fin/Copper Tube, Standard Ambient Temperature, Low Sound
L – MCHX, Standard Ambient Temperature, Low Sound
M – MCHX E-Coat, Standard Ambient Temperature, Low Sound
N – Aluminum Fin/Copper Tube, Standard Ambient Temperature
P – Copper Fin/Copper Tube, Standard Ambient Temperature
Q – Aluminum Pre-Coat Fin/Copper Tube, Standard Ambient Temperature
R – Aluminum E-Coat Fin/Copper Tube, Standard Ambient Temperature
S – Copper E-Coat Fin/Copper Tube, Standard Ambient Temperature
T – MCHX, Standard Ambient Temperature
V – MCHX E-Coat, Standard Ambient Temperature

SEE NEXT PAGE FOR REMAINDER OF MODEL NUMBER NOMENCLATURE

Cooler Options
0 – Cooler with Heater†
3 – Flooded Cooler with Heater, Minus One Pass
5 – Flooded Cooler with Heater, Plus One Pass
7 – Cooler with Heater, Full End Screen, Coil Trim Panels, Grilles†
K – Flooded Cooler with Heater, Minus One Pass, Full End Screen, Coil Trim Panels, Grilles
M – Flooded Cooler with Heater, Plus One Pass, Full End Screen, Coil Trim Panels, Grilles

Hydronic Pump Package Options
- – None

LEGEND

CFSP	—	Coil Face Shipping Protection
DX	—	Direct Expansion
EMM	—	Energy Management Module
LON	—	Local Operating Network
SCCR	—	Short Circuit Current Rating
VFD	—	Variable Frequency Drive
XL	—	Across-the-Line Starter

* xx0, xx1, xx5, and xx6 size units contain flooded style evaporators. xx2 and xx7 size units contain direct expansion (DX) style evaporators.
† Both flooded and DX cooler.
** Available in Middle East only.
# 30XA-501 is shipped in 2 modules and requires field assembly.

ASHRAE 90.1 COMPLIANT

Well exceeds ASHRAE 90.1 Standards.

2006 DEALER DESIGN AWARDS
theNEWS | SILVER

SEISMICOMPLIANT*

* Meets IBC 2006, ASCE-7-05, CBC 2007, and OSHPD seismic requirements.

Quality Assurance
ISO 9001:2008 certified processes

30XA 3 200 6 T - 0 - H - 3

SEE PREVIOUS PAGE FOR REMAINDER OF MODEL NUMBER NOMENCLATURE

Refrigeration Circuit Options
- **-** – None
- **0** – Suction Line Insulation
- **1** – Isolation Valves
- **3** – Suction Line Insulation, Isolation Valves
- **G** – Suction Line Insulation, Isolation Valves, Head Pressure Control, Minimum Load Control
- **H** – None (High Ambient)**
- **J** – Suction Line Insulation (High Ambient)**
- **K** – Isolation Valve (High Ambient)**
- **M** – Suction Line Insulation (High Ambient), Isolation Valve (High Ambient)**

Electrical Options
- **H** – Single Point Power, XL, Terminal Block, Control Transformer
- **J** – Single Point Power, Wye-Delta, Terminal Block, Control Transformer
- **R** – Single Point Power, XL, Disconnect, Control Transformer
- **S** – Single Point Power, Wye-Delta, Disconnect, Control Transformer

Packaging/Security/High SCCR Options
- **0** – Coil Face Shipping Protection (CFSP), Skid
- **1** – CFSP, Skid, Top Crate, Bag
- **3** – CFSP, Coil Trim Panels
- **4** – CFSP, Skid, Coil Trim Panels
- **5** – CFSP, Skid, Top Crate, Bag, Coil Trim Panels
- **7** – CFSP, Coil Trim Panels, Upper and Lower Grilles
- **8** – CFSP, Skid, Coil Trim Panels, Upper and Lower Grilles
- **9** – CFSP, Skid, Top Crate, Bag, Coil Trim Panels, Upper and Lower Grilles
- **C** – CFSP, Coil Trim Panels, Upper and Lower Grilles, Upper Hail Guards
- **D** – CFSP, Skid, Coil Trim Panels, Upper and Lower Grilles, Upper Hail Guards
- **F** – CFSP, Skid, Top Crate, Bag, Coil Trim Panels, Upper and Lower Grilles, Upper Hail Guards
- **L** – CFSP

Controls/Communication Options
- **-** – Navigator™ Display
- **3** – Touch Pilot™ Display

Physical data

30XA080-122 — ENGLISH

UNIT 30XA	080	082	090	092	100	102	110	112	120	122
OPERATING WEIGHT (lb)*										
Al-Cu Condenser Coils	7,674	7,831	8,704	8,828	8,931	9,055	9,071	9,308	9,216	9,426
Cu-Cu Condenser Coils	8,398	8,555	9,669	9,793	9,896	10,020	10,036	10,273	10,181	10,391
MCHX Condenser Coils	7,234	7,391	8,127	8,251	8,348	8,472	8,483	8,720	8,622	8,832
REFRIGERANT TYPE	R-134a, EXV Controlled System									
Refrigerant Charge (lb) Ckt A/Ckt B/Ckt C (RTPF)	110/110/—	83/83/—	110/110/—	83/83/—	120/120/—	93/93/—	135/120/—	108/93/—	135/135/—	108/108/—
Refrigerant Charge (lb) Ckt A/Ckt B/Ckt C (MCHX)	93.5/93.5/—	61/61/—	88/88/—	61/61/—	90/90/—	63/63/—	94/90/—	65/63/—	94/94/—	65/65/—
COMPRESSORS	Semi-Hermetic Twin Rotary Screws									
Quantity	2	2	2	2	2	2	2	2	2	2
Speed (rpm)	3500									
(Qty) Compressor Model Number Ckt A	(1) 06TS-137†	06TS-137†	(1) 06TS-137	(1) 06TS-137	(1) 06TS-155	(1) 06TS-155	(1) 06TS-186	(1) 06TS-186	(1) 06TS-186	(1) 06TS-186
(Qty) Compressor Model Number Ckt B	(1) 06TS-137†	06TS-137†	(1) 06TS-137	(1) 06TS-137	(1) 06TS-155	(1) 06TS-155	(1) 06TS-155	(1) 06TS-155	(1) 06TS-186	(1) 06TS-186
(Qty) Compressor Model Number Ckt C	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Oil Charge (gal), Ckt A/Ckt B/Ckt C	5.5/5.5/—	5.5/5.5/—	5.5/5.5/—	5.5/5.5/—	5.5/5.5/—	5.5/5.5/—	5.5/5.5/—	5.5/5.5/—	5.5/5.5/—	5.5/5.5/—
Minimum Capacity Step (%)										
Standard	15	15	15	15	15	15	14	14	15	15
Optional	9	9	9	9	9	9	8	8	10	10
COOLER	Flooded, Shell and Tube Type	Direct Expansion Cooler	Flooded, Shell and Tube Type	Direct Expansion Cooler	Flooded, Shell and Tube Type	Direct Expansion Cooler	Flooded, Shell and Tube Type	Direct Expansion Cooler	Flooded, Shell and Tube Type	Direct Expansion Cooler
Net Fluid Volume (gal.)	16.5	31.3	18.5	31.3	18.5	31.3	20.0	48.6	23.0	48.6
Maximum Refrigerant Pressure (psig)	220	220	220	220	220	220	220	220	220	220
Maximum Water-Side Pressure (psig)	300	300	300	300	300	300	300	300	300	300
WATER CONNECTIONS										
Drain (NPT, in.)	3/8	3/4	3/8	3/4	3/8	3/4	3/8	3/4	3/8	3/4
Standard, Inlet and Outlet, Victaulic (in.)	5	4	5	4	5	4	5	6	5	6
Number of Passes	2	—	2	—	2	—	2	—	2	—
Minus 1 Pass, Inlet and Outlet, Victaulic (in.)	5	—	5	—	5	—	5	—	5	—
Number of Passes	1	—	1	—	1	—	1	—	1	—
Plus 1 Pass, Inlet and Outlet, Victaulic (in.)	4	—	4	—	4	—	4	—	4	—
Number of Passes	3	—	3	—	3	—	3	—	3	—
CONDENSER FANS	Shrouded Axial Type, Vertical Discharge									
Fan Speed (rpm) Standard/High Ambient**	850/—	850/—	850/—	850/—	850/—	850/—	850/—	850/—	850/—	850/—
No. Blades...Diameter (in.)	9...30	9...30	9...30	9...30	9...30	9...30	9...30	9...30	9...30	9...30
No. Fans (Ckt A/Ckt B/Ckt C)	3/3/—	3/3/—	4/4/—	4/4/—	4/4/—	4/4/—	4/4/—	4/4/—	4/4/—	4/4/—
Total Airflow (cfm) 850 rpm	55,800	55,800	74,400	74,400	74,400	74,400	74,400	74,400	74,400	74,400
Total Airflow (cfm) 1140 rpm	—	—	—	—	—	—	—	—	—	—
CONDENSER COILS										
No. Coils (Ckt A/Ckt B/Ckt C)	3/3/—	3/3/—	4/4/—	4/4/—	4/4/—	4/4/—	4/4/—	4/4/—	4/4/—	4/4/—
Total Face Area (sq ft)	141	141	188	188	188	188	188	188	188	188
CHASSIS DIMENSIONS (ft-in.)										
Length	11-10	11-10	15-9							
Width	7-4 3/4									
Height	7-6 7/16									

30XA140-220 — ENGLISH

UNIT 30XA	140	142	160	162	180	182	200	202	220
OPERATING WEIGHT (lb)*									
Al-Cu Condenser Coils	11,505	11,962	11,748	12,174	13,590	13,935	13,712	14,014	14,727
Cu-Cu Condenser Coils	12,711	13,168	12,954	13,380	15,037	15,382	15,159	15,461	16,295
MCHX Condenser Coils	10,768	11,225	11,000	11,426	12,699	13,044	12,810	13,112	13,748
REFRIGERANT TYPE	R-134a, EXV Controlled System								
Refrigerant Charge (lb) Ckt A/Ckt B/Ckt C (RTPF)	202/121/—	177/103/—	225/159/—	201/126/—	205/205/—	181/181/—	225/225/—	201/201/—	270/225/—
Refrigerant Charge (lb) Ckt A/Ckt B/Ckt C (MCHX)	128/90/—	101/59/—	126/94/—	102/61/—	132/132/—	113/113/—	152/152/—	123/123/—	159.5/152/—
COMPRESSORS	Semi-Hermetic Twin Rotary Screws								
Quantity	2	2	2	2	2	2	2	2	2
Speed (rpm)	3500								
(Qty) Compressor Model Number Ckt A	(1) 06TT-266	(1) 06TT-266	(1) 06TT-301	(1) 06TT-301	(1) 06TT-266	(1) 06TT-266	(1) 06TT-301	(1) 06TT-301	(1) 06TT-356
(Qty) Compressor Model Number Ckt B	(1) 06TS-155	(1) 06TS-155	(1) 06TS-186	(1) 06TS-186	(1) 06TT-266	(1) 06TT-266	(1) 06TT-301	(1) 06TT-301	(1) 06TT-301
(Qty) Compressor Model Number Ckt C	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Oil Charge (gal), Ckt A/Ckt B/Ckt C	6.25/5.5/—	6.25/5.5/—	6.25/5.5/—	6.25/5.5/—	6.25/6.25/—	6.25/6.25/—	6.25/6.25/—	6.25/6.25/—	6.75/6.25/—
Minimum Capacity Step (%)									
Standard	11	11	11	11	15	15	15	15	14
Optional	7	7	8	8	10	10	10	10	10
COOLER	Flooded, Shell and Tube Type	Direct Expansion Cooler	Flooded, Shell and Tube Type	Direct Expansion Cooler	Flooded, Shell and Tube Type	Direct Expansion Cooler	Flooded, Shell and Tube Type	Direct Expansion Cooler	Flooded, Shell and Tube Type
Net Fluid Volume (gal.)	25.5	63.5	27.5	63.5	31.5	73.5	34.0	73.5	37.0
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
WATER CONNECTIONS									
Drain (NPT, in.)	3/8	3/4	3/8	3/4	3/8	3/4	3/8	3/4	3/8
Standard, Inlet and Outlet, Victaulic (in.)	5	6	5	6	6	6	6	6	6
Number of Passes	2	—	2	—	2	—	2	—	2
Minus 1 Pass, Inlet and Outlet, Victaulic (in.)	5	—	5	—	8	—	8	—	8
Number of Passes	1	—	1	—	1	—	1	—	1
Plus 1 Pass, Inlet and Outlet, Victaulic (in.)	5	—	5	—	6	—	6	—	6
Number of Passes	3	—	3	—	3	—	3	—	3
CONDENSER FANS	Shrouded Axial Type, Vertical Discharge								
Fan Speed (rpm) Standard/High Ambient**	850/1140	850/1140	850/1140	850/1140	850/1140	850/1140	850/1140	850/1140	850/1140
No. Blades...Diameter (in.)	9...30	9...30	9...30	9...30	9...30	9...30	9...30	9...30	9...30
No. Fans (Ckt A/Ckt B/Ckt C)	6/4/—	6/4/—	6/4/—	6/4/—	6/6/—	6/6/—	6/6/—	6/6/—	7/6/—
Total Airflow (cfm) 850 rpm	93,000	93,000	93,000	93,000	111,600	111,600	111,600	111,600	120,900
Total Airflow (cfm) 1140 rpm	124,000	124,000	124,000	124,000	148,800	148,800	148,800	148,800	161,200
CONDENSER COILS									
No. Coils (Ckt A/Ckt B/Ckt C)	6/4/—	6/4/—	6/4/—	6/4/—	6/6/—	6/6/—	6/6/—	6/6/—	7/6/—
Total Face Area (sq ft)	234	234	234	234	281	281	281	281	305
CHASSIS DIMENSIONS (ft-in.)									
Length	19-8				23-7				27-6
Width	7-4 3/4								
Height	7-6 7/16								

LEGEND

Cu — Copper
Al — Aluminum
EXV — Electronic Expansion Valve
MCHX — Microchannel Heat Exchanger
N/A — Not Applicable

* Operating weight includes coil trim panels.
† 30XA080,082 units do not have an economizer.
** The standard ambient temperature option is not available on 30XA401, 451, 476, and 501 units. The high ambient temperature option is not available on 30XA080-122 units.

30XA222-325 — ENGLISH

UNIT 30XA	222	240	242	260	262	280	282	300	302	325
OPERATING WEIGHT (lb)*										
Al-Cu Condenser Coils	15,071	14,887	15,231	16,853	17,055	17,022	17,224	17,362	17,834	18,834
Cu-Cu Condenser Coils	16,639	16,455	16,799	18,662	18,864	18,831	19,033	19,292	19,764	21,005
MCHX Condenser Coils	14,092	13,897	14,241	15,720	15,922	15,878	16,080	16,141	16,613	17,467
REFRIGERANT TYPE	R-134a, EXV Controlled System									
Refrigerant Charge (lb) Ckt A/Ckt B/Ckt C (RTPF)	246/198/—	270/270/—	246/246/—	375/220/—	330/206/—	375/270/—	330/256/—	415/270/—	386/261/—	375/375/—
Refrigerant Charge (lb) Ckt A/Ckt B/Ckt C (MCHX)	135/125/—	159.5/159/—	135/135/—	233.5/156/—	188/142/—	226.5/159.5/—	181/145/—	230/161/—	201/152/—	226.5/226.5/—
COMPRESSORS	Semi-Hermetic Twin Rotary Screws									
Quantity	2	2	2	2	2	2	2	2	2	2
Speed (rpm)	3500									
(Qty) Compressor Model Number Ckt A	(1) 06TT-356	(1) 06TT-356	(1) 06TT-356	(1) 06TU-483	(1) 06TU-483	(1) 06TU-483	(1) 06TU-483	(1) 06TU-554	(1) 06TU-554	(1) 06TU-483
(Qty) Compressor Model Number Ckt B	(1) 06TT-301	(1) 06TT-356	(1) 06TT-356	(1) 06TT-301	(1) 06TT-301	(1) 06TT-356	(1) 06TT-356	(1) 06TT-356	(1) 06TT-356	(1) 06TU-483
(Qty) Compressor Model Number Ckt C	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Oil Charge (gal), Ckt A/Ckt B/Ckt C	6.75/6.25/—	6.75/6.75/—	6.75/6.75/—	7.5/6.75/—	7.5/6.75/—	7.5/6.75/—	7.5/6.75/—	7.5/6.75/—	7.5/6.75/—	7.5/7.5/—
Minimum Capacity Step (%)										
Standard	14	15	15	11	11	13	13	12	12	15
Optional	10	10	10	8	8	9	9	7	7	10
COOLER	Direct Expansion Cooler	Flooded, Shell and Tube Type	Direct Expansion Cooler	Flooded, Shell and Tube Type	Direct Expansion Cooler	Flooded, Shell and Tube Type	Direct Expansion Cooler	Flooded, Shell and Tube Type	Direct Expansion Cooler	Flooded, Shell and Tube Type
Net Fluid Volume (gal.)	71.0	39.0	71.0	42.0	82.8	44.0	82.8	48.5	108.0	50.5
Maximum Refrigerant Pressure (psig)	220	220	220	220	220	220	220	220	220	220
Maximum Water-Side Pressure (psig)	300	300	300	300	300	300	300	300	300	300
WATER CONNECTIONS										
Drain (NPT, in.)	3/4	3/8	3/4	3/8	3/4	3/8	3/4	3/8	3/4	3/8
Standard, Inlet and Outlet, Victaulic (in.)	6	6	6	8	6	8	6	8	6	8
Number of Passes	—	2	—	2	—	2	—	2	—	2
Minus 1 Pass, Inlet and Outlet, Victaulic (in.)	—	8	—	8	—	8	—	8	—	8
Number of Passes	—	1	—	1	—	1	—	1	—	1
Plus 1 Pass, Inlet and Outlet, Victaulic (in.)	—	6	—	8	—	8	—	8	—	8
Number of Passes	—	3	—	3	—	3	—	3	—	3
CONDENSER FANS	Shrouded Axial Type, Vertical Discharge									
Fan Speed (rpm) Standard/High Ambient**	850/1140	850/1140	850/1140	850/1140	850/1140	850/1140	850/1140	850/1140	850/1140	850/1140
No. Blades...Diameter (in.)	9...30	9...30	9...30	9...30	9...30	9...30	9...30	9...30	9...30	9...30
No. Fans (Ckt A/Ckt B/Ckt C)	7/6/—	7/6/—	7/6/—	9/6/—	9/6/—	9/7/—	9/7/—	10/6/—	10/6/—	9/9/—
Total Airflow (cfm) 850 rpm	120,900	120,900	120,900	139,500	139,500	148,800	148,800	148,800	148,800	167,400
Total Airflow (cfm) 1140 rpm	161,200	161,200	161,200	186,000	186,000	198,400	198,400	198,400	198,400	223,200
CONDENSER COILS										
No. Coils (Ckt A/Ckt B/Ckt C)	7/6/—	7/6/—	7/6/—	9/6/—	9/6/—	9/7/—	9/7/—	10/6/—	10/6/—	9/9/—
Total Face Area (sq ft)	305	305	305	352	352	375	375	375	375	422
CHASSIS DIMENSIONS (ft-in.)										
Length	27-6			31-5						35-4
Width	7-4 3/4									7-4 3/4
Height	7-6 7/16									7-6 7/16

30XA327-501 — ENGLISH

UNIT 30XA	327	350	352	401	451	476	501
OPERATING WEIGHT (lb)*							
Al-Cu Condenser Coils	19,306	19,040	19,512	22,688	23,423	27,518	29,882
Cu-Cu Condenser Coils	21,477	21,211	21,683	25,100	26,074	30,175	33,020
MCHX Condenser Coils	17,939	17,659	18,131	20,785	21,737	25,362	27,403
REFRIGERANT TYPE	R-134a, EXV Controlled System						
Refrigerant Charge (lb) Ckt A/Ckt B/Ckt C (RTPF)	344/344/—	415/375/—	384/344/—	460 / 385 /—	530 / 385 / —	475 / 465 / —	560 / 495 / —
Refrigerant Charge (lb) Ckt A/Ckt B/Ckt C (MCHX)	195/195/—	231.5/226.5/—	200/195/—	275 / 225 / —	290 / 225 / —	285 / 280 / —	300 / 290 / —
COMPRESSORS	Semi-Hermetic Twin Rotary Screws						
Quantity	2	2	2	2	2	2	2
Speed (rpm)	3500						
(Qty) Compressor Model Number Ckt A	(1) 06TU-483	(1) 06TU-554	(1) 06TU-554	(1) 06TV-680	(1) 06TV-819	(1) 06TV-753	(1) 06TV-819
(Qty) Compressor Model Number Ckt B	(1) 06TU-483	(1) 06TU-483	(1) 06TU-483	(1) 06TU-554	(1) 06TU-554	(1) 06TV-680	(1) 06TV-753
(Qty) Compressor Model Number Ckt C	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Oil Charge (gal), Ckt A/Ckt B/Ckt C	7.5/7.5/—	7.5/7.5/—	7.5/7.5/—	7.5/7.5/—	7.5/7.5/—	7.5/7.5/—	7.5/7.5/—
Minimum Capacity Step (%)							
Standard	15	15	15	15	12	15	15
Optional	10	10	10	11	8	11	11
COOLER	Direct Expansion Cooler	Flooded, Shell and Tube Type	Direct Expansion Cooler	Flooded, Shell and Tube Type			
Net Fluid Volume (gal.)	108.0	53.4	108.0	64.5	64.5	81.8	81.8
Maximum Refrigerant Pressure (psig)	220	220	220	220	220	220	220
Maximum Water-Side Pressure (psig)	300	300	300	300	300	300	300
WATER CONNECTIONS							
Drain (NPT, in.)	3/4	3/8	3/4	3/8	3/8	3/8	3/8
Standard, Inlet and Outlet, Victaulic (in.)	6	8	6	8	8	8	8
Number of Passes	—	2	—	2	2	2	2
Minus 1 Pass, Inlet and Outlet, Victaulic (in.)	—	8	—	8	8	8	8
Number of Passes	—	1	—	1	1	1	1
Plus 1 Pass, Inlet and Outlet, Victaulic (in.)	—	8	—	—	—	—	—
Number of Passes	—	3	—	—	—	—	—
CONDENSER FANS	Shrouded Axial Type, Vertical Discharge						
Fan Speed (rpm) Standard/High Ambient**	850/1140	850/1140	850/1140	—/1140	—/1140	—/1140	—/1140
No. Blades...Diameter (in.)	9...30	9...30	9...30	9...30	9...30	9...30	9...30
No. Fans (Ckt A/Ckt B/Ckt C)	9/9/—	9/9/—	9/9/—	11/9/—	13/9/—	11/11/—	14/12/—
Total Airflow (cfm) 850 rpm	167,400	167,400	167,400	—	—	—	—
Total Airflow (cfm) 1140 rpm	223,200	223,200	223,200	248,000	272,800	272,800	322,400
CONDENSER COILS							
No. Coils (Ckt A/Ckt B/Ckt C)	9/9/—	9/9/—	9/9/—	11/9/—	13/9/—	11/11/—	14/12/—
Total Face Area (sq ft)	422	422	422	469	516	516	608
CHASSIS DIMENSIONS (ft-in.)							
Length	35-4			39-3	43-2		51-3
Width	7-4 3/4						
Height	7-6 7/16						

LEGEND

Cu — Copper
Al — Aluminum
EXV — Electronic Expansion Valve
MCHX — Microchannel Heat Exchanger
N/A — Not Applicable

* Operating weight includes coil trim panels.
† 30XA080,082 units do not have an economizer.
** The standard ambient temperature option is not available on 30XA401, 451, 476, and 501 units. The high ambient temperature option is not available on 30XA080-122 units.

Physical data (cont)

30XA080-122 — SI

UNIT 30XA	080	082	090	092	100	102	110	112	120	122
OPERATING WEIGHT (kg)*										
Al-Cu Condenser Coils	3 481	3 552	3 948	4 004	4 051	4 107	4 115	4 222	4 181	4 276
Cu-Cu Condenser Coils	3 809	3 881	4 386	4 442	4 489	4 545	4 552	4 660	4 618	4 713
MCHX Condenser Coils	3 281	3 353	3 686	3 742	3 786	3 843	3 848	3 955	3 911	4 006
REFRIGERANT TYPE	R-134a, EXV Controlled System									
Refrigerant Charge (kg) Ckt A/Ckt B/Ckt C (RTPF)	50/50/—	38/38/—	50/50/—	38/38/—	54/54/—	42/42/—	61/61/—	49/42/—	61/61/—	49/49/—
Refrigerant Charge (kg) Ckt A/Ckt B/Ckt C (MCHX)	42.4/42.4/—	28/28/—	39.9/39.9/—	28/28/—	40.8/40.8/—	29/29/—	42.6/40.8/—	29/29/—	42.6/42.6/—	29/29/—
COMPRESSORS	Semi-Hermetic Twin Rotary Screws									
Quantity	2	2	2	2	2	2	2	2	2	2
Speed (r/s)	58.3									
(Qty) Compressor Model Number Ckt A	(1) 06TS-137†	06TS-137†	(1) 06TS-137	(1) 06TS-137	(1) 06TS-155	(1) 06TS-155	(1) 06TS-186	(1) 06TS-186	(1) 06TS-186	(1) 06TS-186
(Qty) Compressor Model Number Ckt B	(1) 06TS-137†	06TS-137†	(1) 06TS-137	(1) 06TS-137	(1) 06TS-155	(1) 06TS-155	(1) 06TS-155	(1) 06TS-155	(1) 06TS-186	(1) 06TS-186
(Qty) Compressor Model Number Ckt C	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Oil Charge (liters), Ckt A/Ckt B/Ckt C	20.8/20.8/—	20.8/20.8/—	20.8/20.8/—	20.8/20.8/—	20.8/20.8/—	20.8/20.8/—	20.8/20.8/—	20.8/20.8/—	20.8/20.8/—	20.8/20.8/—
Minimum Capacity Step (%)										
Standard	15	15	15	15	15	15	14	14	15	15
Optional	9	9	9	9	9	9	8	8	10	10
COOLER	Flooded, Shell and Tube Type	Direct Expansion Cooler	Flooded, Shell and Tube Type	Direct Expansion Cooler	Flooded, Shell and Tube Type	Direct Expansion Cooler	Flooded, Shell and Tube Type	Direct Expansion Cooler	Flooded, Shell and Tube Type	Direct Expansion Cooler
Net Fluid Volume (liters)	62.5	118	70.0	118	70.0	118	75.7	184	87.1	184
Maximum Refrigerant Pressure (kPa)	1516.8	1516.8	1516.8	1516.8	1516.8	1516.8	1516.8	1516.8	1516.8	1516.8
Maximum Water-Side Pressure (kPa)	2 068	2068	2 068	2068	2 068	2068	2 068	2068	2 068	2068
WATER CONNECTIONS										
Drain (NPT, in.)	3/8	3/4	3/8	3/4	3/8	3/4	3/8	3/4	3/8	3/4
Standard, Inlet and Outlet, Victaulic (in.)	5	4	5	4	5	4	5	6	5	6
Number of Passes	2	—	2	—	2	—	2	—	2	—
Minus 1 Pass, Inlet and Outlet, Victaulic (in.)	5	—	5	—	5	—	5	—	5	—
Number of Passes	1	—	1	—	1	—	1	—	1	—
Plus 1 Pass, Inlet and Outlet, Victaulic (in.)	4	—	4	—	4	—	4	—	4	—
Number of Passes	3	—	3	—	3	—	3	—	3	—
CONDENSER FANS	Shrouded Axial Type, Vertical Discharge									
Fan Speed (r/s) Standard/High Ambient**	14.2/—	14.2/—	14.2/—	14.2/—	14.2/—	14.2/—	14.2/—	14.2/—	14.2/—	14.2/—
No. Blades...Diameter (mm)	9...762	9...762	9...762	9...762	9...762	9...762	9...762	9...762	9...762	9...762
No. Fans (Ckt A/Ckt B/Ckt C)	3/3/—	3/3/—	4/4/—	4/4/—	4/4/—	4/4/—	4/4/—	4/4/—	4/4/—	4/4/—
Total Airflow (L/s) 14.2 r/s	26 335	26 335	35 113	35 113	35 113	35 113	35 113	35 113	35 113	35 113
Total Airflow (L/s) 19.0 r/s	—	—	—	—	—	—	—	—	—	—
CONDENSER COILS										
No. Coils (Ckt A/Ckt B/Ckt C)	3/3/—	3/3/—	4/4/—	4/4/—	4/4/—	4/4/—	4/4/—	4/4/—	4/4/—	4/4/—
Total Face Area (sq m)	13	13	17	17	17	17	17	17	17	17
CHASSIS DIMENSIONS (mm)										
Length	3 606	3 606	4 800							
Width	2255									
Height	2300									

30XA140-220 — SI

UNIT 30XA	140	142	160	162	180	182	200	202	220
OPERATING WEIGHT (kg)*									
Al-Cu Condenser Coils	5 219	5 426	5 329	5 522	6 164	6 321	6 220	6 357	6 680
Cu-Cu Condenser Coils	5 766	5 973	5 876	6 069	6 821	6 977	6 876	7 013	7 391
MCHX Condenser Coils	4 884	5 091	4 990	5 183	5 760	5 917	5 811	5 948	6 236
REFRIGERANT TYPE	R-134a, EXV Controlled System								
Refrigerant Charge (kg) Ckt A/Ckt B/Ckt C (RTPF)	92/55/—	80/47/—	102/72/—	91/57/—	93/93/—	82/82/—	102/102—	91/91/—	112/102/—
Refrigerant Charge (kg) Ckt A/Ckt B/Ckt C (MCHX)	58.0/40.8/—	46/27/—	57.2/42.6/—	46/28/—	59.9/59.9/—	51/51/—	68.9/68.9/—	56/56/—	72.3/68.9/—
COMPRESSORS	Semi-Hermetic Twin Rotary Screws								
Quantity	2	2	2	2	2	2	2	2	2
Speed (r/s)	58.3								
(Qty) Compressor Model Number Ckt A	(1) 06TT-266	(1) 06TT-266	(1) 06TT-301	(1) 06TT-301	(1) 06TT-266	(1) 06TT-266	(1) 06TT-301	(1) 06TT-301	(1) 06TT-356
(Qty) Compressor Model Number Ckt B	(1) 06TS-155	(1) 06TS-155	(1) 06TS-186	(1) 06TS-186	(1) 06TT-266	(1) 06TT-266	(1) 06TT-301	(1) 06TT-301	(1) 06TT-301
(Qty) Compressor Model Number Ckt C	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Oil Charge (liters), Ckt A/Ckt B/Ckt C	23.7/20.8/—	23.7/20.8/—	23.7/23.7/—	23.7/23.7/—	23.7/23.7/—	23.7/23.7/—	23.7/23.7/—	23.7/23.7/—	25.6/23.7/—
Minimum Capacity Step (%)									
Standard	11	11	11	11	15	15	15	15	14
Optional	7	7	8	8	10	10	10	10	10
COOLER	Flooded, Shell and Tube Type	Direct Expansion Cooler	Flooded, Shell and Tube Type	Direct Expansion Cooler	Flooded, Shell and Tube Type	Direct Expansion Cooler	Flooded, Shell and Tube Type	Direct Expansion Cooler	Flooded, Shell and Tube Type
Net Fluid Volume (liters)	96.5	240	104.1	240	119.2	278	128.7	278	140.1
Maximum Refrigerant Pressure (kPa)	1516.8	1516.8	1516.8	1516.8	1516.8	1516.8	1516.8	1516.8	1516.8
Maximum Water-Side Pressure (kPa)	2 068	2068	2 068	2068	2 068	2068	2 068	2068	2 068
WATER CONNECTIONS									
Drain (NPT, in.)	3/8	3/4	3/8	3/4	3/8	3/4	3/8	3/4	3/8
Standard, Inlet and Outlet, Victaulic (in.)	5	6	5	6	6	6	6	6	6
Number of Passes	2	—	2	—	2	—	2	—	2
Minus 1 Pass, Inlet and Outlet, Victaulic (in.)	5	—	5	—	8	—	8	—	8
Number of Passes	1	—	1	—	1	—	1	—	1
Plus 1 Pass, Inlet and Outlet, Victaulic (in.)	5	—	5	—	6	—	6	—	6
Number of Passes	3	—	3	—	3	—	3	—	3
CONDENSER FANS	Shrouded Axial Type, Vertical Discharge								
Fan Speed (r/s) Standard/High Ambient**	14.2/19.0	14.2/19.0	14.2/19.0	14.2/19.0	14.2/19.0	14.2/19.0	14.2/19.0	14.2/19.0	14.2/19.0
No. Blades...Diameter (mm)	9...762	9...762	9...762	9...762	9...762	9...762	9...762	9...762	9...762
No. Fans (Ckt A/Ckt B/Ckt C)	6/4/—	6/4/—	6/4/—	6/4/—	6/6/—	6/6/—	6/6/—	6/6/—	7/6/—
Total Airflow (L/s) 14.2 r/s	43 891	43 891	43 891	43 891	52 669	52 669	52 669	52 669	57 059
Total Airflow (L/s) 19.0 r/s	58 522	58 522	58 522	58 522	70 226	70 226	70 226	70 226	76 078
CONDENSER COILS									
No. Coils (Ckt A/Ckt B/Ckt C)	6/4/—	6/4/—	6/4/—	6/4/—	6/6/—	6/6/—	6/6/—	6/6/—	7/6/—
Total Face Area (sq m)	22	22	22	22	26	26	26	26	28
CHASSIS DIMENSIONS (mm)									
Length	5 994				7 188				8 382
Width	2255								
Height	2300								

LEGEND

Cu — Copper
Al — Aluminum
EXV — Electronic Expansion Valve
MCHX — Microchannel Heat Exchanger
N/A — Not Applicable

* Operating weight includes coil trim panels.
† 30XA080,082 units do not have an economizer.
** The standard ambient temperature option is not available on 30XA401, 451, 476, and 501 units. The high ambient temperature option is not available on 30XA080-122 units.

30XA222-325 — SI

UNIT 30XA	222	240	242	260	262	280	282	300	302	325
OPERATING WEIGHT (kg)*										
Al-Cu Condenser Coils	6 836	6 753	6 909	7 644	7 736	7 721	7 813	7 876	8 089	8 543
Cu-Cu Condenser Coils	7 547	7 464	7 620	8 465	8 556	8 542	8 633	8 751	8 965	9 528
MCHX Condenser Coils	6 392	6 304	6 459	7 130	7 222	7 202	7 294	7 322	7 535	7 923
REFRIGERANT TYPE	R-134a, EXV Controlled System									
Refrigerant Charge (kg) Ckt A/Ckt B/Ckt C (RTPF)	112/90/—	122.5/122.5/—	112/112/—	170.1/99.8/—	150/93/—	170.1/122.5/—	150/116/—	188.3/122.5/—	175/118/—	170.1/170.1/—
Refrigerant Charge (kg) Ckt A/Ckt B/Ckt C (MCHX)	61/57/—	72.3/72.1/—	61/61/ —	105.9/70.8/—	85/64/—	102.7/72.3/—	82/66/—	104.3/73.0/—	91/69/—	102.7/102.7/—
COMPRESSORS	Semi-Hermetic Twin Rotary Screws									
Quantity	2	2	2	2	2	2	2	2	2	2
Speed (r/s)					3500					
(Qty) Compressor Model Number Ckt A	(1) 06TT-356	(1) 06TT-356	(1) 06TT-356	(1) 06TU-483	(1) 06TU-483	(1) 06TU-483	(1) 06TU-483	(1) 06TU-554	(1) 06TU-554	(1) 06TU-483
(Qty) Compressor Model Number Ckt B	(1) 06TT-301	(1) 06TT-356	(1) 06TT-356	(1) 06TT-301	(1) 06TT-301	(1) 06TT-356	(1) 06TT-356	(1) 06TT-356	(1) 06TT-356	(1) 06TU-483
(Qty) Compressor Model Number Ckt C	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Oil Charge (liter), Ckt A/Ckt B/Ckt C	25.6/23.7/—	25.6/25.6/—	25.6/25.6/—	28.4/25.6/—	28.4/25.6/—	28.4/25.6/—	28.4/25.6/—	28.4/25.6/—	28.4/25.6/—	28.4/28.4/—
Minimum Capacity Step (%)										
Standard	14	15	15	10	11	13	13	12	12	15
Optional	10	10	10	8	8	9	9	7	7	10
COOLER	Direct Expansion Cooler	Flooded, Shell and Tube Type	Direct Expansion Cooler	Flooded, Shell and Tube Type	Direct Expansion Cooler	Flooded, Shell and Tube Type	Direct Expansion Cooler	Flooded, Shell and Tube Type	Direct Expansion Cooler	Flooded, Shell and Tube Type
Net Fluid Volume (liters)	269.0	147.6	269.0	159.0	313.0	166.6	313.0	183.6	409.0	191.2
Maximum Refrigerant Pressure (kPa)	1516.8	1516.8	1516.8	1516.8	1516.8	1516.8	1516.8	1516.8	1516.8	1516.8
Maximum Water-Side Pressure (kPa)	2 068	2 068	2 068	2 068	2 068	2 068	2 068	2 068	2 068	2 068
WATER CONNECTIONS										
Drain (NPT, in.)	3/4	3/8	3/4	3/8	3/4	3/8	3/4	3/8	3/4	3/8
Standard, Inlet and Outlet, Victaulic (in.)	6	6	6	8	6	8	6	8	6	8
Number of Passes	—	2	—	2	—	2	—	2	—	2
Minus 1 Pass, Inlet and Outlet, Victaulic (in.)	—	8	—	8	—	8	—	8	—	8
Number of Passes	—	1	—	1	—	1	—	1	—	1
Plus 1 Pass, Inlet and Outlet, Victaulic (in.)	—	6	—	8	—	8	—	8	—	8
Number of Passes	—	3	—	3	—	3	—	3	—	3
CONDENSER FANS	Shrouded Axial Type, Vertical Discharge									
Fan Speed (r/s) Standard/High Ambient**	14.2/19.0	14.2/19.0	14.2/19.0	14.2/19.0	14.2/19.0	14.2/19.0	14.2/19.0	14.2/19.0	14.2/19.0	14.2/19.0
No. Blades...Diameter (mm)	9...762	9...762	9...762	9...762	9...762	9...762	9...762	9...762	9...762	9...762
No. Fans (Ckt A/Ckt B/Ckt C)	7/6/—	7/6/—	7/6/—	9/6/—	9/6/—	9/7/—	9/7/—	10/6/—	10/6/—	9/9/—
Total Airflow (L/s) 14.2 r/s	57 059	57 059	57 059	65 837	65 837	70 226	70 226	70 226	70 226	79 004
Total Airflow (L/s) 19.0 r/s	76 078	76 078	76 078	87 782	87 782	93 634	93 634	93 634	93 634	93 634
CONDENSER COILS										
No. Coils (Ckt A/Ckt B/Ckt C)	7/6/—	7/6/—	7/6/—	9/6/—	9/6/—	9/7/—	9/7/—	10/6/—	10/6/—	9/9/—
Total Face Area (sq m)	28	28	28	33	33	35	35	35	35	39
CHASSIS DIMENSIONS (mm)										
Length	8 382			9 576						10 770
Width	2 255									
Height	2 300									

30XA327-501 — SI

UNIT 30XA	327	350	352	401	451	476	501
OPERATING WEIGHT (kg)*							
Al-Cu Condenser Coils	8 757	8 636	8 850	10 292	10 624	12 482	13 557
Cu-Cu Condenser Coils	9 742	9 621	9 835	11 387	11 827	13 686	14 087
MCHX Condenser Coils	8 137	8 010	8 224	9 424	9 859	10 641	11 540
REFRIGERANT TYPE	R-134a, EXV Controlled System						
Refrigerant Charge (kg) Ckt A/Ckt B/Ckt C (RTPF)	156/156/—	188.3/170.1/—	174/156/—	209 / 175 /—	240 / 175 / —	215 / 211 / —	254 / 224 / —
Refrigerant Charge (kg) Ckt A/Ckt B/Ckt C (MCHX)	88/88/—	105.0/102.7/—	91/88/—	125 / 102 / —	132 / 102 / —	129 / 127 / —	136 / 132 / —
COMPRESSORS	Semi-Hermetic Twin Rotary Screws						
Quantity	2	2	2	2	2	2	2
Speed (r/s)				58.3			
(Qty) Compressor Model Number Ckt A	(1) 06TU-483	(1) 06TU-554	(1) 06TU-554	(1) 06TV-680	(1) 06TV-819	(1) 06TV-753	1) 06TV-819
(Qty) Compressor Model Number Ckt B	(1) 06TU-483	(1) 06TU-483	(1) 06TU-483	(1) 06TU-554	(1) 06TU-554	(1) 06TV-680	(1) 06TV-753
(Qty) Compressor Model Number Ckt C	N/A	N/A	N/A	N/A	(1) 06TU-554	N/A	N/A
Oil Charge (liter), Ckt A/Ckt B/Ckt C	28.4/28.4/—	28.4/28.4/—	28.4/28.4/—	28.4/28.4/—	28.4/28.4/—	28.4/28.4/—	28.4/28.4/—
Minimum Capacity Step (%)							
Standard	15	14	14	15	12	15	15
Optional	10	10	10	11	8	11	11
COOLER	Direct Expansion Cooler	Flooded, Shell and Tube Type	Direct Expansion Cooler	Flooded, Shell and Tube Type			
Net Fluid Volume (liters)	409.0	202.1	409.0	244.2	244.2	309.6	309.6
Maximum Refrigerant Pressure (kPa)	1516.8	1516.8	1516.8	1516.8	1516.8	1516.8	1516.8
Maximum Water-Side Pressure (kPa)	2 068	2 068	2 068	2 068	2 068	2 068	2 068
WATER CONNECTIONS							
Drain (NPT, in.)	3/4	3/8	3/4	3/8	3/8	3/8	3/8
Standard, Inlet and Outlet, Victaulic (in.)	6	8	6	8	8	8	8
Number of Passes	—	2	—	2	2	2	2
Minus 1 Pass, Inlet and Outlet, Victaulic (in.)	—	8	—	8	8	8	8
Number of Passes	—	1	—	1	1	1	1
Plus 1 Pass, Inlet and Outlet, Victaulic (in.)	—	8	—	—	—	—	—
Number of Passes	—	3	—	—	—	—	—
CONDENSER FANS	Shrouded Axial Type, Vertical Discharge						
Fan Speed (r/s) Standard/High Ambient**	14.2/19.0	14.2/19.0	14.2/19.0	—/19.0	—/19.0	—/19.0	—/19.0
No. Blades...Diameter (mm)	9...762	9...762	9...762	9...762	9...762	9...762	9...762
No. Fans (Ckt A/Ckt B/Ckt C)	9/9/—	9/9/—	9/9/—	11/9/—	13/9/—	11/11/—	14/12/—
Total Airflow (L/s) 14.2 r/s	79 004	79 004	79 004	—	—	—	—
Total Airflow (L/s) 19.0 r/s	93 634	105 339	105 339	117 044	128 748	128 748	152 157
CONDENSER COILS							
No. Coils (Ckt A/Ckt B/Ckt C)	9/9/—	9/9/—	9/9/—	11/9/—	13/9/—	11/11/—	14/12/—
Total Face Area (sq m)	39	39	39	44	48	48	57
CHASSIS DIMENSIONS (mm)							
Length	10 770			11 945	13 139		15 532
Width				2 255			
Height				2 300			

LEGEND

Cu — Copper
Al — Aluminum
EXV — Electronic Expansion Valve
MCHX — Microchannel Heat Exchanger
N/A — Not Applicable

* Operating weight includes coil trim panels.
† 30XA080,082 units do not have an economizer.
** The standard ambient temperature option is not available on 30XA401, 451, 476, and 501 units. The high ambient temperature option is not available on 30XA080-122 units.

Physical data (cont)

UNIT MOUNTING WEIGHTS
UNITS WITH MCHX CONDENSER COILS — ENGLISH

30XA UNIT SIZE	MOUNTING WEIGHT (lb) MCHX CONDENSER COILS				
	A	B	C	D	Total
080	1947	1673	1670	1943	7234
082	1989	1709	1706	1985	7391

30XA UNIT SIZE	MOUNTING WEIGHT (lb) MCHX CONDENSER COILS						
	A	B	C	D	E	F	Total
090	1201	2043	750	951	1983	1199	8127
092	1219	2074	761	965	2013	1217	8251
100	1226	2098	780	981	2038	1224	8348
102	1244	2129	792	996	2068	1242	8472
110	1239	2136	798	1006	2075	1229	8483
112	1274	2196	820	1034	2133	1263	8720
120	1272	2174	800	1007	2106	1263	8622
122	1303	2227	819	1032	2157	1294	8832

30XA UNIT SIZE	MOUNTING WEIGHT (lb) MCHX CONDENSER COILS								
	A	B	C	D	E	F	G	H	Total
140	1897	1444	864	1181	1217	883	1584	1699	10,768
142	1977	1505	901	1231	1269	920	1651	1771	11,225
160	1949	1469	878	1206	1246	899	1603	1750	11,000
162	2024	1526	912	1253	1294	934	1665	1818	11,426

30XA UNIT SIZE	MOUNTING WEIGHT (lb) MCHX CONDENSER COILS										
	A	B	C	D	E	F	G	H	I	J	Total
180	905	1484	1164	1849	1187	1224	1868	840	1289	888	12,699
182	930	1524	1196	1899	1219	1257	1919	863	1324	912	13,044
200	909	1499	1188	1870	1192	1232	1879	848	1299	893	12,810
202	930	1534	1216	1914	1220	1261	1923	868	1330	914	13,112

30XA UNIT SIZE	MOUNTING WEIGHT (lb) MCHX CONDENSER COILS												
	A	B	C	D	E	F	G	H	I	J	K	L	Total
220	813	1196	1592	1498	828	1216	1259	848	1363	1064	1237	832	13,748
222	833	1226	1632	1535	849	1246	1290	869	1397	1091	1268	853	14,092
240	829	1218	1617	1520	830	1218	1261	850	1371	1073	1260	849	13,897
242	849	1248	1657	1558	851	1248	1292	871	1405	1100	1291	870	14,241
260	495	1431	1630	763	2465	1013	1528	2380	800	1333	1386	495	15,720
262	501	1449	1651	773	2497	1026	1548	2411	810	1350	1404	501	15,922
280	497	1451	1663	771	2497	1015	1530	2390	803	1358	1406	497	15,878
282	503	1469	1684	781	2529	1028	1549	2420	813	1375	1424	503	16,080
300	502	1465	1686	786	2568	1027	1557	2454	811	1367	1417	502	16,141
302	517	1508	1735	809	2643	1057	1602	2526	835	1407	1458	517	16,613

30XA UNIT SIZE	MOUNTING WEIGHT (lb) MCHX CONDENSER COILS														
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	Total
325	742	742	978	1531	783	2546	1067	1563	2334	804	1646	1247	742	742	17,467
327	762	762	1004	1572	804	2615	1096	1605	2397	826	1690	1281	762	762	17,939
350	745	745	982	1546	792	2598	1077	1589	2386	808	1651	1249	745	745	17,659
352	765	765	1008	1587	813	2667	1106	1631	2450	830	1695	1282	765	765	18,131

30XA UNIT SIZE	MOUNTING WEIGHT (lb) MCHX CONDENSER COILS																
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Total
401	1471	1827	1921	2057	2134	1154	579	579	579	579	1950	1902	971	971	1147	964	20,785
451	524	683	3121	3060	2130	858	978	1085	1705	1974	762	1017	1193	1281	842	524	21,737
476	725	1000	3556	4035	2626	913	998	1105	1720	1988	784	1127	1339	1446	1214	786	25,362
501A	1639	2120	2616	2829	2616	1237	826	610	610	610	785	2070	2340	1126	1448	915	24,397
501B	631	812	631	932	—	—	—	—	—	—	—	—	—	—	—	—	3,006

LEGEND

MCHX — Microchannel Heat Exchanger

NOTE: Size 501 ships as two modules. The 501A and 501B modules are installed as one chiller.

UNIT MOUNTING WEIGHTS (cont)

UNITS WITH MCHX CONDENSER COILS — SI

30XA UNIT SIZE	MOUNTING WEIGHT (kg) MCHX CONDENSER COILS				
	A	B	C	D	Total
080	883	759	758	882	3281
082	902	775	774	900	3353

30XA UNIT SIZE	MOUNTING WEIGHT (kg) MCHX CONDENSER COILS						
	A	B	C	D	E	F	Total
090	545	927	340	431	899	544	3686
092	553	941	345	438	913	552	3742
100	556	952	354	445	924	555	3786
102	564	966	359	452	938	563	3843
110	562	969	362	456	941	558	3848
112	578	996	372	469	968	573	3955
120	577	986	363	457	955	573	3911
122	591	1010	372	468	979	587	4006

30XA UNIT SIZE	MOUNTING WEIGHT (kg) MCHX CONDENSER COILS								
	A	B	C	D	E	F	G	H	Total
140	860	655	392	536	552	401	719	771	4884
142	897	683	409	558	575	418	749	803	5091
160	884	666	398	547	565	408	727	794	4990
162	918	692	414	568	587	424	755	825	5183

30XA UNIT SIZE	MOUNTING WEIGHT (kg) MCHX CONDENSER COILS										
	A	B	C	D	E	F	G	H	I	J	Total
180	410	673	528	839	538	555	847	381	584	403	5760
182	422	691	542	861	553	570	870	391	601	414	5917
200	412	680	539	848	541	559	852	385	589	405	5811
202	422	696	552	868	553	572	872	394	603	415	5948

30XA UNIT SIZE	MOUNTING WEIGHT (kg) MCHX CONDENSER COILS												
	A	B	C	D	E	F	G	H	I	J	K	L	Total
220	369	542	722	680	376	552	571	385	618	483	561	378	6236
222	378	556	740	696	385	565	585	394	634	495	575	387	6392
240	376	552	734	690	377	553	572	386	622	487	572	385	6304
242	385	566	752	707	386	566	586	395	637	499	586	395	6460
260	225	649	740	346	1118	460	693	1079	363	605	629	225	7130
262	227	657	749	351	1132	465	702	1093	368	612	637	227	7222
280	225	658	754	350	1133	461	694	1084	364	616	638	225	7202
282	228	667	764	354	1147	466	703	1098	369	624	646	228	7294
300	228	664	765	357	1165	466	706	1113	368	620	643	228	7322
302	234	684	787	367	1199	479	727	1146	379	638	662	234	7535

30XA UNIT SIZE	MOUNTING WEIGHT (kg) MCHX CONDENSER COILS														
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	Total
325	337	337	444	695	355	1155	484	709	1058	365	746	565	337	337	7923
327	346	346	456	713	365	1186	497	728	1087	375	767	581	346	346	8137
350	338	338	446	701	359	1179	488	721	1082	367	749	567	338	338	8010
352	347	347	457	720	369	1210	502	740	1111	376	769	582	347	347	8224

30XA UNIT SIZE	MOUNTING WEIGHT (kg) MCHX CONDENSER COILS																
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Total
401	667	829	871	933	968	523	262	262	262	262	885	863	440	440	520	437	9 424
451	238	310	1416	1388	966	389	443	492	773	895	346	461	541	581	382	238	9 859
476	329	418	1488	1689	1099	382	418	463	720	832	328	472	561	605	508	329	10 641
501A	683	884	1091	1180	1091	516	345	255	255	255	328	863	976	470	604	381	10 177
501B	286	368	423	286	—	—	—	—	—	—	—	—	—	—	—	—	1 364

LEGEND

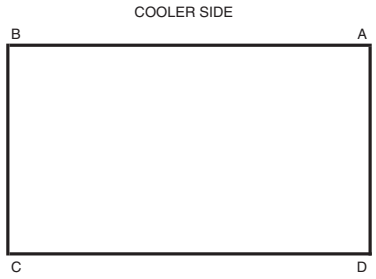
MCHX — Microchannel Heat Exchanger

NOTE: Size 501 ships as two modules. The 501A and 501B modules are installed as one chiller.

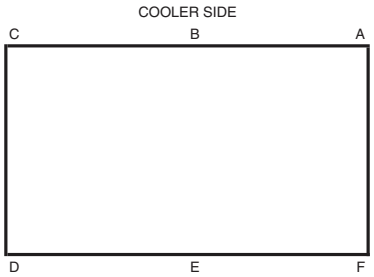
Physical data (cont)

UNIT MOUNTING WEIGHTS (cont)
UNITS WITH MCHX CONDENSER COILS

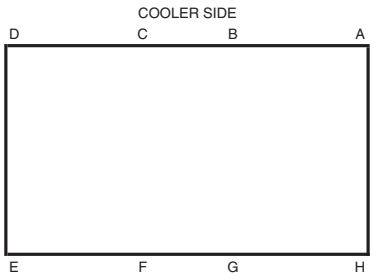
30XA080, 082



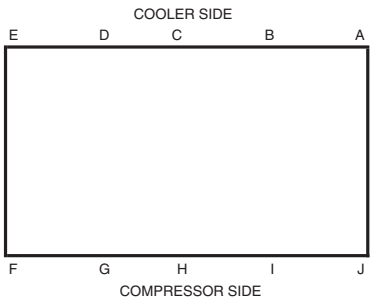
30XA090-122



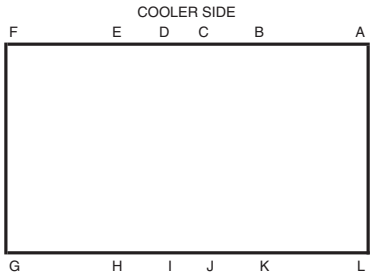
30XA140-162



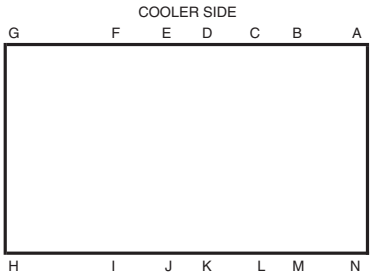
30XA180-202



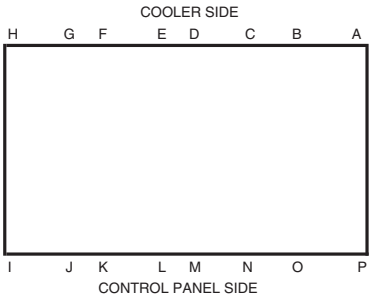
30XA220-302



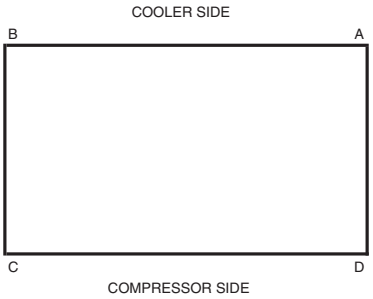
30XA325-352



30XA401-501A



30XA501B



LEGEND

MCHX — Microchannel Heat Exchanger

NOTE: Size 501 ships as two modules. The 501A and 501B modules are installed as one chiller.

UNIT MOUNTING WEIGHTS (cont)
UNITS WITH Al/Cu CONDENSER COILS — ENGLISH

30XA UNIT SIZE	MOUNTING WEIGHT (lb) — Al/Cu*				
	A	B	C	D	Total
080	2059	1785	1778	2051	7674
082	2101	1822	1814	2093	7831

30XA UNIT SIZE	MOUNTING WEIGHT (lb) — Al/Cu*						
	A	B	C	D	E	F	Total
090	1273	2188	822	1023	2127	1271	8704
092	1291	2219	834	1038	2157	1289	8828
100	1299	2244	853	1054	2184	1297	8931
102	1317	2275	865	1069	2214	1315	9055
110	1312	2284	872	1079	2222	1303	9071
112	1346	2344	895	1107	2280	1337	9308
120	1346	2322	874	1082	2255	1337	9216
122	1377	2375	894	1107	2306	1367	9426

30XA UNIT SIZE	MOUNTING WEIGHT (lb) — Al/Cu*								
	A	B	C	D	E	F	G	H	Total
140	2007	1554	938	1254	1291	957	1695	1809	11,505
142	2087	1616	975	1304	1342	995	1762	1881	11,962
160	2061	1581	953	1281	1321	974	1715	1862	11,748
162	2136	1638	988	1327	1369	1009	1777	1930	12,174

30XA UNIT SIZE	MOUNTING WEIGHT (lb) — Al/Cu*										
	A	B	C	D	E	F	G	H	I	J	Total
180	979	1558	1239	1998	1261	1298	2016	915	1363	962	13,590
182	1004	1598	1270	2049	1293	1331	2067	938	1398	986	13,935
200	984	1574	1263	2020	1267	1308	2029	923	1375	968	13,712
202	106	1609	1291	2065	1295	1337	2074	943	1405	989	14,014

30XA UNIT SIZE	MOUNTING WEIGHT (lb) — Al/Cu*												
	A	B	C	D	E	F	G	H	I	J	K	L	Total
220	883	1266	1697	1603	898	1286	1329	918	1468	1169	1307	902	14,727
222	904	1296	1737	1640	919	1316	1360	939	1502	1196	1337	923	15,071
240	900	1288	1723	1626	901	1289	1331	921	1477	1179	1331	920	14,887
242	921	1318	1763	1664	922	1319	1362	942	1511	1206	1362	941	15,231
260	566	1572	1701	834	2607	1084	1599	2521	871	1404	1528	566	16,853
262	573	1591	1721	844	2638	1097	1618	2551	881	1421	1546	573	17,055
280	569	1594	1734	843	2640	1087	1601	2533	875	1429	1549	569	17,022
282	576	1613	1755	853	2671	1100	1620	2563	885	1446	1567	576	17,224
300	578	1617	1762	862	2720	1103	1633	2607	887	1444	1570	578	17,362
302	594	1661	1810	885	2794	1133	1677	2678	911	1483	1613	594	17,834

30XA UNIT SIZE	MOUNTING WEIGHT (lb) — Al/Cu*														
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	Total
325	856	856	1054	1607	859	2697	1143	1639	2485	880	1722	1322	856	856	18,834
327	877	877	1080	1647	881	2765	1172	1680	2547	902	1765	1355	877	877	19,306
350	860	860	1059	1623	869	2752	1153	1666	2539	885	1727	1326	860	860	19,040
352	881	881	1085	1663	891	2820	1182	1707	2602	907	1770	1359	881	881	19,512

30XA UNIT SIZE	MOUNTING WEIGHT (lb) — Al/Cu*																
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Total
401	1599	1960	2056	2194	2272	1278	667	667	667	667	2085	2036	1092	1092	1271	1085	22,688
451	597	758	3260	3198	2254	962	1084	1193	1822	2095	865	1124	1303	1392	919	597	23,423
476	916	1133	3709	4195	2767	1032	1118	1227	1850	2121	901	1248	1464	1571	1350	916	27,518
501A	1767	2255	2757	2973	2757	1360	917	699	699	699	903	2204	2478	1248	1574	1034	26,324
501B	747	961	1103	747	—	—	—	—	—	—	—	—	—	—	—	—	3,558

*Condenser Coil: Aluminum Fins/Copper Tubing.

NOTE: Size 501 ships as two modules. The 501A and 501B modules are installed as one chiller.

Physical data (cont)

UNIT MOUNTING WEIGHTS (cont)
UNITS WITH Al/Cu CONDENSER COILS — SI

30XA UNIT SIZE	MOUNTING WEIGHT (kg) — Al/Cu*				
	A	B	C	D	Total
080	934	810	807	930	3481
082	953	826	823	949	3552

30XA UNIT SIZE	MOUNTING WEIGHT (kg) — Al/Cu*						
	A	B	C	D	E	F	Total
090	578	992	373	464	965	576	3948
092	586	1007	378	471	979	585	4004
100	589	1018	387	478	991	588	4051
102	597	1032	392	485	1004	596	4107
110	595	1036	396	489	1008	591	4115
112	611	1063	406	502	1034	606	4222
120	611	1053	397	491	1023	607	4181
122	624	1077	405	502	1046	620	4276

30XA UNIT SIZE	MOUNTING WEIGHT (kg) — Al/Cu*								
	A	B	C	D	E	F	G	H	Total
140	910	705	425	569	585	434	769	821	5219
142	946	733	442	591	609	451	799	853	5426
160	935	717	432	581	599	442	778	845	5329
162	969	743	448	602	621	458	806	875	5522

30XA UNIT SIZE	MOUNTING WEIGHT (kg) — Al/Cu*										
	A	B	C	D	E	F	G	H	I	J	Total
180	444	707	562	906	572	589	915	415	618	436	6164
182	455	725	576	929	586	604	938	426	634	447	6321
200	446	714	573	916	575	593	920	419	624	439	6220
202	456	730	586	936	587	606	941	428	637	449	6357

30XA UNIT SIZE	MOUNTING WEIGHT (kg) — Al/Cu*												
	A	B	C	D	E	F	G	H	I	J	K	L	Total
220	401	574	770	727	407	583	603	416	666	530	593	409	6680
222	410	588	788	744	417	597	617	426	681	543	607	419	6836
240	408	584	782	738	409	585	604	418	670	535	604	417	6753
242	418	598	800	755	418	598	618	427	685	547	618	427	6909
260	257	713	772	378	1182	492	725	1144	395	637	693	257	7644
262	260	722	781	383	1197	498	734	1157	400	644	701	260	7736
280	258	723	787	382	1197	493	726	1149	397	648	703	258	7721
282	261	732	796	387	1212	499	735	1163	402	656	711	261	7813
300	262	734	799	391	1234	501	741	1182	402	655	712	262	7876
302	269	753	821	402	1267	514	761	1215	413	673	731	269	8089

30XA UNIT SIZE	MOUNTING WEIGHT (kg) — Al/Cu*														
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	Total
325	388	388	478	729	390	1224	518	744	1127	399	781	600	388	388	8543
327	398	398	490	747	399	1254	531	762	1155	409	801	615	398	398	8757
350	390	390	480	736	394	1248	523	756	1152	401	784	601	390	390	8636
352	400	400	492	754	404	1279	536	774	1180	411	803	616	400	400	8850

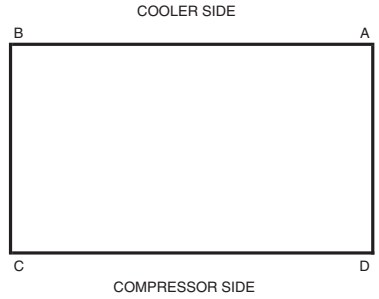
30XA UNIT SIZE	MOUNTING WEIGHT (kg) — Al/Cu*																
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Total
401	725	889	933	995	1030	580	303	303	303	303	946	924	495	495	576	492	10 292
451	271	344	1479	1450	1022	436	492	541	826	950	393	510	591	631	417	271	10 624
476	416	514	1682	1903	1255	468	507	556	839	962	409	566	664	713	612	416	12 482
501A	802	1023	1251	1349	1251	617	416	317	317	317	410	1000	1124	566	714	469	11 943
501B	339	436	500	339	—	—	—		—	—	—	—	—	—	—	—	1 614

*Condenser Coil: Aluminum Fins/Copper Tubing.

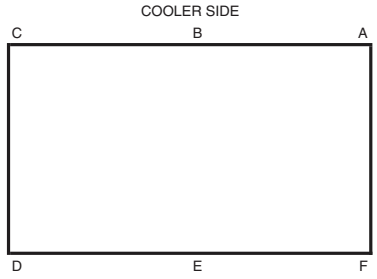
NOTE: Size 501 ships as two modules. The 501A and 501B modules are installed as one chiller.

UNIT MOUNTING WEIGHTS (cont)
UNITS WITH Al/Cu CONDENSER COILS

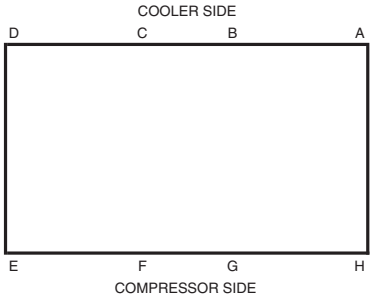
30XA080, 082



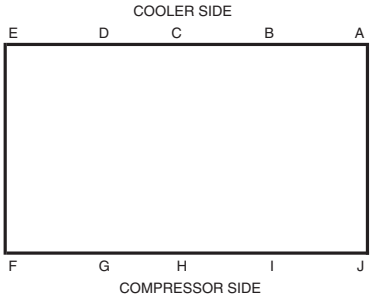
30XA090-122



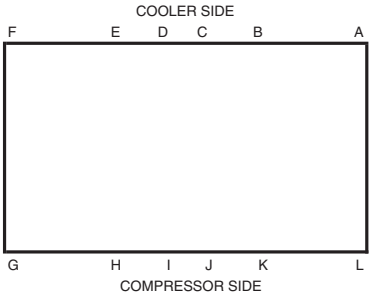
30XA140-162



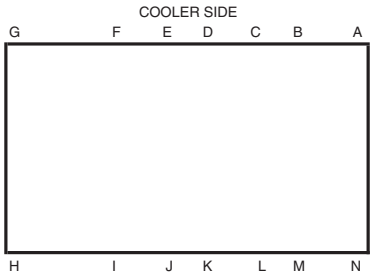
30XA180-202



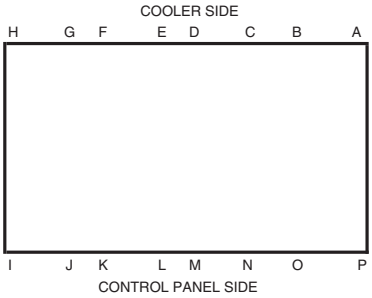
30XA220-302



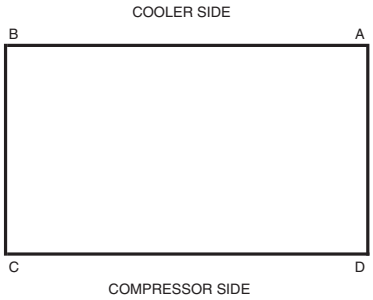
30XA325-352



30XA401-501A



30XA501B



NOTE: Size 501 ships as two modules. The 501A and 501B modules are installed as one chiller.

UNIT MOUNTING WEIGHTS (cont)
UNITS WITH Cu/Cu CONDENSER COILS — ENGLISH

30XA UNIT SIZE	MOUNTING WEIGHT (lb) — Cu/Cu†				
	A	B	C	D	Total
080	2244	1970	1956	2228	8398
082	2286	2007	1993	2270	8555

30XA UNIT SIZE	MOUNTING WEIGHT (lb) — Cu/Cu†						
	A	B	C	D	E	F	Total
090	1394	2429	943	1144	2368	1392	9,669
092	1412	2460	955	1159	2398	1410	9,793
100	1420	2485	974	1174	2425	1418	9,896
102	1438	2516	986	1189	2455	1436	10,020
110	1433	2525	993	1200	2463	1424	10,036
112	1467	2585	1016	1228	2521	1458	10,273
120	1467	2563	995	1202	2496	1458	10,181
122	1497	2616	1016	1227	2547	1488	10,391

30XA UNIT SIZE	MOUNTING WEIGHT (lb) — Cu/Cu†								
	A	B	C	D	E	F	G	H	Total
140	2188	1735	1058	1375	1411	1078	1876	1990	12,711
142	2267	1797	1096	1424	1462	1117	1943	2061	13,168
160	2242	1762	1074	1401	1442	1095	1896	2043	12,954
162	2316	1820	1109	1447	1489	1131	1958	2110	13,380

30XA UNIT SIZE	MOUNTING WEIGHT (lb) — Cu/Cu†										
	A	B	C	D	E	F	G	H	I	J	Total
180	1099	1679	1359	2239	1382	1419	2258	1035	1483	1083	15,037
182	1124	1717	1390	2290	1414	1452	2310	1059	1517	1108	15,382
200	1105	1695	1384	2261	1388	1428	2271	1044	1495	1089	15,159
202	1127	1729	1412	2306	1416	1456	2316	1065	1525	1111	15,461

30XA UNIT SIZE	MOUNTING WEIGHT (lb) — Cu/Cu†												
	A	B	C	D	E	F	G	H	I	J	K	L	Total
220	995	1378	1865	1771	1010	1398	1441	1030	1636	1337	1419	1014	16,295
222	1016	1407	1904	1808	1031	1427	1471	1052	1671	1365	1449	1035	16,639
240	1012	1400	1891	1794	1013	1401	1443	1033	1645	1347	1443	1032	16,455
242	1033	1429	1930	1831	1034	1430	1473	1055	1679	1375	1473	1054	16,799
260	679	1798	1814	947	2833	1197	1712	2748	984	1517	1754	679	18,662
262	686	1817	1834	957	2864	1210	1730	2778	995	1533	1773	686	18,864
280	682	1820	1847	956	2866	1200	1715	2759	988	1542	1775	682	18,831
282	689	1839	1867	966	2897	1213	1733	2789	999	1559	1794	689	19,033
300	699	1858	1883	983	2962	1224	1754	2848	1008	1564	1811	699	19,292
302	716	1903	1929	1007	3034	1254	1797	2918	1033	1602	1855	716	19,764

30XA UNIT SIZE	MOUNTING WEIGHT (lb) — Cu/Cu†														
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	Total
325	1037	1037	1175	1728	980	2939	1263	1760	2727	1001	1842	1443	1037	1037	21,005
327	1060	1060	1201	1767	1002	3005	1291	1800	2788	1023	1883	1475	1060	1060	21,477
350	1041	1041	1180	1743	990	2993	1274	1786	2780	1006	1848	1447	1041	1041	21,211
352	1064	1064	1206	1782	1012	3060	1302	1826	2842	1028	1889	1479	1064	1064	21,683

30XA UNIT SIZE	MOUNTING WEIGHT (lb) — Cu/Cu†																
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Total
401	1759	2118	2213	2350	2428	1440	791	791	791	791	2242	2193	1256	1256	1433	1248	25,100
451	736	897	3424	3362	2424	1142	1263	1372	1996	2268	1046	1302	1480	1569	1057	736	26,074
476	1103	1319	3858	4341	2922	1196	1282	1390	2010	2279	1067	1412	1626	1733	1534	1103	30,175
501A	1928	2413	2913	3127	2913	1523	1040	823	823	823	1069	2363	2634	1412	1736	1199	33,020
501B	899	1156	1327	899	—	—	—	—	—	—	—	—	—	—	—	—	4,282

†Condenser Coil: Copper Fins/Copper Tubing.

NOTE: Size 501 ships as two modules. The 501A and 501B modules are installed as one chiller.

UNIT MOUNTING WEIGHTS (cont)
UNITS WITH Cu/Cu CONDENSER COILS — SI

30XA UNIT SIZE	MOUNTING WEIGHT (kg) — Cu/Cu†				
	A	B	C	D	Total
080	1018	893	887	1011	3809
082	1037	910	904	1030	3881

30XA UNIT SIZE	MOUNTING WEIGHT (kg) — Cu/Cu†						
	A	B	C	D	E	F	Total
090	632	1102	428	519	1074	631	4386
092	640	1116	433	526	1088	639	4442
100	644	1127	442	533	1100	643	4489
102	652	1141	447	539	1114	651	4545
110	650	1145	450	544	1117	646	4552
112	665	1172	461	557	1144	661	4660
120	665	1163	451	545	1132	661	4618
122	679	1187	461	556	1156	675	4713

30XA UNIT SIZE	MOUNTING WEIGHT (kg) — Cu/Cu†								
	A	B	C	D	E	F	G	H	Total
140	992	787	480	624	640	489	851	903	5766
142	1028	815	497	646	663	507	881	935	5973
160	1017	799	487	636	654	497	860	927	5876
162	1050	826	503	656	676	513	888	957	6069

30XA UNIT SIZE	MOUNTING WEIGHT (kg) — Cu/Cu†										
	A	B	C	D	E	F	G	H	I	J	Total
180	499	762	617	1016	627	644	1024	470	673	491	6821
182	510	779	631	1039	641	658	1048	480	688	503	6977
200	501	769	628	1026	630	648	1030	474	678	494	6876
202	511	784	640	1046	642	661	1051	483	692	504	7013

30XA UNIT SIZE	MOUNTING WEIGHT (kg) — Cu/Cu†												
	A	B	C	D	E	F	G	H	I	J	K	L	Total
220	451	625	846	804	458	634	653	467	742	607	644	460	7391
222	461	638	864	820	468	648	667	477	758	619	657	470	7547
240	459	635	858	814	460	635	655	469	746	611	654	468	7464
242	469	648	876	831	469	649	668	478	762	624	668	478	7620
260	308	816	823	429	1285	543	777	1246	446	688	796	308	8465
262	311	824	832	434	1299	549	785	1260	451	696	804	311	8557
280	309	826	838	434	1300	544	778	1252	448	700	805	309	8542
282	313	834	847	438	1314	550	786	1265	453	707	814	313	8633
300	317	843	854	446	1343	555	796	1292	457	710	821	317	8751
302	325	863	875	457	1376	569	815	1323	468	727	842	325	8965

30XA UNIT SIZE	MOUNTING WEIGHT (kg) — Cu/Cu†														
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	Total
325	470	470	533	784	445	1333	573	798	1237	454	836	655	470	470	9528
327	481	481	545	801	455	1363	586	816	1265	464	854	669	481	481	9742
350	472	472	535	791	449	1358	578	810	1261	456	838	656	472	472	9621
352	483	483	547	808	459	1388	591	828	1289	466	857	671	483	483	9835

30XA UNIT SIZE	MOUNTING WEIGHT (kg) — Cu/Cu†																
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Total
401	798	961	1004	1066	1101	653	359	359	359	359	1017	995	570	570	650	566	11 387
451	334	407	1553	1525	1100	518	573	622	905	1029	474	591	671	712	479	334	11 827
476	500	598	1750	1969	1325	543	582	630	912	1034	484	640	737	786	696	500	13 686
501A	815	1020	1231	1321	1231	644	440	348	348	348	452	998	1113	596	733	507	12 145
501B	408	524	602	408	—	—	—	—	—	—	—	—	—	—	—	—	1 942

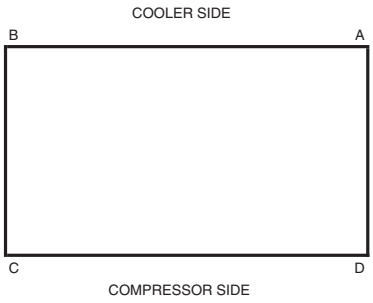
†Condenser Coil: Copper Fins/Copper Tubing.

NOTE: Size 501 ships as two modules. The 501A and 501B modules are installed as one chiller.

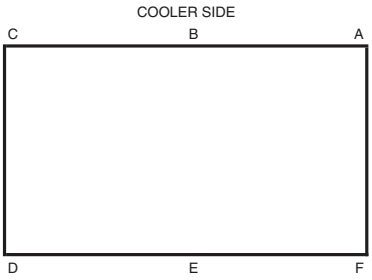
Physical data (cont)

UNIT MOUNTING WEIGHTS (cont)
UNITS WITH Cu/Cu CONDENSER COILS

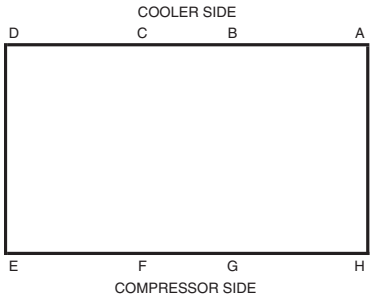
30XA080, 082



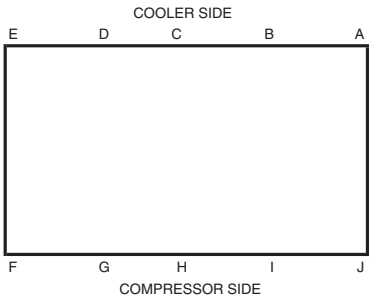
30XA090-122



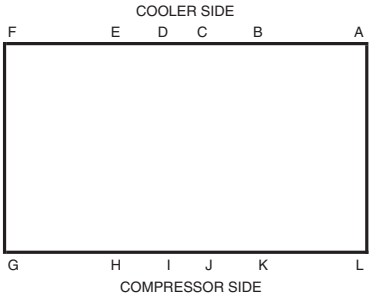
30XA140-162



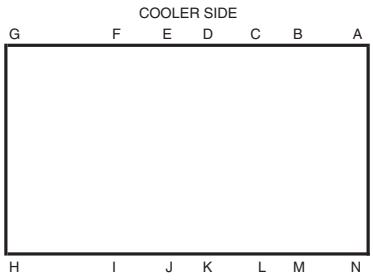
30XA180-202



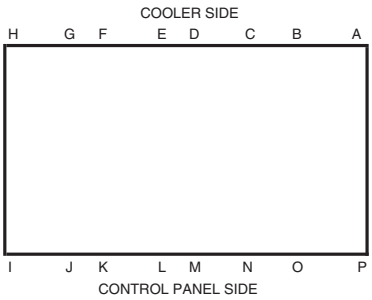
30XA220-302



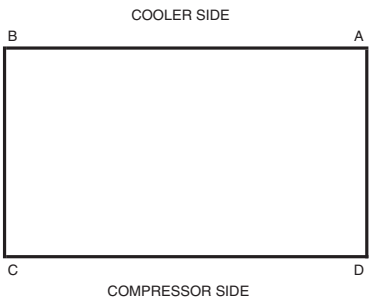
30XA325-352



30XA401-501A



30XA501B



NOTE: Size 501 ships as two modules. The 501A and 501B modules are installed as one chiller.

Options and accessories

ITEM	FACTORY-INSTALLED OPTION	FIELD-INSTALLED ACCESSORY
Condenser Coil and Fan Options		
MCHX, E-Coated	X	
Aluminum Fins/Copper Tube	X	
Aluminum Fins/Copper Tube, Pre-Coated	X	
Aluminum Fins/Copper Tube, E-Coated	X	
Copper Fins/Copper Tube, E-Coated	X	
Copper Fins/Copper Tube Condenser Coils	X	
Compressor Sound Reduction Enclosures	X	
High Ambient Temperature Option (140-501 only)	X	
Controls/Communication Options		
BACnet Communication		X
BACnet/Modbus Translator Control		X
Chillervisor System Manager III Multi-Unit Control		X
Energy Management Module (EMM)		X
LON Translator Control		X
Navigator™ Module	X	X
Remote Service Port		X
Touch Pilot™ Display	X	X
Dual Chiller Accessory Kit		X
Cooler Options		
Minus-One-Pass Cooler	X	
Plus-One-Pass Cooler (not available on 401-501)	X	
Remote Cooler		X
DX (Direct Expansion) Cooler (not available on 401-501)	X	
Electrical Options		
Unit-Mounted Main Disconnect, Non-Fused	X	
Convenience Outlet		X
Refrigeration Circuit Options		
Wye-Delta Compressor Start	X	
Low Ambient Temperature Head Pressure Control	X	X
Minimum Load Control	X	X
Isolation Valve	X	
Suction Line Insulation	X	
Security/Packaging Option		
Security Grilles	X	X
Upper Hail Guard	X	
Full End Screen	X	
Full Hail Guard		X
Condenser Coil Trim Panels	X	X

LEGEND

E-Coated — Epoxy Coating Applied to Entire Coil Assembly
EMM — Energy Management Module
LON — Local Operating Network
MCHX — Microchannel Heat Exchanger

NOTE: Std SCCR (short circuit current rating) (5 kA).

Factory-installed options

Condenser coil options are available to match coil construction to the site conditions for the best durability. Refer to the Condenser Coil Corrosion Protection Options table on page 21 or the appropriate selection guide for more information.

High ambient temperature option provides high-speed condenser fan motors to increase the condenser airflow. This option may allow for an increase in machine capacity, and may also result the selection of a smaller chassis to meet given capacity requirements. The high ambient temperature option is not available on 30XA080-122 units. This option is required for 30XA401-501 units, and is also required for all 30XA401-501 units that are either operating in multi-chiller configurations or have ambient temperatures at or above 100°F (37.8°C).

Minus-one-pass cooler provides a lower pressure drop through the cooler for applications with low delta T (temperature) or high flow or where the coolers are piped in a series arrangement. Applies to flooded coolers only.

Plus-one-pass cooler provides a greater efficiency for brine applications and in applications with a high delta T and low flow. Applies to flooded coolers only. This option is not available on unit sizes 401-501.

Wye-delta start is an alternate starting method which reduces the in-rush current when starting the compressor.

Direct expansion (DX) cooler option provides a shell and tube, direct expansion cooler as an alternative to the standard flooded cooler. The DX cooler is especially beneficial in low temperature applications and/or applications employing high glycol concentrations. This option is not available on sizes 401-501.

Low ambient temperature head pressure control permits operation of the 30XA units to –20°F (–29°C) outdoor ambient temperature. The control is also available as a field-installed accessory and requires field-installed wind baffles.

Options and accessories (cont)

Minimum load control allows additional capacity reduction for unit operation below the minimum step of unloading via hot gas bypass. Minimum load control is also available as a field-installed accessory.

Isolation valve provides a means of isolating the compressors from the cooler vessel, which is beneficial in servicing the chiller. The isolation option comes in various configurations depending on the cooler type (flooded or DX cooler) and the installation region (Middle Eastern or elsewhere). On all units equipped with the flooded cooler which are not installed in the Middle East region, liquid line service valves and motorized discharge service valves are always provided per refrigerant circuit. For Middle Eastern regions only, in addition to the liquid line service valves, manual discharge valves are standard and motorized discharge service valves are optional. On units equipped with the optional DX cooler, the liquid line service valves and manual discharge service valves are included in the isolation valve option, regardless of the region of installation. Regardless of which cooler option is employed, the selection of the isolation valve option results in chillers which are equipped with a liquid line service valve, a discharge service valve (motorized or manual type), and a series of valves on or near the cooler. The net effect is to provide isolation capability in the condenser area, the cooler area and the compressor area.

Unit-mounted non-fused disconnect option provides non-fused disconnect for unit power located at the unit.

Suction line insulation is tubular closed-cell insulation. This option is required on applications with leaving fluid temperatures below 30°F (–1.1°C) and recommended for areas of high dewpoints where condensation may be a concern.

Condenser coil trim panels provide an aesthetic, finished appearance for the condenser coil ends of the compressor side of the unit. Condenser coil trim panels are also available as a field-installed accessory.

Security grilles are coated grilles that protect the condenser, cooler and compressors. These are also available as an accessory.

Upper hail guard consists of louvered panels on the ends of the machine, which firmly fasten to the machine frame and provide coverage from the top of the unit to the bottom of the coil. A hinged accessory hail guard is also available. The accessory covers the entire unit end (both ends), and, with its hinged design, is not identical to this option.

Full end screen consists of louvered panels on the ends of the machine, providing complete coverage from the top to the bottom of the unit. This option functions as both a privacy screen and a hail guard. For hail protection, an accessory hail guard is also available. The accessory covers the entire unit end (both ends), and, with its hinged design, is not identical to this option.

Compressor enclosures provide sound reduction for the screw compressors.

Navigator™ module provides a portable, hand-held display for convenient access to unit status, operation, configuration and troubleshooting diagnostics capability.

Touch Pilot™ display provides a touch screen user interface. This fixed screen display can be used to commission, monitor and control Carrier Comfort Network® devices. It provides access to configuration, maintenance, service, set point, time schedule, alarm history and status data.

Field-installed accessories

Touch Pilot display used as an accessory is a cost-effective, touch-screen, remote mount device that can be used in lieu of the remote enhanced display.

Remote cooler kit allows for remote installation of the cooler. Never bury refrigerant lines when using this accessory or in any other application. This accessory is not available on sizes 401-501.

Chillervisor System Manager III multi-unit control allows sequencing of two chillers in series, or between two and eight chillers in parallel.

Low ambient temperature head pressure control permits operation of the 30XA units to –20°F (–29°C) outdoor ambient temperature. The control is also available as a factory-installed option and requires field-installed wind baffles.

Energy management module provides energy management capabilities to minimize chiller energy consumption. Several features are provided with this module including leaving fluid temperature reset, cooling set point, space temperature reset (requires field-installed space temperature sensor) or demand limit control from a 4 to 20 mA signal, 2-step demand limit control (from 0 to 100%) activated by a remote contact closure (one-step demand limit does not require the energy management module), and discrete input for "Ice Done" indication for ice storage system interface.

Remote service port consists of a receptacle for Navigator device connection. The port is housed in a waterproof enclosure conveniently located for easy access to information during operation and maintenance routines.

Navigator™ module is required when there is a need for a portable hand-held display, and the main display is a Touch Pilot™ display.

Convenience outlet includes 4-amp GFI (ground fault interrupt) receptacle. Convenience outlet is 115-v female receptacle. Not available with 380-v units.

BACnet communication provides pre-programmed field-installed communication capability with a BACnet MS/TP network and allows integration with i-Vu® Open control system or a third-party BACnet building automation system. No field programming is required.

BACnet/Modbus[1] translator control provides an interface between the chiller and a BACnet Local Area Network (LAN, i.e., MS/TP EIA-485). The BACnet/Modbus translator control is also available as a factory-installed option. Field programming is required.

LON translator control provides an interface between the chiller and a Local Operating Network (LON, i.e., LonWorks[2] FT-10A ANSI/EIA-709.1). The LON translator control is

1. Modbus is a registered trademark of Schneider Electric.
2. LonWorks is a registered trademark of Echelon Corporation.

also available as a factory-installed option. Field programming is required.

Condenser coil trim panels provide an aesthetic, finished appearance for the condenser coil ends of the compressor side of the unit. Condenser coil trim panels are also available as a factory-installed option.

Full hail guard consists of hinged, louvered panels, which cover both ends of the unit. This accessory provides complete protection from hail and flying debris. For hail protection, two factory options are also available. These options directly fasten to the end of the chillers (are not hinged), and therefore are not identical to this accessory.

Minimum load control allows additional capacity reduction for unit operation below the minimum step of unloading via hot gas bypass. Minimum load control is also available as a factory-installed option.

Security grilles are coated grilles that protect the condenser, cooler, and compressors. These are also available as a factory-installed option.

Dual chiller accessory kit provides the additional hardware (thermistors, wells, connectors) required for applications with 2 chillers running in parallel.

CONDENSER COIL CORROSION PROTECTION OPTIONS

ENVIRO-SHIELD™ OPTION*	ENVIRONMENT				
	Standard	Mild Coastal	Severe Coastal	Industrial	Combined Industrial/Coastal
Novation® Heat Exchanger (Standard)	See NACO Packaged Chiller Builder				
Novation Heat Exchanger, E-coat	See NACO Packaged Chiller Builder				
AL Fins	X				
CU Fins		X			
AL Fins, E-Coat			X	X	X
CU Fins, E-Coat			X		
AL Fins, Pre-Coated		X			

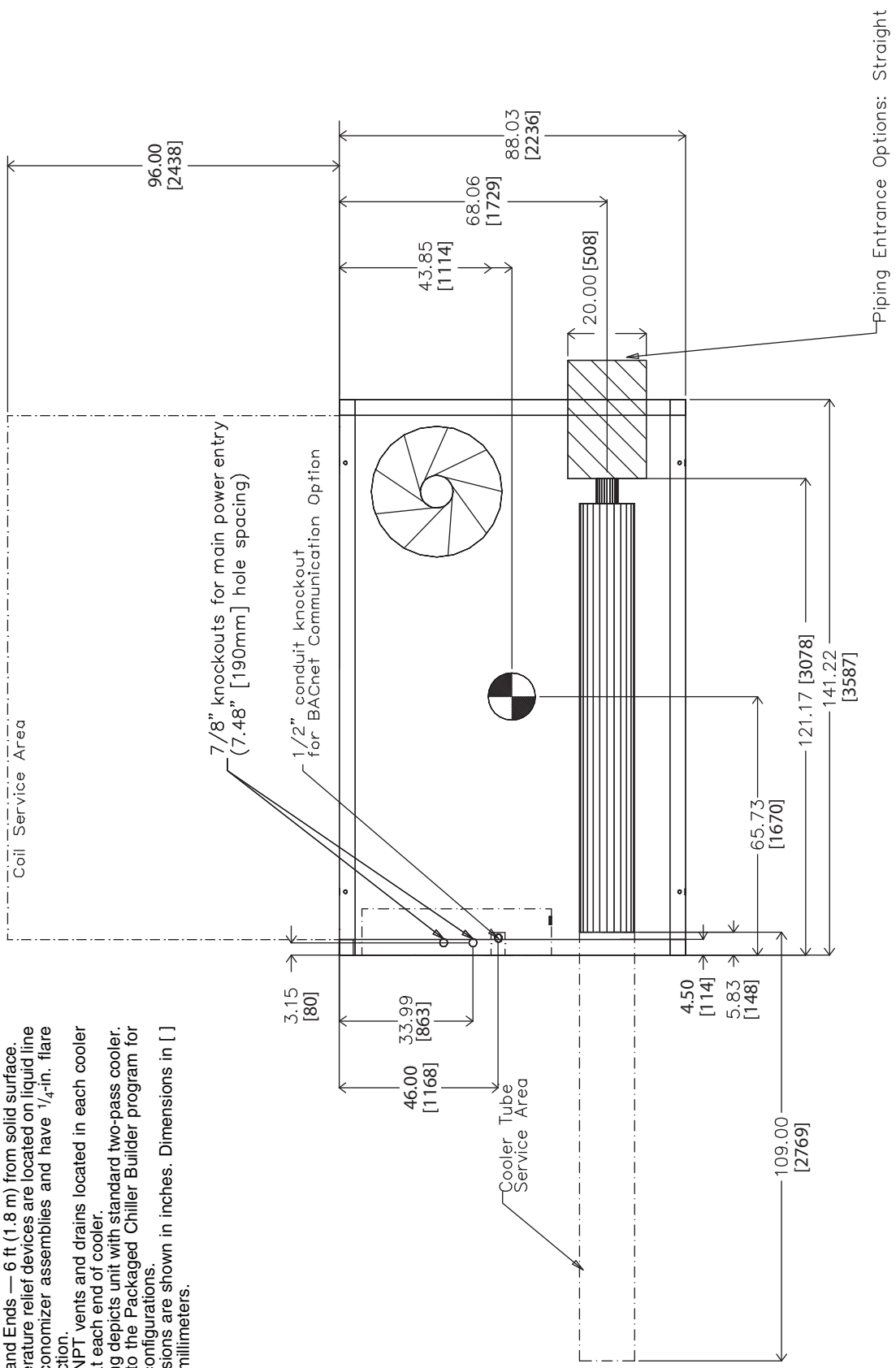
LEGEND

AL — Aluminum
CU — Copper
NACO — North American Commercial Operations

* See NACO Packaged Chiller Builder for details. Additional corrosion protection is available. For Novation or Round Tube/Plate Fin (RTPF) heat exchangers, see selection guide “Environmental Corrosion Protection” (Publication 04-581061-01).

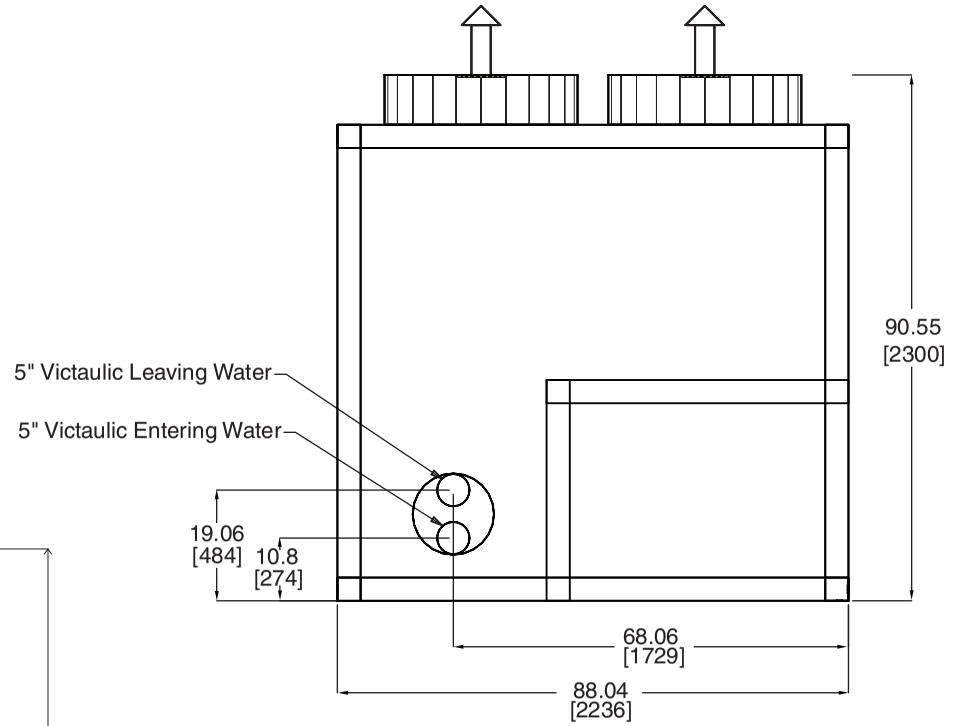
Dimensions

30XA080 (SEE NOTE 4)

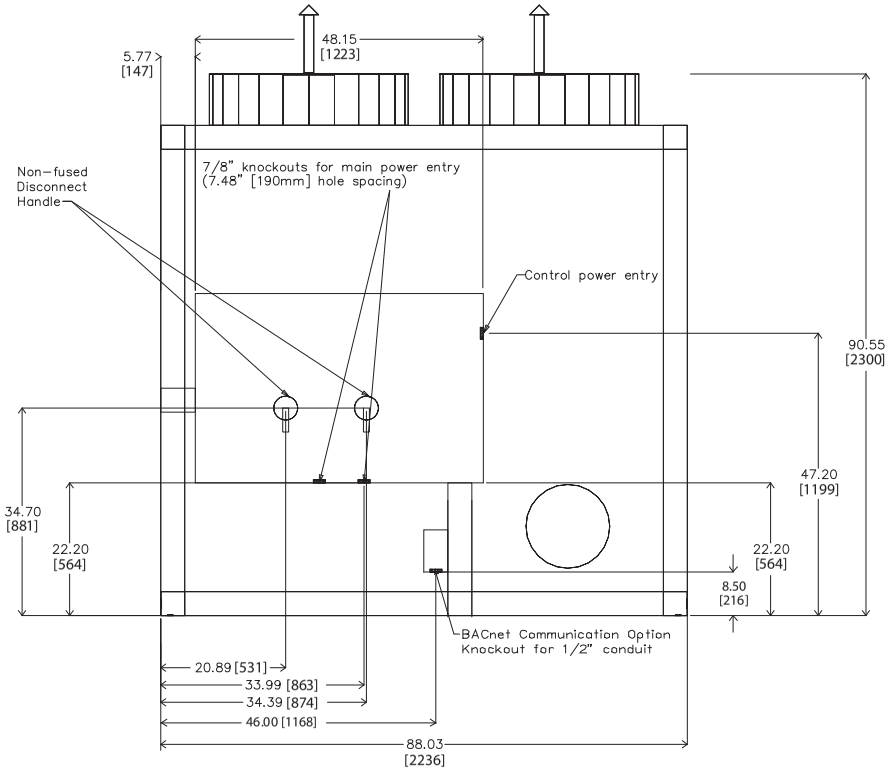


TOP VIEW

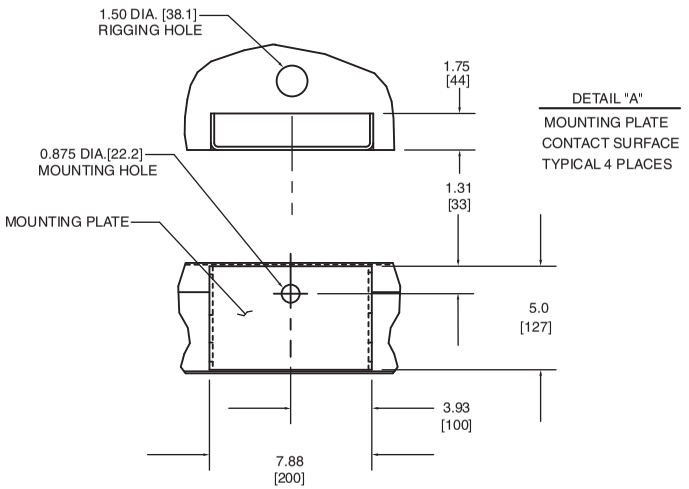
NOTES:
1. Unit must have clearances as follows:
   Top — Do not restrict
   Sides and Ends — 6 ft (1.8 m) from solid surface.
2. Temperature relief devices are located on liquid line and economizer assemblies and have 1/4-in. flare connection.
3. 3/8-in. NPT vents and drains located in each cooler head at each end of cooler.
4. Drawing depicts unit with standard two-pass cooler. Refer to the Packaged Chiller Builder program for other configurations.
5. Dimensions are shown in inches. Dimensions in [ ] are in millimeters.



RIGHT END VIEW

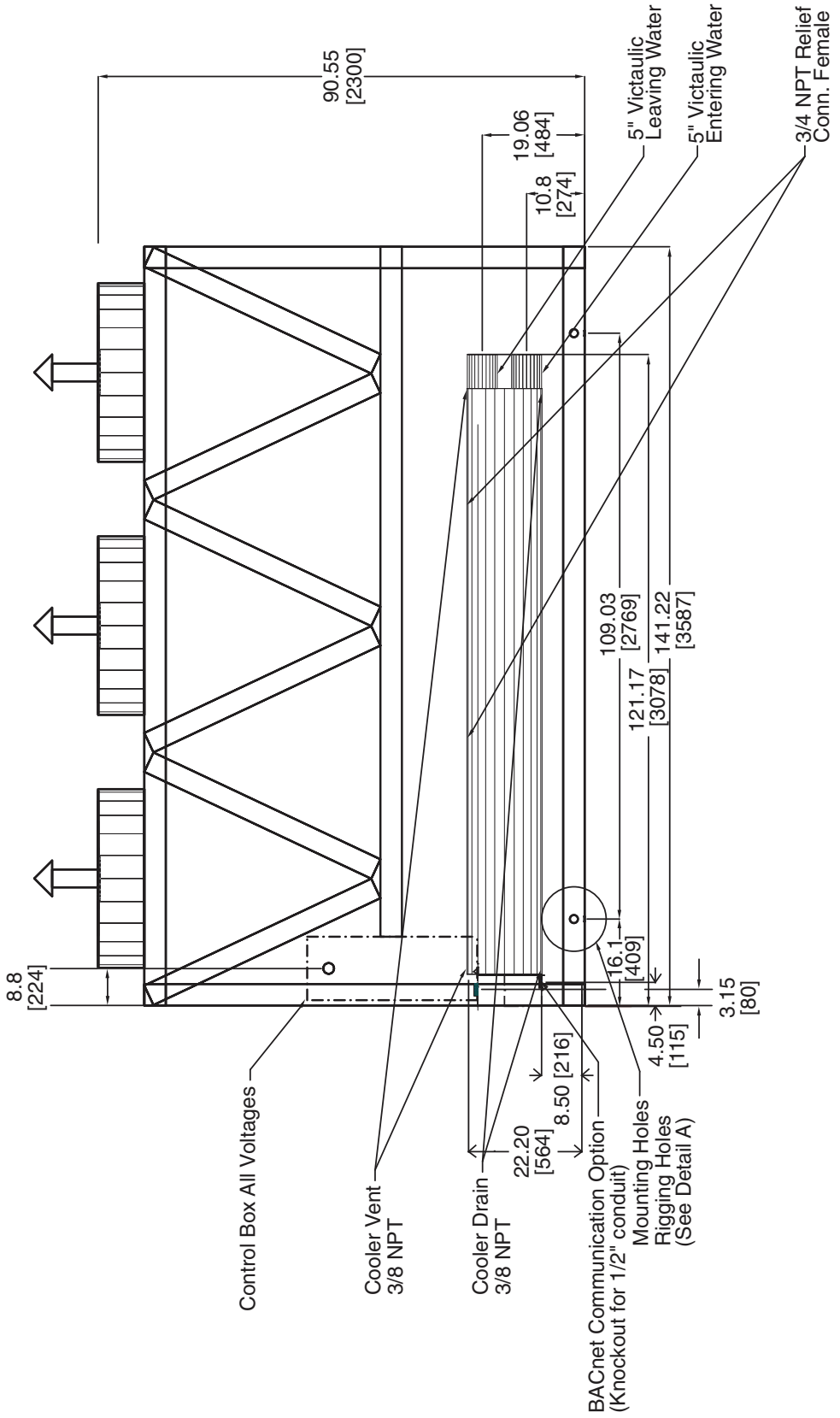


LEFT END VIEW



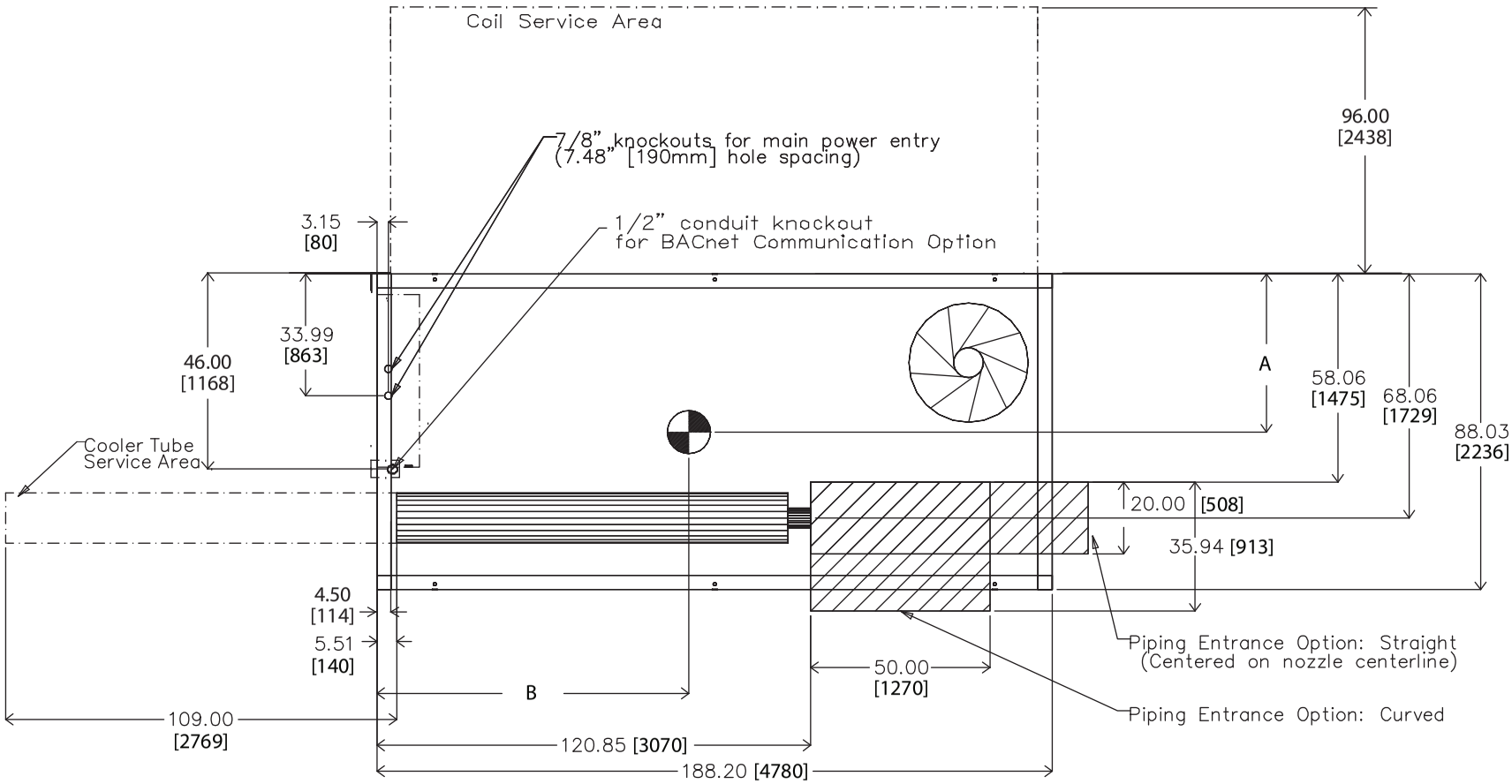
Dimensions (cont)

30XA080 (cont)



FRONT VIEW

30XA090,100,110,120 (SEE NOTE 4)



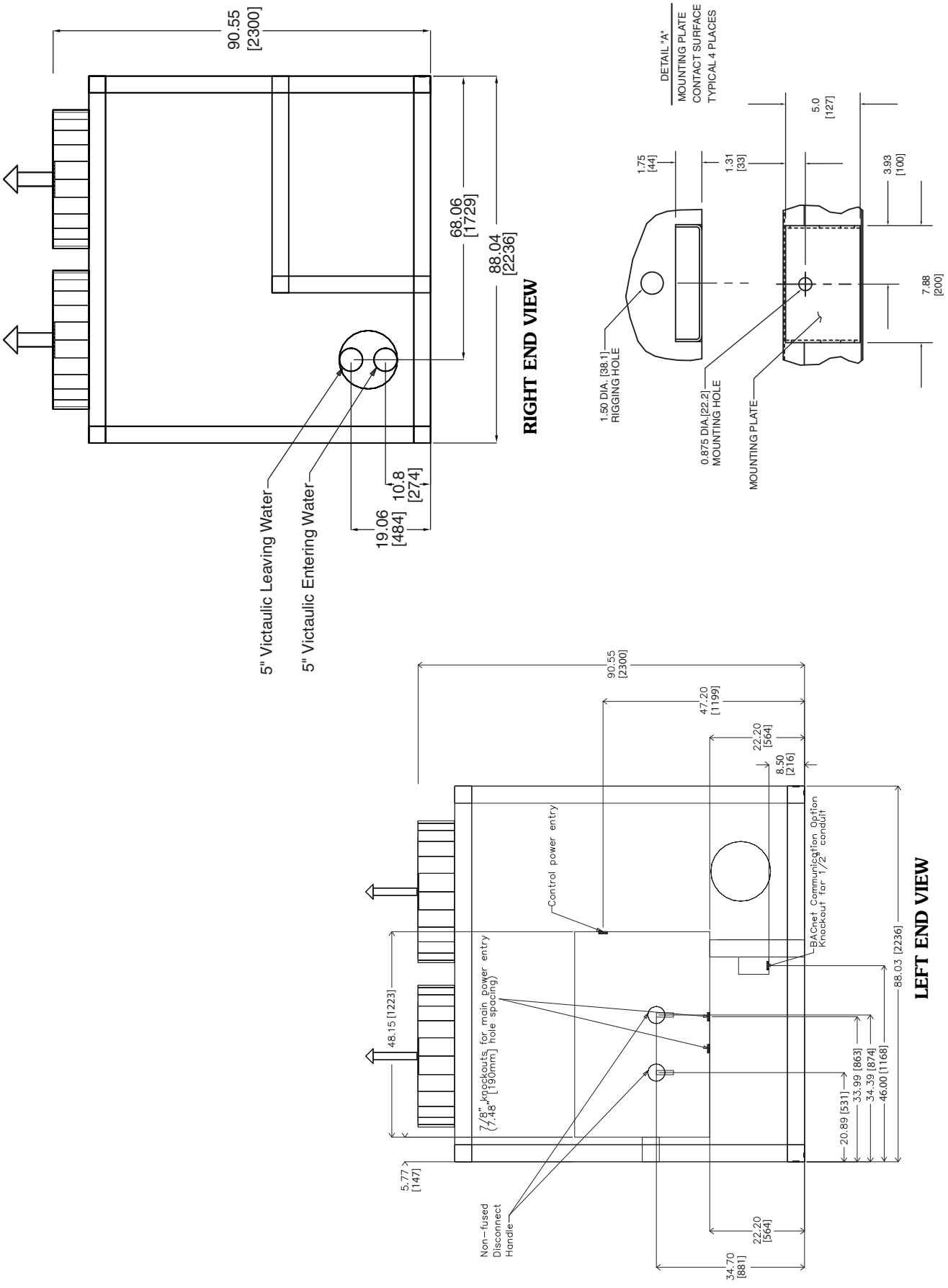
TOP VIEW

30XA UNIT	A	B
090	44.11 [1120]	86.93 [2208]
100	44.11 [1120]	87.22 [2215]
110	44.11 [1120]	87.62 [2226]
120	44.11 [1120]	87.12 [2213]

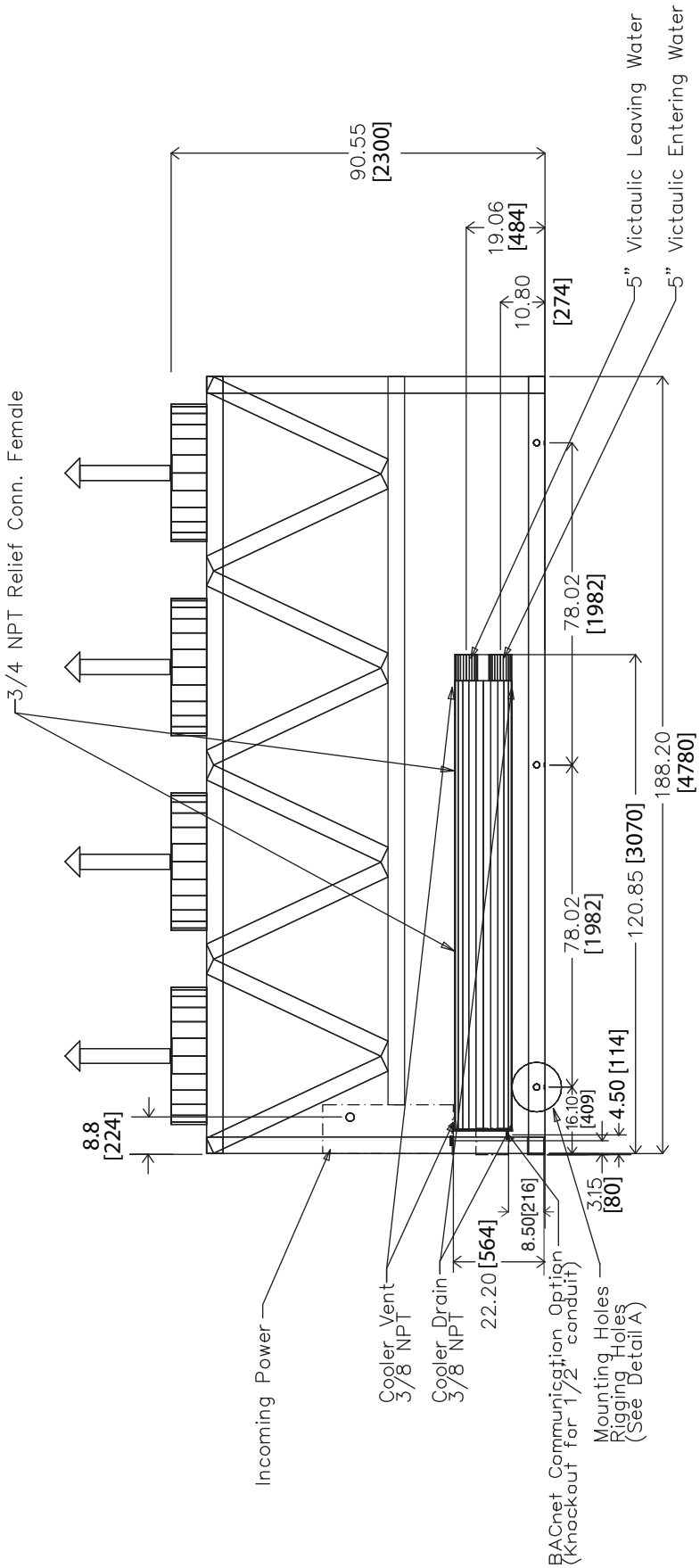
NOTES:
1. Unit must have clearances as follows:
   Top — Do not restrict
   Sides and Ends — 6 ft (1.8 m) from solid surface.
2. Temperature relief devices are located on liquid line and economizer assemblies and have $^{1}/_{4}$-in. flare connection.
3. $^{3}/_{8}$-in. NPT vents and drains located in each cooler head at each end of cooler.
4. Drawing depicts unit with standard two-pass cooler. Refer to the Packaged Chiller Builder program for other configurations.
5. Dimensions are shown in inches. Dimensions in [ ] are in millimeters.

Dimensions (cont)

30XA090,100,110,120 (cont)



30XA090,100,110,120 (cont)

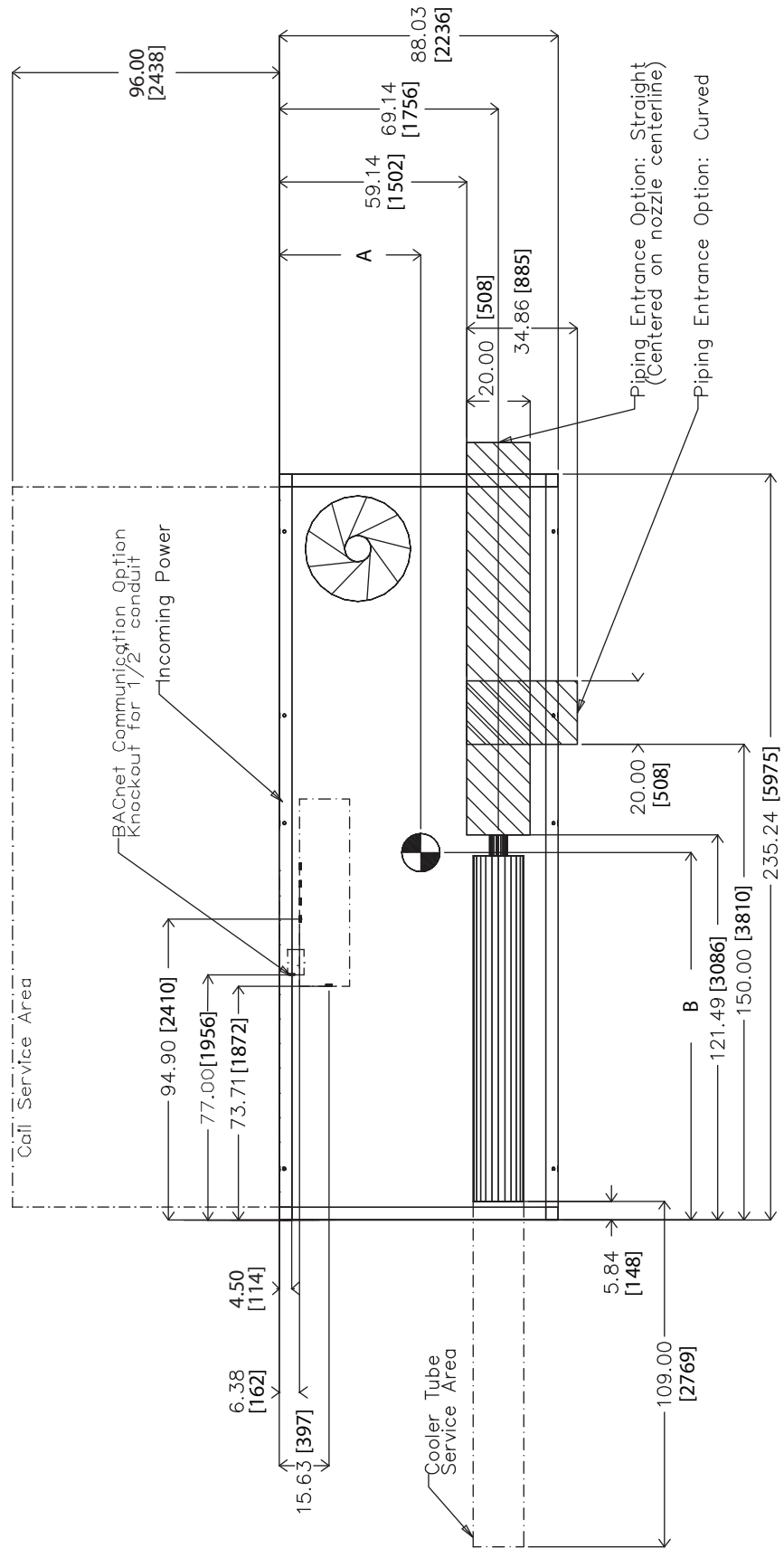


FRONT VIEW

Dimensions (cont)

30XA140,160 (SEE NOTE 4)

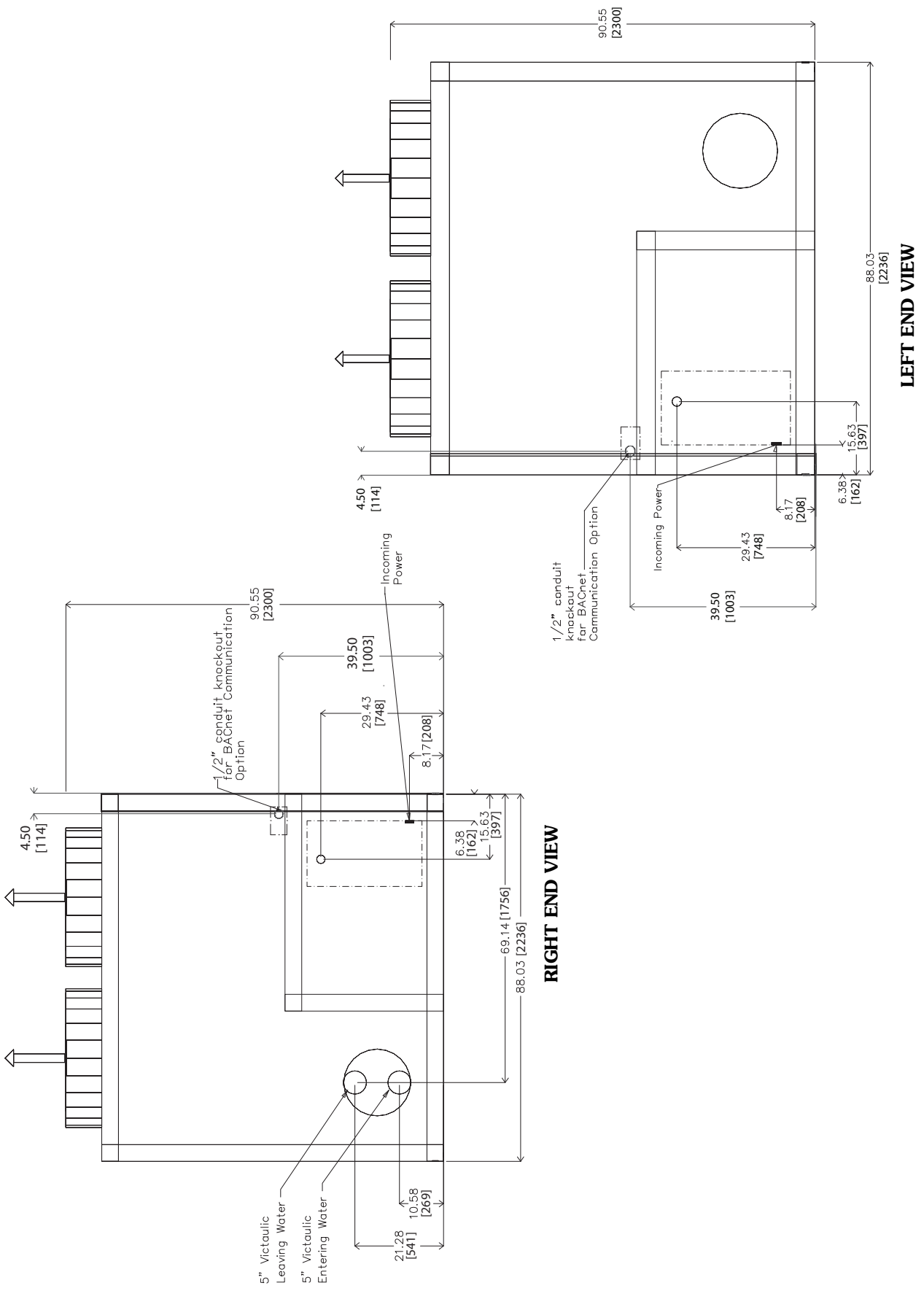
30XA UNIT	A	B
140	44.63 [1134]	115.88 [2943]
160	44.61 [1133]	115.64 [2937]



TOP VIEW

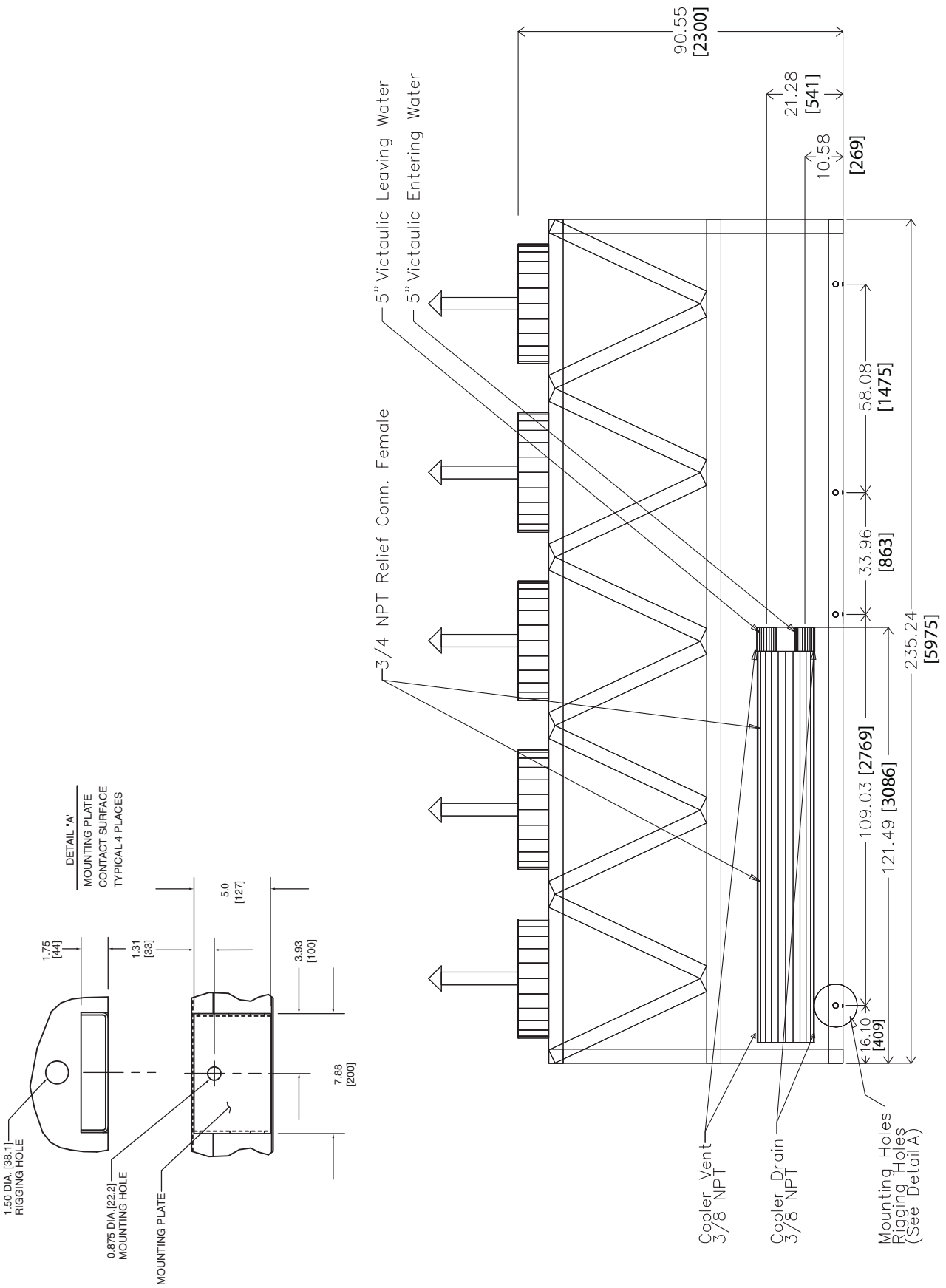
NOTES:
1. Unit must have clearances as follows:
   Top — Do not restrict
   Sides and Ends — 6 ft (1.8 m) from solid surface.
2. Temperature relief devices are located on liquid line and economizer assemblies and have 1/4-in. flare connection.
3. 3/8-in. NPT vents and drains located in each cooler head at each end of cooler.
4. Drawing depicts unit with standard two-pass cooler. Refer to the Packaged Chiller Builder program for other configurations.
5. Dimensions are shown in inches. Dimensions in [ ] are in millimeters.

30XA140,160 (cont)

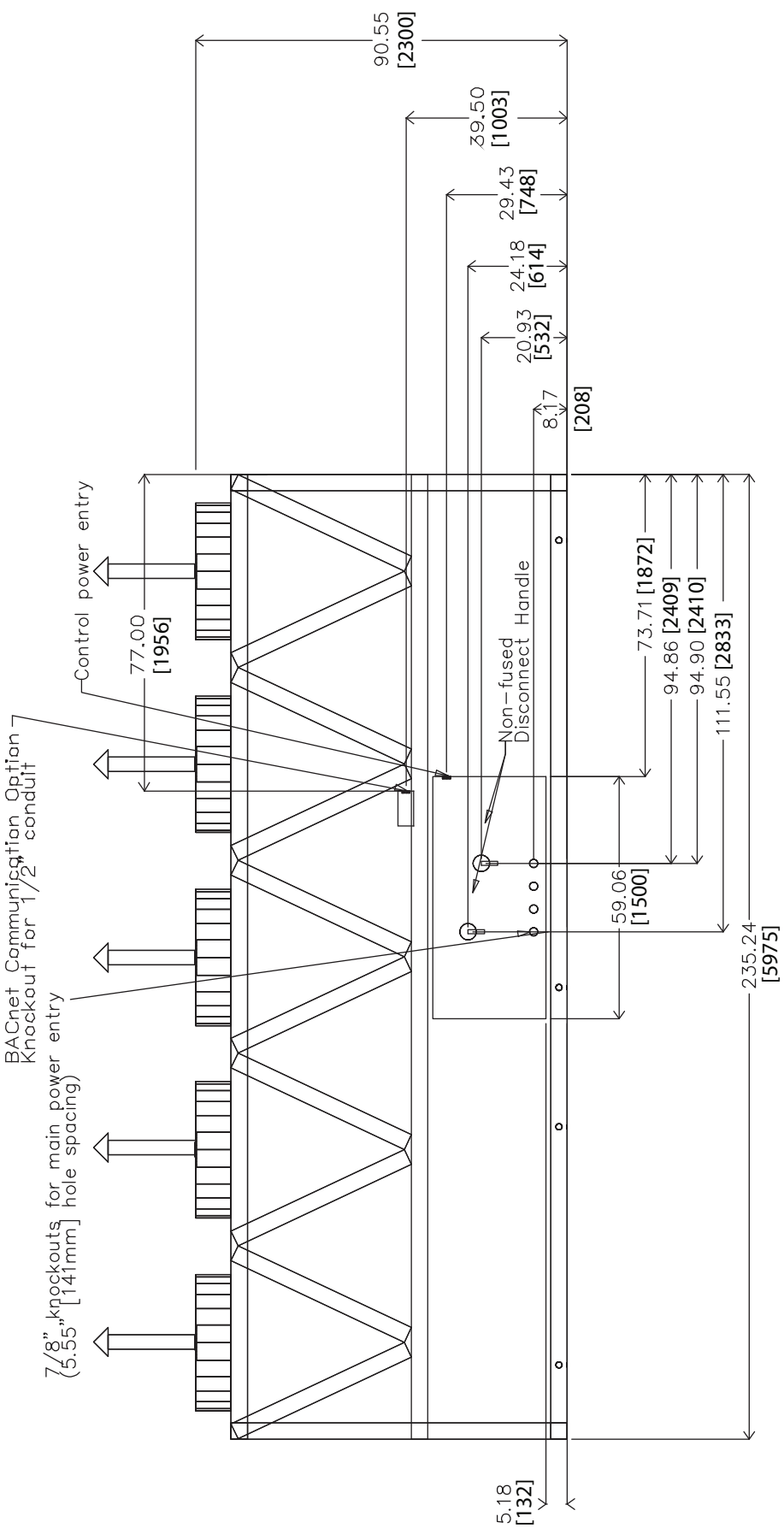


Dimensions (cont)

30XA140,160 (cont)



30XA140,160 (cont)

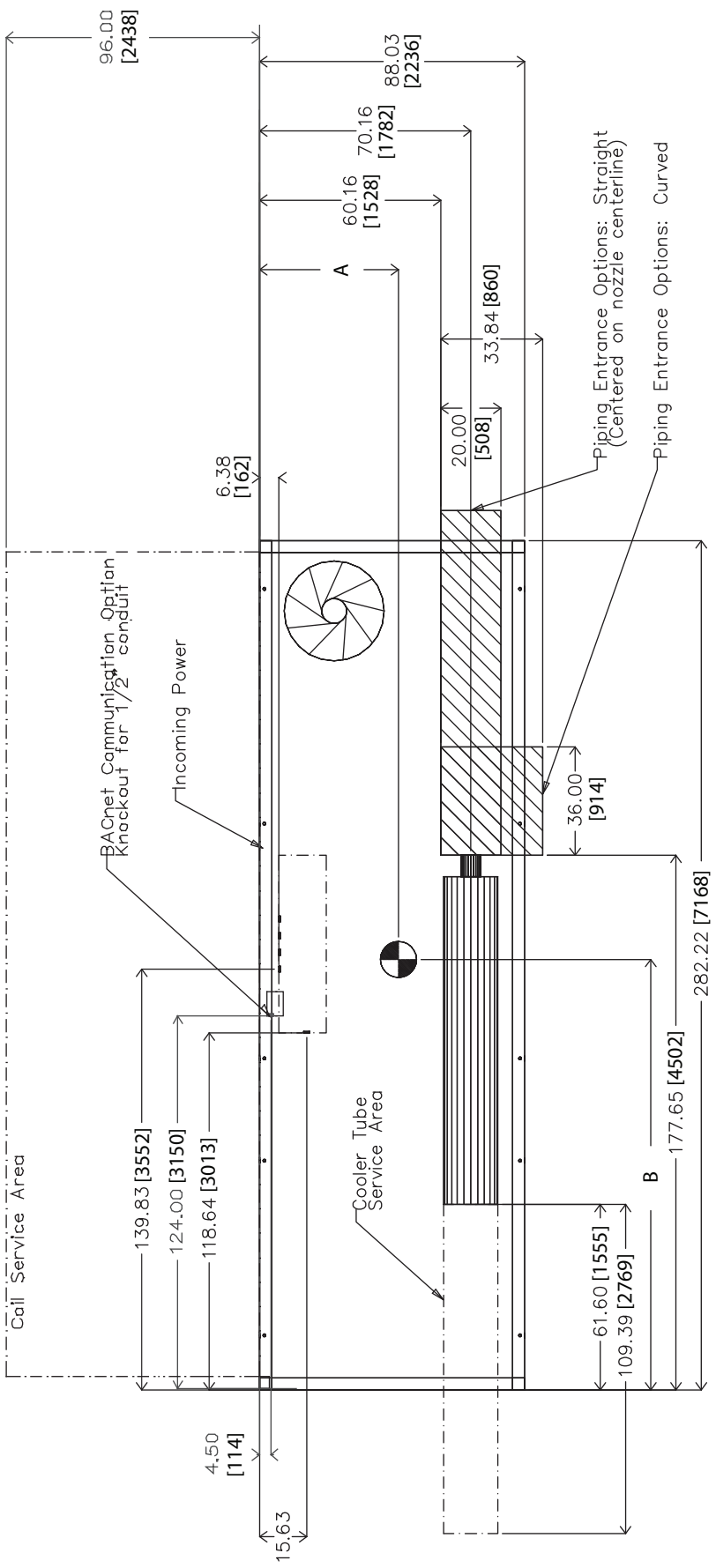


BACK VIEW

Dimensions (cont)

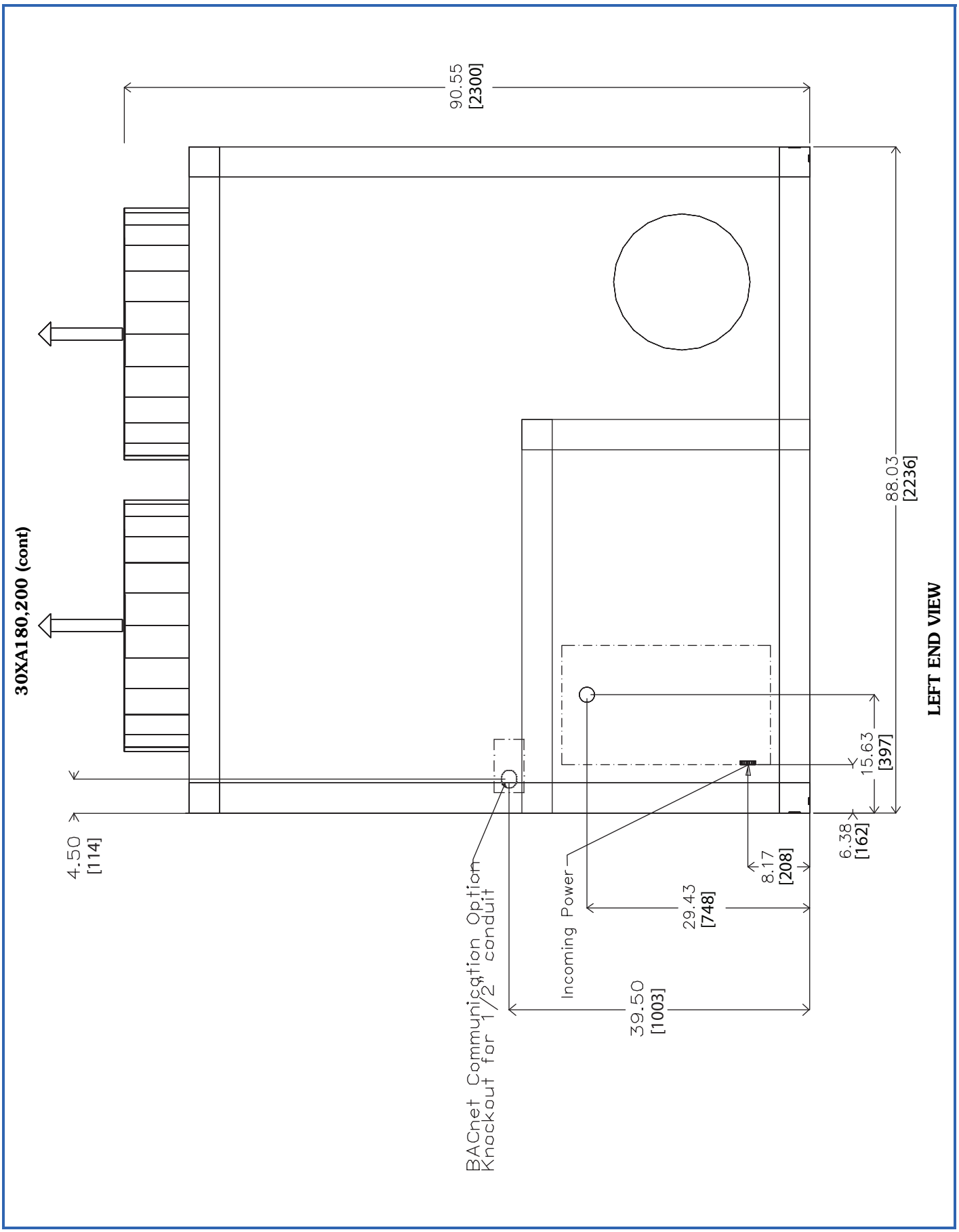
30XA180,200 (SEE NOTE 4)

30XA UNIT	A	B
180	46.12 [1171]	143.04 [3633]
200	46.15 [1172]	142.97 [3631]



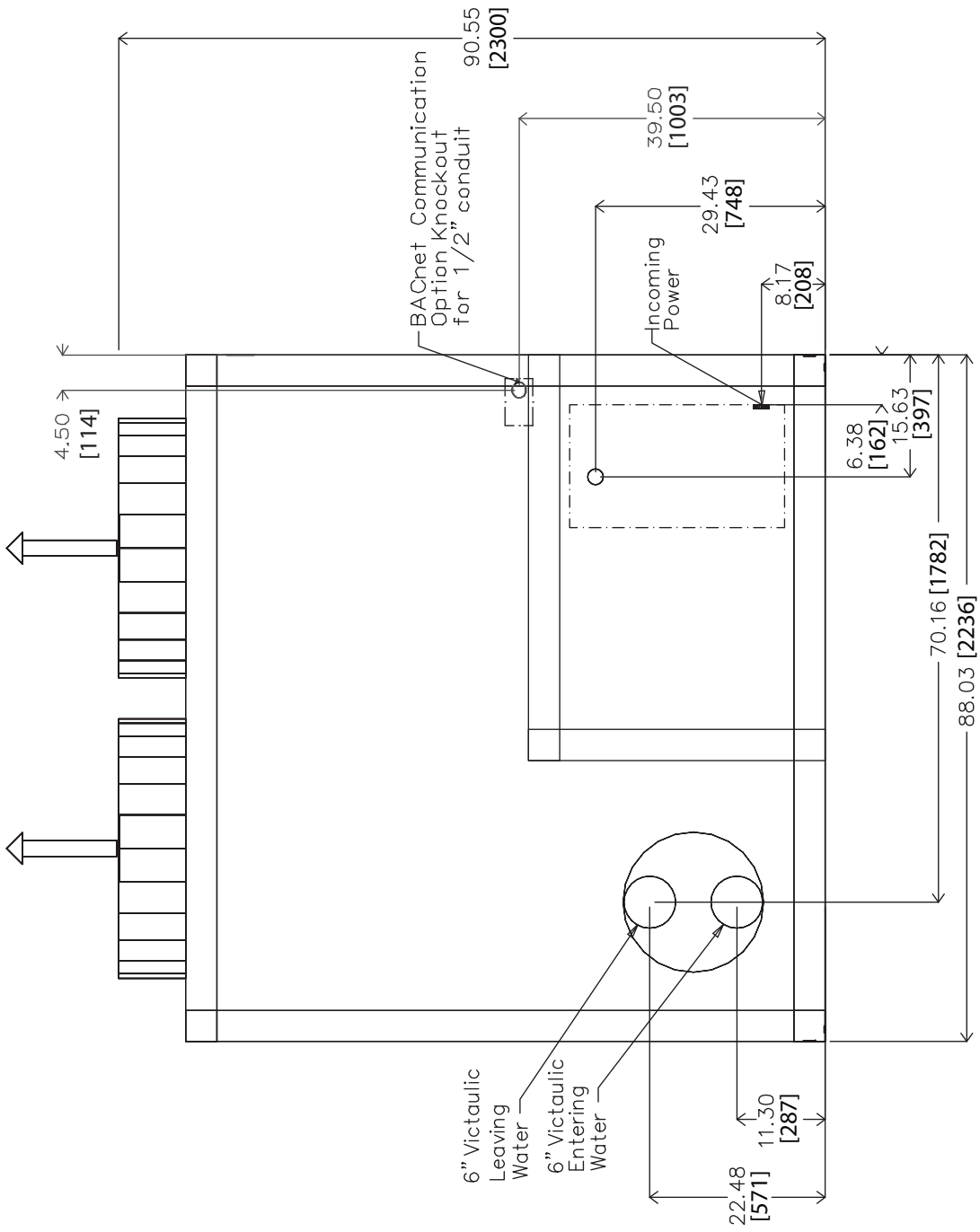
TOP VIEW

NOTES:
1. Unit must have clearances as follows:
   Top — Do not restrict
   Sides and Ends — 6 ft (1.8 m) from solid surface.
2. Temperature relief devices are located on liquid line and economizer assemblies and have $^{1}/_{4}$-in. flare connection.
3. $^{3}/_{8}$-in. NPT vents and drains located in each cooler head at each end of cooler.
4. Drawing depicts unit with standard two-pass cooler. Refer to the Packaged Chiller Builder program for other configurations.
5. Dimensions are shown in inches. Dimensions in [ ] are in millimeters.


30XA180,200 (cont)
90.55
[2300]
88.03
[2236]
15.63
[397]
6.38
[162]
4.50
[114]
8.17
[208]
29.43
[748]
39.50
[1003]
Incoming Power
BACnet Communication Option
Knockout for 1/2" conduit
LEFT END VIEW

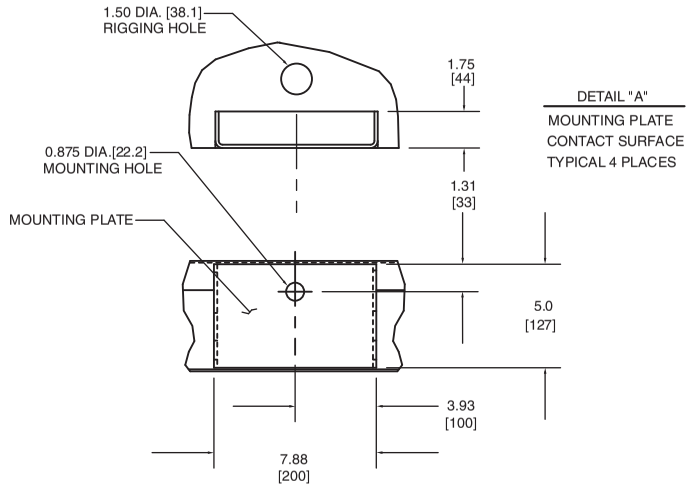
Dimensions (cont)

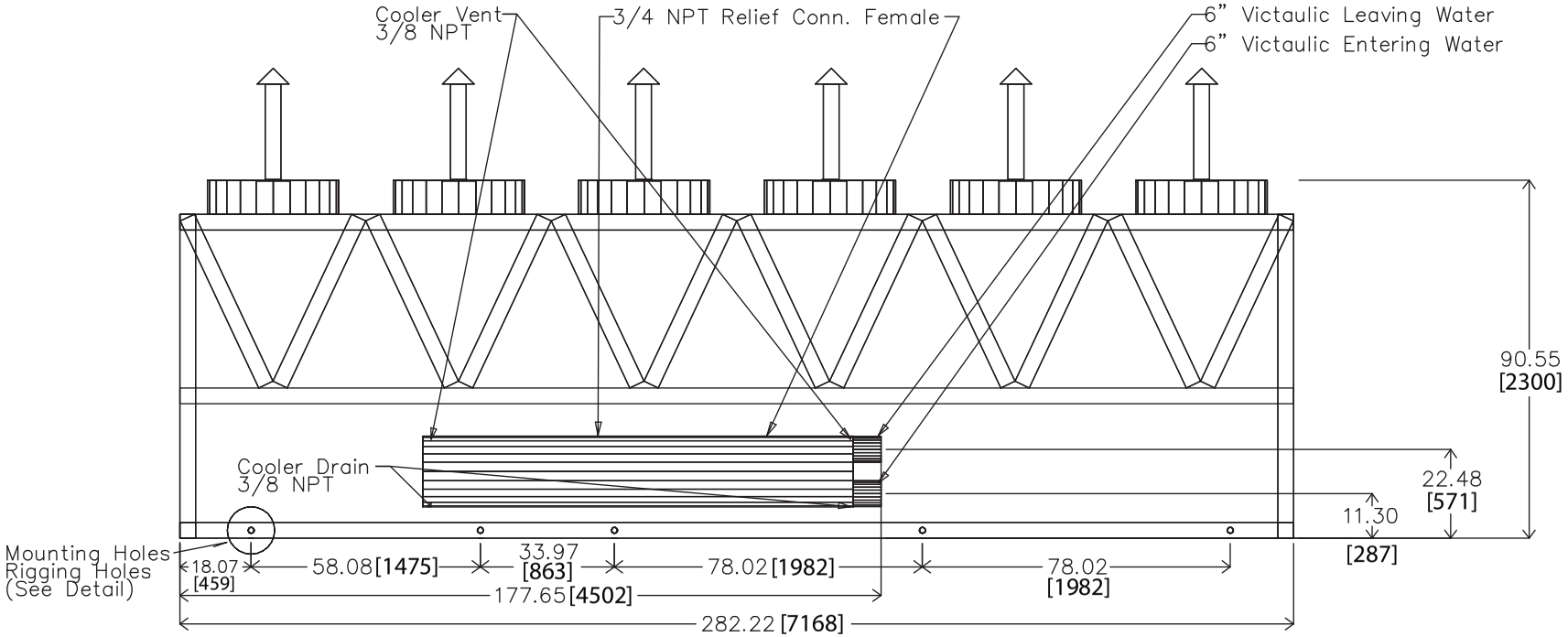
30XA180,200 (cont)



RIGHT END VIEW

30XA180,200 (cont)

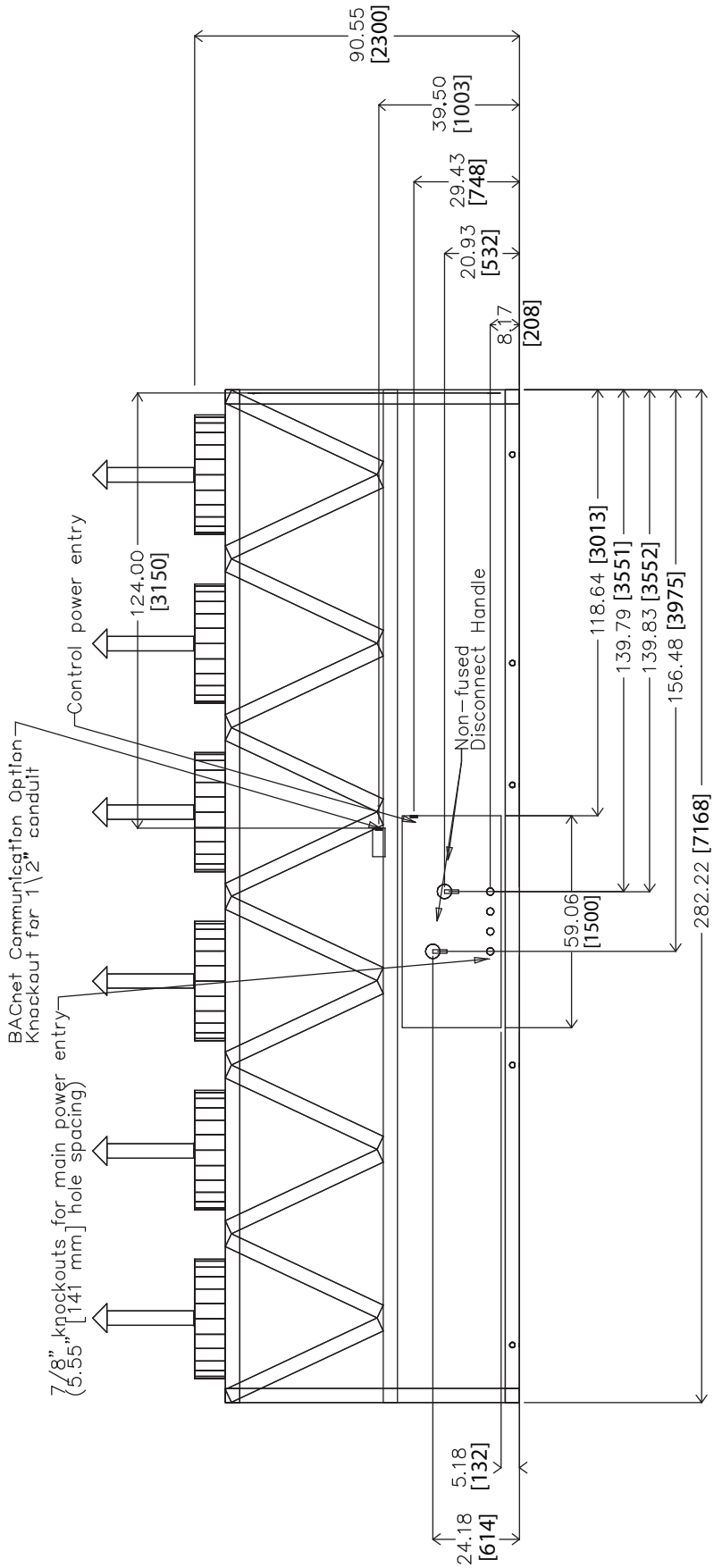




FRONT VIEW

Dimensions (cont)

30XA180,200 (cont)

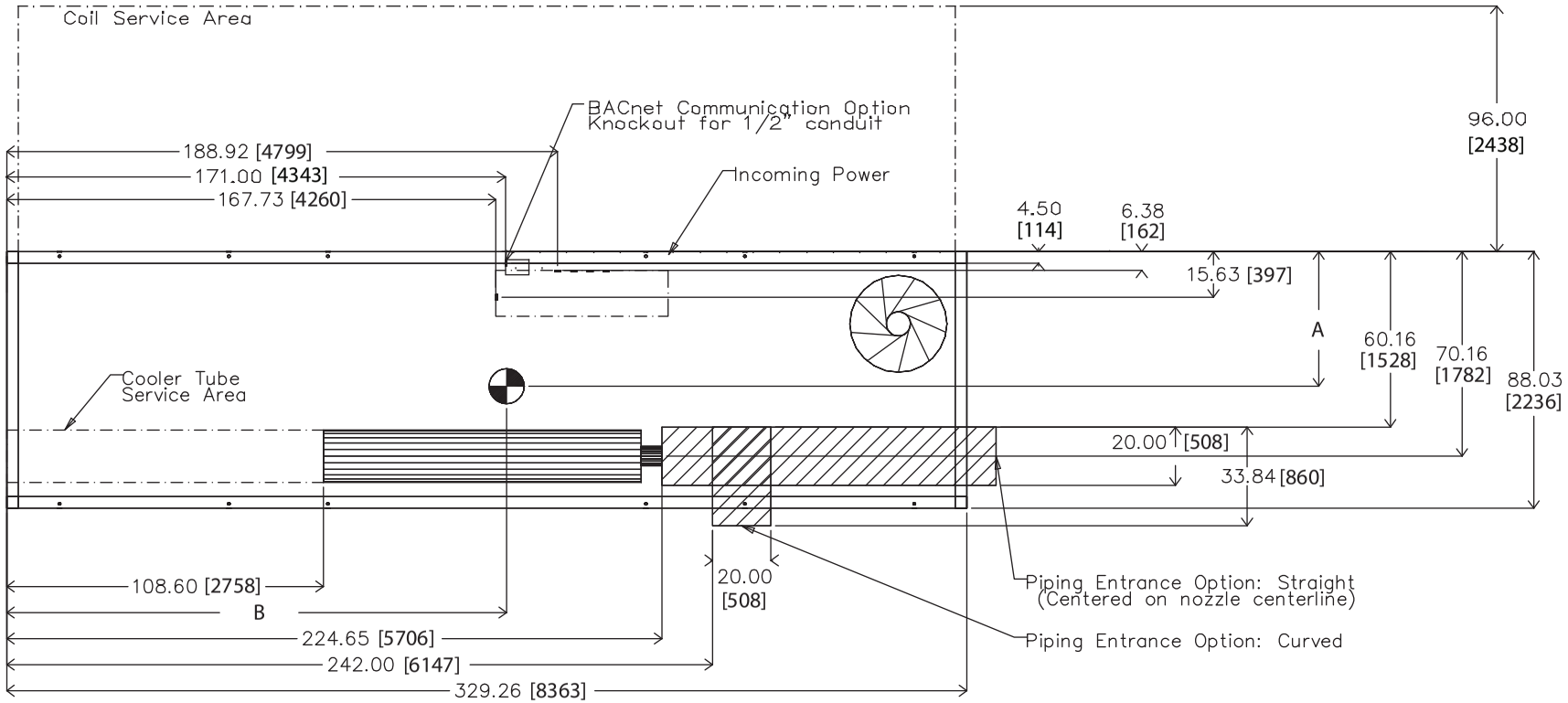


BACK VIEW

30XA220,240 (SEE NOTE 4)

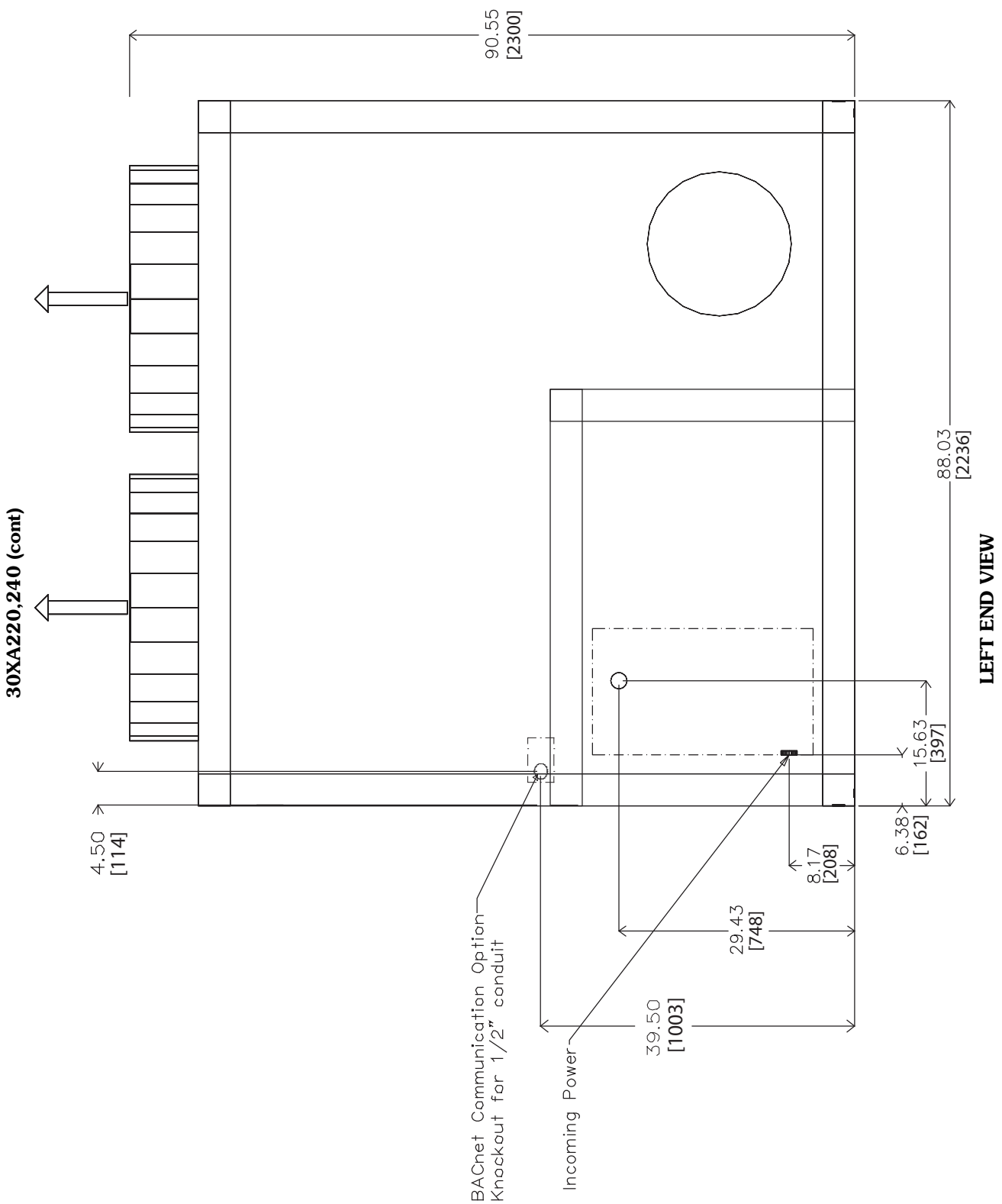
NOTES:
1. Unit must have clearances as follows:
   Top — Do not restrict
   Sides and Ends — 6 ft (1.8 m) from solid surface.
2. Temperature relief devices are located on liquid line and economizer assemblies and have $^{1}/_{4}$-in. flare connection.
3. $^{3}/_{8}$-in. NPT vents and drains located in each cooler head at each end of cooler.
4. Drawing depicts unit with standard two-pass cooler. Refer to the Packaged Chiller Builder program for other configurations.
5. Dimensions are shown in inches. Dimensions in [ ] are in millimeters.

30XA UNIT	A	B
220	46.17 [1173]	171.42 [4354]
240	46.23 [1174]	170.83 [4339]

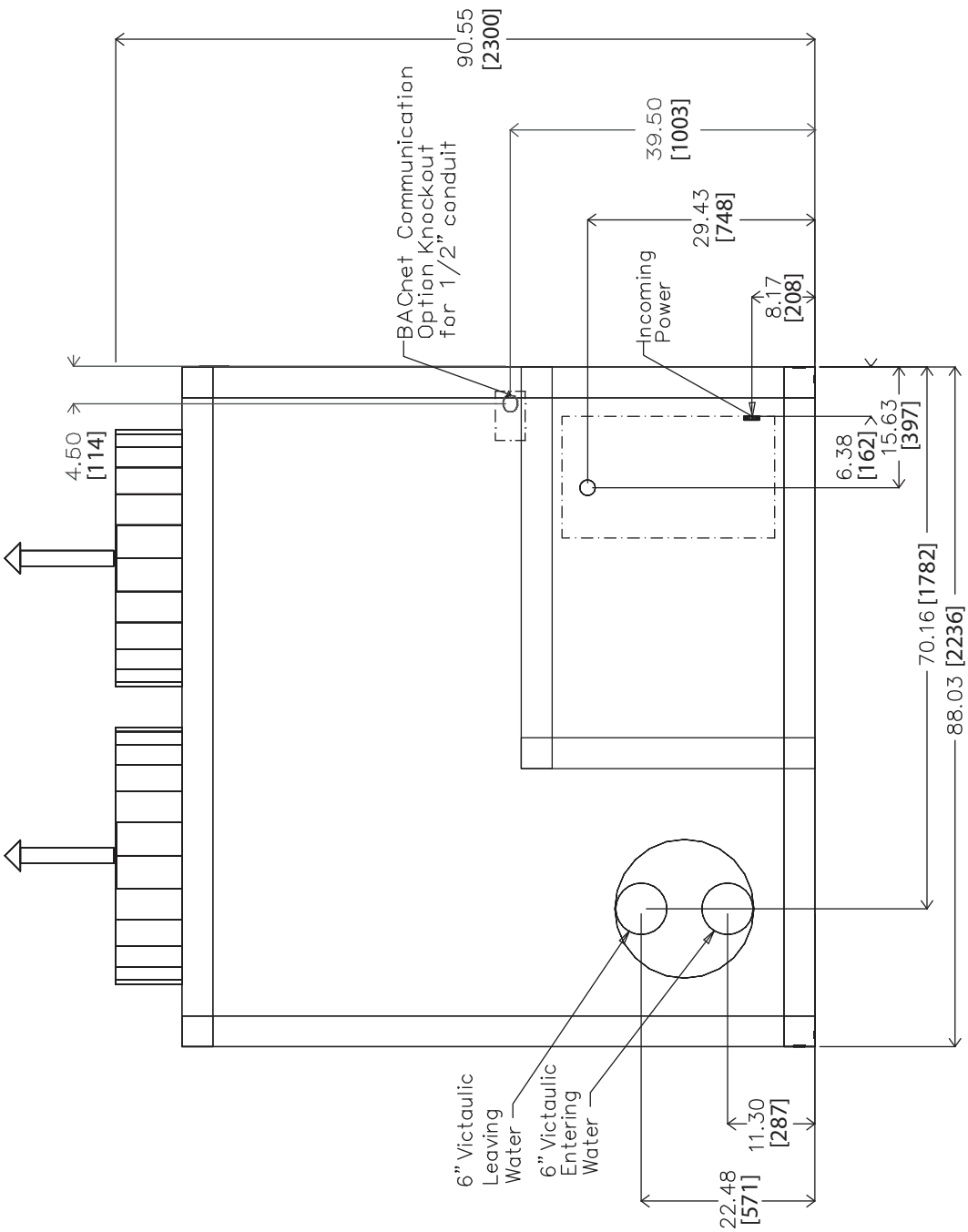


TOP VIEW

Dimensions (cont)



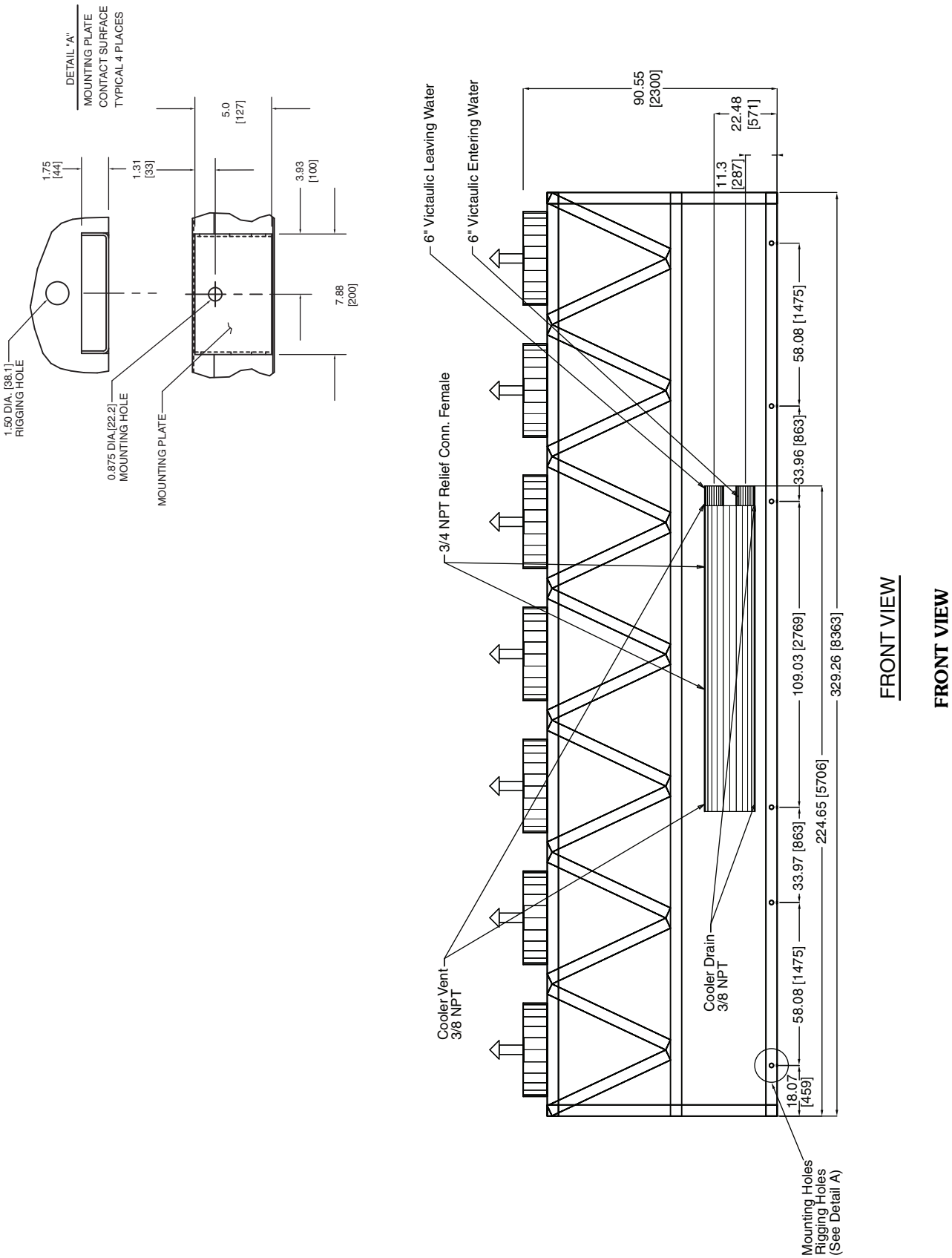
30XA220,240 (cont)



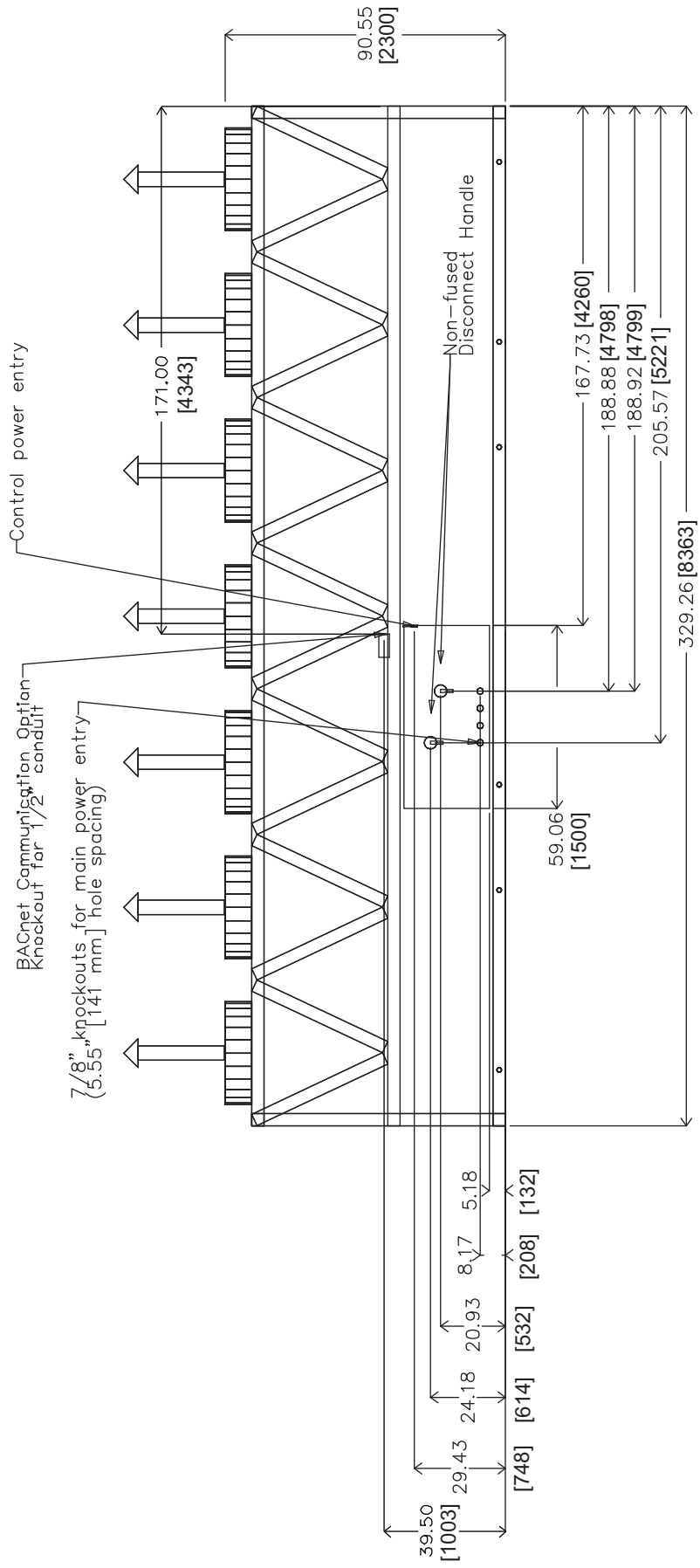
RIGHT END VIEW

Dimensions (cont)

30XA220,240 (cont)



30XA220,240 (cont)

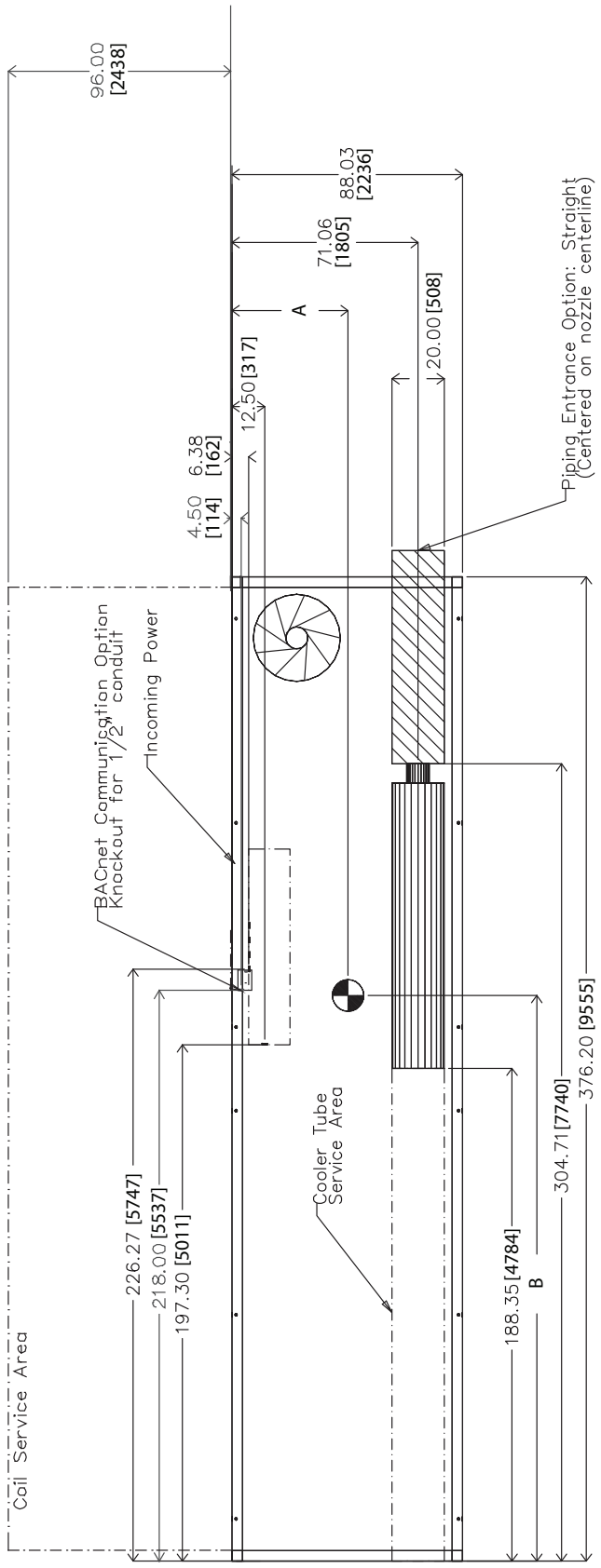


BACK VIEW

Dimensions (cont)

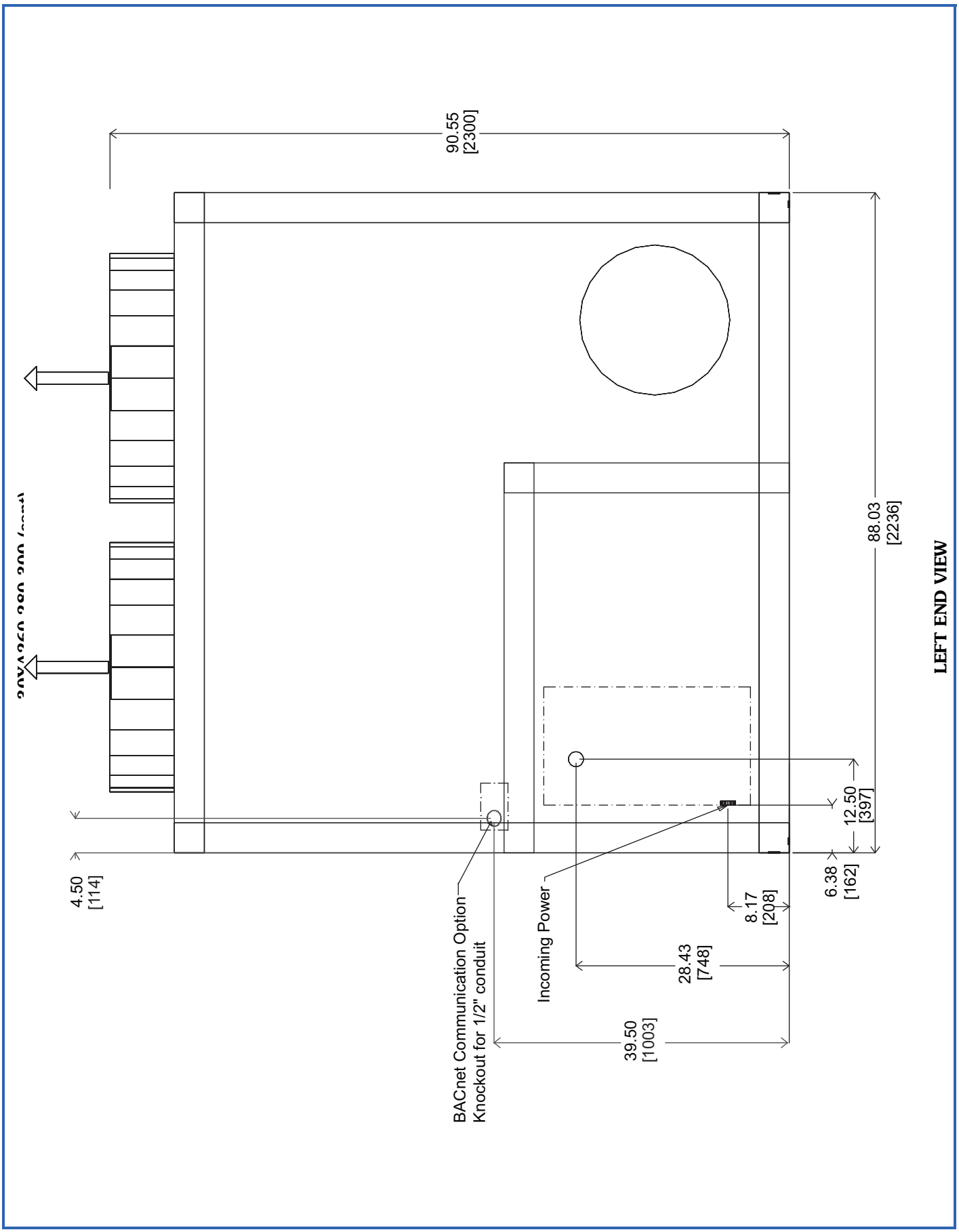
30XA260,280,300 (SEE NOTE 4)

30XA UNIT	A	B
260	44.22 [1123]	216.16 [5490]
280	44.30 [1125]	215.86 [5483]
300	44.32 [1126]	216.18 [5491]



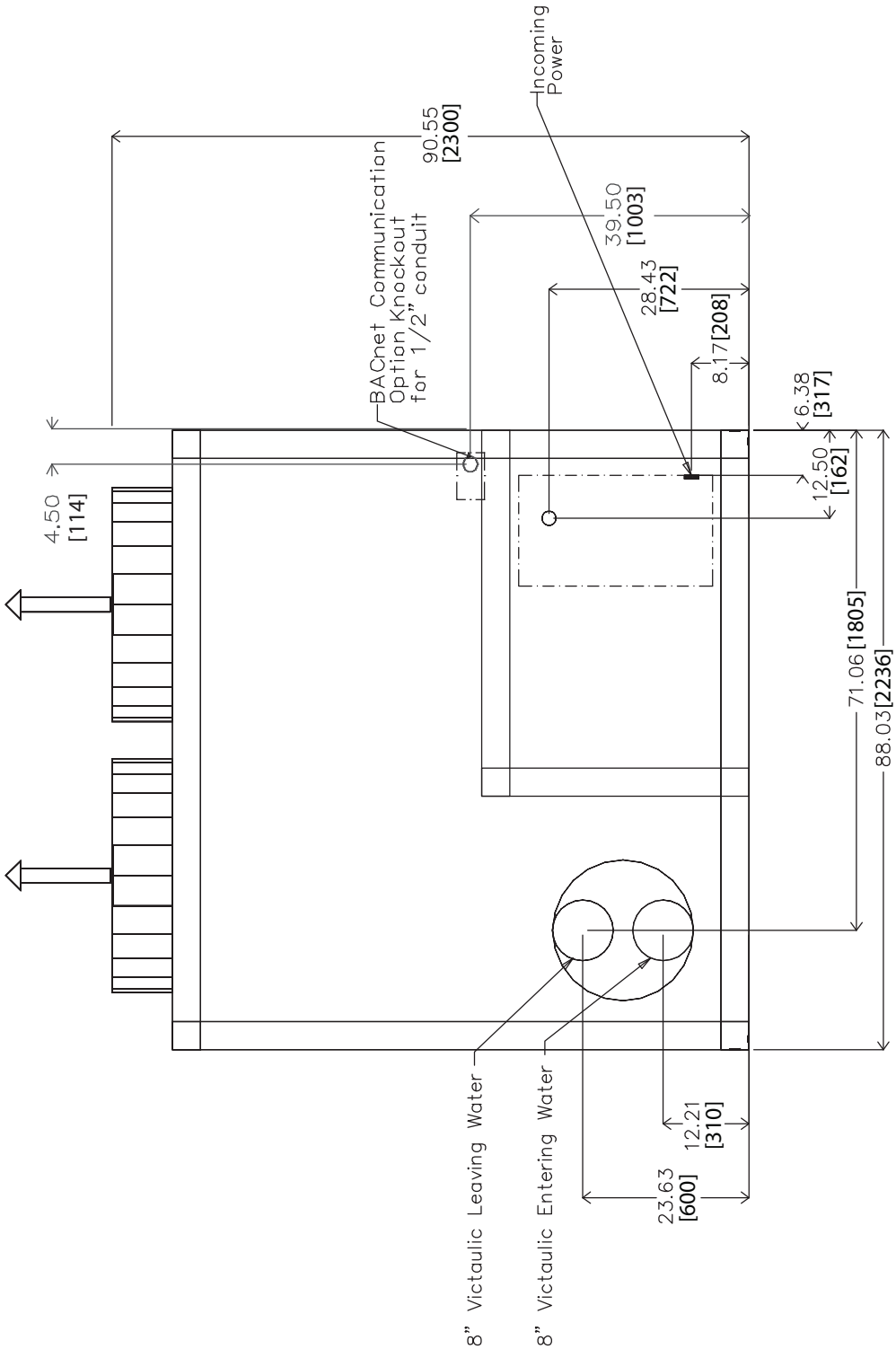
TOP VIEW

NOTES:
1. Unit must have clearances as follows:
   Top — Do not restrict
   Sides and Ends — 6 ft (1.8 m) from solid surface.
2. Temperature relief devices are located on liquid line and economizer assemblies and have 1/4-in. flare connection.
3. 3/8-in. NPT vents and drains located in each cooler head at each end of cooler.
4. Drawing depicts unit with standard two-pass cooler. Refer to the Packaged Chiller Builder program for other configurations.
5. Dimensions are shown in inches. Dimensions in [ ] are in millimeters.


90.55
[2300]
88.03
[2236]
12.50
[397]
6.38
[162]
4.50
[114]
8.17
[208]
28.43
[748]
39.50
[1003]
BACnet Communication Option
Knockout for 1/2" conduit
Incoming Power
LEFT END VIEW

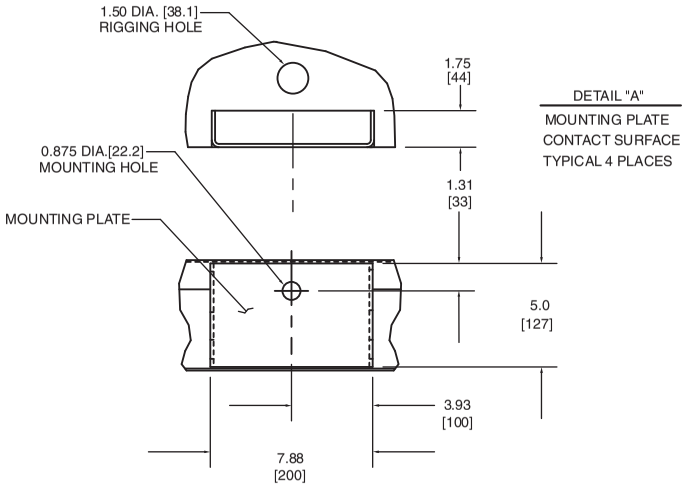
Dimensions (cont)

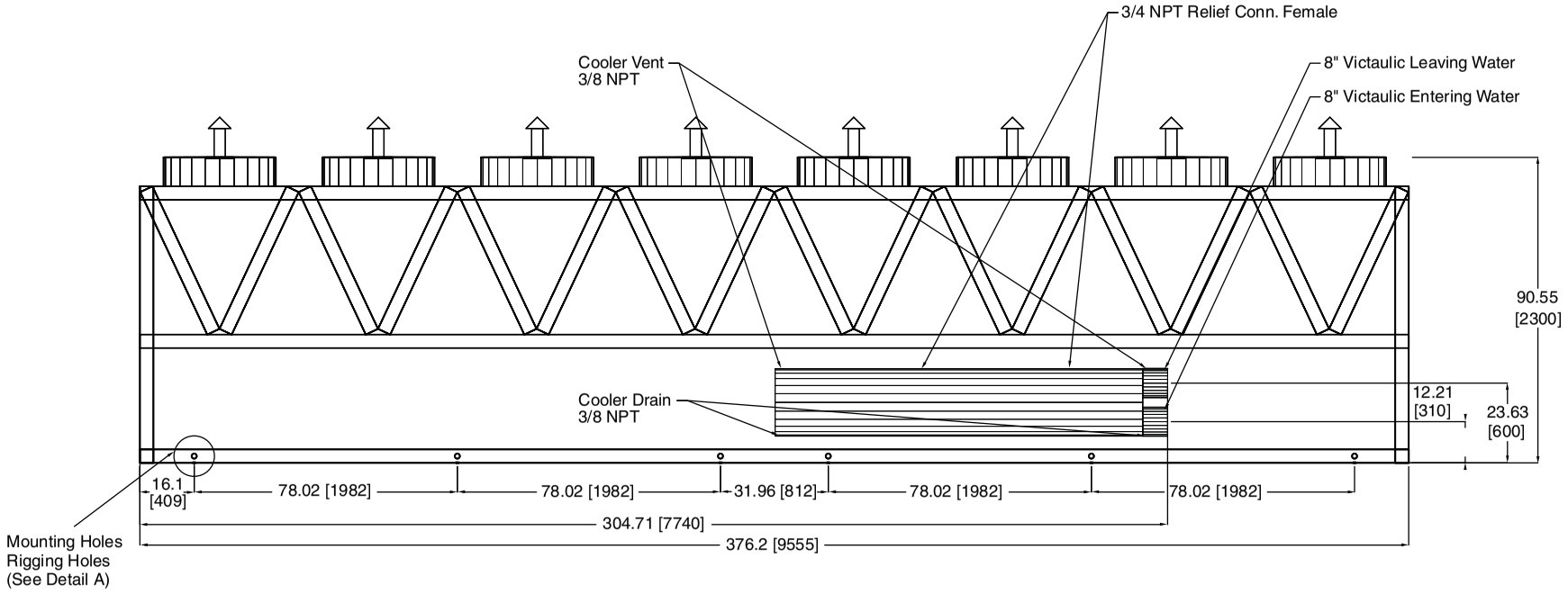
30XA260,280,300 (cont)



RIGHT END VIEW

30XA260,280,300 (cont)

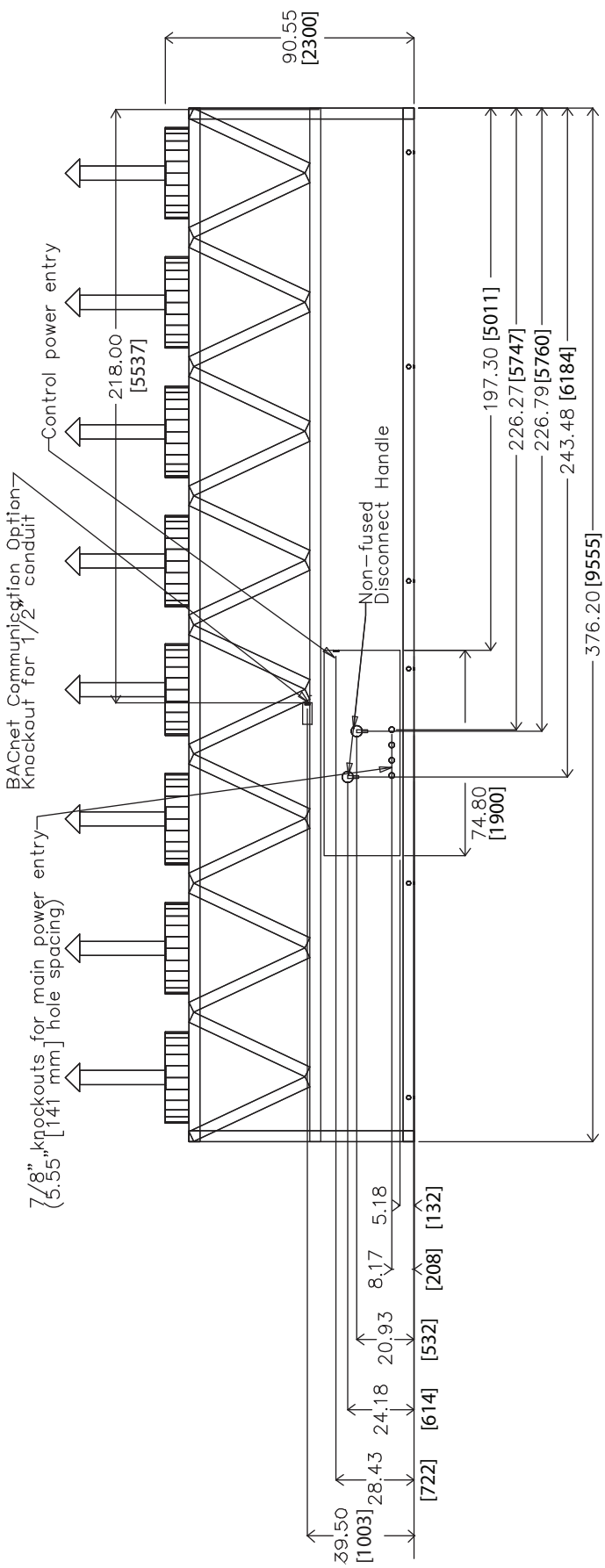




FRONT VIEW

Dimensions (cont)

30XA260,280,300 (cont)

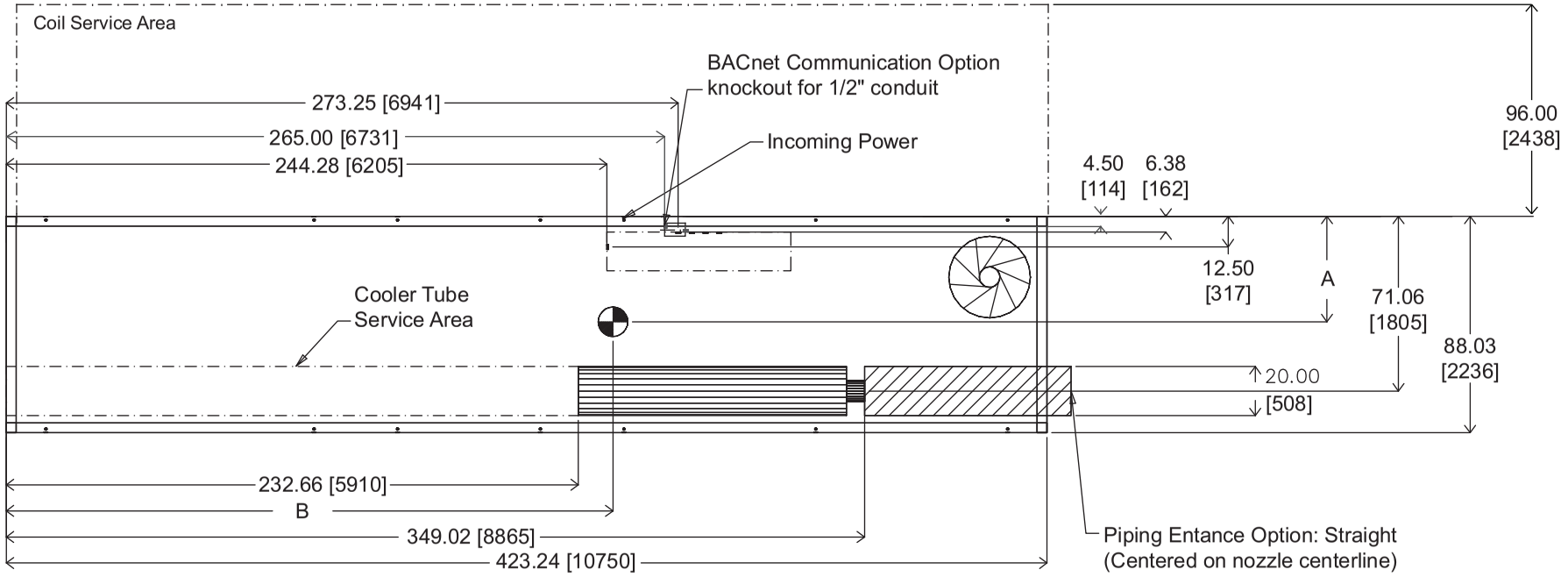


BACK VIEW

30XA325,350 (SEE NOTE 4)

NOTES:
1. Unit must have clearances as follows:
   Top — Do not restrict
   Sides and Ends — 6 ft (1.8 m) from solid surface.
2. Temperature relief devices are located on liquid line and economizer assemblies and have $^1/_4$-in. flare connection.
3. $^3/_8$-in. NPT vents and drains located in each cooler head at each end of cooler.
4. Drawing depicts unit with standard two-pass cooler. Refer to the Packaged Chiller Builder program for other configurations.
5. Dimensions are shown in inches. Dimensions in [ ] are in millimeters.

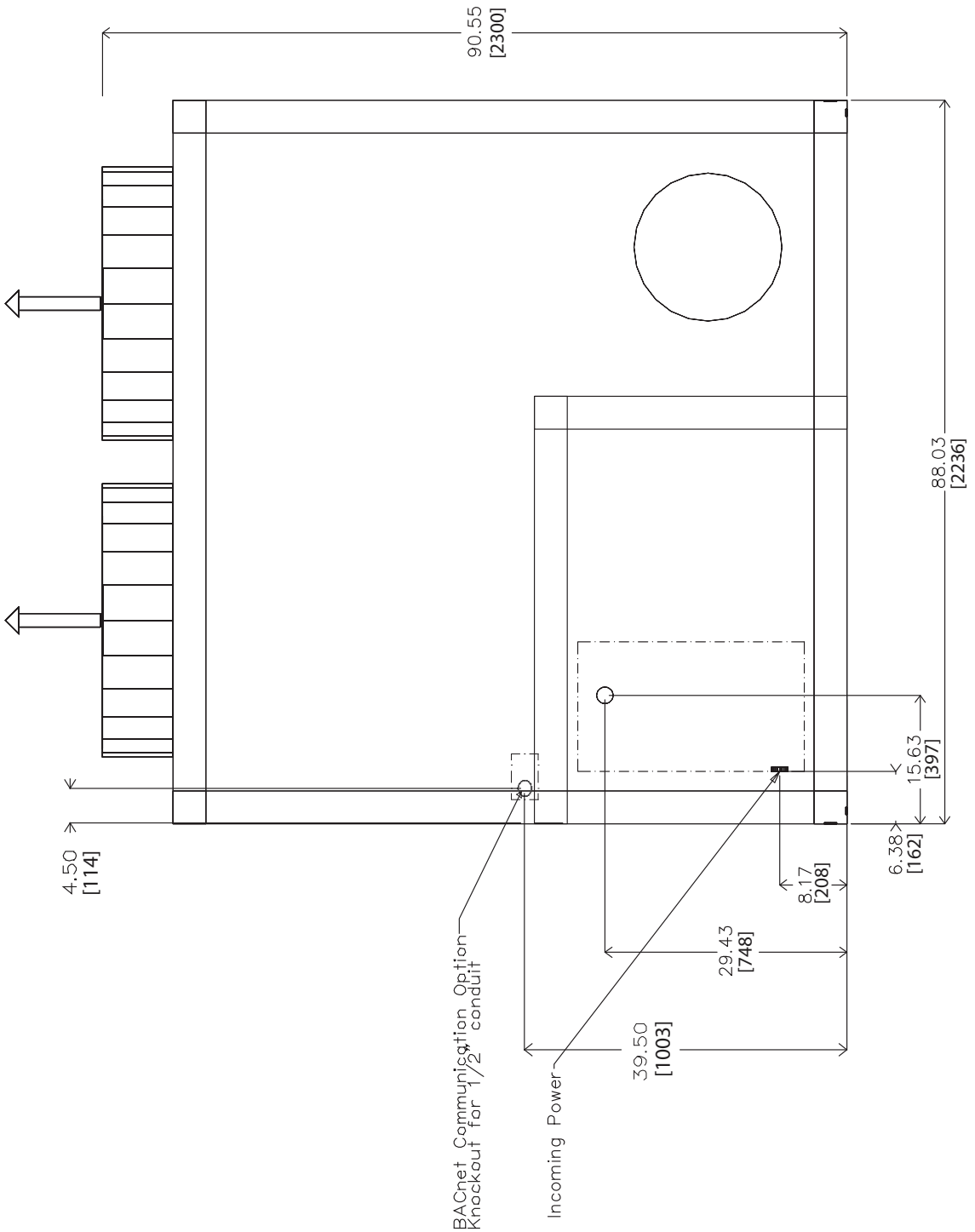
30XA UNIT	A	B
325	42.92 [1090]	246.16 [6252]
350	42.92 [1090]	246.72 [6267]



TOP VIEW

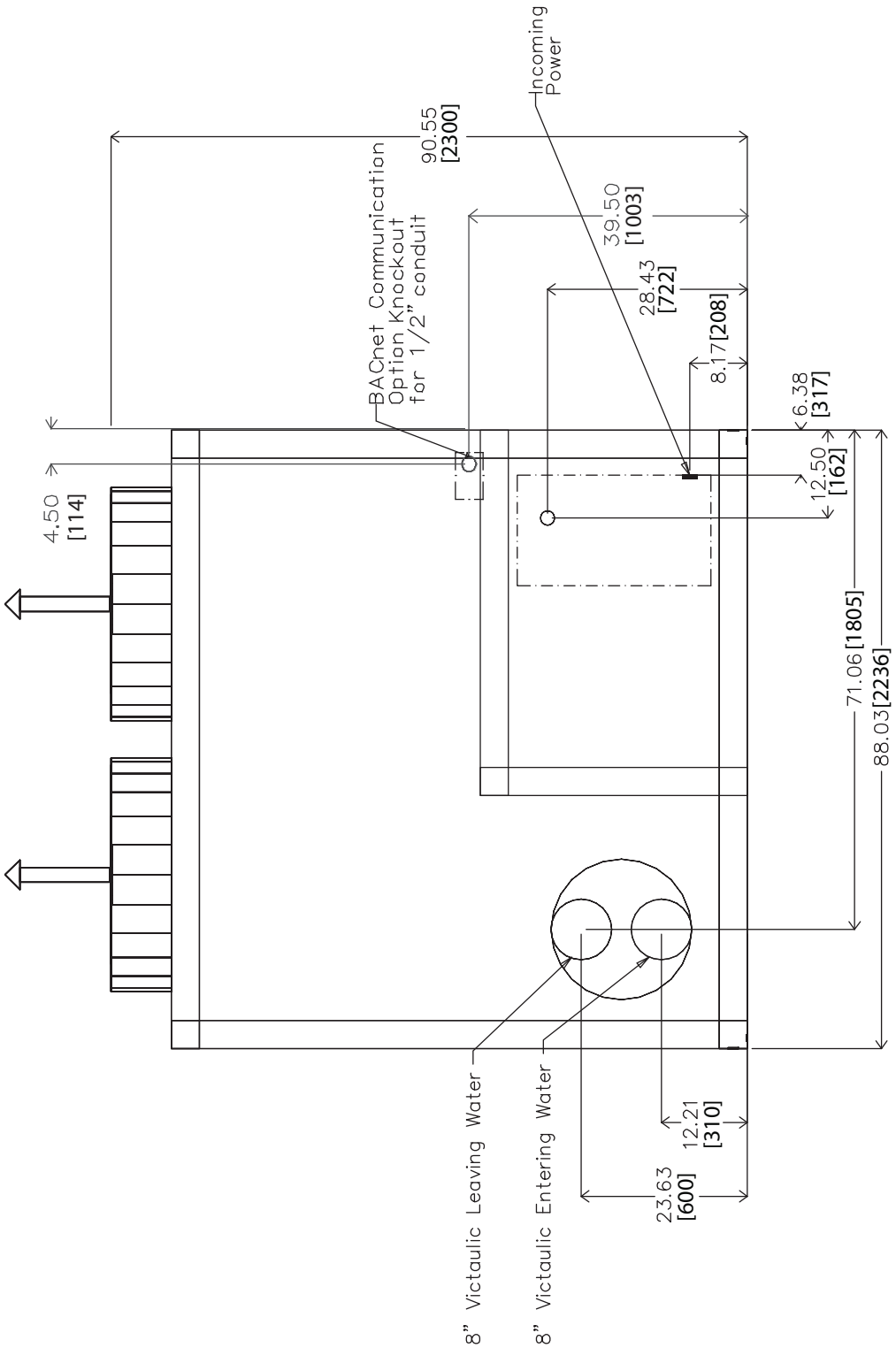
Dimensions (cont)

30XA325,350 (cont)



LEFT END VIEW

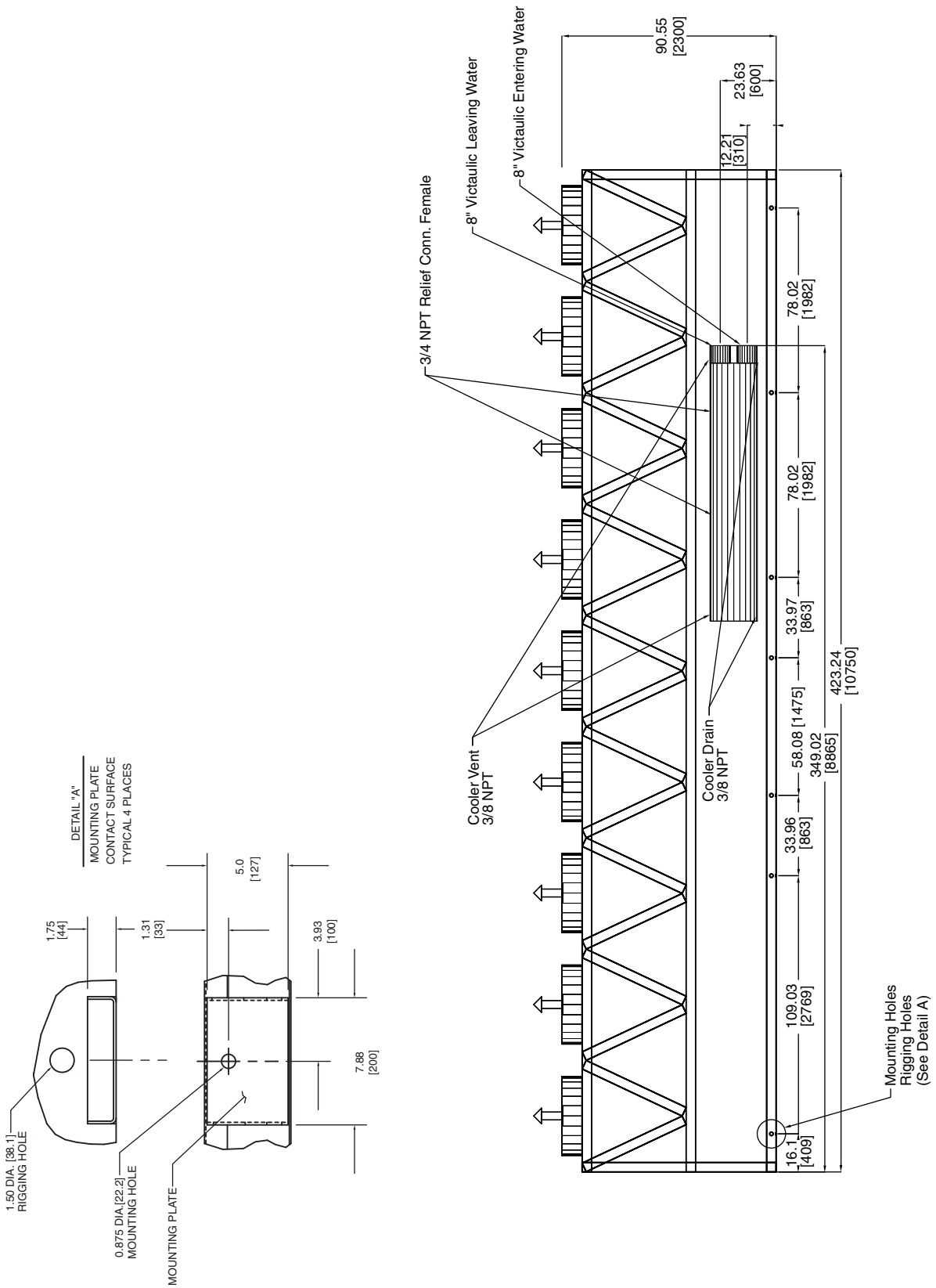
30XA325,350 (cont)



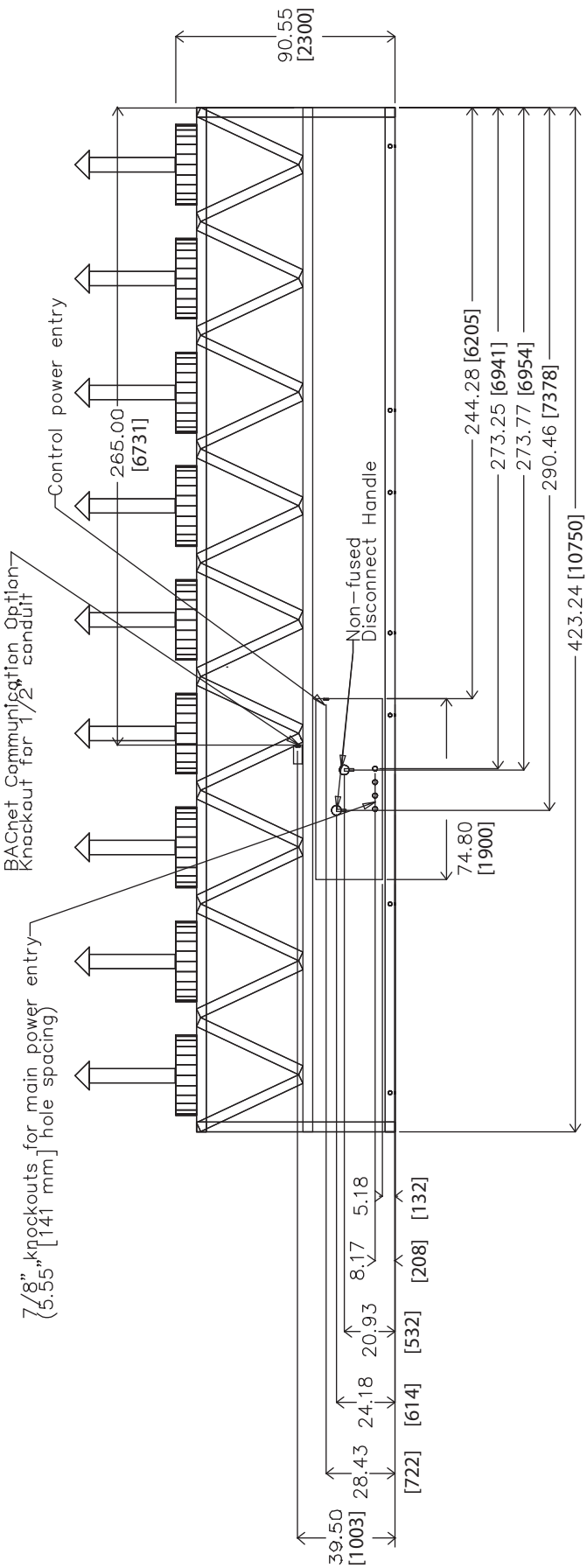
RIGHT END VIEW

Dimensions (cont)

30XA325,350 (cont)



30XA325,350 (cont)

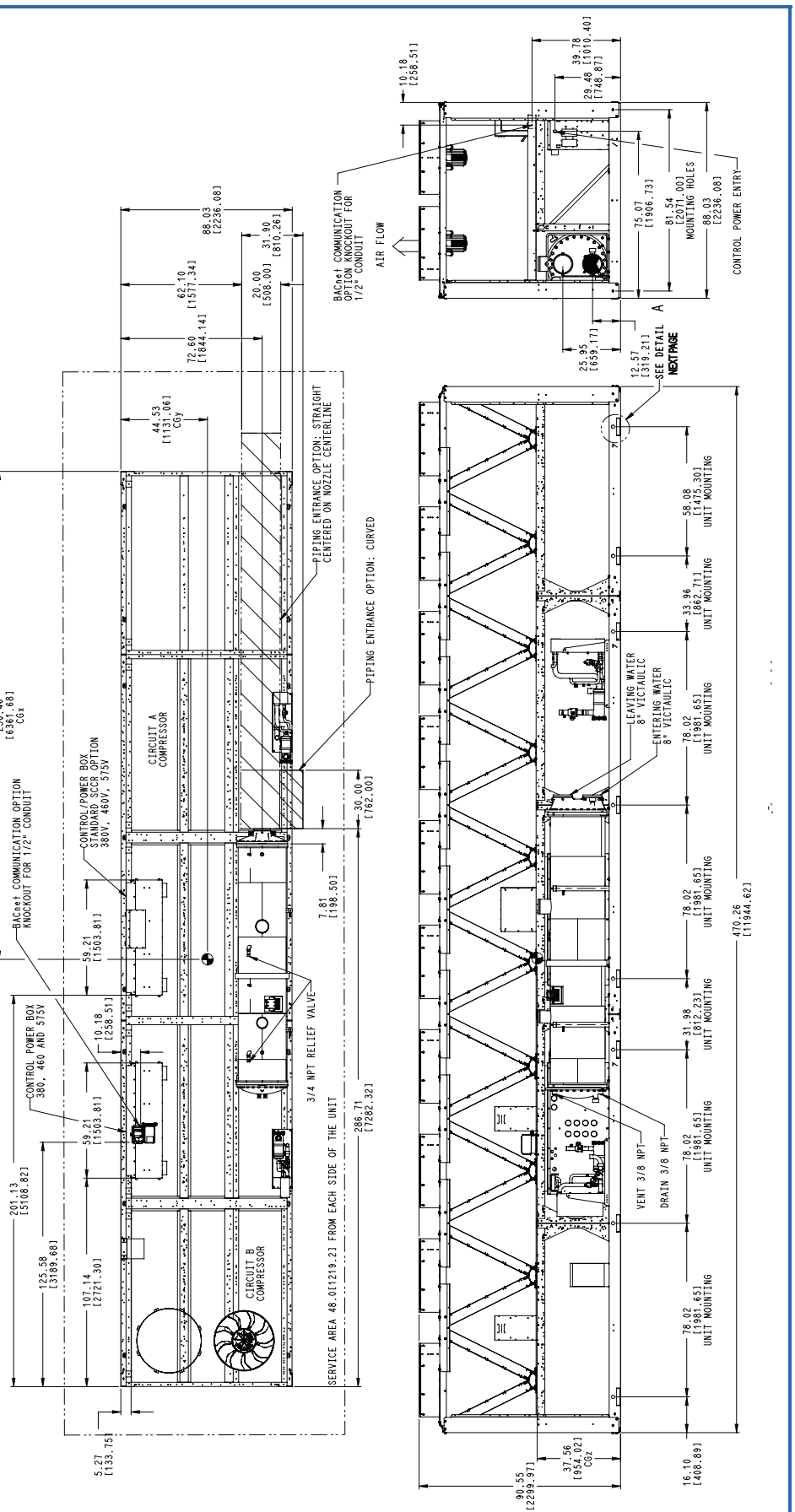


BACK VIEW

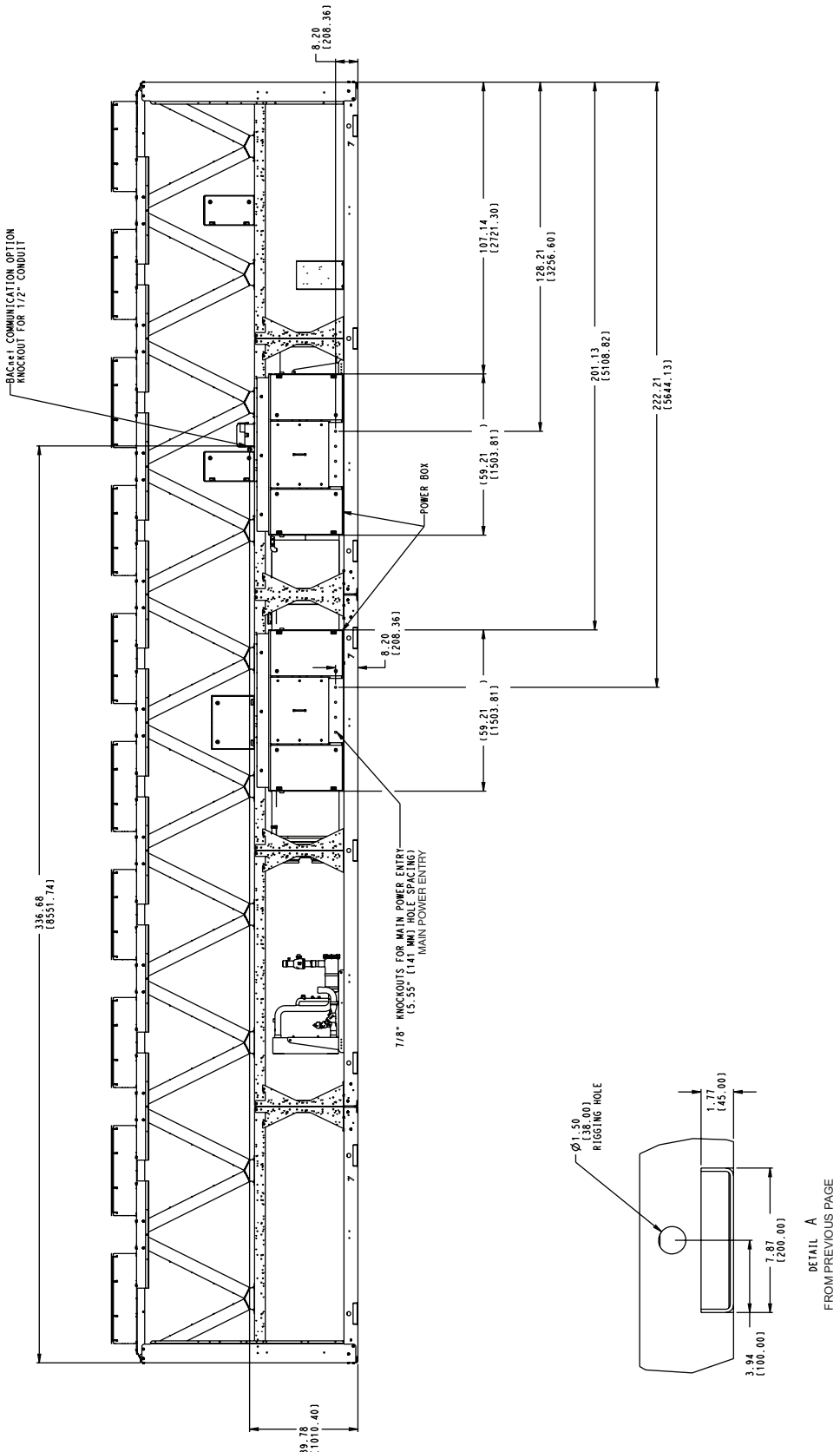
Dimensions (cont)

30XA401

NOTES:
1. Unit must have clearances as follows:
   Top — Do not restrict
   Sides and End — 6 ft (1.8 m) from solid surface for airflow.
   Side — 8 ft (2.4 m) required for coil service area.
2. Temperature relief devices are located on liquid line and economizer assemblies and have 1/4-in. flare connection.
3. Pressure relief devices are located on the cooler (3/4-in. NPT male connector) and on each oil separator (3/8-in. flare connector).
4. 3/8-in. NPT vents and drains are located in each cooler head at each end of cooler.
5. Dimensions are shown in inches. Dimensions in [ ] are in millimeters.

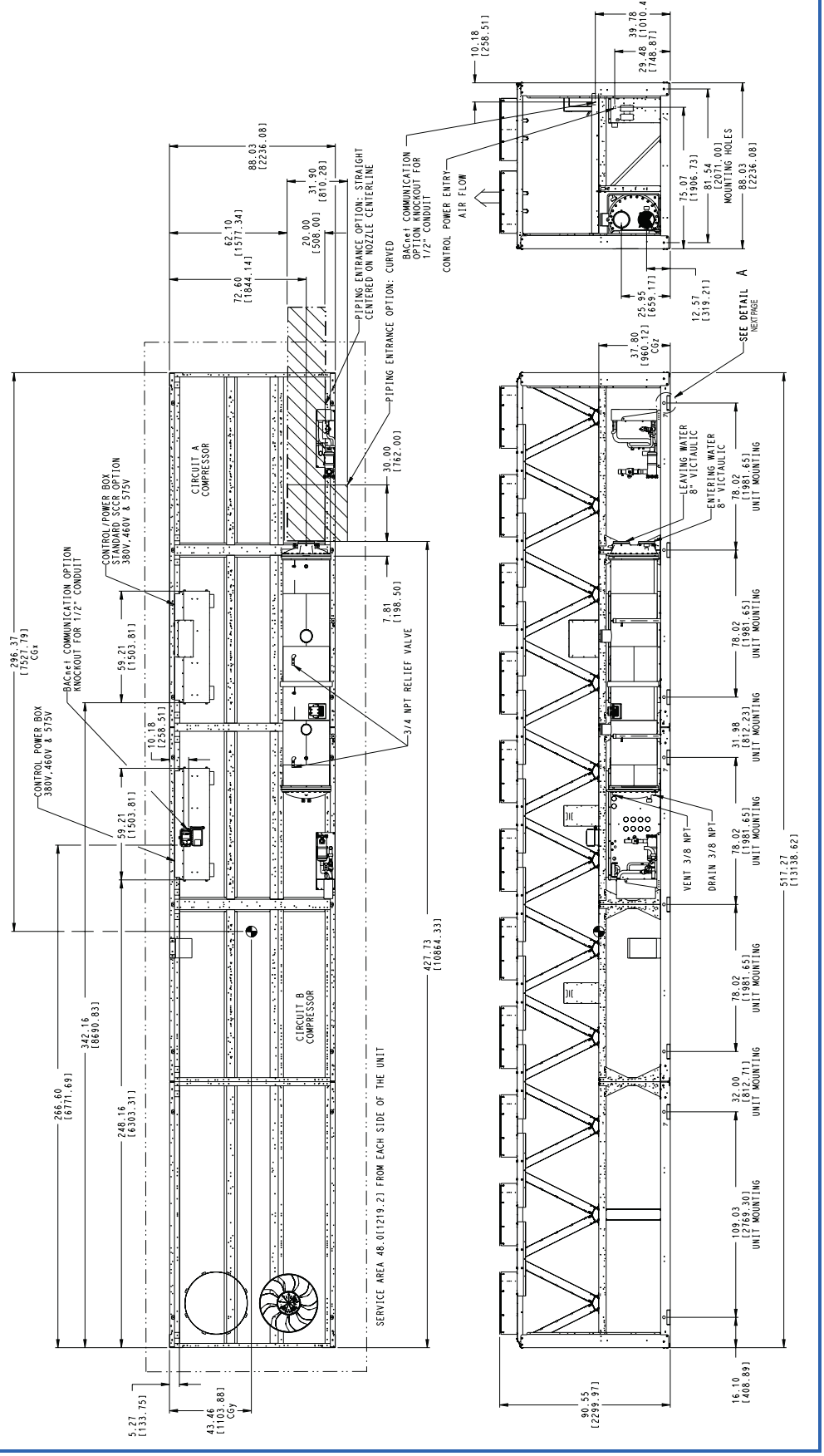


30XA401 (cont)



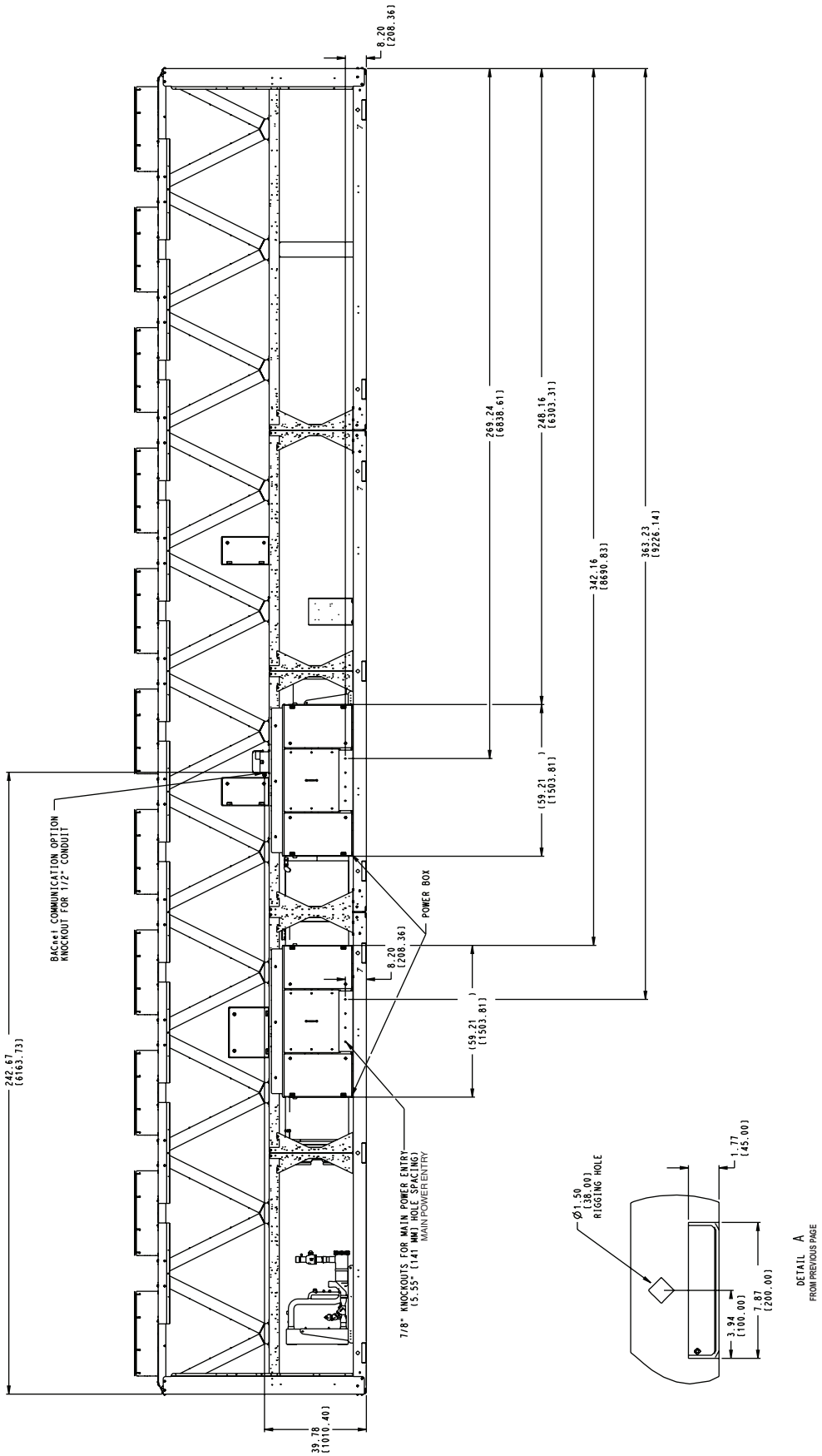
Dimensions (cont)

30XA451



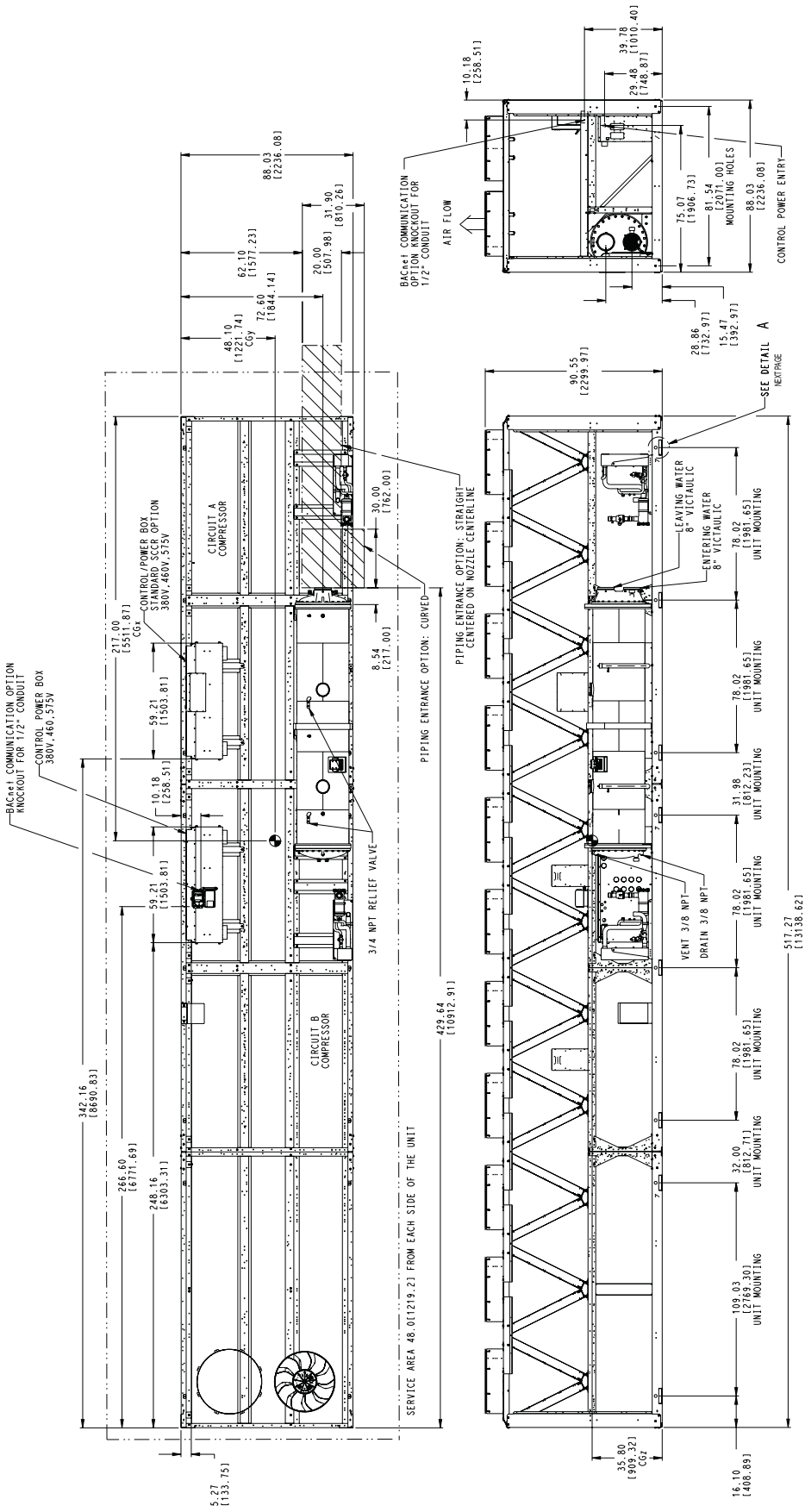
NOTES:
1. Unit must have clearances as follows:
   Top — Do not restrict
   Sides and End — 6 ft (1.8 m) from solid surface for airflow.
   Side — 8 ft (2.4 m) required for coil service area.
2. Temperature relief devices are located on liquid line and economizer assemblies and have $^{1}/_{4}$-in. flare connection.
3. Pressure relief devices are located on the cooler ($^{3}/_{4}$-in. NPT male connector) and on each oil separator ($^{3}/_{8}$-in. flare connector).
4. $^{3}/_{8}$-in. NPT vents and drains are located in each cooler head at each end of cooler.
5. Dimensions are shown in inches. Dimensions in [ ] are in millimeters.

30XA451 (cont)



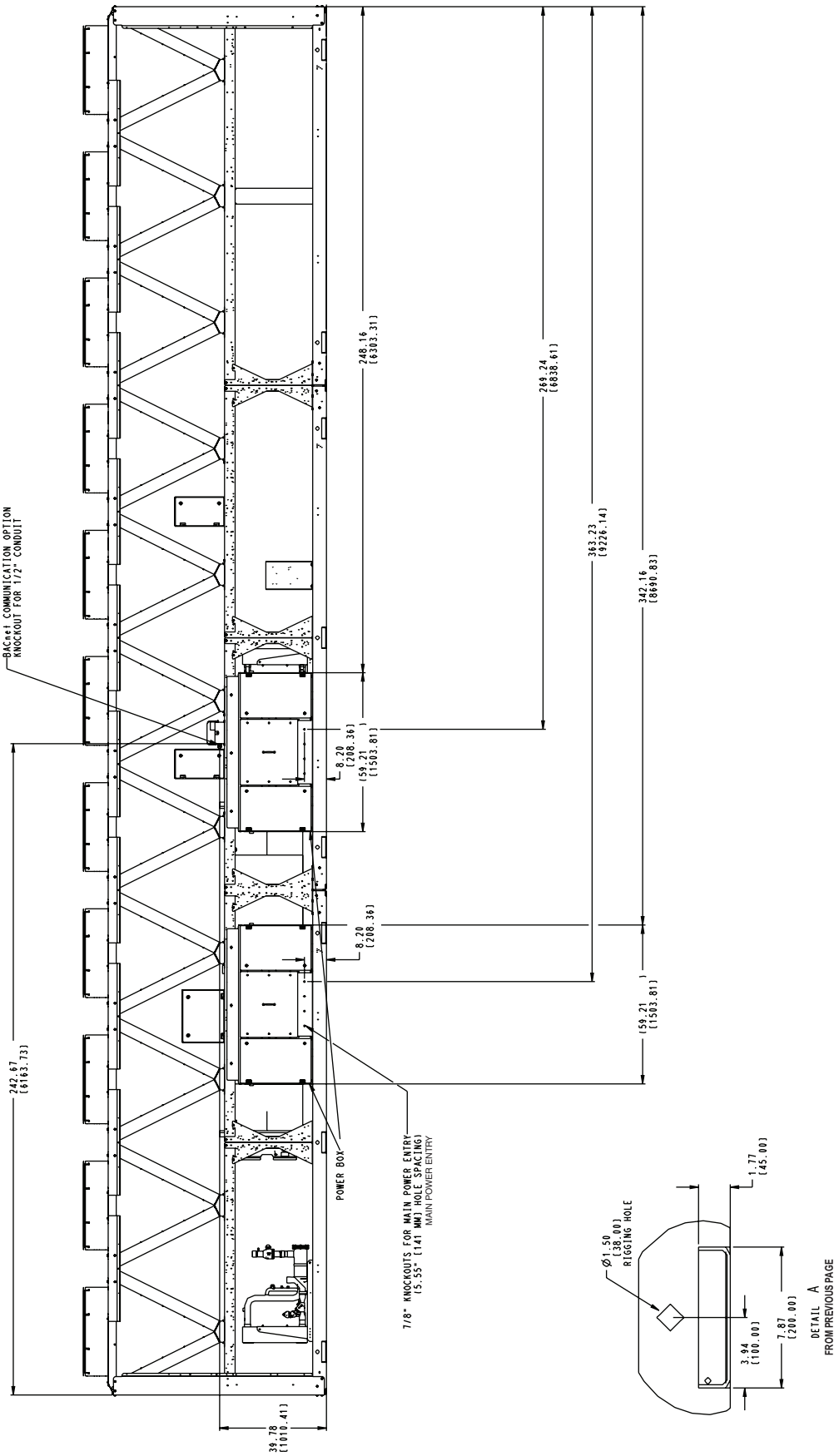
Dimensions (cont)

30XA476



NOTES:
1. Unit must have clearances as follows:
   Top — Do not restrict
   Sides and End — 6 ft (1.8 m) from solid surface for airflow.
   Side — 8 ft (2.4 m) required for coil service area.
2. Temperature relief devices are located on liquid line and economizer assemblies and have 1/4-in. flare connection.
3. Pressure relief devices are located on the cooler (3/4-in. NPT male connector) and on each oil separator (3/8-in. flare connector).
4. 3/8-in. NPT vents and drains are located in each cooler head at each end of cooler.
5. Dimensions are shown in inches. Dimensions in [ ] are in millimeters.

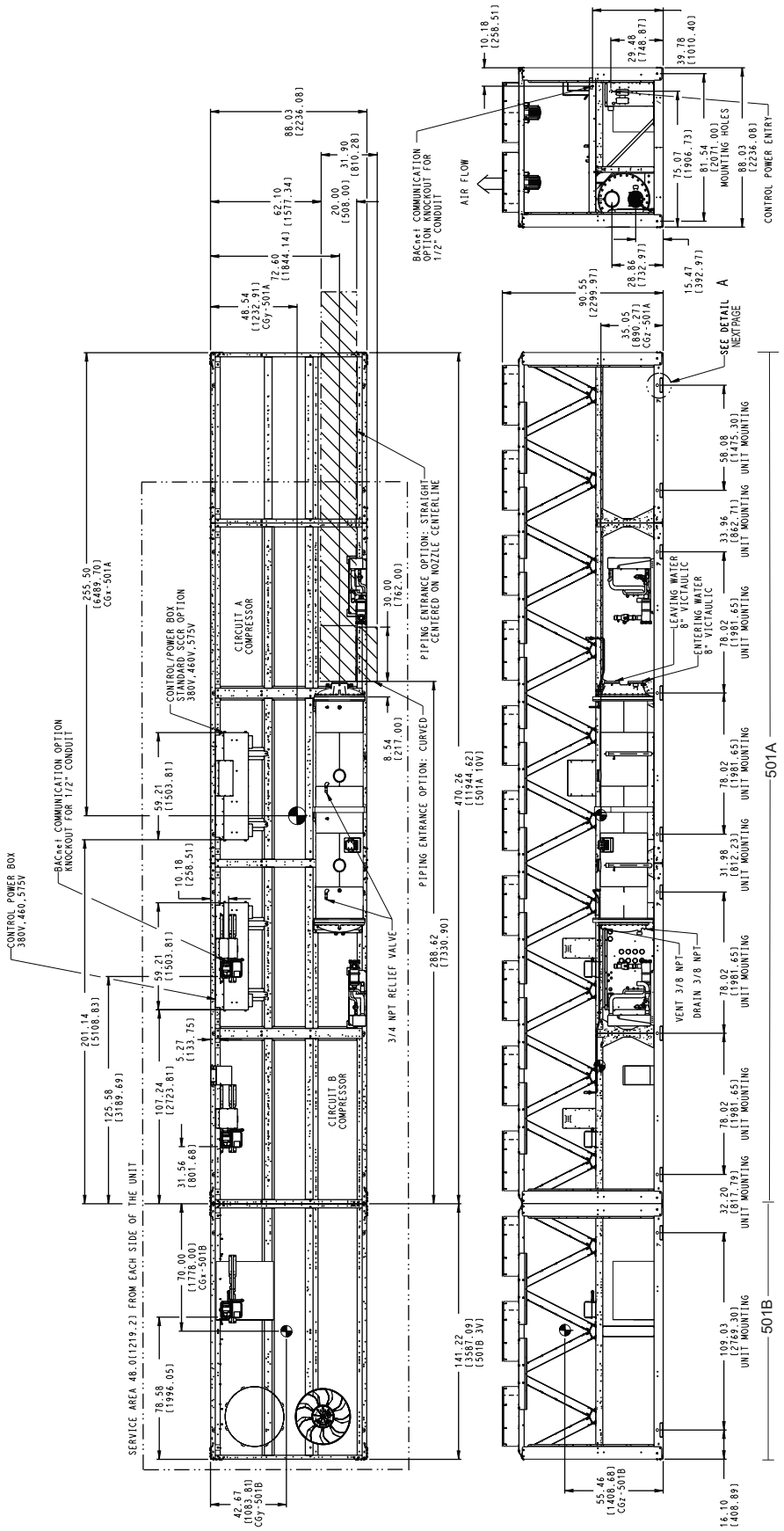
30XA476 (cont)



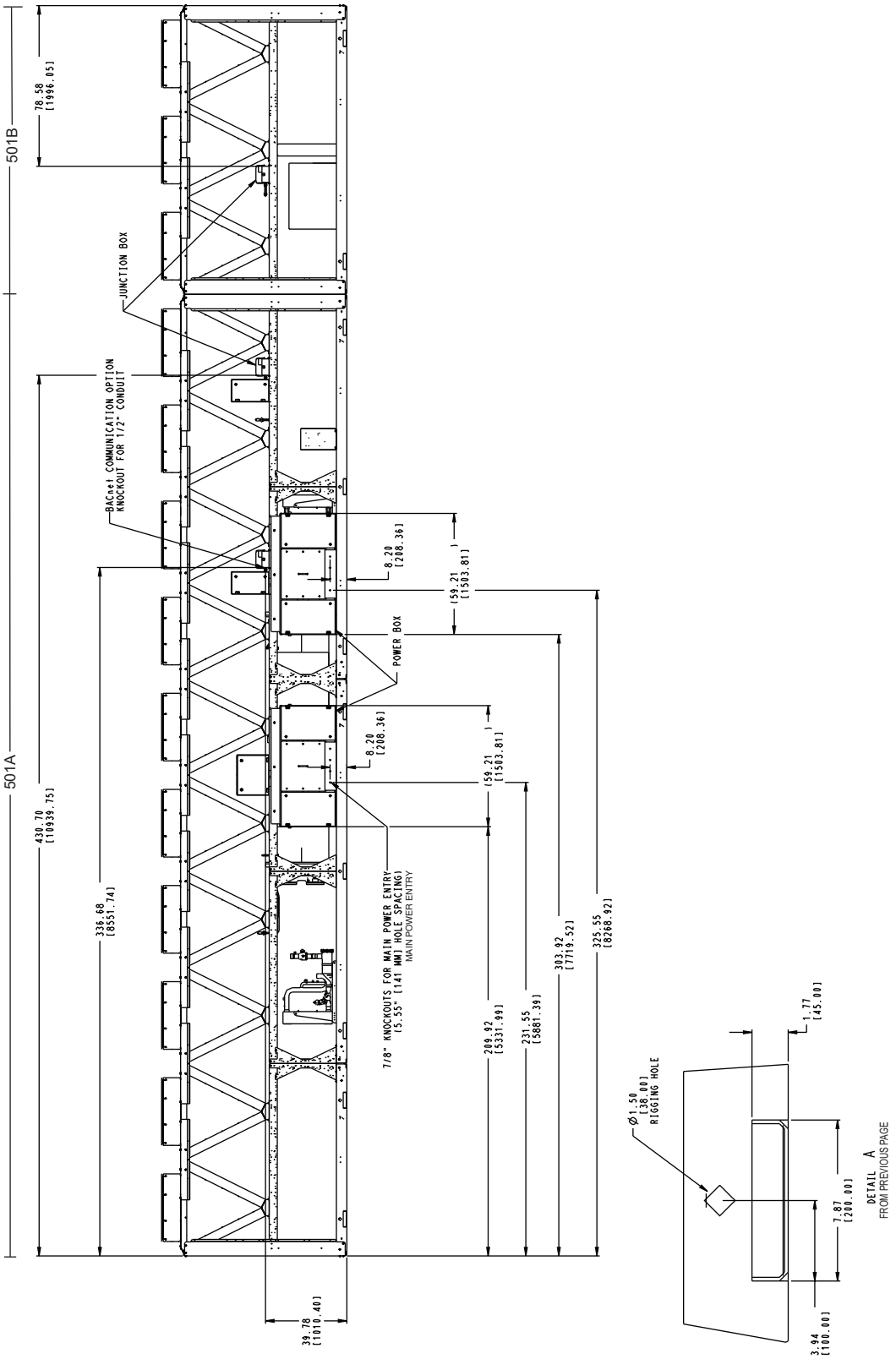
Dimensions (cont)

30XA501 (501A AND 501B MODULES)

NOTES:
1. Unit must have clearances as follows:
   Top — Do not restrict
   Sides and End — 6 ft (1.8 m) from solid surface for airflow.
   Side — 8 ft (2.4 m) required for coil service area.
2. Temperature relief devices are located on liquid line and economizer assemblies and have 1/4-in. flare connection.
3. Pressure relief devices are located on the cooler (3/4-in. NPT male connector) and on each oil separator (3/8-in. flare connector).
4. 3/8-in. NPT vents and drains are located in each cooler head at each end of cooler.
5. 501A and 501B modules to be shipped separately.
6. Dimensions are shown in inches. Dimensions in [ ] are in millimeters.



30XA501 (501A AND 501B MODULES) (cont)



Selection procedure

Carrier's Packaged Chiller Builder Selection Program provides quick, easy selection of Carrier's air-cooled liquid chillers. The program considers specific temperature, fluid and flow requirements among other factors such as fouling and altitude corrections.

Before selecting a chiller, consider the following points:

Leaving water (fluid) temperature (LWT)

- If the LWT is less than 40°F (4.4°C), loop freeze protection to a minimum of 15°F (8.3°C) below the LWT set point is required. When the leaving fluid temperature is less than 30°F (–1.1°C), suction line insulation and low ambient head pressure control are required. In the flooded cooler case, a plus-one-pass cooler is also required. Consider the DX cooler option for these conditions.
- If the LWT requirement is greater than 60°F (15.5°C), a mixing loop is required.

Entering water temperature (EWT)

- If the EWT requirement is greater than 70°F (21.1°C), a mixing loop is required. The EWT should not exceed 70°F (21.1°C) for extended operation. Pulldown can be accomplished from 95°F (35°C).

Cooler flow rate or cooler delta-T:

- The cooler delta-T (EWT – LWT) must fall between 3 and 20°F (1.7 and 11.1°C) while still meeting both the fluid minimum/maximum temperature requirements as well as the fluid minimum/maximum flow requirements.
- For larger or smaller delta-T applications, a mixing loop is required.
- If the cooler flow is variable, the rate of change of flow should not exceed 10% per minute. A loop volume of greater than 3 gallons per ton (3.2 l/kW) is also recommended.

Cooler pressure drop:

- A high cooler pressure drop can be expected when the cooler delta-T is low. A mixing loop can help to alleviate this situation.
- Alternatively, consider a reduced pass option on flooded coolers when there is a low delta-T.
- A low cooler pressure drop can be expected when cooler delta-T is high.
- The plus-one-pass cooler option is recommended on flooded coolers to increase performance when cooler delta-T is high. This is particularly helpful with brine applications.

Water quality, fouling factor:

- Poor water quality can increase the required cooler fouling factor.
- Higher than standard fouling factors lead to lower capacity and higher input kW from a given chiller size compared to running the same application with better quality water (and lower fouling factors).

Operation below 32°F (0°C) ambient temperature:

- Low ambient temperature head pressure control is required.
- Wind baffles are required.
- Consider higher loop volumes, 6 to 10 gallons per nominal ton (6.5 to 10.8 l/kW).
- Loop freeze protection with glycol is strongly recommended to a minimum of 15°F (8.3°C) below lowest anticipated ambient temperature.
- Chilled water pump control is strongly recommended; otherwise override capability is required.

Chiller idle below 32°F (0°C) ambient temperature:

- Loop freeze protection with glycol is strongly recommended to a minimum of 15°F (8.3°C) below lowest anticipated ambient temperature.
- Chilled water pump control is strongly recommended; otherwise override capability is required.
- Drain the cooler — This will require a small amount of glycol for residual water. If cooler heaters are installed, the heaters will need to be disconnected.
- Consider using a remote cooler. Do not bury refrigerant piping.

Ambient temperature:

- Highest allowable ambient air temperature is 125.6°F (52°C) for all unit sizes other than 401-501 units. Highest allowable ambient air temperature is 131°F (55°C) for 401-501 units.

NOTE: The high ambient option is standard for 30XA401-501 units, and it is required for 30XA401-501 chillers that are either operating in multi-chiller configurations or have ambient temperatures at or above 100°F (37.8°C). Regardless of unit size, it may be necessary to select the high ambient option to obtain performance with ambient air temperatures approaching 125.6°F (52°C).

Cooling capacity requirement:

- Do not oversize the chillers by more than 15% at design conditions.
- If capacity control is required below the standard minimum step of unloading, the minimum load control option should be employed. (See selection program.)

Coil corrosion requirements:

- Coastal application
- Industrial application
- Coastal/industrial application
- Urban application
- Farming

NOTE: See NACO (North American Commercial Operations) Packaged Chiller Builder and appropriate selection guides for more information.

Temperature reset:

- Return water (standard)
- Outside air temperature (standard)
- Space temperature (accessory sensor required)
- 4 to 20 mA (requires an energy management module)

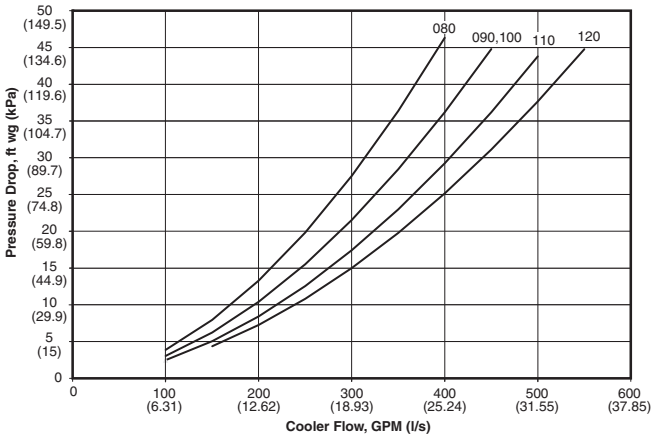
Demand limit:

- 2-step (requires an energy management module)
- 4 to 20 mA (requires an energy management module)
- CCN Loadshed

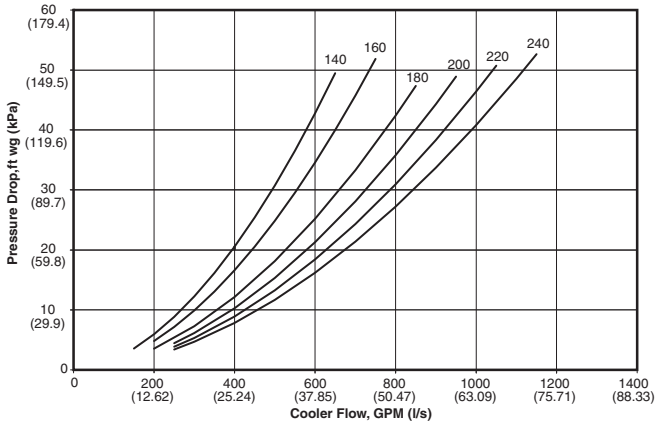
Performance data

COOLER PRESSURE DROP CURVES

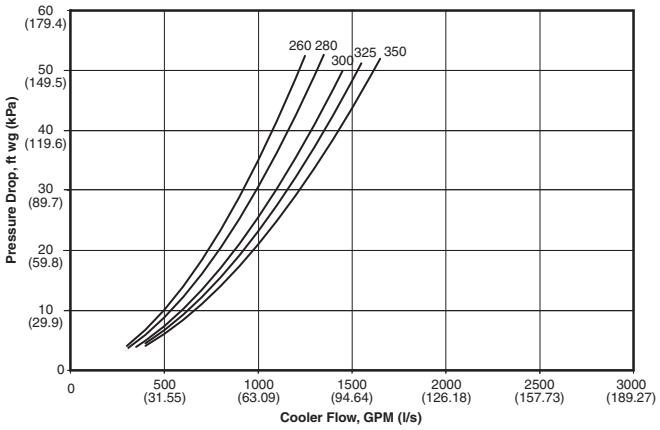
30XA080, 090, 100, 110, 120



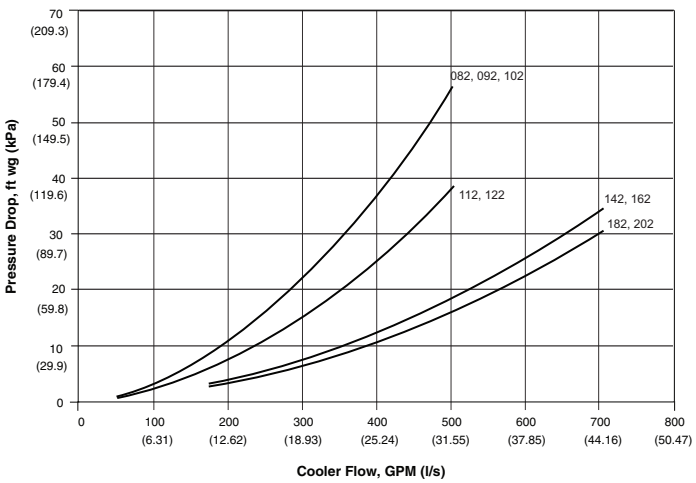
30XA140, 160, 180, 200, 220, 240



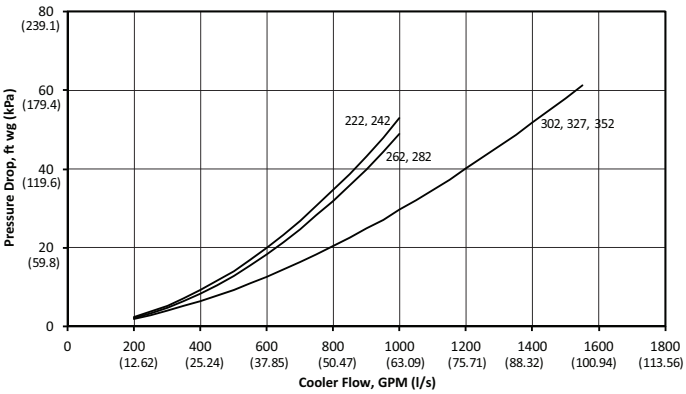
30XA260, 280, 300, 325, 350



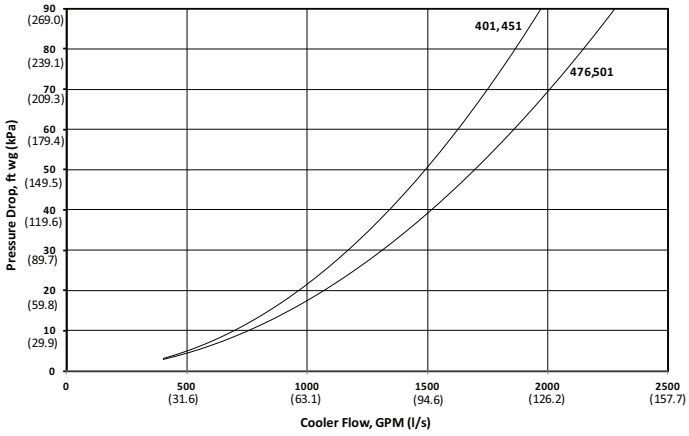
30XA082, 092, 102, 112, 122, 142, 162, 182, 202 (DX Cooler)



30XA222, 242, 262, 282, 302, 327, 352 (DX Cooler)

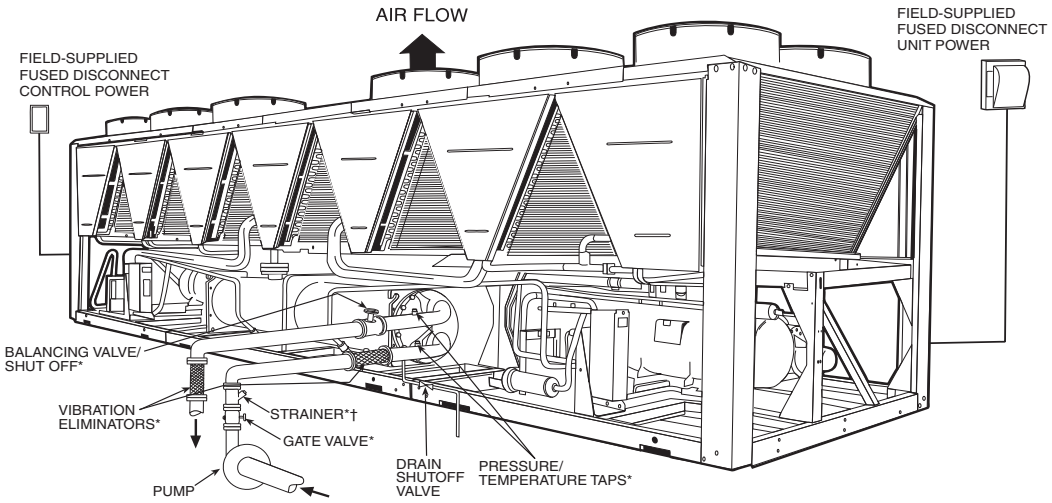


30XA401-501A



Typical piping and wiring (flooded cooler)

30XA UNITS



HEAT TAPE AND INSULATION ARE RECOMMENDED ON ALL EXPOSED PIPING IF AMBIENT TEMPERATURE <32°F (0°C) AND NO ANTIFREEZE SOLUTION IS IN SYSTEM

LEGEND

- Airflow Through Condenser
- Power Wiring
- Chilled Water Piping

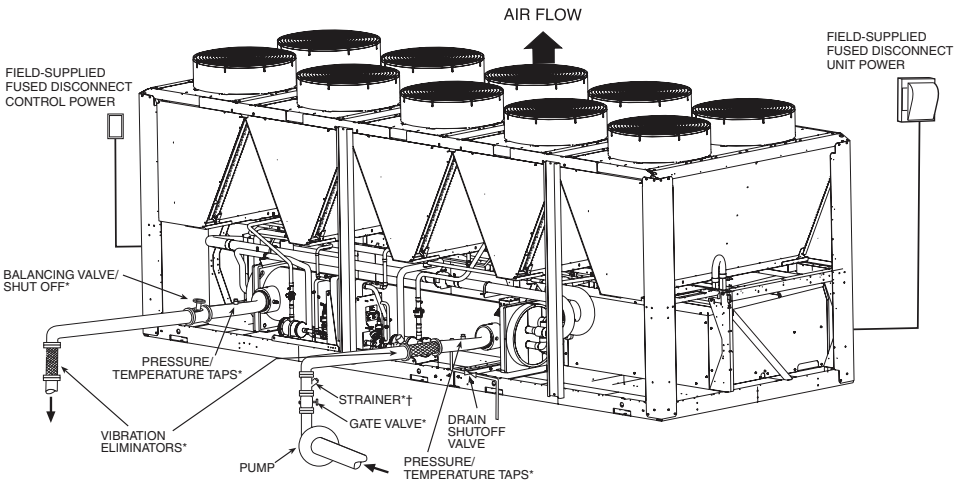
*Field-installed.
†See note 5.

NOTES:

1. Chiller must be installed level to maintain proper compressor oil return.
2. 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, Refrigerating, and Air-Conditioning Engineers) handbook for details.
5. A 20-mesh strainer must be field-supplied and installed within 10 feet (3 meters) of the cooler inlet.

Typical piping and wiring (DX cooler)

30XA UNITS



HEAT TAPE AND INSULATION ARE RECOMMENDED ON ALL EXPOSED PIPING IF AMBIENT TEMPERATURE <32°F (0°C) AND NO ANTIFREEZE SOLUTION IS IN SYSTEM

LEGEND

- Airflow Through Condenser
- Power Wiring
- Chilled Water Piping

*Field-installed.
†See note 5.

NOTES:
1. Chiller must be installed level to maintain proper compressor oil return.
2. 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, Refrigerating, and Air-Conditioning Engineers) handbook for details.
5. A 20-mesh strainer must be field-supplied and installed within 10 feet (3 meters) of the cooler inlet.

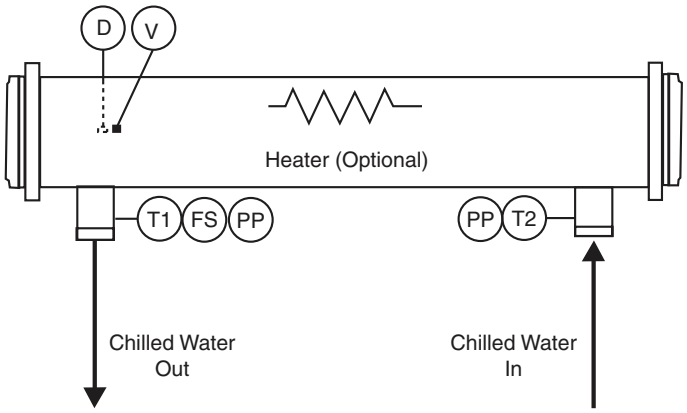
Typical piping and wiring (cont)

TYPICAL PIPING DIAGRAM ON 30XA FLOODED COOLER UNITS

LEGEND

D — Drain, $^{3}/_{4}$-in. NPT
FS — Flow Switch
PP — Pipe Plug, $^{1}/_{4}$-in. NPT
T1 — Leaving Water Thermistor
T2 — Entering Water Thermistor
V — Vent, $^{1}/_{4}$-in. NPT

TYPICAL PIPING DIAGRAM ON 30XA DX COOLER OPTION UNITS



LEGEND

D — Drain, $^{3}/_{4}$-in. NPT
FS — Flow Switch
PP — Pipe Plug, $^{1}/_{4}$-in. NPT
T1 — Leaving Water Thermistor
T2 — Entering Water Thermistor
V — Vent, $^{1}/_{4}$-in. NPT

Electrical data

STANDARD CONDENSER FAN MOTORS

UNIT 30XA	UNIT VOLTAGE			NUMBER OF COND FANS	MCA	MOCP	ICF		Rec Fuse Size	CONTROL CIRCUIT	
	V-Hz (3 Ph)	Supplied					WD	XL		Voltage 1 PH, 60 Hz	MCA and MOCP
		Min	Max								
080, 082	460-60	414	506	6	157.7	200	242.1	585.1	175	115	40
	380-60	342	418	6	183.5	250	289.7	704.7	225	115	40
090, 092	460-60	414	506	8	167.0	225	249.6	592.6	200	115	40
	380-60	342	418	8	194.5	250	298.6	713.6	225	115	40
100, 102	460-60	414	506	8	182.3	250	268.4	639.4	200	115	40
	380-60	342	418	8	212.7	250	321.7	770.7	250	115	40
110, 112	460-60	414	506	8	202.4	250	268.4	639.4	225	115	40
	380-60	342	418	8	236.4	300	321.7	770.7	300	115	40
120, 122	460-60	414	506	8	218.4	300	284.4	655.4	250	115	40
	380-60	342	418	8	255.3	350	340.6	789.6	300	115	40
140, 142	460-60	414	506	10	267.3	400	398.4	1030.4	350	115	40
	380-60	342	418	10	311.2	450	478.9	1243.9	350	115	40
160, 162	460-60	414	506	10	309.7	450	498.4	1306.4	350	115	40
	380-60	342	418	10	361.1	500	598.9	1577.9	450	115	40
180, 182	460-60	414	506	12	336.6	450	467.6	1099.6	400	115	60
	380-60	342	418	12	391.5	500	559.2	1324.2	450	115	60
200, 202	460-60	414	506	12	383.9	500	572.6	1380.6	450	115	60
	380-60	342	418	12	447.2	600	685.0	1664.0	500	115	60
220, 222	460-60	414	506	13	424.7	600	575.6	1383.6	500	115	60
	380-60	342	418	13	494.5	700	688.6	1667.6	600	115	60
240, 242	460-60	414	506	13	455.0	600	605.9	1413.9	600	115	60
	380-60	342	418	13	529.5	700	723.5	1702.5	600	115	60
260, 262	460-60	414	506	15	516.5	700	777.6	1999.6	600	115	60
	380-60	342	418	15	600.2	800	933.9	2412.9	700	115	60
280, 282	460-60	414	506	16	549.7	800	810.9	2032.9	700	115	60
	380-60	342	418	16	638.7	800	972.4	2451.4	800	115	60
300, 302	460-60	414	506	16	610.9	800	810.9	2032.9	700	115	60
	380-60	342	418	16	710.3	1000	972.4	2451.4	800	115	60
325, 327	460-60	414	506	18	624.3	800	885.5	2107.5	700	115	60
	380-60	342	418	18	724.7	1000	1058.4	2537.4	800	115	60
350, 352	460-60	414	506	18	685.5	800	885.5	2107.5	800	115	60
	380-60	342	418	18	796.3	1000	1058.4	2537.4	1000	115	60

LEGEND

ICF — Instantaneous Current Flow
MCA — Minimum Circuit Amps
MOCP — Maximum Overcurrent Protection
WD — Wye-Delta
XL — Across-the-Line

NOTES:

1. Units are suitable for use on electrical systems where voltage supplied to the unit terminals is not below or above the listed minimum and maximum limits. Maximum allowable phase imbalance is: voltage, 2%; amps 10%.
2. Cooler heater (where applicable) is wired into the control circuit so it is always operable as long as the control power supply disconnect is on, even if any safety device is open.
3. For MCA that is less than or equal to 380 amps, 3 conductors are required.
   For MCA between 381-760 amps, 6 conductors are required.
   For MCA between 761-1140 amps, 9 conductors are required.
   For MCA between 1141-1520 amps, 12 conductors are required.
   Calculation of conductors required is based on 75 C copper wire.
4. Wiring for main field supply must be rated 75 C minimum. Use copper for all units.
   a. Incoming wire size range for the terminal block is no. 4 AWG (American Wire Gage) to 500 kcmil.
   b. Incoming wire size range of non-fused disconnect with MCA up to 599.9 amps is 3/0 to 500 kcmil.
   c. Incoming wire size range of non-fused disconnect with MCA from 600 to 799.9 amps is 1/0 to 500 kcmil.
   d. Incoming wire size range of non-fused disconnect with MCA from 800 to 1199.9 amps is 250 kcmil to 500 kcmil.
5. Standard condenser fan motors are not used with sizes 30XA401-501. These sizes use high ambient temperature condenser fans.

Electrical data (cont)

HIGH AMBIENT OPTION

UNIT 30XA	UNIT VOLTAGE			NUMBER OF COND FANS	MCA	MOCP	ICF		Rec Fuse Size	CONTROL CIRCUIT	
	V-Hz (3 Ph)	Supplied					WD	XL		Voltage 1 PH, 60 Hz	MCA and MOCP
		Min	Max								
140, 142	460-60	414	506	10	281.0	400	419.5	1051.5	350	115	40
	380-60	342	418	10	328.3	450	504.6	1269.6	400	115	40
160, 162	460-60	414	506	10	320.5	450	518.0	1326.0	400	115	40
	380-60	342	418	10	374.9	500	622.8	1601.8	450	115	40
180, 182	460-60	414	506	12	351.9	450	490.4	1122.4	400	115	60
	380-60	342	418	12	410.8	500	587.2	1352.2	450	115	60
200, 202	460-60	414	506	12	396.9	500	594.4	1402.4	450	115	60
	380-60	342	418	12	463.8	600	711.7	1690.7	600	115	60
220, 222	460-60	414	506	13	438.0	600	599.8	1407.8	500	115	60
	380-60	342	418	13	511.5	700	718.3	1697.3	600	115	60
240, 242	460-60	414	506	13	466.5	600	628.3	1436.3	600	115	60
	380-60	342	418	13	544.4	700	751.2	1730.2	600	115	60
260, 262	460-60	414	506	15	529.1	700	806.6	2028.6	600	115	60
	380-60	342	418	15	616.7	800	969.3	2448.3	700	115	60
280, 282	460-60	414	506	16	563.0	800	840.5	2062.5	700	115	60
	380-60	342	418	16	656.2	800	1008.8	2487.8	800	115	60
300, 302	460-60	414	506	16	619.6	800	840.5	2062.5	700	115	60
	380-60	342	418	16	722.3	1000	1008.8	2487.8	1000	115	60
325, 327	460-60	414	506	18	638.1	800	915.6	2137.6	700	115	60
	380-60	342	418	18	743.0	1000	1095.6	2574.6	1000	115	60
350, 352	460-60	414	506	18	694.6	800	915.6	2137.6	800	115	60
	380-60	342	418	18	809.1	1000	1095.6	2574.6	1000	115	60
401	460-60	414	506	20	853.6	1200	1018.6	2299.6	1000	115	60
	380-60	342	418	20	1017.7	1200	1219.6	2773.6	1200	115	60
451	460-60	414	506	22	864.4	1200	1029.4	2310.4	1000	115	60
	380-60	342	418	22	1030.8	1200	1232.7	2786.7	1200	115	60
476	460-60	414	506	22	861.5	1200	1055.4	2336.4	1000	115	60
	380-60	342	418	22	1046.2	1200	1280.1	2834.1	1200	115	60
501	460-60	414	506	26	912.9	1200	1077.9	2358.9	1200	115	60
	380-60	342	418	26	—	—	—	—	—	115	60

LEGEND

ICF — Instantaneous Current Flow
MCA — Minimum Circuit Amps
MOCP — Maximum Overcurrent Protection
WD — Wye-Delta
XL — Across-the-Line

NOTES:

1. Units are suitable for use on electrical systems where voltage supplied to the unit terminals is not below or above the listed minimum and maximum limits. Maximum allowable phase imbalance is: voltage, 2%; amps 10%.
2. Cooler heater (where applicable) is wired into the control circuit so it is always operable as long as the control power supply disconnect is on, even if any safety device is open.
3. For MCA that is less than or equal to 380 amps, 3 conductors are required.
   For MCA between 381-760 amps, 6 conductors are required.
   For MCA between 761-1140 amps, 9 conductors are required.
   For MCA between 1141-1520 amps, 12 conductors are required.
   Calculation of conductors required is based on 75 C copper wire.
4. Wiring for main field supply must be rated 75 C minimum. Use copper for all units.
   a. Incoming wire size range for the terminal block is no. 4 AWG (American Wire Gage) to 500 kcmil.
   b. Incoming wire size range of non-fused disconnect with MCA up to 599.9 amps is 3/0 to 500 kcmil.
   c. Incoming wire size range of non-fused disconnect with MCA from 600 to 799.9 amps is 1/0 to 500 kcmil.
   d. Incoming wire size range of non-fused disconnect with MCA from 800 to 1199.9 amps is 250 kcmil to 500 kcmil.
5. High ambient fan motors are not available on unit sizes 30XA080-122.

COMPRESSOR AND FAN ELECTRICAL DATA

30XA UNIT SIZE	UNIT VOLTAGE V-Hz (3 Ph, 60 Hz)	NUMBER OF COND FANS*	CONDENSER FANS FLA		COMPRESSOR							
					A				B			
					LRA (All Units)		RLA		LRA (All Units)		RLA	
			High Ambient Temp Cond. Fans (1140 rpm)	Standard Cond. Fans (850 rpm)	XL	WD	High Ambient Temp Cond. Fans (1140 rpm)	Standard Cond. Fans (850 rpm)	XL	WD	High Ambient Temp Cond. Fans (1140 rpm)	Standard Cond. Fans (850 rpm)
080, 082	380	3/3	—	3.6	611	196	—	71.9	611	196	—	71.9
	460	3/3	—	3.0	505	162	—	62.1	505	162	—	62.1
090, 092	380	4/4	—	3.6	611	196	—	73.5	611	196	—	73.5
	460	4/4	—	3.0	505	162	—	63.6	505	162	—	63.6
100, 102	380	4/4	—	3.6	660	211	—	81.6	660	211	—	81.6
	460	4/4	—	3.0	545	174	—	70.4	545	174	—	70.4
110, 112	380	4/4	—	3.6	660	211	—	100.6	660	211	—	81.6
	460	4/4	—	3.0	545	174	—	86.4	545	174	—	70.4
120, 122	380	4/4	—	3.6	660	211	—	100.6	660	211	—	100.6
	460	4/4	—	3.0	545	174	—	86.4	545	174	—	86.4
140, 142	380	6/4	6.5	3.6	1126	361	147.7	154.6	660	211	78.3	81.6
	460	6/4	5.4	3.0	930	298	127.6	133.6	545	174	67.5	70.4
160, 162	380	6/4	6.5	3.6	1441	462	171.3	179.4	660	211	95.4	100.6
	460	6/4	5.4	3.0	1190	382	147.6	154.6	545	174	82.0	86.4
180, 182	380	6/6	6.5	3.6	1126	361	147.7	154.6	1126	361	147.7	154.6
	460	6/6	5.4	3.0	930	298	127.6	133.6	930	298	127.6	133.6
200, 202	380	6/6	6.5	3.6	1441	462	171.3	179.4	1441	462	171.3	179.4
	460	6/6	5.4	3.0	1190	382	147.6	154.6	1190	382	147.6	154.6
220, 222	380	7/6	6.5	3.6	1441	462	204.2	214.3	1441	462	171.3	179.4
	460	7/6	5.4	3.0	1190	382	176.1	184.9	1190	382	147.6	154.6
240, 242	380	7/6	6.5	3.6	1441	462	204.2	214.3	1441	462	204.2	214.3
	460	7/6	5.4	3.0	1190	382	176.1	184.9	1190	382	176.1	184.9

LEGEND

FLA — Full Load Amps
LRA — Locked Rotor Amps
RLA — Rated Load Amps
WD — Wye Delta
XL — Across-the-Line

*Quantity of fan motors for incoming power supply Circuit 1/Circuit 2.

Electrical data (cont)

COMPRESSOR AND FAN ELECTRICAL DATA (cont)

30XA UNIT SIZE	UNIT VOLTAGE V-Hz (3 Ph, 60 Hz)	NUMBER OF COND FANS*	CONDENSER FANS FLA		COMPRESSOR							
					A				B			
					LRA (All Units)		RLA		LRA (All Units)		RLA	
			High Ambient Temp Cond. Fans (1140 rpm)	Standard Cond. Fans (850 rpm)	XL	WD	High Ambient Temp Cond. Fans (1140 rpm)	Standard Cond. Fans (850 rpm)	XL	WD	High Ambient Temp Cond. Fans (1140 rpm)	Standard Cond. Fans (850 rpm)
260, 262	380	9/6	6.5	3.6	2179	700	277.9	293.0	1441	462	171.3	179.4
	460	9/6	5.4	3.0	1800	578	240.4	253.5	1190	382	147.6	154.6
280, 282	380	9/7	6.5	3.6	2179	700	277.9	293.0	1441	462	204.2	214.3
	460	9/7	5.4	3.0	1800	578	240.4	253.5	1190	382	176.1	184.9
300, 302	380	10/6	6.5	3.6	2179	700	330.8	350.3	1441	462	204.2	214.3
	460	10/6	5.4	3.0	1800	578	285.6	302.4	1190	382	176.1	184.9
325, 327	380	9/9	6.5	3.6	2179	700	277.9	293.0	2179	700	277.9	293.0
	460	9/9	5.4	3.0	1800	578	240.4	253.5	1800	578	240.4	253.5
350, 352	380	9/9	6.5	3.6	2179	700	330.8	350.3	2179	700	277.9	293.0
	460	9/9	5.4	3.0	1800	578	285.6	302.4	1800	578	240.4	253.5
401	380	11/9	6.5	—	2312	758	449.8	—	2179	700	418.9	—
	460	11/9	5.4	—	1906	625	371.0	—	1800	578	346.3	—
451	380	13/9	6.5	—	2312	758	529.4	—	2179	700	403.9	—
	460	13/9	5.4	—	1906	625	438.2	—	1800	578	346.3	—
476	380	11/11	6.5	—	2312	756	490.8	—	2312	758	449.8	—
	460	11/11	5.4	—	1906	625	404.3	—	1906	625	371.0	—
501	380	14/12	6.5	—	2312	758	535.9	—	2312	758	497.3	—
	460	14/12	5.4	—	1906	625	443.6	—	1906	625	409.7	—

LEGEND

FLA — Full Load Amps
LRA — Locked Rotor Amps
RLA — Rated Load Amps
WD — Wye Delta
XL — Across-the-Line

*Quantity of fan motors for incoming power supply Circuit 1/Circuit 2.

Controls

Microprocessor

The *Comfort*Link microprocessor controls overall unit operation and controls a number of processes simultaneously. These processes include internal timers, reading inputs, analog to digital conversions, fan control, display control, diagnostic control, output relay control, demand limit, capacity control, head pressure control, and temperature reset. Some processes are updated almost continuously, others every 2 to 3 seconds, and some every 30 seconds. The microprocessor routine is started by switching the Emergency ON-OFF switch to ON position. Pump control of external, single pumps (where configured) will energize the cooler pump to the internal (or CCN) time schedule (or input occupied signal from external system). If chiller control of dual, external pumps is required, the external pump control accessory package (part number 00EFN900003200A) must be installed.

When the unit receives a call for cooling (based on a deviation from chilled water set point), the unit stages up in capacity to maintain the cooler fluid set point. The first compressor starts 1 to 3 minutes after the call for cooling. The *Comfort*Link microprocessor controls the capacity of the chiller by varying the number of compressors on and each loading capacity to satisfy actual dynamic load conditions. The control maintains leaving-fluid temperature set point shown on the Navigator™ device through intelligent positioning of the slide valve and compressor cycling. Accuracy depends on loop volume, loop flow rate, load, and outdoor-air temperature. No adjustment for cooling range or cooler flow rate is required, because the control automatically compensates for cooling range by measuring both return-fluid temperature and leaving-fluid temperature. This is referred to as leaving-fluid temperature control with return-fluid temperature compensation.

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

If pulldown control has been selected (adjustable setting), no additional capacity is added as long as the difference between leaving-fluid temperature and the set point is greater than 4°F (2.2°C) and rate of change in leaving-water temperature is greater than the adjustable setting. If it has been less than 90 seconds since the last capacity change, compressors will continue to run unless a safety device trips. This prevents rapid cycling and also helps return oil during short operating periods.

Control sequence

Off cycle — If ambient temperature is below 36°F (2.2°C), cooler heaters (if installed) are also energized.

Start-up — After control circuit switches on, the prestart process takes place, then microprocessor checks itself, starts pump (if configured) and waits for temperature to stabilize. The controlled pulldown feature limits compressor loading on start-up to reduce demand on start-up and unnecessary compressor usage.

Capacity control — On the first call for cooling, the microprocessor starts initial compressor and fan stage on lead circuit.

As additional cooling is required, the capacity of the compressor is increased by changing the position of the slide valve. As the load increases above the compressor's capacity, another compressor is started and both are staged together.

The speed at which capacity is added or reduced is controlled by temperature deviation from set point and rate of temperature change of chilled fluid.

The main base board (MBB) responds to the supply chilled water temperature to cycle the compressors to match cooling load requirements.

The minimum load control valve is energized by the MBB. The valve allows hot gas to pass directly into the cooler circuit on the initial step of unloading, permitting the unit to operate at lower loads with less compressor cycling.

Sensors

Thermistors are used to control temperature-sensing inputs to the microprocessor. No additional thermistor sensors are required for optional leaving chilled water temperature, return water, or outdoor air reset.

The following temperature sensors are provided on 30XA units:

- Cooler leaving chilled fluid temperature (T1)
- Cooler entering fluid (return) temperature (T2)
- Outside-air temperature (T9)
- Space temperature (T10)

Two refrigerant pressure transducers are used in each circuit for sensing suction and discharge pressure. The microprocessor uses these inputs to control capacity and fan cycling.

The following pressure transducers are provided on 30XA units:

- Saturated condensing temperature
- Cooler saturation temperature
- Oil
- Economizer (sizes 090-501)

Additional information

Detailed information on controls and operation is available in the Controls, Start-Up, Operation, Service, and Troubleshooting guide included with each unit. Packaged Service Training programs are also available. Contact your local Carrier representative for more information.

*Comfort*Link controls

Dynamic *Comfort*Link controls keep the chiller on line during periods of extreme operating conditions. If the entering fluid temperature is 95°F (35°C) and the saturated suction temperature is 50°F (10°C) or higher the maximum operating pressure (MOP) feature limits the suction to keep the chiller online. The controller automatically starts the chiller in the

unloaded state to eliminate the potential of compressor overload due to high head pressure or low suction pressure. The controller will equalize run time on each circuit through the lead/lag feature. If a circuit becomes disabled, the controller will automatically set the active circuit to lead, keeping the chiller online at a reduced capacity.

Standard *Comfort*Link controls with Touch Pilot™ display — A touch screen display for convenient access to unit status, operation, configuration and troubleshooting diagnostics capability is standard on 30XA units. The VGA LCD display provides clear language information in English, French, Spanish, or Portuguese. The weatherproof enclosure makes the display ideally suited for outdoor applications.

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

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

Temperature reset

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

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

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

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

For details on applying a reset option, refer to the Controls, Start-Up, Operation, Service and Troubleshooting literature shipped with the unit. Obtain ordering part numbers for reset option from the Packaged Chiller Builder program or contact your local Carrier representative.

Safety

Abnormal conditions — All control safeties in the chiller operate through compressor protection board or control relay and microprocessor.

Loss of feedback signal to the MBB will cause the compressor(s) to shut down. For other safeties, microprocessor makes appropriate decision to shut down a compressor due to a safety trip or bad sensor reading and displays appropriate failure code on the display. Chiller holds in safety mode until reset; it then reverts to normal control when unit is reset.

Low-pressure safety — Safety cuts out if system pressure drops below minimum.

High-pressure cutout — Switch shuts down compressors if compressor discharge pressure increases to 290.3 psig (2001.5 kPa).

Compressor anti-cycling — This feature limits compressor cycling.

Loss of flow protection — Proof of flow switches are standard and installed on all 30XA chillers.

Sensor failures — Failures are detected by the microprocessor.

Accessory controls

Demand can be limited by controlling the chiller capacity through the demand limit control (the energy management module is required for this function). This FIOP/accessory interfaces with the microprocessor to control the unit so that the chiller's kW demand does not exceed its setting. It is activated from an external switch or a 4 to 20 mA signal.

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

Demand limit

If the demand limit is applied, it limits the total power draw of unit to a selected point by controlling the number of operational compressors during periods of peak electrical demand.

The energy management module is required for either 2-step or 4 to 20 mA demand limit.

Electronic expansion valve (EXV)

The EXV controls refrigerant flow to the cooler for different operating conditions by varying an orifice size to increase or decrease the flow area through the valve based on microprocessor input. The orifice is positioned by a stepper motor through approximately 3,600 discrete steps and is monitored every three seconds.

Diagnostics

The microprocessor may be put through a service test (see Controls, Start-Up, Operation, Service, and Troubleshooting literature). Service test confirms microprocessor is functional, informs observer through display the condition of each sensor and switch in chiller, and allows observer to check for proper operation of fans and compressors.

Default settings

To facilitate quick start-ups, 30XA chillers with *Comfort*Link controls are pre-configured with a default setting that assumes stand-alone operation supplying 44°F (6.6°C) chilled water.

Configuration settings will be based on any options or accessories included with the unit at the time of manufacturing.

Date and time are set to U.S.A. Eastern Time zone and will need reconfiguring based on location and local time zone. If operation based on occupancy scheduling is desired, schedule must be set during installation.

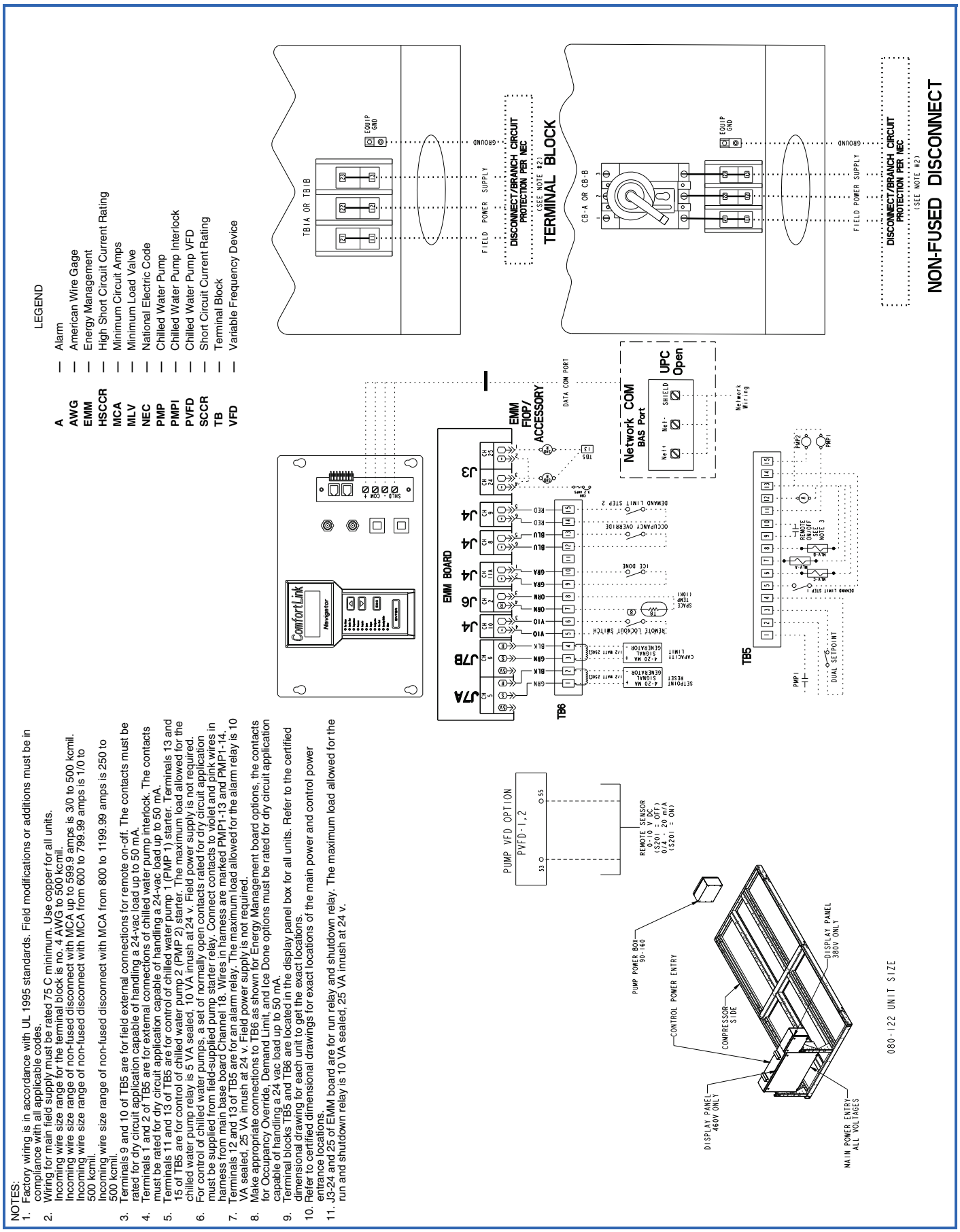
Ice duty

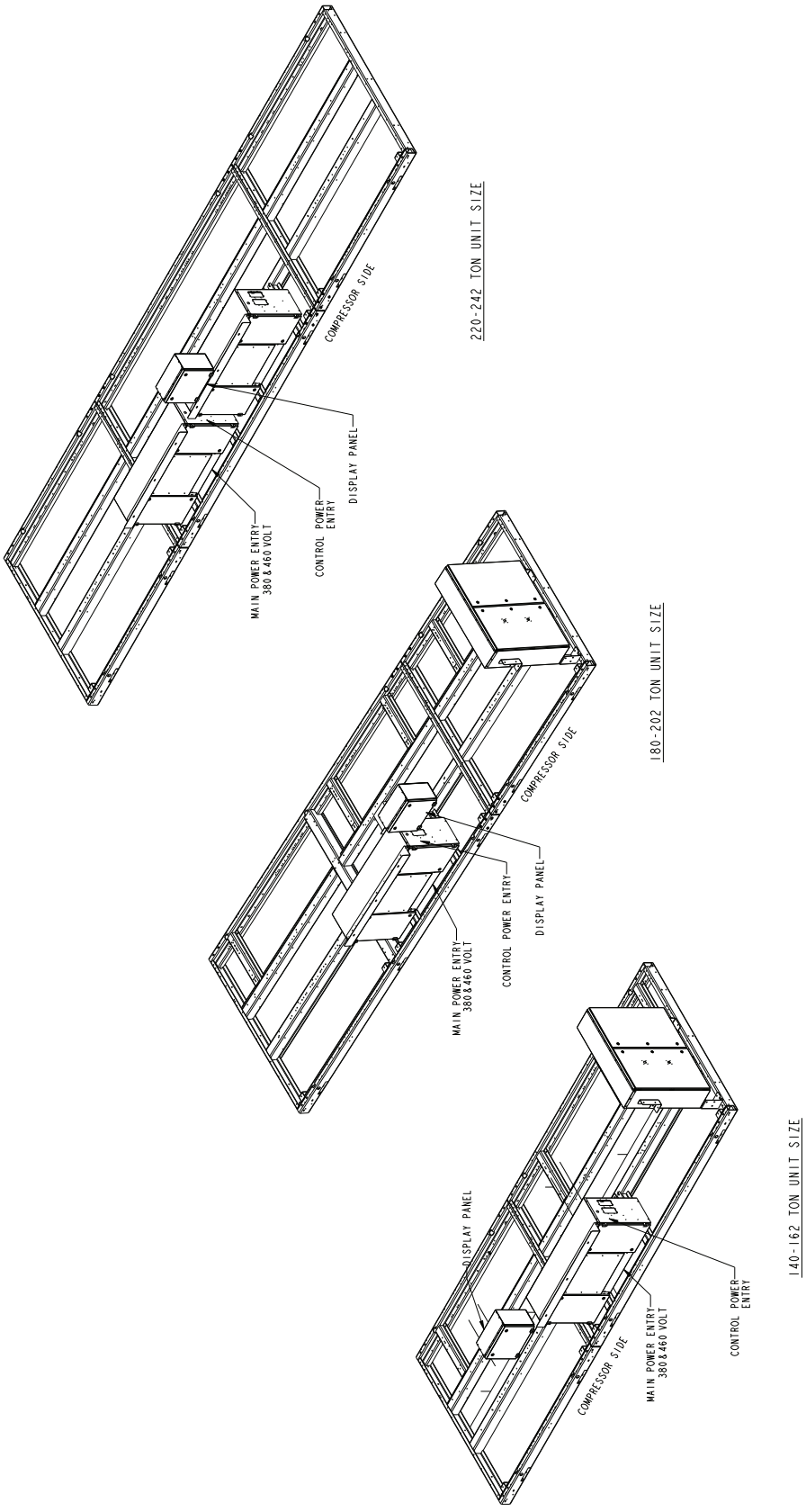
*Comfort*Link controls have the capability of reduced leaving fluid temperature operation for thermal storage, or ice duty. The optional Energy Management display includes input contacts for the "ice done" signal generated by the thermal storage control system. The ice duty feature may be configured to start on an external input command or by the *Comfort*Link standard internal scheduling function. The ice duty function requires brine modification for leaving fluid temperatures below 40°F (4.4°C). Ice duty may be used in combination with any other standard features offered by the energy management module and *Comfort*Link controls.

The production of ice, which is stored for peak cooling demands, can significantly decrease energy costs. The unit produces ice (normally at night) by supplying ice storage tanks with low temperature cooling fluid. The chiller takes advantage of reduced ambient conditions at night for ice-making mode, so the capacity suffers a lower penalty for the low leaving fluid temperatures.

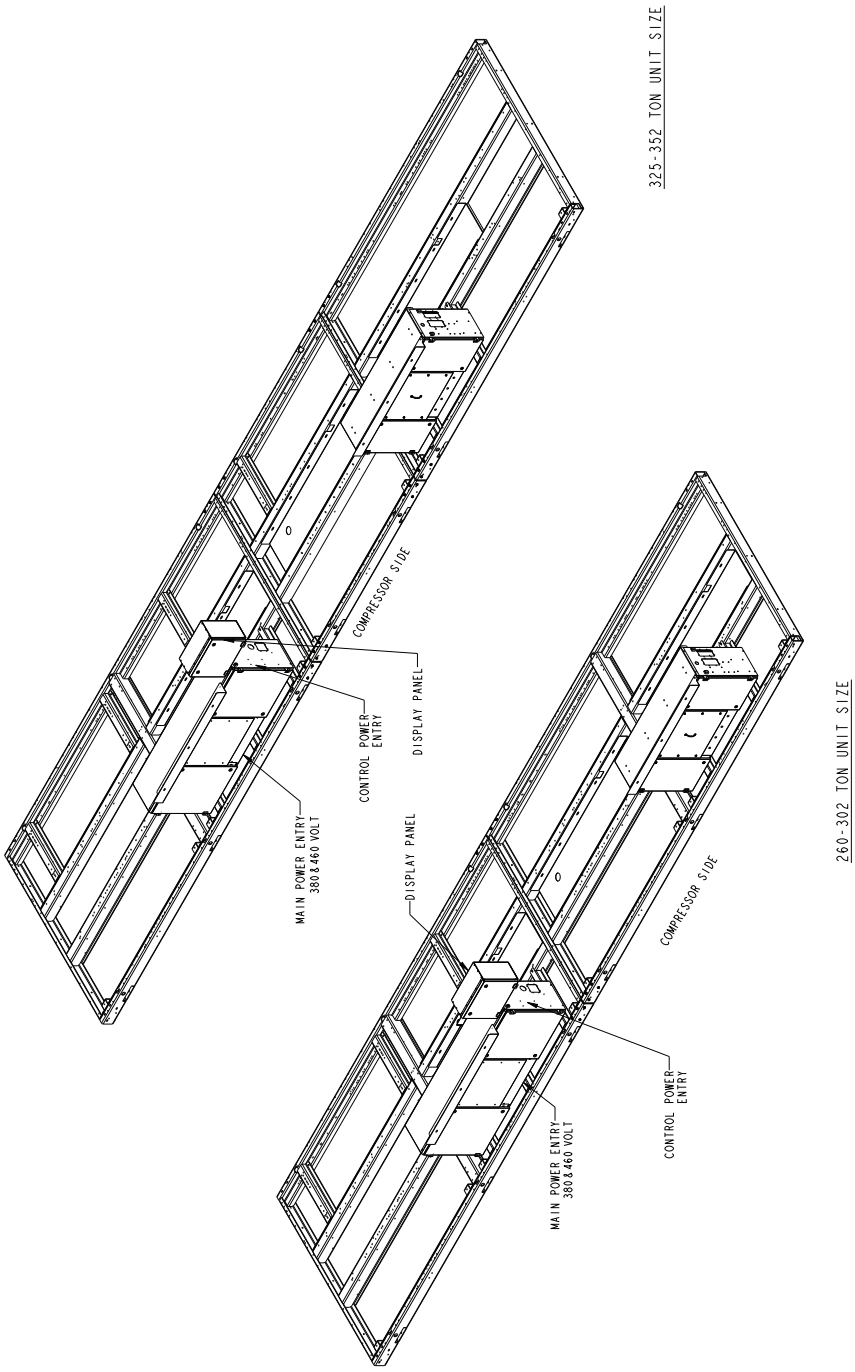
At peak cooling demands, the chiller and the stored ice may share the cooling load to reduce operating costs. The thermal storage system may potentially reduce the size of the chiller plant required to meet demand loads.

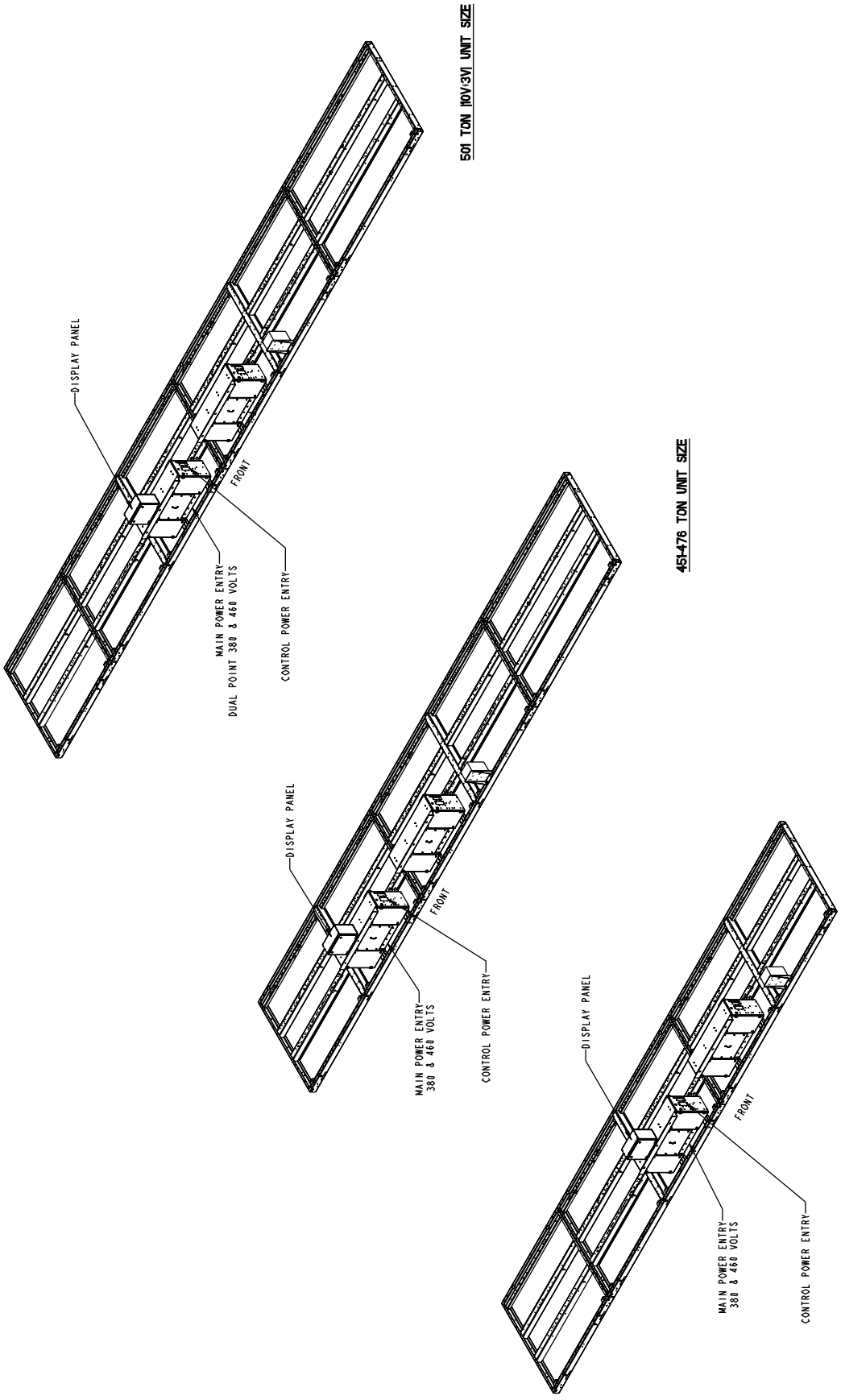
Control and power wiring schematic




220-242 TON UNIT SIZE
COMPRESSOR SIDE
DISPLAY PANEL
CONTROL POWER ENTRY
MAIN POWER ENTRY 380 & 460 VOLT
180-202 TON UNIT SIZE
COMPRESSOR SIDE
CONTROL POWER ENTRY
DISPLAY PANEL
MAIN POWER ENTRY 380 & 460 VOLT
140-162 TON UNIT SIZE
DISPLAY PANEL
COMPRESSOR SIDE
MAIN POWER ENTRY 380 & 460 VOLT
CONTROL POWER ENTRY

Control and power wiring schematic (cont)




501 TON (40V/3V) UNIT SIZE
DISPLAY PANEL
MAIN POWER ENTRY
DUAL POINT 380 & 460 VOLTS
CONTROL POWER ENTRY
FRONT
451-476 TON UNIT SIZE
DISPLAY PANEL
MAIN POWER ENTRY
380 & 460 VOLTS
CONTROL POWER ENTRY
FRONT
401 TON UNIT SIZE
DISPLAY PANEL
MAIN POWER ENTRY
380 & 460 VOLTS
CONTROL POWER ENTRY
FRONT

Application data

Chiller location and clearances

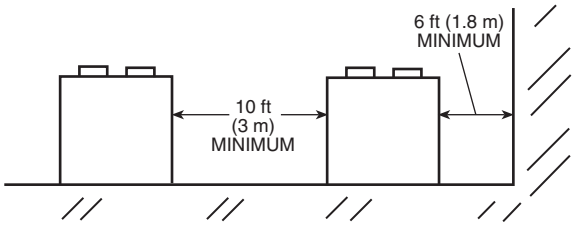
The 30XA unit must be installed outdoors.

Do not locate near sound sensitive areas without proper acoustic consideration. For applications requiring mounting a chiller on a building rooftop, consideration should be given to using rubber-in-shear or spring isolators to minimize structure-borne transmission. Unit must be level when installed to ensure proper oil return to the compressors. Clearances must be provided around chillers for airflow, service and local code requirements. See dimensional drawings for specific unit clearance requirements. Ensure adequate clearance between adjacent chillers is maintained. A minimum of 10 ft (3.0 m) is recommended. Chiller fan discharge is strongly recommended to be at least as high as adjacent solid walls. Installation in pits is not recommended.

Minimum clearances

The recommended minimum clearance to ensure proper airflow through the condenser coils and to allow fan maintenance is as shown below.

MULTIPLE UNIT SEPARATION



ALIGNED SIDE BY SIDE

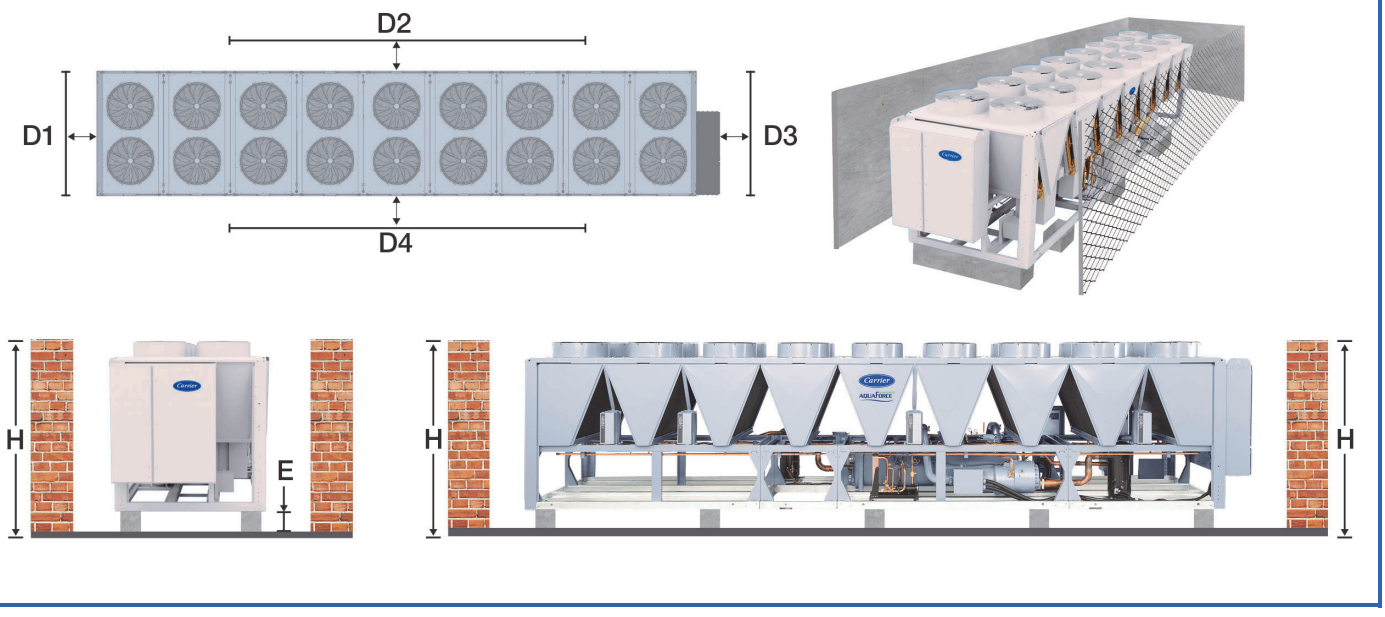
Acceptable clearance on the cooler connection side or end opposite the control box of the unit can be reduced to 3 ft (1 m) without sacrificing performance as long as the remaining three sides are unrestricted. Acceptable clearance on the side with a control box can be reduced to 4 ft (1.3 m) due to NEC (National Electric Code, U.S.A.) regulations, without sacrificing performance as long as the remaining three sides are unrestricted. Clearance between chillers in dual chiller applications may be reduced to 6 ft (1.8 m) without sacrificing performance provided the remaining sides are unrestricted.

There are applications, however, in which recommended minimum clearances are not available. In these situations, customers request a prediction of the chiller performance within the confined space. A generalized derating factor may be insufficient to fully predict performance with various real-life physical layouts and ambient conditions.

To improve performance predictions when recommended clearances cannot be met, Carrier has developed the ExpertFit™ Software Model. An interface in the computerized chiller selection program predicts air-cooled chiller performance within a confined space, taking into account various spatial constraints and conditions, thus providing actual performance reports and not just derate guidelines.

Using this tool will provide the customer with a realistic expectation for their actual installation. The illustration below is an example of a typical installation that the software can model.

EXPERTFIT™ MODEL EXAMPLE



Strainers

A screen strainer with a minimum screen size of 20 mesh must be installed a maximum of 10 ft (3 m) from the unit to prevent debris from damaging internal tubes of the cooler.

STRAINER REQUIREMENTS

APPLICATION	30XA (ANY HEAT EXCHANGER TYPE)	
	With Hydronic Package*	Without Hydronic Package
	Type of Strainer	
Closed Loop	1/8-in. Perforated (Factory Supplied)	20 Mesh†
Open Loop	1/8-in. Perforated (Factory Supplied) and 20 Mesh†	20 Mesh†

* Units with a hydronic package are shipped with a fine mesh start-up strainer that must be removed within 24 hours after start-up.
† A 20-mesh strainer must be field supplied and installed within 10 ft (3 m) of the cooler inlet.

Oversizing chillers

Oversizing chillers by more than 15% at design conditions must be avoided as the system operating efficiency is adversely affected (resulting in greater or excessive electrical demand). When future expansion of equipment is anticipated, install a single chiller to meet present load requirements and add a second chiller to meet the additional load demand. It is also recommended that 2 smaller chillers be installed where operation at minimum load is critical. The operation of a smaller chiller loaded to a greater percentage over minimum is preferred to operating a single chiller at or near its minimum recommended value. Minimum load control should not be used as a means to allow oversizing chillers. Minimum load control should be given consideration where substantial operating time is anticipated below the minimum unloading step.

Cooler water temperature

1. Maximum leaving chilled water temperature (LCWT) for the unit is 60°F (15.5°C). Unit can start and pull down with up to 95°F (35°C) entering-water temperature. The entering-water temperature must not exceed 70°F (21.1°C).
2. Minimum LCWT is 40°F (4.4°C). For leaving-water temperatures below 39.9°F (4.4°C) an inhibited antifreeze solution is required. Application of chiller at leaving fluid temperatures lower than 30°F (–1.1°C) is not available on 30XA401-501 units, but it is possible on all other unit sizes by including suction line insulation and low ambient head pressure control, and when a flooded cooler is employed, a plus-one-pass cooler is also required. The low leaving fluid temperature applications are generally best accomplished by employing the DX cooler option.

   The flooded cooler may be used on applications with leaving fluid temperatures lower than 30°F (–1.1°C) by strictly adhering to the limits presented in the following table.

FLOODED COOLER LOW LCWT RESTRICTIONS

PARAMETER	30XA SIZES	BRINE TYPE	
		EG	PG
Cooler Passes	080-350	3 (or +1)	3 (or +1)
Minimum Leaving Fluid Temperature	080-350	21.2°F (–6.0°C)	26.6°F (–2.9°C)
Maximum Glycol	080-350	35%	33%
Allowable Cooler Delta Temperature*	080-090	2.0 to 7.2 delta °F (1.1 to 4.0 delta °C)	2.0 to 5.4 delta °F (1.1 to 3.0 delta °C)
	100-350	2.0 to 7.2 delta °F (1.1 to 4.0 delta °C)	2.0 to 7.2 delta °F (1.1 to 4.0 delta °C)

LEGEND
EG — Ethylene Glycol
LCWT — Leaving Chiller Water Temperature
PG — Propylene Glycol

* Leaving fluid temperature less than 32°F (0°C).

NOTES:
1. Water flowing through cooler should not exceed 100°F (37.8°C).
2. Direct expansion (DX) cooler can operate down to 15°F (–1.1°C) without these restrictions.

Cooler flow/range

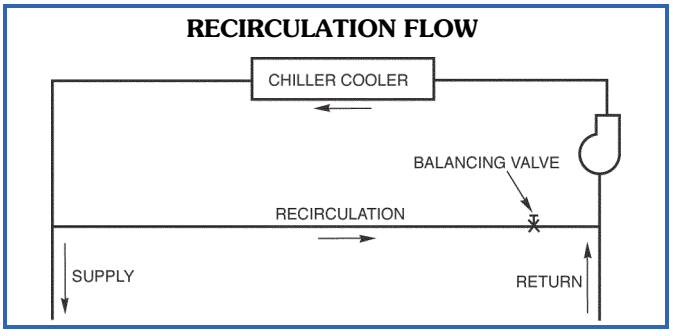
Ratings and performance data in this publication are for a cooling temperature rise of 10°F (5.6°C). The 30XA chillers may be operated at a different temperature rise, providing flow limits are not exceeded and corrections to system guidelines are made. For minimum and maximum cooler flow rates, see the Minimum and Maximum Cooler Flow Rates table. A high flow rate is generally limited by the maximum pressure drop that can be tolerated by the unit. The 30XA chillers are designed for a full load temperature rise of 3° to 20°F (1.7° to 11.1°C). Use the Carrier Selection Program to obtain the rating if a temperature rise other than 10°F (5.6°C) is used. The DX cooler option is the preferred choice for applications with leaving fluid temperatures lower than 30°F (–1.1°C).

Minimum cooler flow (maximum cooler temperature rise) — The minimum cooler flow for all units is shown in the Minimum and Maximum Cooler Flow Rates table on page 80. When system design conditions require a lower flow (or higher rise) than the minimum allowable cooler flow, follow the recommendations below.

a. Multiple smaller chillers may be applied in series, each providing a portion of the design temperature rise.
b. Cooler fluid may be recirculated to raise the flow rate to the chiller. The mixed temperature entering the cooler must be maintained to a minimum of at least 3°F (1.7°C) above the LCWT and a maximum of no more than 20°F (11.1°C) above the LCWT.

NOTE: Recirculation flow is shown below.

RECIRCULATION FLOW

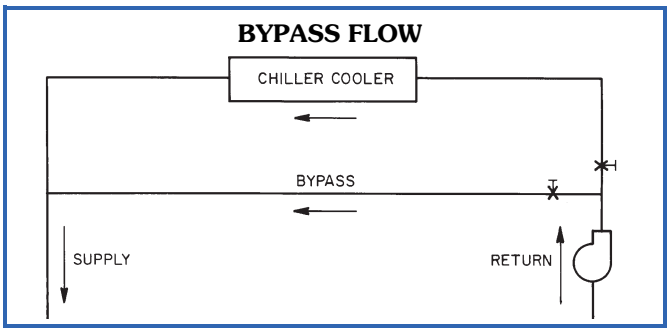


Application data (cont)

Maximum cooler flow — The maximum cooler flow (approximately 3°F [1.7°C] rise) results in a practical maximum pressure drop through cooler.

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

NOTE: Bypass flow is shown below.



Variable cooler flow rates

Variable flow rates may be applied to a standard chiller. The unit will, however, attempt to maintain a constant leaving chilled water temperature. In such cases, the minimum flow must be in excess of the minimum flow given in the Minimum and Maximum Cooler Fluid Flow Rates table, adjusted for any glycol in the system, and the minimum fluid volume must be in excess of 3 gallons per ton (3.2 L per kW). The flow rate must change at a rate less than 10% per minute. Apply a minimum of 6 gallons per ton (6.5 L per kW) water loop volume if the flow rate changes more rapidly.

Traditional pumping systems incorporate constant speed drives and waste energy by relying upon throttling valves as the only means to control flow. A more energy-efficient approach to this issue is to use a variable-speed drive.

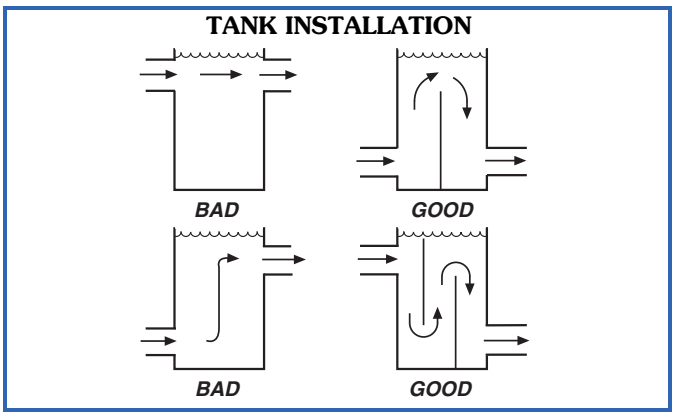
The major cost of a pump over its lifetime will be energy consumption and maintenance, and both of these factors will be reduced using variable-speed pumping. Energy is saved by the combination of lowering the pump speed in conjunction with the resulting lowering of pumping system resistance when conditions permit.

Fluid loop volume

The volume in circulation must equal or exceed 3 gal. per nominal ton (3.2 l/kW) of cooling for temperature stability and accuracy in normal air conditioning applications. In process cooling applications, or for operation at ambient temperature below 32°F (0°C) with low loading conditions, there should be from 6 to 10 gal. per ton (6.5 to 10.8 l/kW). To achieve this volume, it is often necessary to install a tank in the loop.

Tank should be baffled to ensure there is no stratification and that water (or brine) entering tank is adequately mixed with liquid in the tank.

The piping between the chiller and the fluid loop volume tank can be done to allow the tank to be on the return side of the chiller (tank piped to chiller inlet) or the supply side of the chiller (tank piped to the chiller outlet). However, it is recommended that the tank be piped to the return side of the chiller to buffer any changes in load, allowing more stable chiller operation.



Cooler fouling factor

The fouling factor used to calculate tabulated ratings is 0.0001 $ft^2 \cdot hr \cdot °F/Btu$ (.000018 $m^2 \cdot °C/W$). As fouling factor is increased, both unit capacity and EER decrease. The impact of the fouling factor on performance varies significantly with chiller size and application conditions. Ratings must be determined by the Carrier Selection Program.

Cooler freeze protection

Freeze protection for the cooler is standard on all 30XA air-cooled chillers. Flooded cooler units are protected from freezing down to 0°F (–18°C) through the cooler heaters and control algorithms. If flooded cooler chillers control the chilled water pump/valves, allowing for flow through the cooler, the unit is protected from freezing down to –20°F (–29°C). Chillers equipped with DX cooler are protected from freezing down to –20°F (–29°C). Since power is sometimes lost for extended periods during winter storms, freeze protection provided by heater tapes will be effective only if a back-up power supply can be assured for the unit's control circuit, heater and cooler pump. If not protected with an anti-freeze solution, draining the cooler and outdoor piping is recommended if the system will not be used during freezing weather conditions.

Consider both leaving water set point and ambient freeze conditions when determining antifreeze concentration. Both of these parameters can help determine the recommended concentration level. Higher concentration must be used to adequately protect the machine.

NOTE: Use only antifreeze solutions approved for heat exchanger duty.

For applications in which the leaving fluid temperature set point is less than 40°F (4.4°C), a suitable inhibited antifreeze solution must be used. The solution concentration must be sufficient to protect the chilled water loop to a freeze protection (first crystals) concentration of at least 15°F (8.3°C) below the leaving fluid temperature set point.

If the chiller refrigerant or fluid lines are in an area where ambient conditions fall below 34°F (1.1°C), it is highly recommended that an antifreeze solution be added to protect the unit and fluid piping to a temperature of 15°F (8.3°C) below the lowest anticipated ambient temperature.

Select concentration based on either burst or freeze protection as dictated by the application. If the chiller does not operate during the winter, and a start-up is not expected, a burst protection concentration is recommended. This concentration may not be high enough to pump the fluid through the unit. Burst protection is typically a lower concentration that will provide better performance from the machine. If the chiller does operate during winter, a freeze protection concentration is recommended. This concentration will be high enough to keep the fluid in a condition that it can be pumped at low ambient conditions.

IMPORTANT: Glycol antifreeze solutions are highly recommended since heater tapes provide no protection in the event of a power failure.

Consult glycol fluid manufacturers for burst protection recommendations and fluid specifications.

Application data (cont)

MINIMUM AND MAXIMUM COOLER FLOW RATES

ITEM					MINIMUM		MAXIMUM	
Cooler Leaving Water Temperature*					40°F (4.4°C)		60°F (15°C)	
Cooler Entering Water Temperature†					45°F (7.2°C)		70°F (21.1°C)	
30XA UNIT SIZE	Nominal Flow Rate (gpm)	Nominal Flow Rate (L/s)	Cooler	Number of Passes	Minimum Flow Rate** (gpm)	Minimum Flow Rate** (L/s)	Maximum Flow Rate (gpm)	Maximum Flow Rate (L/s)
080	180.4	11.4	Standard, Flooded	2	95	6.0	379	23.9
			Plus One Pass, Flooded	3	43	2.7	192	12.1
			Minus One Pass, Flooded	1	196	12.4	782	49.3
082	172.8	10.9	DX Cooler	—	86	5.4	346	21.8
090	201.9	12.7	Standard, Flooded	2	101	6.4	403	25.4
			Plus One Pass, Flooded	3	43	2.7	200	12.6
			Minus One Pass, Flooded	1	229	14.4	917	57.9
092	193.7	12.2	DX Cooler	—	97	6.1	387	24.4
100	225.5	14.2	Standard, Flooded	2	101	6.4	403	25.4
			Plus One Pass, Flooded	3	43	2.7	200	12.6
			Minus One Pass, Flooded	1	229	14.4	917	57.9
102	214.3	13.5	DX Cooler	—	107	6.7	429	27.0
110	244.9	15.5	Standard, Flooded	2	125	7.9	501	31.6
			Plus One Pass, Flooded	3	61	3.8	244	15.4
			Minus One Pass, Flooded	1	254	16.0	1014	64.0
112	235.2	14.8	DX Cooler	—	118	7.4	470	29.6
120	264.8	16.7	Standard, Flooded	2	125	7.9	501	31.6
			Plus One Pass, Flooded	3	73	4.6	293	18.5
			Minus One Pass, Flooded	1	281	17.7	1124	70.9
122	254.7	16.0	DX Cooler	—	127	8.0	509	32.1
140	317.8	20.1	Standard, Flooded	2	134	8.5	538	33.9
			Plus One Pass, Flooded	3	73	4.6	293	18.5
			Minus One Pass, Flooded	1	324	20.4	1296	81.8
142	303.5	19.1	DX Cooler	—	152	9.6	607	38.2
160	365.1	23	Standard, Flooded	2	165	10.4	660	41.6
			Plus One Pass, Flooded	3	98	6.2	391	24.7
			Minus One Pass, Flooded	1	354	22.3	1418	89.5
162	347	21.9	DX Cooler	—	174	10.9	694	43.7
180	409.6	25.8	Standard, Flooded	2	202	12.7	807	50.9
			Plus One Pass, Flooded	3	73	4.6	391	24.7
			Minus One Pass, Flooded	1	416	26.2	1662	104.9
182	401.7	25.3	DX Cooler	—	201	12.6	803	50.6
200	463.9	29.3	Standard, Flooded	2	223	14.1	892	56.3
			Plus One Pass, Flooded	3	98	6.2	391	24.7
			Minus One Pass, Flooded	1	458	28.9	1833	115.6
202	447.1	28.2	DX Cooler	—	224	14.1	894	56.3
220	505.9	31.9	Standard, Flooded	2	235	14.8	941	59.4
			Plus One Pass, Flooded	3	122	7.7	489	30.9
			Minus One Pass, Flooded	1	501	31.6	2004	126.4
222	493	31.1	DX Cooler	—	246	15.5	950	59.9
240	545.8	34.4	Standard, Flooded	2	266	16.8	1063	67.1
			Plus One Pass, Flooded	3	147	9.3	587	37.0
			Minus One Pass, Flooded	1	538	33.9	2151	135.7
242	530	33.5	DX Cooler	—	265	16.7	950	59.9
260	600.3	37.9	Standard, Flooded	2	257	16.2	1027	64.8
			Plus One Pass, Flooded	3	141	8.9	562	35.5
			Minus One Pass, Flooded	1	584	36.8	2334	147.3
262	583	36.8	DX Cooler	—	292	18.4	950	59.9
280	642.2	40.5	Standard, Flooded	2	293	18.5	1173	74.0
			Plus One Pass, Flooded	3	141	8.9	562	35.5
			Minus One Pass, Flooded	1	620	39.1	2481	156.5
282	627	39.5	DX Cooler	—	313	19.8	950	59.9

MINIMUM AND MAXIMUM COOLER FLOW RATES (cont)

ITEM					MINIMUM		MAXIMUM	
Cooler Leaving Water Temperature*					40°F (4.4°C)		60°F (15°C)	
Cooler Entering Water Temperature†					45°F (7.2°C)		70°F (21.1°C)	
30XA UNIT SIZE	Nominal Flow Rate (gpm)	Nominal Flow Rate (L/s)	Cooler	Number of Passes	Minimum Flow Rate** (gpm)	Minimum Flow Rate** (L/s)	Maximum Flow Rate (gpm)	Maximum Flow Rate (L/s)
300	687.5	43.4	Standard, Flooded	2	327	20.6	1308	82.5
			Plus One Pass, Flooded	3	174	11.0	697	44.0
			Minus One Pass, Flooded	1	687	43.3	2750	173.5
302	665	42.0	DX Cooler	—	333	21.0	1331	83.9
325	733.4	46.3	Standard, Flooded	2	361	22.8	1442	91.0
			Plus One Pass, Flooded	3	211	13.3	843	53.2
			Minus One Pass, Flooded	1	724	45.7	2897	182.8
327	720	45.4	DX Cooler	—	360	22.7	1440	90.8
350	775.4	48.9	Standard, Flooded	2	379	23.9	1516	95.6
			Plus One Pass, Flooded	3	244	15.4	978	61.7
			Minus One Pass, Flooded	1	767	48.4	3068	193.6
352	757	47.8	DX Cooler	—	379	23.9	1514	95.5
401	948	59.9	Standard, Flooded	2	474	29.9	1896	119.6
			Plus One Pass, Flooded	—	—	—	—	—
			Minus One Pass, Flooded	1	800	50.5	3792	239.3
451	1047	66.1	Standard, Flooded	2	524	33.0	2094	132.1
			Plus One Pass, Flooded	—	—	—	—	—
			Minus One Pass, Flooded	1	800	50.5	4000	252.4
476	1104	69.7	Standard, Flooded	2	552	34.8	2208	139.3
			Plus One Pass, Flooded	—	—	—	—	—
			Minus One Pass, Flooded	1	950	59.9	4000	252.4
501	1184	74.7	Standard, Flooded	2	592	37.3	2368	149.4
			Plus One Pass, Flooded	—	—	—	—	—
			Minus One Pass, Flooded	1	950	59.9	4000	252.4

*For applications requiring cooler leaving water temperature operation at less than 40°F (4.4°C), the units require the use of antifreeze. Contact your local Carrier representative for more information.

†For applications requiring cooler entering water temperature operation at less than 45°F (7.2°C), contact your local Carrier representative for unit selection using the Carrier electronic catalog.

**For minimum cooler flow rate with brine applications, refer to E-CAT software performance tables.

NOTES:

1. The 30XA units will start and pull down with loop temperatures up to 95°F (35°C).
2. Nominal flow rates required at AHRI conditions 44°F (7°C) leaving fluid temperature, 54°F (12°C) entering water temperature, 95°F (35°C) ambient. Fouling factor 0.00010 ft^2-hr-F/Btu (0.0176 ($m^2 \cdot$ °C/kW).
3. To obtain proper temperature control, cooler loop fluid volume must be at least 3 gal/ton (3.23 L/kW) of chiller nominal capacity for air conditioning and at least 6 gal/ton (6.5 L/kW) for process applications or systems that must operate in low ambient temperatures (below 32°F [0°C]).

Application data (cont)

High ambient temperature operation

High outdoor ambient chiller start-up and operation is possible for standard 30XA chillers at ambient temperatures up to 125.6°F (52°C) at nominal voltage, and up to 131°F (55°C) for size 401-501 units. For applications approaching these temperatures, it may be advisable to select the high ambient temperature option to increase fan airflow. The high ambient temperature option is standard for 30XA401-501 chillers, and it is not available for unit sizes 30XA080-122.

Low ambient temperature operation

Units will start and operate down to 32°F (0°C) as standard. Operation to –20°F (–29°C) requires optional low ambient head pressure control as well as wind baffles (field fabricated and installed to all units for operation below 32°F [0°C]). Inhibited propylene glycol or other suitable corrosion-resistant antifreeze solution must be field supplied and installed in all units for unit operation below 34°F (1.1°C). Solution must be added to fluid loop to protect loop down to 15°F (8.3°C) below minimum operating ambient temperature. Concentration should be based on expected minimum temperature and either "Burst" or "Freeze" protection levels. At least 6 gal. per ton (6.5 l/kW) of water volume is the recommended minimum for a moderate system load.

Altitude correction factors

Correction factors must be applied to standard ratings at altitudes above 2000 ft (609.6 m) using the following multipliers:

ALTITUDE CORRECTION FACTORS

ALTITUDE		CAPACITY MULTIPLIER	COMPRESSOR POWER MULTIPLIER
(ft)	(m)		
2,000	609.6	0.99	1.01
4,000	1219.2	0.98	1.02
6,000	1828.8	0.97	1.03
8,000	2438.4	0.96	1.04
10,000	3048.0	0.95	1.05

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

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

Multiple chillers

Where chiller capacities greater than can be supplied by a single 30XA chiller are required or where standby capability is desired, standard flooded cooler chillers may be installed in parallel or series, whereas chillers with the DX cooler option may be installed in parallel. Units may be of the same or different sizes with this piping arrangement. However, for parallel chiller applications, cooler flow rates must be balanced to ensure proper flow to each chiller.

Unit software is capable of controlling two units as a single plant by making use of the dual chiller control feature. Refer to the Controls, Start-up, Operation, Service and Troubleshooting guide for further details. The accessory Chillervisor System Manager can be used to ensure proper staging sequence of up to 8 chillers in parallel. Refer to the accessory Chillervisor System Manager installation instructions for further details.

If the dual chiller algorithm is used and the machines are installed in parallel, an additional chilled water sensor must be installed for each chiller (to provide the required hardware, a dual chiller accessory kit is available from the factory). Install one thermistor and well per chiller in the common leaving water header. Chillers installed in series do not require additional sensors.

Parallel chiller control with dedicated pumps is recommended. The chiller must start and stop its own water pump located in its own piping. Check valves are required at the discharge of each pump (*when the factory hydronic package option is chosen, and* ***dual pumps*** *are selected, the check valves are automatically supplied*). If pumps are not dedicated for each chiller, then isolation valves are required. Each chiller must open and close its own isolation valve through the unit control (the valve must be connected to the pump outputs).

Hydronic pump packages may not be applied in series applications. Refer to the chiller piping configurations shown in the parallel dual chiller operation figure, page 83.

Dual chiller control

The *Comfort*Link controller allows 2 chillers (piped in parallel or series) to operate as a single chilled water plant with standard control functions coordinated through the master chiller controller. This standard *Comfort*Link feature requires a communication link between the 2 chillers.

There are several advantages to this type of control:

- Redundancy (multiple circuits)
- Better low load control (lower tonnage capability)
- Lower rigging lift weights (2 machines rather than one large machine)
- Chiller lead-lag operation (evens the wear between the two machines)

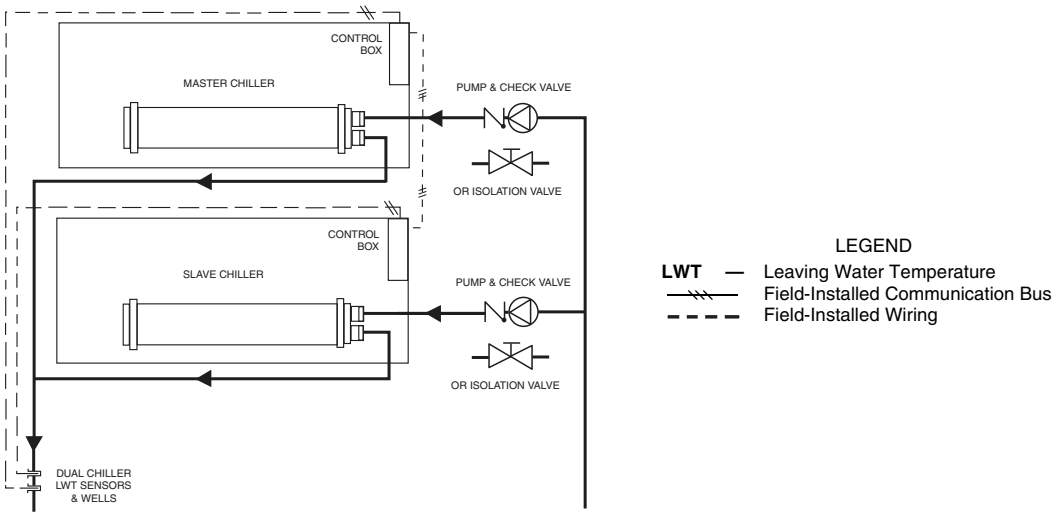
Condenser coil protection (*Enviro-Shield*™)

Refer to the environmental selection guides for more information. If the standard Novation® (microchannel) coil does not meet the corrosion requirements for a given application, additional coil options are available. For specific geographical recommendations, please refer to the NACO Packaged Chiller Builder program.

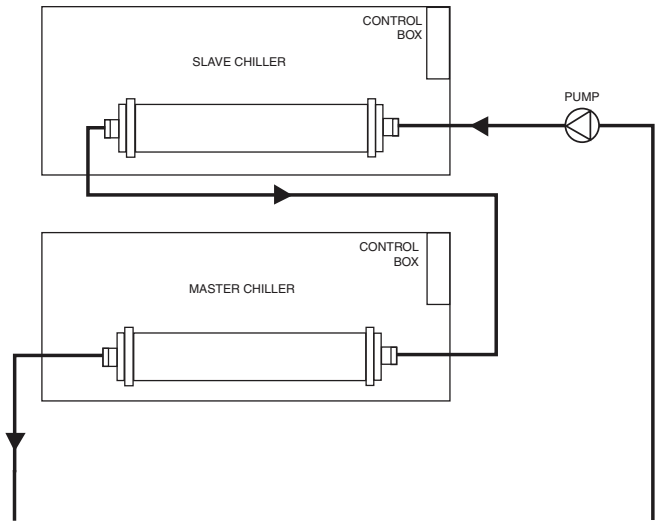
Aluminum fin/copper tube coils are constructed of seamless copper tubes mechanically bonded to aluminum fins. The fins have wavy enhancements. These condenser coils are recommended with remote cooler applications. These coils are not recommended for corrosive environments.

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

PARALLEL DUAL CHILLER OPERATION (FLOODED COOLER SHOWN)



SERIES DUAL CHILLER OPERATION (FLOODED COOLER SHOWN)



Copper-fin coils provide increased corrosion resistance compared to aluminum fin coils. All-copper coils eliminate bimetallic construction to eliminate the potential for galvanic corrosion. Application in industrial environments is not recommended due to potential attack from sulfur, sulfur oxide, nitrogen oxides, carbon and several other industrial airborne contaminants.

E-coated Novation® coils have an extremely flexible and durable epoxy coating uniformly applied to all coil surfaces. Unlike brittle phenolic dip and bake coatings, e-coat provides superior protection with unmatched flexibility, edge coverage, metal adhesion, thermal performance and most importantly, corrosion resistance. E-coated coils provide this protection since all coil surfaces are completely encapsulated from environmental contamination. This option provides the best protection for Novation coil technology. E-coated aluminum microchannel coils shall be capable of withstanding an 8000-hour salt spray test in accordance with the ASTM (American Society for Testing and Materials) (U.S.A.) B-117 Standard.

E-coated aluminum-fin coils have the same flexible and durable epoxy coating as e-coated Novation coils. This option provides better protection compared to standard or pre-coated aluminum-fin coils in many environments.

E-coated copper-fin coils have the same flexible and durable epoxy coating as other e-coated coils. However, this option combines the natural salt and environmental resistance of all-copper construction with the highest level of corrosion protection within the round-tube, plate-fin type of coils.

Air separation

For proper system operation, it is essential that water loops be installed with proper means to manage air in the system. Free air in the system can cause noise, reduce

terminal output, stop flow, or even cause pump failure due to pump cavitation. For closed systems, equipment should be provided to eliminate all air from the system.

The amount of air that water can hold in solution depends on the pressure and temperature of the water/air mixture. Air is less soluble at higher temperatures and at lower pressures. Therefore, separation can best be done at the point of highest water temperature and lowest pressure. Typically, this point would be on the suction side of the pump as the water is returning from the system or terminals. This is generally the optimal place to install an air separator, if possible.

Install automatic air vents at all high points in the system. (If the 30XA unit is located at the high point of the system, a vent can be installed on the piping leaving the heat exchanger on the $^1/_4$ in. NPT female port.)

Install an air separator in the water loop, at the place where the water is at higher temperatures and lower pressures — usually in the chilled water return piping. On a primary-secondary system, the highest temperature water is normally in the secondary loop, close to the decoupler. Preference should be given to that point on the system. In-line or centrifugal air separators are readily available in the field.

It may not be possible to install air separators at the place of the highest temperature and lowest pressure. In such cases, preference should be given to the points of highest temperature. It is important that the pipe be sized correctly so that free air can be moved to the point of separation. Generally, a water velocity of at least 2 feet per second (0.6 m per second) will keep free air entrained and prevent it from forming air pockets.

Automatic vents should be installed at all physically elevated points in the system so that air can be eliminated during system operation. Provisions should also be made for manual venting during the water loop fill.

IMPORTANT: Automatic vents should be located in accessible locations for maintenance purposes and protected from freezing.

Electrical/utility interests

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

Demand limiting (load shedding)

When a utility's demand for electricity exceeds a certain level, loads are shed to keep electricity demand below a prescribed maximum level. Typically, this happens on hot days when air conditioning is most needed. The energy management module (EMM) can be added to accomplish this reduction. Demand may be limited on the unit by resetting water temperature, or by unloading the chiller to a given predetermined percentage of the load. Demand limit may also be driven by an external 4 to 20 mA signal. These features require a signal from an intelligent central control. Do not cycle demand limiter for less than 10 minutes on and 5 minutes off. Duty cycling cycles electrical loads at regular intervals regardless of need. This reduces the electrical operating costs of building by "fooling" demand indicating devices. Duty cycling of compressors or fans is not recommended since motor winding and bearing life will suffer from constant cycling.

Remote on-off control

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

Minimum time to power chiller before start-up

In order to ensure that the oil sump heaters are provided sufficient time to raise the oil sump temperature to the required operating point, power must be applied to the control circuit a minimum of 24 hours prior to chiller start-up. On 30XA chillers, the control circuit obtains its power either from a direct 115-V, single-phase power source or from an optional control transformer on the main 3-phase power supply.

Guide specifications

Outdoor Air-Cooled Liquid Chiller

HVAC Guide Specifications

Size Range: **80 to 500 Tons, Nominal**
(265 to 1740 kW, Nominal)
Carrier Model Number: **30XA**

Part 1 — General

1.01 SYSTEM DESCRIPTION

Microprocessor controlled, air-cooled liquid chiller for outdoor installation, utilizing screw compressors and low sound fans.

1.02 QUALITY ASSURANCE

A. Unit shall be rated in accordance with AHRI (Air-Conditioning, Heating, and Refrigeration Institute) Standard 550/590 (U.S.A.) latest edition and all units shall be ASHRAE (American Society of Heating, Refrigerating, and Air-Conditioning Engineers) 90.1 compliant.

B. Unit construction shall comply with ASHRAE 15 Safety Code, UL (Underwriters Laboratories) 1995, and ASME (American Society of Mechanical Engineers) applicable codes (U.S.A. codes).

C. The management system governing the manufacture of this product is ISO (International Organization for Standardization) 9001:2008 certified.

D. Unit shall be full load run tested at the factory.

1.03 DELIVERY, STORAGE AND HANDLING

A. Unit controls shall be capable of withstanding 150°F (65.5°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 chassis, air-cooled liquid chiller. Contained within the unit cabinet shall be all factory wiring, piping, controls, refrigerant charge (R-134a), and special features required prior to field start-up.

B. Materials of Construction:

1. The base rail is industrial-quality, 7 ga, zinc-dipped galvanized frame (with Magni-coated screws).
2. Cabinet shall be galvanized steel casing with a baked enamel powder or pre-painted finish.
3. Cabinet shall be capable of withstanding 500-hour salt spray test in accordance with the ASTM (American Society for Testing and Materials) (U.S.A.) B-117 standard.

C. Fans:

1. Condenser fans shall be direct-driven, 9-blade airfoil cross-section, reinforced polymer construction, shrouded-axial type, and shall be statically and dynamically balanced with inherent corrosion resistance.
2. Air shall be discharged vertically upward.
3. Fans shall be protected by coated steel wire safety guards.

D. Compressor/Compressor Assembly:

1. Comprised of semi-hermetic twin screw type compressors.
2. Compressor motor shall be direct drive, 3500 rpm, protected by motor temperature sensors, suction gas cooled motor.
3. Capacity control shall utilize an infinitely modulating slide valve to modulate capacity from 100% to 15% full load.
4. Compressor performance shall not rely on an internal Teflon[1] coating because this material deteriorates over time. This deterioration results in loss of capacity, higher operating costs due to lower efficiency and increased maintenance requirements.

E. Flooded Cooler:

1. Shall be a mechanically cleanable tubes in a shell-and-tube type cooler with removable heads.
2. Tubes shall be internally enhanced seamless-copper type rolled into tube sheets.
3. Shall be equipped with Victaulic-type water connections.
4. Shell and cooler heads shall be insulated with $^3/_4$-in. PVC foam (closed-cell) with a maximum K factor of 0.28.
5. Design shall incorporate 2 independent refrigerant circuits.
6. Cooler shall be tested and stamped in accordance with ASME Code for a refrigerant working side pressure of 220 psig (1517 kPa). Cooler shall have a maximum water-side pressure of 300 psig (2068 kPa).
7. Cooler shall have a cooler drain and vent.
8. Low-ambient temperature protection: unit shall have factory-installed cooler heater (where applicable), and pumpout cycle to protect cooler from ambient temperature freeze down to 0°F (–17.8°C).
9. Cooler shall be provided with a factory-installed flow switch.

F. Condenser:

1. Coil shall be air-cooled Novation® heat exchanger technology (MCHX) and shall have a series of flat tubes containing a series of multiple, parallel flow microchannels layered between the refrigerant manifolds. Novation coils shall consist of a two-pass arrangement. Coil construction shall consist of aluminum alloys for fins, tubes, and manifolds in combination with a corrosion-resistant coating.
2. Tubes shall be cleaned, dehydrated, and sealed.

1. Teflon is a registered trademark of Dupont.

3. Assembled condenser coils shall be pressure tested at the coil factory at 660 psig (5448 kPa) and subsequently shall be leak tested at 145 psig ±5 psig (1000 kPa ±34.5 kPa) and pressure tested at 350 psig (2413 kPa) at final unit assembly.
4. To plan the chiller installation and for ease of maintenance/coil removal, all refrigerant piping entering and leaving the condenser coils shall be located on only one side of the chiller so the coils can be removed (when needed) from the side free of piping. This is important to consider because removing the coils from the header side, although possible, involves extra labor due to extra bending and brazing of the coil headers.

G. Refrigeration Components:

Refrigerant circuit components shall include replaceable-core filter drier, moisture indicating sight glass, electronic expansion valve, discharge service valves and liquid line service valves, and complete operating charge of both refrigerant R-134a and compressor oil.

H. Controls, Safeties, and Diagnostics:
1. Unit controls shall include the following minimum components:
   a. Microprocessor with non-volatile memory. Battery backup system shall not be accepted.
   b. Separate terminal block for power and controls.
   c. Separate 115-v power supply to serve all controllers, relays, and control components.
   d. ON/OFF control switch.
   e. Replaceable solid-state controllers.
   f. Pressure sensors installed to measure suction, oil, economizer, and discharge pressure. Thermistors installed to measure cooler entering and leaving fluid temperatures and outside air temperature.
2. Unit controls shall include the following functions:
   a. Automatic circuit lead/lag.
   b. Capacity control based on leaving chilled fluid temperature and compensated by rate of change of return-fluid temperature with temperature set point accuracy to 0.1°F (0.05°C).
   c. Limiting the chilled fluid temperature pull-down rate at start-up to an adjustable range of 0.2°F to 2°F (0.1 to 1.1°C) per minute to prevent excessive demand spikes at start-up.
   d. Seven-day time schedule.
   e. Leaving chilled fluid temperature reset from return fluid and outside air temperature.
   f. Chilled water pump start/stop control.
   g. Chiller control for parallel chiller applications without addition of hardware modules and control panels (requires thermistors).
   h. Timed maintenance scheduling to signal maintenance activities for strainer maintenance and user-defined maintenance activities.
   i. Low ambient protection to energize cooler heaters (if installed).
   j. Single step demand limit control activated by remote contact closure.
   k. Periodic pump start to ensure pump seals are properly maintained during off-season periods.
   l. Night time sound mode to reduce the sound of the machine by a user-defined schedule.
3. Diagnostics:
   a. The control panel shall include, as standard, a display:
      1) Touch screen display consisting of $^1/_4$ VGA LCD (liquid crystal display) with adjustable contrast and backlighting.
      2) Display shall allow a user to navigate through menus, select desired options and modify data.
   b. Features of the display shall include:
      1) Display shall be customizable and allow up to 72 data points.
      2) Display shall support both local equipment or network made for remote mount.
      3) Display shall allow access to configuration, maintenance, service, set point, time schedules, alarm history and status data.
      4) Display shall have one button for chiller on/off.
      5) Display shall include three levels of password protection against unauthorized access to configuration and maintenance information, and display set up parameters.
      6) Display shall allow for easy connection of a portable hand held technician tool to access information and upload and/or download chiller settings.
      7) Display shall be compatible with the Carrier Comfort Network® (CCN) system and provide network alarm acknowledgment or indication and provide capability to fully monitor and control chiller.
      8) Display alarms and parameters shall be capable of being displayed in full text.
      9) Display shall be capable of displaying the last 50 alarms and will store a snapshot of a minimum of 20 status data parameters for each alarm.
      10) Compressor run hours.
      11) Compressor number of starts.
      12) Compressor current.
      13) Time of day:
         a) Display module, in conjunction with the microprocessor, must also be capable of displaying the output

(results) of a service test. Service test shall verify operation of every switch, thermistor, fan, and compressor before chiller is started.

b) Diagnostics shall include the ability to review a list of the 30 most recent alarms with clear language descriptions of the alarm event. Display of alarm codes without the ability for clear language descriptions shall be prohibited.

c) An alarm history buffer shall allow the user to store no less than 30 alarm events with clear language descriptions, time and date stamp event entry.

d) The chiller controller shall include multiple connection ports for communicating with the local equipment network, the Carrier Comfort Network® (CCN) system and the ability to access all chiller control functions from any point on the chiller.

e) The control system shall allow software upgrade without the need for new hardware modules.

4. Safeties:

a. Unit shall be equipped with thermistors and all necessary components in conjunction with the control system to provide the unit with the following protections:

1) Loss of refrigerant charge.
2) Reverse rotation.
3) Low chilled fluid temperature.
4) Motor overtemperature.
5) High pressure.
6) Electrical overload.
7) Loss of phase.
8) Loss of chilled water flow.

b. Condenser-fan motors shall have internal overcurrent protection.

I. Operating Characteristics:

1. Unit shall be capable of starting and running at outdoor ambient temperatures from 32°F (0°C) to 125.6°F (52°C) for all sizes.
2. Unit shall be capable of starting up with 95°F (35°C) entering fluid temperature to the cooler.

J. Motors:

Condenser-fan motors shall be totally enclosed, air over, single speed, 3-phase type with permanently lubricated bearings and Class F insulation.

K. Electrical Requirements:

1. Unit primary electrical power supply shall enter the unit at a single location, and control power (24 V) shall be provided by a factory-installed control transformer.
2. Primary electrical power supply shall be rated to operate up to 131°F (55°C) for 401-501 units and up to 125°F (52°C) ambient temperature for all other models.
3. Unit shall operate on 3-phase power at the voltage shown in the equipment schedule.
4. Control points shall be accessed through terminal block.
5. Unit shall be shipped with factory control and power wiring installed.

L. Chilled Water Circuit:

1. Chilled water circuit shall be rated for 300 psig (2068 kPa).
2. Thermal dispersion proof of flow switch shall be factory installed and wired.

M. Special Features:

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

1. DX (Direct Expansion) Cooler Option (Not Available on sizes 401-501):

a. Shell-and-tube type, direct expansion.

b. Tubes shall be internally enhanced seamless-copper type rolled into tube sheets.

c. Shall be equipped with Victaulic-type water connections.

d. Shell shall be insulated with $^{3}/_{4}$-in. (19 mm) PVC foam (closed-cell) with a maximum K factor of 0.28.

e. Design shall incorporate a minimum of 2 independent direct-expansion refrigerant circuits.

f. Cooler shall be rested and stamped in accordance with ASME Code for a refrigerant working side pressure of 220 psig (1517 kPa). Cooler shall have a maximum water-side pressure of 300 psig (2068 kPa).

g. Cooler shall be provided with a factory-installed heater and flow switch.

* 2. Low Ambient Temperature Head Pressure Control:

Unit shall be capable of running at outdoor ambient temperatures down to –20°F (–29°C) with the addition of antifreeze in the cooler circuit, wind baffles, and field-installed or factory-installed solid-state low ambient temperature head pressure control with condenser coil temperature sensor.

3. Unit-Mounted Non-Fused Disconnect:

Unit shall be supplied with factory-installed, lockable, non-fused electrical disconnect for main power supply. This is not available with the combination of dual point power and high SCCR (short circuit current rating).

4. Optional Condenser Coil Materials:
   a. E-coated microchannel coils:

      E-coated aluminum microchannel coil shall have a flexible epoxy polymer coating uniformly applied to all coil external surface areas without material bridging between fins or louvers. Coating process shall ensure complete coil encapsulation, including all exposed fin edges. E-coat shall have a thickness of 0.8 to 1.2 mil with top coat having a uniform dry film thickness from 1.0 to 2.0 mil on all external coil surface areas including fin edges. E-coated coils shall have superior hardness characteristics of 2H per ASTM D3363-00 and cross hatch adhesion of 4B-5B per ASTM D3359-02. Impact resistance shall be up to 160 in./lb (ASTM D2794-93). E-coated coil shall have superior impact resistance with no cracking, chipping, or peeling per NSF/ANSI 51-2002 Method 10.2. E-coated aluminum microchannel coils shall be capable of withstanding an 8000-hour salt spray test in accordance with the ASTM (American Society for Testing and Materials) (U.S.A.) B-117 Standard.

   b. Aluminum fin/copper-tube coils:

      Coil shall be constructed of seamless copper tubes mechanically bonded to aluminum fins. Fins shall have wavy enhancements. These condenser coils are recommended with remote cooler applications. These coils are not recommended for corrosive environments.

   c. Pre-coated aluminum-fin coils:

      Shall have a durable epoxy-phenolic coating to provide protection in mildly corrosive coastal environments. Coating shall be applied to the aluminum fin stock prior to the fin stamping process to create an inert barrier between the aluminum fin and copper tube. Epoxy-phenolic barrier shall minimize galvanic action between dissimilar metals.

   d. Copper-fin coils:

      Shall be constructed of copper fins mechanically bonded to copper tubes and copper tube sheets. Galvanized steel tube sheets shall not be acceptable. A polymer strip shall prevent coil assembly from contacting sheet metal coil pan to minimize potential for galvanic corrosion between the coil and pan. All copper construction shall provide protection in moderate coastal applications.

   e. E-coated aluminum-fin coils:

      Shall have a flexible epoxy polymer coating uniformly applied to all coil surface areas without material bridging between fins. Coating process shall ensure complete coil encapsulation. Color shall be high gloss black with gloss — 60° of 65-90% per ASTM D523-89. Uniform dry film thickness from 0.8 to 1.2 mil on all surface areas including fin edges. Superior hardness characteristics of 2H per ASTM D3363-92A and cross hatch adhesion of 4B-5B per ASTM D3359-93. Impact resistance shall be up to 160 in./lb (ASTM D2794-93). Humidity and water immersion resistance shall be up to minimum 1000 and 250 hours respectively (ASTM D2247-92 and ASTM D870-92). Corrosion durability shall be confirmed through testing to no less than 3000 hours salt spray per ASTM B117-90. Coil construction shall be aluminum fins mechanically bonded to copper tubes.

   f. E-coated copper-fin coils:

      Shall have a flexible epoxy polymer coating uniformly applied to all coil surface areas without material bridging between fins. Coating process shall ensure complete coil encapsulation. Color shall be high gloss black with gloss — 60° of 65-90% per ASTM D523-89. Uniform dry film thickness from 0.8 to 1.2 mil on all surface areas including fin edges. Superior hardness characteristics of 2H per ASTM D3363-92A and cross hatch adhesion of 4B-5B per ASTM D3359-93. Impact resistance shall be up to 160 in./lb (ASTM D2794-93). Humidity and water immersion resistance shall be up to minimum 1000 and 250 hours respectively (ASTM D2247-92 and ASTM D870-92). Corrosion durability shall be confirmed through testing to no less than 3000 hours salt spray per ASTM B117-90. Coil construction shall be copper-fins mechanically bonded to copper tube sheets. Galvanized steel tube sheets shall not be acceptable. A polymer strip shall prevent coil assembly from contacting sheet metal coil pan to maintain coating integrity and minimize corrosion potential between the coil and pan.

5. Chillervisor System Manager III Multi-Unit Control:

   Field-installed control shall sequence 2 chillers in series, or between 2 and 8 chillers in parallel in a single system.

6. Energy Management Module:

   A field-installed module shall provide the following energy management capabilities: 4 to 20 mA signals for leaving fluid temperature reset, cooling set point reset or demand limit control; 2-step demand limit control (from 0% to 100%) activated by a remote contact closure; and discrete input for “Ice Done” indication for ice storage system interface.

7. Condenser Coil Trim Panels:

   Unit shall be supplied with field-installed coil covers.

8. BACnet[1] Communication:

   Shall provide pre-programmed field-installed communication capability with a BACnet MS/TP network. Allows integration with i-Vu® Open control system or a third-party BACnet building automation system. No field programming shall be required.

9. BACnet/Modbus[2] Translator Control:

   Unit shall be supplied with field-installed interface between the chiller and a BACnet Local Area Network (LAN, i.e., MS/TP EIA-485). Field programming shall be required.

10. LON Translator Control:

    Unit shall be supplied with field-installed interface between the chiller and a Local Operating Network (LON; i.e., LonWorks[3] FT-10A ANSI/EIA-709.1). Field programming shall be required.

11. Navigator™ hand-held portable display:

    a. Portable hand-held display module with a minimum of 4 lines and 20 characters per line, or clear English, Spanish, Portuguese or French language.

    b. Display menus shall provide clear language descriptions of all menu items, operating modes, configuration points and alarm diagnostics. Reference to factory codes shall not be accepted.

    c. RJ-14 connection plug shall allow display module to be connected to factory-installed receptacle.

    d. Industrial grade coiled extension cord shall allow the display module to be moved around the chiller.

    e. Magnets shall hold the display module to any sheet metal panel to allow hands-free operation.

    f. Display module shall have NEMA 4x housing suitable for use in outdoor environments.

    g. Display shall have backlight and contrast adjustment for easy viewing in bright sunlight or night conditions.

    h. Raised surface buttons with positive tactile response.

12. Touch Pilot™ Display:

    Unit shall be supplied with a field-installed, remote-mount, touch screen display for network attachment to the chiller. The Touch Pilot display provides information in clear English, Spanish, Portuguese, or French language.

13. Isolation Valve Option:

    Unit shall be supplied with factory-installed isolation valve which provides a means of isolating the compressors from the cooler vessel, which is beneficial in servicing the chiller. The isolation option comes in various configurations depending on the cooler type (flooded or DX) and the installation region (Middle Eastern or elsewhere). On all units equipped with the flooded cooler which are not installed in the Middle East region, a liquid line service valve and a motorized discharge isolation valve are always provided per refrigerant circuit. For Middle Eastern regions only, a manual discharge valve is standard and a motorized discharge ball valve is optional. On units equipped with the optional DX cooler, the liquid line service valve and a manual discharge service valve is included in the isolation valve option, regardless of the region of installation. Regardless of which cooler option is employed, the selection of the isolation valve option results in chillers which are equipped with a liquid line service valve, a discharge service valve (motorized or manual type), and a series of valves on or near the cooler. The net effect is to provide isolation capability in the condenser area, the cooler area and the compressor area.

    NOTE: The only situation in which the isolation of the condenser area allows the full charge to be stored in the condenser is when round tube, plate fin (RTPF) coils are employed.

14. Suction Line Insulation:

    Unit shall be supplied with suction line insulation. Insulation shall be tubular closed-cell insulation. This option shall be required with applications with leaving fluid temperatures below 30°F (–1.1°C) and recommended for areas of high dewpoints where condensation may be a concern.

15. Remote Service Port:

    Shall be a field-installed receptacle for Navigator device connection.

16. Wye-Delta Starter:

    Unit shall have a factory-installed, wye-delta start to minimize electrical inrush current.

17. GFI Convenience Outlet:

    Shall be field-installed and mounted with easily accessible 115-v female receptacle. Shall include 4 amp GFI (ground fault interrupt) receptacle. Not available with 380-v units.

18. Plus-One-Pass Cooler (Flooded Coolers Only):

    Unit shall be equipped with plus-one-pass cooler heads to be used with high delta T application. This option is not available on unit sizes 401-501.

1. BACnet is a registered trademark of ASHRAE (American Society of Heating, Refrigerating and Air-Conditioning Engineers).
2. Modbus is a registered trademark of Schneider Electric.
3. LonWorks is a registered trademark of Echelon Corporation.

Guide specifications (cont)

19. Minus-One-Pass Cooler (Flooded Coolers Only):

    Unit shall be equipped with minus-one-pass cooler heads with reduced water-side pressure drop for series flow dual chiller control or high chilled water flow applications.

20. High Ambient Temperature:

    Unit shall be equipped with high speed condenser fan motors to improve performance at high ambient temperatures. This option shall be required for 30XA401-501 chillers, and it is also required for all 30XA401-501 chillers which are operating in multi-chiller configurations or have ambient temperatures at or above 100°F (37.8°C).

21. Security Grilles:

    Unit shall be provided with factory (or field) installed painted grilles to protect the condenser, cooler and compressor.

22. Upper Hail Guard:

    Unit shall be equipped with a factory-installed option consisting of louvered panels on the ends of the machine which firmly fasten to the machine frame. These panels shall cover the unit from the top to the bottom of the coils, thus providing protection of the coils from hail damage.

23. Full Hail Guard:

    Unit shall be equipped with field-installed accessory consisting of hinged, louvered panels, which cover both ends of the unit. This accessory provides complete protection from hail.

24. Full End Screen:

    Unit shall be equipped with a factory-installed option consisting of louvered panels that cover the machine ends from top to bottom and firmly fasten to the machine frame. These end screens function as a privacy screen and also provide hail protection.

25. Low Sound Package:

    Unit shall be provided with sound attenuation package to include sheet metal enclosures with sound absorbing panels for each compressor.

26. Remote Cooler Kit:

    Allows remote installation of the cooler. This is not available on sizes 401-501.

27. Minimum Load Control:

    Unit shall be equipped with microprocessor-controlled minimum load control that shall permit unit operation below the minimum standard operation (varies by unit size).

28. Dual Chiller Accessory Kit:

    For dual chiller applications (with units piped in parallel), unit shall be provided with the additional hardware (thermistors, wells, connectors) required for proper system operation.

29. Seismic Certification:

    A seismic kit is available which will result in a unit SDS (seismic design acceleration parameter) level of 2.4.

Pg 92 Catalog No. 04-52300112-01 Printed in U.S.A. Form 30XA-20PD
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