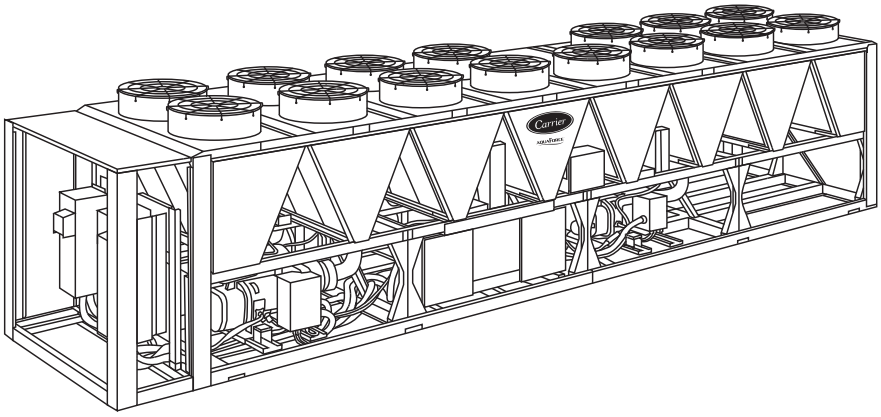
Carrier
United Technologies

Product Data

AquaForce® 30XA140-352 Variable Speed Air-Cooled Liquid Chillers with Greenspeed® Intelligence

140 to 350 Nominal Tons
(490 to 1230 Nominal kW)

greenspeed AQUAFORCE



ASHRAE 90.1 COMPLIANT

Well exceeds ASHRAE 90.1 Standards.

SEISMICOMPLIANT*

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

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 Touch Pilot™ controls
- Greenspeed intelligence, featuring high-efficiency variable-speed screw compressors and variable-speed condenser fans.

Features/Benefits

AquaForce 30XA chillers with Greenspeed intelligence provide best full load and part load performance in a single chassis from 140 to 350 tons

Premium performance

Aqua series chillers with Greenspeed intelligence are Carrier's most efficient air-cooled models. The AquaForce chiller is one of the most affordable air-cooled chillers to operate and maintain. The AquaForce chiller with Greenspeed intelligence offers full load EER (Energy Efficiency Ratio) up to 10.9 and IPLV (Integrated Part Load Value) up to 18.1 with Novation heat exchanger technology. High-efficiency, variable-speed rotary screw compressors with Greenspeed intelligence allow the chillers to exactly match actual load conditions, delivering exceptional part load performance.

Features/Benefits (cont)

The AquaForce® chillers with Greenspeed® intelligence deliver superior efficiency through the entire operating range to keep costs and demand charges down. This exceptional performance has a significant impact on energy savings and cost of ownership.

AquaForce chillers' quiet operation makes 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. The AquaForce chiller's AeroAcoustic™ fan is almost twice as quiet per cfm as the competition. In part load operation, such as cooler weather or night time duty, the fans operate at lower speed. This results in even quieter operation.

30XA chillers with Greenspeed intelligence feature high-efficiency, variable-speed screw compressors along with high-efficiency, variable-speed condenser fans combined with fine-tuned Touch Pilot™ controls. Together, this combination of features provides premium part load efficiency to facilitate reduced utility costs over the lifespan of the chiller. Additionally, the use of variable-speed technology results in lower sound levels at part load operating conditions, and this can be very beneficial for sensitive acoustic applications.

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 F (52 C), with a combination of options and control methods. The following features are also provided to help ensure reliable performance:

Capacity Recovery™ feature reduces capacity recovery time. With the rise in data centers and critical cooling applications, focus has increased on capacity recovery times for chiller products. Capacity recovery is defined as the time it takes to reach 100% capacity after power is restored to the chiller, given that the full cooling load is present. Capacity recovery times are the critical factor to consider in data centers due to the consistently high loads in the space and the need to maintain the temperatures. Carrier now offers the Capacity Recovery™ feature, a standard capacity control feature that can reduce the capacity recovery time to less than 5 minutes for the 30XA chiller with Greenspeed® intelligence. Other manufacturers often discuss restart time without providing the details of how long it takes to reach full capacity, but the achievement of full capacity is critical to the end user. Capacity recovery is described in greater detail in the Application data section on page 90.

Standard DC link reactor is included in all drives for the fans and main compressor motors. The use of this component mitigates customer concern over electrical system harmonics, and therefore AC line reactors should not be required for applications employing 30XA chillers with Greenspeed intelligence.

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.

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*, efficient and environmentally balanced refrigerant.

Easy installation

A single chassis design provides a one-piece unit from 140 to 352 tons. The base rail is industrial-quality cold-rolled steel for maximum structural integrity. The base rail is 7 ga with RTPF (round tube, plate fin) coils or MCHX (microchannel) coils. 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.

Touch Pilot controls for ease of use

The Touch Pilot controls communicate in easy to understand English, making it as easy as possible to monitor and control each AquaForce chiller with Greenspeed intelligence while accurately maintaining fluid temperatures. Touch Pilot controls are also available with French, Portuguese and Spanish as a standard configuration option. Carrier's 30 Series chillers' Touch Pilot 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.

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

Table of contents

The user interface comes with a standard 7-in. Touch Pilot display with chiller pictorial. The Touch Pilot display is an easy-to-use touch screen that provides simple navigation for configuration and control of AquaForce units.

The display can be used by the touch of a finger or by employing a factory-provided stylus. The Touch Pilot display helps technicians quickly diagnose chiller issues and help prevent problems from occurring. All AquaForce units are ready for use with Carrier Comfort Network® (CCN) devices.

A BACnet*/Modbus† Translator control as well as a LON (local operating network) Translator control is available as either a factory-installed option or a field-installed accessory. These devices, when provided with appropriate field programming, allow interface between the network and the 30XA chiller with Greenspeed intelligence.

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 8,000-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 the requested data, the E-CAT program output will advise the appropriate coil to be used.

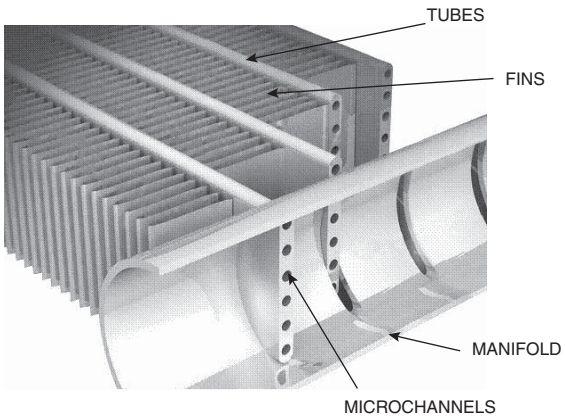
Other factors described in "Selection Guide: Environmental Corrosion Protection" catalog number 04-581061-01 must also be considered to determine if corrosion protection is required.

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

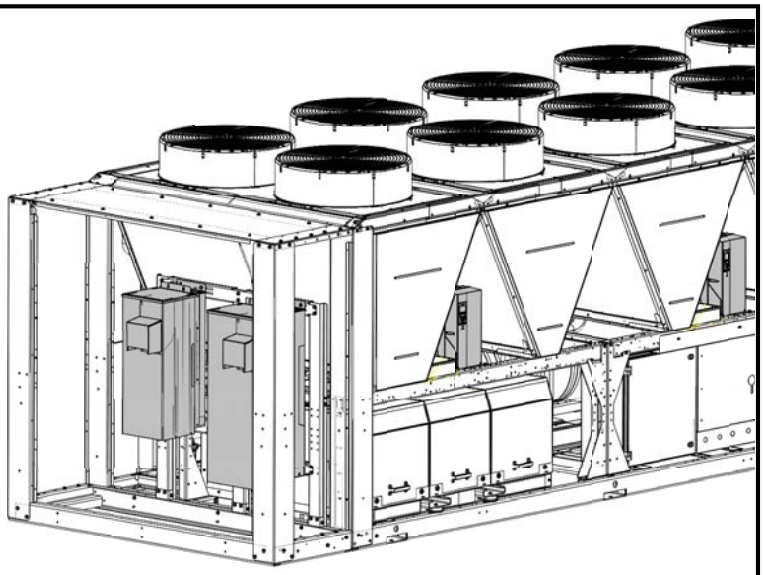
Due to the compact all-aluminum design, microchannel coils will reduce overall unit operating weight by 6 to 7%. The streamlined MCHX coil design reduces refrigerant charge by up to 30%.

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.

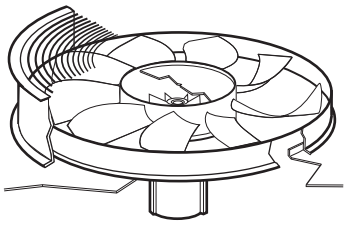
TOUCH PILOT™ DISPLAY



NOVATION® HEAT EXCHANGER TECHNOLOGY WITH MICROCHANNEL CONDENSER COILS



COMPRESSOR AND FAN VARIABLE FREQUENCY DRIVE (VFD) STANDARD ON ALL UNITS



LOW-NOISE AEROACOUSTIC™ FAN

*Sponsored by ASHRAE (American Society of Heating, Refrigerating, and Air-Conditioning Engineers).

†Registered trademark of Schneider Electric.

Model number nomenclature

30XA B 200 F 4 - 0 - - - L

30XA – AquaForce® Air-Cooled Chiller

Design Series

Unit Sizes*

140	182	240	282	350
142	200	242	300	352
160	202	260	202	
162	220	262	325	
180	222	280	327	

Voltage
A – 575-3-60
B – 380-3-60
F – 460-3-60

Condenser Coil/Low Sound Options
- – Aluminum Fin/Copper Tube
0 – Copper Fin/Copper Tube
1 – Aluminum Pre-Coat Fin/Copper Tube
2 – Aluminum E-Coat Fin/Copper Tube
3 – Copper E-Coat Fin/Copper Tube
4 – Novation® Heat Exchanger (MCHX)
5 – MCHX E-Coat
6 – Aluminum Fin/Copper Tube, Low Sound
7 – Copper Fin/Copper Tube, Low Sound
8 – Aluminum Pre-Coat Fin/Copper Tube, Low Sound
9 – Aluminum E-Coat Fin/Copper Tube, Low Sound
B – Copper E-Coat Fin/Copper Tube, Low Sound
C – MCHX,Low Sound
D – MCHX E-Coat, Low Sound

Hydronic Pump Package Options
- – None

Cooler Options
- – Flooded or DX Cooler without Heater†
0 – Flooded or DX Cooler with Heater
3 – Flooded Cooler with Heater, Minus One Pass
5 – Flooded Cooler with Heater, Plus One Pass
7 – Flooded or DX Cooler with Heater, Full End Screen
G – Flooded or DX Cooler without Heater, Full End Screen†
K – Flooded Cooler with Heater, Minus One Pass, Full End Screen
M – Flooded Cooler with Heater, Plus One Pass, Full End Screen

Packaging/Security Options
0 – Coil Face Shipping Protection (CFSP), Skid
1 – CFSP, Export Packaging (Skid, Bag)
3 – CFSP, Coil Trim Panels
4 – CFSP, Skid, Coil Trim Panels
5 – CFSP, Export Packaging (Skid, 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, Export Packaging (Skid, 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, Export Packaging (Skid, Bag), Coil Trim Panels, Upper and Lower Grilles, Upper Hail Guards
L – CFSP

Controls/Communication Options
- – Touch Pilot™ Display
0 – Touch Pilot Display, EMM
7 – Touch Pilot Display, BACnet/Modbus Translator
8 – Touch Pilot Display, BACnet/Modbus Translator, EMM
H – Touch Pilot Display, LON Translator
J – Touch Pilot Display, LON Translator, EMM

Electrical Options
- – Single Point Power, VFD Start, Terminal Block No Control Transformer
3 – Dual Point Power, VFD Start, Terminal Block, No Control Transformer
7 – Single Point Power, VFD Start, Disconnect, No Control Transformer
C – Dual Point Power, VFD Start, Disconnect, No Control Transformer
H – Single Point Power, VFD Start, Terminal Block, Control Transformer
M – Dual Point Power, VFD Start, Terminal Block, Control Transformer
R – Single Point Power, VFD Start, Disconnect, Control Transformer
W – Dual Point Power, VFD Start, Disconnect, Control Transformer

Refrigeration Circuit Options
- – None
0 – Suction Line Insulation
1 – Isolation Valves
3 – Suction Line Insulation, Isolation Valves
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)**

LEGEND

CFSP — Coil Face Shipping Protection
DX — Direct Expansion
EMM — Energy Management Module
LON — Local Operating Network
MCHX — Microchannel Heat Exchanger
VFD — Variable Frequency Drive

* Unit sizes ending in 0 or 5 have flooded coolers. Unit sizes ending in 2 or 7 have direct expansion (DX) coolers.
†Flooded cooler without heater available in Middle East only.
**Available in Middle East only.

Quality Assurance
Certified to ISO 9001

AHRI* capacity ratings (English and SI)

UNITS WITH AL/CU CONDENSER COILS

30XA UNIT SIZE	CAPACITY		TOTAL POWER (kW)	FULL LOAD		IPLV		COOLER FLOW RATE		COOLER PRESSURE DROP	
	Tons	kW		EER	COP	EER	COP	GPM	L/s	ft wg	kPa
140	131.7	463.1	149.5	10.6	3.1	17.3	5.1	316.0	19.9	13.1	39.1
160	149.5	525.7	175.2	10.2	3.0	17.4	5.1	358.8	22.6	12.7	37.9
180	169.2	595.2	190.0	10.7	3.1	17.3	5.1	406.2	25.6	15.2	45.4
200	190.2	669.0	220.8	10.3	3.0	17.5	5.1	456.5	28.8	12.8	38.1
220	211.9	745.1	242.7	10.5	3.1	17.2	5.1	508.5	32.1	15.5	46.5
240	225.4	792.7	264.0	10.2	3.0	17.5	5.1	540.9	34.1	17.4	52.1
260	251.4	884.1	284.4	10.6	3.1	17.8	5.2	603.3	38.1	10.3	30.8
280	266.0	935.5	303.9	10.5	3.1	17.7	5.2	638.4	40.3	11.4	34.0
300	281.3	989.2	327.9	10.3	3.0	17.8	5.2	675.0	42.6	12.6	37.8
325	304.2	1069.8	347.5	10.5	3.1	17.8	5.2	730.0	46.1	13.3	39.8
350	320.7	1127.9	367.2	10.5	3.1	17.9	5.2	769.7	48.6	14.7	43.8

UNITS WITH MCHX CONDENSER COILS

MCHX COILS 30XA UNIT SIZE	CAPACITY		TOTAL POWER (kW)	FULL LOAD		IPLV		COOLER FLOW RATE		COOLER PRESSURE DROP	
	Tons	kW		EER	COP	EER	COP	GPM	L/s	ft wg	kPa
140	132.6	466.4	147.2	10.8	3.2	17.5	5.1	318.3	20.1	13.2	39.6
160	150.6	529.5	172.7	10.5	3.1	17.7	5.2	361.4	22.8	12.8	38.4
180	170.4	599.3	187.0	10.9	3.2	17.5	5.1	409.0	25.8	15.4	46.0
200	191.5	673.6	217.9	10.5	3.1	17.8	5.2	459.7	29.0	12.9	38.6
220	213.5	750.8	238.8	10.7	3.1	17.5	5.1	512.4	32.3	15.8	47.1
240	227.1	798.7	259.7	10.5	3.1	17.8	5.2	545.1	34.4	17.7	52.8
260	252.6	888.4	281.5	10.8	3.2	17.9	5.2	606.2	38.2	10.4	31.1
280	267.3	940.3	300.5	10.7	3.1	17.8	5.2	641.6	40.5	11.5	34.3
300	282.6	993.8	324.8	10.4	3.1	18.0	5.3	678.2	42.8	12.7	38.1
325	305.1	1073.1	345.0	10.6	3.1	17.9	5.3	732.3	46.2	13.4	40.0
350	321.6	1130.9	365.1	10.6	3.1	18.1	5.3	771.8	48.7	14.7	44.1

LEGEND

AL — Aluminum
COP — Coefficient of Performance
CU — Copper
EER — Energy Efficiency Ratio
IPLV — Integrated Part Load Value
MCHX — Microchannel Heat Exchanger

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

NOTES:
1. Rated in accordance with AHRI Standard 550/590 at standard rating conditions.
2. Standard rating conditions are as follows:
   Cooler Conditions:
   Leaving water temperature: 44 F (6.7 C)
   Flow rate: 2.4 gpm/ton (0.043 l/s per kW)
   Fouling Factor:
   0.00010 hr x sq ft °F/Btu (0.000018 m^2 x °C/W)
   Condenser Conditions:
   Entering air temperature: 95 F (35 C)
3. Units configured with no suction service valve or suction line insulation.
4. Unit performances will vary depending on the options configured. All data in the above tables was generated in Packaged Chiller Builder version 3.49h. Refer to the latest version of the Packaged Chiller Builder for the most up-to-date data.

AHRI CERTIFIED®
www.ahridirectory.org
Air-Cooled Chillers
AHRI Standards 550/590 and 551/591

Physical data

30XA140-220, FLOODED COOLER — ENGLISH

UNIT 30XA WITH FLOODED COOLER	140	160	180	200	220
OPERATING WEIGHT (lb)*					
Al-Cu Condenser Coils	12,390	12,633	14,476	14,598	15,613
Cu-Cu Condenser Coils	13,596	13,839	15,923	16,045	17,181
MCHX Condenser Coils	11,653	11,885	13,585	13,696	14,634
REFRIGERANT TYPE	R-134a, EXV Controlled System				
Refrigerant Charge (lb) Ckt A/Ckt B	202/121	225/159	205/205	225/225	270/225
Refrigerant Charge (lb) Ckt A/Ckt B (MCHX)	128/90	126/94	132/132	152/152	159.5/152
COMPRESSORS	Semi-Hermetic Twin Rotary Screws				
Quantity	2	2	2	2	2
Speed (rpm)	3500				
(Qty) Compressor Model Number Ckt A	(1) 06TT-266	(1) 06TT-301	(1) 06TT-266	(1) 06TT-301	(1) 06TT-356
(Qty) Compressor Model Number Ckt B	(1) 06TS-155	(1) 06TS-186	(1) 06TT-266	(1) 06TT-301	(1) 06TT-301
Oil Charge (gal), Ckt A/Ckt B	6.25/5.5	6.25/5.5	6.25/6.25	6.25/6.25	6.75/6.25
Minimum Capacity Step (%)	12	12	12	12	12
COOLER	Flooded, Shell and Tube Type				
Net Fluid Volume (gal.)	25.5	27.5	31.5	34.0	37.0
Maximum Refrigerant Pressure (psig)	220	220	220	220	220
Maximum Water-Side Pressure without Pumps (psig)	300	300	300	300	300
WATER CONNECTIONS					
Drain (NPT, in.)	3/8	3/8	3/8	3/8	3/8
Standard, Inlet and Outlet, Victaulic (in.)	5	5	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)	1140	1140	1140	1140	1140
No. Blades...Diameter (in.)	9...30	9...30	9...30	9...30	9...30
No. Fans (Ckt A/Ckt B)	6/4	6/4	6/6	6/6	7/6
Total Airflow (cfm)	124,000	124,000	148,800	148,800	161,200
CONDENSER COILS					
No. Coils (Ckt A/Ckt B)	6/4	6/4	6/6	6/6	7/6
Total Face Area (sq ft)	234	234	281	281	305
CHASSIS DIMENSIONS (ft-in.)					
Length	22-0		25-11		29-10
Width	7-4 3/4				
Height	7-6 7/16				

LEGEND

Cu — Copper
Al — Aluminum
EXV — Electronic Expansion Valve
MCHX — Microchannel Heat Exchanger

*Operating weights include coil trim panels. See pages 14-19 for mounting weight details.

30XA240-350, FLOODED COOLER — ENGLISH

UNIT 30XA WITH FLOODED COOLER	240	260	280	300	325	350
OPERATING WEIGHT (lb)*						
Al-Cu Condenser Coils	15,773	17,930	18,099	18,439	20,102	20,308
Cu-Cu Condenser Coils	17,341	19,739	19,908	20,369	22,273	22,479
MCHX Condenser Coils	14,783	16,797	16,955	17,218	18,735	18,927
REFRIGERANT TYPE	R-134a, EXV Controlled System					
Refrigerant Charge (lb) Ckt A/Ckt B	270/270	375/220	375/270	415/270	375/375	415/375
Refrigerant Charge (lb) Ckt A/Ckt B (MCHX)	159.5/159	233.5/156	226.5/159.5	230/161	226.5/226.5	231.5/226.5
COMPRESSORS	Semi-Hermetic Twin Rotary Screws					
Quantity	2	2	2	2	2	2
Speed (rpm)	3500					
(Qty) Compressor Model Number Ckt A	(1) 06TT-356	(1) 06TU-483	(1) 06TU-483	(1) 06TU-554	(1) 06TU-483	(1) 06TU-554
(Qty) Compressor Model Number Ckt B	(1) 06TT-356	(1) 06TT-301	(1) 06TT-356	(1) 06TT-356	(1) 06TU-483	(1) 06TU-483
Oil Charge (gal), Ckt A/Ckt B	6.75/6.75	7.5/6.75	7.5/6.75	7.5/6.75	7.5/7.5	7.5/7.5
Minimum Capacity Step (%)	12	12	12	12	12	12
COOLER	Flooded, Shell and Tube Type					
Net Fluid Volume (gal.)	39.0	42.0	44.0	48.5	50.5	53.4
Maximum Refrigerant Pressure (psig)	220	220	220	220	220	220
Maximum Water-Side Pressure without Pumps (psig)	300	300	300	300	300	300
WATER CONNECTIONS						
Drain (NPT, in.)	3/8	3/8	3/8	3/8	3/8	3/8
Standard, Inlet and Outlet, Victaulic (in.)	6	8	8	8	8	8
Number of Passes	2	2	2	2	2	2
Minus 1 Pass, Inlet and Outlet, Victaulic (in.)	8	8	8	8	8	8
Number of Passes	1	1	1	1	1	1
Plus 1 Pass, Inlet and Outlet, Victaulic (in.)	6	8	8	8	8	8
Number of Passes	3	3	3	3	3	3
CONDENSER FANS	Shrouded Axial Type, Vertical Discharge					
Fan Speed (rpm)	1140	1140	1140	1140	1140	1140
No. Blades...Diameter (in.)	9...30	9...30	9...30	9...30	9...30	9...30
No. Fans (Ckt A/Ckt B	7/6	9/6	9/7	10/6	9/9	9/9
Total Airflow (cfm)	161,200	186,000	198,400	198,400	223,200	223,200
CONDENSER COILS						
No. Coils (Ckt A/Ckt B	7/6	9/6	9/7	10/6	9/9	9/9
Total Face Area (sq ft)	305	352	375	375	422	422
CHASSIS DIMENSIONS (ft-in.)						
Length	29-10	33-9			37-8	
Width	7-4 3/4					
Height	7-6 7/16					

LEGEND

Cu — Copper
Al — Aluminum
EXV — Electronic Expansion Valve
MCHX — Microchannel Heat Exchanger

*Operating weights include coil trim panels. See pages 14-19 for mounting weight details.

Physical data (cont)

30XA142-242, DX COOLER — ENGLISH

UNIT 30XA WITH DX COOLER	142	162	182	202	222	242
OPERATING WEIGHT (lb)*						
Al-Cu Condenser Coils	12,847	13,059	14,821	14,900	15,957	16,117
Cu-Cu Condenser Coils	14,052	14,265	16,268	16,347	17,525	17,685
MCHX Condenser Coils	12,110	12,311	13,930	13,998	14,978	15,127
REFRIGERANT TYPE	R-134a, EXV Controlled System					
Refrigerant Charge (lb) Ckt A/Ckt B	177/103	201/126	181/181	201/201	246/198	246/246
Refrigerant Charge (lb) Ckt A/Ckt B (MCHX)	101/59	102/61	131/131	123/123	135/125	135/135
COMPRESSORS	Semi-Hermetic Twin Rotary Screws					
Quantity	2	2	2	2	2	2
Speed (rpm)	3500					
(Qty) Compressor Model Number Ckt A	(1) 06TT-266	(1) 06TT-301	(1) 06TT-266	(1) 06TT-301	(1) 06TT-356	(1) 06TT-356
(Qty) Compressor Model Number Ckt B	(1) 06TS-155	(1) 06TS-186	(1) 06TT-266	(1) 06TT-301	(1) 06TT-301	(1) 06TT-356
Oil Charge (gal), Ckt A/Ckt B	6.25/5.5	6.25/5.5	6.25/6.25	6.25/6.25	6.75/6.25	6.75/6.75
Minimum Capacity Step (%)	12	12	12	12	12	12
COOLER	Direct Expansion					
Net Fluid Volume (gal.)	63.5	63.5	73.5	73.5	71.0	71.0
Maximum Refrigerant Press. (psig)	220	220	220	220	220	220
Maximum Water-Side Press. without Pumps (psig)	300	300	300	300	300	300
WATER CONNECTIONS						
Drain (NPT, in.)	3/4	3/4	3/4	3/4	3/4	3/4
Standard, Inlet and Outlet, Victaulic (in.)	6	6	6	6	6	6
Number of Passes	—	—	—	—	—	—
Minus 1 Pass, Inlet and Outlet, Victaulic (in.)	—	—	—	—	—	—
Number of Passes	—	—	—	—	—	—
Plus 1 Pass, Inlet and Outlet, Victaulic (in.)	—	—	—	—	—	—
Number of Passes	—	—	—	—	—	—
CONDENSER FANS	Shrouded Axial Type, Vertical Discharge					
Fan Speed (rpm)	1140	1140	1140	1140	1140	1140
No. Blades...Diameter (in.)	9...30	9...30	9...30	9...30	9...30	9...30
No. Fans (Ckt A/Ckt B)	6/4	6/4	6/6	6/6	7/6	7/6
Total Airflow (cfm)	124,000	124,000	148,800	148,800	161,200	161,200
CONDENSER COILS						
No. Coils (Ckt A/Ckt B)	6/4	6/4	6/6	6/6	7/6	7/6
Total Face Area (sq ft)	234	234	281	281	305	305
CHASSIS DIMENSIONS (ft-in.)						
Length	22-0		25-11		29-10	
Width	7-4 3/4					
Height	7-6 7/16					

LEGEND

Cu — Copper
Al — Aluminum
EXV — Electronic Expansion Valve
MCHX — Microchannel Heat Exchanger

*Operating weights include coil trim panels. See pages 14-19 for mounting weight details.

30XA262-352, DX COOLER — ENGLISH

UNIT 30XA WITH DX COOLER	262	282	302	327	352
OPERATING WEIGHT (lb)*					
Al-Cu Condenser Coils	18,132	18,301	18,911	20,574	20,780
Cu-Cu Condenser Coils	19,941	20,110	20,841	22,745	22,951
MCHX Condenser Coils	16,999	17,157	17,690	19,207	19,399
REFRIGERANT TYPE	R-134a, EXV Controlled System				
Refrigerant Charge (lb) Ckt A/Ckt B	330/206	330/256	386/261	344/344	384/344
Refrigerant Charge (lb) Ckt A/Ckt B (MCHX)	188/142	181/145	201/152	195/195	200/195
COMPRESSORS	Semi-Hermetic Twin Rotary Screws				
Quantity	2	2	2	2	2
Speed (rpm)	3500				
(Qty) Compressor Model Number Ckt A	(1) 06TU-483	(1) 06TU-483	(1) 06TU-554	(1) 06TU-483	(1) 06TU-554
(Qty) Compressor Model Number Ckt B	(1) 06TT-301	(1) 06TT-356	(1) 06TT-356	(1) 06TU-483	(1) 06TU-483
Oil Charge (gal), Ckt A/Ckt B	7.5/6.75	7.5/6.75	7.5/6.75	7.5/7.5	7.5/7.5
Minimum Capacity Step (%)	12	12	12	12	12
COOLER	Direct Expansion				
Net Fluid Volume (gal.)	82.8	82.8	108.0	108.0	108.0
Maximum Refrigerant Press. (psig)	220	220	220	220	220
Maximum Water-Side Press. without Pumps (psig)	300	300	300	300	300
WATER CONNECTIONS					
Drain (NPT, in.)	3/4	3/4	3/4	3/4	3/4
Standard, Inlet and Outlet, Victaulic (in.)	6	6	6	6	6
Number of Passes	—	—	—	—	—
Minus 1 Pass, Inlet and Outlet, Victaulic (in.)	—	—	—	—	—
Number of Passes	—	—	—	—	—
Plus 1 Pass, Inlet and Outlet, Victaulic (in.)	—	—	—	—	—
Number of Passes	—	—	—	—	—
CONDENSER FANS	Shrouded Axial Type, Vertical Discharge				
Fan Speed (rpm)	1140	1140	1140	1140	1140
No. Blades...Diameter (in.)	9...30	9...30	9...30	9...30	9...30
No. Fans (Ckt A/Ckt B)	9/6	9/7	10/6	9/9	9/9
Total Airflow (cfm)	186,000	198,400	198,400	223,200	223,200
CONDENSER COILS					
No. Coils (Ckt A/Ckt B)	9/6	9/7	10/6	9/9	9/9
Total Face Area (sq ft)	352	375	375	442	442
CHASSIS DIMENSIONS (ft-in.)					
Length	33-9			29-10	
Width	7-4 3/4				
Height	7-6 7/16				

LEGEND

Cu — Copper
Al — Aluminum
EXV — Electronic Expansion Valve
MCHX — Microchannel Heat Exchanger

*Operating weights include coil trim panels. See pages 14-19 for mounting weight details.

Physical data (cont)

30XA140-220, FLOODED COOLER — SI

UNIT 30XA WITH FLOODED COOLER	140	160	180	200	220
OPERATING WEIGHT (kg)*					
Al-Cu Condenser Coils	5 620	5 730	6 566	6 622	7 082
Cu-Cu Condenser Coils	6 167	6 277	7 223	7 278	7 793
MCHX Condenser Coils	5 286	5 391	6 162	6 213	6 638
REFRIGERANT TYPE	R-134a, EXV Controlled System				
Refrigerant Charge (kg) Ckt A/Ckt B	92/55	102/72	93/93	102/10	112/102
Refrigerant Charge (kg) Ckt A/Ckt B (MCHX)	58.0/40.8	57.2/42.6	59.9/59.9	68.9/68.9	72.3/68.9
COMPRESSORS	Semi-Hermetic Twin Rotary Screws				
Quantity	2	2	2	2	2
Speed (r/s)			58.3		
(Qty) Compressor Model Number Ckt A	(1) 06TT-266	(1) 06TT-301	(1) 06TT-266	(1) 06TT-301	(1) 06TT-356
(Qty) Compressor Model Number Ckt B	(1) 06TS-155	(1) 06TS-186	(1) 06TT-266	(1) 06TT-301	(1) 06TT-301
Oil Charge (liters), Ckt A/Ckt B	23.7/20.8	23.7/23.7	23.7/23.7	23.7/23.7	25.6/23.7
Minimum Capacity Step (%)	12	12	12	12	12
COOLER	Flooded, Shell and Tube Type				
Net Fluid Volume (liters)	96.5	104.1	119.2	128.7	140.1
Maximum Refrigerant Press. (kPa)	1516.8	1516.8	1516.8	1516.8	1516.8
Maximum Water-Side Press. without Pumps (kPa)	2 068	2 068	2 068	2 068	2 068
WATER CONNECTIONS					
Drain (NPT, in.)	3/8	3/8	3/8	3/8	3/8
Standard, Inlet and Outlet, Victaulic (in.)	5	5	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)	19.0	19.0	19.0	19.0	19.0
No. Blades...Diameter (mm)	9...762	9...762	9...762	9...762	9...762
No. Fans (Ckt A/Ckt B	6/4	6/4	6/6	6/6	7/6
Total Airflow (L/s)	58 522	58 522	70 226	70 226	76 078
CONDENSER COILS					
No. Coils (Ckt A/Ckt B	6/4	6/4	6/6	6/6	7/6
Total Face Area (sq m)	22	22	26	26	28
CHASSIS DIMENSIONS (mm)					
Length	6 693		7 887		9 081
Width	2255				
Height	2300				

LEGEND

Cu — Copper
Al — Aluminum
EXV — Electronic Expansion Valve
MCHX — Microchannel Heat Exchanger

*Operating weights include coil trim panels. See pages 14-19 for mounting weight details.

30XA240-350, FLOODED COOLER — SI

UNIT 30XA WITH FLOODED COOLER	240	260	280	300	325	350
OPERATING WEIGHT (kg)*						
Al-Cu Condenser Coils	7 155	8 133	8 210	8 365	9 118	9 211
Cu-Cu Condenser Coils	7 866	8 954	9 031	9 240	10 103	10 196
MCHX Condenser Coils	6 706	7 619	7 691	7 811	8 498	8 585
REFRIGERANT TYPE	R-134a, EXV Controlled System					
Refrigerant Charge (kg) Ckt A/Ckt B	122.5/122.5	170.1/99.8	170.1/122.5	188.3/122.5	170.1/170.1	188.3/170.1
Refrigerant Charge (kg) Ckt A/Ckt B (MCHX)	72.3/72.1	105.9/70.8	102.7/72.3	104.3/73.0	102.7/102.7	105.0/102.7
COMPRESSORS	Semi-Hermetic Twin Rotary Screws					
Quantity	2	2	2	2	2	2
Speed (r/s)	58.3					
(Qty) Compressor Model Number Ckt A	(1) 06TT-356	(1) 06TU-483	(1) 06TU-483	(1) 06TU-554	(1) 06TU-483	(1) 06TU-554
(Qty) Compressor Model Number Ckt B	(1) 06TT-356	(1) 06TT-301	(1) 06TT-356	(1) 06TT-356	(1) 06TU-483	(1) 06TU-483
Oil Charge (liter), Ckt A/Ckt B	25.6/25.6	28.4/25.6	28.4/25.6	28.4/25.6	28.4/28.4	28.4/28.4
Minimum Capacity Step (%)	12	12	12	12	12	12
COOLER	Flooded, Shell and Tube Type					
Net Fluid Volume (liters)	147.6	159.0	166.6	183.6	191.2	202.1
Maximum Refrigerant Press. (kPa)	1516.8	1516.8	1516.8	1516.8	1516.8	1516.8
Maximum Water-Side Press. without Pumps (kPa)	2 068	2 068	2 068	2 068	2 068	2 068
WATER CONNECTIONS						
Drain (NPT, in.)	3/8	3/8	3/8	3/8	3/8	3/8
Standard, Inlet and Outlet, Victaulic (in.)	6	8	8	8	8	8
Number of Passes	2	2	2	2	2	2
Minus 1 Pass, Inlet and Outlet, Victaulic (in.)	8	8	8	8	8	8
Number of Passes	1	1	1	1	1	1
Plus 1 Pass, Inlet and Outlet, Victaulic (in.)	6	8	8	8	8	8
Number of Passes	3	3	3	3	3	3
CONDENSER FANS	Shrouded Axial Type, Vertical Discharge					
Fan Speed (r/s) Standard	19.0	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
No. Fans (Ckt A/Ckt B)	7/6	9/6	9/7	10/6	9/9	9/9
Total Airflow (L/s)	76 078	87 782	93 634	93 634	93 634	105 339
CONDENSER COILS						
No. Coils (Ckt A/Ckt B)	7/6	9/6	9/7/	10/6	9/9	9/9
Total Face Area (sq m)	28	33	35	35	39	39
CHASSIS DIMENSIONS (mm)						
Length	9 081	10 275			11 469	
Width	2 255					
Height	2 300					

LEGEND

Cu — Copper
Al — Aluminum
EXV — Electronic Expansion Valve
MCHX — Microchannel Heat Exchanger

*Operating weights include coil trim panels. See pages 14-19 for mounting weight details.

Physical data (cont)

30XA142-252, DX COOLER — SI

UNIT 30XA WITH DX COOLER	142	162	182	202	222	242
OPERATING WEIGHT (kg)*						
Al-Cu Condenser Coils	5 827	5 923	6 723	6 759	7 238	7 311
Cu-Cu Condenser Coils	6 374	6 470	7 379	7 415	7 949	8 022
MCHX Condenser Coils	5 493	5 584	6 319	6 350	6 794	6 861
REFRIGERANT TYPE	R-134a, EXV Controlled System					
Refrigerant Charge (kg) Ckt A/Ckt B	80/47	91/57	82/82	91/91	112/90	112/112
Refrigerant Charge (kg) Ckt A/Ckt B (MCHX)	46/27	46/28	51/51	56/56	61/57	61/61
COMPRESSORS	Semi-Hermetic Twin Rotary Screws					
Quantity	2	2	2	2	2	2
Speed (r/s)	58.3					
(Qty) Compressor Model Number Ckt A	(1) 06TT-266	(1) 06TT-301	(1) 06TT-266	(1) 06TT-301	(1) 06TT-356	(1) 06TT-356
(Qty) Compressor Model Number Ckt B	(1) 06TS-155	(1) 06TS-186	(1) 06TT-266	(1) 06TT-301	(1) 06TT-301	(1) 06TT-356
Oil Charge (liter), Ckt A/Ckt B	23.7/20.8	23.7/23.7	23.7/23.7	23.7/23.7	25.6/23.7	25.6/25.6
Minimum Capacity Step (%)	12	12	12	12	12	12
COOLER	Direct Expansion					
Net Fluid Volume (liters)	240	240	278	278	269	269
Maximum Refrigerant Press. (kPa)	1516.8	1516.8	1516.8	1516.8	1516.8	1516.8
Maximum Water-Side Press. without Pumps (kPa)	2 068	2 068	2 068	2 068	2 068	2 068
WATER CONNECTIONS						
Drain (NPT, in.)	3/4	3/4	3/4	3/4	3/4	3/4
Standard, Inlet and Outlet, Victaulic (in.)	6	6	6	6	6	6
Number of Passes	—	—	—	—	—	—
Minus 1 Pass, Inlet and Outlet, Victaulic (in.)	—	—	—	—	—	—
Number of Passes	—	—	—	—	—	—
Plus 1 Pass, Inlet and Outlet, Victaulic (in.)	—	—	—	—	—	—
Number of Passes	—	—	—	—	—	—
CONDENSER FANS	Shrouded Axial Type, Vertical Discharge					
Fan Speed (r/s) Standard	19.0	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
No. Fans (Ckt A/Ckt B)	6/4	6/4	6/6	6/6	7/6	7/6
Total Airflow (L/s)	58 522	58 522	70 226	70 226	76 078	76 078
CONDENSER COILS						
No. Coils (Ckt A/Ckt B)	6/4	6/4	6/6	6/6	7/6	7/6
Total Face Area (sq m)	22	22	26	26	28	28
CHASSIS DIMENSIONS (mm)						
Length	6 693		7 887		9 081	
Width	2 255					
Height	2 300					

LEGEND

Cu — Copper
Al — Aluminum
EXV — Electronic Expansion Valve
MCHX — Microchannel Heat Exchanger

*Operating weights include coil trim panels. See pages 14-19 for mounting weight details.

30XA262-352, DX COOLER — SI

UNIT 30XA WITH DX COOLER	262	282	302	327	352
OPERATING WEIGHT (kg)*					
Al-Cu Condenser Coils	8 225	8 302	8 578	9 332	9 425
Cu-Cu Condenser Coils	9 045	9 122	9 454	10 317	10 410
MCHX Condenser Coils	7 711	7 783	8 024	8 712	8 799
REFRIGERANT TYPE	R-134a, EXV Controlled System				
Refrigerant Charge (kg) Ckt A/Ckt B	150/93	150/116	175/118	156/156	174/156
Refrigerant Charge (kg) Ckt A/Ckt B (MCHX)	85/64	82/66	175/118	88/88	91/88
COMPRESSORS	Semi-Hermetic Twin Rotary Screws				
Quantity	2	2	2	2	2
Speed (r/s)	58.3				
(Qty) Compressor Model Number Ckt A	(1) 06TU-483	(1) 06TU-483	(1) 06TU-554	(1) 06TU-483	(1) 06TU-554
(Qty) Compressor Model Number Ckt B	(1) 06TT-301	(1) 06TT-356	(1) 06TT-356	(1) 06TU-483	(1) 06TU-483
Oil Charge (liter), Ckt A/Ckt B	28.4/25.6	28.4/25.6	28.4/25.6	28.4/28.4	28.4/28.4
Minimum Capacity Step (%)	12	12	12	12	12
COOLER	Direct Expansion				
Net Fluid Volume (liters)	313	313	409	409	409
Maximum Refrigerant Press. (kPa)	1516.8	1516.8	1516.8	1516.8	1516.8
Maximum Water-Side Press. without Pumps (kPa)	2 068	2 068	2 068	2 068	2 068
WATER CONNECTIONS					
Drain (NPT, in.)	3/4	3/4	3/4	3/4	3/4
Standard, Inlet and Outlet, Victaulic (in.)	6	6	6	6	6
Number of Passes	—	—	—	—	—
Minus 1 Pass, Inlet and Outlet, Victaulic (in.)	—	—	—	—	—
Number of Passes	—	—	—	—	—
Plus 1 Pass, Inlet and Outlet, Victaulic (in.)	—	—	—	—	—
Number of Passes	—	—	—	—	—
CONDENSER FANS	Shrouded Axial Type, Vertical Discharge				
Fan Speed (r/s) Standard	19.0	19.0	19.0	19.0	19.0
No. Blades...Diameter (mm)	9...762	9...762	9...762	9...762	9...762
No. Fans (Ckt A/Ckt B)	9/6	9/7	10/6/	9/9	9/9
Total Airflow (L/s)	87 782	93 634	93 634	93 634	105 339
CONDENSER COILS					
No. Coils (Ckt A/Ckt B)	9/6	9/7	10/6	9/9	9/9
Total Face Area (sq m)	33	35	35	39	39
CHASSIS DIMENSIONS (mm)					
Length		10 275		11 469	
Width			2 255		
Height			2 300		

LEGEND

Cu — Copper
Al — Aluminum
EXV — Electronic Expansion Valve
MCHX — Microchannel Heat Exchanger

*Operating weights include coil trim panels. See pages 14-19 for mounting weight details.

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	E	F	G	H	Total
140	1897	1444	864	1525	1561	982	1683	1699	11,653
142	1977	1505	901	1575	1613	1019	1750	1771	12,110
160	1949	1469	878	1550	1590	998	1702	1750	11,885
162	2024	1526	912	1597	1638	1033	1764	1818	12,311

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	1527	1564	1937	909	1358	888	13,585
182	930	1524	1196	1899	1559	1597	1988	932	1393	912	13,930
200	909	1499	1188	1870	1532	1572	1948	917	1368	893	13,696
202	930	1534	1216	1914	1560	1601	1992	937	1399	914	13,998

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	1556	1599	900	1415	1115	1289	832	14,634
222	833	1226	1632	1535	849	1586	1630	921	1449	1143	1320	853	14,978
240	829	1218	1617	1520	830	1558	1601	902	1422	1124	1312	849	14,783
242	849	1248	1657	1558	851	1588	1632	923	1457	1152	1343	870	15,127
260	495	1431	1630	763	2465	1423	1938	2444	864	1397	1450	495	16,797
262	501	1449	1651	773	2497	1436	1958	2475	874	1414	1468	501	16,999
280	497	1451	1663	771	2497	1425	1940	2454	867	1422	1470	497	16,955
282	503	1469	1684	781	2529	1438	1959	2484	877	1439	1488	503	17,157
300	502	1465	1686	786	2568	1437	1967	2518	875	1431	1481	502	17,218
302	517	1508	1735	809	2643	1467	2012	2590	899	1471	1522	517	17,690

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	1547	2043	2411	881	1723	1324	742	742	18,735
327	762	762	1004	1572	804	2615	1576	2085	2474	903	1767	1358	762	762	19,207
350	745	745	982	1546	792	2598	1557	2069	2463	885	1728	1326	745	745	18,927
352	765	765	1008	1587	813	2667	1586	2111	2527	907	1772	1359	765	765	19,399

UNITS WITH MCHX CONDENSER COILS — SI

30XA UNIT SIZE	MOUNTING WEIGHT (kg) MCHX CONDENSER COILS								
	A	B	C	D	E	F	G	H	Total
140	860	655	392	692	708	445	763	771	5286
142	897	683	409	714	732	462	794	803	5493
160	884	666	396	703	721	452	772	794	5391
162	918	692	414	724	743	468	800	825	5584

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	693	709	878	412	616	403	6162
182	422	691	542	861	707	724	902	423	632	414	6319
200	412	680	539	848	695	713	883	416	620	405	6212
202	422	696	552	868	708	726	903	425	634	415	6349

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	679	376	706	725	408	642	506	584	377	6638
222	378	556	740	696	385	719	739	418	657	518	599	387	6794
240	376	552	733	689	376	707	726	409	645	510	595	385	6705
242	385	566	752	707	386	720	740	418	661	522	609	395	6862
260	225	649	739	346	1118	645	879	1109	392	634	658	225	7619
262	227	657	749	351	1133	651	888	1123	397	642	666	227	7711
280	225	658	754	350	1133	646	880	1113	393	645	667	225	7691
282	228	666	764	354	1147	652	889	1127	398	653	675	228	7782
300	228	665	765	357	1165	652	892	1142	397	649	672	228	7810
302	235	684	787	367	1199	665	913	1175	408	667	690	235	8024

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	694	355	1155	702	927	1094	400	782	601	337	337	8498
327	346	346	455	713	365	1186	715	946	1122	410	802	616	346	346	8712
350	338	338	445	701	359	1178	706	938	1117	401	784	601	338	338	8585
352	347	347	457	720	369	1210	719	958	1146	411	804	616	347	347	8799

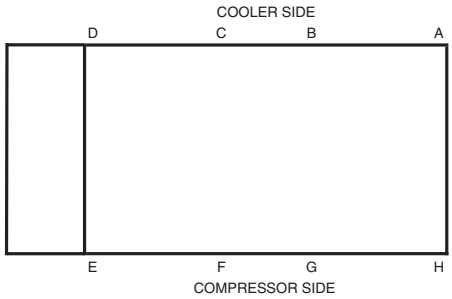
LEGEND

MCHX — Microchannel Heat Exchanger

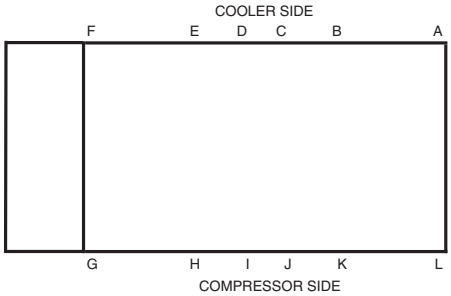
NOTE: See page 15 for mounting weight reference points.

UNIT MOUNTING WEIGHT REFERENCE POINTS (UNITS WITH MCHX CONDENSER COILS)

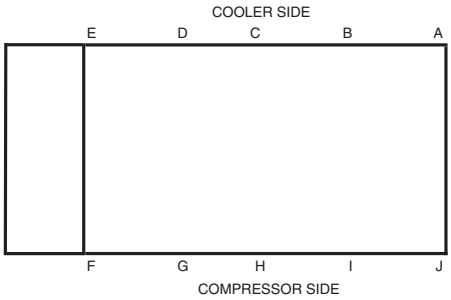
30XA140-162



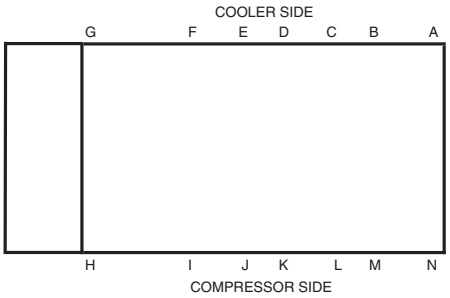
30XA220-302



30XA180-202



30XA325-352



Physical data (cont)

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

30XA UNIT SIZE	MOUNTING WEIGHT (lb) — Al/Cu								
	A	B	C	D	E	F	G	H	Total
140	2007	1554	938	1598	16735	1056	1794	1809	12,390
142	2087	1616	975	1648	1686	1094	1861	1881	12,847
160	2061	1581	953	1625	1665	1073	1814	1862	12,633
162	2136	1638	988	1671	1713	1108	1876	1930	13,059

30XA UNIT SIZE	MOUNTING WEIGHT (lb) — Al/Cu										
	A	B	C	D	E	F	G	H	I	J	Total
180	979	1558	1239	1998	1601	1638	2085	984	1432	962	14,476
182	1004	1598	1270	2049	1633	1671	2136	1007	1467	986	14,821
200	984	1574	1263	2020	1607	1648	2098	992	1444	968	14,598
202	1006	1609	1291	2065	1635	1677	2143	1012	1474	989	14,900

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	1626	1669	970	1520	1221	1359	902	15,613
222	904	1296	1737	1640	919	1656	1700	991	1558	1248	1389	923	15,957
240	900	1288	1723	1626	901	1629	1671	973	1529	1231	1383	920	15,773
242	921	1318	1763	1664	922	1659	1702	994	1563	1258	1414	941	16,117
260	566	1572	1701	834	2607	1494	2009	2585	935	1468	1592	566	17,930
262	573	1591	1721	844	2638	1507	2028	2615	945	1485	1610	573	18,132
280	569	1594	1734	843	2640	1497	2011	2597	939	1493	1613	569	18,099
282	576	1613	1755	853	2671	1510	2030	2627	949	1510	1631	576	18,301
300	578	1617	1762	862	2720	1513	2043	2671	951	1508	1634	578	18,439
302	594	1661	1810	885	2794	1543	2087	2742	975	1547	1677	594	18,911

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	1623	2119	2562	957	1799	1399	856	856	20,102
327	877	877	1080	1647	881	2765	1652	2160	2624	979	1842	1432	877	877	20,574
350	860	860	1059	1623	869	2752	1633	2146	2616	962	1804	1403	860	860	20,308
352	881	881	1085	1663	891	2820	1662	2187	2679	984	1847	1436	881	881	20,780

UNITS WITH Al/Cu CONDENSER COILS — SI

30XA UNIT SIZE	MOUNTING WEIGHT (kg) — Al/Cu								
	A	B	C	D	E	F	G	H	Total
140	910	705	425	725	742	479	814	821	5620
142	947	733	442	748	765	496	844	853	5827
160	935	717	432	737	755	487	823	845	5730
162	969	743	448	758	777	502	851	875	5924

30XA UNIT SIZE	MOUNTING WEIGHT (kg) — Al/Cu										
	A	B	C	D	E	F	G	H	I	J	Total
180	444	707	562	906	726	743	946	446	649	436	6566
182	455	725	576	929	741	758	969	457	665	447	6723
200	446	714	573	916	729	748	952	450	655	439	6622
202	456	730	586	937	742	761	972	459	668	449	6759

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	738	757	440	689	554	616	409	7082
222	410	588	788	744	417	751	771	449	705	566	630	419	7238
240	408	584	782	738	409	739	758	441	693	558	627	417	7155
242	418	598	800	755	418	753	772	451	709	570	641	427	7311
260	257	713	772	378	1183	678	911	1173	424	666	722	257	8133
262	260	722	781	383	1197	684	920	1186	429	674	730	260	8225
280	258	723	787	382	1197	679	912	1178	426	677	732	258	8210
282	261	732	796	387	1212	685	921	1192	431	685	740	261	8301
300	262	733	799	391	1234	686	927	1212	431	684	741	262	8364
302	269	753	821	401	1267	700	947	1244	442	702	761	269	8578

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	1223	736	961	1162	434	816	635	388	388	9118
327	398	398	490	747	400	1254	749	980	1190	444	836	650	398	398	9332
350	390	390	480	736	394	1248	741	973	1187	436	818	636	390	390	9212
352	400	400	492	754	404	1279	754	992	1215	446	838	651	400	400	9426

NOTES
1. Al/Cu condenser coils have aluminum fins/copper tubing.
2. See page 17 for mounting weight reference points.

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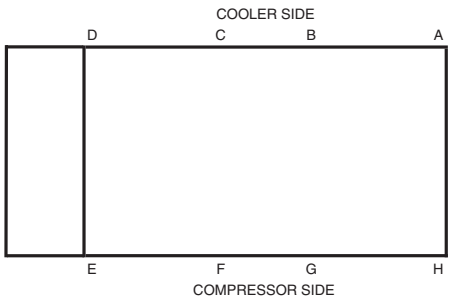
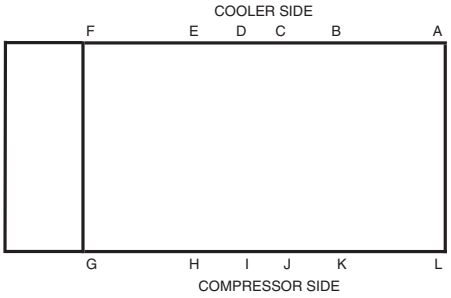
UNIT MOUNTING WEIGHT REFERENCE POINTS (UNITS WITH Al/Cu CONDENSER COILS)

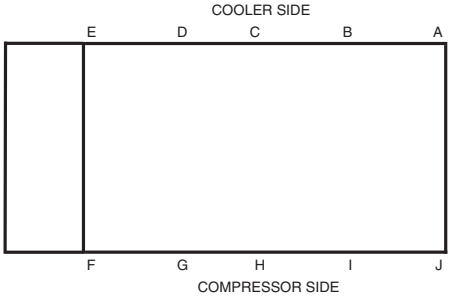
30XA140-162

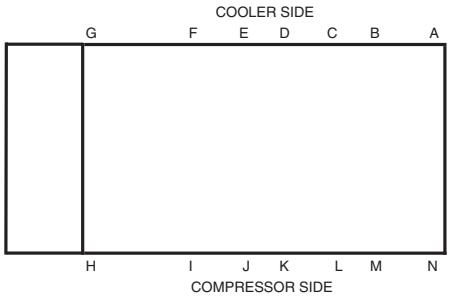




30XA220-302

30XA180-202





30XA325-352

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

30XA UNIT SIZE	MOUNTING WEIGHT (lb) — Cu/Cu								
	A	B	C	D	E	F	G	H	Total
140	2188	1735	1058	1719	1755	1177	1975	1990	13,596
142	2267	1797	1096	1768	1806	1216	2042	2061	14,053
160	2242	1762	1074	1745	1786	1194	1995	2043	13,839
162	2316	1820	1109	1791	1833	1230	2057	2110	14,265

30XA UNIT SIZE	MOUNTING WEIGHT (lb) — Cu/Cu										
	A	B	C	D	E	F	G	H	I	J	Total
180	1099	1679	1359	2239	1722	1759	2327	1104	1552	1083	15,923
182	1124	1717	1390	2290	1754	1792	2379	1128	1586	1108	16,268
200	1105	1695	1384	2261	1728	1768	2340	1113	1564	1089	16,045
202	1127	1729	1412	2306	1756	1796	2385	1134	1594	1111	16,347

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	1738	1781	1082	1688	1389	1471	1014	17,181
222	1016	1407	1904	1808	1031	1767	1811	1104	1723	1417	1501	1035	17,525
240	1012	1400	1891	1794	1013	1741	1783	1085	1697	1399	1495	1032	17,341
242	1033	1429	1930	1831	1034	1770	1813	1107	1731	1427	1525	1054	17,685
260	679	1798	1814	947	2833	1607	2122	2812	1048	1581	1818	679	19,739
262	686	1817	1834	957	2864	1620	2140	2842	1059	1597	1837	686	19,941
280	682	1820	1847	956	2866	1610	2125	2823	1052	1606	1839	682	19,908
282	689	1839	1867	966	2897	1623	2143	2853	1063	1623	1858	689	20,110
300	699	1858	1883	983	2962	1634	2164	2912	1072	1628	1875.3	699	20,369
302	716	1903	1929	1007	3034	1664	2207	2982	1097	1666	1919	716	20,841

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	1743	2240	2804	1078	1919	1520	1037	1037	22,273
327	1060	1060	1201	1767	1002	3005	1771	2280	2865	1100	1960	1552	1060	1060	22,745
350	1041	1041	1180	1743	990	2993	1754	2266	2857	1083	1925	1524	1041	1041	22,479
352	1064	1064	1206	1782	1012	3060	1782	2306	2919	1105	1966	1556	1064	1064	22,951

UNITS WITH Cu/Cu CONDENSER COILS — SI

30XA UNIT SIZE	MOUNTING WEIGHT (kg) — Cu/Cu								
	A	B	C	D	E	F	G	H	Total
140	992	787	480	780	796	534	896	903	6167
142	1028	815	497	802	819	551	926	935	6374
160	1017	799	487	792	810	541	905	927	6277
162	1051	826	503	812	831	558	933	957	6471

30XA UNIT SIZE	MOUNTING WEIGHT (kg) — Cu/Cu										
	A	B	C	D	E	F	G	H	I	J	Total
180	498	762	616	1016	781	798	1055	501	704	492	7223
182	510	779	630	1039	796	813	1079	512	719	503	7379
200	501	769	628	1026	784	802	1061	505	709	494	7278
202	511	784	640	1046	797	815	1082	514	723	504	7415

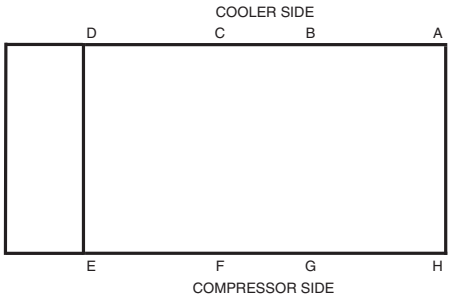
30XA UNIT SIZE	MOUNTING WEIGHT (kg) — Cu/Cu												
	A	B	C	D	E	F	G	H	I	J	K	L	Total
220	451	625	846	803	458	788	808	491	765	630	667	460	7793
222	461	638	864	820	468	801	821	501	781	643	681	469	7949
240	459	635	858	814	459	790	809	492	770	634	678	468	7866
242	469	648	875	831	469	803	822	502	785	647	692	478	8022
260	308	816	823	430	1285	729	963	1276	475	717	825	308	8953
262	311	824	832	434	1299	735	971	1289	480	725	833	311	9045
280	309	826	838	434	1300	730	964	1281	477	729	834	309	9030
282	313	834	847	438	1314	736	972	1294	482	736	843	313	9122
300	317	843	854	446	1344	741	982	1321	486	739	851	317	9239
302	325	863	875	457	1376	755	1001	1353	498	756	871	325	9453

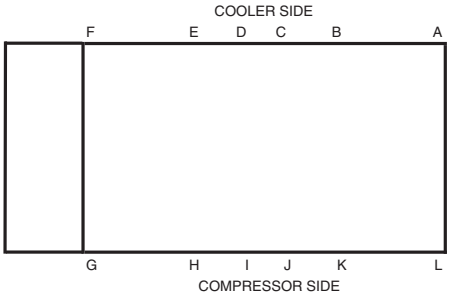
30XA UNIT SIZE	MOUNTING WEIGHT (kg) — Cu/Cu														
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	Total
325	470	470	533	784	445	1333	791	1016	1272	489	870	689	470	470	10 103
327	481	481	545	801	454	1363	803	1034	1300	499	889	704	481	481	10 317
350	472	472	535	791	449	1358	796	1028	1296	491	873	691	472	472	10 196
352	483	483	547	808	459	1388	808	1046	1324	501	892	706	483	483	10 410

NOTES
1. Cu/Cu condenser coils have copper fins/copper tubing.
2. See page 19 for mounting weight reference points.

UNIT MOUNTING WEIGHT REFERENCE POINTS (UNITS WITH Cu/Cu CONDENSER COILS)

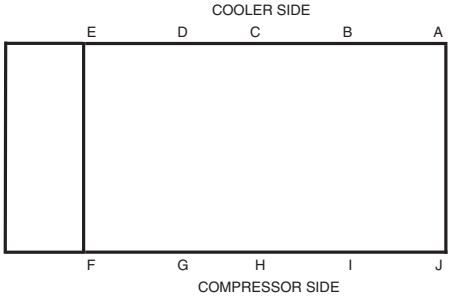
30XA140-162

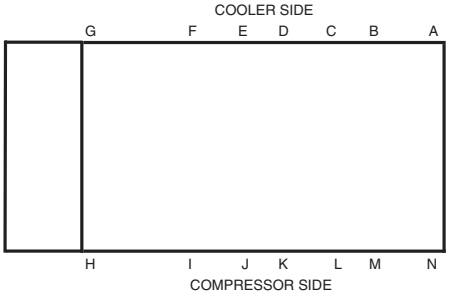




30XA220-302

30XA180-202





30XA325-352

Options and accessories

ITEM	FACTORY-INSTALLED OPTION	FIELD-INSTALLED ACCESSORY
Condenser Coil and Fan Options		
MCHX, E-Coat	X	
Aluminum Fins/Copper Tube	X	
Aluminum Fins/Copper Tube, Pre-Coated	X	
Aluminum Fins/Copper Tube, E-Coat	X	
Copper Fins/Copper Tube, E-Coat	X	
Copper Fins/Copper Tube Condenser Coils	X	
Compressor Sound Reduction Enclosures	X	
Controls/Communication Options		
BACnet/Modbus Translator Control	X	X
Energy Management Module	X	X
LON Translator Control	X	X
Dual Chiller Accessory Kit		X
Cooler Options		
Minus-One-Pass Cooler (flooded cooler only)	X	
Plus-One-Pass Cooler (flooded cooler only)	X	
Remote Cooler		X
DX (Direct Expansion) Cooler	X	
Electrical Options		
Unit-Mounted Main Disconnect, Non-Fused	X	
Control Transformer	X	
Convenience Outlet (not available at 380 v)		X
Refrigeration Circuit Options		
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

LON — Local Operating Network

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.

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.

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 or demand limit control from a 4 to 20 mA signal, space temperature reset (requires field-installed space temperature sensor), 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.

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.

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 recommended for areas of high dewpoints where condensation may be a concern.

BACnet/Modbus 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 field-installed accessory. Field programming is required.

LON translator control provides an interface between the chiller and a Local Operating Network (LON, i.e., LonWorks* FT-10A ANSI/EIA-709.1). The LON translator control is also available as a field-installed accessory. 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 field-installed accessory.

Control transformer is sized to supply the needs of the control circuit from the main power supply.

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.

Field-installed accessories

Remote cooler kit allows for remote installation of the cooler. Never bury refrigerant lines when using this accessory or in any other application.

* Registered trademark of the Echelon Corporation.

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.

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

BACnet/Modbus 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 FT-10A ANSI/EIA-709.1). The LON translator control is 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.

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).

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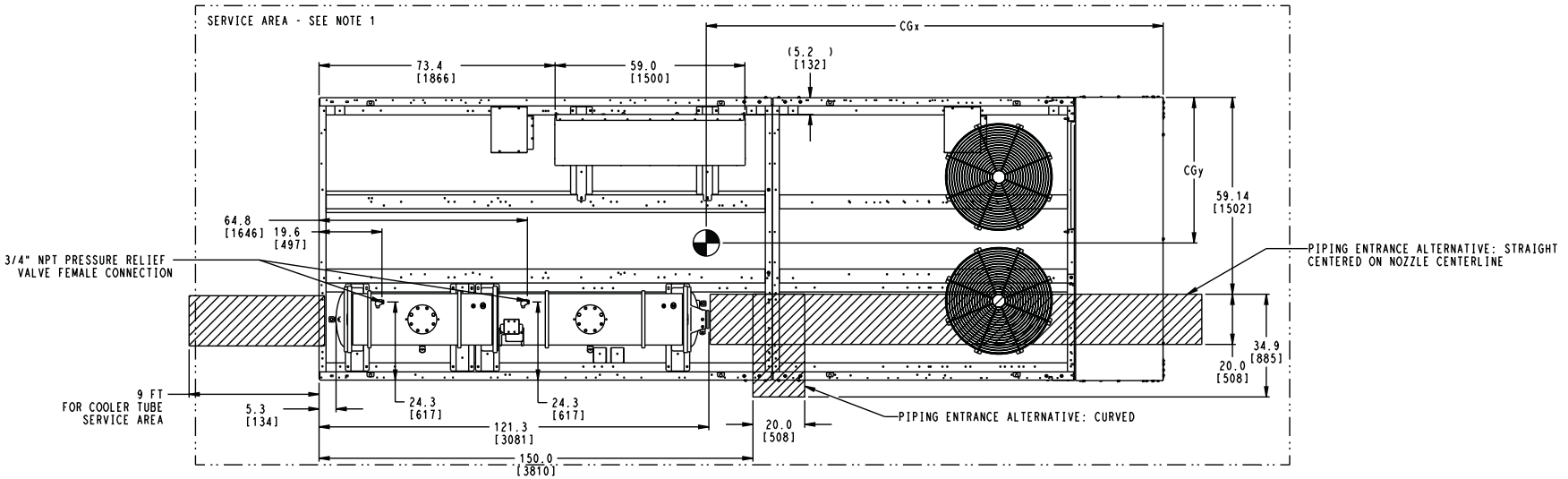
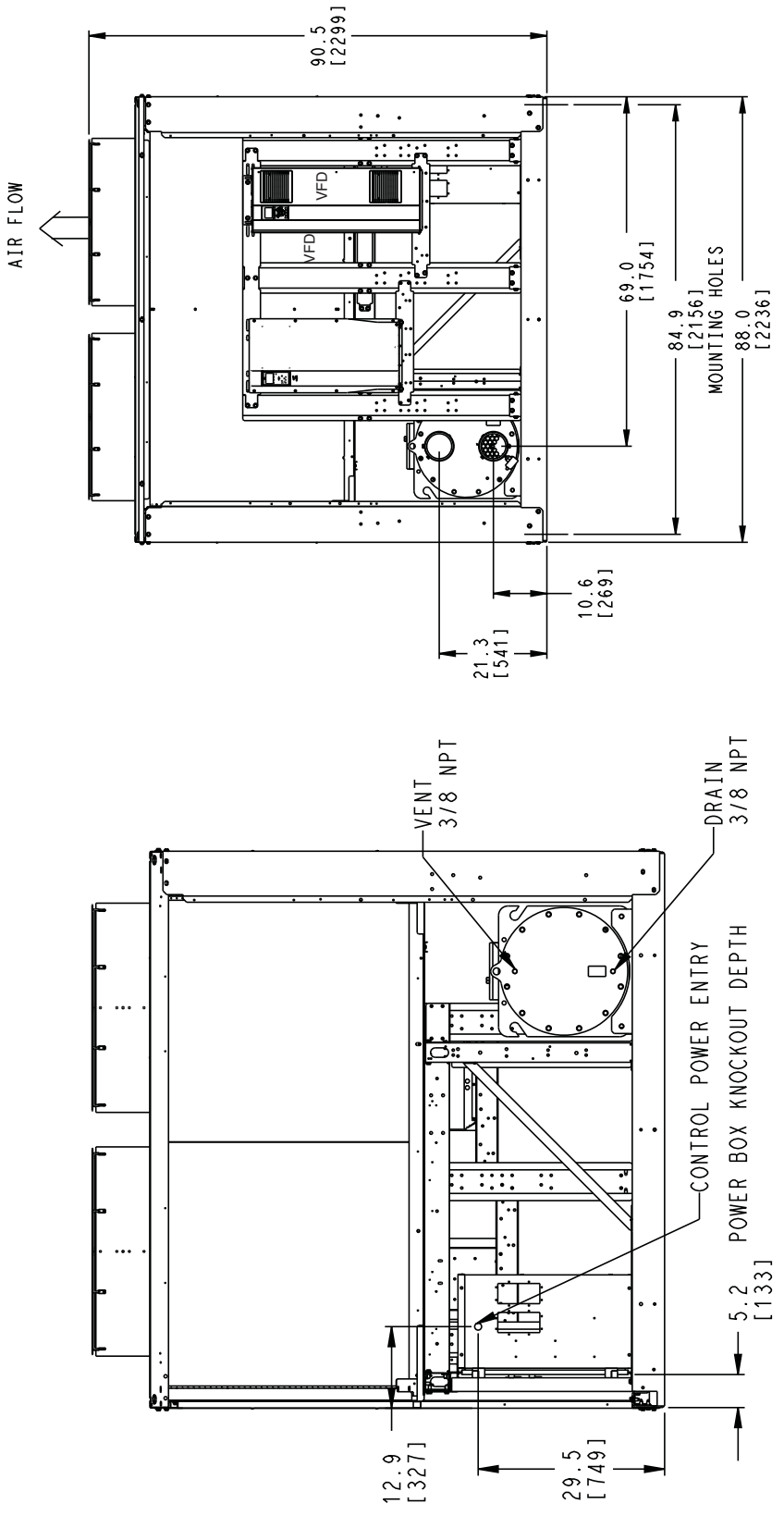
NOTES:
1. Unit must have clearances as follows:
   Top — Do not restrict
   Sides and Ends — 6 ft (1.8 m) from solid surface for airflow.
   Side — 8 ft (2.4 m) required for coil service on the control box side of the unit.
2. Temperature relief devices are located on liquid line and economizer assemblies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

30XA UNIT	CGx	CGy
140 (MCHX and Al/Cu)	140.4 [3566]	44.1 [1121]
140 (Cu/Cu)	140.6 [3571]	44.2 [1124]
160 (MCHX and Al/Cu)	140.7 [3573]	44.1 [1121]
160 (Cu/Cu)	141.0 [3581]	44.1 [1121]



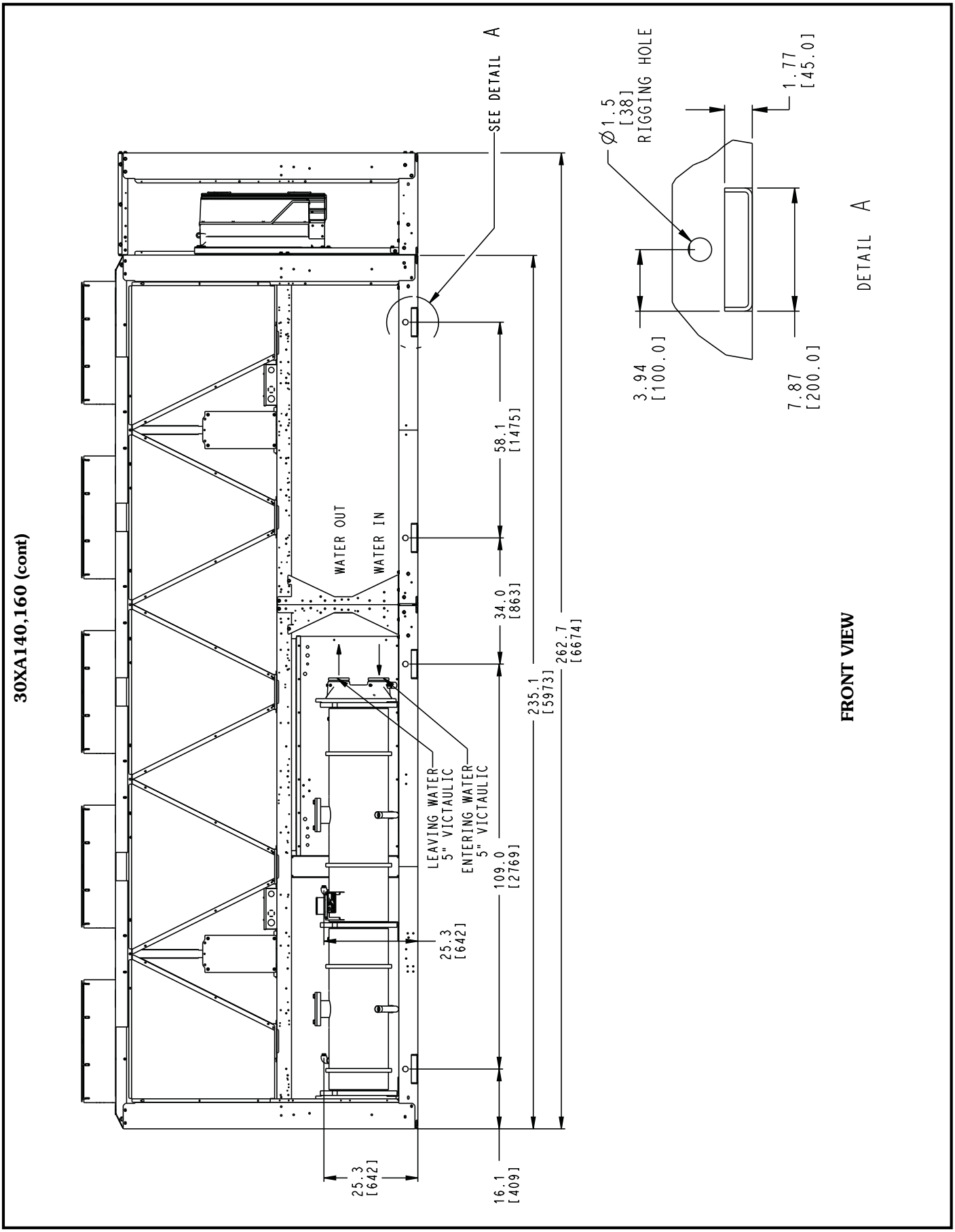
TOP VIEW



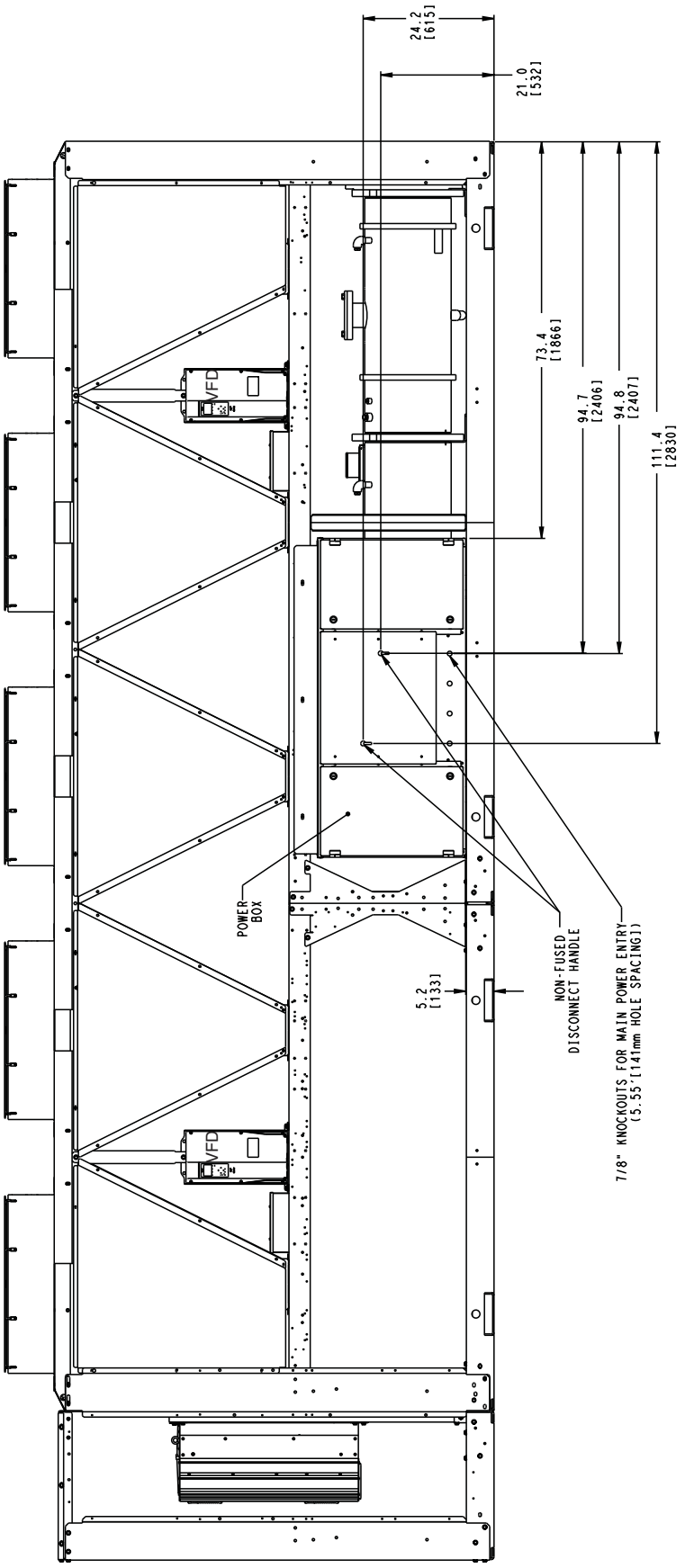
RIGHT END VIEW

LEFT END VIEW

Dimensions (cont)

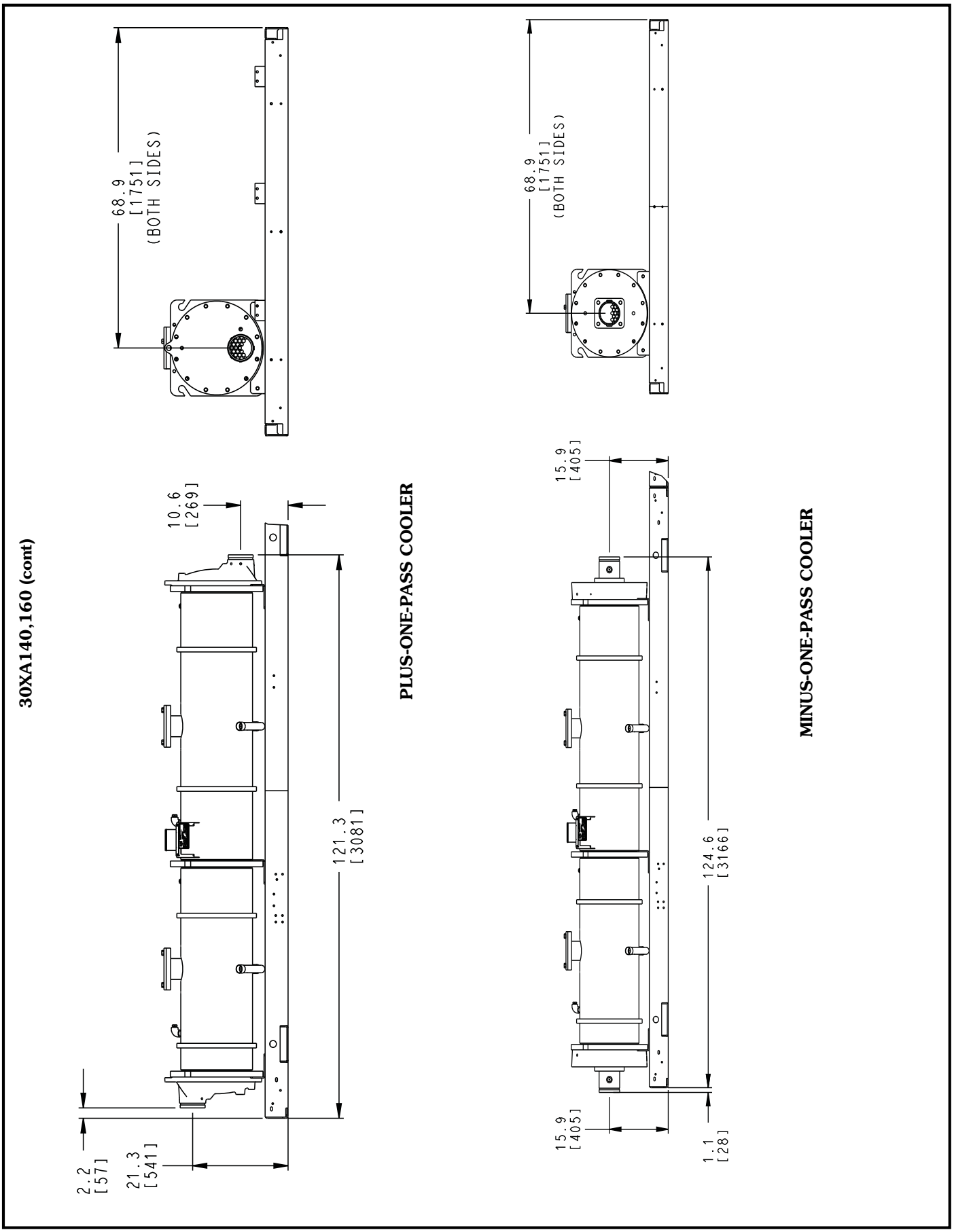


30XA140,160 (cont)



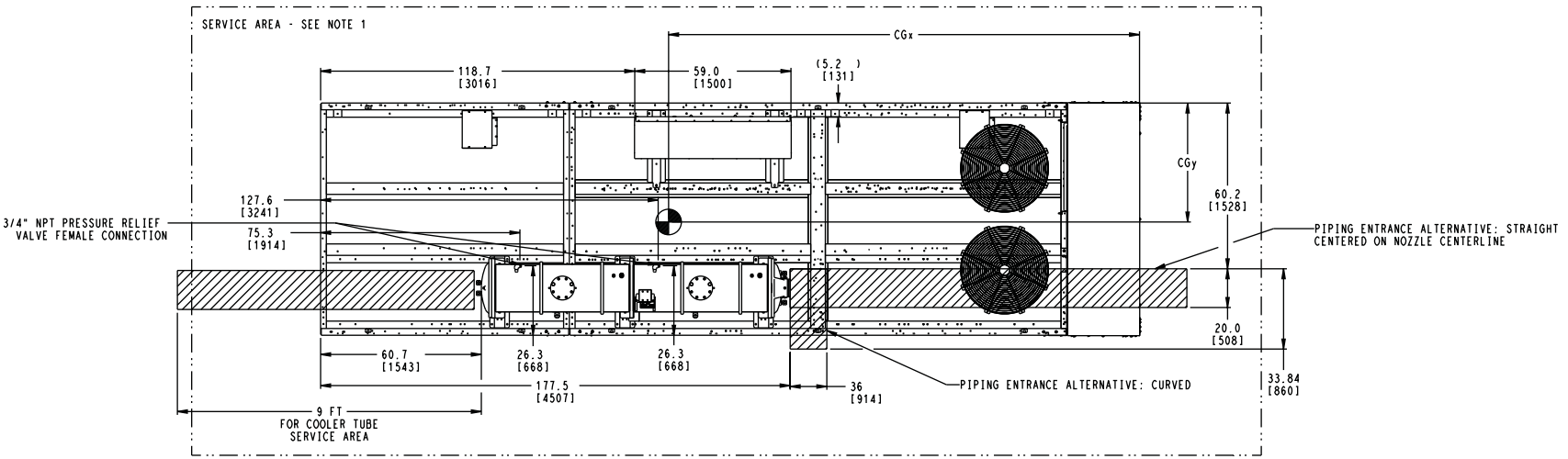
BACK VIEW

Dimensions (cont)



NOTES:
1. Unit must have clearances as follows:
   Top — Do not restrict
   Sides and Ends — 6 ft (1.8 m) from solid surface for airflow.
   Side — 8 ft (2.4 m) required for coil service on the control box side of the unit.
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. Pressure relief devices are located on the cooler (3/4-in. NPT female connection) and on each oil separator (3/8-in. flare connection).
5. Dimensions are shown in inches. Dimensions in [ ] are in millimeters.

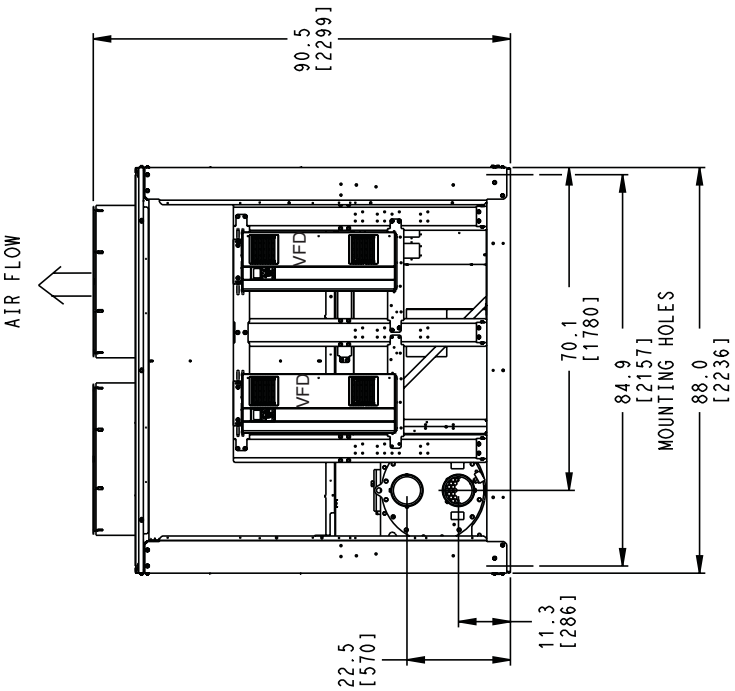
30XA UNIT	CGx	CGy
180 (MCHX and Al/Cu)	159.7 [4055]	45.6 [1158]
180 (Cu/Cu)	160.5 [4076]	45.5 [1157]
200 (MCHX and Al/Cu)	159.8 [4059]	45.6 [1158]
200 (Cu/Cu)	160.6 [4080]	45.5 [1157]



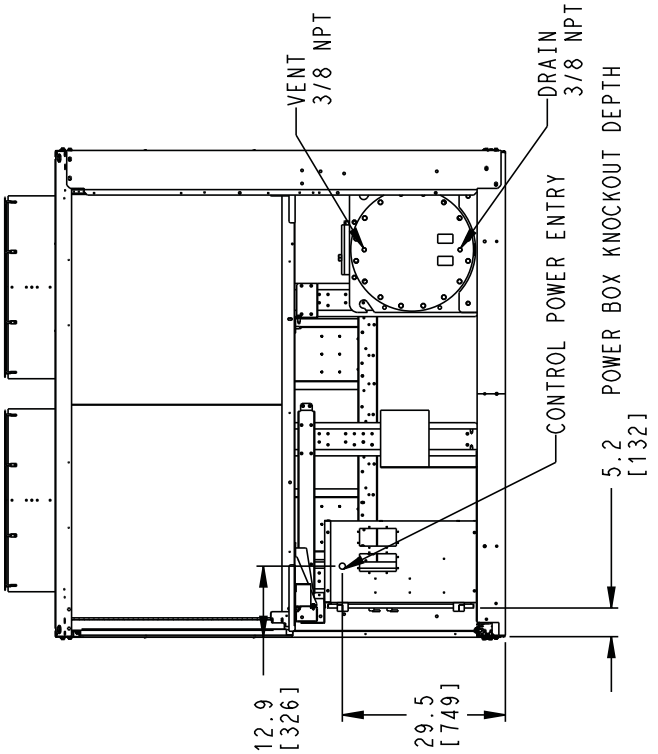
TOP VIEW

Dimensions (cont)

30XA180,200 (cont)

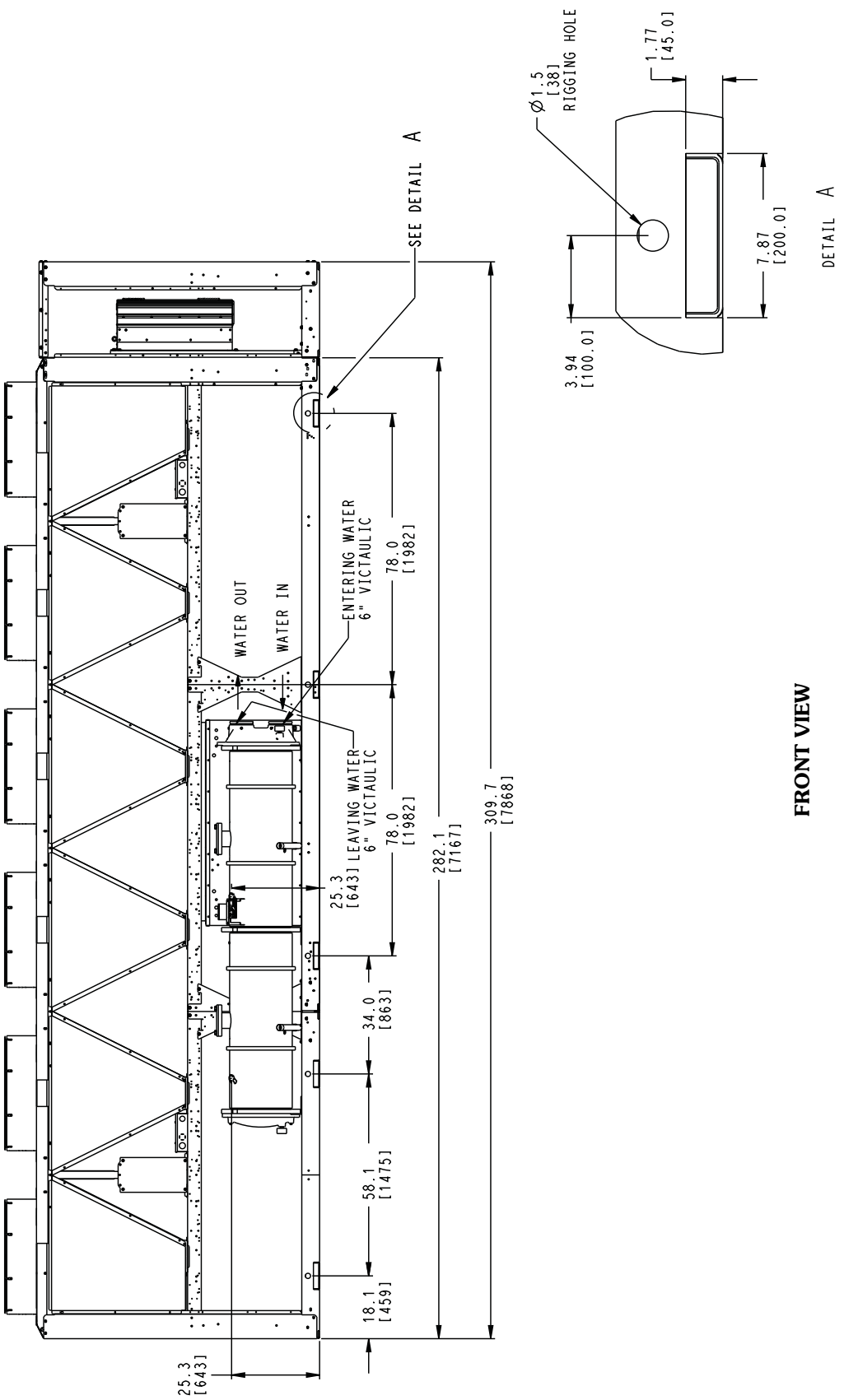


RIGHT END VIEW



LEFT END VIEW

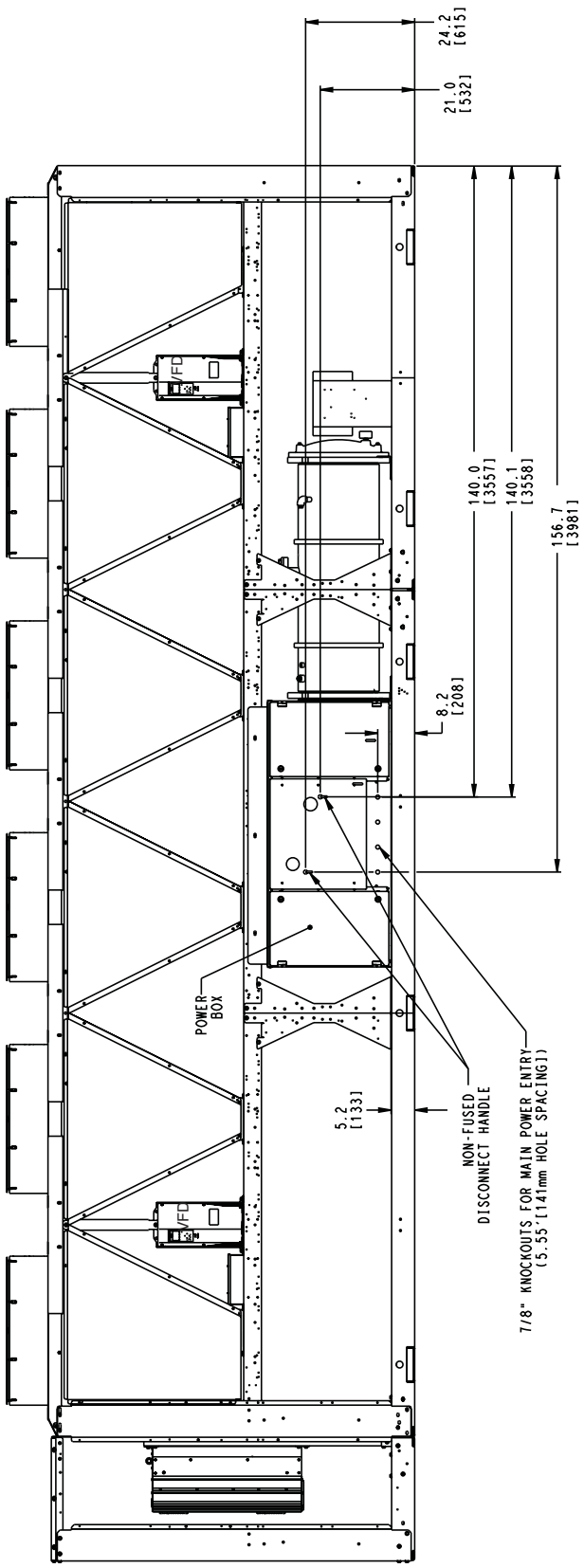
30XA180,200 (cont)



FRONT VIEW

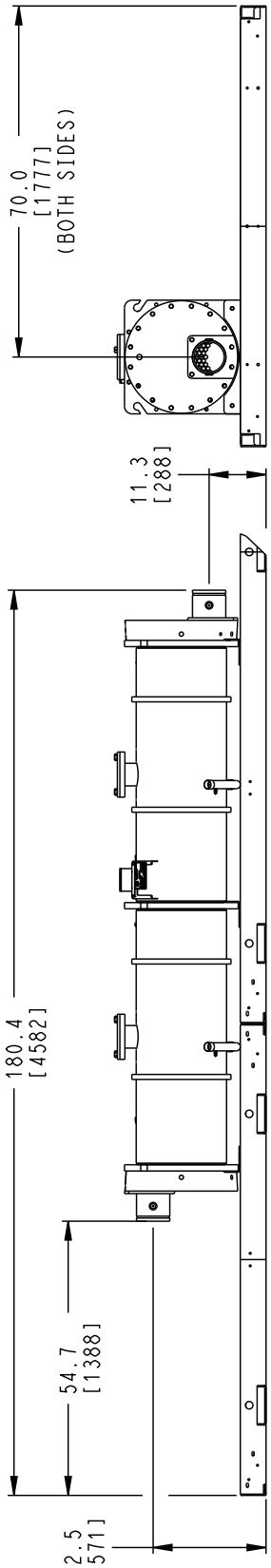
Dimensions (cont)

30XA180,200 (cont)

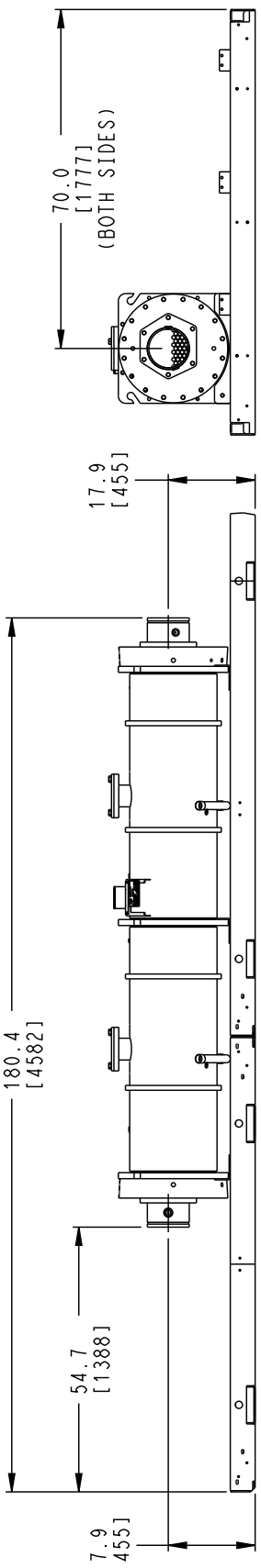


BACK VIEW

30XA180,200 (cont)



PLUS-ONE-PASS COOLER



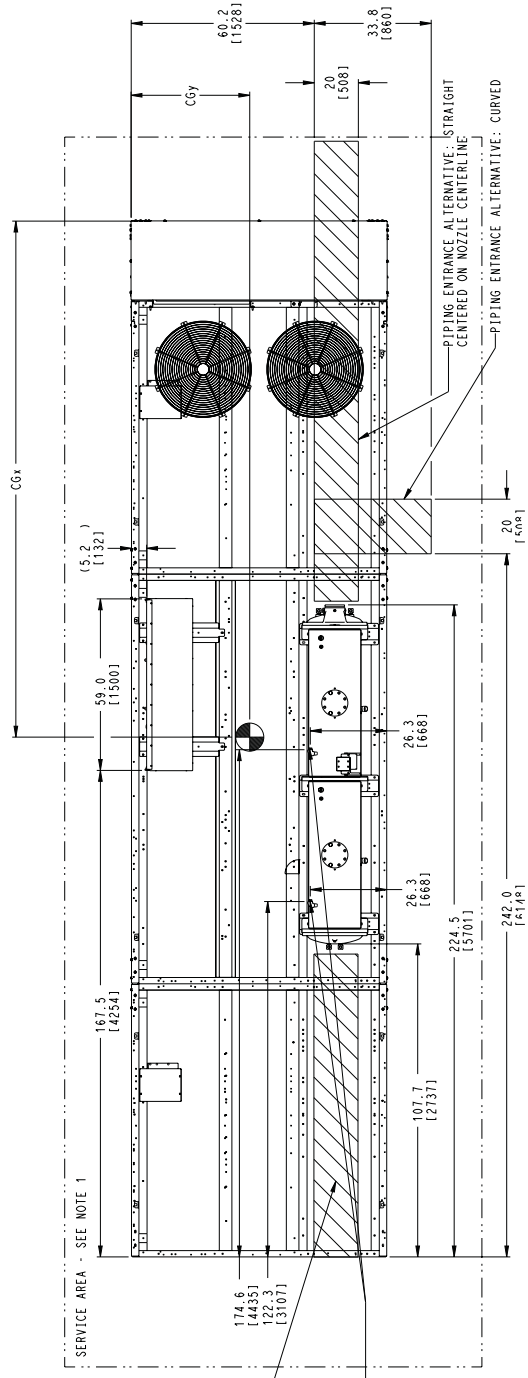
MINUS-ONE-PASS COOLER

Dimensions (cont)

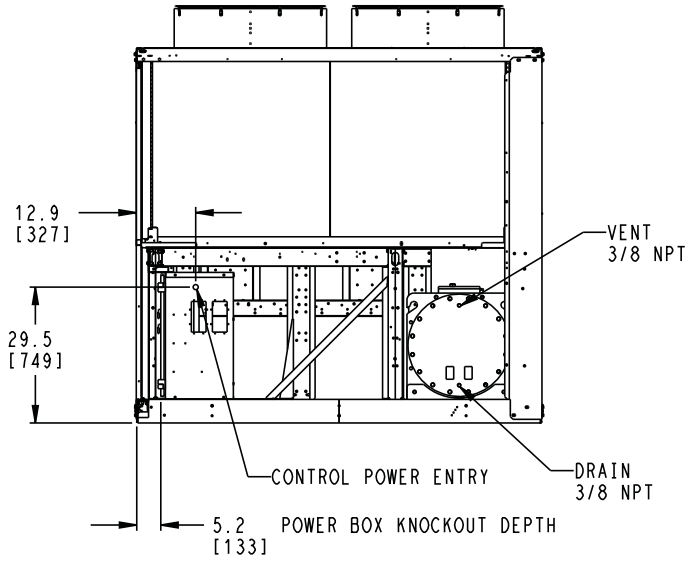
30XA220,240

30XA UNIT	CGx	CGy
220 (MCHX and Al/Cu)	178.1 [4523]	45.7 [1161]
220 (Cu/Cu)	179.3 [4554]	45.6 [1158]
240 (MCHX and Al/Cu)	178.7 [4539]	45.7 [1161]
240 (Cu/Cu)	179.9 [4571]	45.7 [1161]

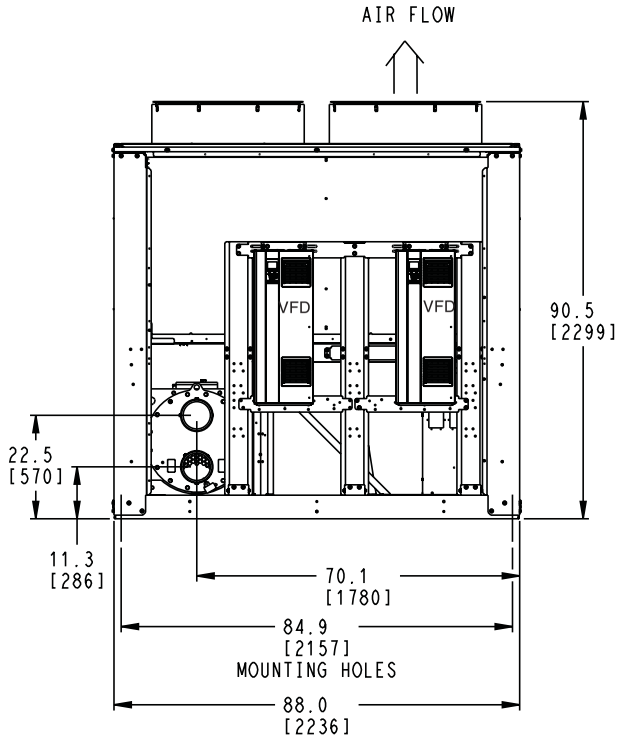
NOTES:
1. Unit must have clearances as follows:
   Top — Do not restrict
   Sides and Ends — 6 ft (1.8 m) from solid surface for airflow.
   Side — 8 ft (2.4 m) required for coil service on the control box side of the unit.
2. Temperature relief devices are located on liquid line and economizer assemblies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



TOP VIEW



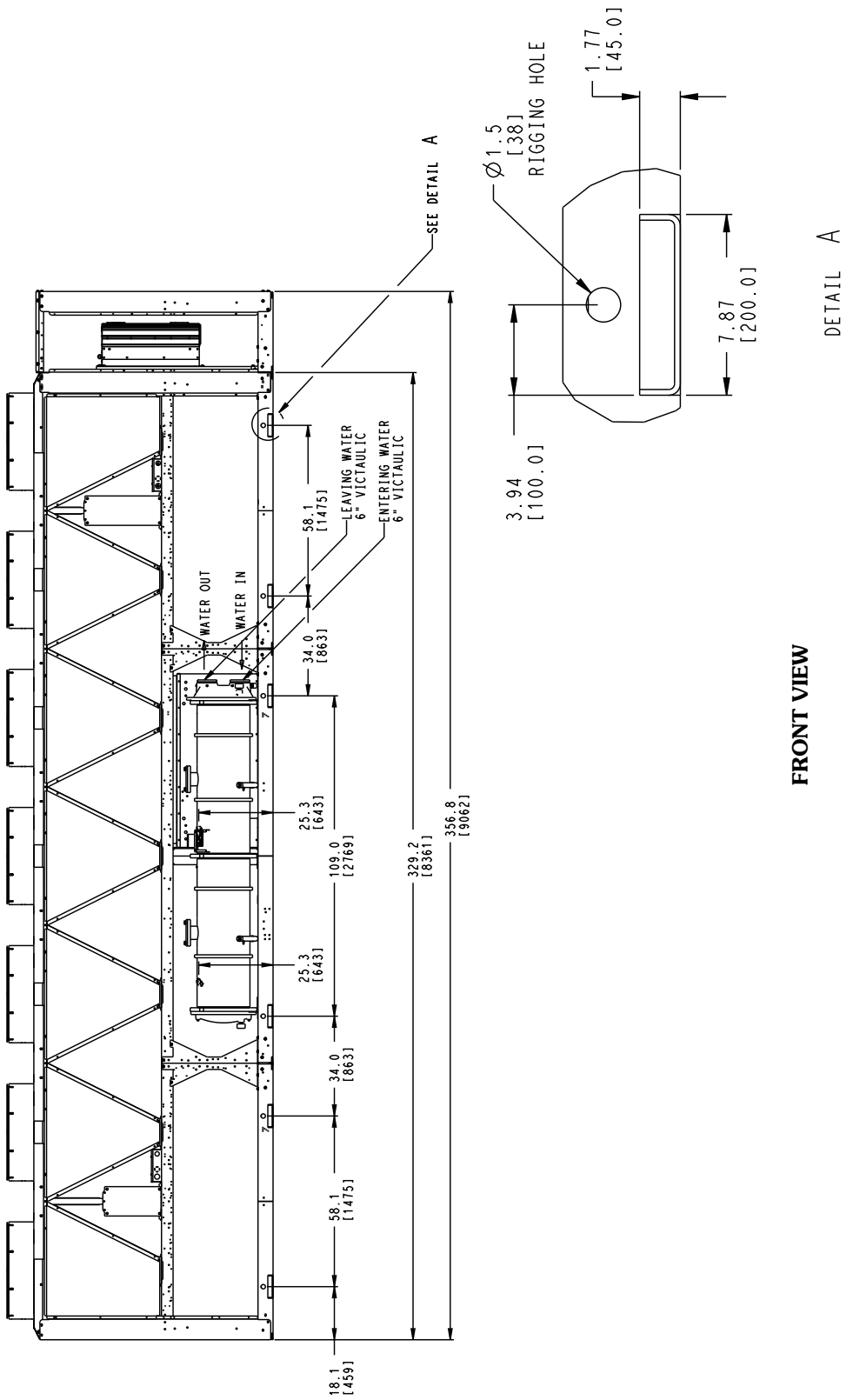
LEFT END VIEW



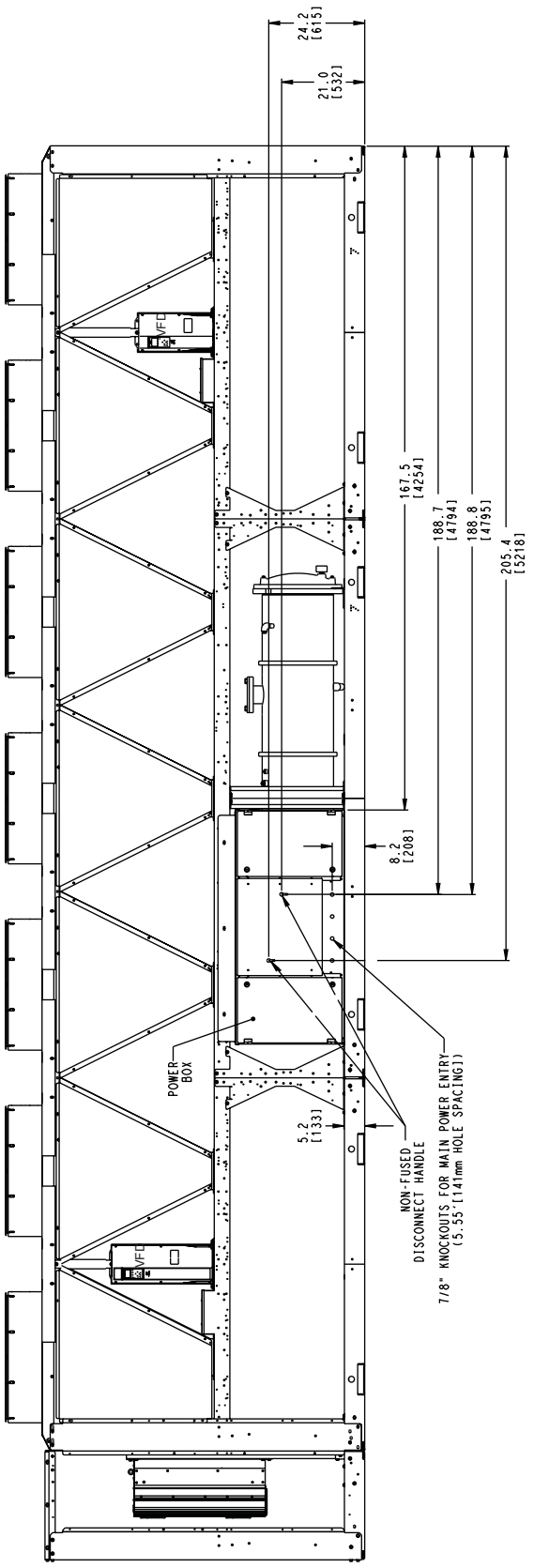
RIGHT END VIEW

Dimensions (cont)

30XA220,240 (cont)



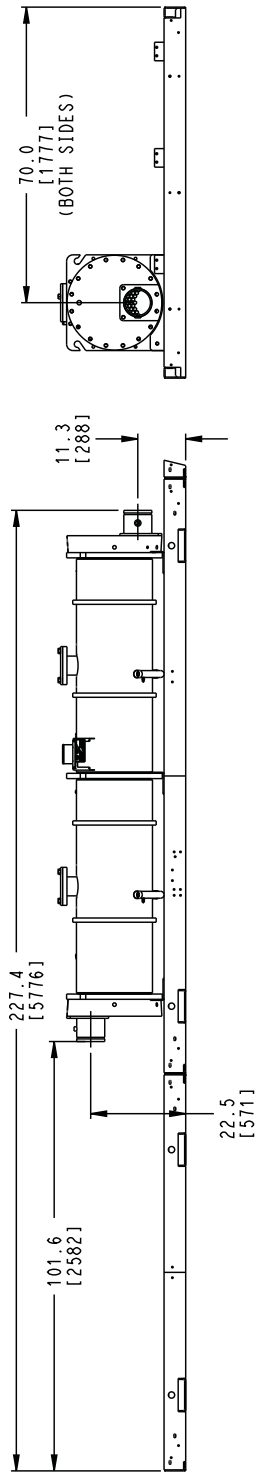
30XA220,240 (cont)



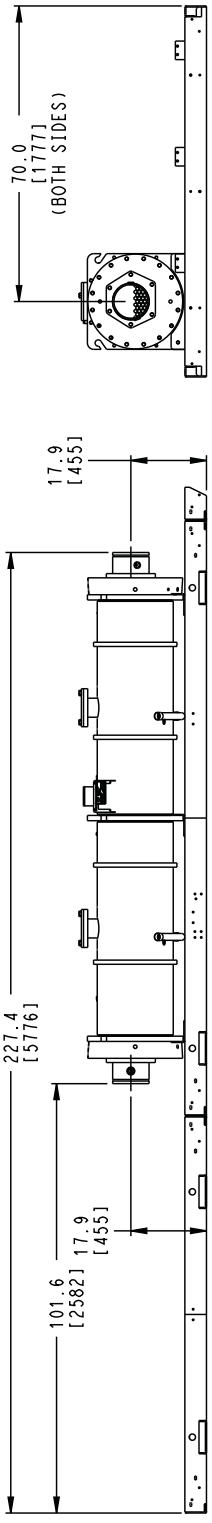
BACK VIEW

Dimensions (cont)

30XA220,240 (cont)



PLUS-ONE-PASS COOLER

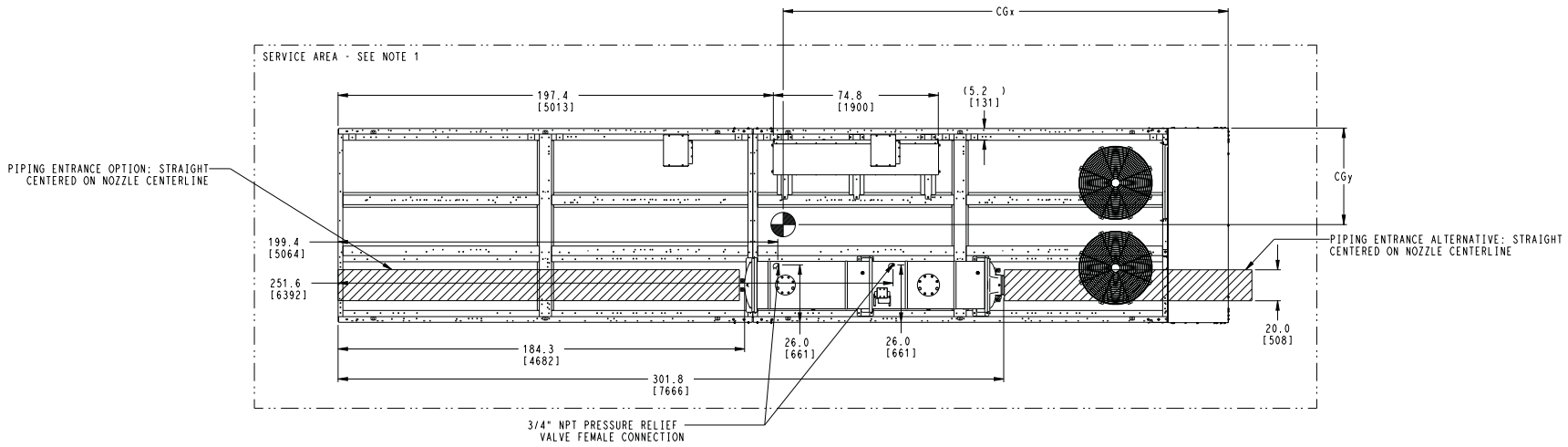


MINUS-ONE-PASS COOLER

30XA260,280,300

NOTES:
1. Unit must have clearances as follows:
   Top — Do not restrict
   Sides and Ends — 6 ft (1.8 m) from solid surface for airflow.
   Side — 8 ft (2.4 m) required for coil service on the control box side of the unit.
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. Pressure relief devices are located on the cooler (3/4-in. NPT female connection) and on each oil separator (3/8-in. flare connection).
5. Dimensions are shown in inches. Dimensions in [ ] are in millimeters.

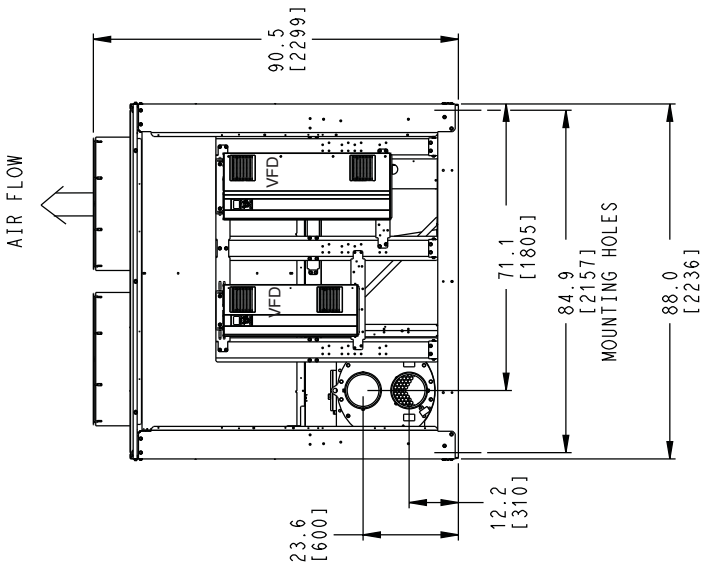
30XA UNIT	CGx	CGy
260 (MCHX and Al/Cu)	179.7 [4565]	43.7 [1109]
260 (Cu/Cu)	183.0 [4649]	43.8 [1113]
280 (MCHX and Al/Cu)	180.1 [4574]	43.8 [1112]
280 (Cu/Cu)	183.4 [4658]	43.9 [1116]
300 (MCHX and Al/Cu)	180.0 [4573]	43.8 [1112]
300 (Cu/Cu)	183.4 [4658]	43.9 [1116]



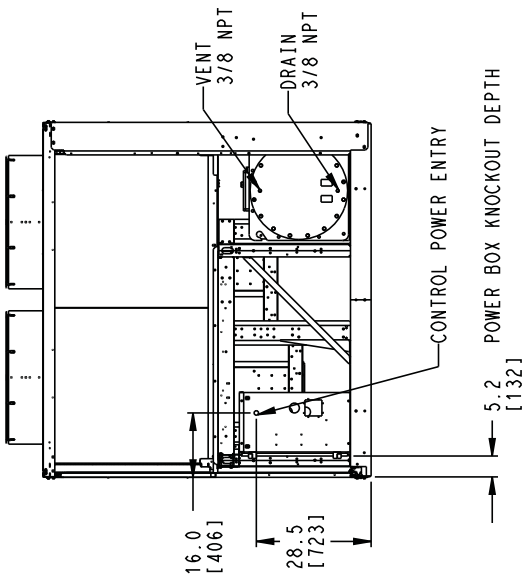
TOP VIEW

Dimensions (cont)

30XA260,280,300 (cont)

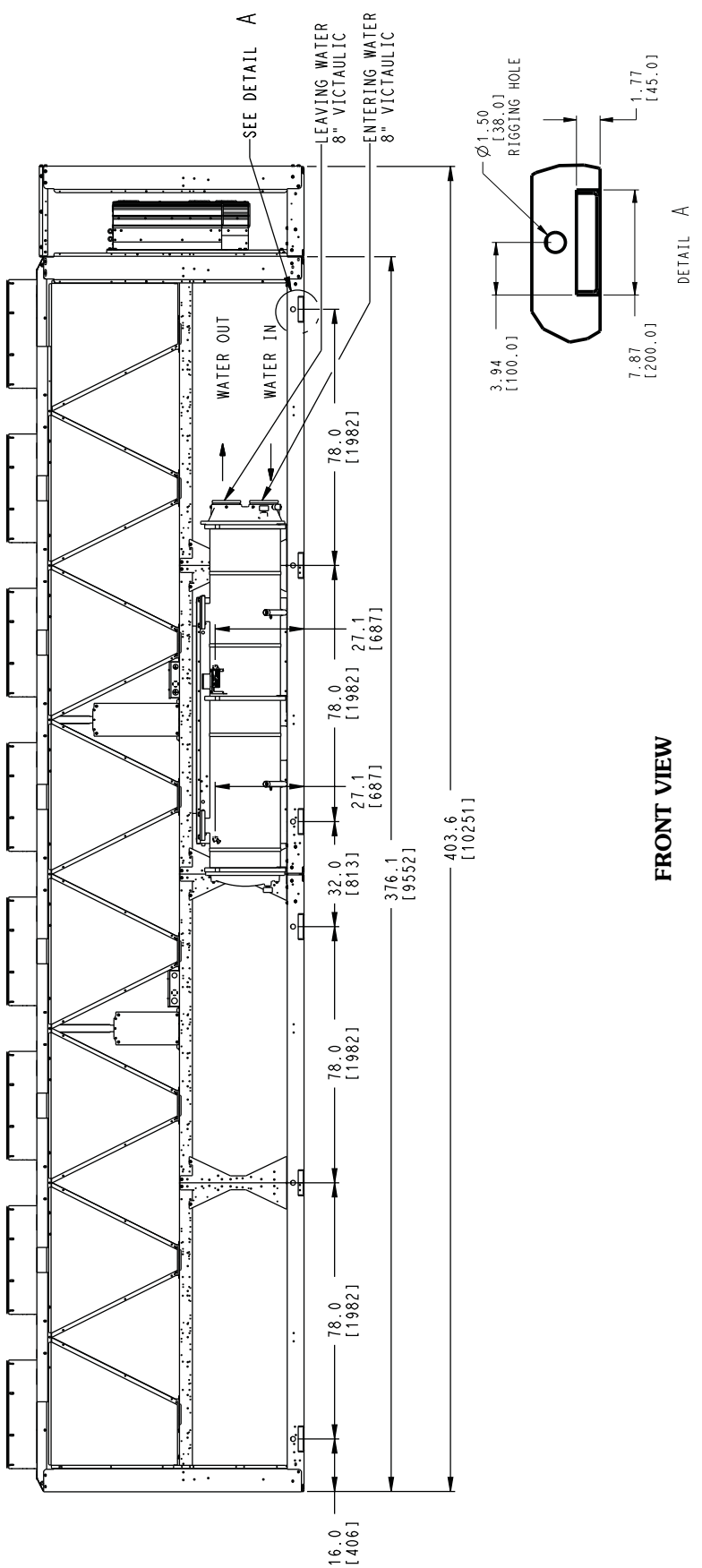


RIGHT END VIEW



LEFT END VIEW

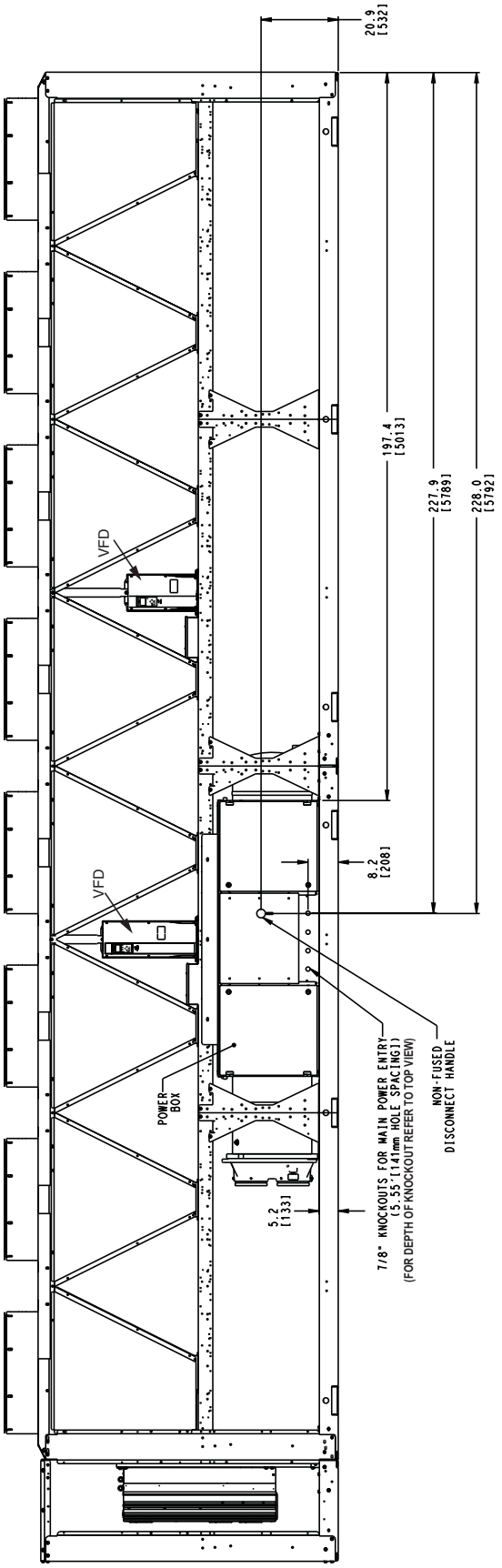
30XA260,280,300 (cont)



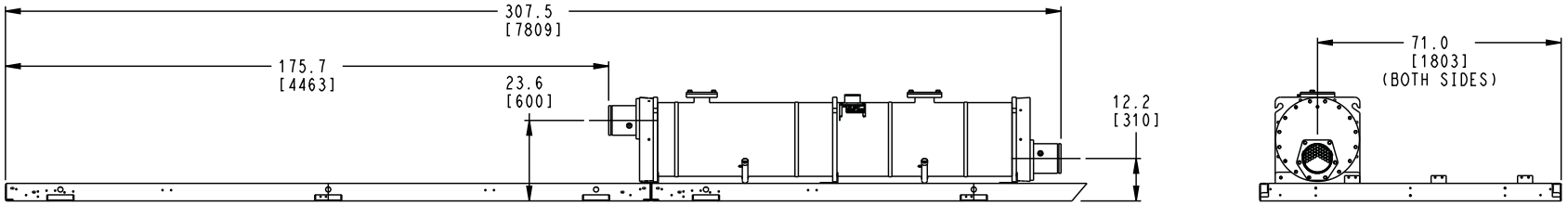
FRONT VIEW

Dimensions (cont)

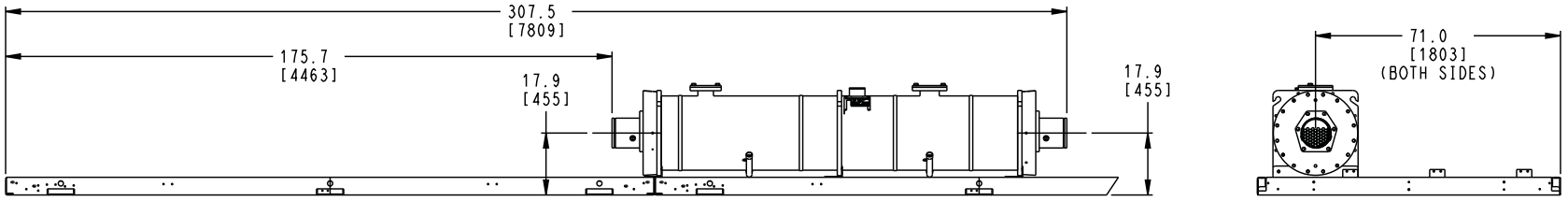
30XA260,280,300 (cont)



BACK VIEW



PLUS-ONE-PASS COOLER

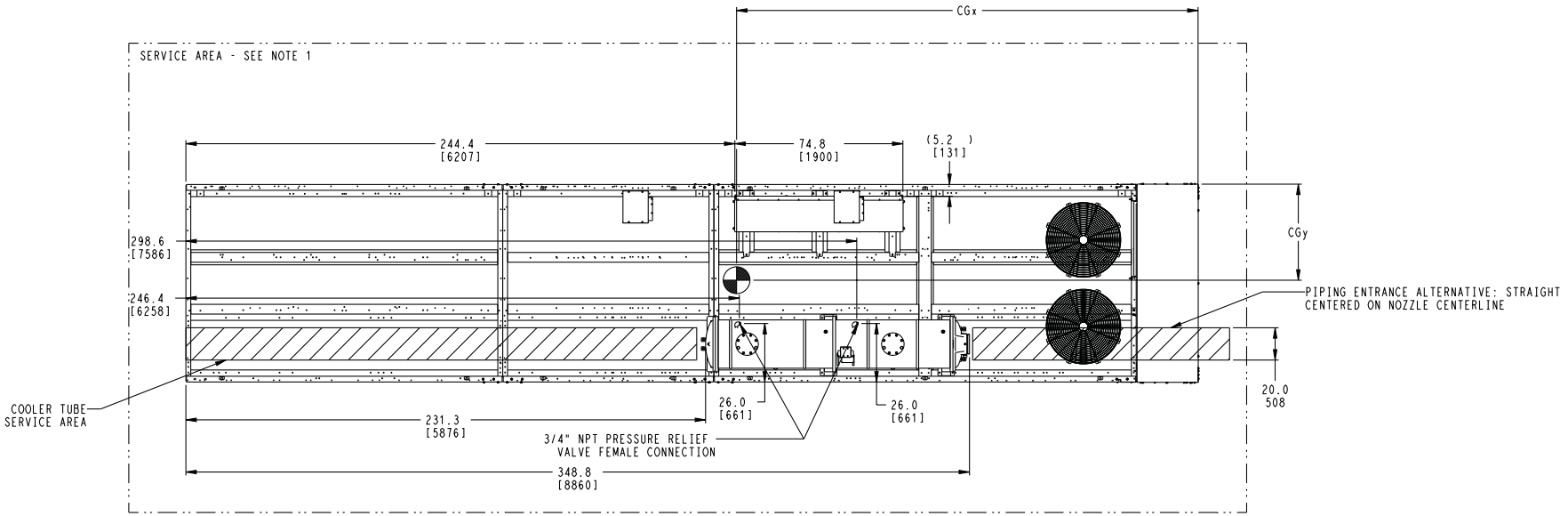


MINUS-ONE-PASS COOLER

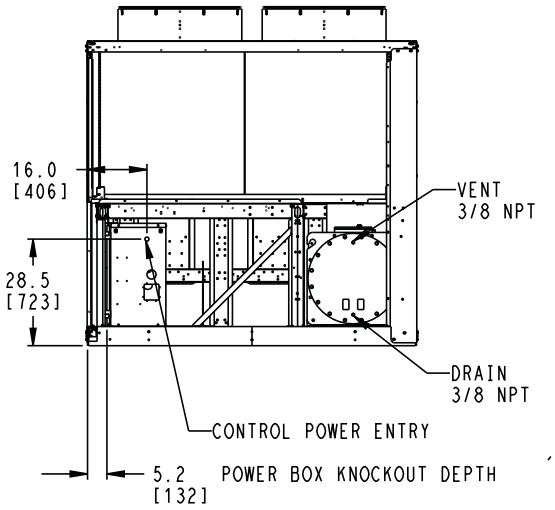
30XA325,350

NOTES:
1. Unit must have clearances as follows:
   Top — Do not restrict
   Sides and Ends — 6 ft (1.8 m) from solid surface for airflow.
   Side — 8 ft (2.4 m) required for coil service on the control box side of the unit.
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. Pressure relief devices are located on the cooler (3/4-in. NPT female connection) and on each oil separator (3/8-in. flare connection).
5. Dimensions are shown in inches. Dimensions in [ ] are in millimeters.

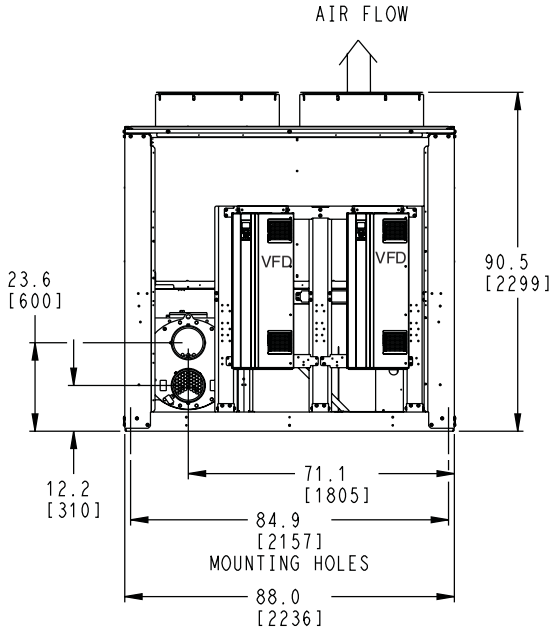
30XA UNIT	CGx	CGy
325 (MCHX and Al/Cu)	195.6 [4969]	42.3 [1075]
325 (Cu/Cu)	200.0 [5079]	42.6 [1082]
350 (MCHX and Al/Cu)	195.3 [4960]	42.3 [1075]
350 (Cu/Cu)	199.6 [5069]	42.6 [1082]



TOP VIEW



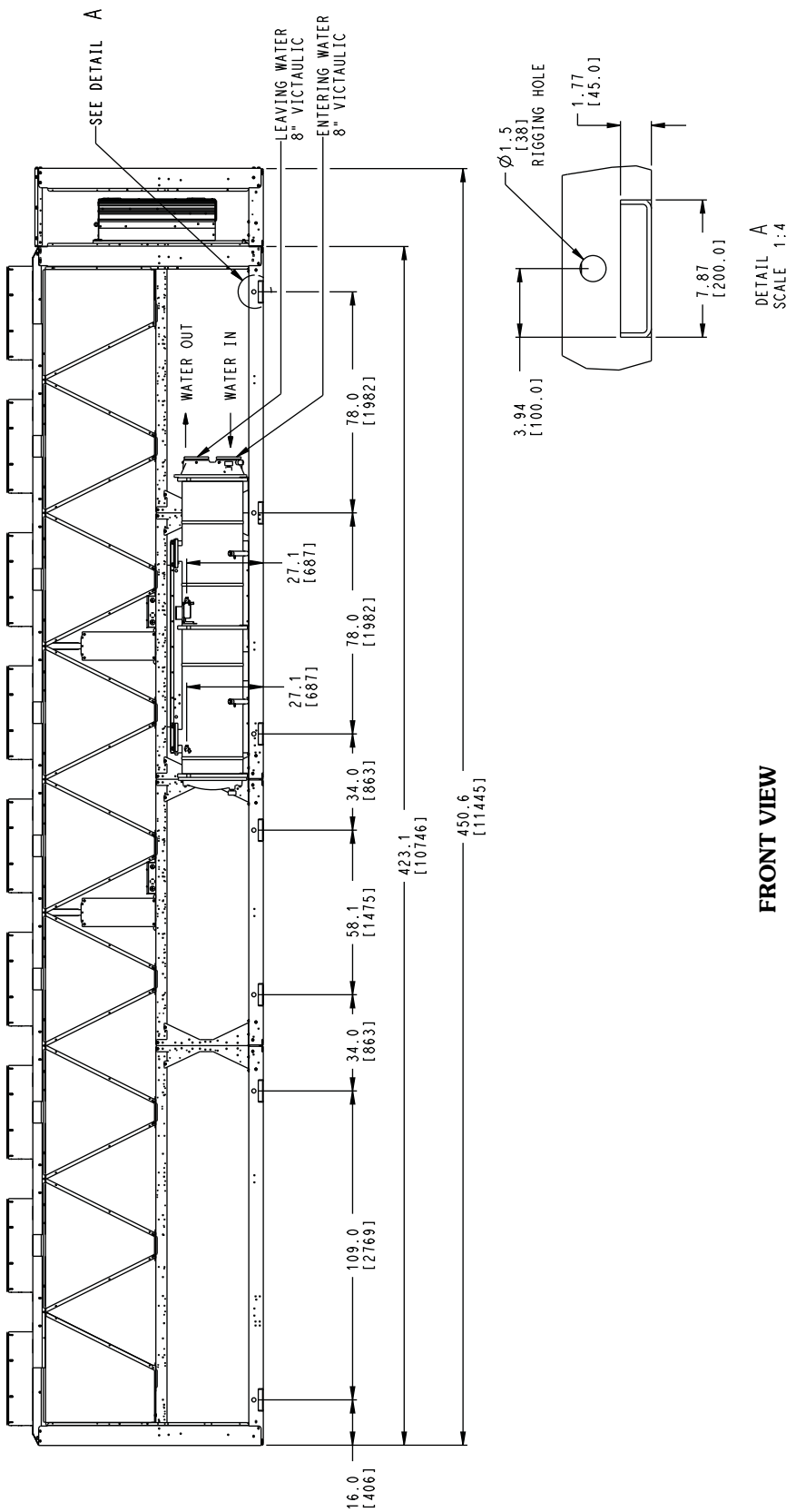
LEFT END VIEW



RIGHT END VIEW

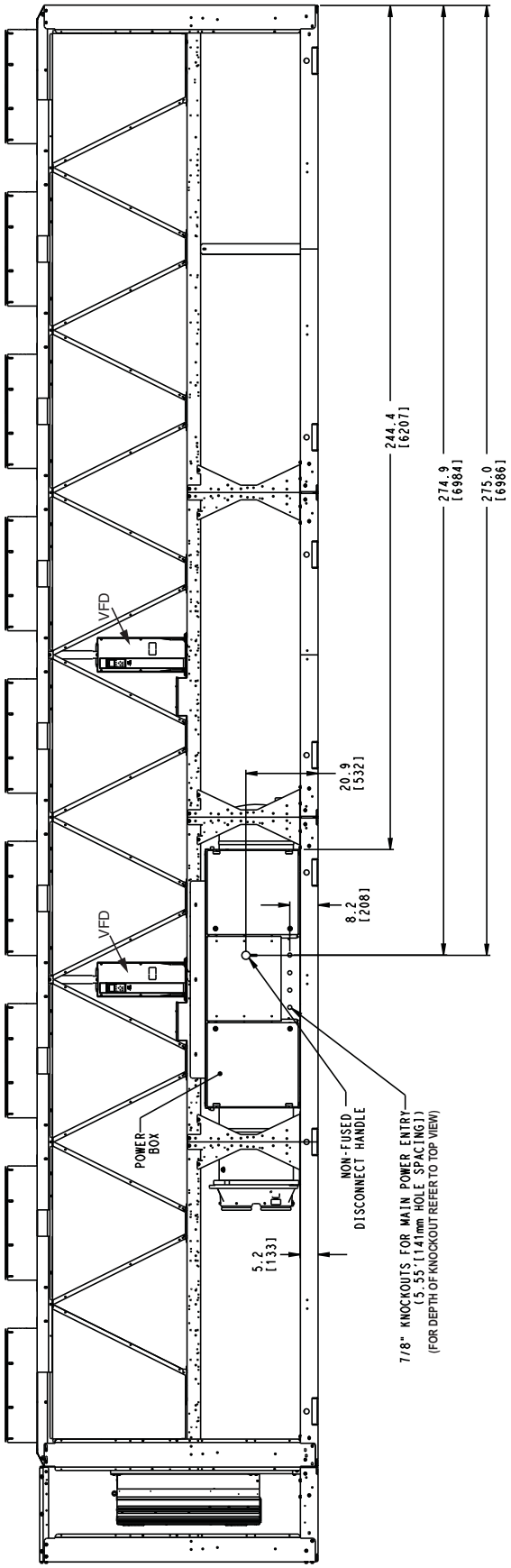
Dimensions (cont)

30XA325,350 (cont)



FRONT VIEW

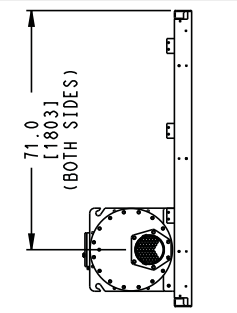
30XA325,350 (cont)

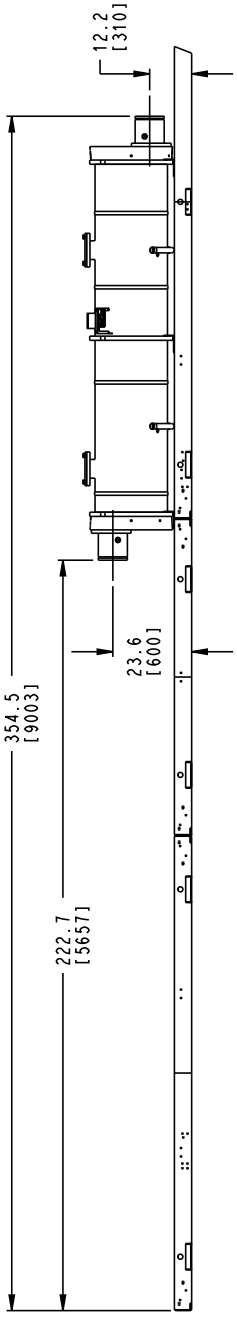


BACK VIEW

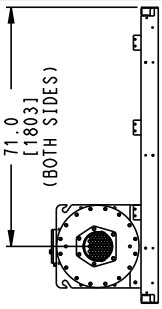
Dimensions (cont)

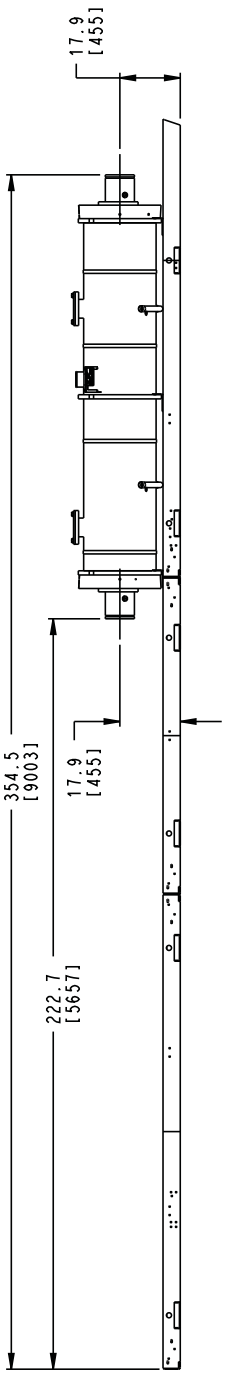
30XA325,350 (cont)





PLUS-ONE-PASS COOLER



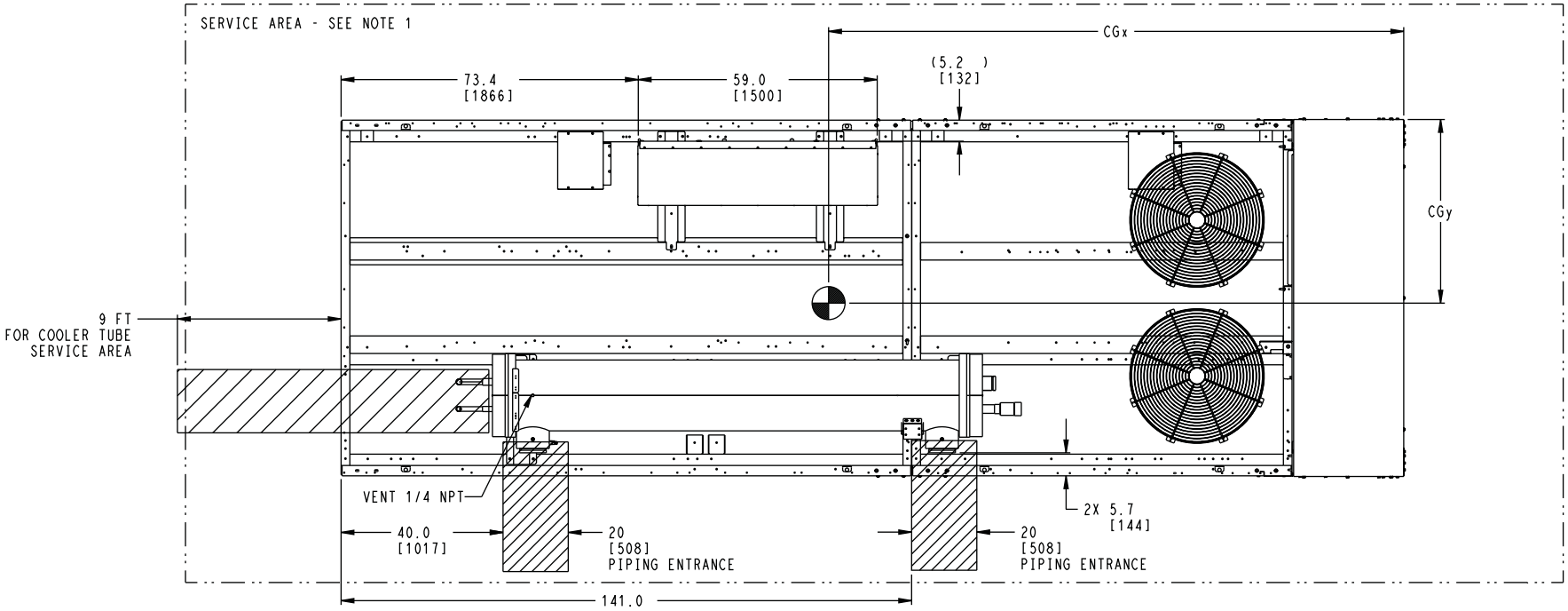


MINUS-ONE-PASS COOLER

30XA142,162

NOTES:
1. Unit must have clearances as follows:
   Top — Do not restrict
   Sides and Ends — 6 ft (1.8 m) from solid surface for airflow.
   Side — 8 ft (2.4 m) required for coil service on the control box side of the unit.
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 female connection) and on each oil separator (3/8-in. flare connection).
4. Dimensions are shown in inches. Dimensions in [ ] are in millimeters.

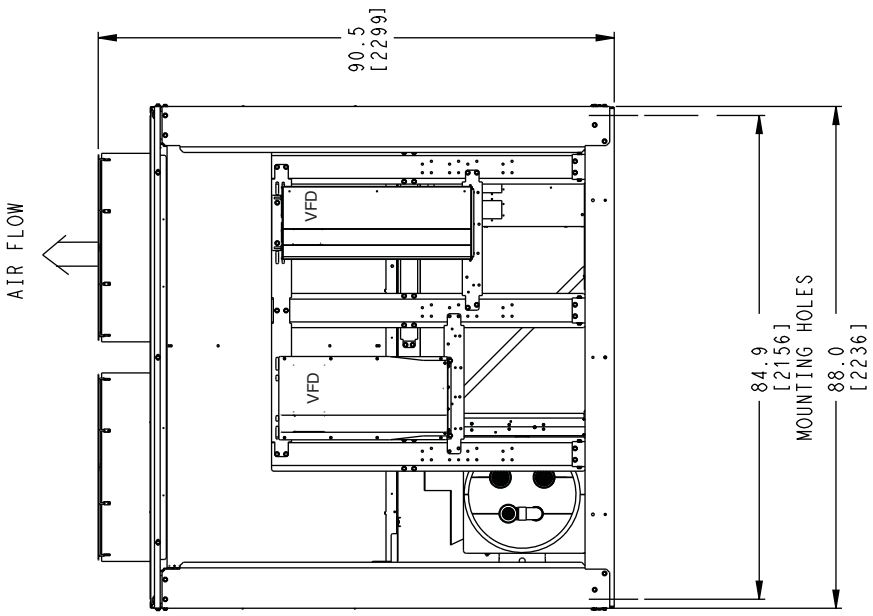
30XA UNIT	CGx	CGy
142 (MCHX and Al/Cu)	140.4 [3566]	44.1 [1120]
142 (Cu/Cu)	140.6 [3571]	44.2 [1124]
162(MCHX and Al/Cu)	140.7 [3573]	44.1 [1121]
162 (Cu/Cu)	141.0 [3581]	44.1 [1121]



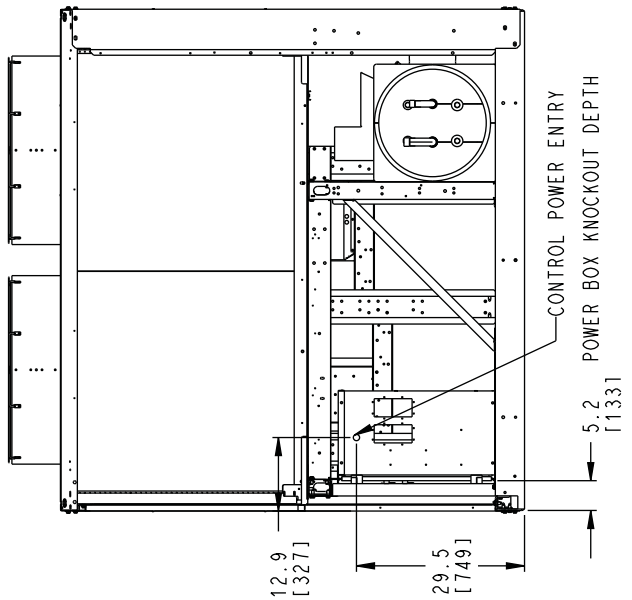
TOP VIEW

Dimensions (cont)

30XA142,162 (cont)

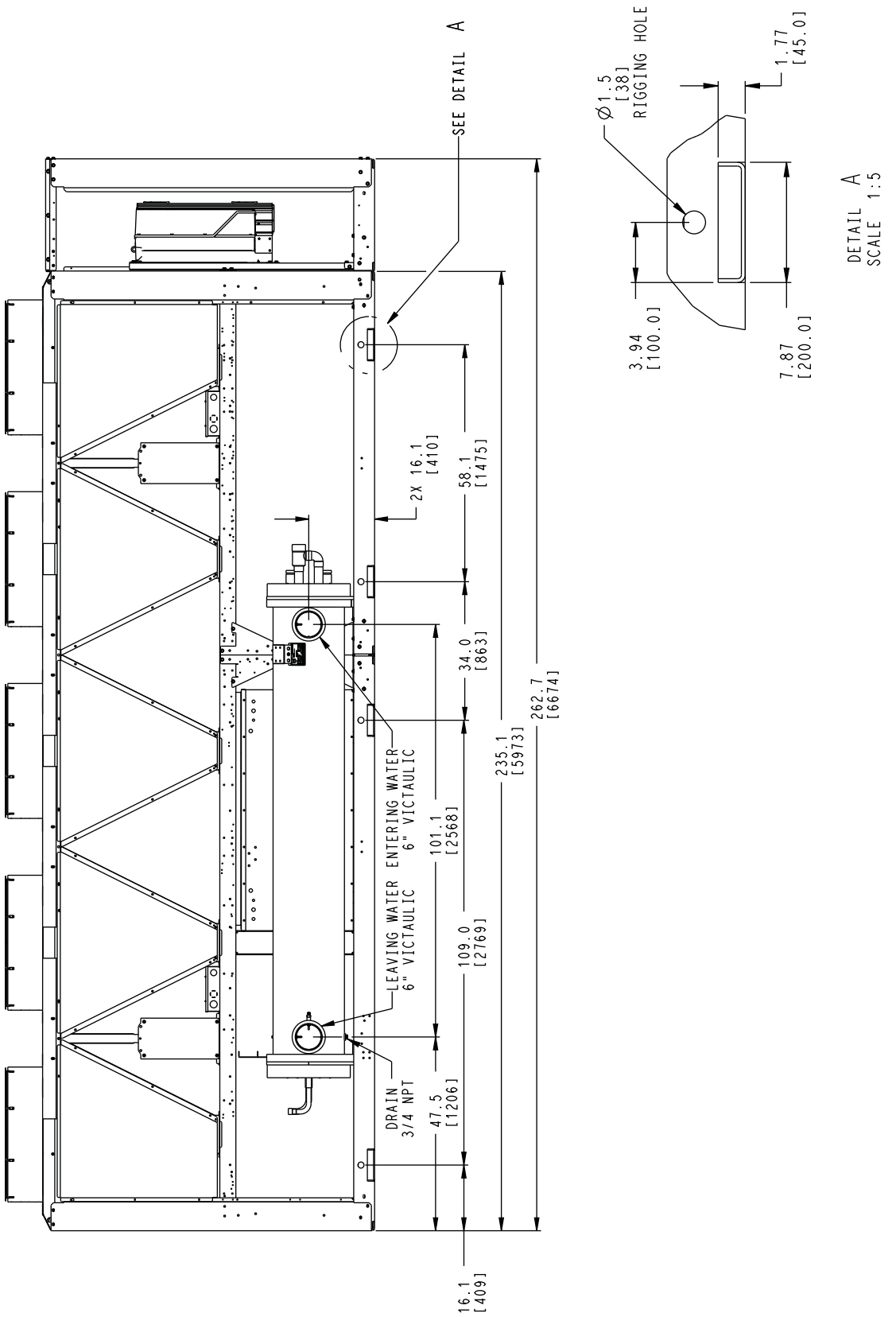


RIGHT END VIEW



LEFT END VIEW

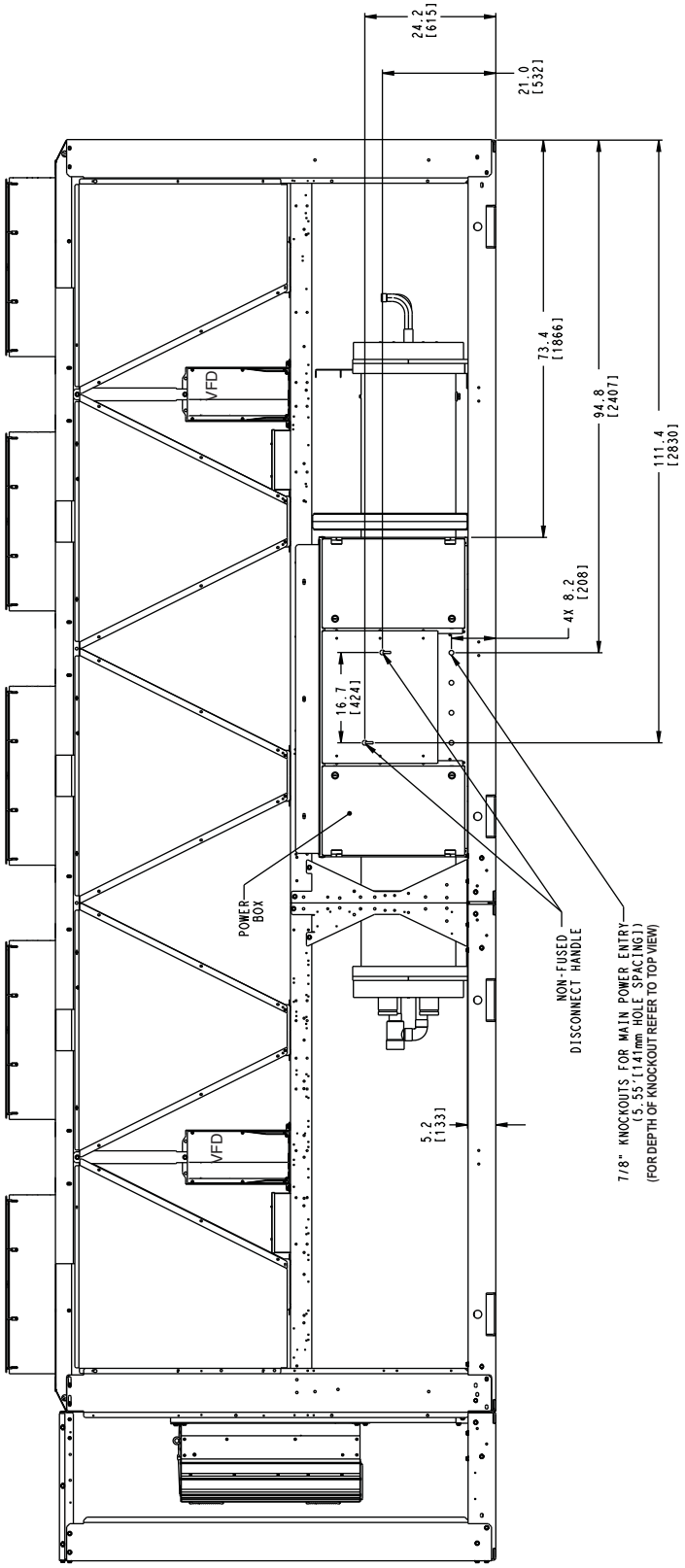
30XA142,162 (cont)



FRONT VIEW

Dimensions (cont)

30XA142,162 (cont)

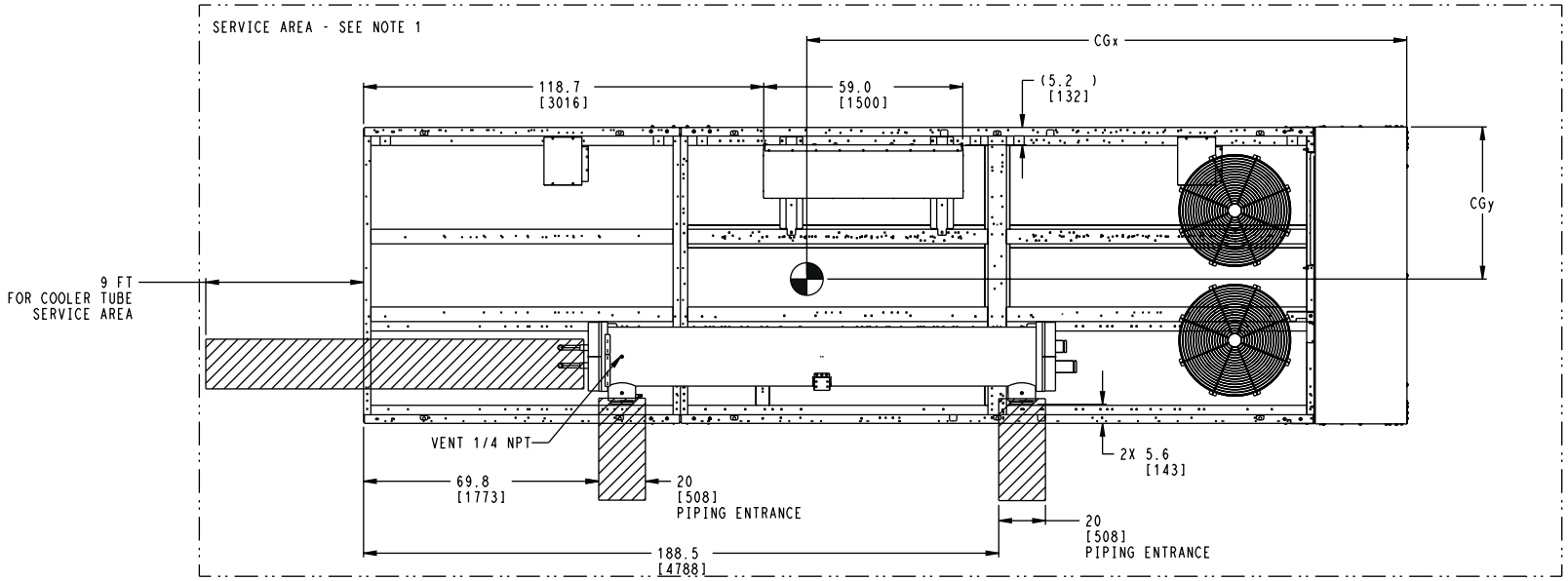


BACK VIEW

30XA182,202

NOTES:
1. Unit must have clearances as follows:
   Top — Do not restrict
   Sides and Ends — 6 ft (1.8 m) from solid surface for airflow.
   Side — 8 ft (2.4 m) required for coil service on the control box side of the unit.
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 female connection) and on each oil separator (3/8-in. flare connection).
4. Dimensions are shown in inches. Dimensions in [ ] are in millimeters.

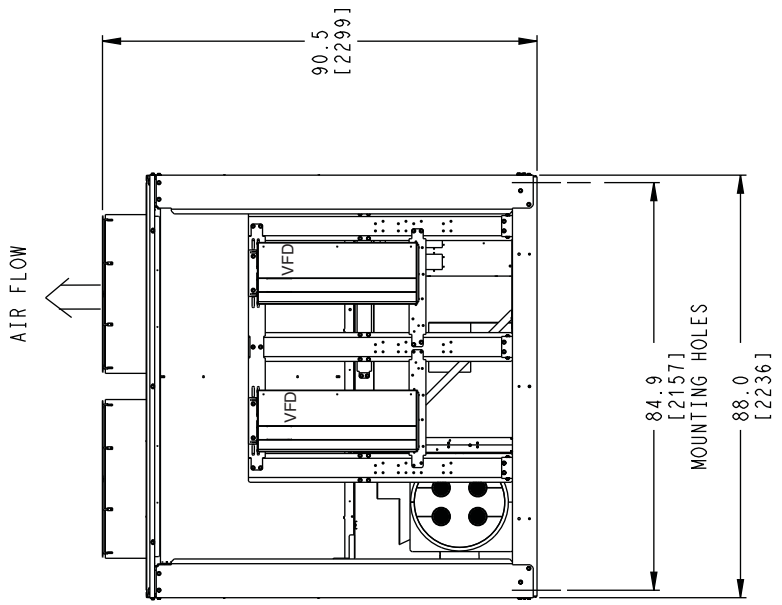
30XA UNIT	CGx	CGy
182 (MCHX and Al/Cu)	159.7 [4055]	45.6 [1158]
182 (Cu/Cu)	160.5 [4076]	45.5 [1157]
202 (MCHX and Al/Cu)	159.8 [4059]	45.6 [1158]
202 (Cu/Cu)	160.6 [4080]	45.5 [1157]



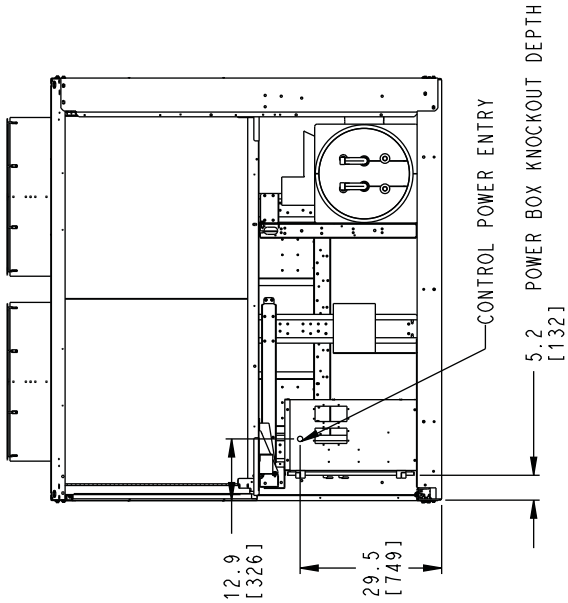
TOP VIEW

Dimensions (cont)

30XA182,202 (cont)

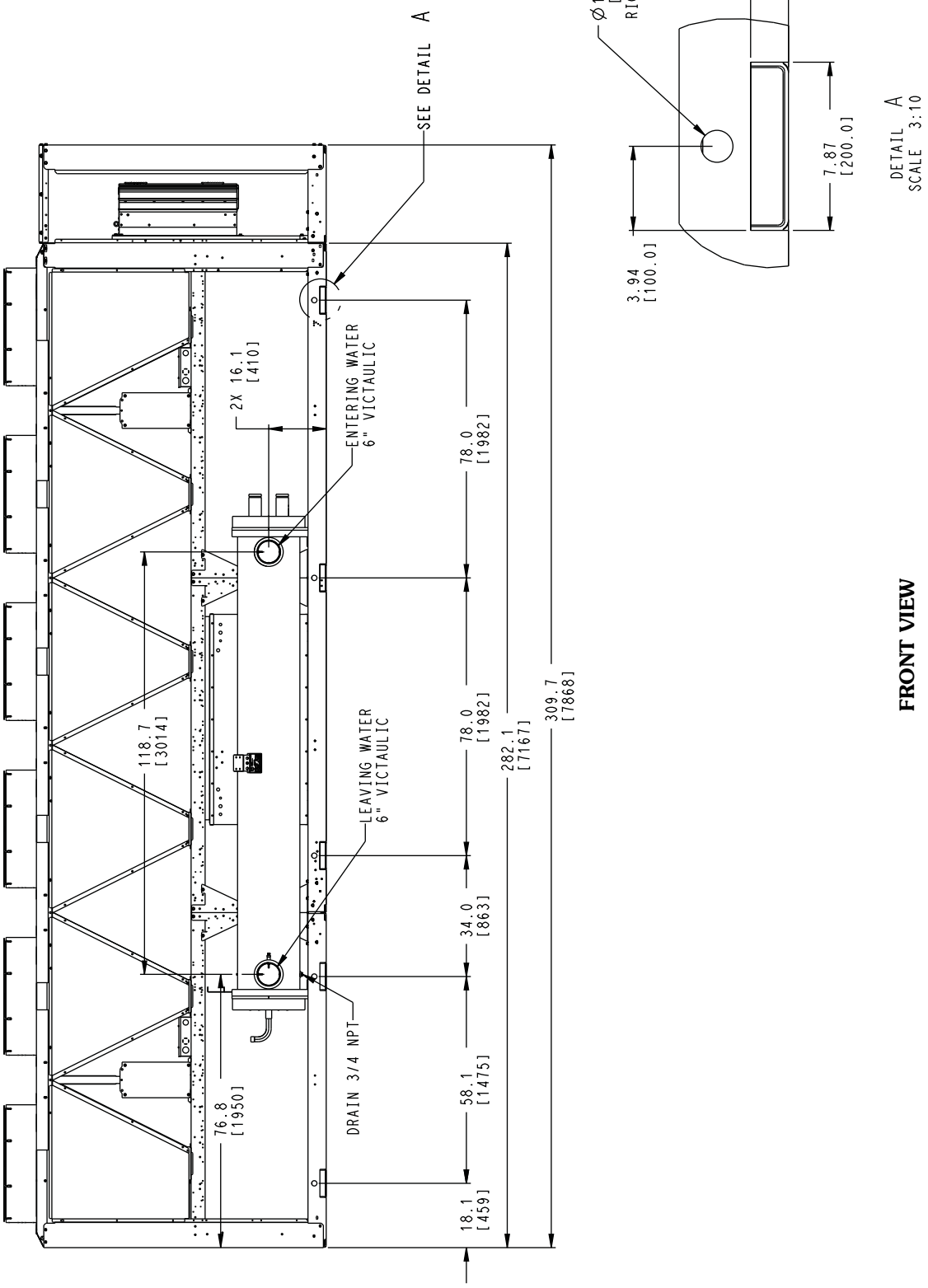


RIGHT END VIEW



LEFT END VIEW

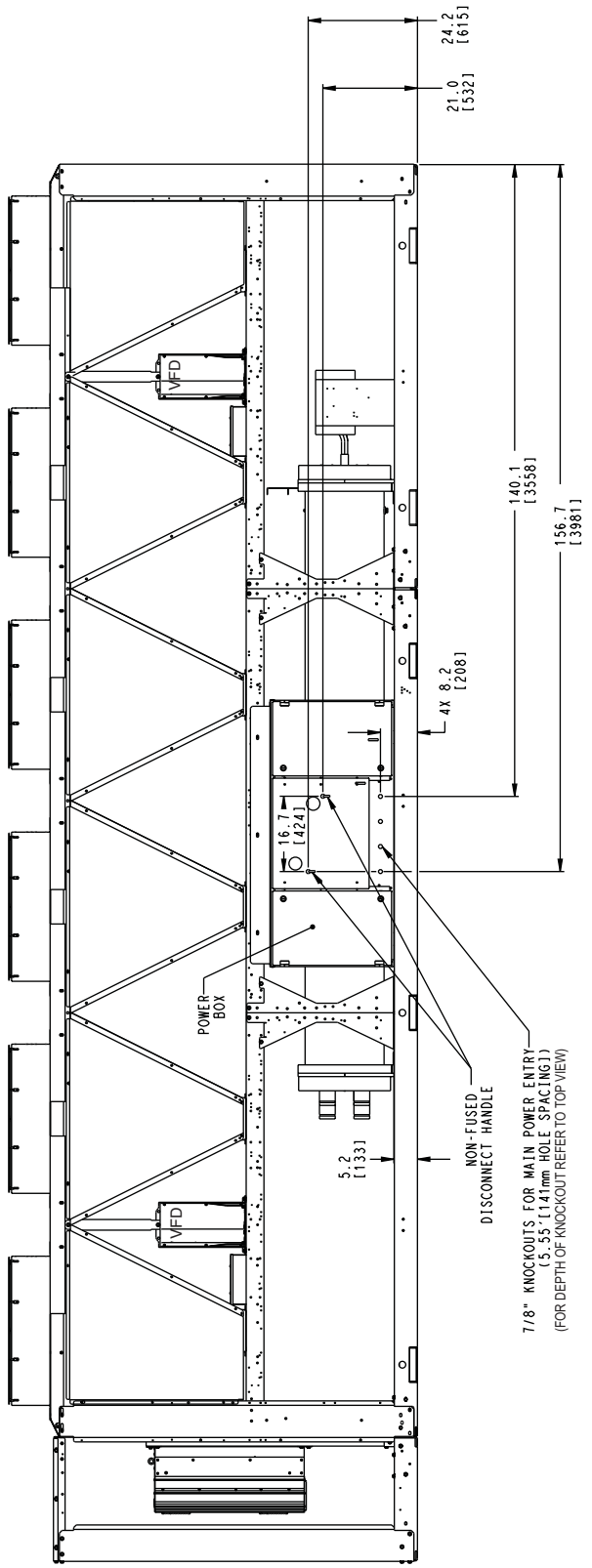
30XA182,202 (cont)



FRONT VIEW

Dimensions (cont)

30XA182,202 (cont)

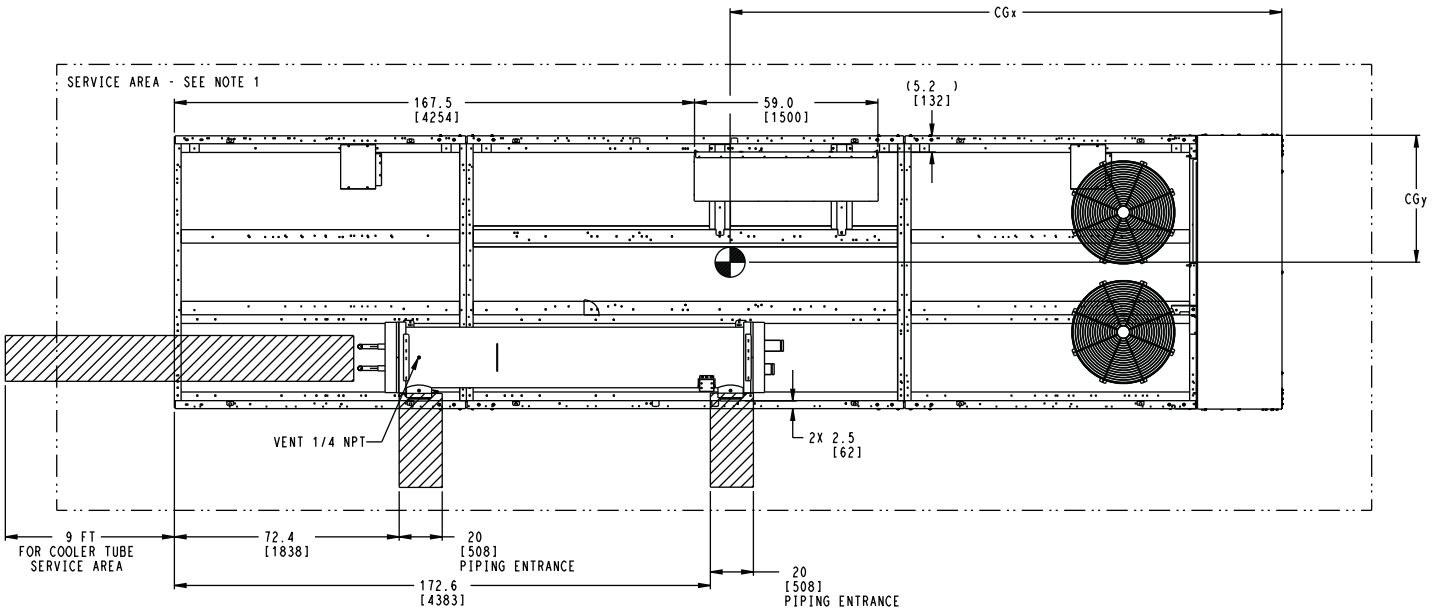


BACK VIEW

30XA222,242

NOTES:
1. Unit must have clearances as follows:
   Top — Do not restrict
   Sides and Ends — 6 ft (1.8 m) from solid surface for airflow.
   Side — 8 ft (2.4 m) required for coil service on the control box side of the unit.
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 female connection) and on each oil separator (3/8-in. flare connection).
4. Dimensions are shown in inches. Dimensions in [ ] are in millimeters.

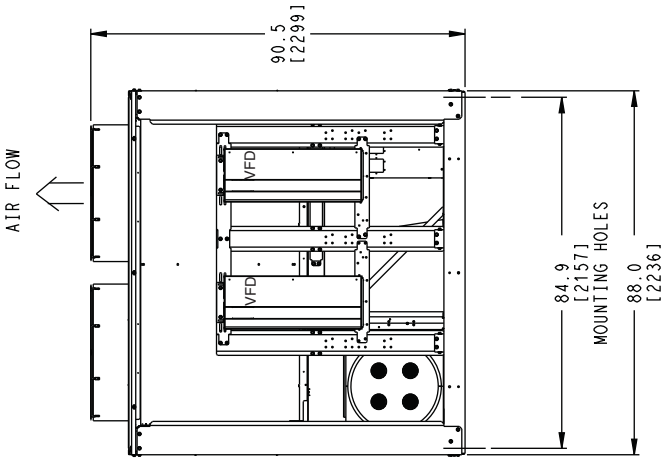
30XA UNIT	CGx	CGy
222 (MCHX and Al/Cu)	178.1 [4523]	45.7 [1161]
222 (Cu/Cu)	179.3 [4554]	45.6 [1158]
242 (MCHX and Al/Cu)	178.7 [4539]	45.7 [1162]
242 (Cu/Cu)	179.9 [4571]	45.7 [1162]



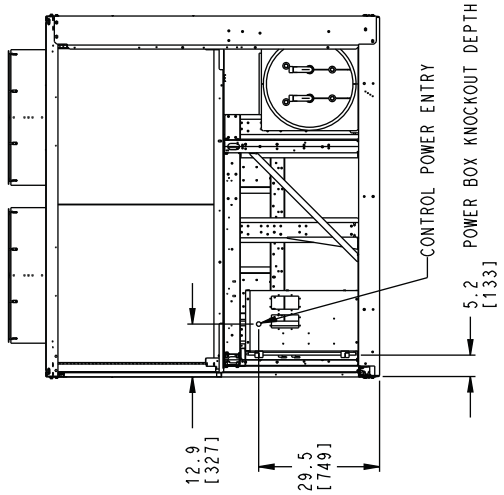
TOP VIEW

Dimensions (cont)

30XA222,242 (cont)

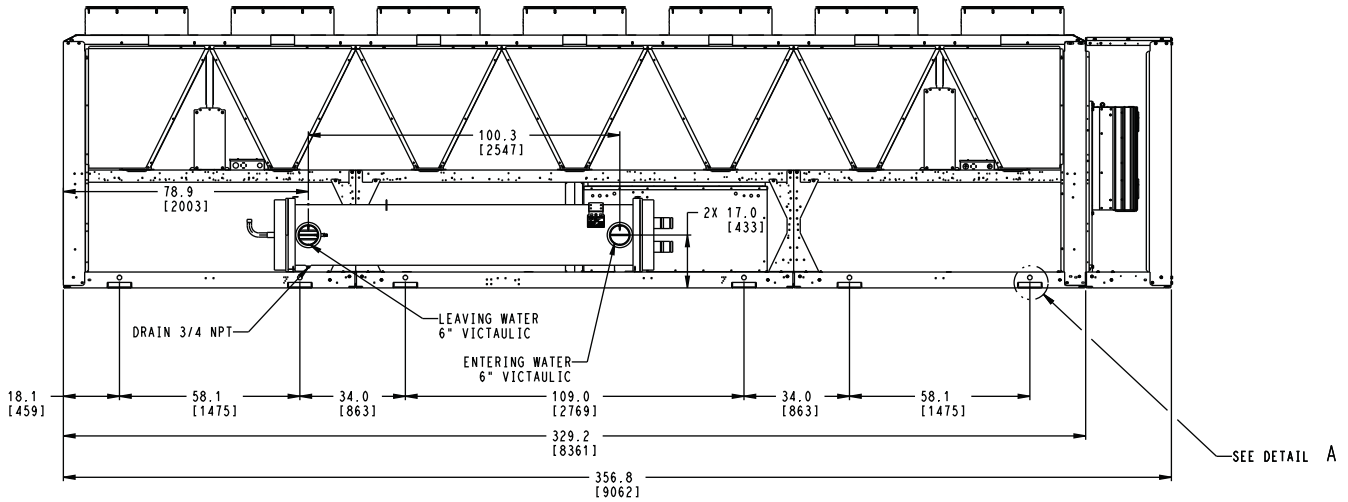


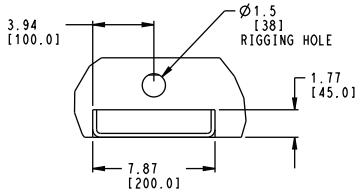
RIGHT END VIEW



LEFT END VIEW

30XA222,242 (cont)



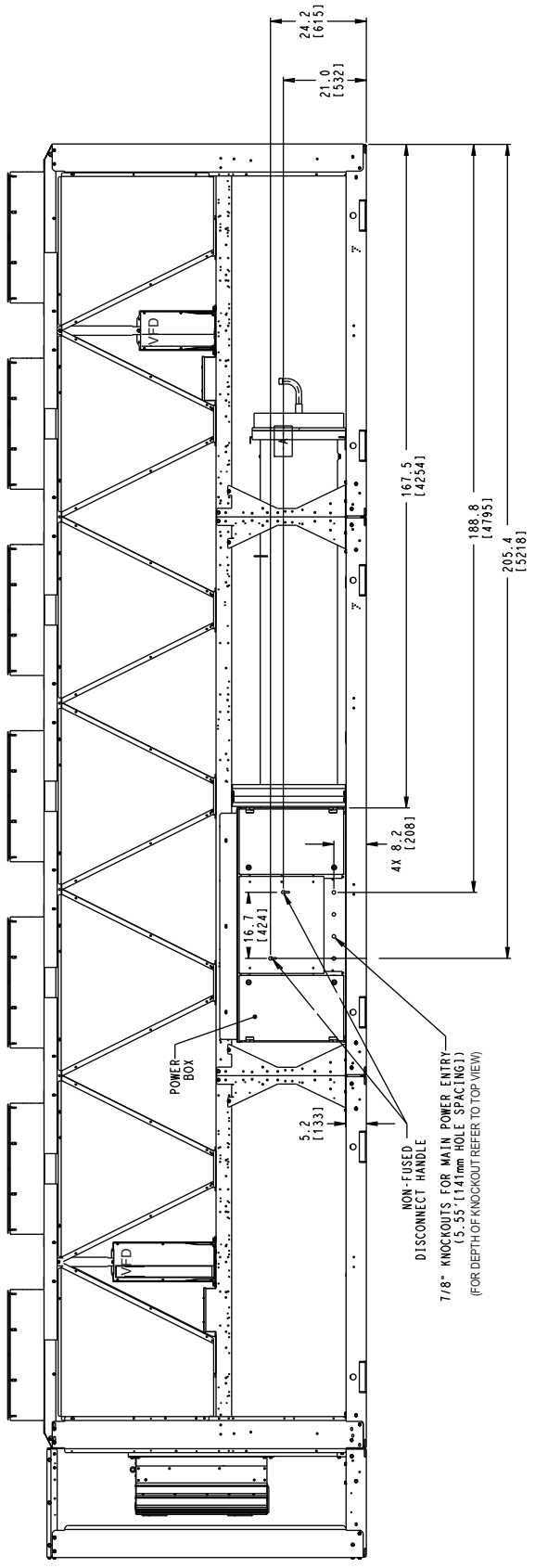


DETAIL A
SCALE 1:4

FRONT VIEW

Dimensions (cont)

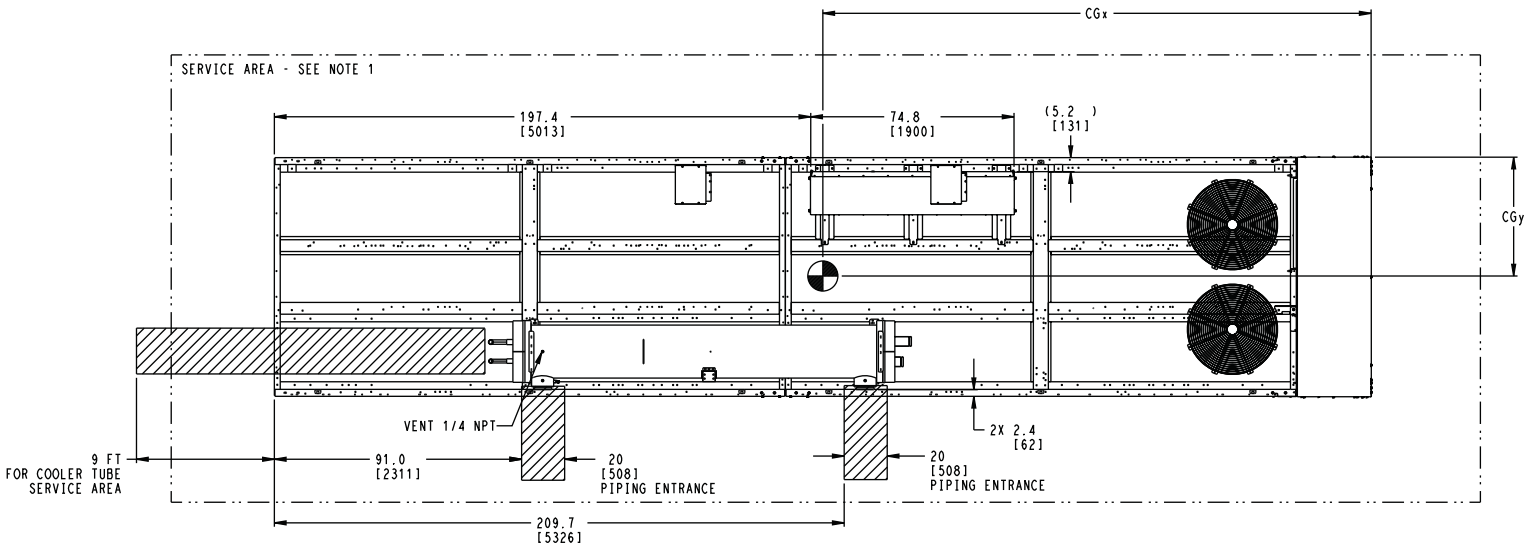
30XA222,242 (cont)



BACK VIEW

NOTES:
1. Unit must have clearances as follows:
   Top — Do not restrict
   Sides and Ends — 6 ft (1.8 m) from solid surface for airflow.
   Side — 8 ft (2.4 m) required for coil service on the control box side of the unit.
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 female connection) and on each oil separator (3/8-in. flare connection).
4. Dimensions are shown in inches. Dimensions in [ ] are in millimeters.

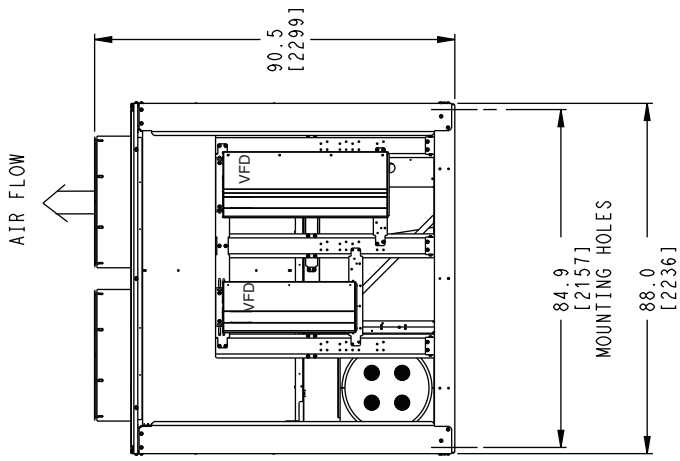
30XA UNIT	CGx	CGy
262 (MCHX and Al/Cu)	179.7 [4565]	43.7 [1109]
262 (Cu/Cu)	183.0 [4649]	43.8 [1113]
282 (MCHX and Al/Cu)	180.1 [4574]	43.8 [1112]
282 (Cu/Cu)	183.4 [4658]	43.9 [1116]



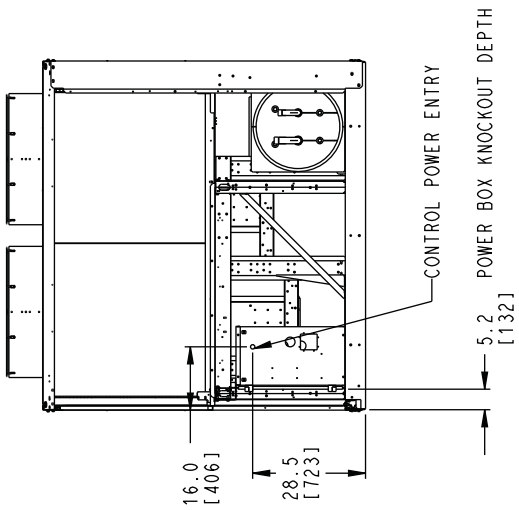
TOP VIEW

Dimensions (cont)

30XA262,282 (cont)

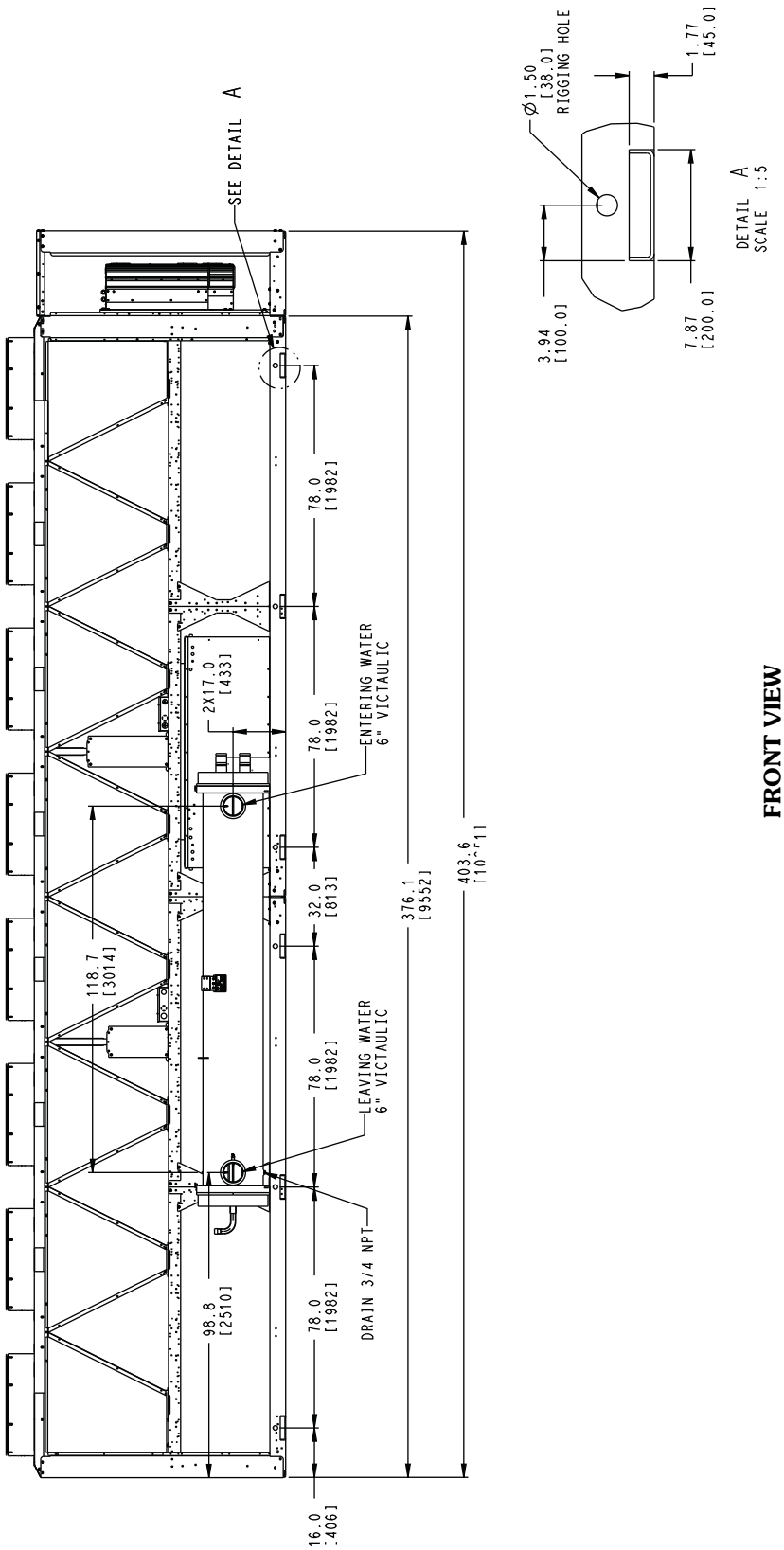


RIGHT END VIEW



LEFT END VIEW

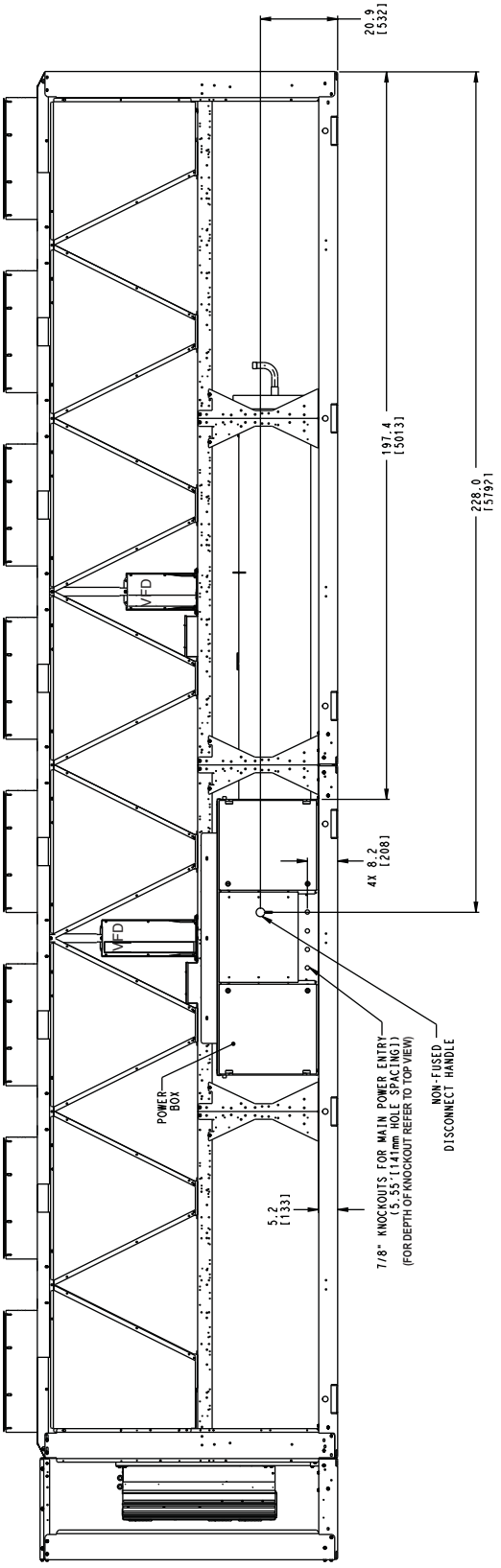
30XA262,282 (cont)



FRONT VIEW

Dimensions (cont)

30XA262,282 (cont)

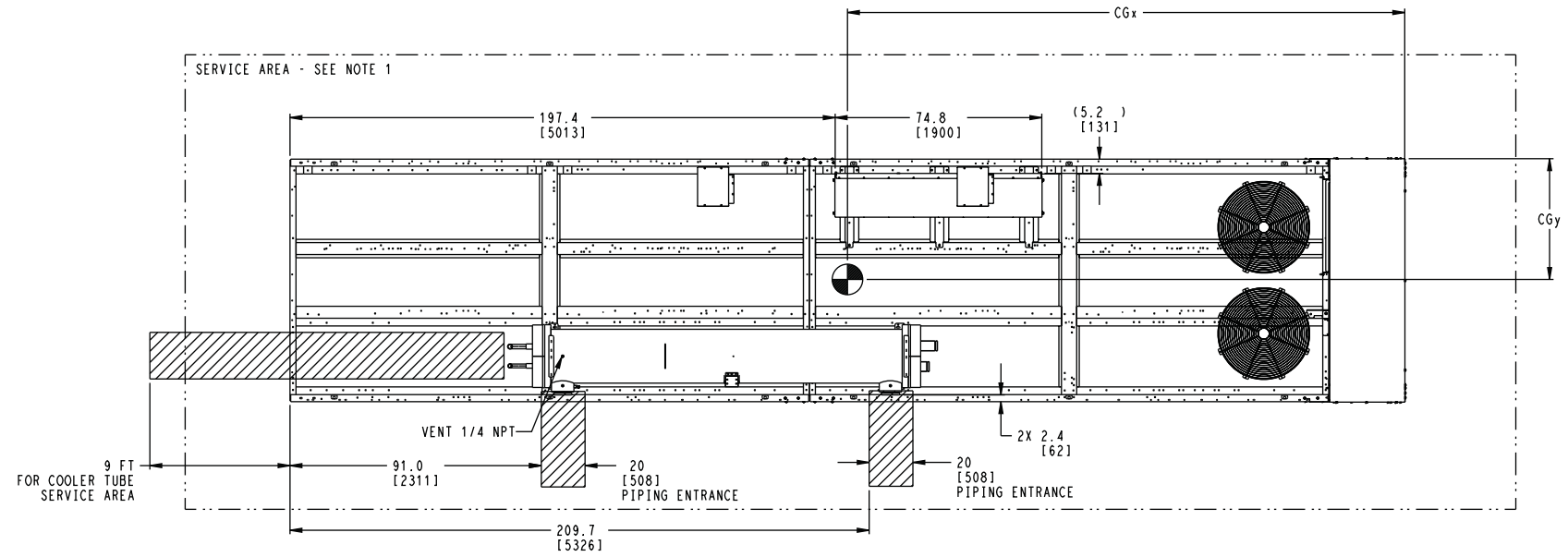


BACK VIEW

30XA302

NOTES:
1. Unit must have clearances as follows:
   Top — Do not restrict
   Sides and Ends — 6 ft (1.8 m) from solid surface for airflow.
   Side — 8 ft (2.4 m) required for coil service on the control box side of the unit.
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 female connection) and on each oil separator (3/8-in. flare connection).
4. Dimensions are shown in inches. Dimensions in [ ] are in millimeters.

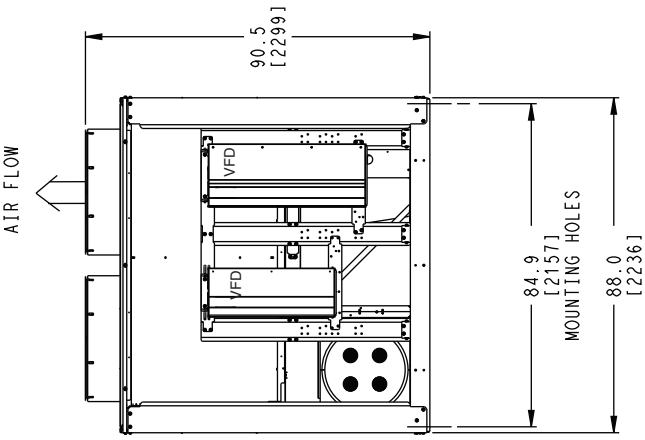
30XA UNIT	CGx	CGy
302 (MCHX and Al/Cu)	180.0 [4573]	43.8 [1112]
302 (Cu/Cu)	183.4 [4659]	43.9 [1116]



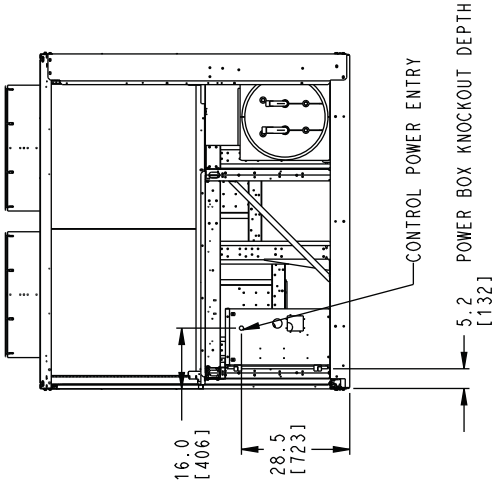
TOP VIEW

Dimensions (cont)

30XA302 (cont)

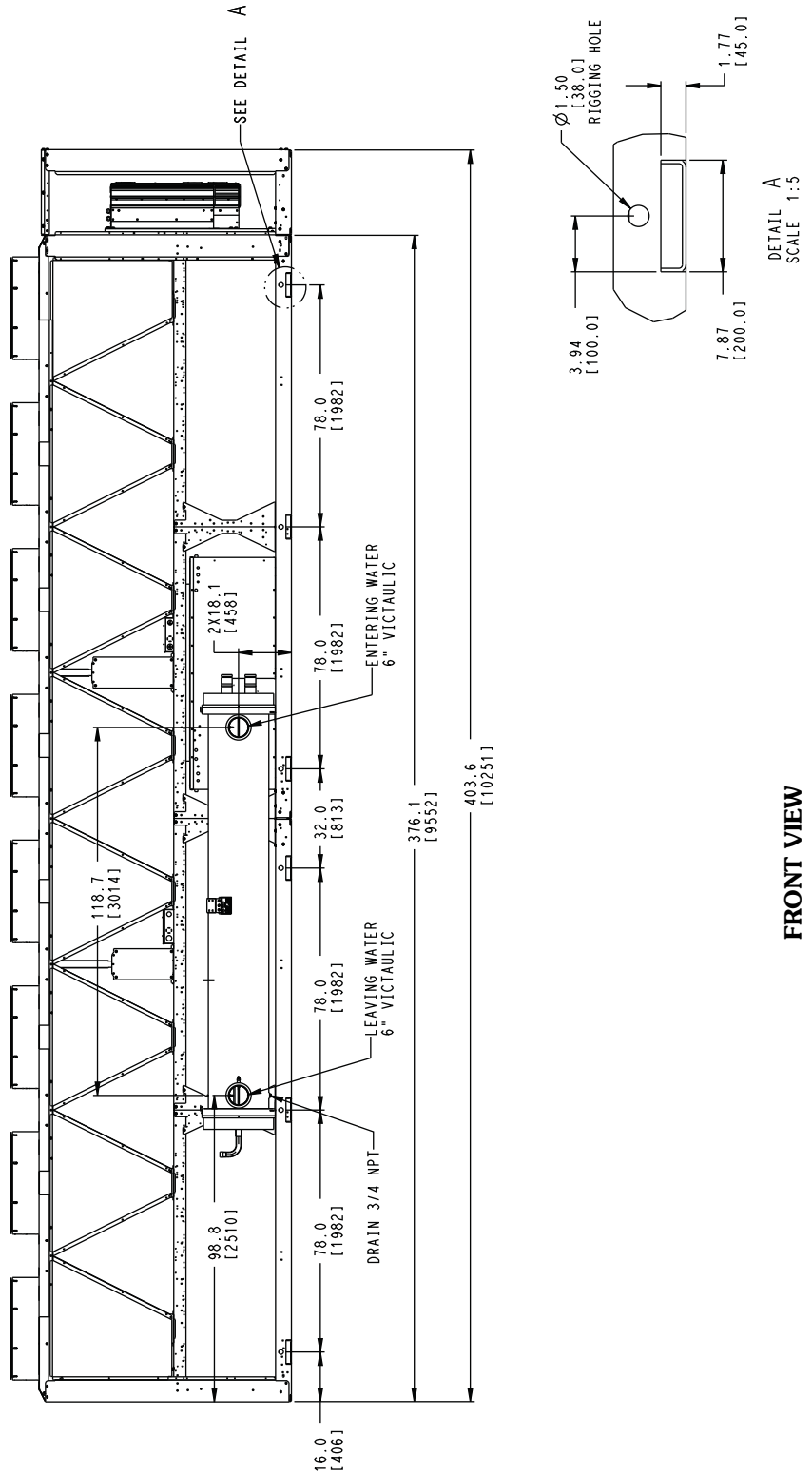


RIGHT END VIEW



LEFT END VIEW

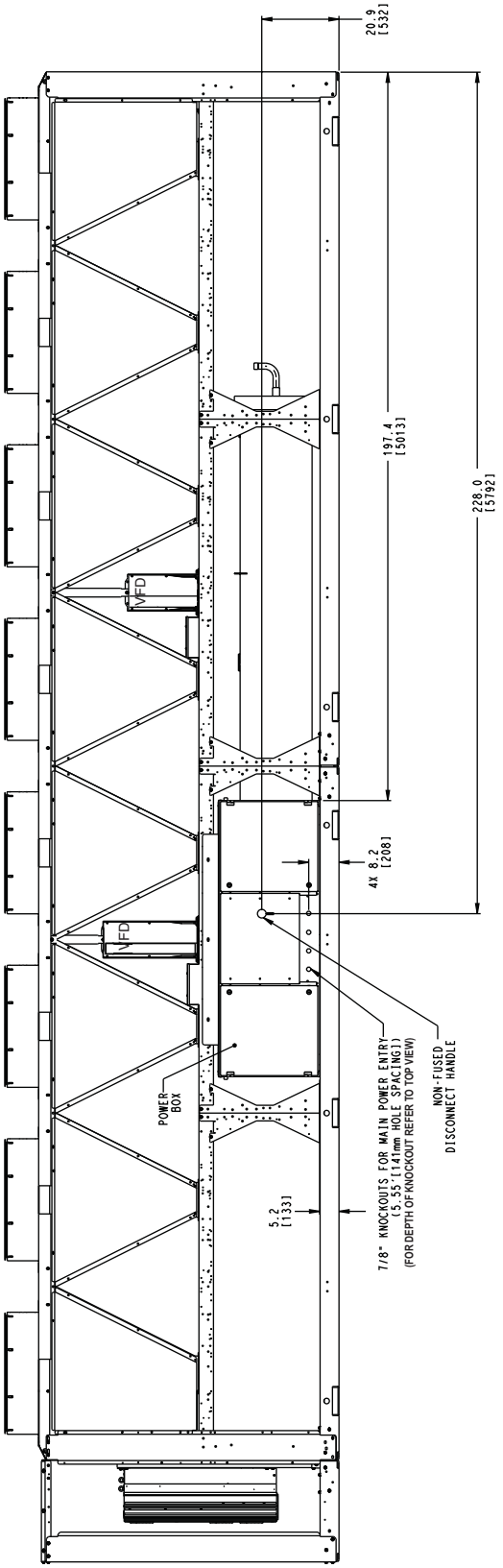
30XA302 (cont)



FRONT VIEW

Dimensions (cont)

30XA302 (cont)

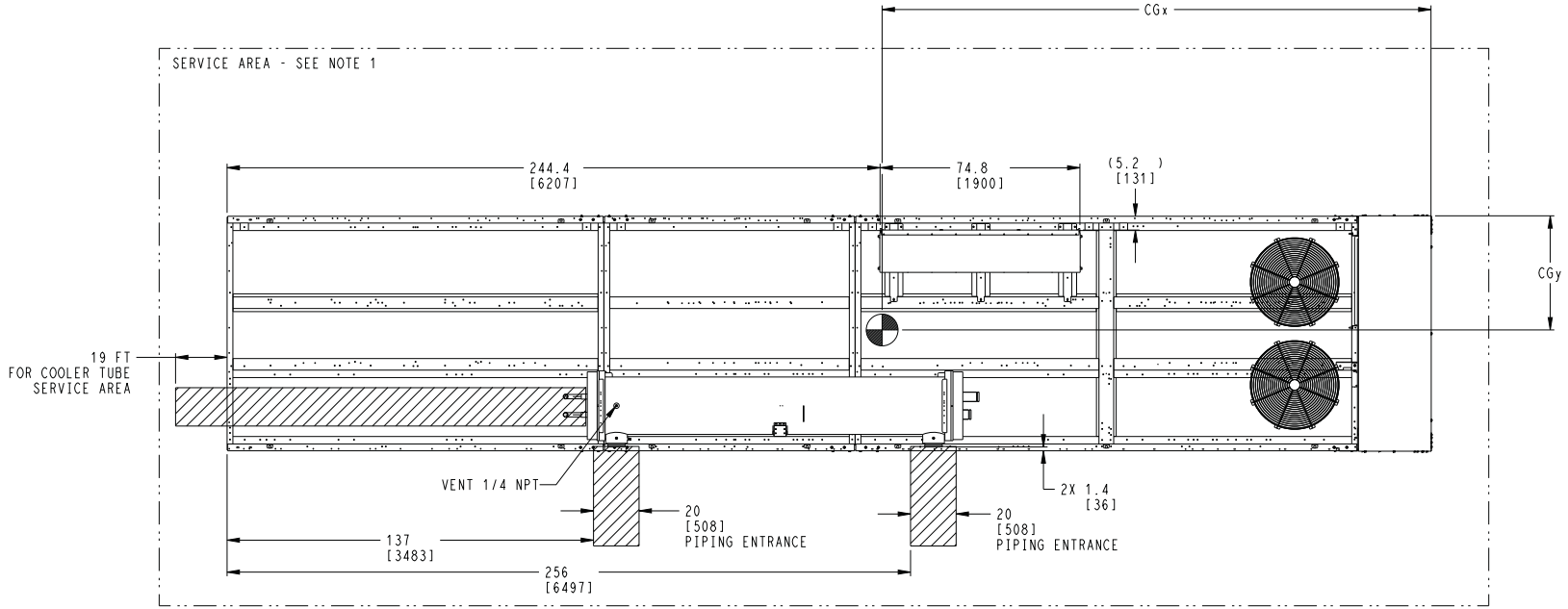


BACK VIEW

30XA327,352

NOTES:
1. Unit must have clearances as follows:
   Top — Do not restrict
   Sides and Ends — 6 ft (1.8 m) from solid surface for airflow.
   Side — 8 ft (2.4 m) required for coil service on the control box side of the unit.
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 female connection) and on each oil separator (3/8-in. flare connection).
4. Dimensions are shown in inches. Dimensions in [ ] are in millimeters.

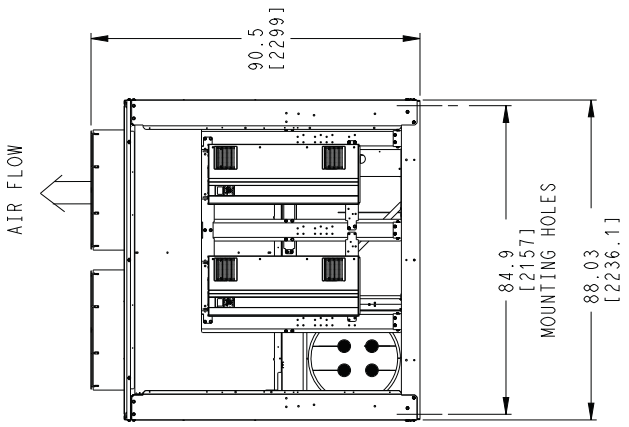
30XA UNIT	CGx	CGy
327 (MCHX and Al/Cu)	195.6 [4969]	42.3 [1075]
327 (Cu/Cu)	200.0 [5079]	42.6 [1082]
352 (MCHX and Al/Cu)	195.3 [4960]	42.3 [1075]
352 (Cu/Cu)	199.6 [5069]	42.6 [1082]



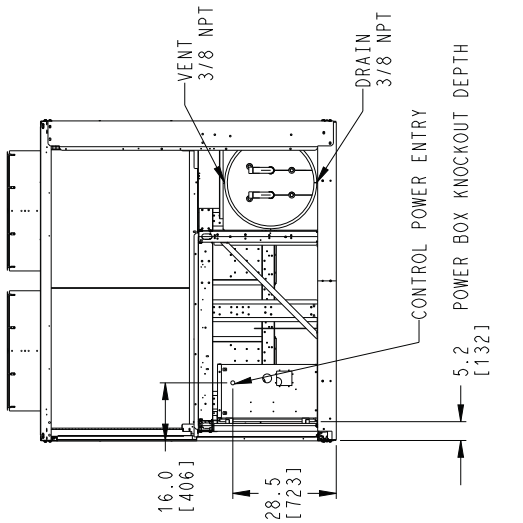
TOP VIEW

Dimensions (cont)

30XA327,352 (cont)

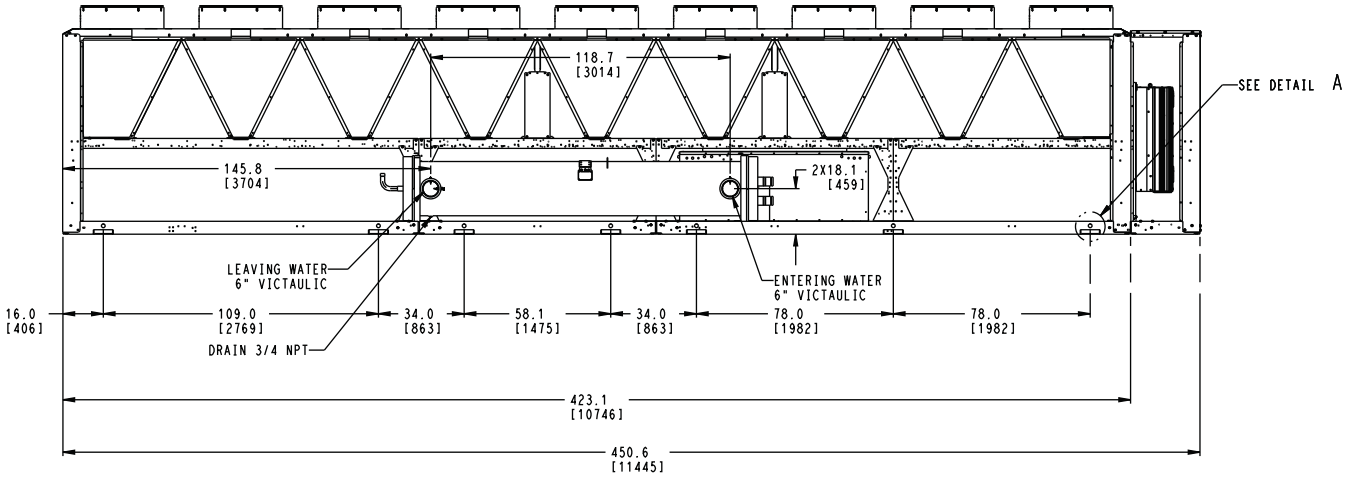


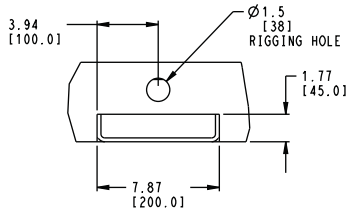
RIGHT END VIEW



LEFT END VIEW

30XA327,352 (cont)



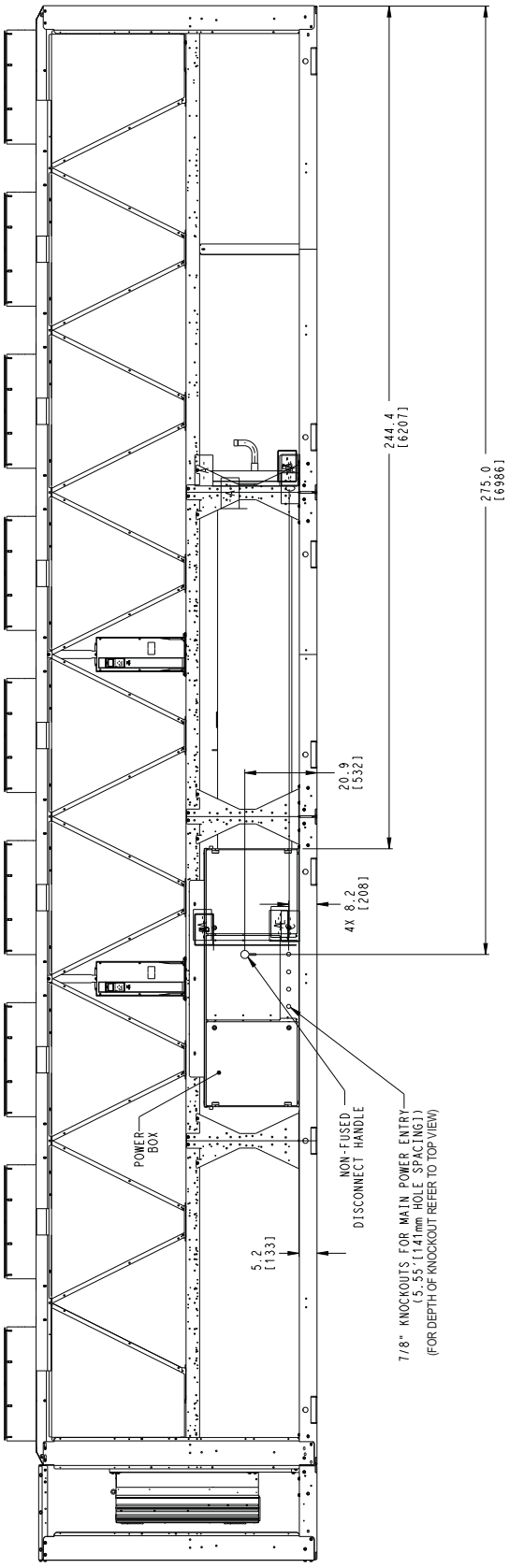


DETAIL A
SCALE 1:4

FRONT VIEW

Dimensions (cont)

30XA327,352 (cont)



BACK VIEW

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 (–9.4 C) below the LWT set point is required. When the leaving fluid temperature is less than 30 F (–1.1 C), suction line insulation is required. In the flooded cooler case, a plus-one-pass cooler is also required. Consider the DX (direct expansion) cooler option for these conditions.
- If the LWT requirement is greater than 60 F (15.5 C), a mixing loop is required.

Entering water (fluid) 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:

- 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 F (52 C) for all unit sizes.
- Lowest allowable ambient temperature for the standard unit to start and operate is 32 F (0°). With the inclusion of wind baffles (field fabricated and installed), the unit is capable to start as low as 5 F (–15 C) and to operate as low as –20 F (–29 C) ambient temperature.

Cooling capacity requirement:

- Do not oversize the chillers by more than 15% at design conditions.

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.

Chilled water reset:

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

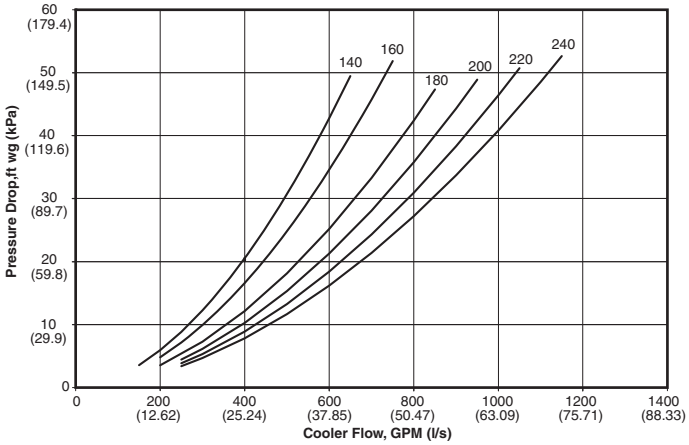
Demand limit:

- 2-step (requires an energy management module)

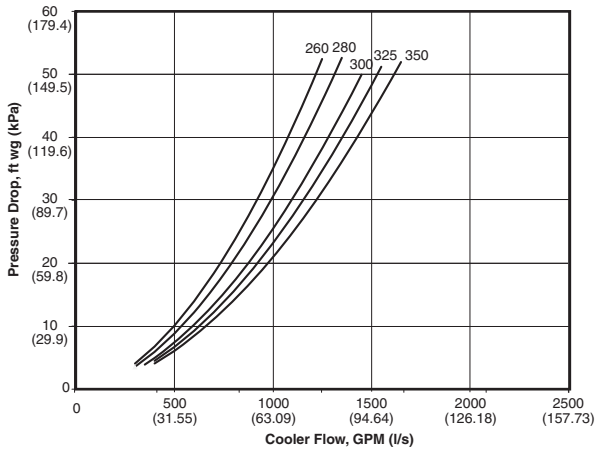
Performance data

COOLER PRESSURE DROP CURVES

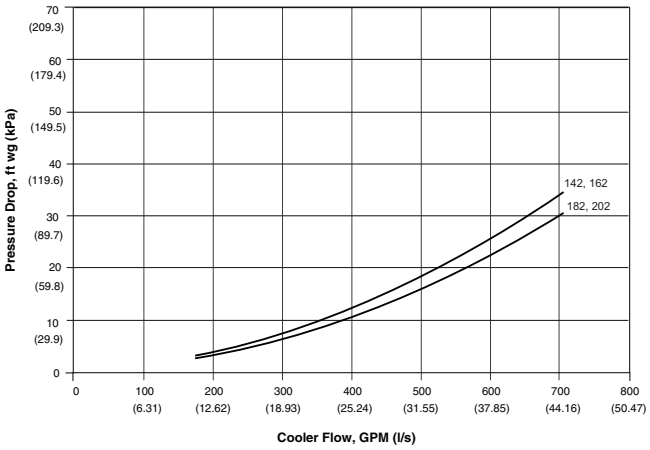
30XA140, 160, 180, 200, 220, 240



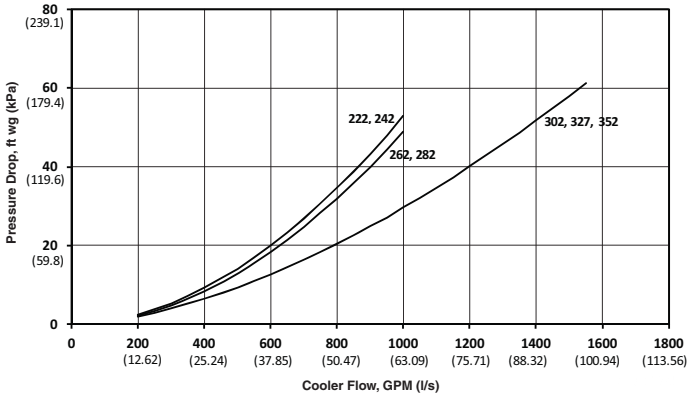
30XA260, 280, 300, 325, 350



30XA142, 162, 182, 202

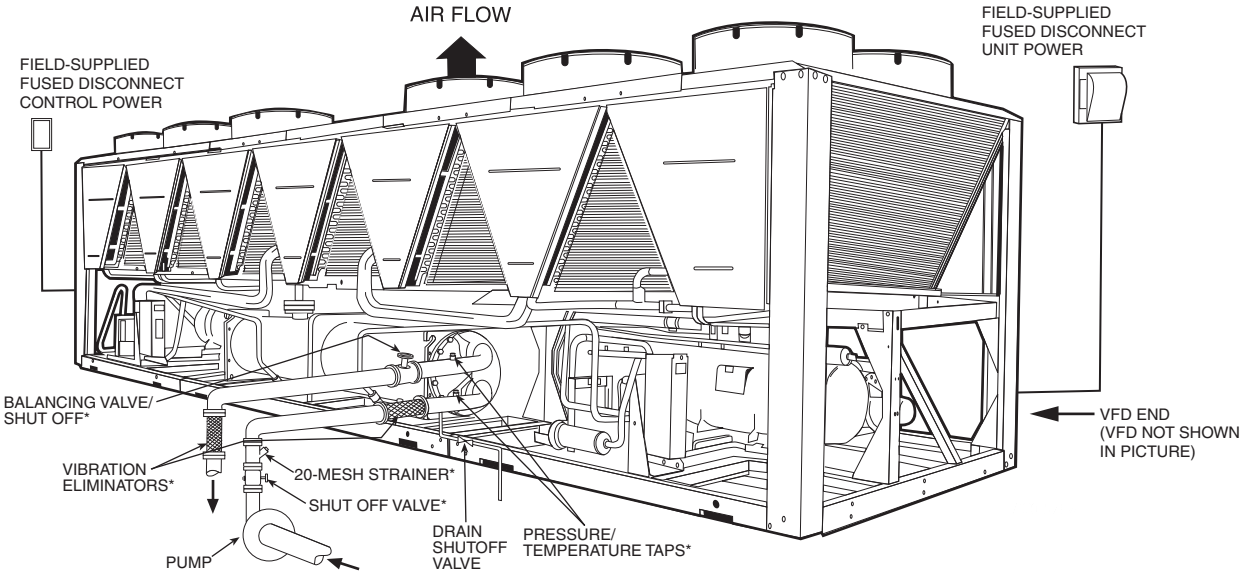


30XA222, 242, 262, 282, 302, 327, 352



Typical piping and wiring

30XA UNITS WITH FLOODED COOLER



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.

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 ft (3 m) of the cooler inlet.

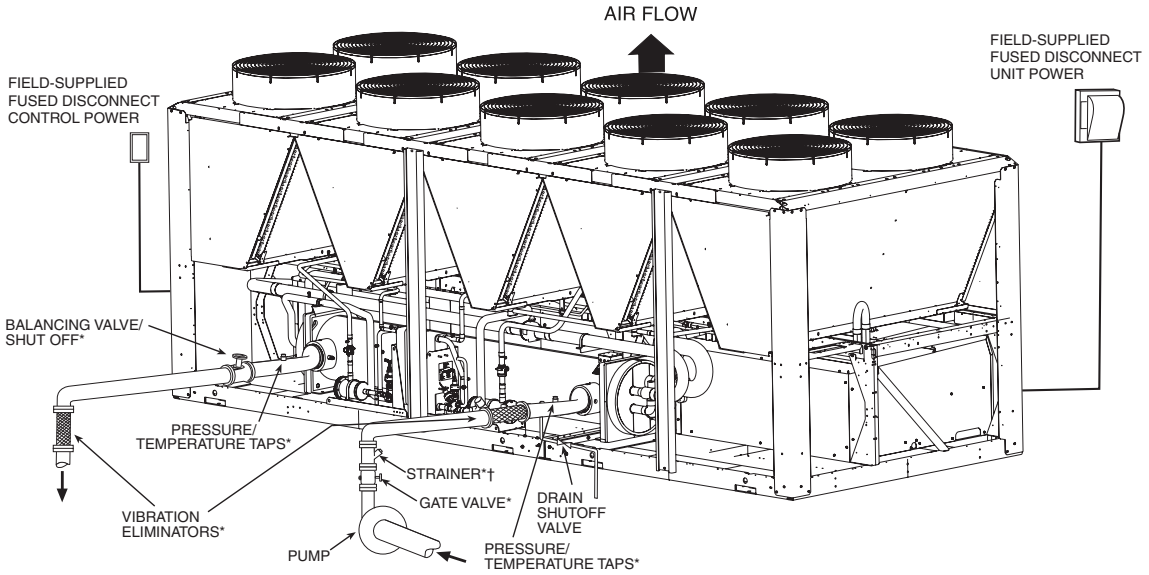
TYPICAL PIPING DIAGRAM FOR 30XA FLOODED COOLERS

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
— 20-Mesh Strainer

Typical piping and wiring (cont)

30XA UNITS WITH DX COOLER



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.

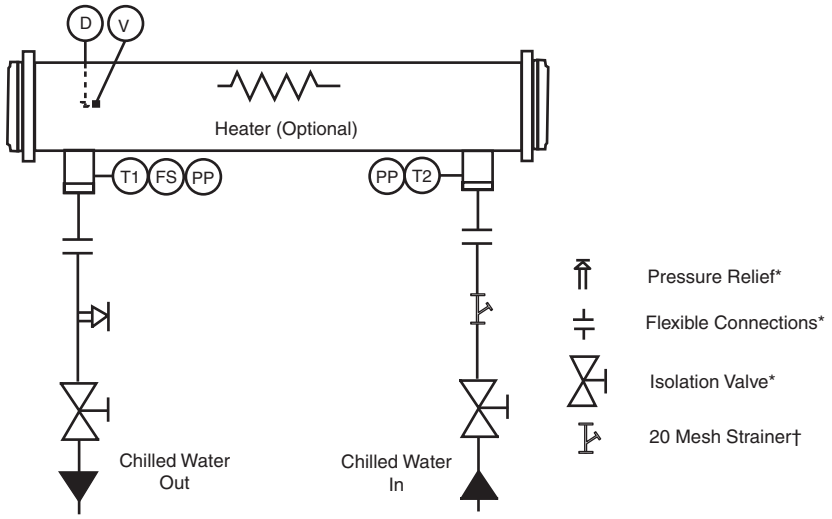
NOTES:
1. Chiller must be installed level to maintain proper compressor oil return.
2. Piping shown are general points-of-connection guides only and are not intended for a specific installation. Wiring and piping shown are for a quick overview of system and are not in accordance with recognized standards.
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 is required within 10 ft (3 m) of the cooler.

TYPICAL PIPING DIAGRAM FOR 30XA UNITS WITH DX COOLERS

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

*Field-supplied and installed.
†Field-supplied and installed, and required within 10 ft (3 m) of cooler inlet.



Electrical data

SINGLE POINT

UNIT 30XA	UNIT VOLTAGE			MCA	MOCP	REC FUSE SIZE	CONTROL CIRCUIT	
	V-Hz (3 Ph)	Supplied					Voltage 1 PH, 60 Hz	MCA and MOCP
		Min	Max					
140, 142	460-60	414	506	281.0	400	350	115	40
	575-60	518	633	216.3	300	250	115	40
	380-60	342	418	328.3	450	400	115	40
160, 162	460-60	414	506	320.5	450	400	115	40
	575-60	518	633	247.2	350	300	115	40
	380-60	342	418	374.9	500	450	115	40
180,182	460-60	414	506	351.9	450	400	115	60
	575-60	518	633	271.1	350	300	115	60
	380-60	342	418	410.8	500	450	115	60
200, 202	460-60	414	506	396.9	500	450	115	60
	575-60	518	633	305.8	400	350	115	60
	380-60	342	418	463.8	600	600	115	60
220, 222	460-60	414	506	438.0	600	500	115	60
	575-60	518	633	337.6	450	400	115	60
	380-60	342	418	511.5	700	600	115	60
240, 242	460-60	414	506	466.5	600	600	115	60
	575-60	518	633	359.5	450	400	115	60
	380-60	342	418	544.4	700	600	115	60
260, 262	460-60	414	506	529.1	700	600	115	60
	575-60	518	633	407.4	500	500	115	60
	380-60	342	418	616.7	800	700	115	60
280, 282	460-60	414	506	563.0	800	700	115	60
	575-60	518	633	433.6	600	500	115	60
	380-60	342	418	656.2	800	800	115	60
300, 302	460-60	414	506	619.6	800	700	115	60
	575-60	518	633	476.7	600	600	115	60
	380-60	342	418	722.3	1000	1000	115	60
325, 327	460-60	414	506	638.1	800	700	115	60
	575-60	518	633	491.2	600	600	115	60
	380-60	342	418	743.0	1000	1000	115	60
350, 352	460-60	414	506	694.6	800	800	115	60
	575-60	518	633	534.2	700	600	115	60
	380-60	342	418	809.1	1000	1000	115	60

LEGEND

MCA — Minimum Circuit Amps
MOCP— Maximum Overcurrent Protection

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. Based on the operational characteristics of a VFD (variable frequency drive), the “inrush” current normally associated with a chiller is limited and will be lower than the MCA rating of the chiller.
5. 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.

Electrical data (cont)

DUAL POINT

UNIT 30XA	UNIT VOLTAGE			MCA	MOCP	REC FUSE SIZE	CONTROL CIRCUIT	
	V-Hz (3 Ph)	Supplied					Voltage 1 PH, 60 Hz	MCA and MOCP
		Min	Max					
140, 142	460-60	414	506	191.9/105.9	300/150	225/125	115	40
	575-60	518	633	147.7/ 81.4	225/125	175/100	115	40
	380-60	342	418	223.9/124.0	350/200	300/150	115	40
160, 162	460-60	414	506	216.9/124.1	350/200	300/150	115	40
	575-60	518	633	167.0/ 95.9	250/150	200/125	115	40
	380-60	342	418	253.3/145.4	400/225	300/175	115	40
180, 182	460-60	414	506	191.9/191.9	300/300	225/225	115	60
	575-60	518	633	147.7/147.7	225/225	175/175	115	60
	380-60	342	418	223.9/223.9	350/350	300/300	115	60
200, 202	460-60	414	506	216.9/216.9	350/350	300/300	115	60
	575-60	518	633	167.0/167.0	250/250	200/200	115	60
	380-60	342	418	253.3/253.3	400/400	300/300	115	60
220, 222	460-60	414	506	258.0/216.9	400/350	350/300	115	60
	575-60	518	633	198.8/167.0	300/250	250/200	115	60
	380-60	342	418	301.0/253.3	500/400	400/300	115	60
240, 242	460-60	414	506	258.0/252.6	400/400	350/300	115	60
	575-60	518	633	198.8/194.5	300/300	250/250	115	60
	380-60	342	418	301.0/294.5	500/450	400/350	115	60
260, 262	460-60	414	506	349.1/216.9	500/350	450/300	115	60
	575-60	518	633	268.6/167.0	450/250	350/200	115	60
	380-60	342	418	406.2/253.3	600/400	500/300	115	60
280, 282	460-60	414	506	349.1/258.0	500/400	450/350	115	60
	575-60	518	633	268.6/198.8	450/300	350/250	115	60
	380-60	342	418	406.2/301.0	600/500	500/400	115	60
300, 302	460-60	414	506	411.0/252.6	600/400	500/300	115	60
	575-60	518	633	315.9/194.5	500/300	400/250	115	60
	380-60	342	418	478.9/294.5	800/450	600/350	115	60
325, 327	460-60	414	506	349.1/349.1	500/500	450/450	115	60
	575-60	518	633	268.6/268.6	450/450	350/350	115	60
	380-60	342	418	406.2/406.2	600/600	500/500	115	60
350, 352	460-60	414	506	405.6/349.1	600/500	500/450	115	60
	575-60	518	633	311.6/268.6	500/450	400/350	115	60
	380-60	342	418	472.4/406.2	800/600	600/500	115	60

LEGEND

MCA — Minimum Circuit Amps
MOCP — Maximum Overcurrent Protection

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. Based on the operational characteristics of a VFD (variable frequency drive), the "inrush" current normally associated with a chiller is limited and will be lower than the MCA rating of the chiller.
5. 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.
6. Data provided as circuit 1/circuit 2 where there are two circuits.

COMPRESSOR AND FAN ELECTRICAL DATA

30XA UNIT SIZE	UNIT VOLTAGE V-Hz (3 Ph, 60 Hz)	NUMBER OF CONDENSER FANS		CONDENSER FANS FLA	COMPRESSOR			
					A		B	
		Single Point	Dual Point*		LRA	RLA	LRA	RLA
140, 142	380	10	6/4	6.5	1126	147.7	660	78.3
	460	10	6/4	5.4	930	127.6	545	67.5
	575	10	6/4	4.3	744	97.5	436	51.3
160, 162	380	10	6/4	6.5	1441	171.3	660	95.4
	460	10	6/4	5.4	1190	147.6	545	82.0
	575	10	6/4	4.3	952	112.9	436	62.9
180, 182	380	12	6/6	6.5	1126	147.7	1126	147.7
	460	12	6/6	5.4	930	127.6	930	127.6
	575	12	6/6	4.3	744	97.5	744	97.5
200, 202	380	12	6/6	6.5	1441	171.3	1441	171.3
	460	12	6/6	5.4	1190	147.6	1190	147.6
	575	12	6/6	4.3	952	112.9	952	112.9
220, 222	380	13	7/6	6.5	1441	204.2	1441	171.3
	460	13	7/6	5.4	1190	176.1	1190	147.6
	575	13	7/6	4.3	952	134.8	952	112.9
240, 242	380	13	7/6	6.5	1441	204.2	1441	204.2
	460	13	7/6	5.4	1190	176.1	1190	176.1
	575	13	7/6	4.3	952	134.8	952	134.8
260, 262	380	15	9/6	6.5	2179	277.9	1441	171.3
	460	15	9/6	5.4	1800	240.4	1190	147.6
	575	15	9/6	4.3	1440	183.7	952	112.9
280, 282	380	16	9/7	6.5	2179	277.9	1441	204.2
	460	16	9/7	5.4	1800	240.4	1190	176.1
	575	16	9/7	4.3	1440	183.7	952	134.8
300, 302	380	16	10/6	6.5	2179	330.8	1441	204.2
	460	16	10/6	5.4	1800	285.6	1190	176.1
	575	16	10/6	4.3	1440	218.2	952	134.8
325, 327	380	18	9/9	6.5	2179	277.9	2179	277.9
	460	18	9/9	5.4	1800	240.4	1800	240.4
	575	18	9/9	4.3	1440	183.7	1440	183.7
350, 352	380	18	9/9	6.5	2179	330.8	2179	277.9
	460	18	9/9	5.4	1800	285.6	1800	240.4
	575	18	9/9	4.3	1440	218.2	1440	183.7

LEGEND

FLA — Full Load Amps
LRA — Locked Rotor Amps
RLA — Rated Load Amps

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

NOTE: For 30XA140-352 units with dual power supply, main power supply 1 uses refrigerant circuit A components to calculate MCA and MOCP. Main power supply 2 uses refrigerant circuit B components to calculate MCA and MOCP.

Microprocessor

The Touch Pilot™ 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 pumps (where configured) will energize the cooler pump to the internal (or CCN) time schedule (or input occupied signal from external system).

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 Touch Pilot microprocessor controls the capacity of the chiller by varying the number of compressors on and each loading capacity to satisfy actual dynamic load conditions. 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 4° F (2.2° C) above 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 4° F (2.2° C) above the set point for brine to protect against freezing.

In pulldown mode, no additional capacity is added if the rate of change of the leaving water temperature is greater than the adjustable setting.

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 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 and increasing the drive frequency. As the load increases above 100% of the first compressor's capacity, another compressor is started and both are staged together to optimize efficiency.

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 controls respond to the supply chilled water temperature to cycle the compressors to match cooling load requirements.

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) (optional with EMM board)

Three refrigerant pressure transducers are used in each circuit for sensing suction, discharge, and liquid pressure. The microprocessor uses these inputs to control capacity, fan speed, and valve openings to optimize efficiency.

The following pressure transducers are provided on 30XA units:

- Saturated condensing temperature
- Cooler saturation temperature
- Oil
- Economizer
- Liquid saturated temperature

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.

Touch Pilot controls

Dynamic Touch Pilot controls keep the chiller online 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.

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

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

Temperature reset

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.

The energy management module is required for 4 to 20 mA signal temperature reset for outdoor-air temperature or space temperature. Return fluid temperature does not require this module.

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 the VFD (variable frequency drive) and the microprocessor. For safeties, the VFD and microprocessor make appropriate decision to shut down a compressor due to a safety trip or bad sensor reading and display 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 Touch Pilot™ 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 resets 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.

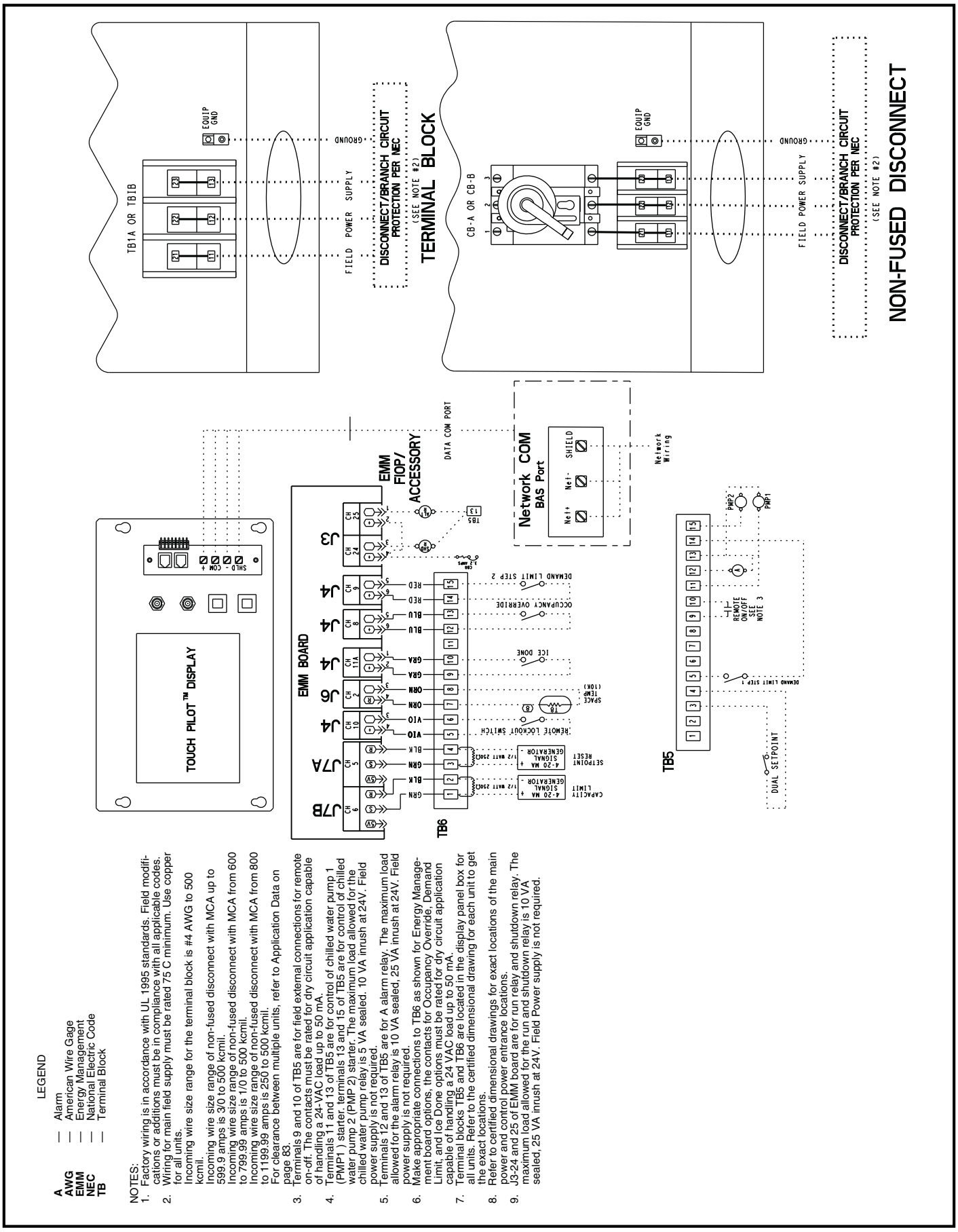
Default settings

To facilitate quick start-ups, 30XA chillers with Touch Pilot 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.

Control and power wiring schematic

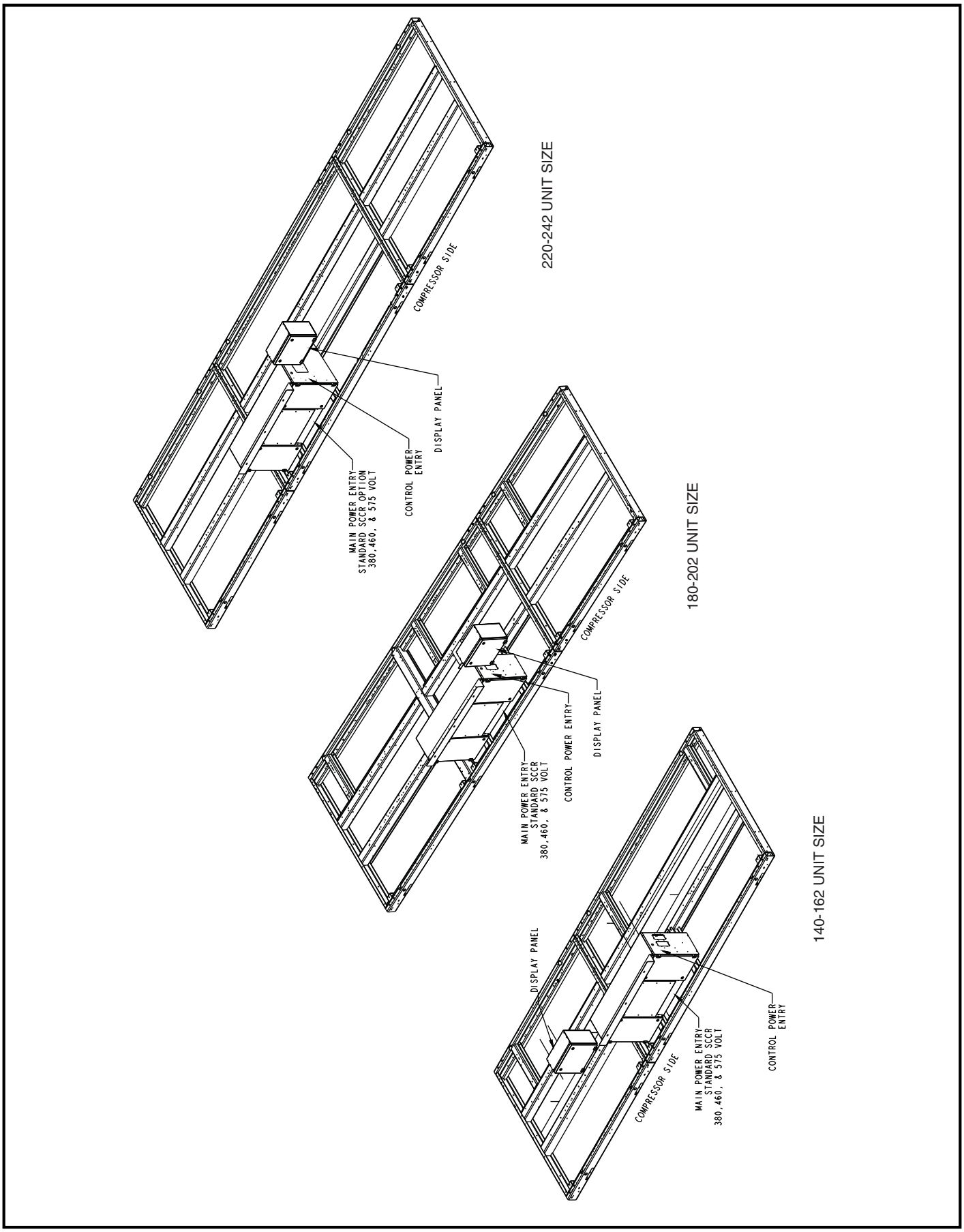


LEGEND

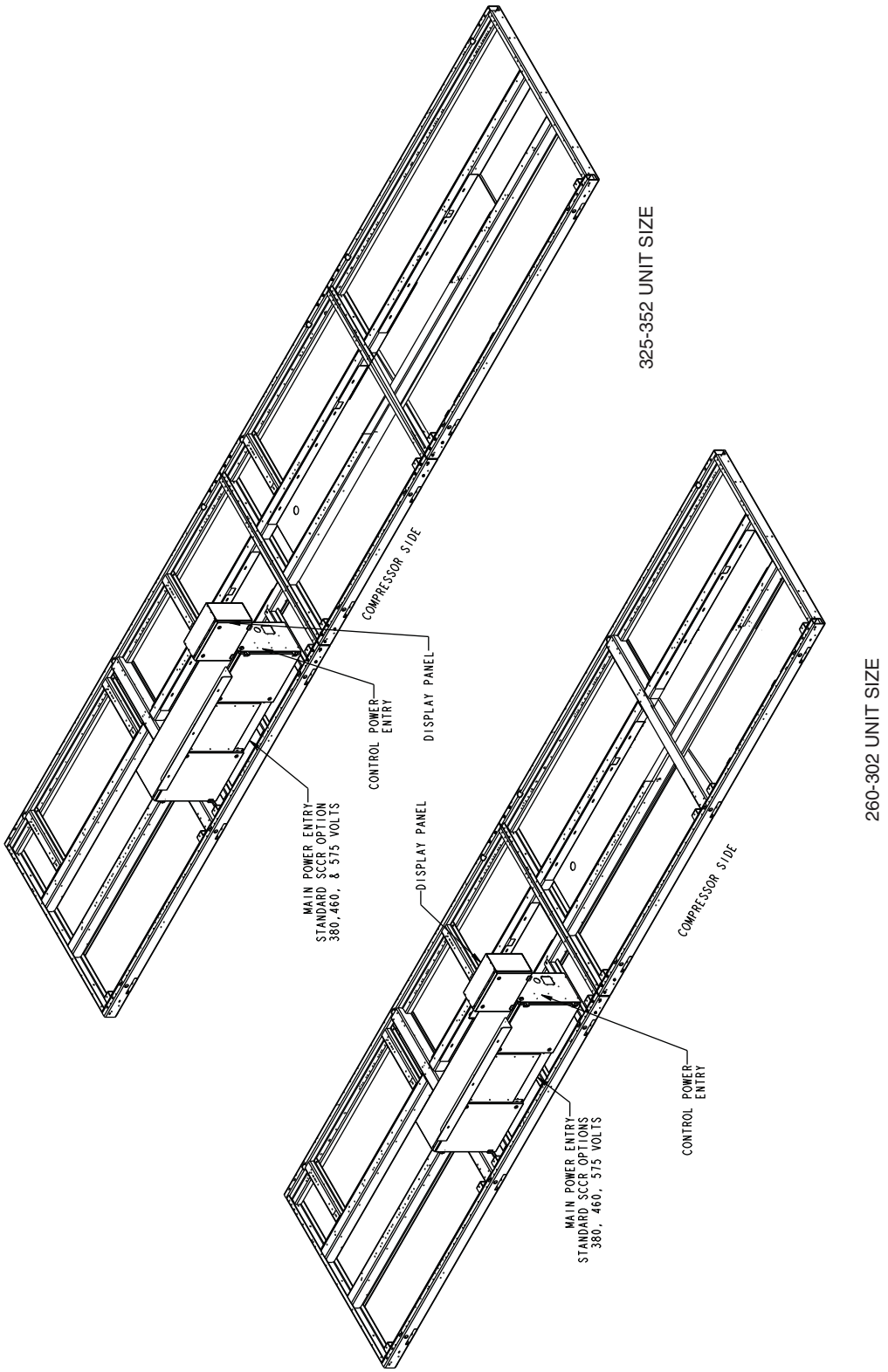
A	—	Alarm
AWG	—	American Wire Gage
EMM	—	Energy Management
NEC	—	National Electric Code
TB	—	Terminal Block

NOTES:

1. Factory wiring is in accordance with UL 1995 standards. Field modifications or additions must be in compliance with all applicable codes.
2. Wiring for main field supply must be rated 75 C minimum. Use copper for all units.
   Incoming wire size range for the terminal block is #4 AWG to 500 kcmil.
   Incoming wire size range of non-fused disconnect with MCA up to 599.9 amps is 3/0 to 500 kcmil.
   Incoming wire size range of non-fused disconnect with MCA from 600 to 799.99 amps is 1/0 to 500 kcmil.
   Incoming wire size range of non-fused disconnect with MCA from 800 to 1199.99 amps is 250 to 500 kcmil.
   For clearance between multiple units, refer to Application Data on page 83.
3. Terminals 9 and 10 of TB5 are for field external connections for remote on-off. The contacts must be rated for dry circuit application capable of handling a 24-VAC load up to 50 mA.
4. Terminals 11 and 13 of TB5 are for control of chilled water pump 1 (PMP1) starter. terminals 13 and 15 of TB5 are for control of chilled water pump 2 (PMP 2) starter. The maximum load allowed for the chilled water pump relay is 5 VA sealed. 10 VA inrush at 24V. Field power supply is not required.
5. Terminals 12 and 13 of TB5 are for A alarm relay. The maximum load allowed for the alarm relay is 10 VA sealed, 25 VA inrush at 24V. Field power supply is not required.
6. Make appropriate connections to TB6 as shown for Energy Management board options, the contacts for Occupancy Override, Demand Limit, and Ice Done options must be rated for dry circuit application capable of handling a 24 VAC load up to 50 mA.
7. Terminal blocks TB5 and TB6 are located in the display panel box for all units. Refer to the certified dimensional drawing for each unit to get the exact locations.
8. Refer to certified dimensional drawings for exact locations of the main power and control power entrance locations.
9. J3-24 and 25 of EMM board are for run relay and shutdown relay. The maximum load allowed for the run and shutdown relay is 10 VA sealed, 25 VA inrush at 24V. Field Power supply is not required.


220-242 UNIT SIZE
COMPRESSOR SIDE
MAIN POWER ENTRY
STANDARD SCCR OPTION
380,460, & 575 VOLT
CONTROL POWER
ENTRY
DISPLAY PANEL
180-202 UNIT SIZE
COMPRESSOR SIDE
MAIN POWER ENTRY
STANDARD SCCR
380,460, & 575 VOLT
CONTROL POWER ENTRY
DISPLAY PANEL
140-162 UNIT SIZE
DISPLAY PANEL
COMPRESSOR SIDE
MAIN POWER ENTRY
STANDARD SCCR
380,460, & 575 VOLT
CONTROL POWER
ENTRY

Control and power wiring schematic (cont)



Application data

Chiller location and clearances

The 30XA with Greenspeed® intelligence unit must be installed outdoors.

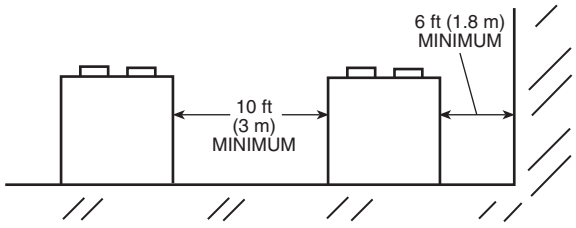
Do not locate near sound sensitive areas without proper acoustic consideration. For applications requiring mounting a chiller on a building rooftop, consideration should be given to using rubber-in-shear or spring isolators to minimize structure-borne transmission. Unit must be level when installed to 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 must 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.

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. For acceptable clearance with layout involving more than 2 chillers, please contact application engineering.

MULTIPLE UNIT SEPARATION



ALIGNED SIDE BY SIDE

Strainers

A field-supplied 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 WITH GREEENSPEED INTELLIGENCE (ANY HEAT EXCHANGER TYPE)
	Type of Strainer
Closed Loop	20 Mesh*
Open Loop	20 Mesh*

* No strainers are supplied with the units. 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.

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).
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 possible on all unit sizes by including suction line insulation, 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 table below.

FLOODED COOLER LOW LCWT RESTRICTIONS

PARAMETER	BRINE TYPE	
	EG	PG
Cooler Passes	3 (or +1)	3 (or +1)
Minimum Leaving Fluid Temperature	21.2 F (–6.0 C)	26.6 F (–2.9 C)
Maximum Glycol	35%	33%
Allowable Cooler Delta Temperature*	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 14 F (–10 C) without these restrictions.

Application data (cont)

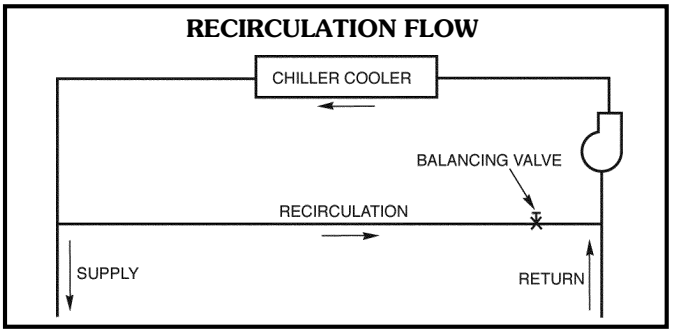
Cooler flow/range

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 on page 86. 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.

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 86. 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.

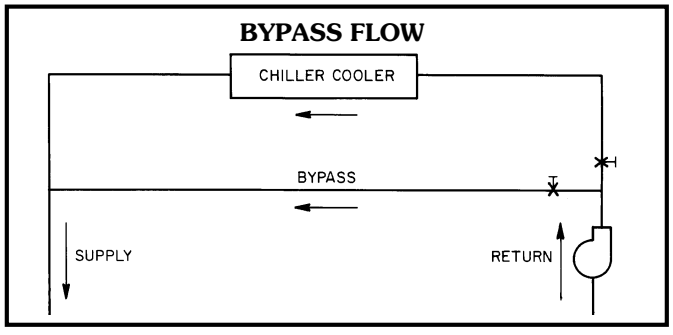
NOTE: Recirculation flow is shown below.



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

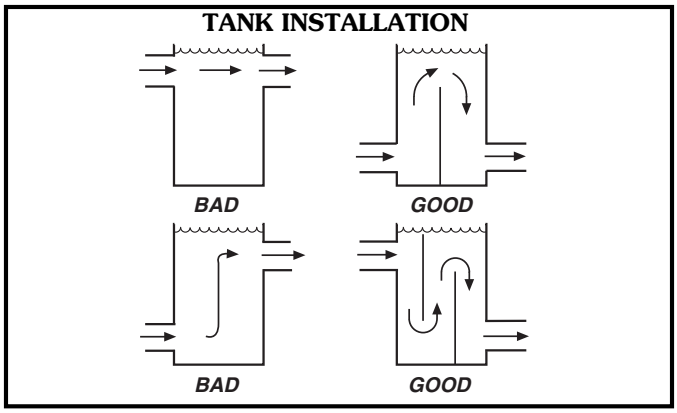
Variable flow rates may be applied to a standard chiller. The unit will, however, attempt to maintain a constant leaving chilled water temperature. In such cases, the minimum flow must be in excess of the minimum flow given in the Minimum and Maximum Cooler Fluid Flow Rates table, adjusted for any glycol 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.

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 flooded-cooler 30XA air-cooled chillers with Greenspeed® intelligence (except for areas which require the high ambient option). Flooded-cooler units are protected from freezing down to 0° F (–18 C) through the cooler heaters (if installed) 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 a DX cooler and optional heaters 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 antifreeze solution, draining the cooler and outdoor piping, followed by the addition of a small amount of antifreeze solution, 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 between 40 F (4.4 C) and 38 F (3.3 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		Cooler	Number of Passes	Minimum Flow Rate**		Maximum Flow Rate	
	(gpm)	(L/s)			(gpm)	(L/s)	(gpm)	(L/s)
140	318	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	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	410	25.9	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	464	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	506	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	546	34.4	Standard, Flooded	2	266	16.8	1063	67.1
			Plus One Pass, Flooded	3	147	9.3	587	37
			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	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	40.5	Standard, Flooded	2	293	18.5	1173	74
			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
300	687	43.4	Standard, Flooded	2	327	20.6	1308	82.5
			Plus One Pass, Flooded	3	174	11	697	44
			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	46.3	Standard, Flooded	2	361	22.8	1442	91
			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	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

*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 (0.000018 m^2-K/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]).

High ambient temperature operation

High outdoor ambient chiller start-up and operation is possible for standard 30XA chillers at ambient temperatures up to 125 F (52 C) at nominal voltage.

Low ambient temperature operation

Units will start and operate down to 32 F (0° C) as standard. With the inclusion of wind baffles (field fabricated and installed), the unit is capable to start as low as 5 F (–15 C) and be operational to as low as –20 F (–29 C) ambient temperature. 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 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, 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.

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. 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).

Dual chiller control

The Touch Pilot™ 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 Touch Pilot 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.

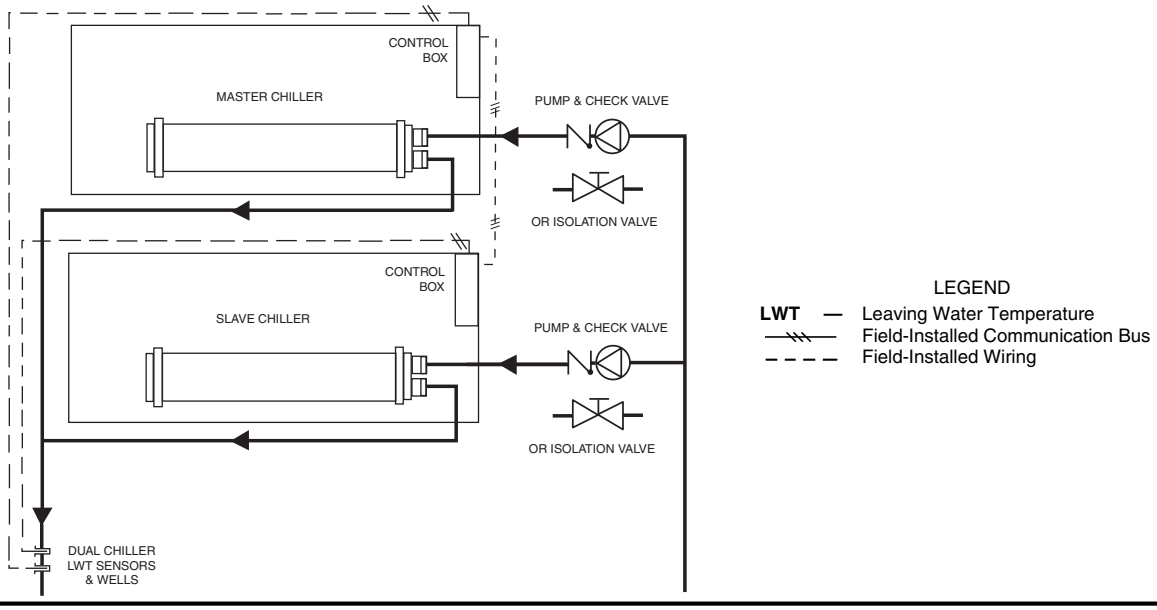
Aluminum fin/copper tube coils are constructed of seamless copper tubes mechanically bonded to aluminum fins. The fins have wavy enhancements. These condenser coils are recommended with remote cooler applications. These coils are not recommended for corrosive environments.

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

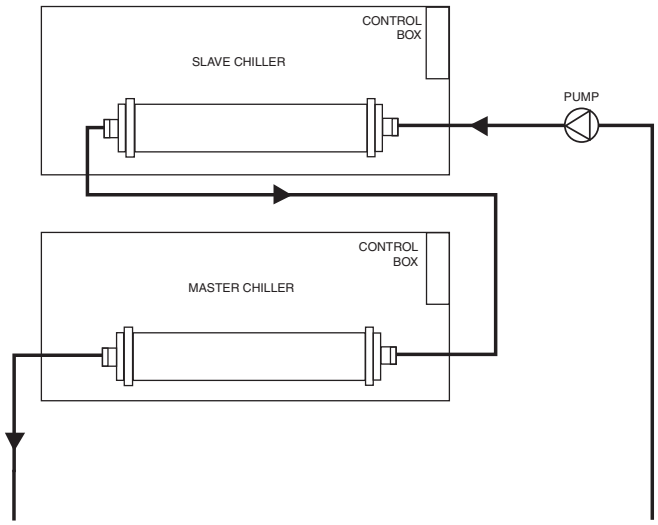
Copper-fin coils provide increased corrosion resistance compared to aluminum fin coils. All-copper coils eliminate bimetallic construction to eliminate the potential for galvanic corrosion. Application in industrial environments is not recommended due to potential attack from sulfur, sulfur oxide, nitrogen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

Application data (cont)

PARALLEL DUAL CHILLER OPERATION



SERIES DUAL CHILLER OPERATION



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 8,000-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

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.

Integrated VFDs for increased efficiency

The 30XA units with Greenspeed® intelligence are equipped with VFDs powering the compressors and fans of each circuit. The VFDs are individually controlled to optimize unit efficiency and performance, particularly at variable and part load conditions.

Application data (cont)

Capacity Recovery™ feature

With the rise in data centers and critical cooling applications, focus has increased on capacity recovery times for chiller products. Capacity recovery is defined as the time it takes to reach 100% capacity after power is restored to the chiller, given that the full cooling load is present. Capacity recovery times are the critical factor to consider in data centers due to the consistently high loads in the space and the need to maintain the temperatures. Other manufacturers often discuss re-start time without providing the details of how long it takes to reach full capacity, but the achievement of full capacity is the critical parameter to the end user.

With Carrier's standard Capacity Recovery™ feature, the AquaForce® 30XA140-350 air cooled chiller with Greenspeed® intelligence high-efficiency variable-speed screw compressors and variable-speed condenser fans is able to restart and produce 100% of the cooling capacity within 5 minutes after a restart is commanded when power is restored immediately following a power outage. This restart and capacity recovery capability can be accomplished without the use of an individual uninterruptable power supply (UPS) unit or a separate UPS circuit.

This functional capability/requirement is under normal conditions and is dependent upon there being no safety/control manual reset items or alarms and with the provision that required chilled water flow is available. This capability may take longer or be prevented in the case where condenser air inlet temperature is >110 F (43.3 C) and leaving chilled water temperature is >55 F (12.7 C) or similar extreme conditions.

Guide specifications

Outdoor Air-Cooled Liquid Chiller

HVAC Guide Specifications

Size Range: **140 to 350 Tons, Nominal (490 to 1230 kW, Nominal)**

Carrier Model Number: **30XA with Greenspeed® Intelligence**

Part 1 — General

1.01 SYSTEM DESCRIPTION

Microprocessor controlled, air-cooled liquid chiller for outdoor installation, utilizing variable speed screw compressors and low sound variable speed 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. Unit shall be manufactured in a facility registered to ISO (International Organization for Standardization) 9001 Manufacturing Quality Standard.

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 variable-speed, 9-blade airfoil cross-section, reinforced polymer construction, shrouded-axial type, and shall be statically and dynamically balanced with inherent corrosion resistance.
2. The variable speed drives for the condenser fans shall include a DC link reactor.
3. Air shall be discharged vertically upward.
4. 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, VFD (variable frequency drive) controlled to match the load requirement, with a maximum speed of 3500 rpm. The motors are protected by motor temperature sensors, and are suction gas cooled.
3. Capacity control shall utilize a VFD to unload the compressors from 100% to 50% of full load. Below 50% load, the combination of VFD and slide valves will unload the compressors to 12% of full load.
4. The VFD for each compressor motor shall include a DC link reactor.

E. Flooded Cooler:

1. Shall be 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 a minimum of 2 or 3 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.
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.

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, discharge, and liquid 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. 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) Seven-inch color touch screen display with stylus.
      2) Display shall allow a user to navigate through menus, select desired options and modify data.
   b. Features of the display shall include:
      1) Multiple connection ports for USB, Ethernet, LEN (local equipment network), and Carrier Comfort Network® (CCN) connections.
      2) Web connectivity for remote access to configuration, alarm, operation, and other menu functions.
      3) Automatic reporting of unit performance and operation available via internet.
      4) Ability to graphically plot trends of system performance and conditions over time.
      5) Graphical summary display of current chiller operation and water conditions.
      6) Display shall allow access to configuration, maintenance, service, set point, time schedules, alarm history, and status data.
      7) Three levels of password protection against unauthorized access to configuration and maintenance information, and display set up parameters.
      8) Full compatibility with the Carrier Comfort Network (CCN) system to provide email alarm notification and to provide network capability to fully monitor and control chiller.
      9) Display shall be capable of displaying the last 50 alarms with clear full text description and time and date stamp, and will store a snapshot of operating conditions before and after the 20 most recent alarms.
      10) Display run hours and number of starts for machine and individual compressors.
      11) Display current draw for each circuit compressor and fans.
      12) Capability of displaying the output (results) of a service test. Service test shall verify operation of each circuit fan and compressor, EXV (electronic expansion valve), switch, and sensors before chiller is started

13) 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, without modification, shall be capable of starting and running at outdoor ambient temperatures from 32 F (0° C) to 125 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.
   3. After power restoration, and with the Capacity Recovery™ feature (a standard controls feature) enabled, unit shall be capable of full capacity recovery in less than 5 minutes.

J. Motors:

   Condenser-fan motors shall be totally enclosed, 6-pole, air over, variable 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 (all chiller voltage/size combinations shall have the ability to accommodate 2 power supplies to meet job-specific requirements).
   2. Primary electrical power supply shall be rated to operate up to 125 F (52 C) ambient temperature for all 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.
   6. Unit shall have a standard SCCR (short circuit current rating) value of 10 kA.

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:
      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 flow switch.
   2. Unit-Mounted Non-Fused Disconnect:

      Unit shall be supplied with factory-installed, lockable, non-fused electrical disconnect for main power supply.
   3. 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 8,000-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.

4. Energy Management Module:

A factory or 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.

5. Condenser Coil Trim Panels:

Unit shall be supplied with factory-installed or field-installed coil covers.

6. BACnet/Modbus Translator Control:

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

7. LON Translator Control:

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

8. 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.

9. 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.

10. Control Transformer:

    Unit shall be supplied with a factory-installed transformer that will allow supply control circuit power from the main unit power supply.

11. GFI Convenience Outlet:

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

12. Plus-One-Pass Cooler:

    Unit shall be equipped with plus-one-pass cooler heads to be used with high delta T application. Applies to flooded coolers only.

13. Minus-One-Pass Cooler:

    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. Applies to flooded coolers only.

14. Security Grilles:

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

15. 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.

16. 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.

17. 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.

18. Low Sound Package:

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

19. Remote Cooler Kit:

    Allows remote installation of the cooler.

20. 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.

21. Seismic Certification:

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

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