AquaSnap®
30MPA021-080, MPW017-080 and 30MPQ021-080
Liquid Chillers with Scroll Compressors and PIC6 Controls

Installation Instructions

CONTENTS

SAFETY CONSIDERATIONS

Installing, starting up, and servicing air-conditioning equipment can be hazardous due to system pressures, electrical components, and equipment location.

Only trained, qualified installers and service mechanics should install, start-up, and service this equipment.

Untrained personnel can perform basic maintenance functions, such as cleaning coils. All other operations should be performed by trained service personnel. Qualified installers and service technicians are required to have been trained on the following topics when installing and servicing air-conditioning equipment with A2L refrigerant such as R-32:

1. Explosive potential of A2L refrigerants.
2. Potential ignition sources.
3. Safety measures for unventilated and ventilated rooms or enclosures.
4. Refrigerant detectors.
5. Concept of sealed components and sealed enclosures according to IEC 60079-15:2010.
6. Correct work procedures for the following:
   a. Commissioning
   b. Maintenance
   c. Repair
   d. Decommissioning
   e. Disposal

See Controls and Troubleshooting Guide for complete guidelines.

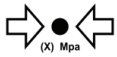
When working on the equipment, observe precautions in the literature and on tags, stickers, and labels attached to the equipment.

1. Follow all safety codes.
2. Keep quenching cloth and fire extinguisher nearby when brazing.
3. Wear safety glasses and work gloves.
4. Use care in handling, rigging, and setting bulky equipment.

It is important to recognize safety information. This is the safety-alert symbol ⚠. When you see this symbol on the unit and in instructions or manuals, be alert to the potential for personal injury.

Understand the signal words DANGER, WARNING, CAUTION, and NOTE. These words are used with the safety-alert symbol. DANGER identifies the most serious hazards which **will** result in severe personal injury or death. WARNING signifies hazards which **could** result in personal injury or death. CAUTION is used to identify unsafe practices, which **may** result in minor personal injury or product and property damage. NOTE is used to highlight suggestions which **will** result in enhanced installation, reliability, or operation.

NOTE: Refer to the following symbols, which are required for A2L refrigerants and can be found on the unit:

SYMBOL	CODE	MEANING
	IEC 60417-5032 (2002-10)	Alternating Current
	IEC 60417-5019 (2006-8)	Protective Earth
	IEC 60417-5018 (2006-10)	Functional Earthing
	ISO 7000-0434A (2004-01)	Caution
	ISO 7000-0790 (2004-01)	Read Operator's Manual
	IEC 60417-5036 (2002-10)	Dangerous Voltage
	GHS02: Flammable	Flammable Gas
	ISO 7010-W021 (2011-05)	Warning: Flammable Materials
	ISO 7000-1659 (2004-01)	Service Indicator: Read Technical Manual
	ISO 7000-1701 (2004-01)	Pressure
	ISO 7000-1641 (2004-01)	Operator's Manual: Operating Instructions

⚠ WARNING

DO NOT use means to accelerate the defrosting process, or to clean, other than those recommended by the manufacturer.

If unit is to be stored, it shall be stored in an area or room without continuously operating open flames (for example, an operating gas appliance) or other potential ignition sources, such as operating electric heaters or hot surfaces.

Do not pierce or burn.

Be aware that refrigerants may not contain an odor.

IMPORTANT: This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with these instructions, may cause radio interference. It has been tested and found to comply with the limits of a Class A computing device pursuant to International Standard in North America EN 61000-2/3, which are designed to provide reasonable protection against such interference when operated in a commercial environment.

⚠ WARNING

This product can expose you to chemicals including lead and lead components, which are known to the State of California to cause cancer and birth defects or other reproductive harm. For more information, go to www.P65Warnings.ca.gov.

⚠ WARNING

DO NOT USE TORCH to remove any component. System contains oil and refrigerant under pressure.

To remove a component, wear protective gloves and goggles and proceed as follows:

a. Shut off electrical power to unit.
b. Recover refrigerant to relieve all pressure from system using both high-pressure and low pressure ports.
c. Traces of vapor should be displaced with nitrogen and the work area should be well ventilated. Refrigerant in contact with an open flame produces toxic gases.
d. Cut component connection tubing with tubing cutter and remove component from unit. Use a pan to catch any oil that may come out of the lines and as a gauge for how much oil to add to the system.
e. Carefully un-sweat remaining tubing stubs when necessary. Oil can ignite when exposed to torch flame.

Failure to follow these procedures may result in personal injury or death.

⚠ WARNING

Electrical shock can cause personal injury and death. Shut off all power to this equipment during installation and service. There may be more than one disconnect switch. Tag all disconnect locations to alert others not to restore power until work is completed.

⚠ CAUTION

DO NOT re-use compressor oil or any oil that has been exposed to the atmosphere. Dispose of oil per local codes and regulations. DO NOT leave refrigerant system open to air any longer than the actual time required to service the equipment. Seal circuits being serviced and charge with dry nitrogen to prevent oil contamination when timely repairs cannot be completed. Failure to follow these procedures may result in damage to equipment.

⚠ CAUTION

This system uses an A2L refrigerant (R-32) which have higher pressures than R-22 and other refrigerants. No other refrigerant can be used in this system. Failure to use gauge set, hoses, and recovery systems designed to handle refrigerant R-32 may result in equipment damage or personal injury. Refer to 30MP Controls, Start-up, Service, and Troubleshooting for guidelines on proper A2L refrigerant handling and equipment used for A2L refrigerant. If unsure about equipment, consult the equipment manufacturer.

GENERAL

These installation instructions cover the 30MPA, 30MPW, and 30MPQ units with PIC6 controls. The 30MPA units are condenserless units and the 30MPW/30MPQ units are fluid cooled. See Fig. 1-4 for different unit configurations. See Fig. 5 and 6 for model number nomenclatures and Fig. 7-24 for unit dimensional details and corner weights.

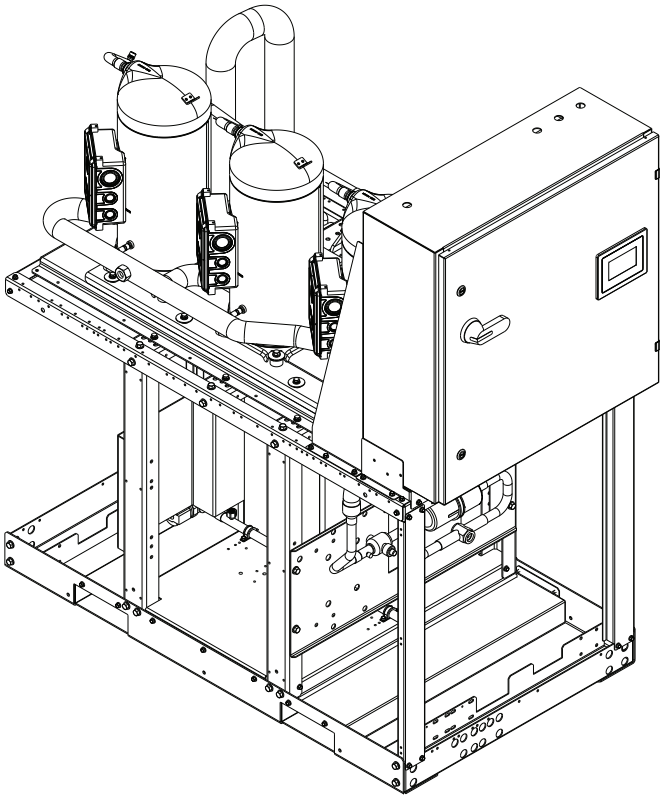


Fig. 1 — 30MPA Unit (Size 021-046)

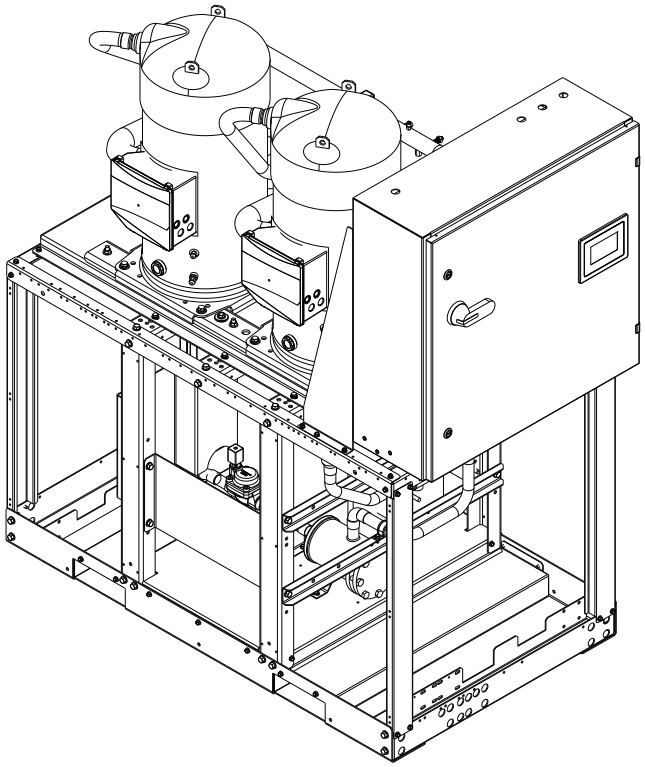


Fig. 3 — 30MPA Unit (Size 051-080)

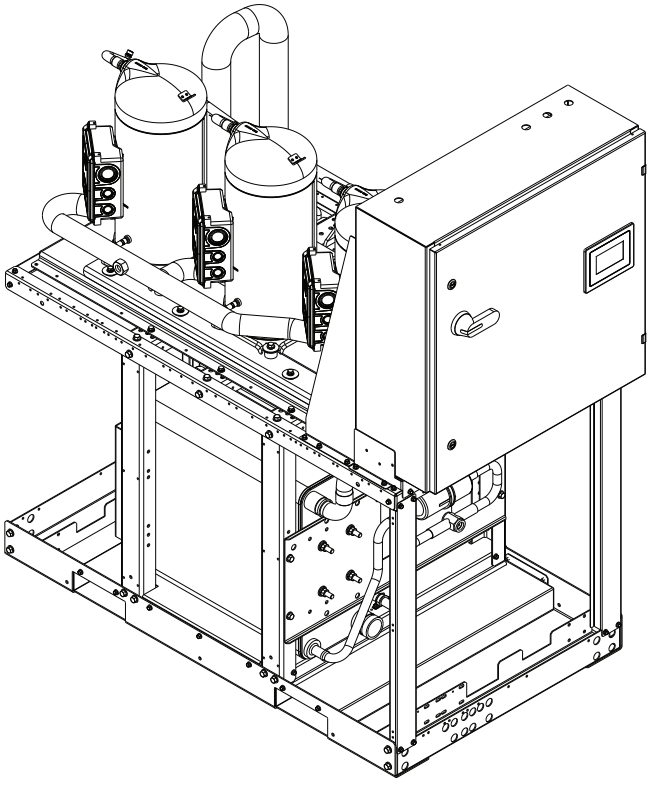


Fig. 2 — 30MPW/Q Unit (Size 017-046)

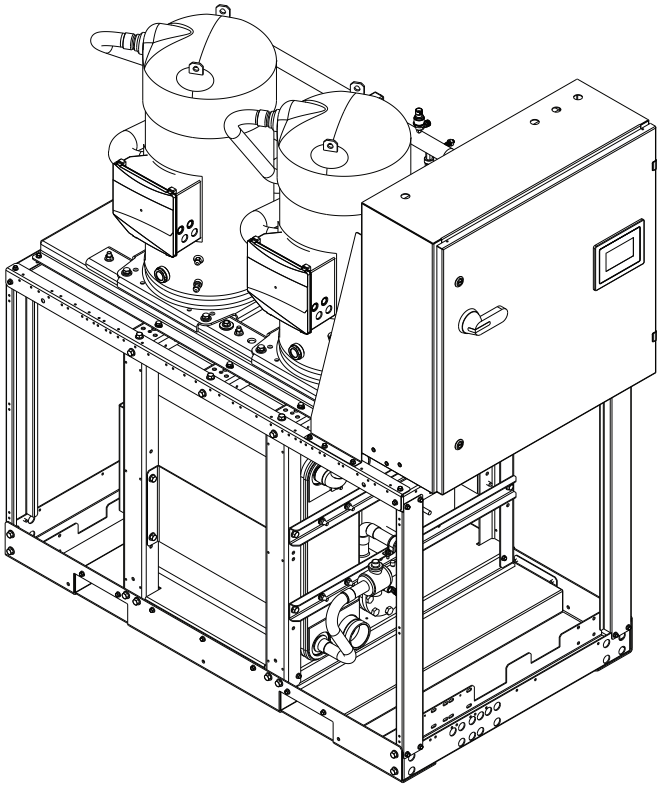


Fig. 4 — 30MPW/Q Unit (Size 051-080)

30MP W 017 6 0 - 0 0 0 1 5

30MP – Water-Cooled AquaSnap® Chiller

Condenser Option
A – Std. without Condenser (not available for sizes 017 and 033)
W – Std. with Condenser
Q – Heat Pump (not available for sizes 017 and 033)

Unit Size — Nominal Tons (kW)
017 – 15 (53) (only available in 30MPW)
021 – 20 (70)
031 – 30 (106)
033 – 30 (106) (only available in 30MPW)
041 – 40 (141)
046 – 45 (158)
051 – 50 (176)
056 – 55 (194)
066 – 65 (229)
080 – 80 (280)

Voltage Options
1 – 575-3-60
2 – 380-3-60 (not available for size 032)
5 – 208/230-3-60
6 – 460-3-60

Sound/Mounting Options
0 – None (Std)
1 – Sound Enclosure Panels
3 – Height Adjustment Kit
4 – Sound Enclosure Panel and Height Adjustment Kit
5 – Height Adjustment Kit and Sound Enclosure
9 – Mobility Kit (Wheels)
B – Sound Enclosure Panel and Mobility Kit (Wheels)
D – Height Adjustment Kit and Mobility Kit (Wheels)
F – Sound Enclosure Panel, Height Adjustment Kit, and Mobility Kit (Wheels)
G – Sound Enclosure Panel, Height Adjustment Kit, and Mobility Kit (Wheels)
L – Compressor Sound Blanket
M– Mobility Kit (Wheels) and Compressor Sound Blanket
N – Height Adjustment Kit and Compressor Sound Blanket
P – Height Adjustment Kit, Compressor Sound Blanket, and Mobility Kit (Wheels)
Q – Compressor Sound Blanket with Compressor Insulation
R – Mobility Kit (Wheels) and Compressor Sound Blanket with Compressor Insulation
S – Height Adjustment Kit and Compressor Sound Blanket with Compressor Insulation
T – Mobility Kit (Wheels), Height Adjustment Kit, and Compressor Sound Blanket with Compressor Insulation

Unit Design Revision
- – Design Revision Level

Packaging Options
1 – Bag, No Compressor Insulation (Std)[a]
2 – Export Crate, No Compressor Insulation[a]
3 – Bag, and Compressor Insulation[a]
4 – Export Crate, Compressor Insulation[a]
5 – Bag, No Compressor Insulation (Std)[b]
7 – Bag and Compressor Insulation[b]
B – Export Crate, No Compressor Insulation[b]
D – Export Crate, Compressor Insulation[b]

Controls/Communication Options
1 – PIC6 (STD)
3 – PIC6 with Edge Remote Connectivity
5 – PIC6 with EMM
7 – PIC6 with Edge Remote Connectivity and EMM

Disconnect Options
0 – Terminal Block (Std)
1 – Non-Fused Disconnect
2 – Fused Disconnect (select models)[c]

Capacity Control
(Evaporator insulation is standard)
0 – No Hot Gas Bypass(Std)
1 – With Hot Gas Bypass
2 – With Digital Compressor
3 – High Interrupt
4 – High Interrupt and Hot Gas Bypass
5 – High Interrupt and Digital Compressor

Comfort Cooling Duty/Medium Temperature Brine Option
0 – Comfort Cooling Duty (32 to 60°F LCFT, 0 to 16°C (Std) with Refrigerant Charge (MPW) or Nitrogen (MPA)
1 – Water Manifold Piping (Comfort Cooling Duty) with Refrigerant Charge (MPW/MPQ) or Nitrogen (MPA)
2 – Evaporator Isolation with Water Manifold Piping (Comfort Cooling Duty) with Refrigerant Charge (MPW) or Nitrogen (MPA)
3 – Head Pressure Control with Water Manifold Piping (Comfort Cooling Duty) with Refrigerant Charge (MPW)
4 – Head Pressure Control, Evaporator Isolation with Water Manifold Piping (Comfort Cooling Duty) with Refrigerant Charge (MPW)
5 – Water Manifold Piping (Medium Temperature Brine (15 to 32°F, –9 to 0°C), Evaporator Isolation with Refrigerant Charge (MPW) or Nitrogen (MPA)
6 – Water Manifold Piping (Medium Temperature Brine), Head Pressure Control with Refrigerant Charge (MPW)
7 – Medium Temperature Brine with Refrigerant Charge (MPW) or Nitrogen (MPA)
8 – Water Manifold Piping (Medium Temperature Brine) with Refrigerant Charge (MPW/MPQ) or Nitrogen (MPA)
9 – Head Pressure Control, Evaporator Isolation with Water Manifold Piping (Medium Temperature Brine) with Refrigerant Charge (MPW)
A – Water Manifold Piping (Medium Temperature Brine) and Condenser Isolation and Refrigerant Charge (MPQ)
B – Comfort Cooling Duty (32 to 60°F LCFT, 0 to 16°C) (Std) with Nitrogen Charge (MPW)
C – Water Manifold Piping (Comfort Cooling Duty) with Nitrogen Charge (MPW/MPQ)
D – Evaporator Isolation with Water Manifold Piping (Comfort Cooling Duty) with Nitrogen Charge (MPW)
E – Water Manifold Piping (Medium Temperature Brine), Evaporator and Condenser Isolation and Refrigerant Charge (MPQ)
F – Head Pressure Control with Water Manifold Piping (Comfort Cooling Duty) with Nitrogen Charge (MPW)
G – Head Pressure Control, Evaporator Isolation with Water Manifold Piping (Comfort Cooling Duty) with Nitrogen Charge (MPW)
H – Medium Temperature Brine (15 to 32°F, –9 to 0°C) with Nitrogen Charge (MPW)
I – Medium Temperature Brine and Nitrogen Charge (MPQ)
J – Water Manifold Piping (Medium Temperature Brine) with Nitrogen Charge (MPW/MPQ)
K – Evaporator Isolation with Water Manifold Piping (Medium Temperature Brine) with Nitrogen Charge (MPW)
L – Head Pressure Control with Water Manifold Piping (Medium Temperature Brine) with Nitrogen Charge (MPW)
M – Head Pressure Control, Evaporator Isolation with Water Manifold Piping (Medium Temperature Brine) with Nitrogen Charge (MPW)
N – Head Pressure Control (Single Unit) (Comfort Cooling Duty) with Refrigerant Charge (MPW)
O – Water Manifold Piping (Medium Temperature Brine), Condenser Isolation and Nitrogen Charge (MPQ)
P – Head Pressure Control (Single Unit) (Medium Temperature Brine) with Refrigerant Charge (MPW)
Q – Head Pressure Control (Single Unit) (Comfort Cooling Duty) with Nitrogen Charge (MPW)
R – Head Pressure Control (Single Unit) (Medium Temperature Brine Duty) with Nitrogen Charge (MPW)
S – Refrigerant Charge (MPQ)
T – Nitrogen Charge (MPQ)
U – Water Manifold Piping (Medium Temperature Brine, Evaporator and Condenser Isolation and Nitrogen Charge (MPQ)
V – Water Manifold Piping (Comfort Cooling), Condenser Isolation with Refrigerant Charge (MPQ)
W – Water Manifold Piping (Comfort Cooling), Condenser Isolation with Nitrogen Charge (MPQ)
X – Water Manifold Piping (Comfort Cooling), Evaporator and Condenser Isolation with Refrigerant Charge (MPQ)
Y – Water Manifold Piping (Comfort Cooling), Evaporator and Condenser Isolation with Nitrogen Charge (MPQ)
Z – Medium Temperature Brine and Refrigerant Charge (MPQ)

LEGEND
EMM — Energy Management Module
LCFT — Leaving Chilled Fluid Temperature
Std — Standard

NOTES:
a. Available with nitrogen charge (30MPW only).
b. Available with refrigerant charge (30MPW, 30MPQ) or nitrogen charge (30MPA).
c. Fused disconnect switch is required for 017 and 033 units equipped with the High Interrupt Option. Fused disconnect switch is NOT available for any other units.

ASHRAE 90.1 COMPLIANT

Quality Assurance
ISO 9001:2015-certified processes

Fig. 5 — 30MPA, MPW Model Number Nomenclature

30MPE W 6 7300 – 0 0 L W

30MPE – Water-Cooled AquaSnap® Chiller Electrical Distribution Panel

Condenser Option

A – Air-Cooled Condenser
W – Water-Cooled/Heat Pump Condenser

Voltage Options

1 – 575-3-60
2 – 380-3-60
5 – 208/230-3-60
6 – 460-3-60 (Standard)

Breaker Amp Rating for each Electrical Position

Positions[a]				Breaker
8	9	10	11	Size
0	0	0	0	– None
3	3	3	3	– 25
4	4	4	4	– 30
5	5	5	5	– 35
6	6	6	6	– 40
7	7	7	7	– 45
8	8	8	8	– 50
9	9	9	9	– 60
B	B	B	B	– 70
C	C	C	C	– 80
D	D	D	D	– 90
F	F	F	F	– 100
G	G	G	G	– 110
H	H	H	H	– 125
J	J	J	J	– 150
K	K	K	K	– 175
L	L	L	L	– 200
M	M	M	M	– 225
N	N	N	N	– 250
P	P	P	P	– 300
W	W	W	W	– 350
R	R	R	R	– 400

Wire Option

W – Wire

Load Side

L – Electrical Load Side on Left
R – Electrical Load Side on Right

Piping/Height Adjustment/Mobility/ Packaging/Sound Options

0 – Water Manifold Piping/Height Adjustment Kit/ Bag (Standard)
1 – Water Manifold Piping/Height Adjustment Kit/ Mobility Kit (Wheels)/Bag
2 – Water Manifold Piping/Height Adjustment Kit/ Export Crate
3 – Water Manifold Piping/Height Adjustment Kit/ Mobility Kit (Wheels)/Export Crate
4 – Water Manifold Piping/Height Adjustment Kit/ Sound Enclosure Panels/Bag
5 – Water Manifold Piping/Height Adjustment Kit/ Mobility Kit (Wheels)/Sound Enclosure/Bag
6 – Water Manifold Piping/Height Adjustment Kit/ Sound Enclosure Panels/Export Crate
7 – Water Manifold Piping/Height Adjustment Kit/ Mobility Kit (Wheels)/Sound Enclosure Panels/ Export Crate

High Interrupt Option[b]

0 – Standard
1 – High[c]

Revision Level

NOTES:

a. The largest breaker requirement will be in position 8 and will go from largest to smallest in positions 9-11.
b. Bussbar is required when the additive amperage of the electrical distribution panel is 760 amps or higher.
c. If the total amperage of the electrical distribution panels exceeds 600A, there is no available option for High Interrupt.
d. If chillers are selected with high interrupt, then the electrical distribution panel must be selected with high interrupt, and vice versa.

ASHRAE 90.1 COMPLIANT

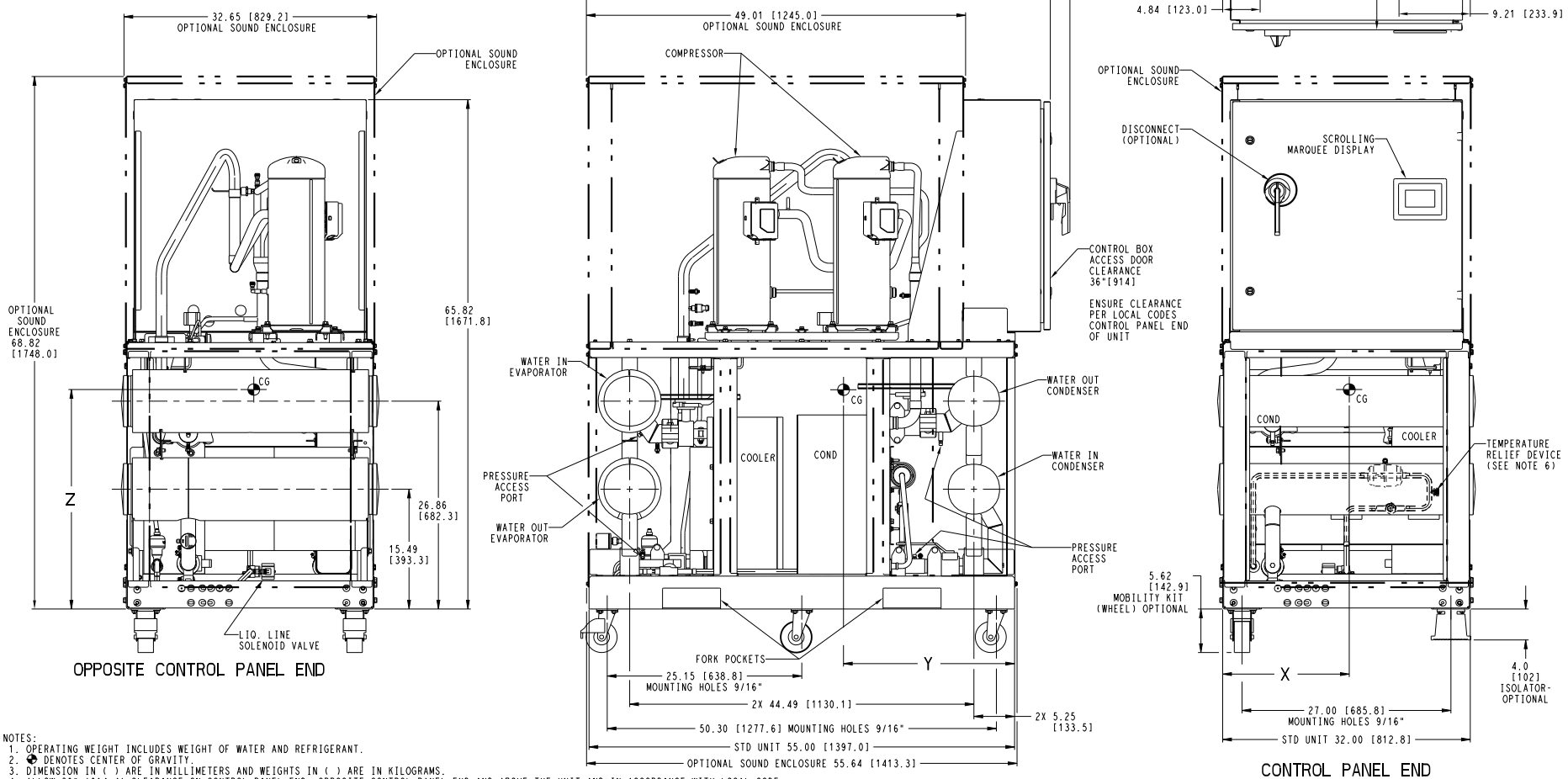
Quality Assurance

ISO 9001:2015-certified processes

Fig. 6 — 30MPE Electrical Distribution Panel Model Number Nomenclature

UNIT	OPERATING WEIGHT	CENTER OF GRAVITY			WATER HEADERS (COND. & COOLER) IN/OUT VICTAULICS
		X	Y	Z	
30MP017	1206 (547)	15.08 [383.0]	23.66 [601.0]	24.61 [625.0]	6.0"
30MP021	1322 (600)	15.08 [383.0]	23.66 [601.0]	24.61 [625.0]	
30MP031	1549 (703)	14.25 [362.0]	24.69 [627.0]	26.57 [675.0]	

30MPW 017T / 021T / 031T
30MPQ 021T / 031T
STANDARD UNIT WITH MANIFOLD



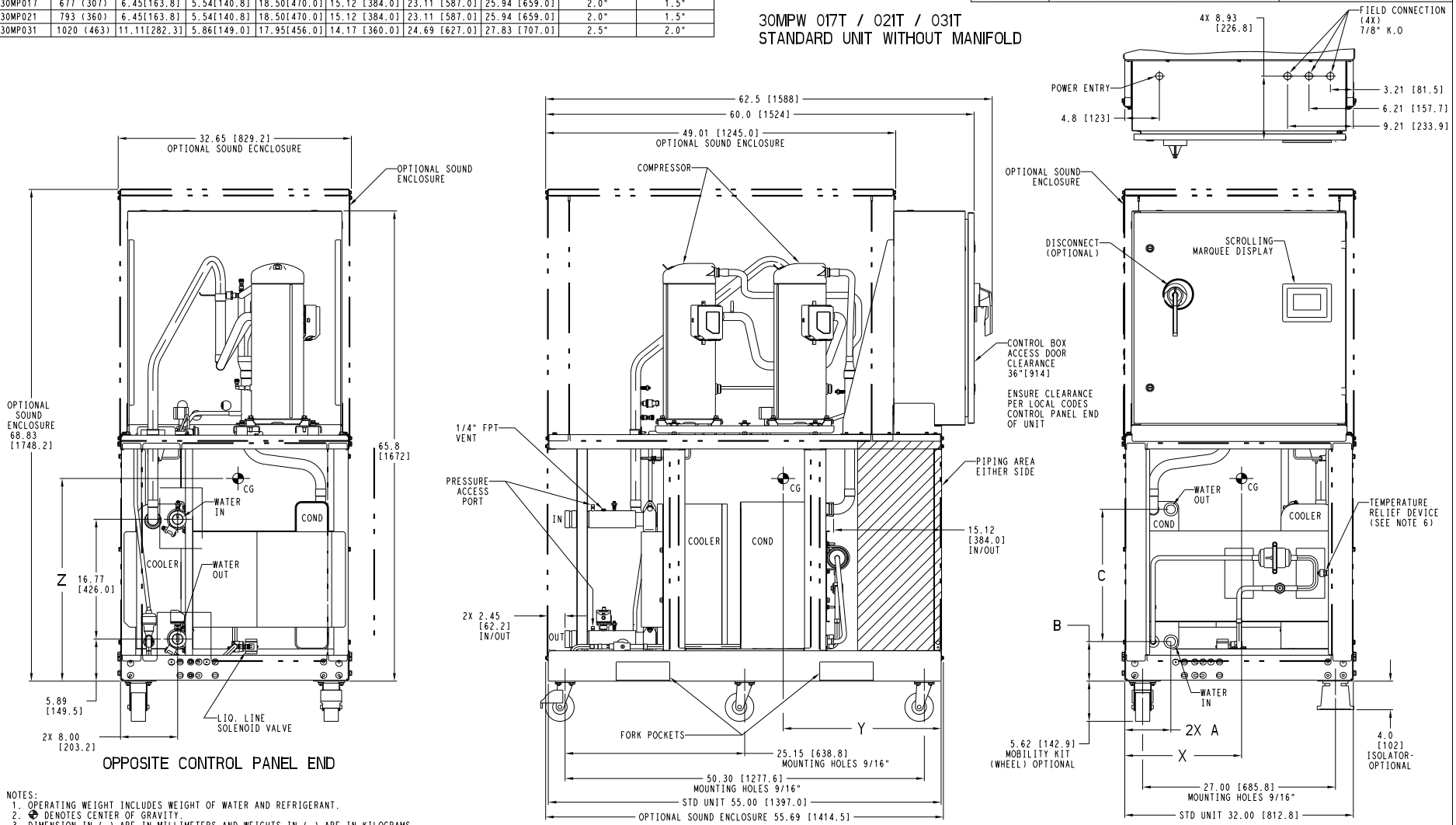
NOTES:
1. OPERATING WEIGHT INCLUDES WEIGHT OF WATER AND REFRIGERANT.
2. ⊕ DENOTES CENTER OF GRAVITY.
3. DIMENSION IN ( ) ARE IN MILLIMETERS AND WEIGHTS IN ( ) ARE IN KILOGRAMS.
4. ALLOW 36" (914.4) CLEARANCE ON CONTROL PANEL END, OPPOSITE CONTROL PANEL END AND ABOVE THE UNIT AND IN ACCORDANCE WITH LOCAL CODE.
5. ——— - - DENOTES ACCESSORY OR FACTORY INSTALLED OPTION.
6. TEMPERATURE RELIEF DEVICE LOCATED ON LIQUID LINE. 3/8" SAE FLARE CONNECTION. DO NOT CAP OR OTHERWISE OBSTRUCT TEMPERATURE/PRESSURE RELIEF.

ITC CLASSIFICATION	SHEET	DATE	SUPERCEDES	30MPW 017-031T UNIT ASSY		REV
U.S. ECCN:EAR99	3 OF 4	07/30/24	-	-	30MP60000200	B

Fig. 7 — Dimensions — 30MPW 017-031, 30MPQ 021 and 031 With Manifold (Standard Unit)

UNIT	OPERATING WEIGHT	A	B	C	CENTER OF GRAVITY			COOLER WATER IN / OUT VICTAULIC	COND. WATER IN / OUT VICTAULIC
					X	Y	Z		
30MP017	677 (307)	6.45[163.8]	5.54[140.8]	18.50[470.0]	15.12 [384.0]	23.11 [587.0]	25.94 [659.0]	2.0"	1.5"
30MP021	793 (360)	6.45[163.8]	5.54[140.8]	18.50[470.0]	15.12 [384.0]	23.11 [587.0]	25.94 [659.0]	2.0"	1.5"
30MP031	1020 (463)	11.11[282.3]	5.86[149.0]	17.95[456.0]	14.17 [360.0]	24.69 [627.0]	27.83 [707.0]	2.5"	2.0"

30MPW 017T / 021T / 031T
STANDARD UNIT WITHOUT MANIFOLD

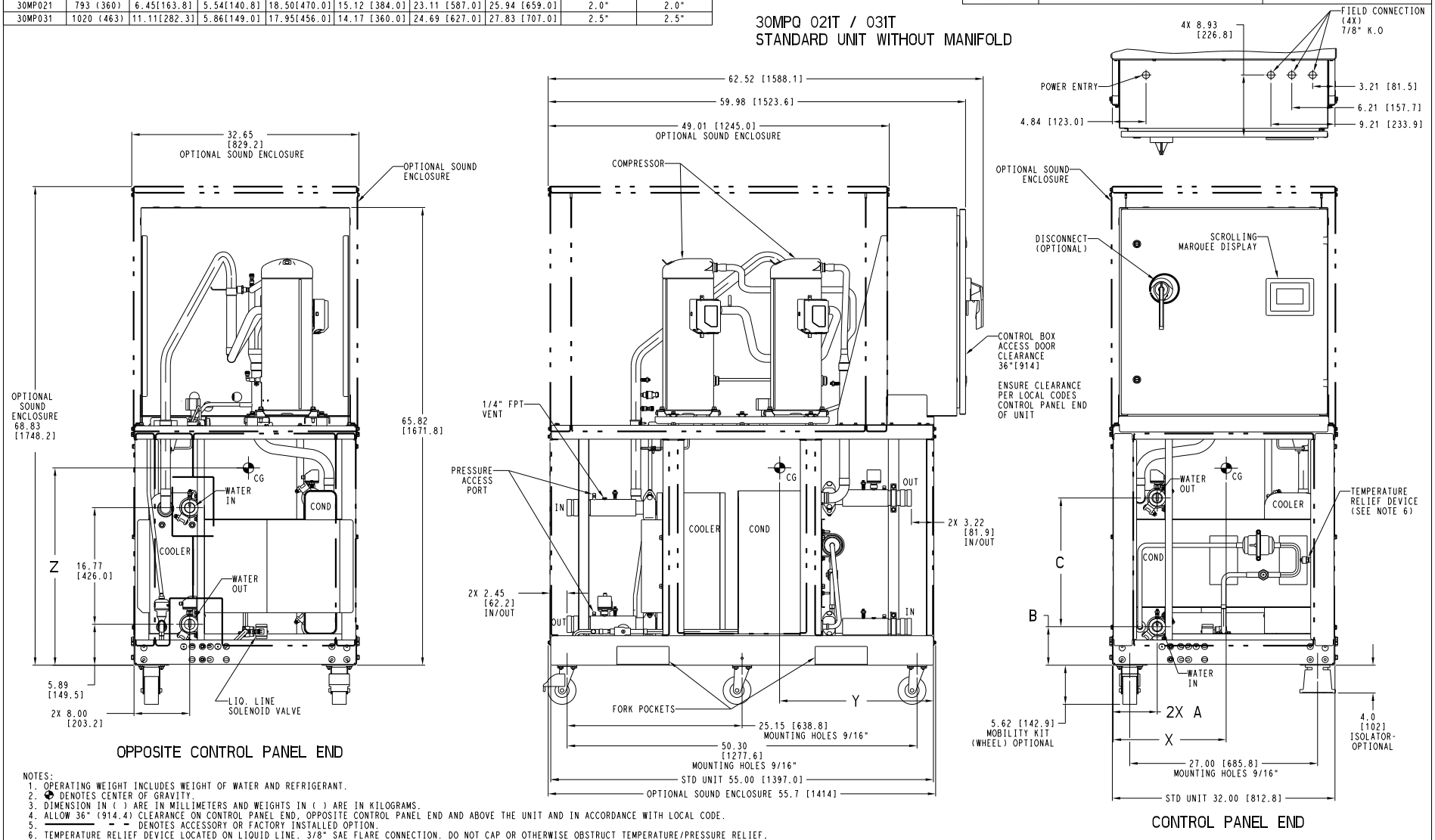


NOTES:
1. OPERATING WEIGHT INCLUDES WEIGHT OF WATER AND REFRIGERANT.
2. ⊕ DENOTES CENTER OF GRAVITY.
3. DIMENSION IN ( ) ARE IN MILLIMETERS AND WEIGHTS IN ( ) ARE IN KILOGRAMS.
4. ALLOW 36" (914.4) CLEARANCE ON CONTROL PANEL END, OPPOSITE CONTROL PANEL END AND ABOVE THE UNIT AND IN ACCORDANCE WITH LOCAL CODE.
5. ——— - - - DENOTES ACCESSORY OR FACTORY INSTALLED OPTION.
6. TEMPERATURE RELIEF DEVICE LOCATED ON LIQUID LINE. 3/8" SAE FLARE CONNECTION. DO NOT CAP OR OTHERWISE OBSTRUCT TEMPERATURE/PRESSURE RELIEF.

ITC CLASSIFICATION	SHEET	DATE	SUPERCEDES	30MPW 017-031T UNIT ASSY		REV
U.S. ECCN:EAR99	2 OF 4	07/30/24	-	-	30MP60000200	B

Fig. 8 — Dimensions — 30MPW 017-031 Without Manifold (Standard Unit)

UNIT	OPERATING WEIGHT	A	B	C	CENTER OF GRAVITY			COOLER WATER IN / OUT VICTAULIC	COND. WATER IN / OUT VICTAULIC
					X	Y	Z		
30MP021	793 (360)	6.45[163.8]	5.54[140.8]	18.50[470.0]	15.12 [384.0]	23.11 [587.0]	25.94 [659.0]	2.0"	2.0"
30MP031	1020 (463)	11.11[282.3]	5.86[149.0]	17.95[456.0]	14.17 [360.0]	24.69 [627.0]	27.83 [707.0]	2.5"	2.5"



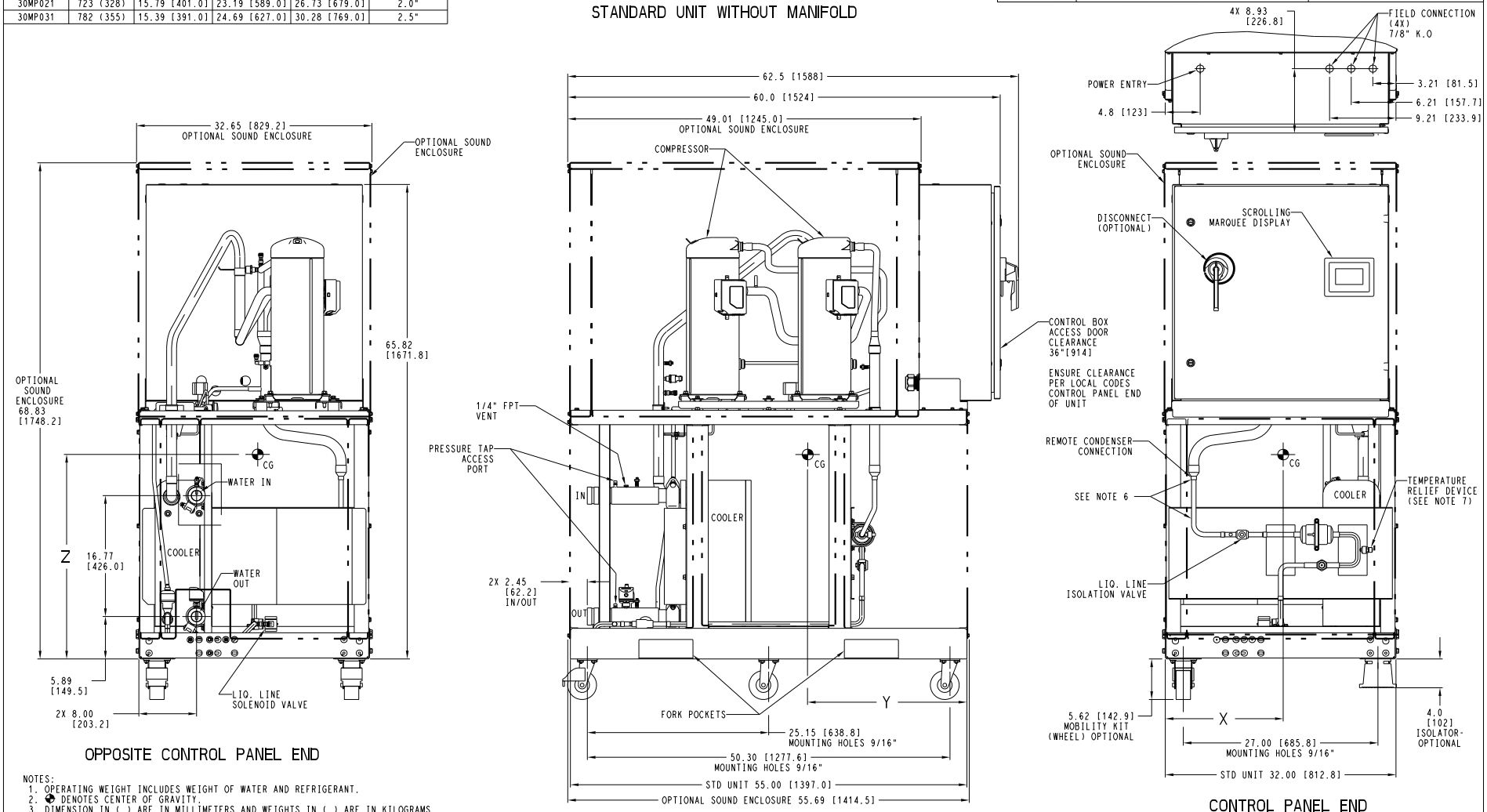
NOTES:
1. OPERATING WEIGHT INCLUDES WEIGHT OF WATER AND REFRIGERANT.
2. ⊕ DENOTES CENTER OF GRAVITY.
3. DIMENSION IN ( ) ARE IN MILLIMETERS AND WEIGHTS IN ( ) ARE IN KILOGRAMS.
4. ALLOW 36" (914.4) CLEARANCE ON CONTROL PANEL END, OPPOSITE CONTROL PANEL END AND ABOVE THE UNIT AND IN ACCORDANCE WITH LOCAL CODE.
5. ——— — — DENOTES ACCESSORY OR FACTORY INSTALLED OPTION.
6. TEMPERATURE RELIEF DEVICE LOCATED ON LIQUID LINE. 3/8" SAE FLARE CONNECTION. DO NOT CAP OR OTHERWISE OBSTRUCT TEMPERATURE/PRESSURE RELIEF.

ITC CLASSIFICATION	SHEET	DATE	SUPERCEDES	30MPW 017-031T UNIT ASSY	30MP60000200	REV
U.S. ECCN:EAR99	4 OF 4	07/30/24	-	-		B

Fig. 9 — Dimensions — 30MPQ 021 and 031 Without Manifold (Standard Unit)

UNIT	OPERATING WEIGHT	CENTER OF GRAVITY			COOLER WATER IN / OUT VICTAULIC
		X	Y	Z	
30MP021	723 (328)	15.79 [401.0]	23.19 [589.0]	26.73 [679.0]	2.0"
30MP031	782 (355)	15.39 [391.0]	24.69 [627.0]	30.28 [769.0]	2.5"

30MPA 021T & 031T
STANDARD UNIT WITHOUT MANIFOLD



NOTES:
1. OPERATING WEIGHT INCLUDES WEIGHT OF WATER AND REFRIGERANT.
2. ⊕ DENOTES CENTER OF GRAVITY.
3. DIMENSION IN ( ) ARE IN MILLIMETERS AND WEIGHTS IN ( ) ARE IN KILOGRAMS.
4. ALLOW 36" (914.4) CLEARANCE ON CONTROL PANEL END, OPPOSITE CONTROL PANEL END AND ABOVE THE UNIT AND IN ACCORDANCE WITH LOCAL CODE.
5. ——— — – — DENOTES ACCESSORY OR FACTORY INSTALLED OPTION.
6. UNIT SHIPPED WITH NITROGEN HOLDING CHARGE. FIELD REMOVAL OF TUBE AND REDUCING COUPLING REQUIRED. CONSULT INSTALLATION INSTRUCTIONS FOR DISCHARGE AND LIQUID PIPE CONNECTION SIZES.
7. TEMPERATURE RELIEF DEVICE LOCATED ON LIQUID LINE. 3/8" SAE FLARE CONNECTION. DO NOT CAP OR OTHERWISE OBSTRUCT TEMPERATURE/PRESSURE RELIEF.

ITC CLASSIFICATION	SHEET	DATE	SUPERCEDES	30MPA 017-031T UNIT ASSY		REV
U.S. ECCN:EAR99	1 OF 4	07/30/24	-	-	30MP60000200	B

Fig. 10 — Dimensions — 30MPA 021 and 031 Without Manifold (Standard Unit)

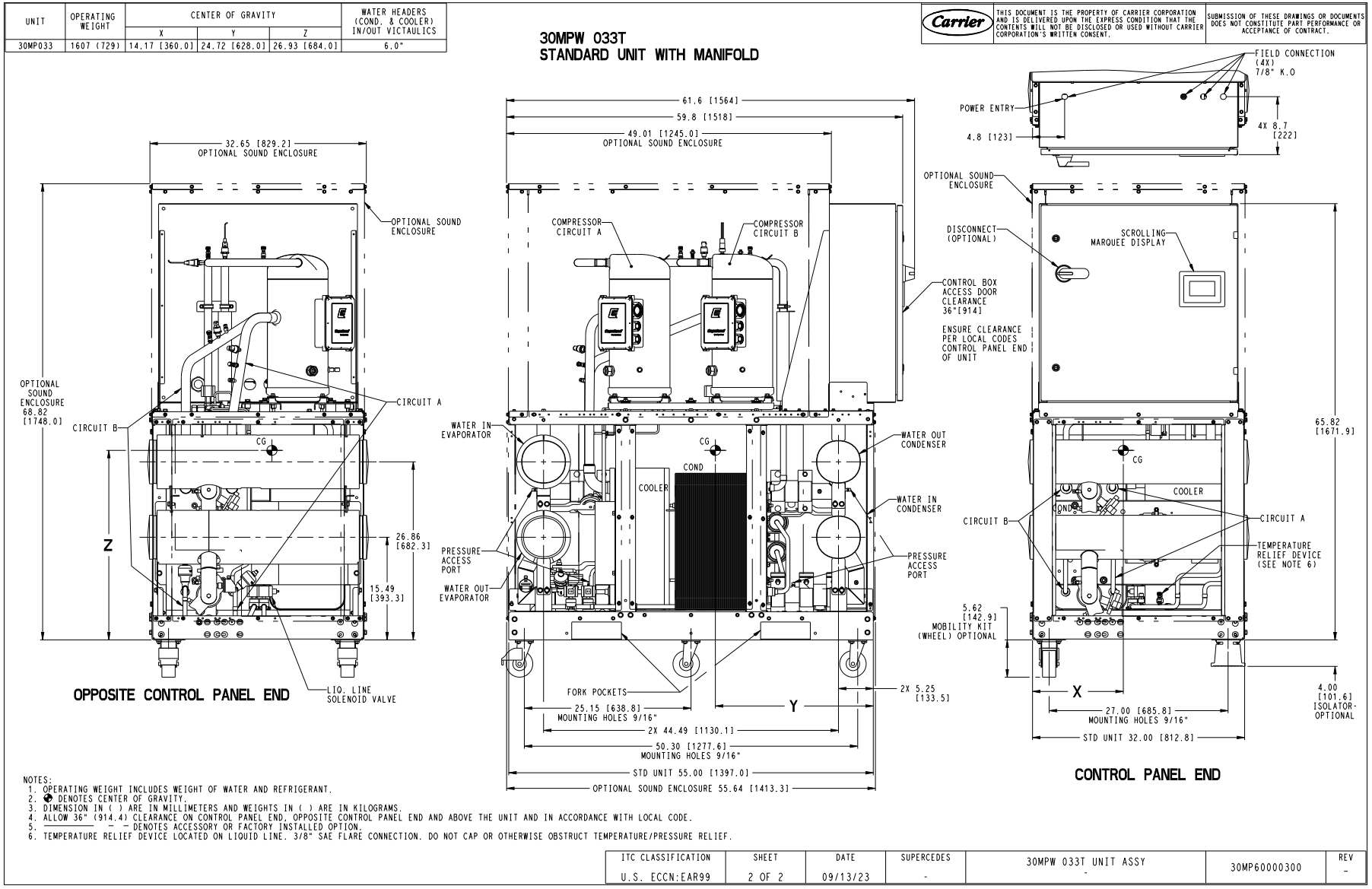


Fig. 11 — Dimensions — 30MPW 033 With Manifold (Standard Unit)

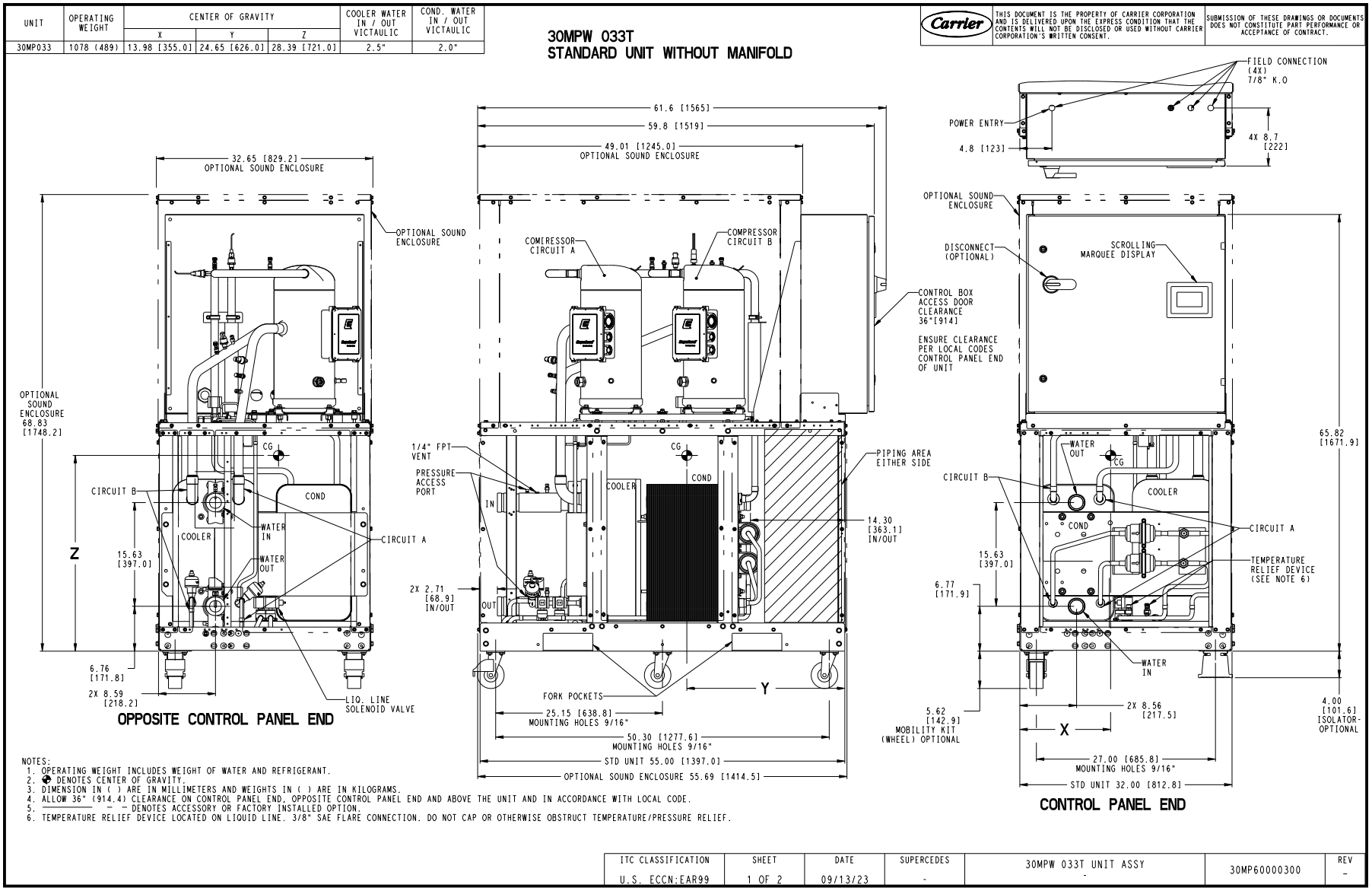
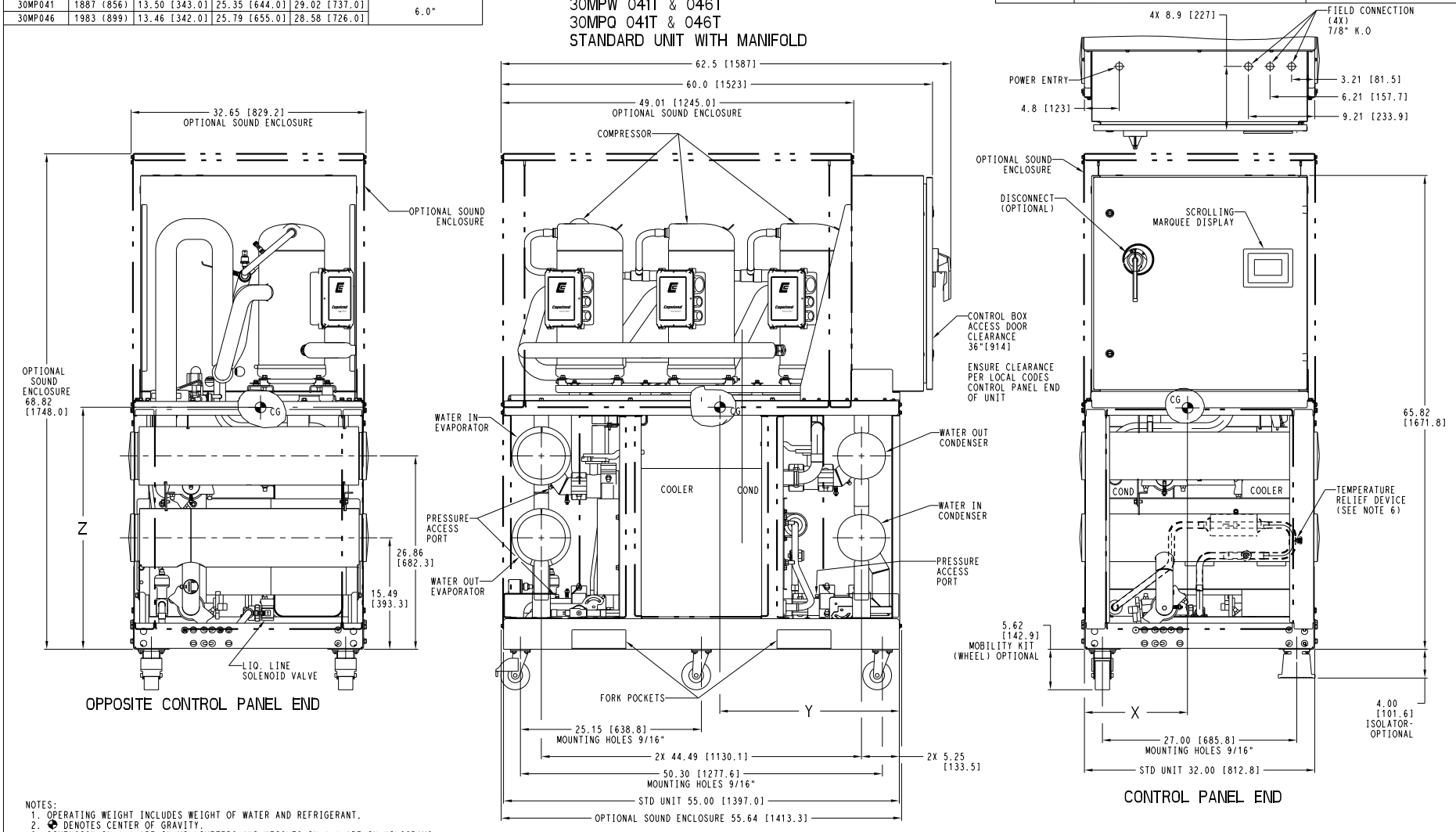


Fig. 12 — 30MPW 033 Without Manifold (Standard Unit)

UNIT	OPERATING WEIGHT	CENTER OF GRAVITY			WATER HEADERS (COND. & COOLER) IN/OUT VICTAULICS
		X	Y	Z	
30MP041	1887 (856)	13.50 [343.0]	25.35 [644.0]	29.02 [737.0]	6.0"
30MP046	1983 (899)	13.46 [342.0]	25.79 [655.0]	28.58 [726.0]	

30MPW 041T & 046T
30MPQ 041T & 046T
STANDARD UNIT WITH MANIFOLD

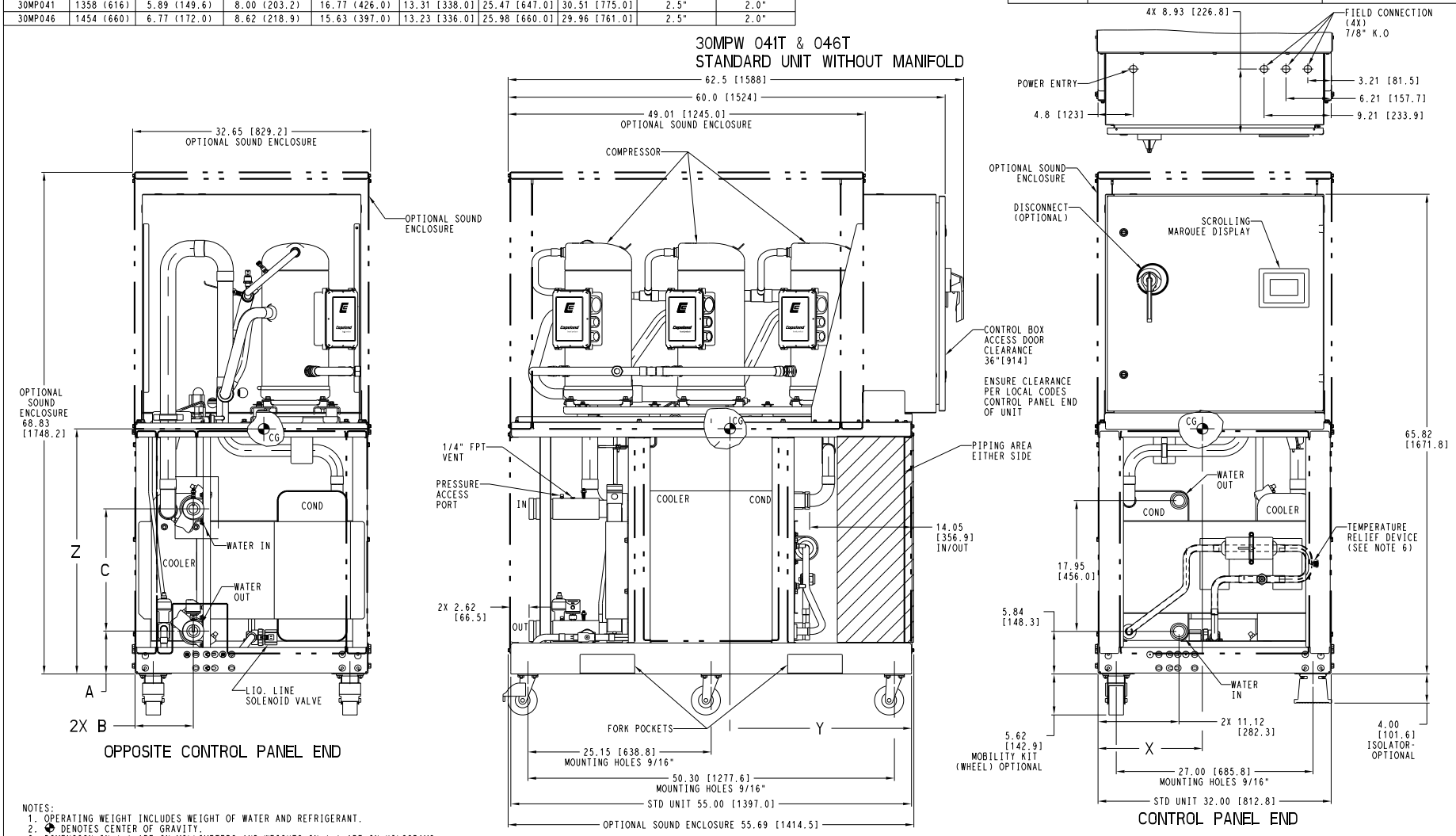


NOTES:
1. OPERATING WEIGHT INCLUDES WEIGHT OF WATER AND REFRIGERANT.
2. ⊕ DENOTES CENTER OF GRAVITY.
3. DIMENSION IN ( ) ARE IN MILLIMETERS AND WEIGHTS IN ( ) ARE IN KILOGRAMS.
4. ALLOW 36" (914.4) CLEARANCE ON CONTROL PANEL END, OPPOSITE CONTROL PANEL END AND ABOVE THE UNIT AND IN ACCORDANCE WITH LOCAL CODE.
5. ———— – – DENOTES ACCESSORY OR FACTORY INSTALLED OPTION.
6. TEMPERATURE RELIEF DEVICE LOCATED ON LIQUID LINE. 3/8" SAE FLARE CONNECTION. DO NOT CAP OR OTHERWISE OBSTRUCT TEMPERATURE/PRESSURE RELIEF.

ITC CLASSIFICATION	SHEET	DATE	SUPERCEDES	30MPW 041-046T UNIT ASSY	30MP60000400	REV
U.S. ECCN:EAR99	3 OF 4	08/08/24	-	-		B

Fig. 13 — Dimensions — 30MPW/Q 041 and 046 With Manifold (Standard Unit)

UNIT	OPERATING WEIGHT	A	B	C	CENTER OF GRAVITY			COOLER WATER IN / OUT VICTAULIC	COND. WATER IN / OUT VICTAULIC
					X	Y	Z		
30MP041	1358 (616)	5.89 (149.6)	8.00 (203.2)	16.77 (426.0)	13.31 [338.0]	25.47 [647.0]	30.51 [775.0]	2.5"	2.0"
30MP046	1454 (660)	6.77 (172.0)	8.62 (218.9)	15.63 (397.0)	13.23 [336.0]	25.98 [660.0]	29.96 [761.0]	2.5"	2.0"

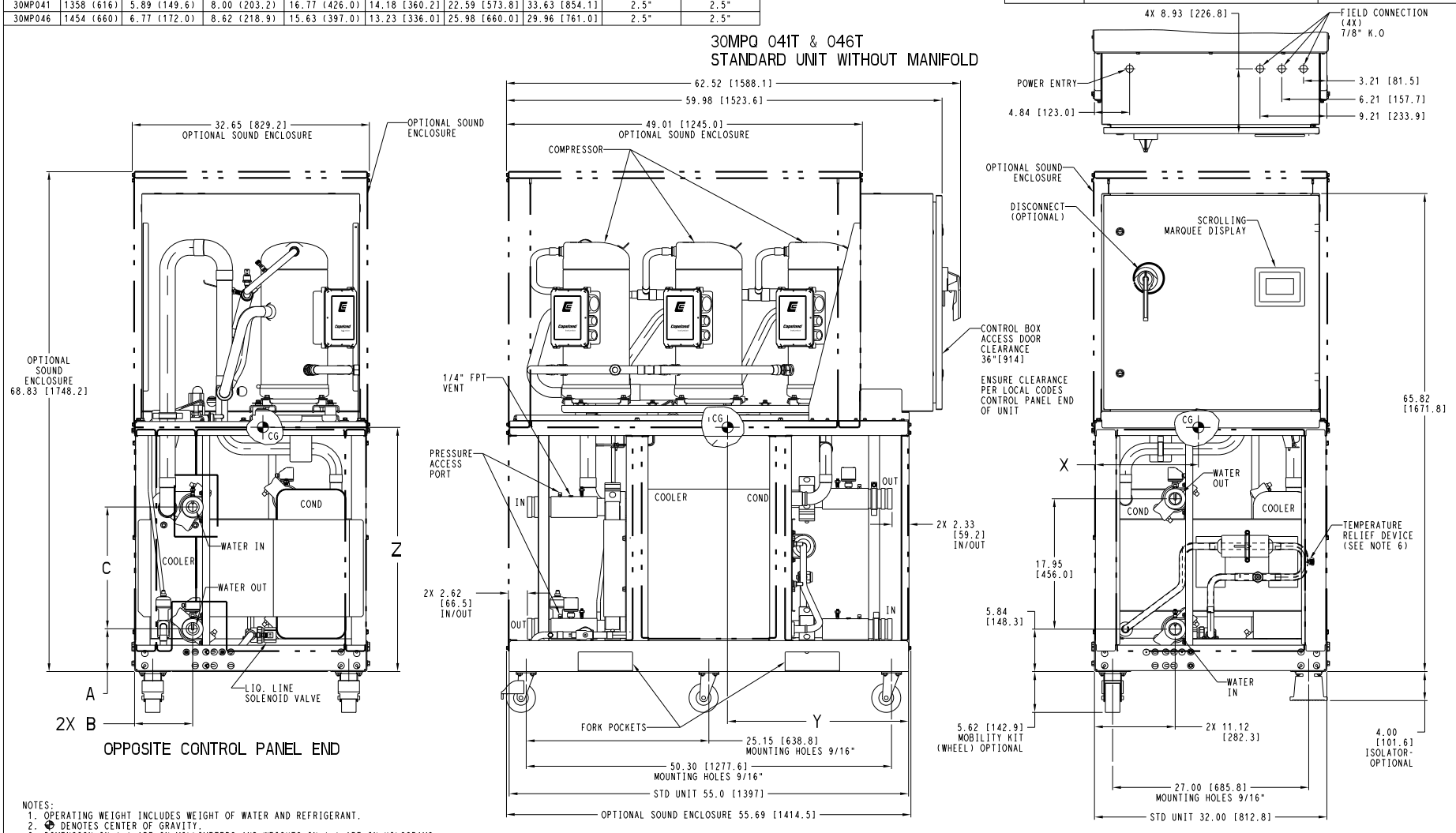


NOTES:
1. OPERATING WEIGHT INCLUDES WEIGHT OF WATER AND REFRIGERANT.
2. ⊕ DENOTES CENTER OF GRAVITY.
3. DIMENSION IN ( ) ARE IN MILLIMETERS AND WEIGHTS IN ( ) ARE IN KILOGRAMS.
4. ALLOW 36" (914.4) CLEARANCE ON CONTROL PANEL END, OPPOSITE CONTROL PANEL END AND ABOVE THE UNIT AND IN ACCORDANCE WITH LOCAL CODE.
5. ———— — — DENOTES ACCESSORY OR FACTORY INSTALLED OPTION.
6. TEMPERATURE RELIEF DEVICE LOCATED ON LIQUID LINE. 3/8" SAE FLARE CONNECTION. DO NOT CAP OR OTHERWISE OBSTRUCT TEMPERATURE/PRESSURE RELIEF.

ITC CLASSIFICATION	SHEET	DATE	SUPERCEDES	30MPW 041-046T UNIT ASSY	30MP60000400	REV
U.S. ECCN:EAR99	2 OF 4	08/08/24	-	-		B

Fig. 14 — Dimensions — 30MPW 041 and 046 Without Manifold (Standard Unit)

UNIT	OPERATING WEIGHT	A	B	C	CENTER OF GRAVITY			COOLER WATER IN / OUT VICTAULIC	COND. WATER IN / OUT VICTAULIC
					X	Y	Z		
30MP041	1358 (616)	5.89 (149.6)	8.00 (203.2)	16.77 (426.0)	14.18 [360.2]	22.59 [573.8]	33.63 [854.1]	2.5"	2.5"
30MP046	1454 (660)	6.77 (172.0)	8.62 (218.9)	15.63 (397.0)	13.23 [336.0]	25.98 [660.0]	29.96 [761.0]	2.5"	2.5"



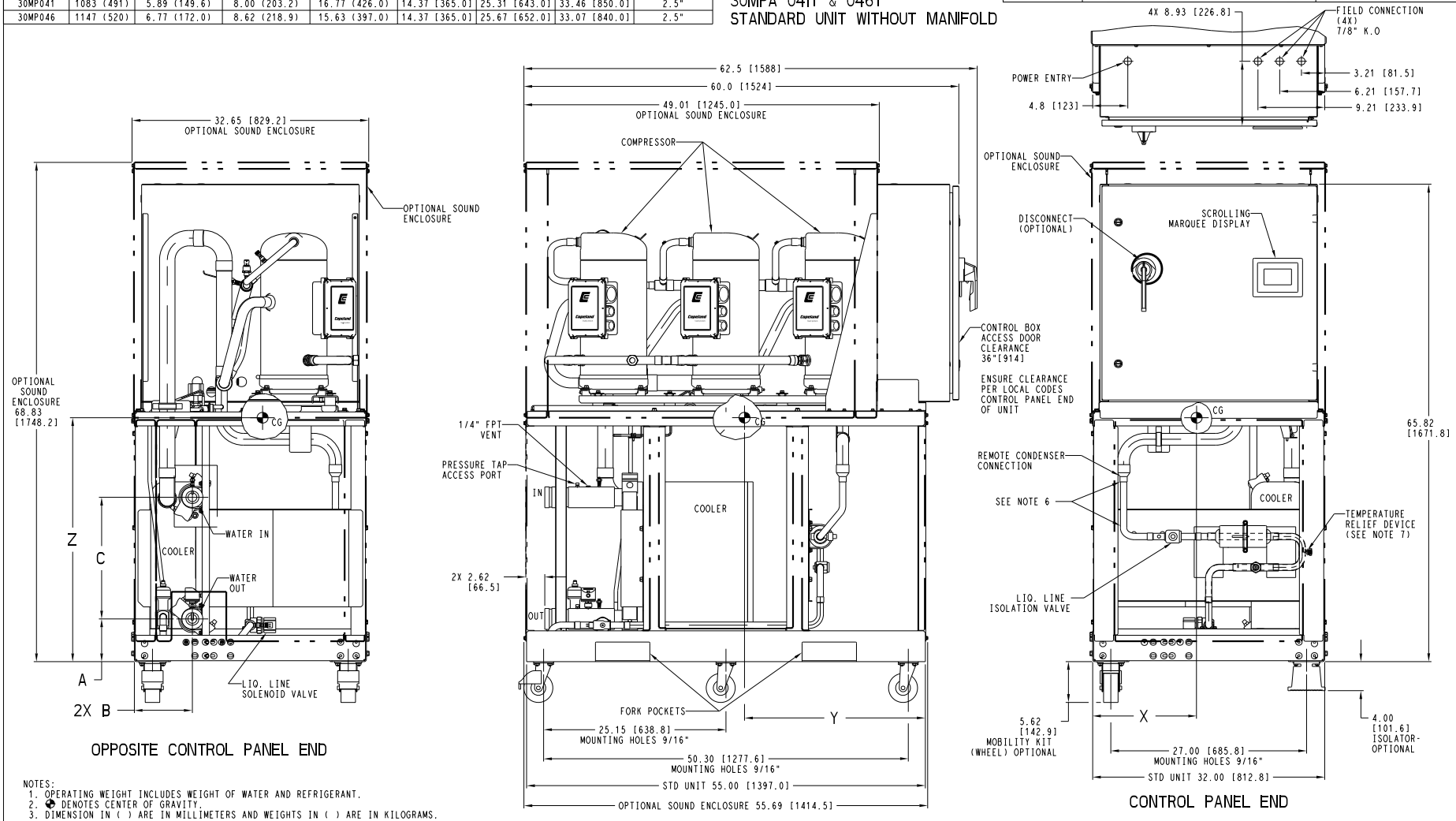
NOTES:
1. OPERATING WEIGHT INCLUDES WEIGHT OF WATER AND REFRIGERANT.
2. ⊕ DENOTES CENTER OF GRAVITY.
3. DIMENSION IN ( ) ARE IN MILLIMETERS AND WEIGHTS IN ( ) ARE IN KILOGRAMS.
4. ALLOW 36" (914.4) CLEARANCE ON CONTROL PANEL END, OPPOSITE CONTROL PANEL END AND ABOVE THE UNIT AND IN ACCORDANCE WITH LOCAL CODE.
5. ———— – – DENOTES ACCESSORY OR FACTORY INSTALLED OPTION.
6. TEMPERATURE RELIEF DEVICE LOCATED ON LIQUID LINE. 3/8" SAE FLARE CONNECTION. DO NOT CAP OR OTHERWISE OBSTRUCT TEMPERATURE/PRESSURE RELIEF.

ITC CLASSIFICATION	SHEET	DATE	SUPERCEDES	30MPW 041-046T UNIT ASSY	30MP60000400	REV
U.S. ECCN:EAR99	4 OF 4	08/08/24	-	-		B

Fig. 15 — Dimensions — 30MPQ 041 and 046 Without Manifold (Standard Unit)

UNIT	OPERATING WEIGHT	A	B	C	CENTER OF GRAVITY			COOLER WATER IN / OUT VICTAULIC
					X	Y	Z	
30MP041	1083 (491)	5.89 (149.6)	8.00 (203.2)	16.77 (426.0)	14.37 [365.0]	25.31 [643.0]	33.46 [850.0]	2.5"
30MP046	1147 (520)	6.77 (172.0)	8.62 (218.9)	15.63 (397.0)	14.37 [365.0]	25.67 [652.0]	33.07 [840.0]	2.5"

30MPA 041T & 046T
STANDARD UNIT WITHOUT MANIFOLD



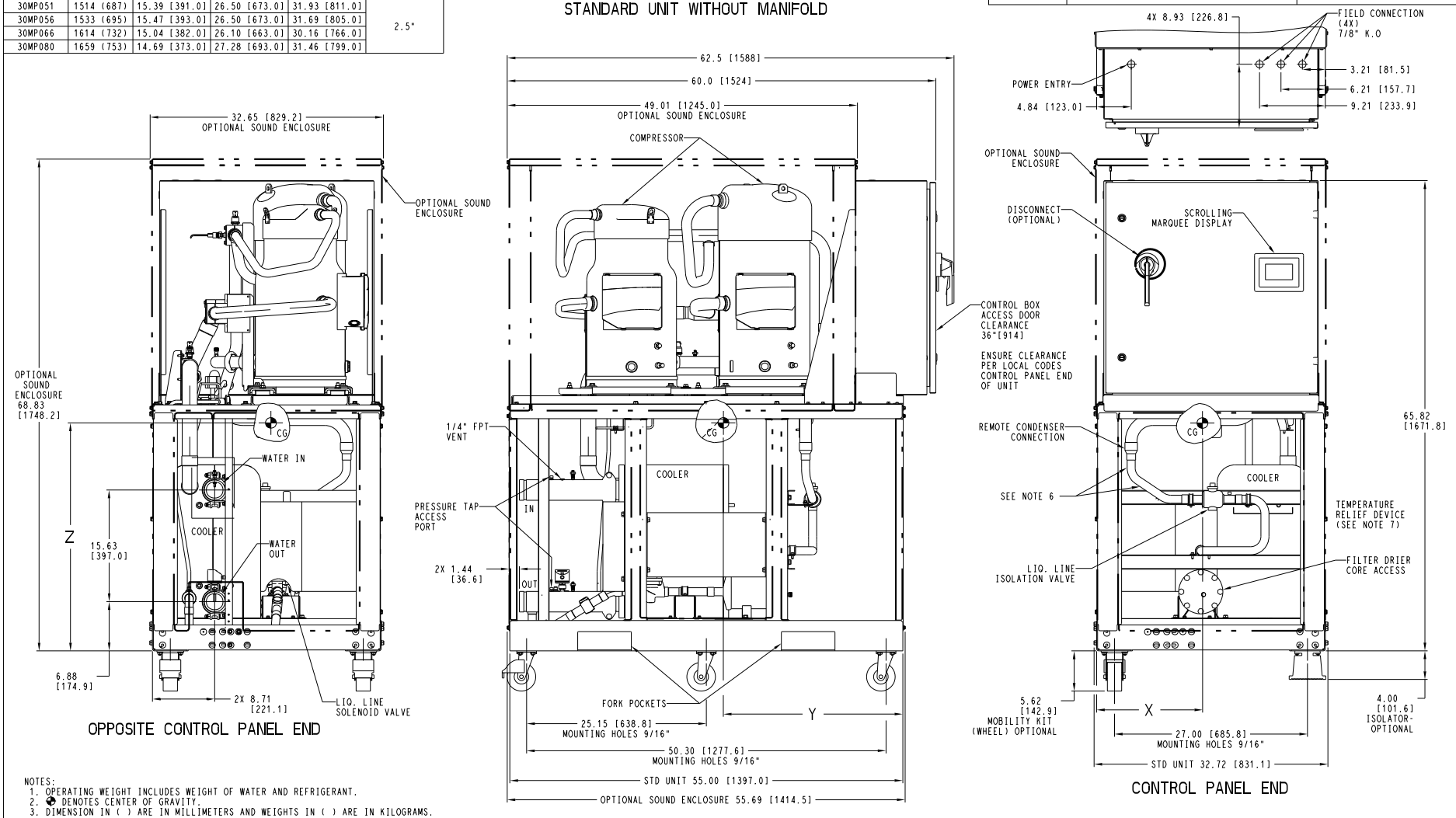
NOTES:
1. OPERATING WEIGHT INCLUDES WEIGHT OF WATER AND REFRIGERANT.
2. ⊕ DENOTES CENTER OF GRAVITY.
3. DIMENSION IN ( ) ARE IN MILLIMETERS AND WEIGHTS IN ( ) ARE IN KILOGRAMS.
4. ALLOW 36" (914.4) CLEARANCE ON CONTROL PANEL END, OPPOSITE CONTROL PANEL END AND ABOVE THE UNIT AND IN ACCORDANCE WITH LOCAL CODE.
5. ——— - - DENOTES ACCESSORY OR FACTORY INSTALLED OPTION.
6. UNIT SHIPPED WITH NITROGEN HOLDING CHARGE. FIELD REMOVAL OF TUBE AND REDUCING COUPLING REQUIRED. CONSULT INSTALLATION INSTRUCTIONS FOR DISCHARGE AND LIQUID PIPE CONNECTION SIZES.
7. TEMPERATURE RELIEF DEVICE LOCATED ON LIQUID LINE. 3/8" SAE FLARE CONNECTION. DO NOT CAP OR OTHERWISE OBSTRUCT TEMPERATURE/PRESSURE RELIEF.

ITC CLASSIFICATION	SHEET	DATE	SUPERCEDES	30MPA 041-046T UNIT ASSY		REV
U.S. ECCN:EAR99	1 OF 4	08/08/24	-	-	30MP60000400	B

Fig. 16 — Dimensions — 30MPA 041 and 046 Without Manifold (Standard Unit)

UNIT	OPERATING WEIGHT	CENTER OF GRAVITY			COOLER WATER IN / OUT VICTAULIC
		X	Y	Z	
30MP051	1514 (687)	15.39 [391.0]	26.50 [673.0]	31.93 [811.0]	2.5"
30MP056	1533 (695)	15.47 [393.0]	26.50 [673.0]	31.69 [805.0]	
30MP066	1614 (732)	15.04 [382.0]	26.10 [663.0]	30.16 [766.0]	
30MP080	1659 (753)	14.69 [373.0]	27.28 [693.0]	31.46 [799.0]	

30MPA 051T / 056T / 066T & 080T
STANDARD UNIT WITHOUT MANIFOLD



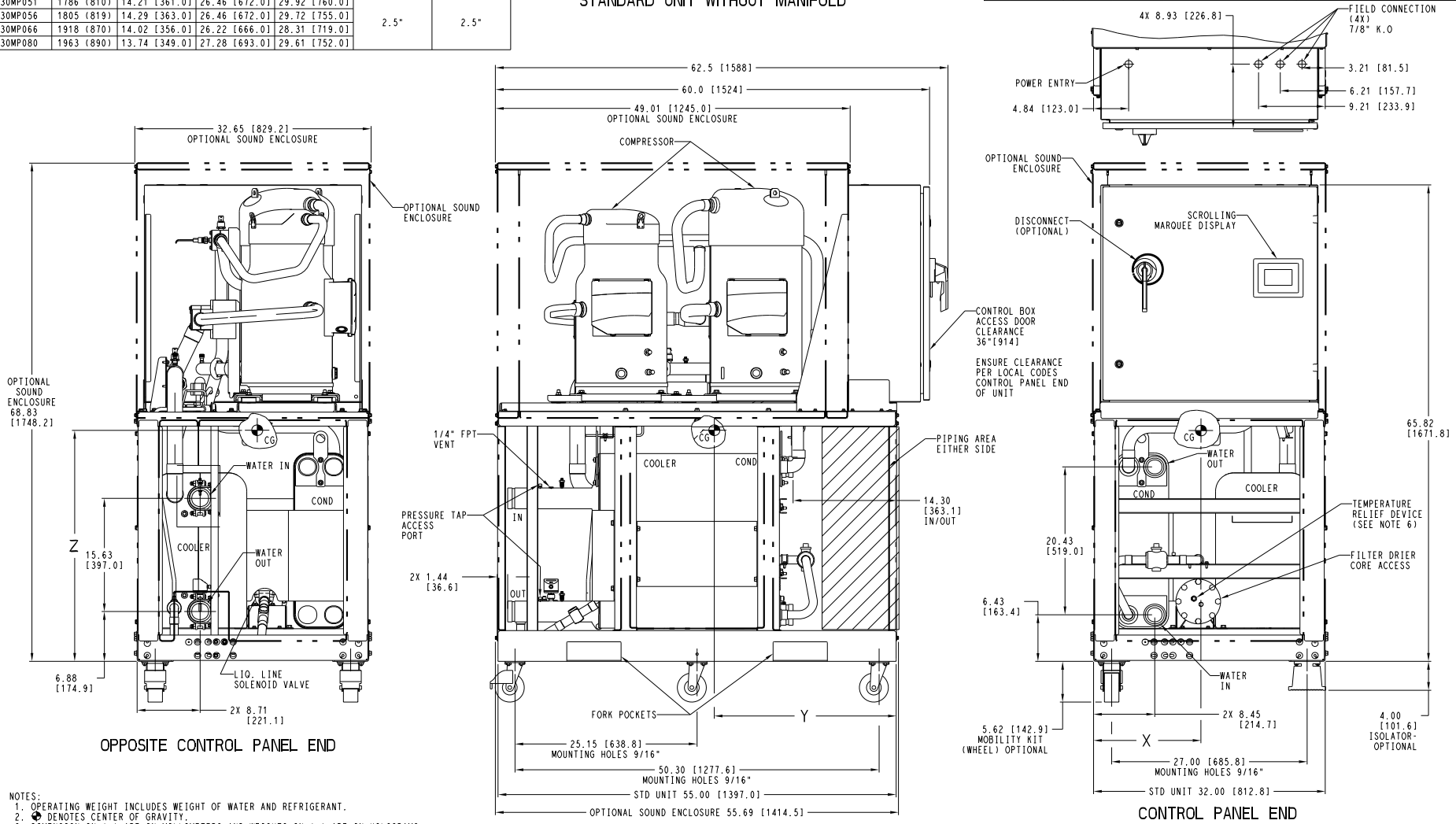
NOTES:
1. OPERATING WEIGHT INCLUDES WEIGHT OF WATER AND REFRIGERANT.
2. ⊕ DENOTES CENTER OF GRAVITY.
3. DIMENSION IN ( ) ARE IN MILLIMETERS AND WEIGHTS IN ( ) ARE IN KILOGRAMS.
4. ALLOW 36" (914.4) CLEARANCE ON CONTROL PANEL END, OPPOSITE CONTROL PANEL END AND ABOVE THE UNIT AND IN ACCORDANCE WITH LOCAL CODE.
5. ——— – – DENOTES ACCESSORY OR FACTORY INSTALLED OPTION.
6. UNIT SHIPPED WITH NITROGEN HOLDING CHARGE. FIELD REMOVAL OF TUBE AND REDUCING COUPLING REQUIRED. CONSULT INSTALLATION INSTRUCTIONS FOR DISCHARGE AND LIQUID PIPE CONNECTION SIZES.
7. TEMPERATURE RELIEF DEVICE LOCATED ON FILTER DRIER, 3/8" SAE FLARE CONNECTION. DO NOT CAP OR OTHERWISE OBSTRUCT TEMPERATURE/PRESSURE RELIEF.

ITC CLASSIFICATION	SHEET	DATE	SUPERCEDES	30MPA 051-080T UNIT ASSY	30MP60000500	REV
U.S. ECCN:EAR99	1 OF 4	08/08/24	-	-		B

Fig. 17 — Dimensions — 30MPA 051-080 Without Manifold (Standard Unit)

UNIT	OPERATING WEIGHT	CENTER OF GRAVITY			COOLER WATER IN / OUT VICTAULIC	COND. WATER IN / OUT VICTAULIC
		X	Y	Z		
30MP051	1786 (810)	14.21 [361.0]	26.46 [672.0]	29.92 [760.0]	2.5"	2.5"
30MP056	1805 (819)	14.29 [363.0]	26.46 [672.0]	29.72 [755.0]		
30MP066	1918 (870)	14.02 [356.0]	26.22 [666.0]	28.31 [719.0]		
30MP080	1963 (890)	13.74 [349.0]	27.28 [693.0]	29.61 [752.0]		

30MPW 051T / 056T / 066T & 080T
STANDARD UNIT WITHOUT MANIFOLD



NOTES:
1. OPERATING WEIGHT INCLUDES WEIGHT OF WATER AND REFRIGERANT.
2. ⊕ DENOTES CENTER OF GRAVITY.
3. DIMENSION IN ( ) ARE IN MILLIMETERS AND WEIGHTS IN ( ) ARE IN KILOGRAMS.
4. ALLOW 36" (914.4) CLEARANCE ON CONTROL PANEL END, OPPOSITE CONTROL PANEL END AND ABOVE THE UNIT AND IN ACCORDANCE WITH LOCAL CODE.
5. ——— - - - DENOTES ACCESSORY OR FACTORY INSTALLED OPTION.
6. TEMPERATURE RELIEF DEVICE LOCATED ON FILTER DRIER, 3/8" SAE FLARE CONNECTION. DO NOT CAP OR OTHERWISE OBSTRUCT TEMPERATURE/PRESSURE RELIEF.

ITC CLASSIFICATION	SHEET	DATE	SUPERCEDES	30MPW 051-080T UNIT ASSY	30MP60000500	REV
U.S. ECCN:EAR99	2 OF 4	08/08/24	-	-		B

Fig. 18 — Dimensions — 30MPW 051-080 Without Manifold (Standard Unit)

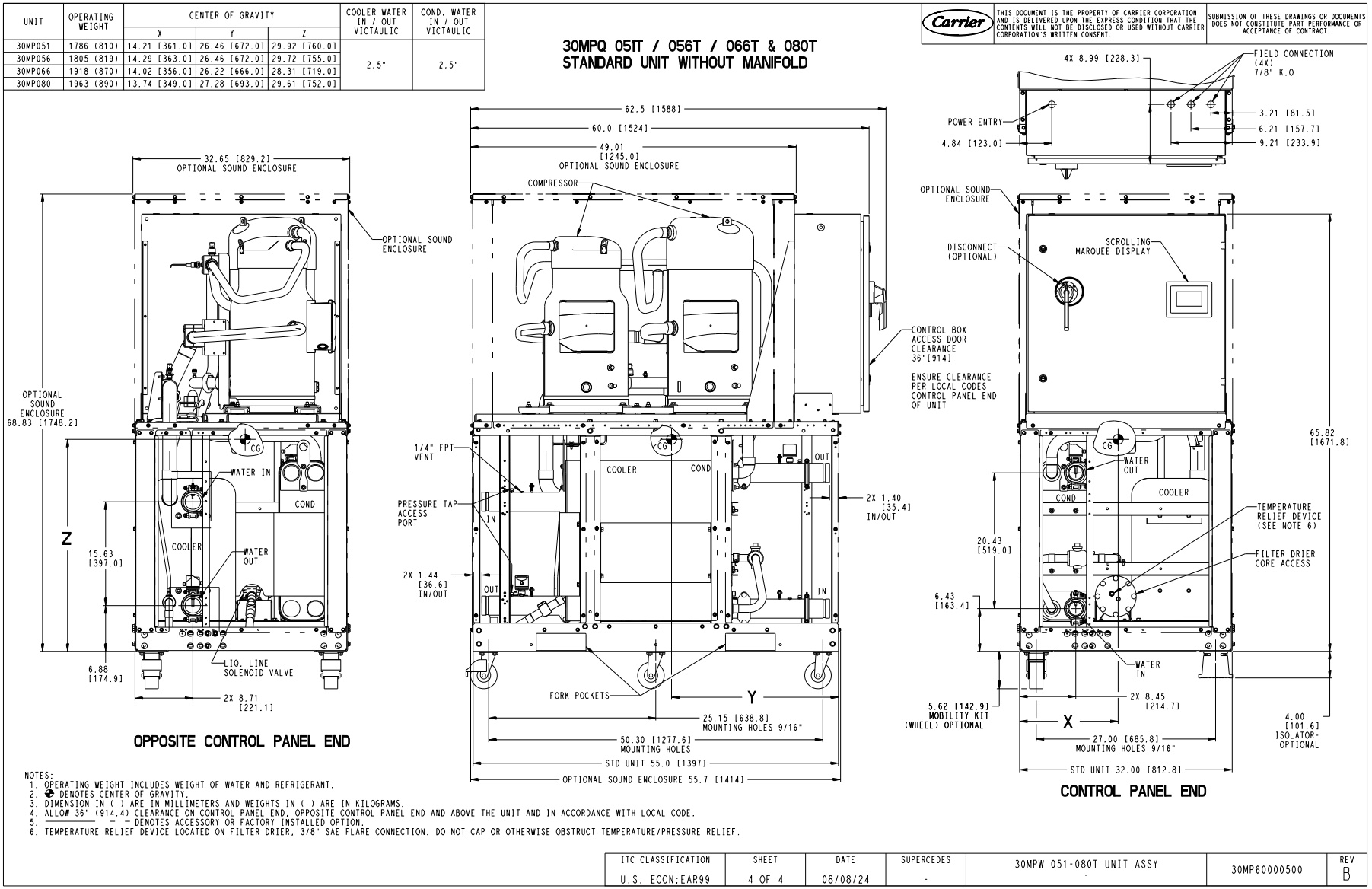
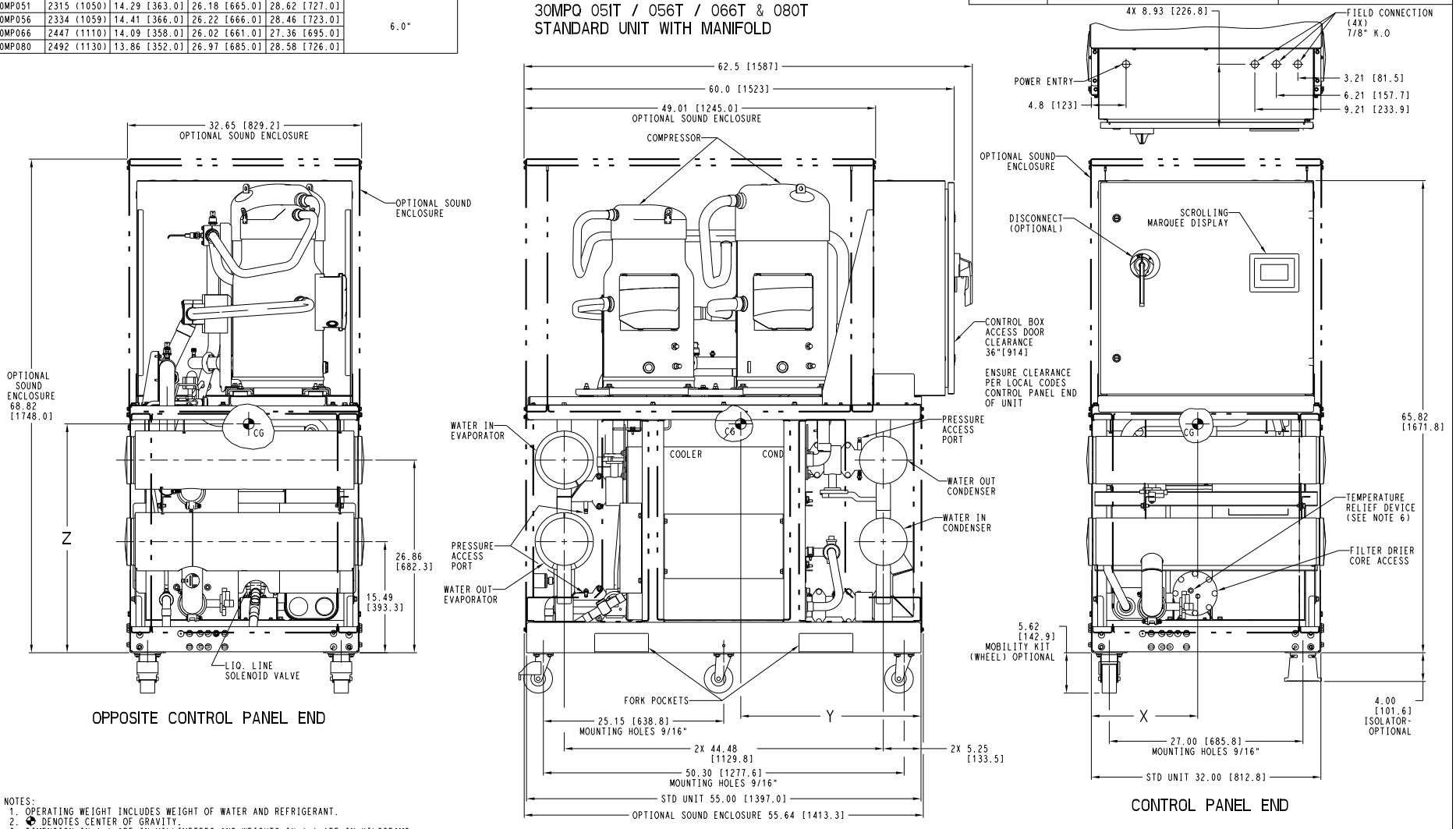


Fig. 19 — Dimensions — 30MPQ 051-080 Without Manifold (Standard Unit)

UNIT	OPERATING WEIGHT	CENTER OF GRAVITY			WATER HEADERS (COND. & COOLER) IN/OUT VICTAULIC
		X	Y	Z	
30MP051	2315 (1050)	14.29 [363.0]	26.18 [665.0]	28.62 [727.0]	6.0"
30MP056	2334 (1059)	14.41 [366.0]	26.22 [666.0]	28.46 [723.0]	
30MP066	2447 (1110)	14.09 [358.0]	26.02 [661.0]	27.36 [695.0]	
30MP080	2492 (1130)	13.86 [352.0]	26.97 [685.0]	28.58 [726.0]	

30MPW 051T / 056T / 066T & 080T
30MPQ 051T / 056T / 066T & 080T
STANDARD UNIT WITH MANIFOLD



NOTES:
1. OPERATING WEIGHT INCLUDES WEIGHT OF WATER AND REFRIGERANT.
2. ⊕ DENOTES CENTER OF GRAVITY.
3. DIMENSION IN ( ) ARE IN MILLIMETERS AND WEIGHTS IN ( ) ARE IN KILOGRAMS.
4. ALLOW 36" (914.4) CLEARANCE ON CONTROL PANEL END, OPPOSITE CONTROL PANEL END AND ABOVE THE UNIT AND IN ACCORDANCE WITH LOCAL CODE.
5. ——— - - DENOTES ACCESSORY OR FACTORY INSTALLED OPTION.
6. TEMPERATURE RELIEF DEVICE LOCATED ON FILTER DRIER, 3/8" SAE FLARE CONNECTION. DO NOT CAP OR OTHERWISE OBSTRUCT TEMPERATURE/PRESSURE RELIEF.

ITC CLASSIFICATION	SHEET	DATE	SUPERCEDES	30MPW 051-080T UNIT ASSY	30MP60000500	REV
U.S. ECCN:EAR99	3 OF 4	08/08/24	-	-		B

Fig. 20 — Dimensions — 30MPW/Q 051-080 With Manifold (Standard Unit)

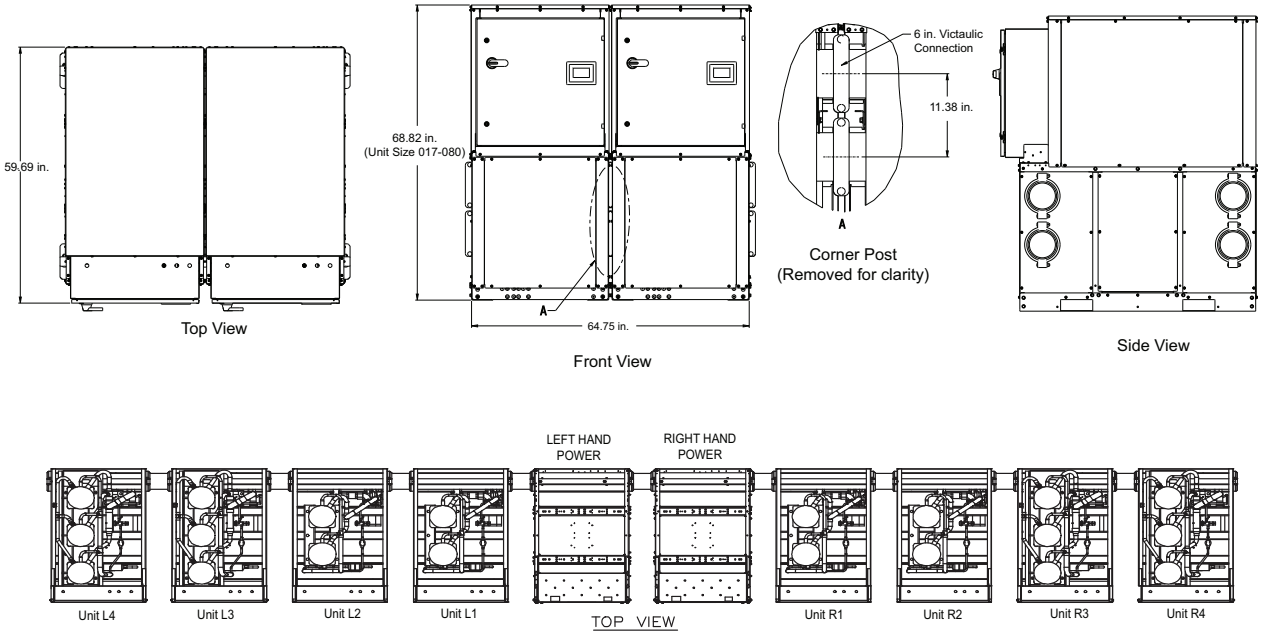


Fig. 21 — Dimensions — 30MP Chiller Units Manifolded Together without Accessory Spacer Pipe (30MPW046 Shown)

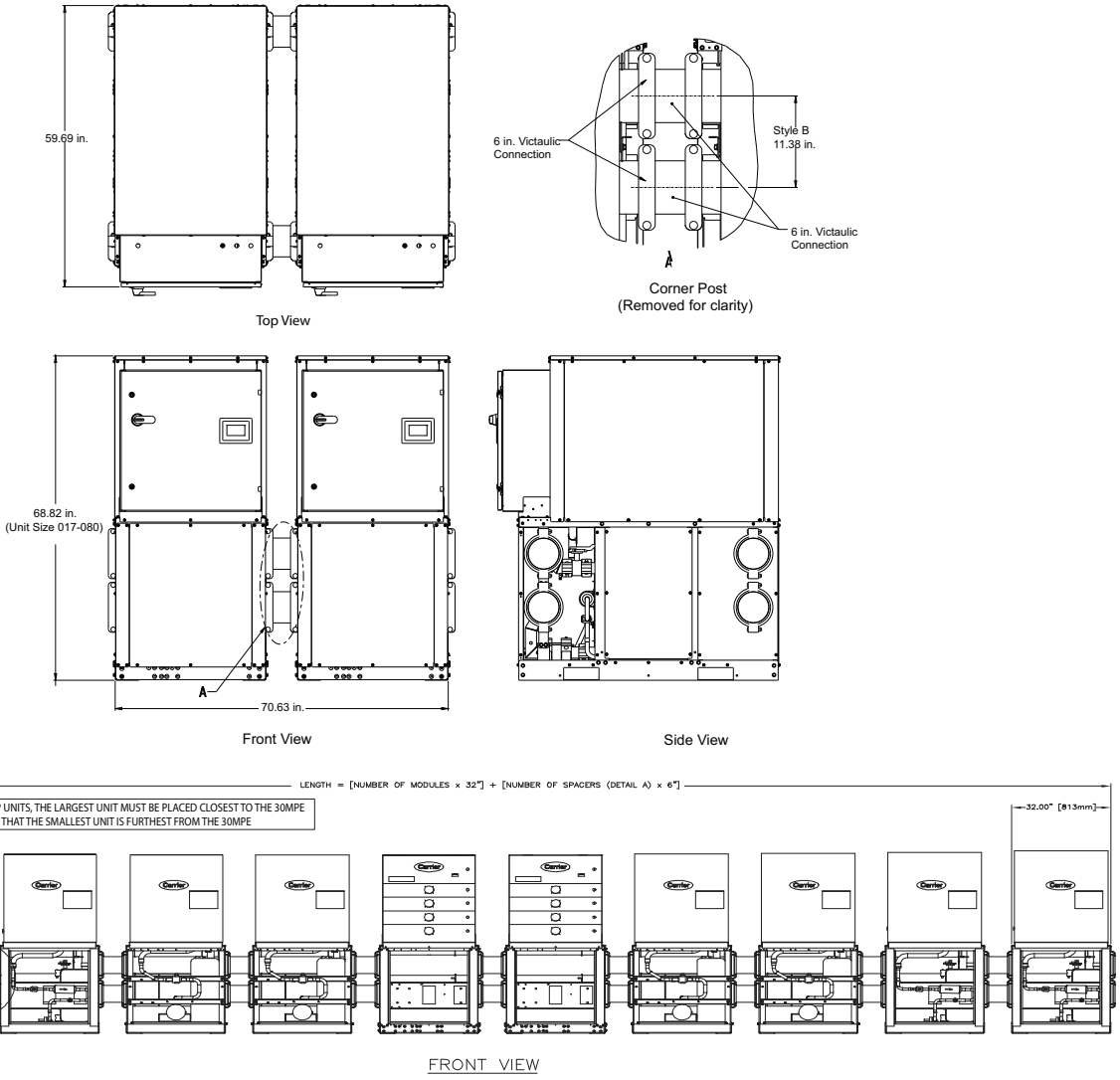
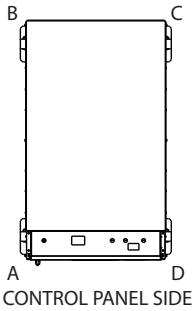


Fig. 22 — Dimensions — 30MP Chiller Units Manifolded Together with Accessory Spacer Pipe (30MPW046 Shown)



ESTIMATED WEIGHT DISTRIBUTION AT EACH MOUNTING HOLE — lb

UNIT 30MP	MOUNTING HOLE (lb)			
	A	B	C	D
A021	162	139	195	228
A031	171	165	219	227
A041	252	255	290	286
A046	263	274	311	299
A051	308	343	454	408
A056	310	345	463	416
A066	344	371	466	432
A080	346	411	489	413
W017	161	137	174	205
W/Q021	189	160	204	240
W/Q031	247	238	263	273
W033	265	255	273	284
W/Q041	340	349	339	330
W/Q046	359	383	368	344
W/Q051	401	445	494	445
W/Q056	403	447	502	453
W/Q066	442	481	519	476
W/Q080	441	523	542	457

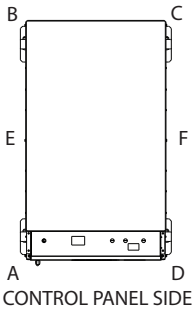
ESTIMATED WEIGHT DISTRIBUTION AT EACH MOUNTING HOLE — kg

UNIT 30MP	MOUNTING HOLE (kg)			
	A	B	C	D
A021	73	63	88	103
A031	78	75	99	103
A041	114	116	131	130
A046	119	124	141	136
A051	140	156	206	185
A056	141	156	210	188
A066	156	168	212	196
A080	157	186	222	187
W017	73	62	79	93
W/Q021	86	73	92	109
W/Q031	112	108	119	124
W033	120	116	124	129
W/Q041	154	158	154	150
W/Q046	163	174	167	156
W/Q051	182	202	224	202
W/Q056	183	203	228	205
W/Q066	200	218	235	216
W/Q080	200	237	246	207

UNIT 30MP WITH MANIFOLD	MOUNTING HOLE (lb)			
	A	B	C	D
A021	194	215	305	274
A031	209	243	320	276
A041	287	340	391	330
A046	295	359	416	342
A051	338	430	566	445
A056	339	429	576	454
A066	375	455	575	474
A080	379	497	595	454
W017	282	251	317	357
W/Q021	309	275	347	391
W/Q031	373	359	401	416
W033	388	375	414	429
W/Q041	468	476	476	468
W/Q046	485	510	507	482
W/Q051	523	567	638	587
W/Q056	521	568	649	596
W/Q066	565	605	661	616
W/Q080	563	651	686	593

UNIT 30MP WITH MANIFOLD	MOUNTING HOLE (kg)			
	A	B	C	D
A021	88	98	138	124
A031	95	110	145	125
A041	130	154	177	150
A046	134	163	188	155
A051	153	195	257	202
A056	154	195	261	206
A066	170	206	261	215
A080	172	225	270	206
W017	128	114	144	162
W/Q021	140	125	157	177
W/Q031	169	163	182	189
W033	176	170	188	194
W/Q041	212	216	216	212
W/Q046	220	231	230	219
W/Q051	237	257	289	266
W/Q056	236	257	294	270
W/Q066	256	275	300	280
W/Q080	255	295	311	269

Fig. 23 — Mounting Hole Weight Distribution (at Four Locations)



ESTIMATED WEIGHT DISTRIBUTION AT EACH MOUNTING HOLE — lb

UNIT 30MP	MOUNTING HOLE (lb)					
	A	B	C	D	E	F
A021	112	89	115	166	100	141
A031	125	99	125	172	112	149
A041	184	154	168	216	169	192
A046	194	164	180	227	179	203
A051	217	216	287	288	217	287
A056	219	218	292	294	219	292
A066	239	238	299	300	239	300
A080	253	251	299	302	252	301
W017	114	85	104	149	99	126
W/Q021	131	102	124	171	117	148
W/Q031	179	144	153	204	162	179
W033	193	154	159	213	173	185
W/Q041	251	208	195	251	230	223
W/Q046	270	224	209	266	247	238
W/Q051	283	281	312	315	282	313
W/Q056	284	282	317	320	283	318
W/Q066	306	309	334	330	308	332
W/Q080	320	322	334	332	321	333

ESTIMATED WEIGHT DISTRIBUTION AT EACH MOUNTING HOLE — kg

UNIT 30MP	MOUNTING HOLE (kg)					
	A	B	C	D	E	F
A021	51	40	52	75	45	64
A031	57	45	56	78	51	68
A041	84	70	76	98	76	87
A046	88	74	82	103	81	92
A051	99	98	130	131	99	130
A056	99	99	133	133	99	133
A066	108	108	135	136	108	136
A080	115	114	136	137	114	136
W017	52	39	47	67	45	57
W/Q021	59	46	56	78	53	67
W/Q031	81	65	69	92	73	81
W033	88	70	72	97	78	84
W/Q041	114	94	88	114	104	101
W/Q046	123	102	95	121	112	108
W/Q051	128	127	141	143	128	142
W/Q056	129	128	144	145	128	144
W/Q066	139	140	151	149	140	151
W/Q080	145	146	152	150	146	151

UNIT 30MP WITH MANIFOLD	MOUNTING HOLE (lb)					
	A	B	C	D	E	F
A021	110	163	236	150	136	193
A031	122	179	239	158	151	198
A041	176	241	283	198	209	240
A046	185	251	294	210	219	253
A051	244	268	355	319	256	338
A056	244	268	361	325	256	344
A066	264	289	367	333	277	350
A080	279	304	366	333	292	350
W017	164	192	244	204	177	225
W/Q021	182	207	266	226	195	246
W/Q031	232	256	289	256	244	272
W033	242	267	297	264	254	281
W/Q041	303	326	329	300	314	314
W/Q046	320	342	342	317	332	330
W/Q051	364	362	407	410	363	408
W/Q056	364	362	413	417	363	415
W/Q066	389	390	427	425	390	425
W/Q080	404	404	427	426	404	426

UNIT 30MP WITH MANIFOLD	MOUNTING HOLE (kg)					
	A	B	C	D	E	F
A021	50	74	107	68	62	88
A031	55	81	108	72	68	90
A041	80	109	128	90	95	109
A046	84	114	134	95	99	115
A051	111	121	161	145	116	153
A056	111	121	164	147	116	156
A066	120	131	166	151	125	159
A080	127	138	166	151	132	159
W017	74	87	111	93	80	102
W/Q021	82	94	120	103	88	112
W/Q031	105	116	131	116	111	124
W033	110	121	135	120	115	128
W/Q041	137	148	149	136	143	143
W/Q046	145	155	155	144	151	149
W/Q051	165	164	184	186	165	185
W/Q056	165	164	187	189	165	188
W/Q066	177	177	193	193	177	193
W/Q080	183	183	194	193	183	193

Fig. 24 — Mounting Hole Weight Distribution (at Six Locations)

INSTALLATION

⚠ WARNING

If a 30MPE electrical distribution panel is purchased, it is crucial that each individual 30MP chiller be placed in the appropriate position relative to its corresponding 30MPE electrical distribution panel. Failure to do so could cause personal injury or death. Please consult the 30MPE Electrical Distribution Panel Installation Instructions for more details.

Location

Chillers are shipped covered with shipping bag. They may be stored outdoors.

⚠ WARNING

30MPW chillers and 30MPQ heat pumps are usually shipped with R-32 refrigerant charge classified as A2L, semi-flammable. For indoor storage, the area must comply with UL 60335-40-2, section GG. Failure to comply with these requirements may cause injury or death.

The chiller is shipped with R-32 refrigerant if position 12 of the model number is 0 thru 9, N, or P. 30MPA chillers are shipped with a nitrogen charge, no refrigerant. Storage restrictions do not apply to MPA chillers until they are charged on site.

When considering location, consult National Electrical Code (NEC) and local code requirements. Allow sufficient space for wiring, piping, and service. Install the unit in an area where it will not be exposed to ambient temperatures below 50°F (10°C).

Allow 36 in. (914 mm) in front of the unit for the control box access door. Additional clearance may be required per local codes. Prior to installation, determine in which direction the compressor will be removed, and leave 3 to 4 ft (914 to 1219 mm) clearance for removal.

On all units leave 3 ft (0.9 m) of clearance opposite the control box end to make water/brine connections to the evaporator, accessing the EXV (electronic expansion valve), fluid thermistors, and proof of flow switch.

For units without water manifold option, leave 2 ft (610 mm) on the left facing control box side for making refrigeration connections (30MPA) or leave 2 ft (610 mm) on one side for making fluid connections (30MPW/Q) to condenser. See Tables 1 and 2 for room area dimensions. Refer to Fig. 7-22 for unit details.

The floor must be strong enough to support the unit operating weight (See Tables 3 and 4, Fig. 7-20, and Fig. 23 and 24 for mounting hole weights). If necessary, add a supporting structure (steel beams or reinforced concrete slabs) to the floor to transfer weight to the nearest beams.

Additional weight of factory-installed sound enclosure option is 75 lb (34 kg). Additional operating weight of 30MPA water manifold option is 218 lb (99 kg). Additional operating weight of 30MPW water manifold option is 436 lb (198 kg).

⚠ CAUTION

Be sure interconnecting piping and electrical conduits are suspended freely, and are not in contact with any adjacent walls. Be sure unit capillaries are not rubbing against anything. Damage to the unit or walls may result.

Mounting Weights

The mounting hole weights from Fig. 23 and 24 should be used for calculating weights for units connected via common water manifold piping (multi-chiller applications) and using the Vibration Isolator Springs Accessory Kit.

Multiple chiller applications using the Vibration Isolator Springs Accessory Kit should be set on a mounting frame, which should then be installed on the isolator springs. I-beam or square metal tubing are acceptable materials for the mounting frame. Each chiller MUST be supported in the center (under the heat exchangers) by the mounting frame; however, isolators are only necessary at the four corners of each unit. Use Fig. 23 for the corner weights of each when supported in four locations.

For standalone units (chillers which are not connected via common water piping), 30MP 017-046 must be supported at the four corner locations shown in Fig. 23. 30MP 051-080 must be supported at the six locations shown in Fig. 24.

Minimum Area Requirements for Installation and Storage

30MP chillers use R-32 refrigerant which is classified as A2L, semi-flammable. The following requirements are based on UL 60335-40-2 Section GG. Assure any other applicable codes are also complied with such as ASHRAE 15 and any other local or national codes.

UNVENTILATED AREA

Chiller sizes 017-046 may be installed without ventilation if the room area is greater than shown in Table 1. For 30MPA chillers, estimate the charge in the chiller, condenser, and connecting lines. Use the formula below to calculate the minimum area without ventilation.

Amin = (mc/0.3414)^2 [sq m] where mc [kg] = actual refrigerant charge in system. See conversion table for refrigerant on page 24 in Natural Ventilation to Occupied Space section.

For remote condenser applications, this includes charge in chiller, condenser, and connecting piping.

Table 1 — 30MPW/MPQ Minimum Room Area - Without Ventilation

MODEL/UNIT SIZE	AREA [m^2]	AREA [ft^2]
017[a]	159	1,710
021	204	2,190
031	835	5,964
033[a]	371	3,984
041	1459	15,662
046	2162	23,212

NOTE(S):

a. 30MPW option only.

NATURAL VENTILATION TO OCCUPIED SPACE

An adjacent space may be included in the area calculation if the following requirements are met:

1. Natural ventilation shall be made to a room where sufficient air is available to dilute the refrigerant below the Lower Flammability Limit (LFL).
2. Natural ventilation from an occupied space shall not be made to the outdoors.

The total area of the space in which the appliance is installed and the adjacent space which is connected by the natural ventilation shall have a room area more than Table 2.

Table 2 — 30MPW/MPQ Minimum Room Area - Natural Ventilation

MODEL/UNIT SIZE	AREA [m^2]	AREA [ft^2]
017[a]	159	1,710
021	204	2,190
031	835	8,964
033[a]	371	3,984
041	1,459	15,662
046	2,162	23,212
051	2,416	25,941
056	2,754	29,564
066	3,263	35,036
080	3,898	41,857

NOTE(S):

a. 30MPW option only.

NOTE: For remote condenser applications, use formula in previous section including refrigerant charge for chiller, condenser, and connecting piping.

The room area (A) shall be defined as the room area enclosed by the projection to the floor of the walls, partitions and doors of the space in which the appliance is installed.

Spaces connected by only drop ceilings, ductwork, or similar connections shall not be considered a single space.

Rooms on the same floor and connected by an open passageway between the spaces can be considered a single room, if the passageway complies *with all* of the following:

1. It is a permanent opening.
2. It extends to the floor.
3. It is intended for people to walk through.
   NOTE: The area of the adjacent rooms, on the same floor, connected by permanent opening in the walls and/or doors between occupied spaces, including gaps between the wall and the floor, can be considered a single room, provided all of the following are met.
4. The minimum opening area for natural ventilation *Anv*min shall not be less than the following:

   *Anv*min = ((*mc-mmax)/LFL*104))*(((A/(9.81*mmax)) (52.02/(52.02-29)))^0.5 (GG.7)* where:

   *Anv*min is the minimum opening for natural ventilation in sq m.

   *m*c is the actual REFRIGERANT CHARGE of refrigerant in the system in kg.

   *m*max is the allowable MAXIMUM REFRIGERANT CHARGE in the system in kg, calculated by mmax=0.3414*A^2 where A is the room area in sq m (GG.2).

Conversion for lb of Refrigerant	
10.794 sq ft	1 sq m
2.205 lb	1 kg
3.281 ft	1 m

5. The area of any opening above 11.8 in. (300 mm) from the floor cannot be considered.
6. The bottom of 50% of the required opening area shall be below 7.9 in. (200 mm) from the floor.
7. The bottom of the lowest opening shall not be higher than 3.9 in. (100 mm).
8. Openings are permanent and cannot be closed.
   NOTE: For openings extended to the floor the height shall not be less than 0.8 in. (20 mm) above the surface of the floor covering.
   A second higher opening must be provided. The total size of the second opening shall not be less than 50% of the minimum opening area and shall be at least 4.9 ft (1.5 m) above the floor.
9. The room into which refrigerant can leak, plus the connected adjacent room(s) shall have a total area of not less than the minimum area in Table 2.

The room area in which the unit is installed shall be not less than 20% of the minimum area in Table 2.

NATURAL VENTILATION TO THE OUTDOORS OR UNOCCUPIED SPACE

If natural ventilation to outdoors is applied, all of the following shall be met.

1. Natural ventilation to outdoors is not allowed below ground level. Natural ventilation from an occupied space shall not be made to outdoors.
   NOTE: User can block the natural ventilation to the outside if it is cold outside.
2. The openings for natural ventilation shall comply with the “NATURAL VENTILATION TO OCCUPIED SPACE” on page 24.
3. The minimum opening area to the outdoors in square meters shall be:

Anvmin=0.14*(mc*0.1308)^0.5, where:

mc=refrigerate charge in kg (Use charge value per circuit. For multiple units use the charge of the largest circuit.) See conversion table for refrigerant on page 24 in Natural Ventilation to Occupied Space section.

MECHANICAL VENTILATION

An installation that does not meet the area requirements for natural ventilation requires mechanical ventilation.

IMPORTANT: For appliances installed in machinery rooms as defined in ANSI/ASHRAE 15 (USA) or CSA B52 (Canada) the requirements of ANSI/ASHRAE 15 (USA) or CSA B52 (Canada) shall apply and requirements below do not apply.

See UL 60335-40-2 for specific requirements for data center equipment not providing comfort cooling to other spaces.

Mechanical ventilation occurs when the appliance enclosure or the room is provided with a ventilating system that, in the event of a leak, is intended to vent refrigerant into an area where there is not a POTENTIAL IGNITION SOURCE and the gas can be readily dispersed.

The mechanical ventilation system fan shall run continuously, other than for short periods for maintenance and service. The airflow shall be detected continuously or monitored continuously. Within 10 seconds in the event that the airflow is reduced below minimum required flowrate (Equation C), the following actions shall be taken:

1. Stop chiller operation by opening the ventilation interlock between TB5-21 and 22. This will stop the operation of the chiller.
2. A ventilation interlock alarm will be triggered.

The airflow shall be calculated using the equation below. Losses caused by ducts or other components in the air stream shall be considered.

Q = (mc-mmax)/98.04.

Q = Minimum Airlfow for Mechanical Ventilation in cubic meters/hour (1 cu m/hr = 0.5886 cfm).

mc = refrigerate charge in kg (Use charge value per circuit. For multiple units use the charge of the largest circuit).

mmax = 0.3414*A^2 or 15.9 kg whichever is less.

A = minimum room area from Table 2 in sq m.

See conversion table for refrigerant on page 24 in Natural Ventilation to Occupied Space section.

Mechanical ventilation shall be made to the outdoors or an indoor space where the room area is larger than the minimum area of the room to which the mechanical ventilation exhausts into, EAmin, in sq m calculated using the following equation:

EAmin = (mc-mmax) / (0.0765 × H)

where:

H = Height of the Room (Assume 2.2 m if Unknown)

For mechanical ventilation, the lower edge of openings extracting air from the room shall not be more than 100 mm above the floor. The openings supplying makeup air to the room shall be located such that the supplied makeup air mixes with the leaked refrigerant.

When makeup air is supplied from the same space where the ventilation air extracted from the space is discharged, ventilation air discharge openings shall be separated by a sufficient distance, but not less than 3 m from the makeup air intake openings to prevent re-circulation to the space.

MECHANICAL VENTILATION – REFRIGERANT LEAK DETECTOR

Continuous mechanical ventilation is not required if a leak detector is used per the requirements below. Leak detector shall comply with UL 60335-40-2 Annex LL. Typical installation is in a machine room with an existing leak detector. This detector shall provide a relay output to close in the event of a leak detection, TB5-21 and 22.

An alternative is to connect leak detector directly to the unit. This method requires the leak detection input, 0-10V, TB5-23 (+) and 24 (–), to be enabled in the unit configuration. This can be done at ***Main Menu → Configuration → Factory → Leak Charge Detection***.

Detector shall be setup to provide a 2.5-v signal at or above 25% of the LFL, 0.0765 kf/m^3 for R-32. The threshold for the leak detector may be changed at ***Main Menu → Configuration → Service Parameters → Leak Charge Threshold*** in the PIC6 controller. Default signal is 2.5-v.

When leak detector alarm is activated, the following shall occur for a minimum of 5 minutes:

1. Compressor operation will stop.
2. Ventilation output relay will close, TB6-25 and TB26. This closure must signal the ventilation fans to start and deliver the minimum airflow required, where mechanical ventilation is required.

Chiller may restart operation after the detection limit is below 25% of the LFL and a minimum time of 5 minutes has passed.

Table 3 — 30MP Units — English[a,b,c,d]

UNIT 30MP	017	021	031	033	041	046	051	056	066	080
OPERATING WEIGHT (lb)										
MPA	—	723	782	—	1083	1147	1514	1533	1614	1659
MPA with Manifold	—	988	1047	—	1348	1412	1779	1798	1879	1924
MPW/Q	677	793	1020	1078	1358	1454	1786	1805	1918	1963
MPW/Q with Manifold	1206	1322	1549	1607	1887	1983	2315	2334	2447	2492
REFRIGERANT TYPE	R-32, EXV Controlled System									
Refrigerant Charge MPA[e] (lb) Ckt A/Ckt B	—	8.5/—	9.4/—	—	12.6/—	12.9/—	25.4/—	27.2/—	29.7/—	36.6/—
Refrigerant Charge MPW/Q (lb) Ckt A/Ckt B	9.5/—	10.75/—	21.75/—	14.5/14.5	28.75/—	35.5/—	37.0/—	39.5/—	43.0/—	47.0/—
COMPRESSORS	Scroll, Hermetic									
Qty	2	2	2	2	3	3	2	2	2	2
Speed (rpm)	3500									
(Qty) Tons, Ckt A	9, 6	10	15	15	13	15	25	27	27, 40	40
(Qty) Tons, Ckt B	—	—	—	15	—	—	—	—	—	—
Oil Charge (Oz) Ckt A/Ckt B	135/—	162/—	236/—	118/118	354/—	354/—	446/—	446/—	446/—	446/—
Oil Charge (Oz) Ckt A/Ckt B (Digital Option)	135/—	162/—	228/—	110/118	346/—	346/—	—	—	—	—
No. Capacity Steps										
Standard	3	2	2	2	3	3	2	2	3	2
With Hot Gas Bypass	4	3	3	3	4	4	3	3	4	3
Digital Compressor Option	22	22	22	22	33	33	—	—	—	—
Minimum Capacity Step (%)										
Standard	40	50	50	50	33	33	50	50	40	50
With Hot Gas Bypass	20	25	34	34	21	22	40	35	33	38
Digital Compressor Option	8	15	15	15	10	10	—	—	—	—
Capacity (%)										
Circuit A	100	100	100	50	100	100	100	100	100	100
Circuit B	—	—	—	50	—	—	—	—	—	—
EVAPORATOR	Brazed, Direct-Expansion Plate Heat Exchanger									
Weight (lb) (empty)	49	58	79	92	97	125	137	150	163	186
Net Fluid Volume (gal)	1.60	1.95	2.82	2.92	3.52	4.21	4.64	5.14	5.64	6.49
Maximum Refrigerant Pressure (psig)	650									
Maximum Water-Side Pressure (psig)	300									
CHILLED WATER CONNECTIONS (in.)										
Inlet and Outlet, Victaulic (IPS Carbon Steel)	1.5	1.5	2	2	2	2	2	2.5	2.5	2.5
Drain (NPT)	0.25									
Manifold Connections, Victaulic (IPS Carbon Steel)	6									
CONDENSER (MPW/Q Only)	Brazed Plate Heat Exchanger									
Weight (lb) (empty)	53	53	189	163	217	242	202	202	220	220
Net Fluid Volume (gal)	2.00	2.00	5.60	5.90	7.10	8.00	5.20	5.20	6.30	6.30
Maximum Refrigerant Pressure (psig)	650									
Maximum Water-Side Pressure	300									
CONDENSER WATER CONNECTIONS (in.)										
Inlet and Outlet, Victaulic (IPS Carbon Steel)	1.5	1.5	2	2	2	2	2.5	2.5	2.5	2.5
Drain (NPT)	0.25									
Manifold Connections, Victaulic (IPS Carbon Steel)	6									
CONDENSER REFRIGERANT CONNECTIONS (in.)										
Liquid Line (ODS) in.	—	1.5	2	—	2	2	2.5	2.5	2.5	2.5
Discharge	—	6	6	—	6	6	6	6	6	6

Table 3 — 30MP Units — English[a,b,c,d] (cont)

UNIT 30MP	017	021	031	033	041	046	051	056	066	080
CHASSIS DIMENSIONS (in.)										
Length	59.50	59.5	59.5	59.5	59.5	59.5	59.5	59.5	59.5	59.5
Width	32	32	32	32	32	32	32	32	32	32
Height	65.8	65.8	65.8	65.8	65.8	65.8	65.8	65.8	65.8	65.8
Height with Optional Sound Enclosure	68.8	68.8	68.8	68.8	68.8	68.8	68.8	68.8	68.8	68.8
MINIMUM SYSTEM FLUID VOLUME (gal per ton)										
Normal Air Conditioning										
Standard	6	6	6	6	3	3	6	6	6	6
Optional Hot Gas Bypass	4	4	4	4	3	3	4	4	4	4
Optional Digital Compressor	3	3	3	3	3	3	—	—	—	—
Low Outdoor Ambient Cooling Operation (30MPA Units)										
Standard	10	10	10	10	6	6	10	10	10	10
Optional Hot Gas Bypass	10	10	10	10	6	6	10	10	10	10
Optional Digital Compressor	6	6	6	6	6	6	—	—	—	—
CAPACITY STEPS (%)										
Step 1	100	100	100	100	100	100	100	100	100	100
Step 2	60	50	50	50	67	67	50	50	42	50
Step 3	40	25[f]	34[f]	34[f]	33	33	40[f]	35[f]	31[f]	38[f]
Step 4	20[f]	—	—	—	21[f]	22[f]	—	—	—	—
MIMIMUN FLOW RATES (gpm)										
Evaporator	22	28	43	43	55	64	70	77	91	117
Condenser	22	28	43	43	55	64	70	77	91	117
MAXIMUM FLOW RATES (gpm)										
Evaporator	74	97	148	148	188	220	286	262	309	384
Condenser	74	97	148	148	188	220	286	262	309	384

NOTE(S):

a. Operating weight includes refrigerant operating charge and weight of fluid in the heat exchangers.
b. Manifold option adds approximately 218 lb to the operating weight of 30MPA units and 436 lb to the operating weight of 30MPW units.
c. 30MPW/Q units are shipped with full operating charge.
d. Models 017 and 033 are not available in an air-cooled or heat pump version.
e. 30MPA units (condenser-less) are shipped with nitrogen holding charge. Approximate cooler operating charge is shown.
f. With optional hot gas bypass.

Table 4 — 30MP Units — SI [a,b,c,d]

UNIT 30MP	017	021	031	033	041	046	051	056	066	080
OPERATING WEIGHT (kg)										
MPA	—	328	355	—	491	520	686	695	732	752
MPA with Manifold	—	448	475	—	611	640	807	815	852	873
MPW/Q	307	360	463	489	616	660	810	819	870	890
MPW/Q with Manifold	547	600	702	729	856	899	1050	1058	1110	1130
REFRIGERANT TYPE	R-32, EXV Controlled System									
Refrigerant Charge MPA[e] (kg) Ckt A/Ckt B	—	4.9/—	4.3/—	—	5.5/—	5.2/—	11.1/—	12.3/—	13.5/—	19.0/—
Refrigerant Charge MPW/Q (kg) Ckt A/Ckt B	4.9/—	6.5/—	9.9/—	5.2/5.2	12.4/—	14.3/—	16.1/—	17.9/—	19.5/—	24.4/—
COMPRESSORS	Scroll, Hermetic									
Qty	2	2	2	2	3	3	2	2	2	2
Speed (rpm)	3500									
Tons (Qty), Ckt A	9, 6	10	15	15	13	15	25	27	27, 40	40
Tons (Qty), Ckt B	—	—	—	15	—	—	—	—	—	—
Oil Charge (oz.) Ckt A/Ckt B	135/—	162/—	236/—	118/118	354/—	354/—	446/—	446/—	446/—	446/—
Oil Charge (oz.) Ckt A/Ckt B (Digital Option)	135/—	162/—	228/—	110/118	346/—	346/—	—	—	—	—
No. of Capacity Steps										
Standard	3	2	2	2	3	3	2	2	3	2
With Hot Gas Bypass	4	3	3	3	4	4	3	3	4	3
Digital Compressor Option	22	22	22	22	33	33	—	—	—	—
Minimum Capacity Step (%)										
Standard	40	50	50	50	33	33	50	50	40	50
With Hot Gas Bypass	20	25	34	34	21	22	40	35	33	38
Digital Compressor Option	8	15	15	15	10	10	—	—	—	—
Capacity (%)										
Circuit A	100	100	100	50	100	100	100	100	100	100
Circuit B	—	—	—	50	—	—	—	—	—	—
EVAPORATOR	Brazed, Direct-Expansion Plate Heat Exchanger									
Weight (kg) (empty)	22.2	26.3	35.8	41.7	44.0	56.7	62.1	68.0	73.9	84.4
Net Fluid Volume (L)	6.1	7.4	10.7	11.1	13.3	15.9	17.5	19.4	21.3	24.6
Maximum Refrigerant Pressure (kPa)	4895									
Maximum Water-Side Pressure (kPa)	2069									
CHILLED WATER CONNECTIONS (in.)										
Inlet and Outlet, Victaulic (IPS Carbon Steel)	1.5	1.5	2	2	2	2	2	2.5	2.5	2.5
Drain (NPT)	0.25									
Manifold Connections, Victaulic (IPS Carbon Steel)	6									
CONDENSER (MPW/Q Only)	Brazed Plate Heat Exchanger									
Weight (kg) (empty)	24.0	24.0	85.7	73.9	98.4	109.8	91.6	91.6	99.8	99.8
Net Fluid Volume (L)	7.6	7.6	21.2	22.3	26.9	30.3	19.7	19.7	23.8	23.8
Maximum Refrigerant Pressure (kPa)	4502									
Maximum Water-Side Pressure (kPa)	2069									
CONDENSER WATER CONNECTIONS (in.)										
Inlet and Outlet, Victaulic (IPS Carbon Steel)	1.5	1.5	2	2	2	2	2.5	2.5	2.5	2.5
Drain (NPT)	0.25									
Manifold Connections, Victaulic (IPS Carbon Steel)	6									
CONDENSER REFRIGERANT CONNECTIONS (in.)										
Liquid Line (ODS) in.	—	1.5	2	—	2	2	2.5	2.5	2.5	2.5
Discharge	—	6	6	—	6	6	6	6	6	6

Table 4 — 30MP Units — SI [a,b,c,d] (cont)

UNIT 30MP	017	021	031	033	041	046	051	056	066	080
CHASSIS DIMENSIONS (mm)										
Length	1511	1511	1511	1511	1511	1511	1511	1511	1511	1511
Width	813	813	813	813	813	813	813	813	813	813
Height	1671	1671	1671	1671	1671	1671	1671	1671	1671	1671
Height with Optional Sound Enclosure	1748	1748	1748	1748	1748	1748	1748	1748	1748	1748
MINIMUM SYSTEM FLUID VOLUME (L per kW)										
Normal Air Conditioning										
Standard	6.5	6.5	6.5	6.5	3.3	3.3	6.5	6.5	6.5	6.5
Optional Hot Gas Bypass	4.3	4.3	4.3	4.3	3.3	3.3	4.3	4.3	4.3	4.3
Optional Digital Compressor	3.3	3.3	3.3	3.3	3.3	3.3	—	—	—	—
Low Outdoor Ambient Cooling Operation (30MPA Units)										
Standard	10.8	10.8	10.8	10.8	6.5	6.5	10.8	10.8	10.8	10.8
Optional Hot Gas Bypass	10.8	10.8	10.8	10.8	6.5	6.5	10.8	10.8	10.8	10.8
Optional Digital Compressor	6.5	6.5	6.5	6.5	6.5	6.5	—	—	—	—
CAPACITY STEPS (%)										
Step 1	100	100	100	100	100	100	100	100	100	100
Step 2	60	50	50	50	67	67	50	50	42	50
Step 3	40	25[f]	34[f]	34[f]	33	33	40[f]	35[f]	31[f]	38[f]
Step 4	20[f]	—	—	—	21[f]	22[f]	—	—	—	—
MIMIMUN FLOW RATES (gpm)										
Evaporator	1.4	1.8	2.7	2.7	3.5	4.0	4.4	4.9	5.7	7.4
Condenser	1.4	1.8	2.7	2.7	3.5	4.0	4.4	4.9	5.7	7.4
MAXIMUM FLOW RATES (gpm)										
Evaporator	4.7	6.1	9.3	9.3	11.9	13.9	18.0	16.5	19.5	24.2
Condenser	4.7	6.1	9.3	9.3	11.9	13.9	18.0	16.5	19.5	24.2

NOTE(S):

a. Operating weight includes refrigerant operating charge and weight of fluid in the heat exchangers.
b. Manifold option adds approximately 218 lb to the operating weight of 30MPA units and 183.7 kg to the operating weight of 30MPW units.
c. 30MPW/Q units are shipped with full operating charge.
d. Models 017 and 033 are not available in an air-cooled or heat pump version.
e. 30MPA units (condenser-less) are shipped with nitrogen holding charge. Approximate cooler operating charge is shown.
f. With optional hot gas bypass.

Step 1 — Inspect Shipment

Inspect the unit for damage or missing parts. If damaged, or if shipment is incomplete, file a claim immediately with the shipping company.

⚠ CAUTION

Unit is top heavy. Unit may tip if handled without care. Damage to unit or injury may result.

Step 2 — Position the Unit

The unit may be moved by means of rollers under the rails or a forklift truck.

If accessory mobility kit is to be used, install this accessory after bringing unit into the building and before moving unit to its final location per installation instructions provided with the accessory. The factory-installed mobility kit option consists of 6 swivel-type wheels that are field-mounted to the legs of the unit. See Fig. 25. NOTE: The wheels are equipped with a thumb-screw brake.

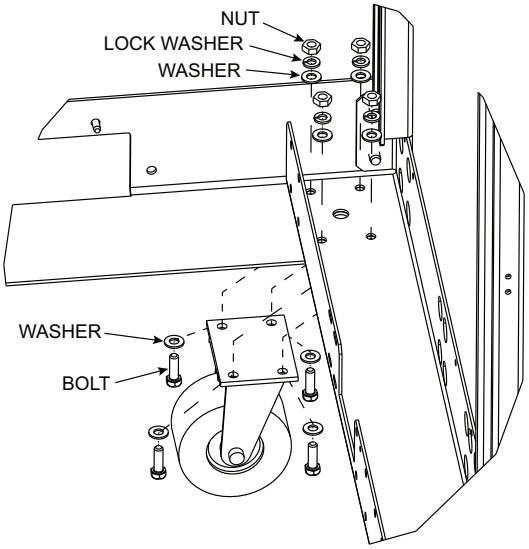


Fig. 25 — Mobility Kit

Step 3 — Place the Unit

NOTE: These units are not suitable for unprotected outdoor use.

Carrier recommends that these units be located in the basement or on the ground floor. However, if it is necessary to locate the unit on an upper floor, be sure the structure has been designed to support the unit weight. If necessary, add structural support to the floor. Also, be sure the surface for installation is level. Refer to Fig. 21-24 for space requirements and weight distribution.

Only electrical power connections, controls, water connections for condenser, fluid connections for evaporator, and strainer installation are required for 30MPW installation. Installation of 30MPA units varies only in field piping required for the remote condenser instead of a water connection.

When the unit is in its final position, remove the packaging and remove the mobility kit wheels (if equipped). Remove the 3/8 in. wheel nuts to remove the wheels from the unit legs. Level the unit (using a level), and bolt the unit to the floor or pad.

If unit is to be mounted on unit external vibration isolators, follow the mounting instructions included with the accessory vibration isolator.

If the unit has accessory leveling kit installed, follow the instructions provided with the accessory to make sure the unit is level and in the correct position. The leveling kit is included with all manifold units.

Step 4 — Check Compressor Mounting

30MP 017-031, 041, and 046 UNITS

As shipped, 30MP017-031 units with two compressors are held down with six bolts through rubber grommets. All 30MP 041 and 046 units with three compressors are held down with eight bolts per pair through grommets.

After unit is installed, verify that mounting bolt torque is 7 to 10 ft-lb (9 to 14 Nm). See Fig. 26.

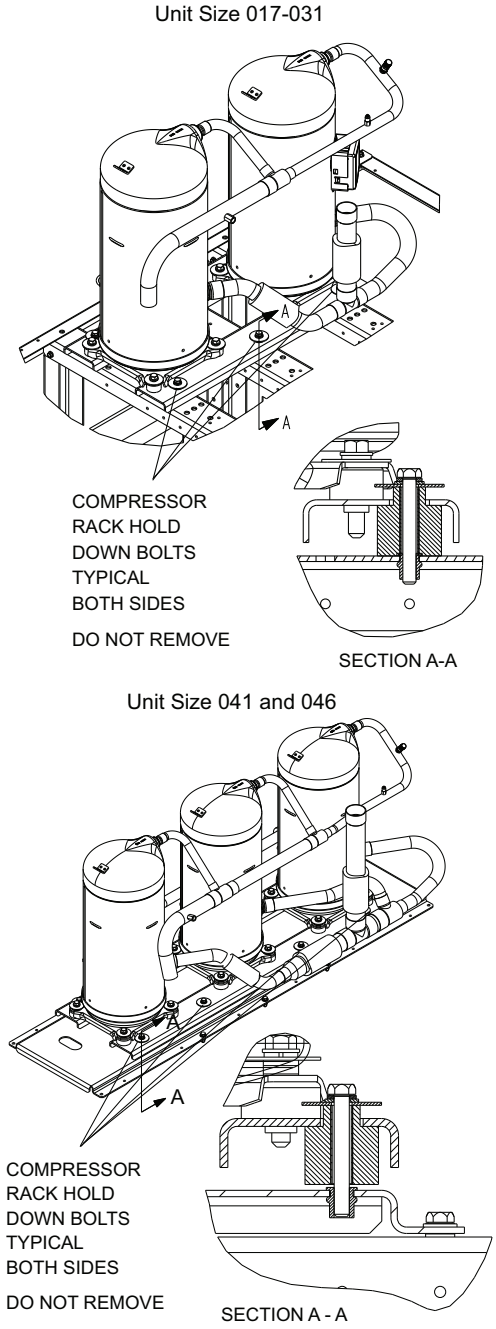


Fig. 26 — Compressor Holddown Bolts (Sizes 017-031, 041, and 046)

30MPW 033 UNITS

For 30MPW033 units, eight RED shipping bolts must be removed from the compressor mounting rail. These RED bolts are for shipping purposes only. See Fig. 27.

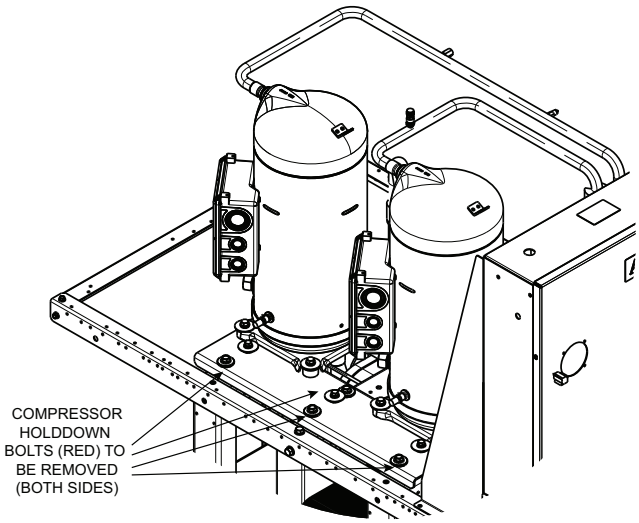


Fig. 27 — Compressor Shipping Bolts (Size 033 Only)

30MP 051-080 UNITS

For 30MP 051-080 units, two RED shipping bolts from the compressor mounting rail must be removed. These RED bolts are for shipping purposes only. See Fig. 28.

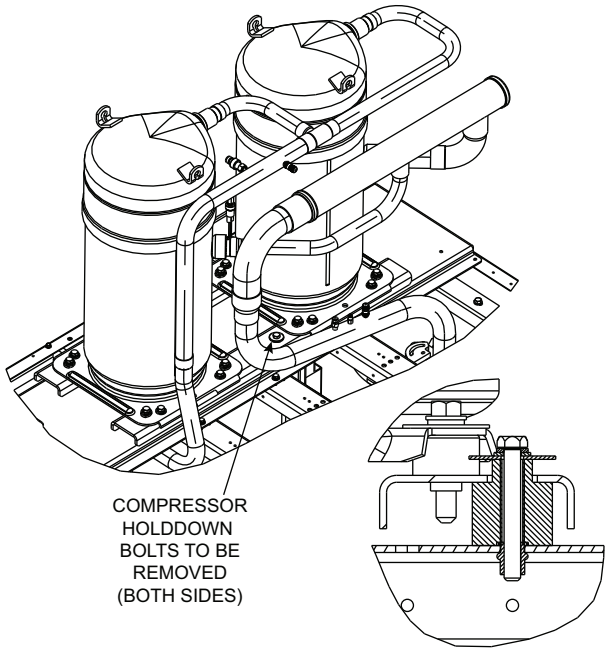


Fig. 28 — Compressor Shipping Bolts (Sizes 051-080 Only)

Step 5 — Make Piping Connections

SAFETY PRECAUTIONS FOR WORKING WITH REFRIGERANT

Ensure that the area is in the open or that it is adequately ventilated before breaking into the system or conducting any hot work. A degree of ventilation shall continue during the period that the work is carried out. The ventilation should safely disperse any released refrigerant and preferably expel it externally into the atmosphere. See Fig. 29-32 for typical piping applications.

Under no circumstances shall potential sources of ignition be used in the searching for or detection of refrigerant leaks. A halide torch (or any other detector using a naked flame) shall not be used. The following leak detection methods are deemed acceptable for all refrigerant systems. Electronic leak detectors may be used to detect refrigerant leaks but, in the case of FLAMMABLE REFRIGERANTS, the sensitivity may not be adequate, or may need re-calibration.

NOTE: Detection equipment shall be calibrated in a refrigerant-free area. Ensure that the detector is not a potential source of ignition and is suitable for the refrigerant used. Leak detection equipment shall be set at a percentage of the Lower Flammability Limit (LFL) of the refrigerant and shall be calibrated to the refrigerant employed, and the appropriate percentage of gas (25% maximum) is confirmed. Leak detection fluids are also suitable for use with most refrigerants but the use of detergents containing chlorine shall be avoided as the chlorine may react with the refrigerant and corrode the copper pipe-work.

IMPORTANT: When breaking into the refrigerant circuit to make repairs (or for any other purpose) conventional procedures shall be used. However, for flammable refrigerants it is important that best practice be followed, since flammability is a consideration. The following procedure shall be adhered to:

1. Safely remove refrigerant following local and national regulations.
2. Evacuate.
3. Purge the circuit with inert gas (optional for A2L).
4. Evacuate (optional for A2L).
5. Continuously flush or purge with inert gas when using flame to open circuit.
6. Open the circuit.

The refrigerant charge shall be recovered into the correct recovery cylinders if venting is not allowed by local and national codes. For appliances containing flammable refrigerants, the system shall be purged with oxygen-free nitrogen to render the appliance safe for flammable refrigerants. This process might need to be repeated several times.

Compressed air or oxygen shall not be used for purging refrigerant systems. For appliances containing flammable refrigerants, refrigerants purging shall be achieved by breaking the vacuum in the system with oxygen-free nitrogen and continuing to fill until the working pressure is achieved, then venting to atmosphere, and finally pulling down to a vacuum (optional for A2L). This process shall be repeated until no refrigerant is within the system (optional for A2L).

When the final oxygen-free nitrogen charge is used, the system shall be vented down to atmospheric pressure to enable work to take place. The outlet for the vacuum pump shall not be close to any potential ignition sources, and ventilation shall be available.

In addition to conventional charging procedures, the following requirements shall be followed:

1. Ensure that contamination of different refrigerants does not occur when using charging equipment.
   Hoses or lines shall be as short as possible to minimize the amount of refrigerant contained in them.
2. Cylinders shall be kept in an appropriate position according to the instructions.
3. Ensure that the REFRIGERATING SYSTEM is earthed prior to charging the system with refrigerant.
4. Label the system when charging is complete (if not already).
5. Extreme care shall be taken not to overfill the REFRIGERATING SYSTEM.

Prior to recharging the system, it shall be pressure-tested with the appropriate purging gas. The system shall be leak-tested on completion of charging but prior to commissioning. A follow up leak test shall be carried out prior to leaving the site.

When removing refrigerant from a system, either for servicing or decommissioning, it is recommended good practice that all refrigerants are removed safely.

When transferring refrigerant into cylinders, ensure that only appropriate refrigerant recovery cylinders are employed. Ensure that the correct number of cylinders for holding the total system charge is available. All cylinders to be used are designated for the recovered refrigerant and labeled for that refrigerant (i.e. special cylinders for the recovery of refrigerant). Cylinders shall be complete with pressure-relief valve and associated shut-off valves in good working order. Empty recovery cylinders are evacuated and, if possible, cooled before recovery occurs.

IMPORTANT: The recovery equipment shall be in good working order with a set of instructions concerning the equipment that is at hand and shall be suitable for the recovery of the flammable refrigerant. If in doubt, the manufacturer should be consulted. In addition, a set of calibrated weighing scales shall be available and in good working order. Hoses shall be complete with leak-free disconnect couplings and in good condition. The recovered refrigerant shall be processed according to local legislation in the correct recovery cylinder, and the relevant waste transfer note arranged. Do not mix refrigerants in recovery units and especially not in cylinders.

UNITS WITHOUT MANIFOLD

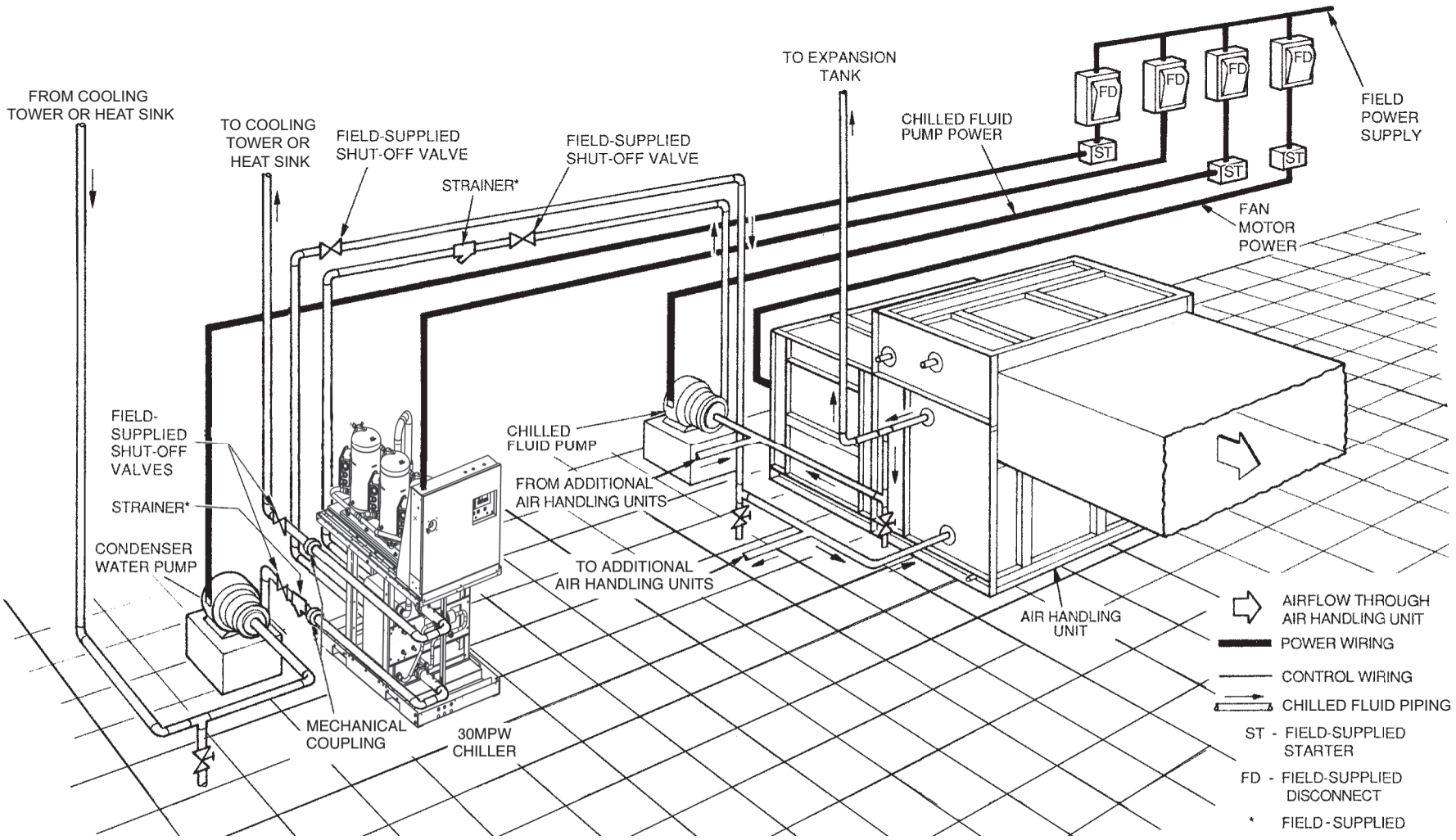
All sizes have Victaulic IPS (Iron Pipe Size) water connections as shown in Tables 3 and 4.

30MPA SYSTEM CONDENSER

For detailed condenser piping installation instructions for 30MPA systems, refer to separate instructions packaged with the remote condenser units.

Condenser refrigerant piping for 30MPA units should be sized to minimize the amount of refrigerant required. Consider the length of piping required between the condenser and indoor unit, the amount of liquid lift, and the compressor oil return. The maximum length of refrigerant piping is 200 ft (61m). Discharge and liquid lines should be sized in accordance with Table 5. Liquid line refrigerant chart is shown in Table 6. Double discharge risers may be required for proper oil return if condenser is located above the chiller and if hot gas bypass is installed, or if unit is used for medium temperature brine application. See Table 7 and Fig. 33.

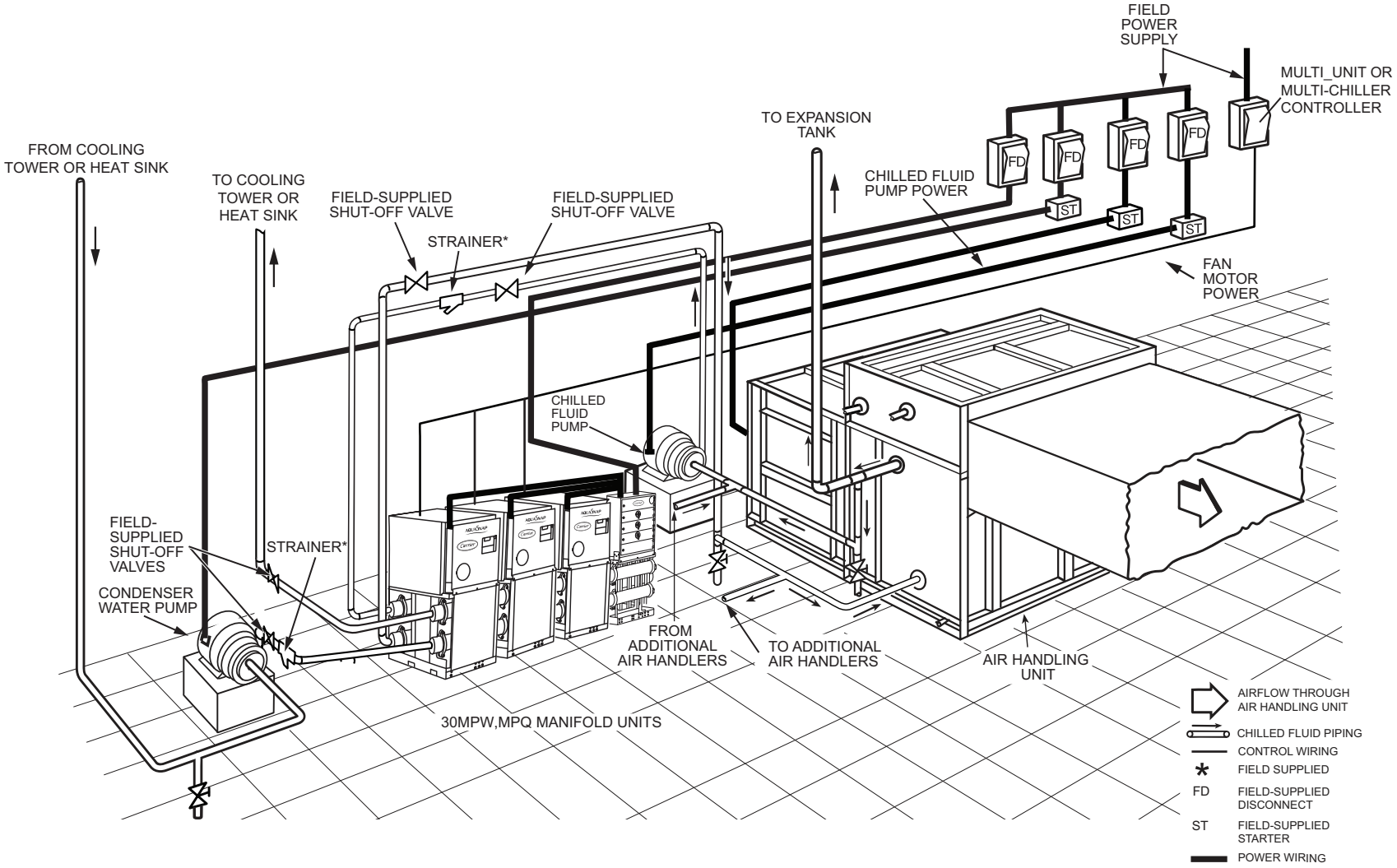
IMPORTANT: Do NOT bury refrigerant piping underground. Failure to comply could result in equipment damage.



NOTES:

1. Chiller must be installed *levelly* to maintain proper compressor oil return.
2. Wiring and piping shown are general points-of-connection guides only and are not intended for a specific installation. Wiring and piping shown are for a quick overview of system and are not in accordance with recognized standards.
3. All wiring must comply with applicable local and national codes.
4. All piping must follow standard piping techniques. Refer to Carrier System Design Manual or appropriate ASHRAE (American Society of Heating, Refrigerating, and Air-Conditioning Engineers) handbook for details.
5. See Table 9 for minimum system fluid volume. This system may require the addition of a holding tank to ensure adequate volume.
6. Operating environment — Chiller should be installed in an indoor environment where the ambient temperature is between 50 and 104°F (10 and 40°C) with a relative humidity (non-condensing) of 95% or less. To ensure that electrical components operate properly, do not locate the chiller in an area exposed to dust, dirt, corrosive fumes, or excessive heat and humidity.

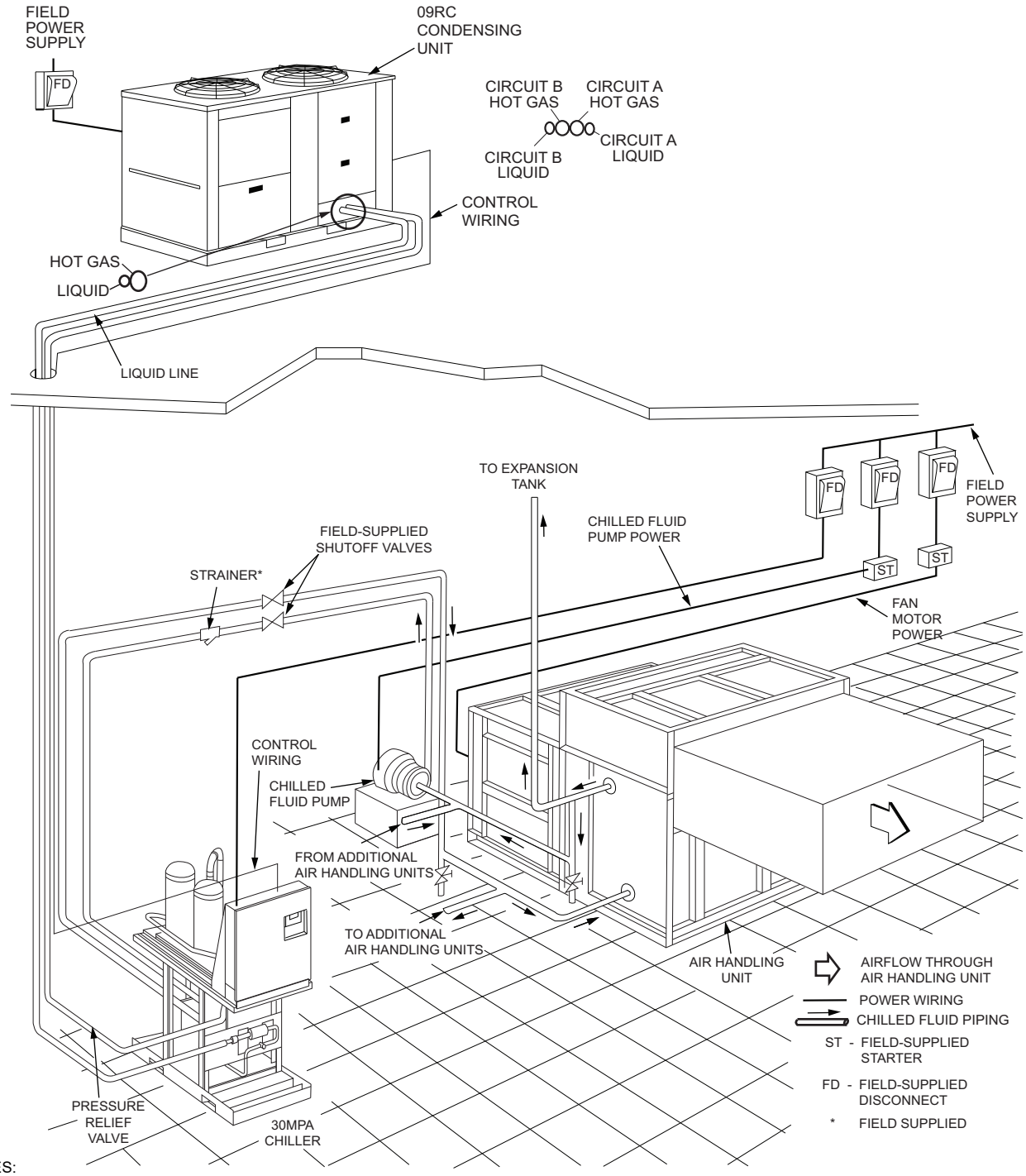
Fig. 29 — Liquid-Cooled Typical Piping and Wiring (30MPW Units Shown)



NOTES:

1. Chiller must be installed *levelly* to maintain proper compressor oil return (level adjustment kit included with manifold piping kit [option]).
2. Wiring and piping shown are general points-of-connection guides only and are not intended for a specific installation. Wiring and piping shown are for a quick overview of system and are not in accordance with recognized standards.
3. All wiring must comply with applicable local and national codes.
4. All piping must follow standard piping techniques. Refer to Carrier System Design Manual or appropriate ASHRAE (American Society of Heating, Refrigerating, and Air-Conditioning Engineers) handbook for details.
5. See Table 9 for minimum system fluid volume. This system may require the addition of a holding tank to ensure adequate volume.
6. Operating environment — Chiller should be installed in an indoor environment where the ambient temperature is between 50 and 104°F (10 and 40°C) with a relative humidity (non-condensing) of 95% or less. To ensure that electrical components operate properly, do not locate the chiller in an area exposed to dust, dirt, corrosive fumes, or excessive heat and humidity.

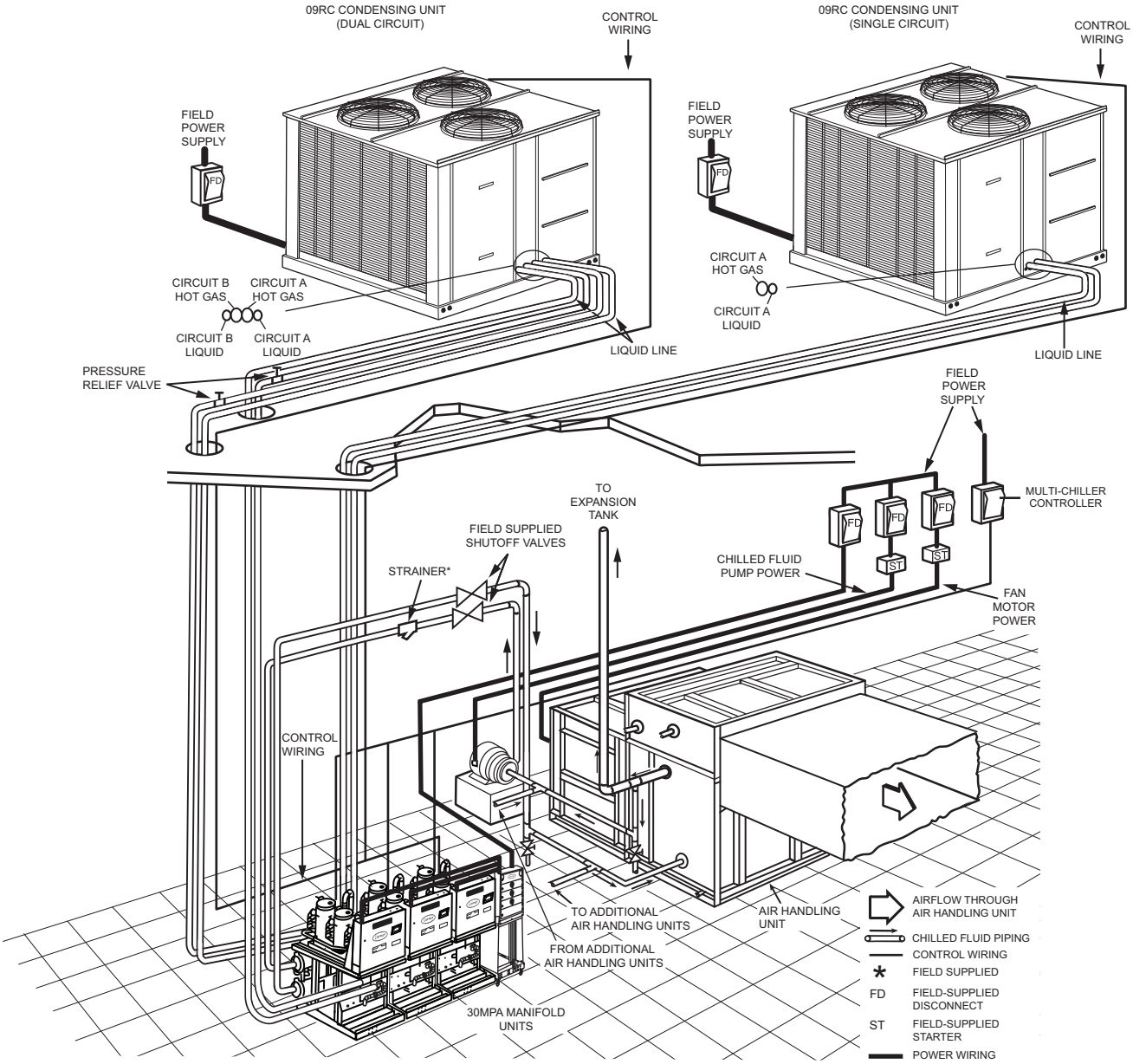
Fig. 30 — Manifold Typical Piping and Wiring (30MPW Units Shown)



NOTES:

1. Chiller must be installed *levelly* to maintain proper compressor oil return.
2. Wiring and piping shown are general points-of-connection guides only and are not intended for a specific installation. Wiring and piping shown are for a quick overview of system and are not in accordance with recognized standards.
3. All wiring must comply with applicable local and national codes.
4. All piping must follow standard piping techniques. Refer to Carrier System Design Manual part 3, Carrier E20-II software Refrigerant Piping program, or appropriate ASHRAE (American Society of Heating, Refrigerating, and Air-Conditioning Engineers) handbook for details on proper piping sizes and design.
5. See Table 9 for minimum system fluid volume. This system may require the addition of a holding tank to ensure adequate volume.
6. Hot gas lines should rise above refrigerant level in condenser circuit. With 30MPA/09RC matched condensers; this is accomplished internally in the 09RC unit. Double riser may be required; Check 30MPA line sizing chart.
7. Trap should be installed on hot gas lines to prevent condenser oil and refrigerant vapor migration from accumulating in the compressor during off cycle.
8. Pitch all horizontal lines downward in the direction of refrigerant flow.
9. For piping lengths greater than 50 ft (15.2 m), provide support to liquid and gas lines near the connections to the condenser coil.
10. For pressure relief requirements, see latest revision of ASHRAE Standard 15, Safety Code for Mechanical Refrigeration.
11. Operating environment — Chiller should be installed in an indoor environment where the ambient temperature is between 50 and 104°F (10 and 40°C) with a relative humidity (non-condensing) of 95% or less. To ensure that electrical components operate properly, do not locate the chiller in an area exposed to dust, dirt, corrosive fumes, or excessive heat and humidity.
12. Inverted trap required at condenser for 09RCM070-130.

Fig. 31 — Typical Piping and Wiring, 30MPA Unit with 09RC Remote Air-Cooled Condenser Shown



NOTES:

1. Chiller must be installed *levelly* to maintain proper compressor oil return (level adjustment kit included with manifold piping kit option).
2. Wiring and piping shown are general points-of-connection guides only and are not intended for a specific installation. Wiring and piping shown are for a quick overview of system and are not in accordance with recognized standards.
3. All wiring must comply with applicable local and national codes.
4. All piping must follow standard piping techniques. Refer to Carrier System Design Manual part 3, Carrier E20-II software Refrigerant Piping program, or appropriate ASHRAE (American Society of Heating, Refrigerating, and Air-Conditioning Engineers) handbook for details on proper piping sizes and design.
5. See Table 9 for minimum system fluid volume. This system may require the addition of a holding tank to ensure adequate volume.
6. Hot gas lines should rise above refrigerant level in condenser circuit. With 30MPA/09RC matched condensers, this is accomplished internally in the 09RC unit. Double riser may be required; Check 30MPA line sizing chart.
7. Trap should be installed on hot gas lines to prevent condenser oil and refrigerant vapor migration from accumulating in the compressor during off cycle.
8. Pitch all horizontal lines downward in the direction of refrigerant flow.
9. For piping lengths greater than 50 ft (15.2 m), provide support to liquid and gas lines near the connections to the condenser coil.
10. For pressure relief requirements, see latest revision of ASHRAE Standard 15, Safety Code for Mechanical Refrigeration.
11. Operating environment — Chiller should be installed in an indoor environment where the ambient temperature is between 50 and 104°F (10 and 40°C) with a relative humidity (non-condensing) of 95% or less. To ensure that electrical components operate properly, do not locate the chiller in an area exposed to dust, dirt, corrosive fumes, or excessive heat and humidity.
12. Inverted trap required at condenser for 09RCM070-130.

Fig. 32 — Typical Piping and Wiring, Manifold 30MPA Units with Dual Circuit 09RC Remote Air-Cooled Condenser Shown

Table 5 — Single Circuit 30MPA Line Sizing Chart[a,b]

30MPA UNIT	UNIT REFRIGERANT CONNECTIONS (CHILLER CONNECTION SIZE) ODS		TOTAL LINEAR LENGTH OF INTERCONNECTING PIPE ft (m)					
			0 - 50 (0 - 15.4) Equiv. Pipe Length = 75 ft		50 - 100 (15.4 - 30.5) Equiv. Pipe Length = 150 ft		100 - 200 (30.5 - 61.0) Equiv. Pipe Length = 300 ft	
	L (in.)	D (in.)	L (in.)	D (in.)	L (in.)	D (in.)	L (in.)	D (in.)
021	1/2	1-3/8	5/8	1-3/8	5/8	1-3/8	7/8	1-3/8
031	5/8	1-3/8	7/8	1-3/8	7/8	1-3/8	7/8	1-3/8
041	5/8	1-5/8	7/8	1-5/8	7/8	1-5/8	1-1/8	1-5/8
046	5/8	1-5/8	7/8	1-5/8	7/8	1-5/8	1-1/8	1-5/8
051	1-1/8	1-5/8	1-1/8	1-5/8	1-1/8	2-1/8	1-3/8	2-1/8
056	1-1/8	1-5/8	1-1/8	1-5/8	1-1/8	2-1/8	1-3/8	2-1/8
066	1-1/8	1-5/8	1-1/8	2-1/8	1-1/8	2-1/8	1-3/8	2-5/8
080	1-1/8	1-5/8	1-1/8	2-1/8	1-1/8	2-1/8	1-3/8	2-5/8

NOTE(S):

a. Shaded areas indicate double discharge riser required if unit is equipped with hot gas bypass or operation below 40°F LWT (Leaving Water Temperature). All units with digital compressors require double discharge riser.
b. Discharge tubing 1-3/8 in. OD and larger. Must be Type K tubing.

LEGEND

D — Discharge Line Size (discharge line size is equal to the chiller connection size).
L — Liquid Line Size (liquid line size is equal to or greater than the chiller connection size).

⚠ CAUTION

Discharge tubing 1-3/8 in. OD or larger. Must be Type K tubing to retain design pressure of system at higher discharge temperatures of R-32 refrigerant.

Table 6 — Liquid Line Refrigerant Chart

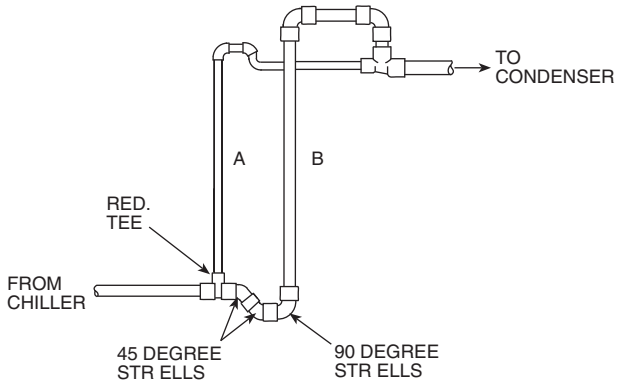
PIPE DIAMETER (in.)	POUNDS PER 10 LINEAR FEET (kg per 3 m)
1/2	0.6 (0.27)
5/8	1.0 (0.45)
7/8	2.0 (0.91)
1-1/8	3.5 (1.58)
1-3/8	5.1 (2.32)

Table 7 — Double Discharge Riser Data

30MPA UNIT	TOTAL LINEAR LENGTH OF INTERCONNECTING PIPE ft (m)[a]		MINIMUM TONNAGE WITH DOUBLE RISER
	0 - 200 (0 - 61.0)		
	RISER A (in.)	RISER B (in.)	
021	7/8	1-1/8	1.86
031	7/8	1-1/8	1.86
041	7/8	1-3/8	1.86
046	7/8	1-3/8	1.86
051	1-5/8	1-5/8	3.16
056	1-5/8	1-5/8	3.16
066	1-5/8	2-1/8	3.16
080	1-5/8	2-1/8	3.16

NOTE(S):

a. All pipe sizes are OD (outside dimensions).



LEGEND

RED. TEE — Reducing Tee
STR ELLS — Street Elbows

Fig. 33 — Double Discharge Riser Construction Detail

The 30MPA units that use air-cooled or evaporative condensers must have adequate means for head pressure control when operating below 65°F (18.3°C) ambient.

The 30MPA remote condenser requirements are as follows:

- If multiple units are connected to a single condenser, ensure each refrigerant circuit has its own head pressure control.
- Condenser must provide 15°F (8.3°C) subcooling, maximum of 40°F (22.2°C) difference between saturated condensing temperature and outdoor ambient temperature (to prevent overload at high ambient temperatures), and a minimum of 20°F (11.1°C) difference (to ensure subcooling).
- Do not manifold multiple refrigerant circuits into a single condenser.
- If air-cooled condenser is located below chiller, refer to condenser manufacturer's performance data for available liquid lift.
- Refer to condenser installation instructions for location guidelines.

Carrier recommends that a field-supplied pressure relief device be installed in each discharge line of 30MPA units. Most local codes require the discharge line relief valve to be vented directly to the outdoors. The vent **must not** be smaller than the discharge line relief valve outlet.

The 30MPA units are shipped with a discharge line loop to facilitate factory testing. Relieve the pressure caused by the nitrogen holding charge. Cut the discharge line loop as close as possible to the elbow. This will leave approximately 2 in. (50 mm) of straight tubing for liquid line connection. Uncap the discharge line. Be sure to connect the discharge line to the larger line. Do not leave the reducing coupling in place.

30MPW/MPQ UNITS WITH NITROGEN CHARGE

For 30MPW/MPQ units with the factory nitrogen charge option, relieve the pressure caused by the nitrogen holding charge and proceed to the Evacuation and Dehydration section. It is best practice to minimize the amount of time the system is exposed to ambient air.

EVACUATION AND DEHYDRATION

Because the 30MP compressor oil can absorb moisture, it is important to minimize the amount of time that the system interior is exposed to the atmosphere. Minimizing the exposure time of the oil to the atmosphere will minimize the amount of moisture that needs to be removed during evacuation.

Once all of the piping connections are complete, leak test the unit and then pull a deep dehydration vacuum. Connect the vacuum pump to the charging valve in the suction line and to the liquid line service valve. For best results, it is recommended that a vacuum of at least 500 microns (0.5 mm Hg) be obtained.

Afterwards, to ensure that no moisture is present in the system, perform a standing vacuum-rise test. With the unit in deep vacuum (500 microns or less), isolate the vacuum pump from the system. Observe the rate-of-rise of the vacuum in the system. If the vacuum rises by more than 50 microns in a 30-minute time period, continue the dehydration process. Maintain a vacuum on the system until the standing vacuum requirement is met. This will ensure a dry system.

By following these evacuation and dehydration procedures, the amount of moisture present in the system will be minimized.

30MPW/MPQ CONDENSER DESCRIPTION

All 30MPW/MPQ units use a brazed-plate heat-exchanger-type condenser. These heat exchangers are made of embossed plates of acid-resistant stainless steel. Every other plate is reversed so that the ridges of the herringbone pattern intersect one another on adjacent plates, forming a lattice of contact points. These plates are vacuum-brazed together to form a compact and pressure-resistant heat exchanger.

After brazing, the impressions in the plates form 2 separate systems of channels where the refrigerant and water flows are counterflow. The number of plates varies depending on unit capacity. The condensers provide approximately 18°F (–8°C) liquid subcooling at the standard Air-Conditioning, Heating and Refrigeration Institute (AHRI) rating condition.

30MPW/MPQ CONDENSER

When facing the unit control box, the condenser is the uninsulated heat exchanger located on the left-hand side. The water connections are on the right-hand side of the heat exchanger with the LIQUID-IN connection at the bottom, and the LIQUID-OUT connection at the top. For 30MPW units with water manifold option, refer to manifold Victaulic spacer fitting kit accessory installation instructions.

A strainer with a minimum of 40 mesh must be installed within 10 ft (3 m) of the chiller closest to the water header inlet to prevent debris from clogging or damaging the chiller's heat exchangers.

To install the Victaulic coupling (see Fig. 34):

1. Use Victaulic couplings designed for use on IPS dimensioned materials; for example, Style 75, Style 77, Quick Vic Style 107, or Style 177.
2. Lubricate the gasket lips and stretch the gasket over the end of the heat exchanger coupling. Avoid twisting the gasket when installing.
3. Bring the pipe and heat exchanger coupling ends together into alignment. Slide the gasket so that it is centered over the ends. Apply a light film of lubricant to the gasket, or to the outside diameter of the pipe. Avoid twisting the gasket during installation.
4. Install the inside coupling half over the gasket and then install the outer half. Connect with nuts and bolts. Tighten the nuts equally on both sides. Ensure there is no gap between the two halves of the coupling.
5. Alternately tighten the nuts with a wrench to draw the coupling halves together uniformly. The joint is now complete.

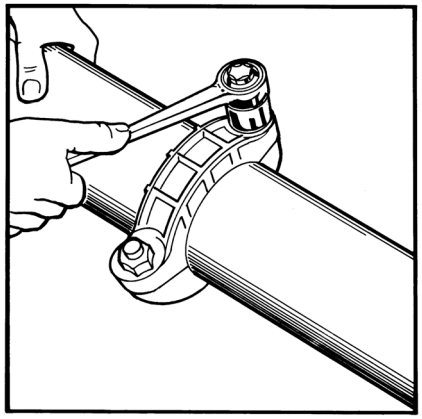


Fig. 34 — Install the Victaulic Coupling

In order to minimize the water pressure drop in the system, use as few bends as possible in the field water piping, and run the lines as short as possible. Size the water lines according to the available pump pressure (not necessarily the connection size), especially on cooling tower applications. See Fig. 35-54 for pressure drops.

CONDENSER WATER CONTROL VALVE

For installations without the Head Pressure Control FIOP, where entering condenser water temperature could be below 65°F (18.3°C), a field-supplied control valve is required. Operation below 65°F (18.3°C) without a valve may result in nuisance low saturated suction alarms.

Set water regulating valve, if installed, to maintain design head pressure. Do not adjust to compensate for high head pressures caused by fouled condensers, excess refrigerant, or the presence of non-condensables. Due to changes in water temperature, it may be necessary to adjust the valve seasonally. After adjusting for design head pressure, shut unit down. The water regulating valve should shut off the flow of water in a few minutes. If it does not, raise head pressure setting. Make sure that the capillary tube from each water regulating valve is connected to the proper condenser access fitting.

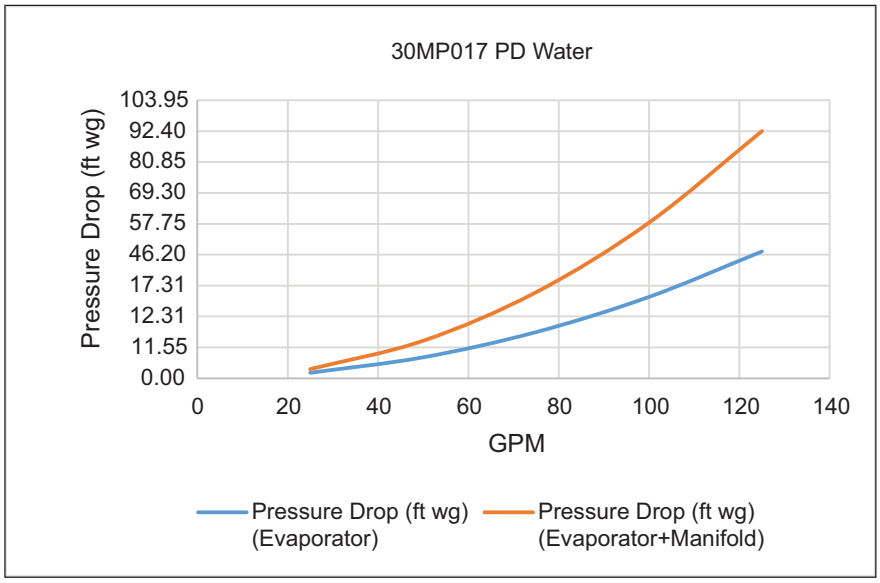
Provide a means for draining the system in the winter (if not used) and for maintenance.

Water leaving the condenser is under pressure and should not be connected directly into sewer lines. Check local codes.

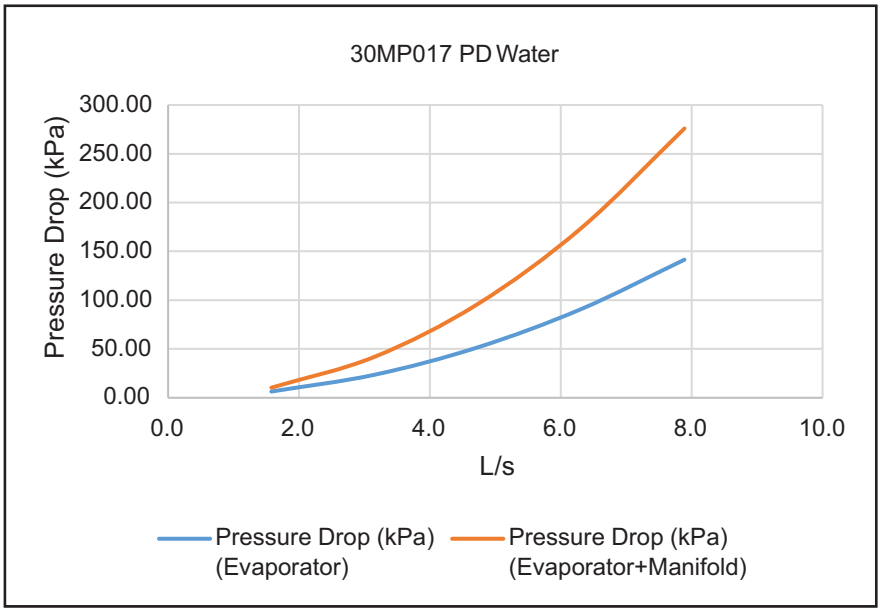
EVAPORATOR DESCRIPTION

All 30MP units use a brazed-plate heat-exchanger type evaporator. The heat exchanger is constructed essentially the same as the brazed-plate condenser used on 30MPW/MPQ units. See 30MPW/MPQ Condenser Description section on page 38 for more details. Similar to the condenser, the evaporator can only be chemically cleaned. See Fig. 35-44 for pressure drops.

English



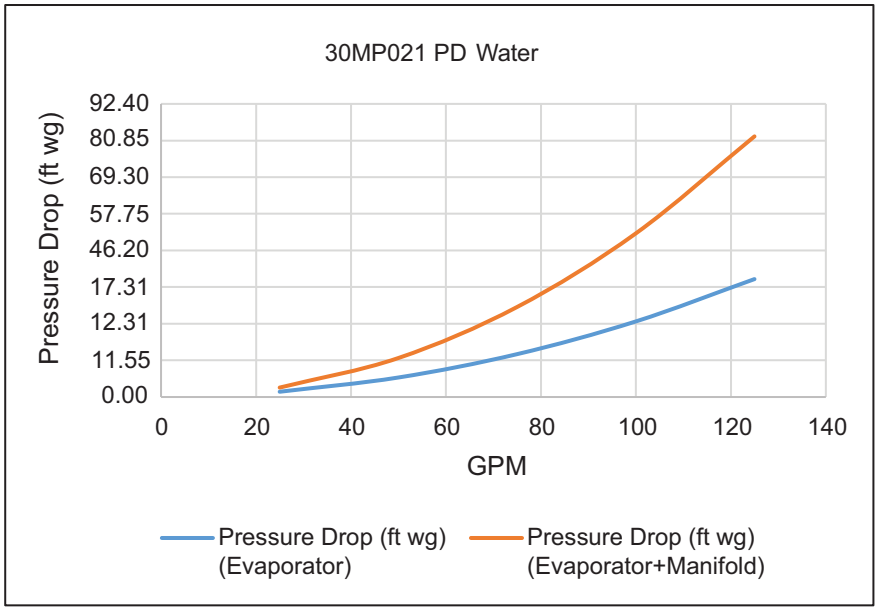
SI



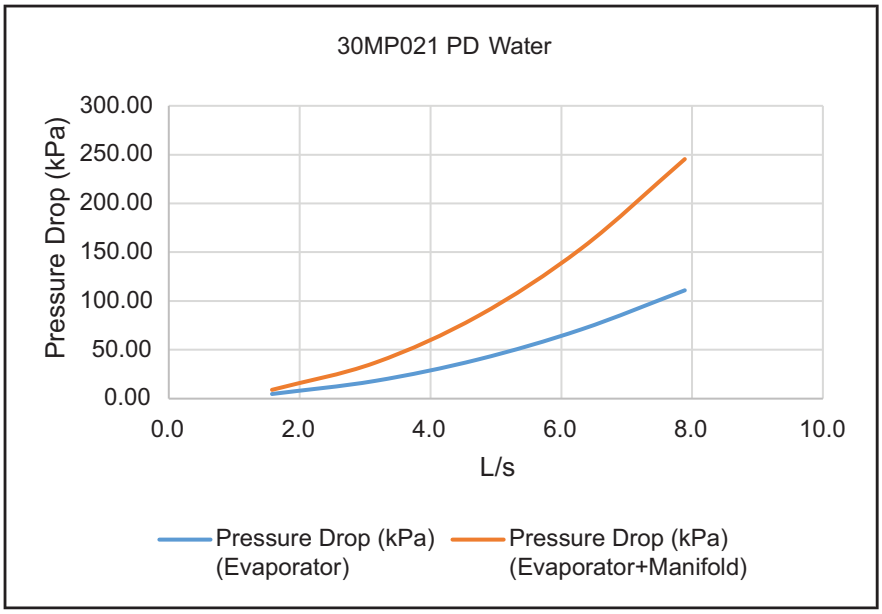
NOTE: Pressure drop curves assume water temperature of 68°F (20°C).

Fig. 35 — Evaporator Water Pressure Drop Curve (Size 017 — 30MPW Only)

English



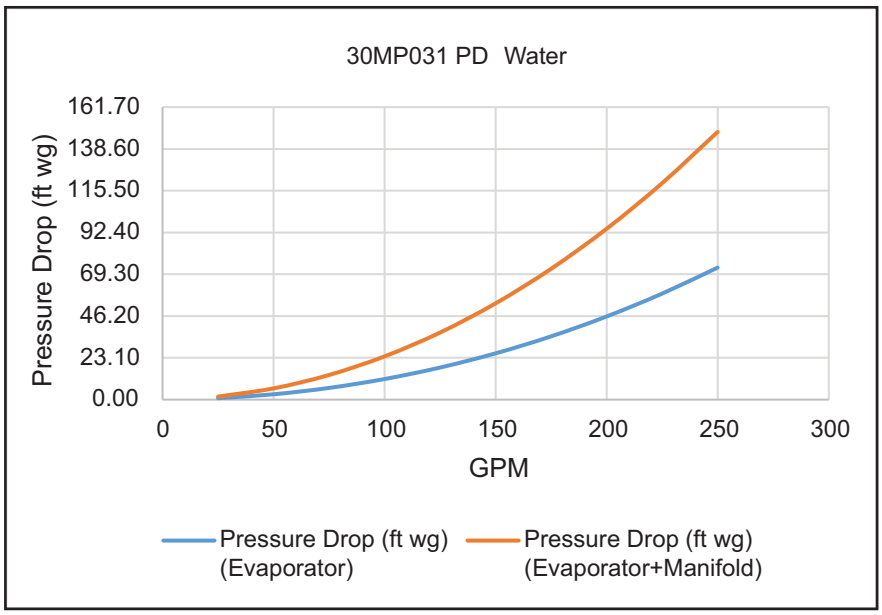
SI



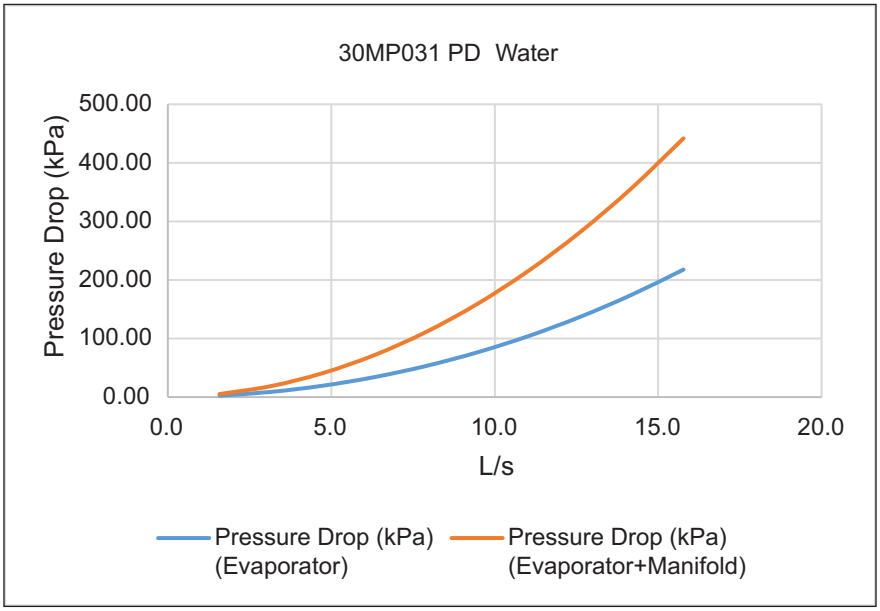
NOTE: Pressure drop curves assume water temperature of 68°F (20°C).

Fig. 36 — Evaporator Water Pressure Drop Curve (Size 021)

English



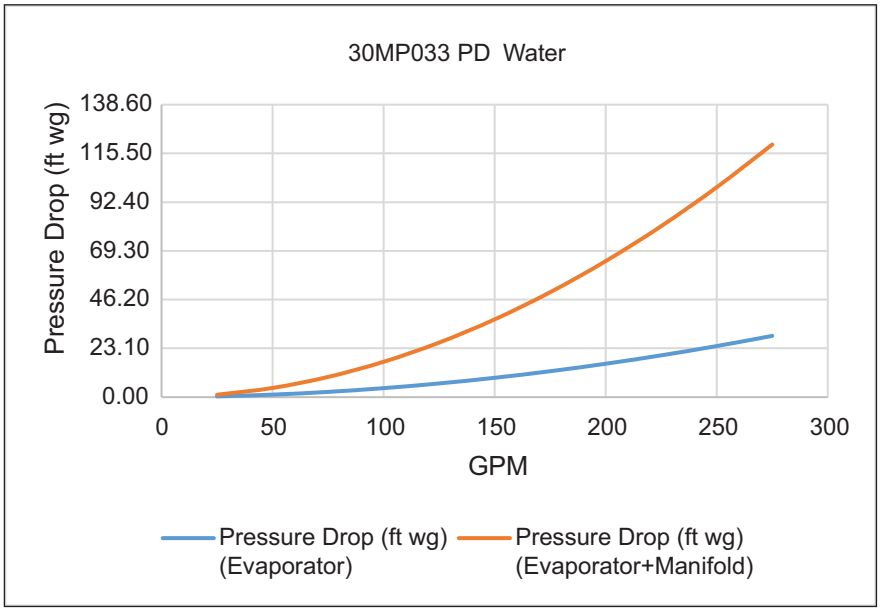
SI



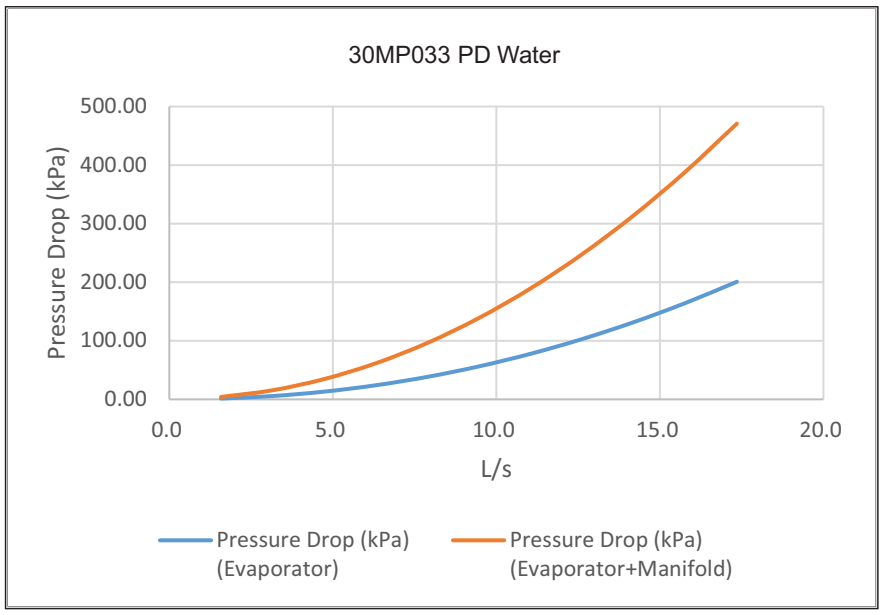
NOTE: Pressure drop curves assume water temperature of 68°F (20°C).

Fig. 37 — Evaporator Water Pressure Drop Curve (Size 031)

English



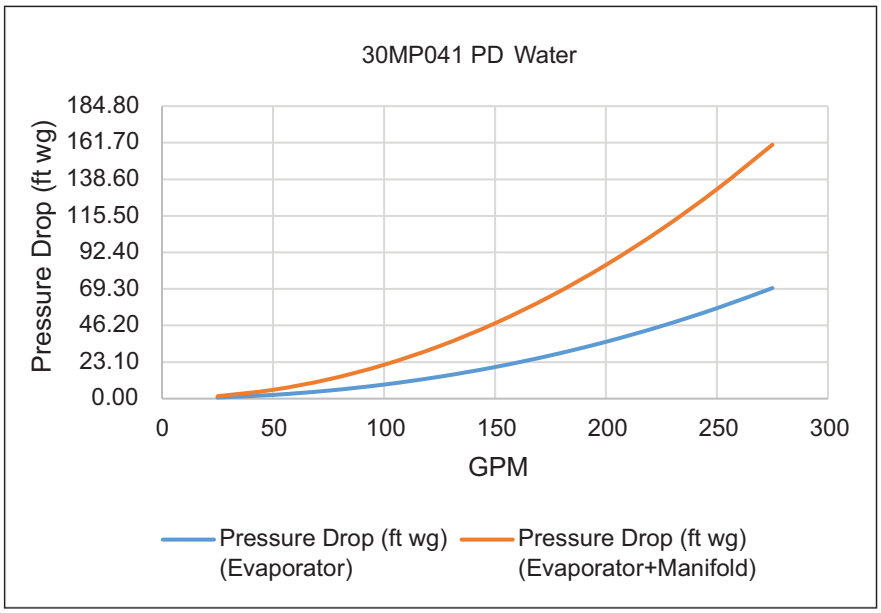
SI



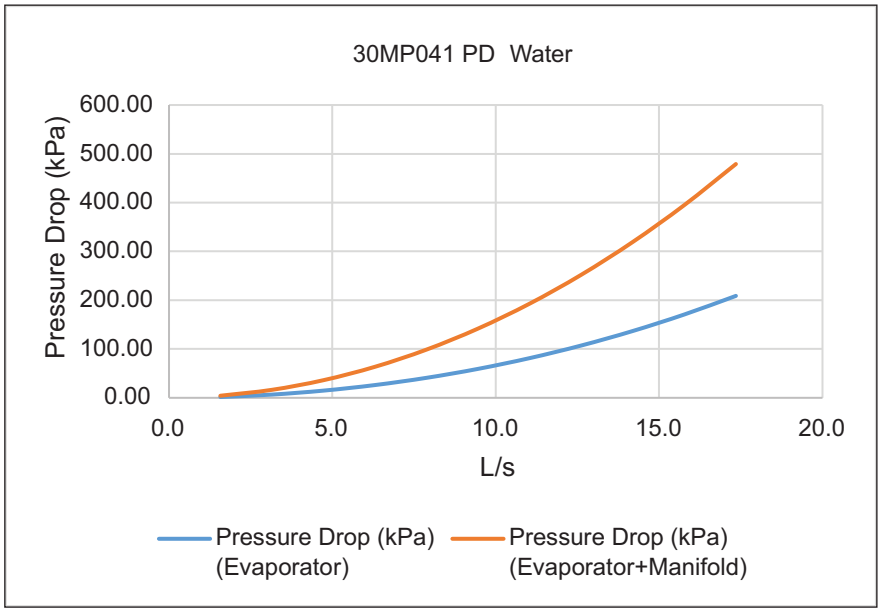
NOTE: Pressure drop curves assume water temperature of 68°F (20°C).

Fig. 38 — Evaporator Water Pressure Drop Curve (Size 033 – 30MPW Units Only)

English



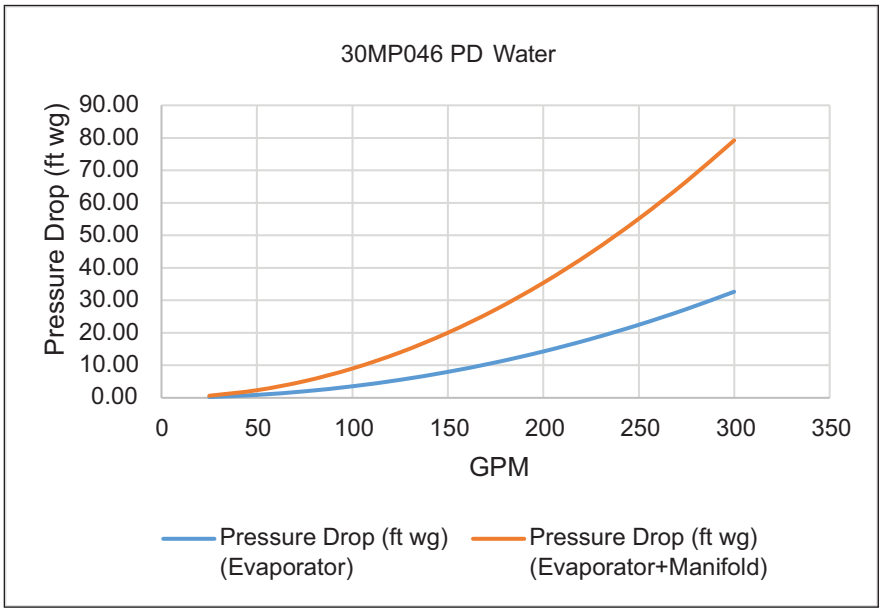
SI



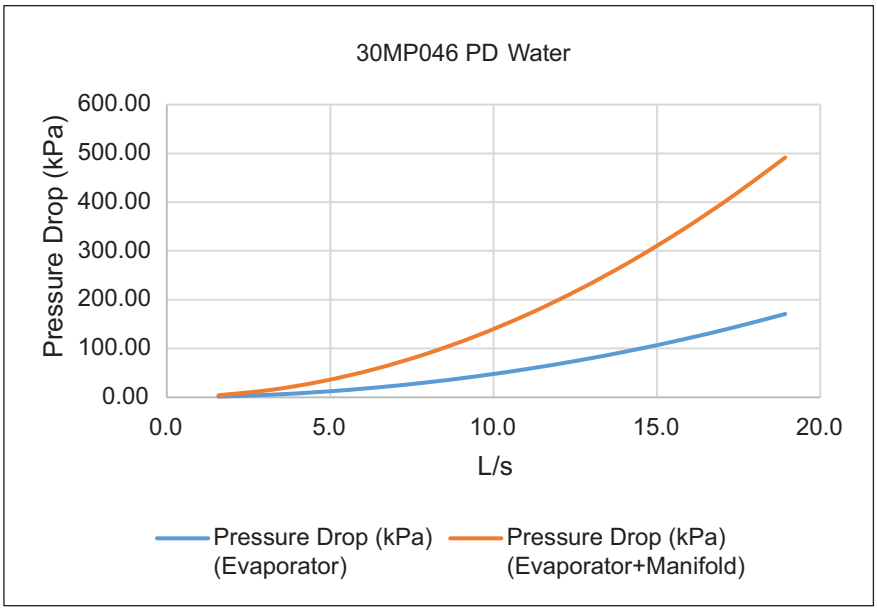
NOTE: Pressure drop curves assume water temperature of 68°F (20°C).

Fig. 39 — Evaporator Water Pressure Drop Curve (Size 041)

English



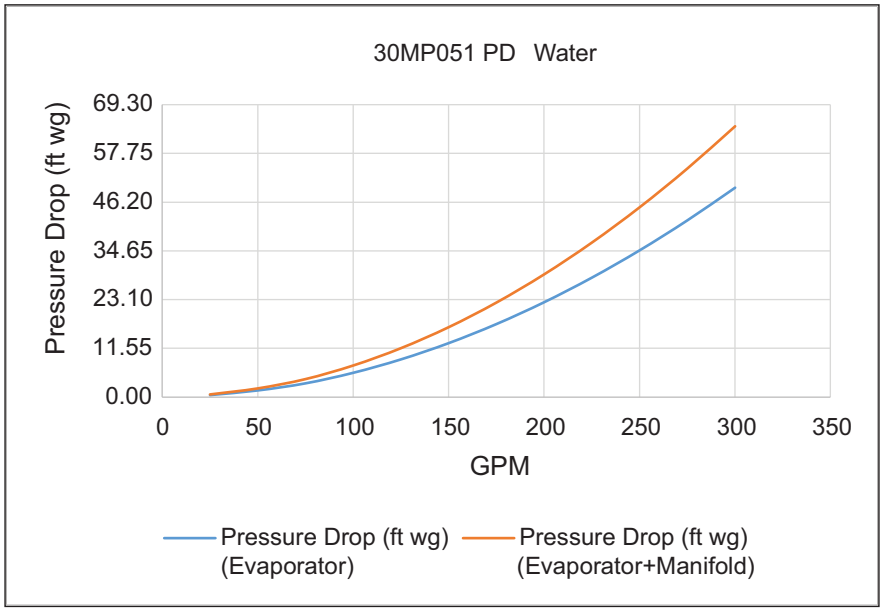
SI



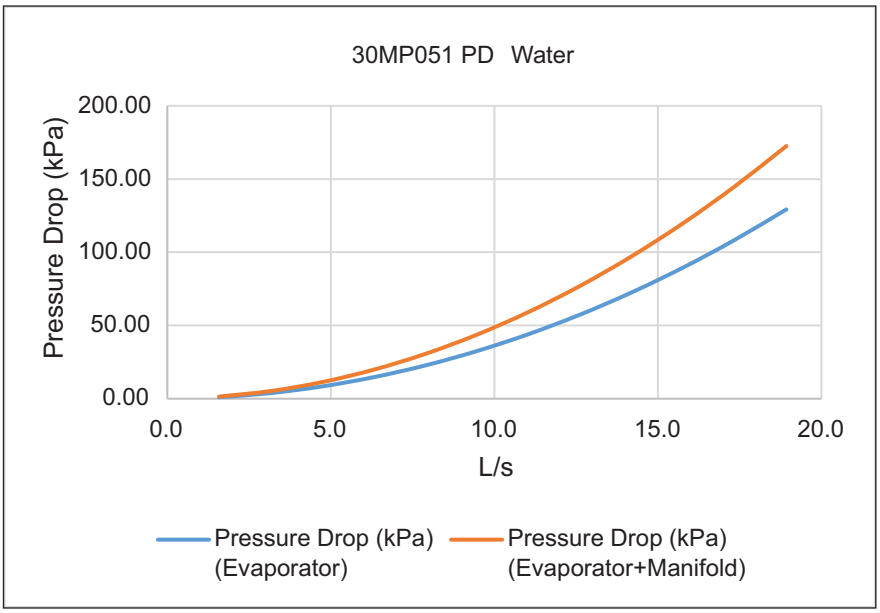
NOTE: Pressure drop curves assume water temperature of 68°F (20°C).

Fig. 40 — Evaporator Water Pressure Drop Curve (Size 046)

English



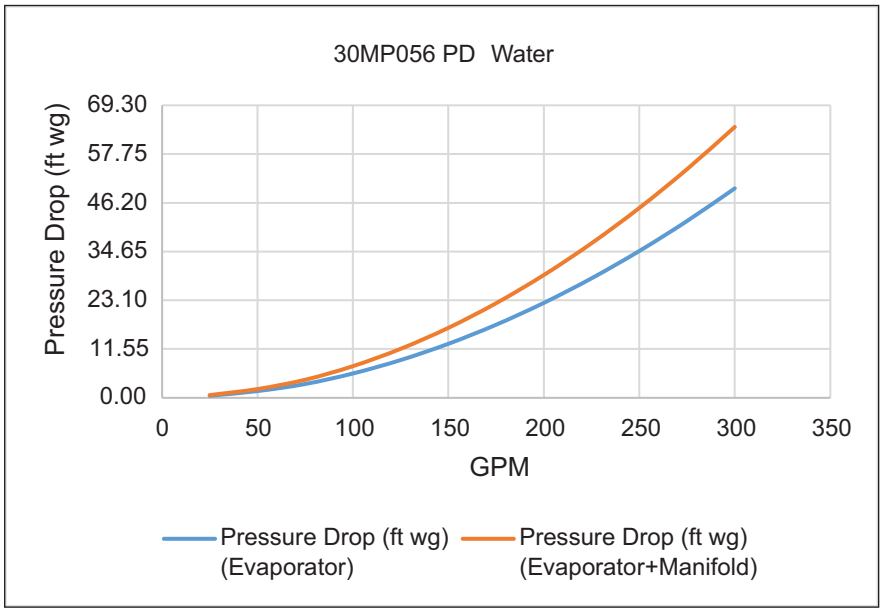
SI



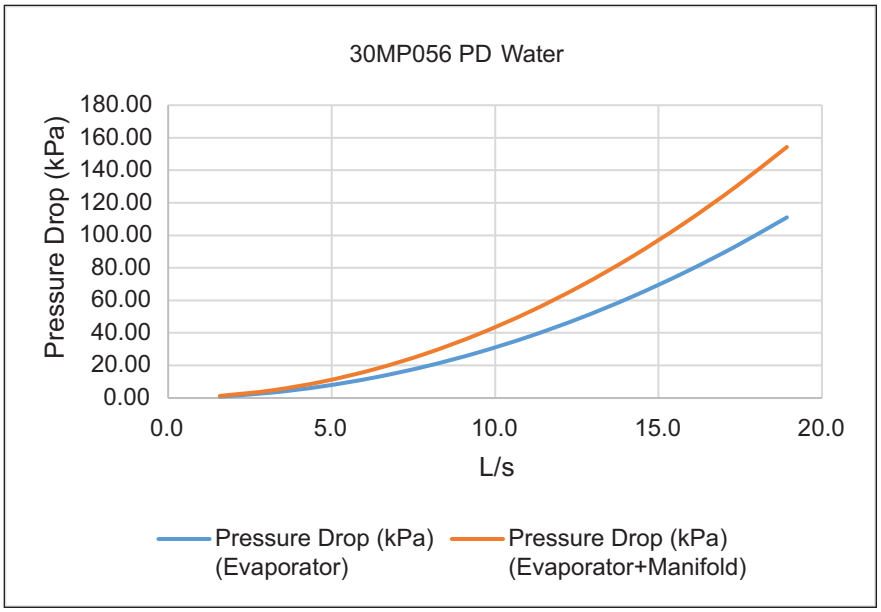
NOTE: Pressure drop curves assume water temperature of 68°F (20°C).

Fig. 41 — Evaporator Water Pressure Drop Curve (Size 051)

English



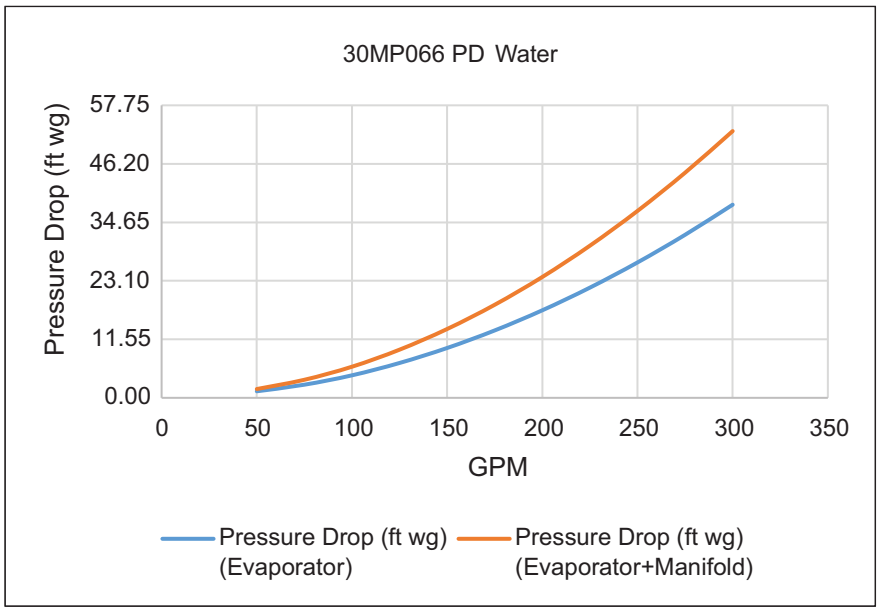
SI



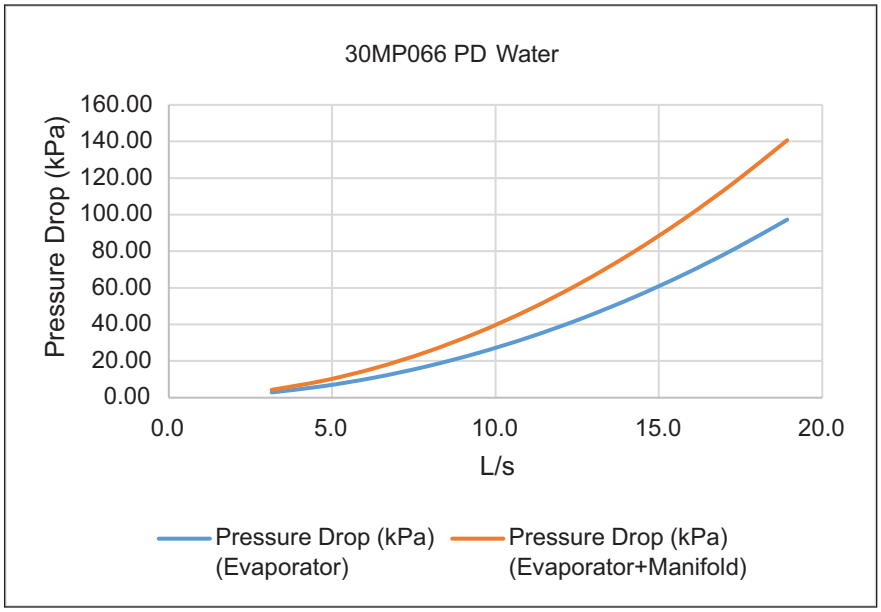
NOTE: Pressure drop curves assume water temperature of 68°F (20°C).

Fig. 42 — Evaporator Water Pressure Drop Curve (Size 056)

English



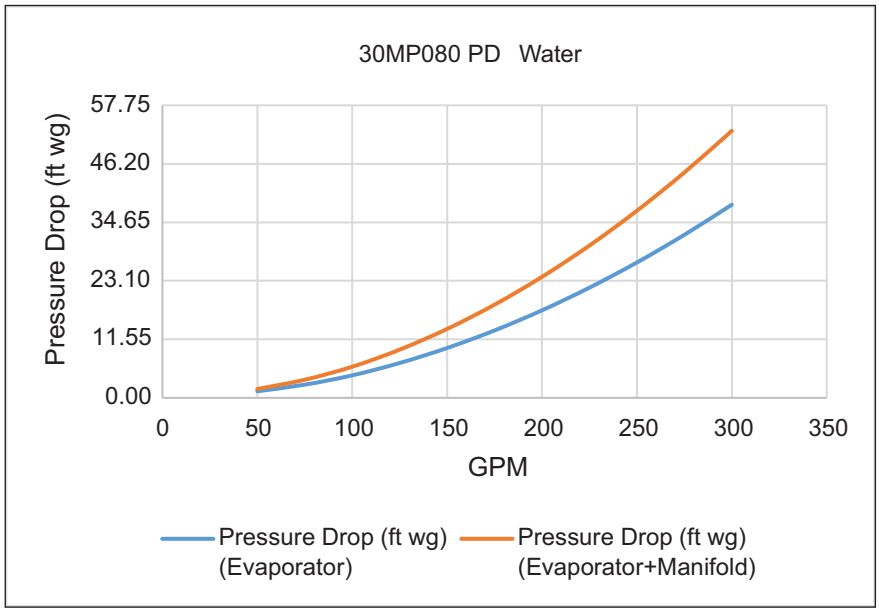
SI



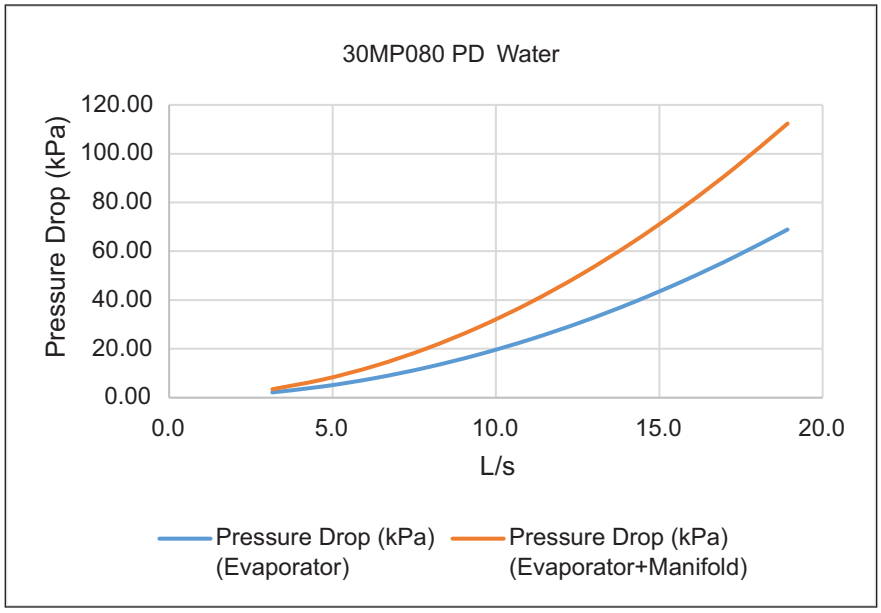
NOTE: Pressure drop curves assume water temperature of 68°F (20°C).

Fig. 43 — Evaporator Water Pressure Drop Curve (Size 066)

English



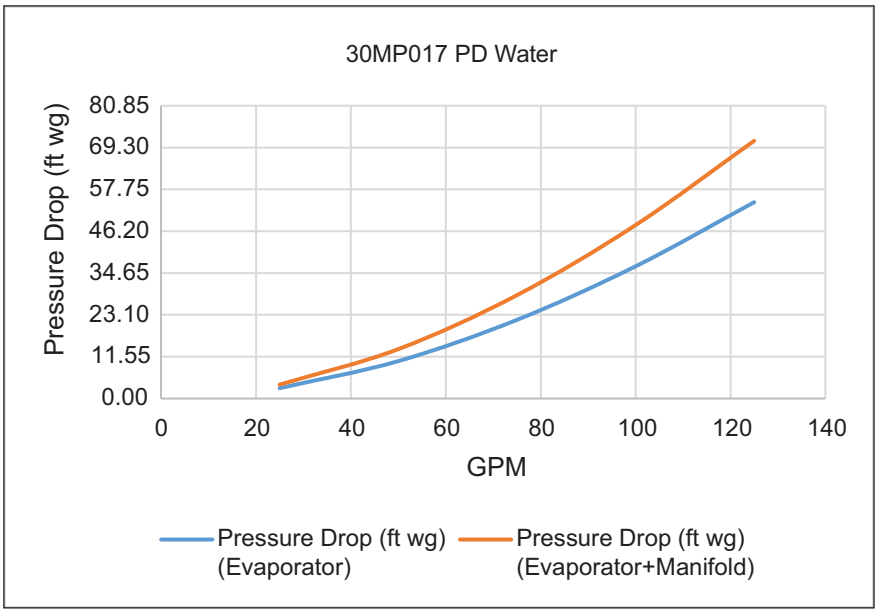
SI



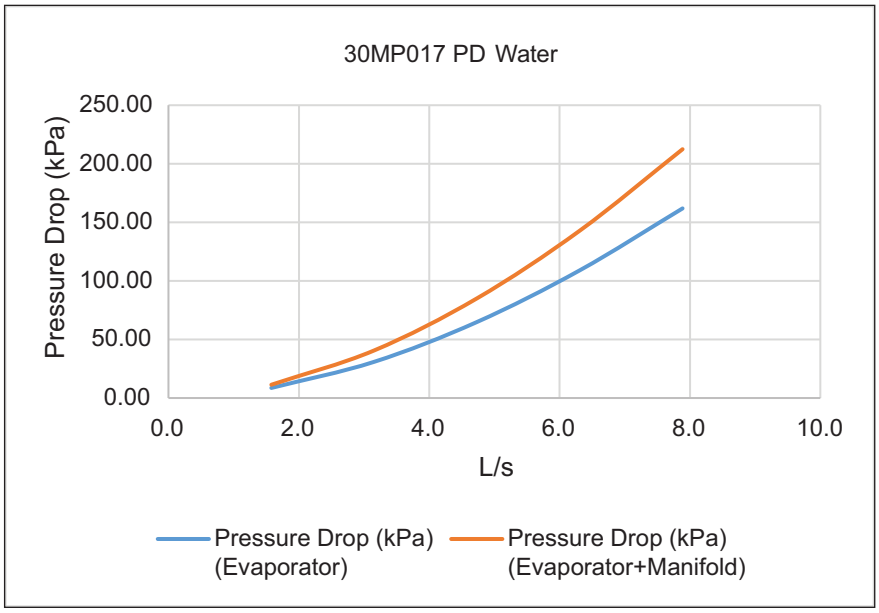
NOTE: Pressure drop curves assume water temperature of 68°F (20°C).

Fig. 44 — Evaporator Water Pressure Drop Curve (Size 080)

English



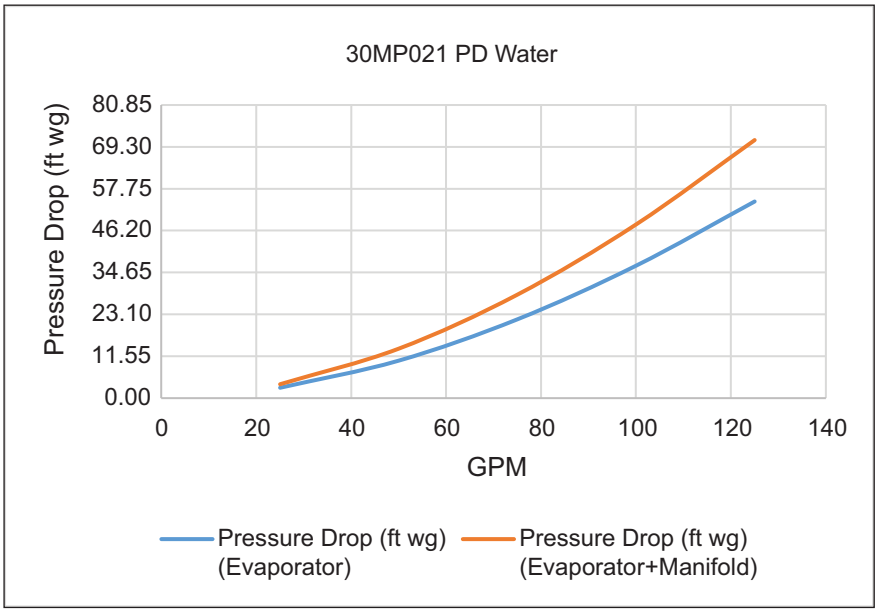
SI



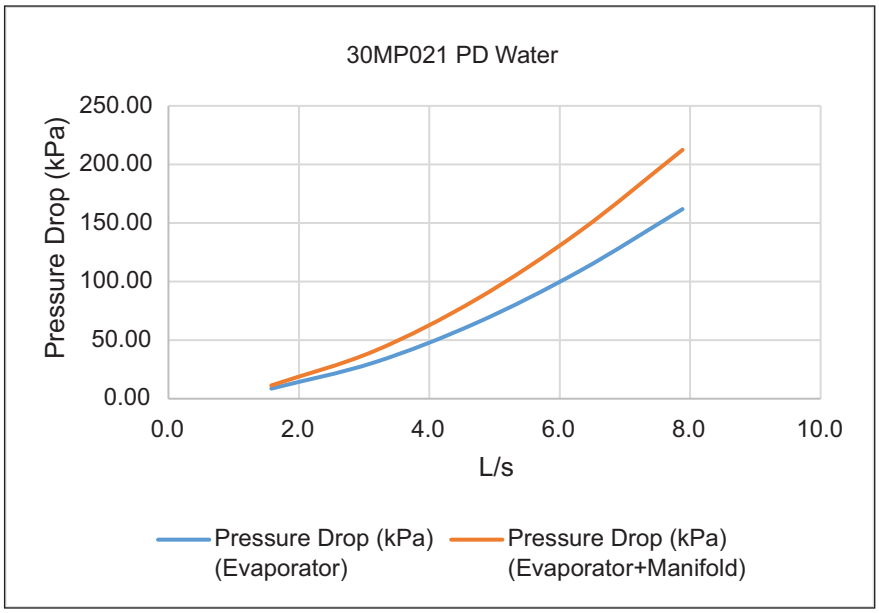
NOTE: Pressure drop curves assume water temperature of 68°F (20°C).

Fig. 45 — Condenser Water Pressure Drop Curve (Size 017 — 30MPW Only)

English



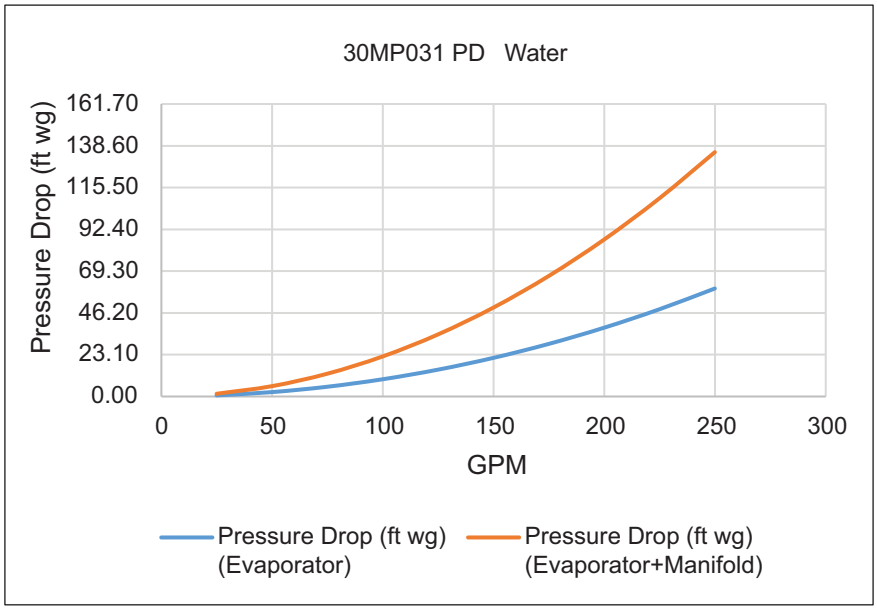
SI



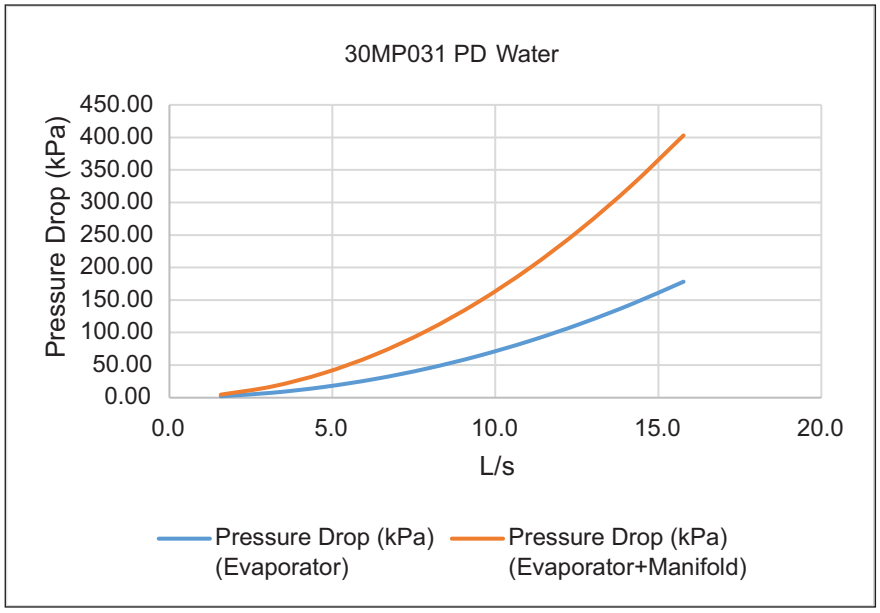
NOTE: Pressure drop curves assume water temperature of 68°F (20°C).

Fig. 46 — Condenser Water Pressure Drop Curve (Size 021)

English



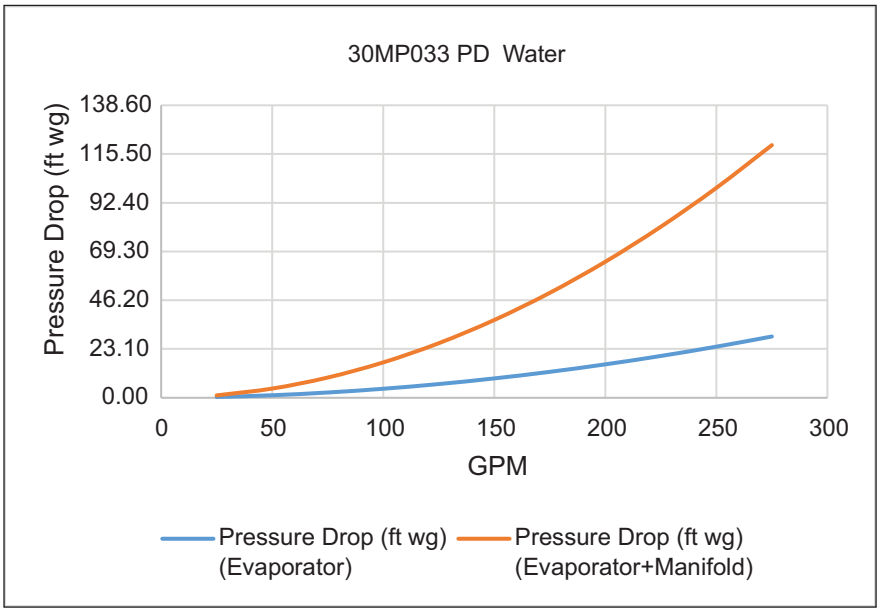
SI



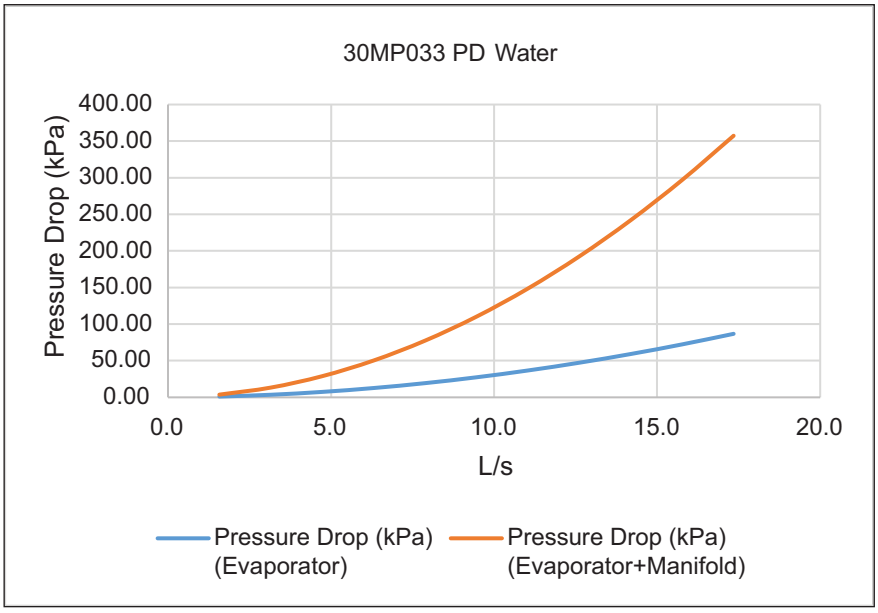
NOTE: Pressure drop curves assume water temperature of 68°F (20°C).

Fig. 47 — Condenser Water Pressure Drop Curve (Size 031)

English



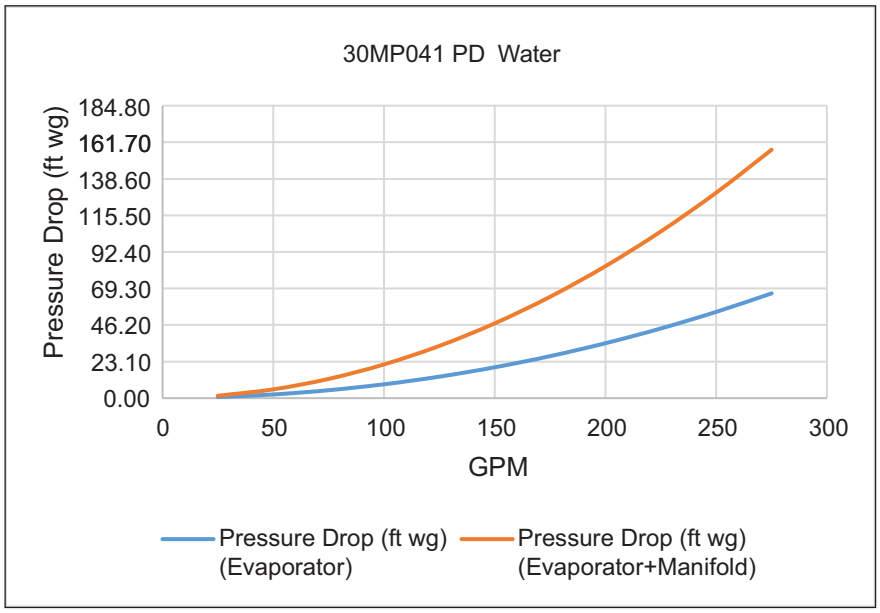
SI



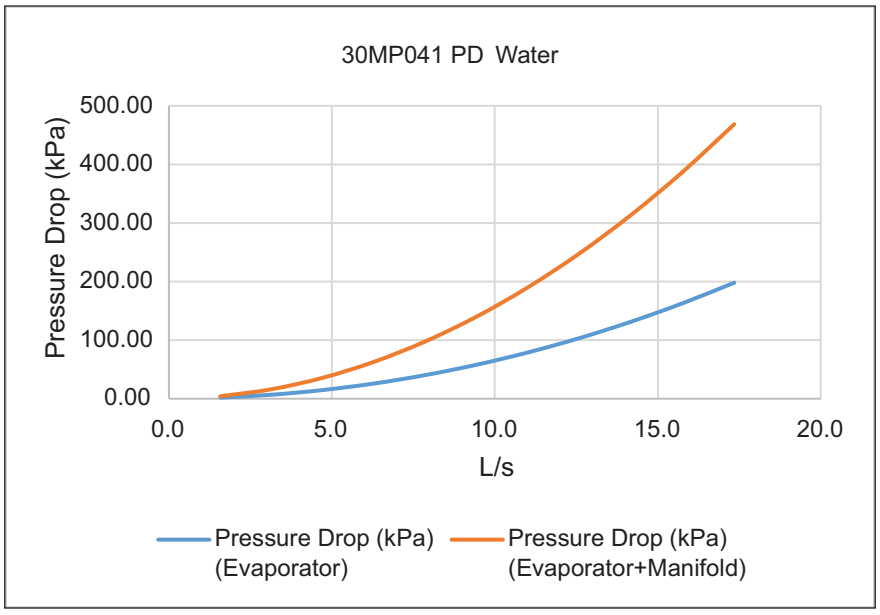
NOTE: Pressure drop curves assume water temperature of 68°F (20°C).

Fig. 48 — Condenser Water Pressure Drop Curve (Size 033 – 30MPW Only)

English



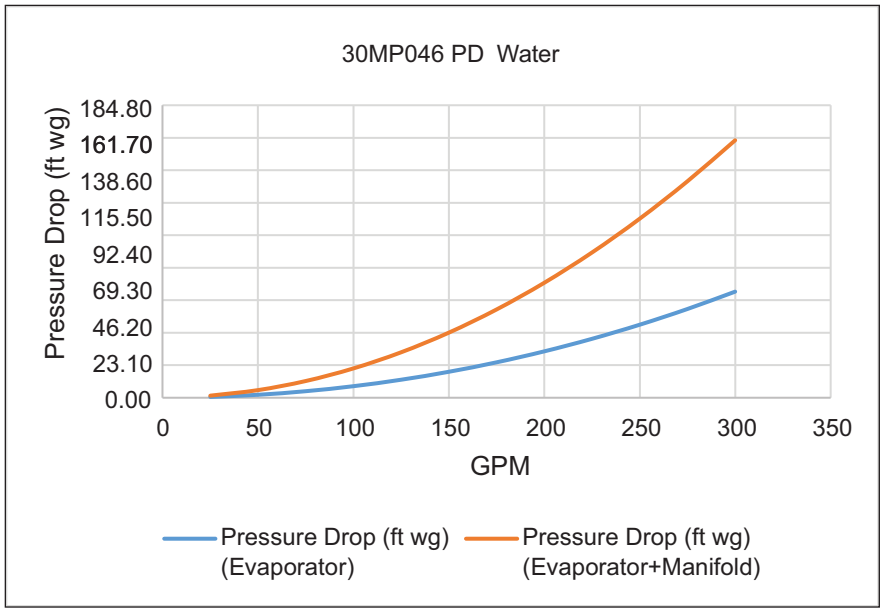
SI



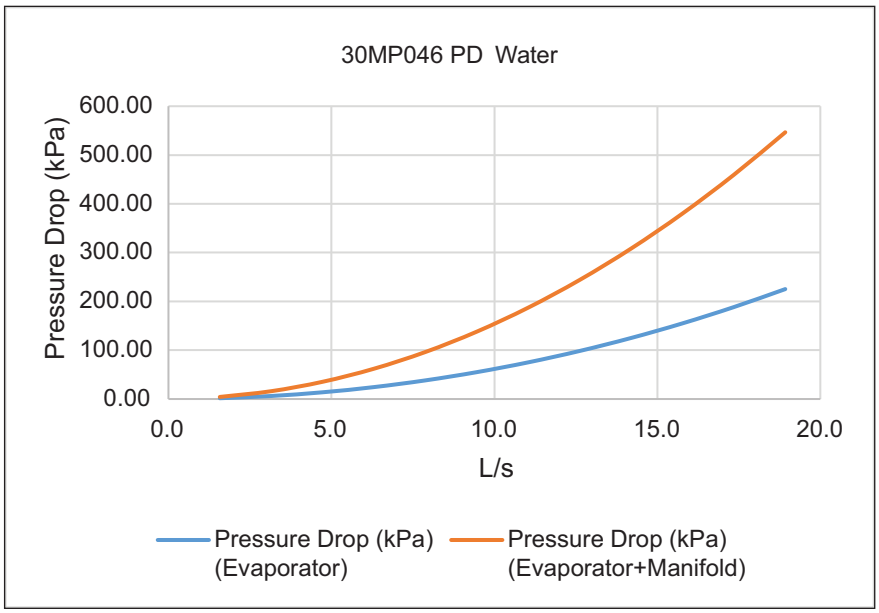
NOTE: Pressure drop curves assume water temperature of 68°F (20°C).

Fig. 49 — Condenser Water Pressure Drop Curve (Size 041)

English



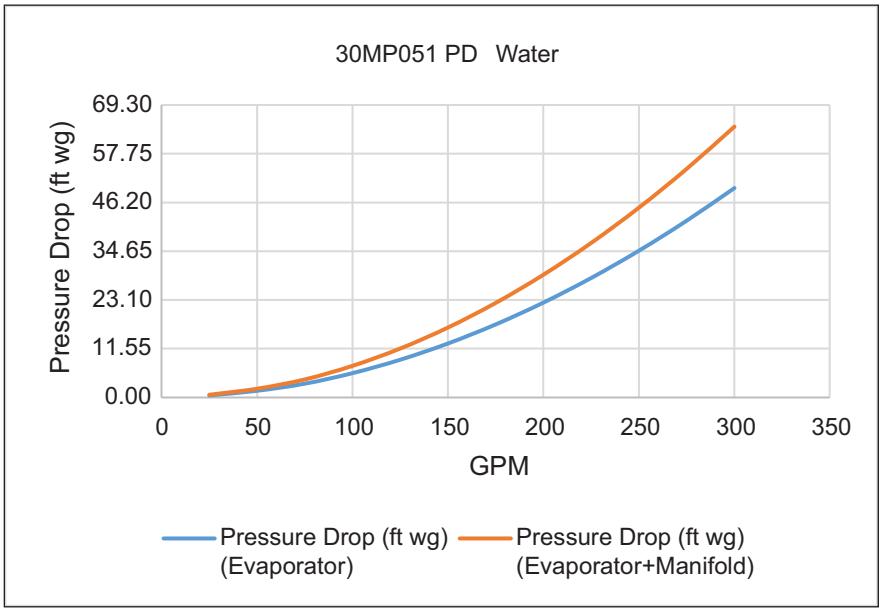
SI



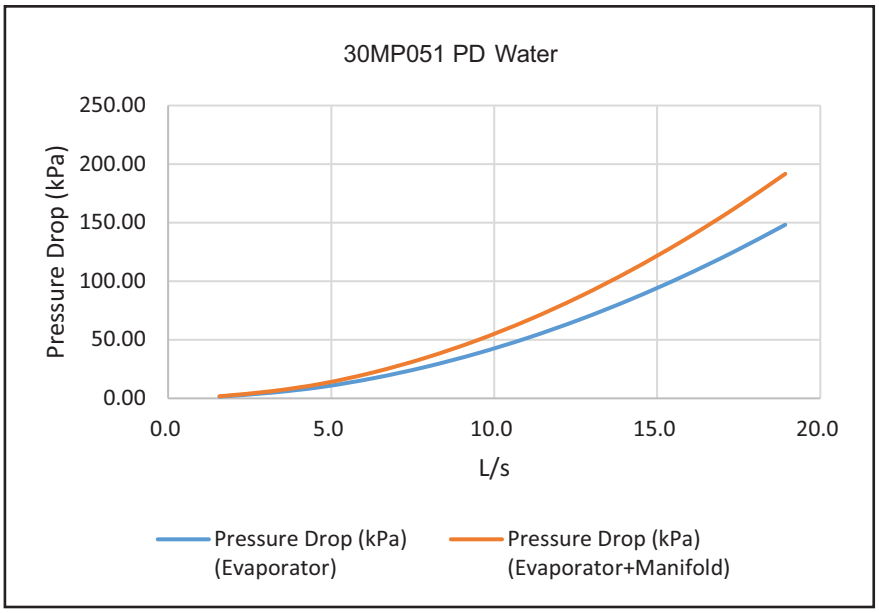
NOTE: Pressure drop curves assume water temperature of 68°F (20°C).

Fig. 50 — Condenser Water Pressure Drop Curve (Size 046)

English



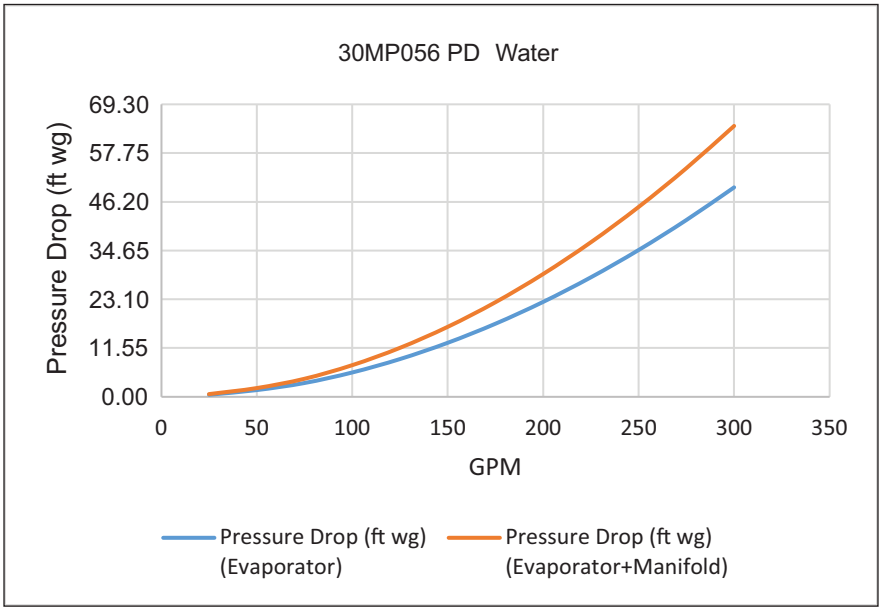
SI



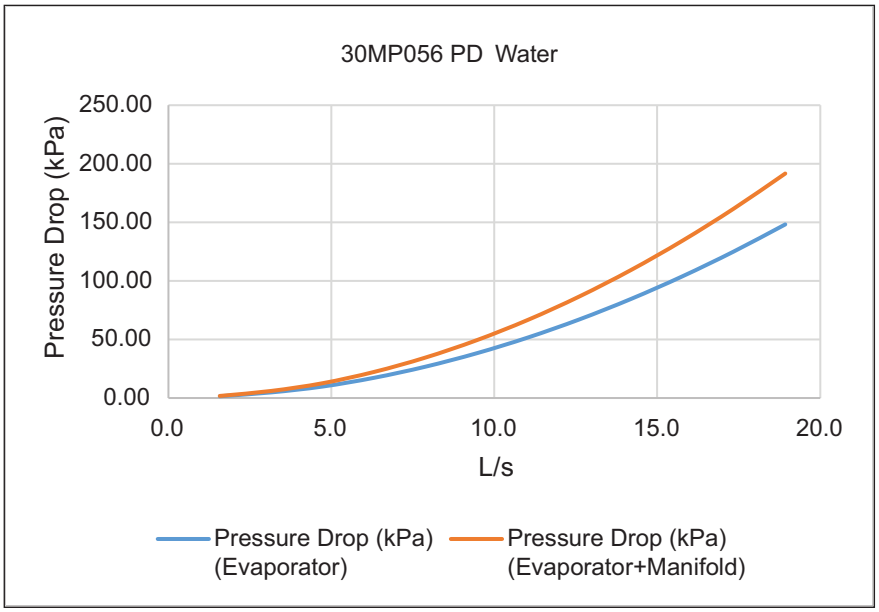
NOTE: Pressure drop curves assume water temperature of 68°F (20°C).

Fig. 51 — Condenser Water Pressure Drop Curve (Size 051)

English



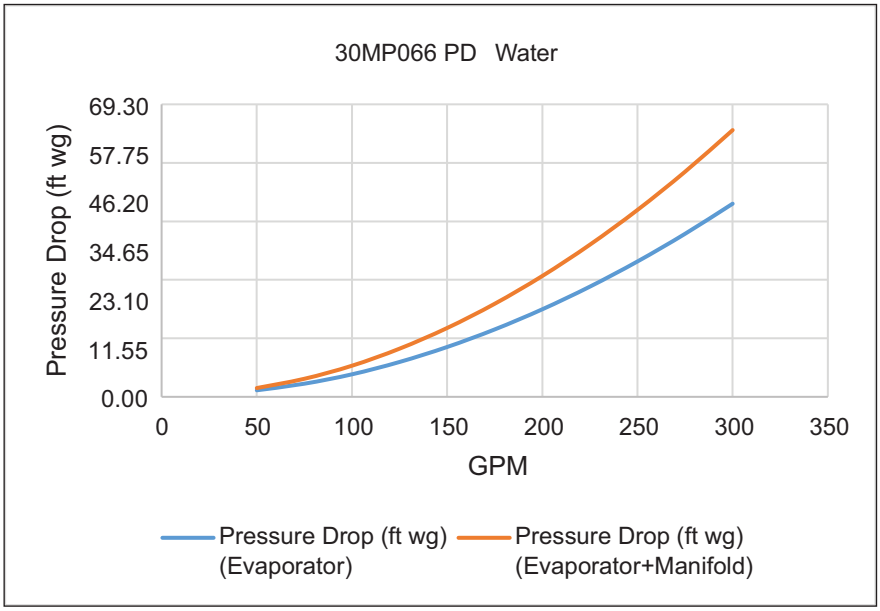
SI



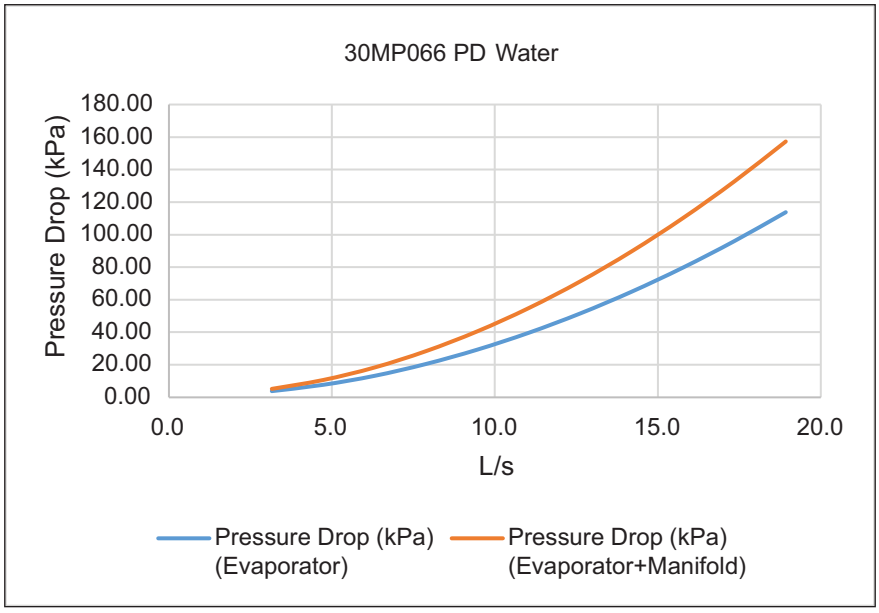
NOTE: Pressure drop curves assume water temperature of 68°F (20°C).

Fig. 52 — Condenser Water Pressure Drop Curve (Size 056)

English



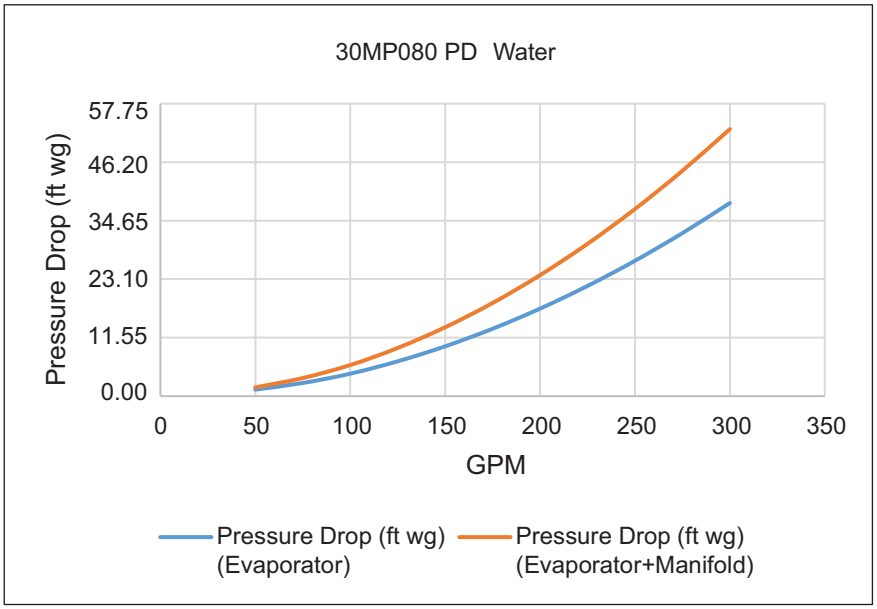
SI



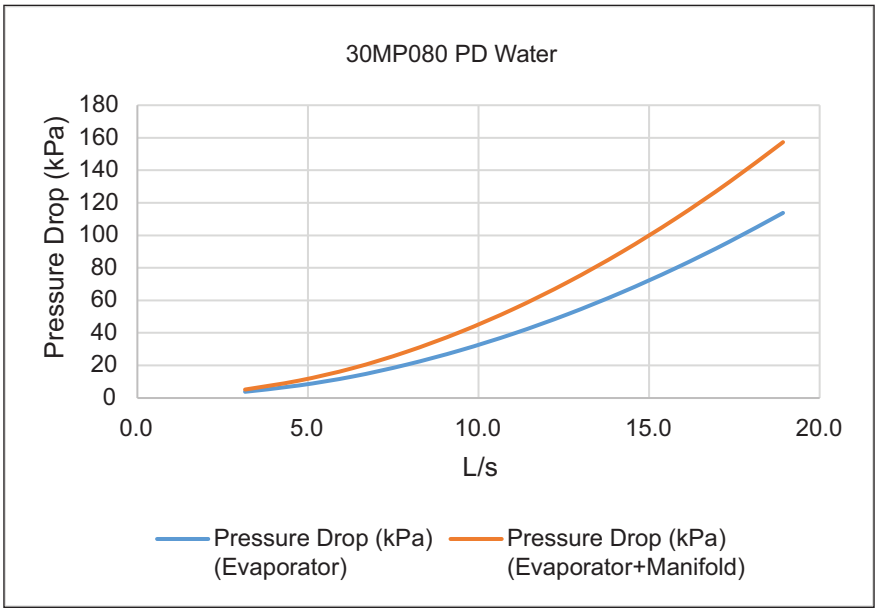
NOTE: Pressure drop curves assume water temperature of 68°F (20°C).

Fig. 53 — Condenser Water Pressure Drop Curve (Size 066)

English



SI



NOTE: Pressure drop curves assume water temperature of 68°F (20°C).

Fig. 54 — Condenser Water Pressure Drop Curve (Size 080)

EVAPORATOR PIPING

Plan evaporator fluid piping for minimum number of changes in elevation and for fewest number of bends possible. Install manual or automatic vent valve at high points in the line. Maintain system pressure by using a pressure tank or a combination of relief and reducing valves. For units with water manifold option, refer to manifold Victaulic spacer fitting kit accessory installation instructions.

A strainer with a minimum of 40 mesh must be installed within 10 ft (3 m) of the chiller closest to the water header inlet to prevent debris from clogging or damaging the chiller's heat exchangers. See Carrier System Design Manual, Part 3, Piping Design, for chilled fluid piping details.

The evaporator fluid inlet and outlet connections are Victaulic. The fluid enters at the top connection and leaves at the bottom connection. Procedures for making the connections are the same as for the 30MPW condensers. See 30MPW Condenser section on page 38 for more details.

Run the pump for 10 minutes, then clean the strainer before starting the unit.

An evaporator flow switch is standard on all units. This is a thermal dispersion type switch that is installed in evaporator fluid outlet. The switch is set to open when the evaporator fluid flow drops below the minimum set point.

For systems with glycol concentrations greater than 30%, it may be necessary to adjust the flow switch set point to avoid nuisance trips. Contact your Carrier representative for the method needed to adjust the switch.

See Table 8 for minimum flow rates. See Table 9 for minimum loop volume.

The thermistors used to sense entering and leaving fluid temperature are factory-installed in the evaporator entering and leaving fluid nozzles.

Table 8 — Minimum Evaporator and Condenser Flow Rates

UNIT SIZE	EVAPORATOR		CONDENSER	
	Gal./Min.	L/s	Gal./Min.	L/s (SI)
30MP017	22	1.4	22	1.4
30MP021	28	1.8	28	1.8
30MP031	43	2.7	43	2.7
30MP033	43	2.7	43	2.7
30MP041	55	3.5	55	3.5
30MP046	64	4.0	64	4.0
30MP051	70	4.5	70	4.5
30MP056	77	4.9	77	4.9
30MP066	91	5.8	91	5.8
30MP080	104	6.7	104	6.7

Table 9 — Minimum Fluid Volume in Circulation

30MP UNIT SIZE	NORMAL AIR CONDITIONING APPLICATION gal/ton (L per kW)			PROCESS COOLING OR LOW AMBIENT OPERATION APPLICATION gal/ton (L per kW)		
	Std Unit	HGBP	Digital	Std Unit	HGBP	Digital
017, 021, 031, 033	6 (6.5)	4 (4.3)	3 (3.3)	10 (10.8)	10 (10.8)	6 (6.5)
041, 046	3 (3.3)	3 (3.3)	3 (3.3)	6 (6.5)	6 (6.5)	6 (6.5)
051-080	6 (6.5)	4 (4.3)	—	10 (10.8)	10 (10.8)	—

LEGEND

HGBP — Hot Gas Bypass

CHILLED WATER FLOW SWITCH

A factory-installed evaporator flow switch is installed in the leaving fluid piping for all units. See Fig. 55. NOTE: This switch is also installed in the condenser water for 30MPQ units.

This is a thermal dispersion flow switch with field adjustments. The switch is set for approximately 0.66 ft/s (20 cm/s) of flow. The sensor tip houses 2 thermistors and a heater element. One thermistor is located in the sensor tip, closest to the flowing fluid. This thermistor is used to detect changes in the flow velocity of the liquid. The second thermistor is bonded to the cylindrical wall and is affected only by changes in the temperature of the liquid. The thermistors are positioned to be in close contact with the wall of the sensor probe and, at the same time, to be kept separated from each other within the confines of the probe.

In order to sense flow, it is necessary to heat one of the thermistors in the probe. When power is applied, the tip of the probe is heated. As the fluid starts to flow, heat will be carried away from the sensor tip. Cooling of the first thermistor is a function of how fast heat is conducted away by the flowing liquid.

The difference in temperature between the 2 thermistors provides a measurement of fluid velocity past the sensor probe.

When fluid velocity is high, more heat will be carried away from the heated thermistor and the temperature differential will be small. As fluid velocity decreases, less heat will be taken from the heated thermistor and there will be an increase in temperature differential.

When unit flow rate is above the minimum flow rate, then the output is switched on, sending 24 vac to the CIOB-B (J1-DI-03) to prove flow has been established.

For recommended maintenance, check the sensor tip for build-up every 6 months. Clean the tip with a soft cloth. If necessary, build-up (e.g., lime) can be removed with a common vinegar cleansing agent.

This flow switch is equipped with a status LED display. When power is supplied to the device, an initialization period is started. During this period, all indicator LEDs are lit green and then turn off from 9 to 0 as the initialization period ends.

Once the initialization period is completed, the normal status LED sequence begins. If the flow is below the switch with increasing flow, sequential LEDs are lit. If the flow switch is open, LED 4 will be red. If the flow switch is closed, LED 4 will be orange.

Table 10 indicates the status of the switch.

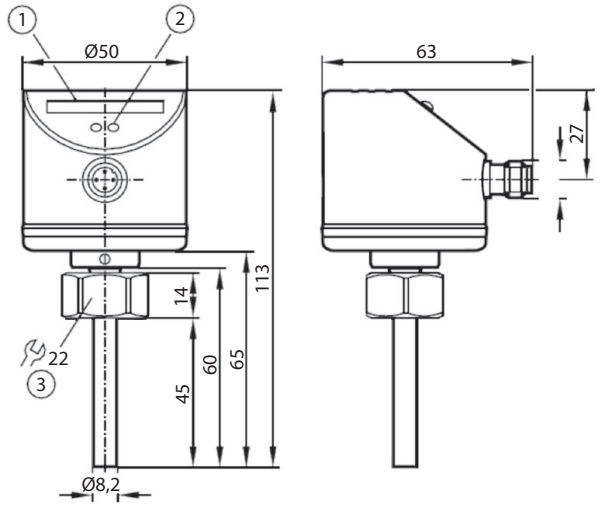
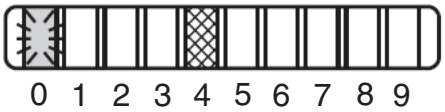
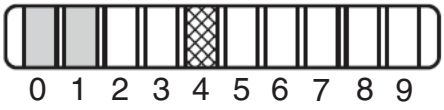
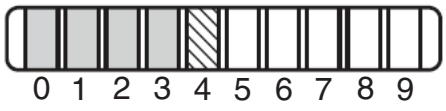
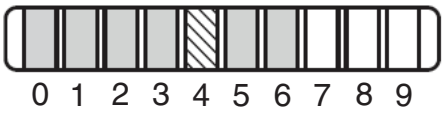
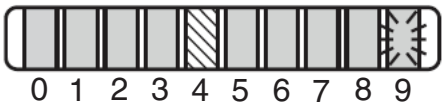


Fig. 55 — Chilled Water Flow Switch

Table 10 — Operating Indicators

	Current flow below the display range
	Current flow below the switch point
	Current flow corresponds to the switch point
	Current flow above the switch point
	Current flow above the display range
INTERFERENCE INDICATORS	
All LEDs are solid orange.	Default Factory Setting restoration initiated
All LEDs are flashing orange.	Default Factory Setting restoration in progress
Display OFF (no LED lights).	No LEDS will be lit for the following conditions: - Manual setpoint correction has been initiated - Default Factory Setting restored - No power to flow switch - The switch has failed
All LEDs are flashing red.	Automatic adjustment not successful — the switch point is outside the measuring range

LEGEND


LED lights green


LED lights red


LED lights orange


LED lights flashing

FOR UNITS WITH WATER MANIFOLD

The water manifold is a factory-installed option; however, the option comes with the leveling kit which must be field-installed. See leveling kit installation instructions.

For 30MP chillers, water valves are included on each water in and out line between the 6 in. manifold and the heat exchanger. These valves can be used for calibration or isolation for service.

⚠ WARNING

It is not recommended to use the water valves for dead end service. If the heat exchanger is removed, it is best to install a Victaulic fitting and end cap on the open end of the valve. Failure to follow these instructions could result in serious personal injury and property damage.

DUAL CHILLER CONTROL OPTION

If the dual chiller algorithm is used, the machines must be installed in parallel. An additional sensor (DUAL) must be installed in the common water line and connected to the primary chiller. See Fig. 56 for typical piping. The units must also be connected via communications. See the Controls and Troubleshooting book for communication connection information.

MULTI-UNIT CHILLER CONTROL ACCESSORY

If the multi-unit chiller control accessory is used, the machines must be installed in parallel (see Fig. 57). The accessory kit contains the necessary chilled water temperature sensor, which must be installed in a common water line; and connected to the controller accessory. All chillers must be equipped with the BACnet[1] communication option and must be connected to the controller accessory on an MS/TP network segment in a daisy chain configuration. NOTE: The sensor is installed in the evaporator loop for 30MPW cooling units and in the condenser loop for 30MPQ heating units. See the Multi-Unit Controller Accessory Installation Instruction for further information.

AIR SEPARATION

⚠ WARNING

Air separator and vent must be installed on leaving water side of evaporator near the chiller. In case of internal unit leak, the refrigerant will vent into the equipment room and not be transferred to occupied areas.

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.

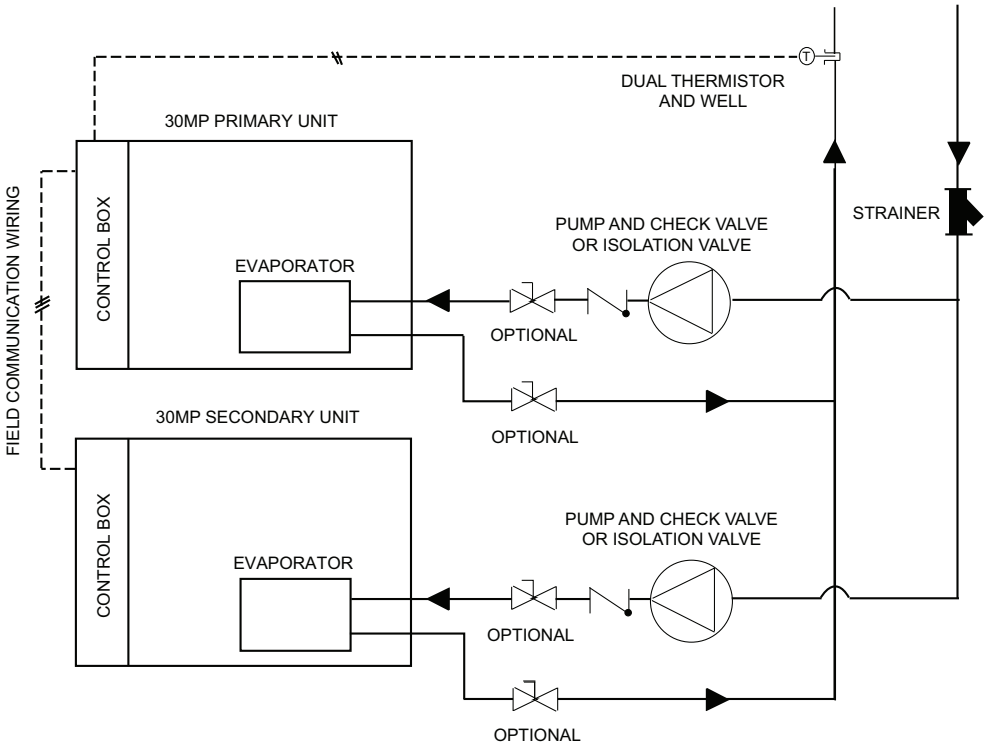
The amount of air that water can hold in solution depends on the pressure and temperature of the water/air mixture. Air is less soluble at higher temperatures and at lower pressures. Therefore, separation can best be done at the point of highest water temperature and lowest pressure. Typically, this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

1. Install automatic air vents at all high points in the system. (If the 30MP unit is located at the high point of the system, a vent can be installed on the piping entering the heat exchanger on the 1/4 in. NPT female port.)
2. 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 (see Fig. 58). In-line or centrifugal air separators are readily available in the field.
3. Additional air separator and vent must be installed on the leaving water side of the evaporator near the chiller. In case of internal unit leak, the refrigerant will vent into the equipment room and not be transferred to occupied areas.

It may not be possible to install air separators at the place of lowest pressure and highest temperature. In such cases, preference should be given to the points of highest temperature. It is important that 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 will keep free air entrained and prevent it from forming air pockets.

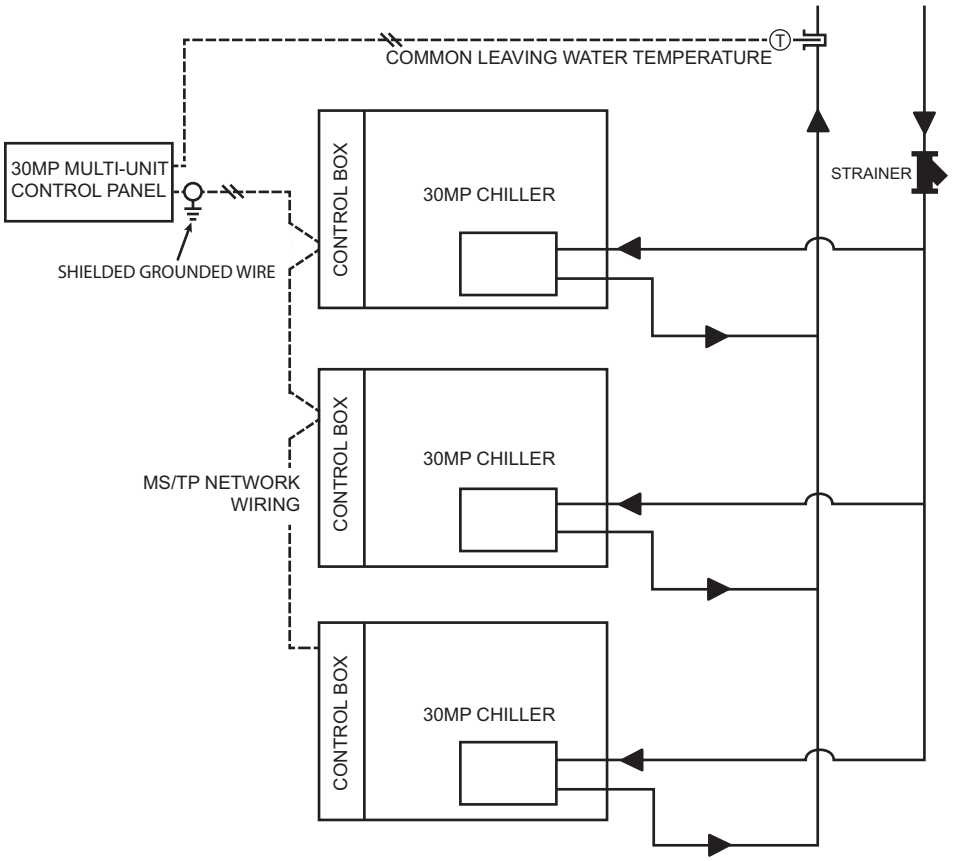
Automatic vents should be installed at all physically elevated points in the system so that air can be eliminated during system operation. Provision should also be made for manual venting during the water loop fill. It is important that the automatic vents be located in accessible locations for maintenance purposes, and that they be located where they can be prevented from freezing.

1. Third-party trademarks and are the property of their respective owners.



NOTE(S):
1. This is a simplified piping diagram; not all hydronic specialties are shown.
2. For 30MPQ units, the common leaving water temperature sensor is installed on the condenser water loop.

Fig. 56 — Dual Chiller Control Option Typical Piping



NOTE: For 30MPQ units, the common leaving water temperature sensor is installed on the condenser water loop.

Fig. 57 — Multi-Unit Control Panel Option

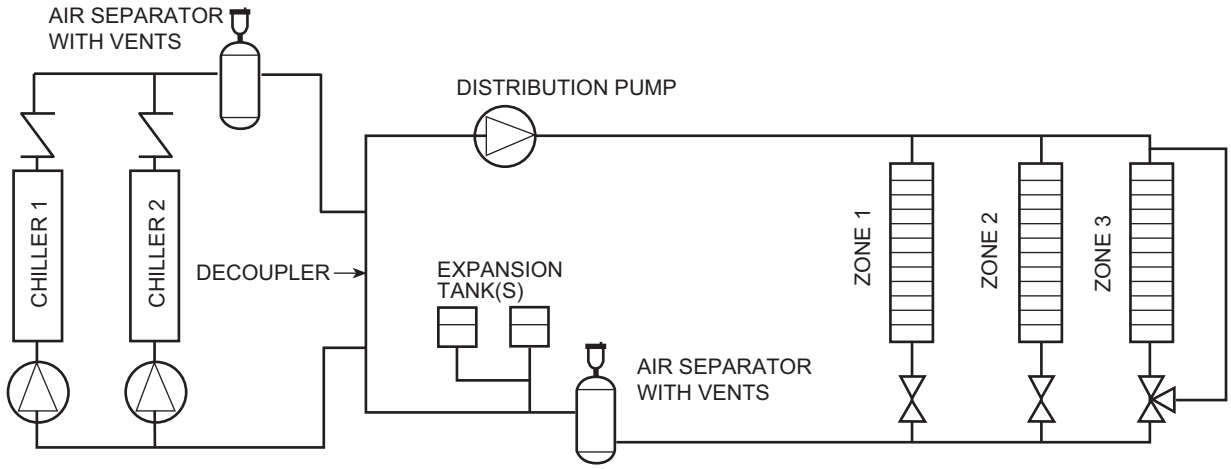


Fig. 58 — Typical Air Separator and Expansion Tank Location on Primary-Secondary Systems

Step 6 — Fill the Chilled Water Loop

WATER SYSTEM CLEANING

Proper water system cleaning is of vital importance. Excessive particulates in the water system can cause excessive pump seal wear, reduce or stop flow, and cause damage of other components. Water quality should be maintained within the limits indicated in Table 11. Failure to maintain proper water quality may result in heat exchanger failure.

⚠ CAUTION

Failure to properly clean all piping and components of the chilled water system before unit start-up may result in plugging of the heat exchanger, which can lead to poor performance, nuisance alarms and damage from freezing. Freezing damage caused by an improperly cleaned system represents abuse and may negatively affect the Carrier product warranty.

Table 11 — Water Quality Characteristics and Limitations

WATER CHARACTERISTIC	QUALITY LIMITATION
Alkalinity (HCO_3^-)	70-300 ppm
Sulfate (SO_4^{2-})	Less than 70 ppm
HCO_3^-/SO_4^{2-}	Greater than 1.0
Electrical Conductivity	10-500 μS/cm
pH	7.5-9.0
Ammonia (NH_3)	Less than 2 ppm
Chlorides (Cl^-)	Less than 300 ppm
Free chlorine (Cl_2)	Less than 1 ppm
Hydrogen Sulfide (H_2S)[a]	Less than 0.05 ppm
Free (aggressive) Carbon Dioxide (CO_2)[b]	Less than 5 ppm
Total Hardness (°dH)	4.0-8.5
Nitrate (NO_3)	Less than 100 ppm
Iron (Fe)	Less than 0.2 ppm
Aluminum (Al)	Less than 0.2 ppm
Manganese (Mn)	Less than 0.1 ppm

NOTE(S):

a. Sulfides in the water quickly oxidize when exposed to air, requiring that no agitation occur as the sample is taken. Unless tested immediately at the site, the sample will require stabilization with a few drops of one Molar zinc acetate solution, allowing accurate sulfide determination up to 24 hours after sampling. A low pH and high alkalinity cause system problems, even when both values are within the ranges shown. The term pH refers to the acidity, basicity, or neutrality of the water supply. Below 7.0, the water is considered to be acidic. Above 7.0, water is considered to be basic. Neutral water has a pH of 7.0.

b. Dissolved carbon dioxide can either be calculated from the pH and total alkalinity values, shown below, or measured on the site using a test kit. Dissolved Carbon Dioxide, PPM = TA x 2[(6.3-pH)/0.3] where TA = Total Alkalinity, PPM as $CaCO_3$.

To perform proper water system cleaning perform the following steps:

1. Install a temporary bypass around the chiller to avoid circulating dirty water and particulates into the pump package and chiller during the flush. Use a temporary circulating pump during the cleaning process. Also, be sure that there is capability to fully drain the system after cleaning (see Fig. 59).
2. Be sure to use a cleaning agent that is compatible with all system materials. Be especially careful if the system contains any galvanized or aluminum components. Both detergent-dispersant and alkaline-dispersant cleaning agents are available.
3. It is a good idea to fill the system through a water meter. This provides a reference point for the future for loop volume readings, but it also establishes the correct quantity of cleaner needed in order to get the required concentration.
4. Use a feeder/transfer pump to mix the solution and fill the system. Circulate the cleaning system for the length of time recommended by the cleaning agent manufacturer.
   a. After cleaning, drain the cleaning fluid and flush the system with fresh water.
   b. A slight amount of cleaning residue in the system can help keep the desired, slightly alkaline, water pH of 8 to 9. Avoid a pH greater than 10, since this will adversely affect pump seal components.
   c. A side stream filter is recommended (see Fig. 60) during the cleaning process. Filter side flow rate should be enough to filter the entire water volume every 3 to 4 hours. Change filters as often as necessary during the cleaning process.
   d. Remove temporary bypass when cleaning is complete.

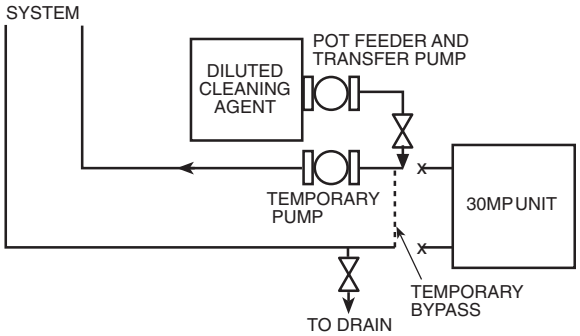


Fig. 59 — Typical Set Up for Cleaning Process

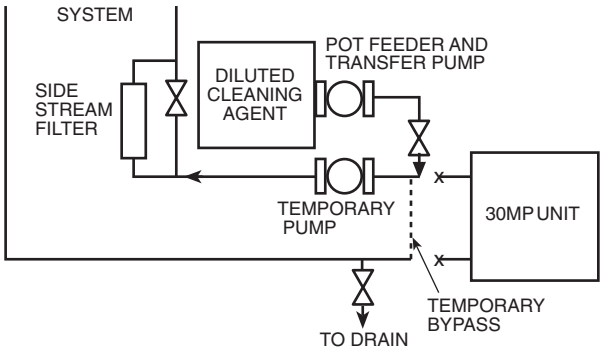


Fig. 60 — Cleaning Using a Side Stream Filter

FILLING THE SYSTEM

The initial fill of the chilled water system must accomplish three purposes:

1. The entire piping system must be filled with water.
2. The pressure at the top of the system must be high enough to vent air from the system (4 psig is adequate for most vents).
3. The pressure at all points in the system must be high enough to prevent flashing in the piping or cavitation in the pump.

The pressure created by an operating pump affects system pressure at all points except one, the connection of the compression tank to the system. This is the only location in the system where pump operation will not give erroneous pressure indications during the fill. Therefore, the best location to install the fill connection is close to the expansion tank. An air vent should be installed close by to help eliminate air that enters during the fill procedure.

Ensure the following when filling the system:

1. Remove temporary bypass piping and cleaning/flushing equipment.
2. Check to make sure all drain plugs are installed.
3. Open the blow-down valve to flush the strainer.

Normally, a closed system needs to be filled only once. The actual filling process is generally a fairly simple procedure. All air should be purged or vented from the system. Thorough venting at the high points and circulation at room temperature for several hours is recommended.

NOTE: Local codes concerning backflow devices and other protection of the city water system should be consulted and followed to prevent contamination of the public water supply. This is especially important when antifreeze is used in the system.

NOTE: Set Water Flow Rate through the chiller once the system is cleaned, pressurized, and filled.

NOTE: Carrier recommends a differential pressure gauge when measuring pressures across the pumps or balancing valves. This provides for greater accuracy and reduces error build-up that often occurs when subtracting pressures made by different gauges.

On primary/secondary systems, it is advisable to set the 30MP balancing valve to maintain design flow plus 10% through the chiller.

A rough estimate of water flow can be obtained from measuring the pressure drop across the 30MP heat exchanger. Figures 35-54 show the relationship between gpm (l/s) and heat exchanger pressure drop. These curves are for "clean" heat exchangers with fresh water; they do not apply to heat exchangers with fouling or glycol. Adjust the external balancing valve until the correct pressure drop is obtained for the required gpm.

Step 7 — Make Electrical Connections

All field wiring must comply with local code requirements. Electrical data for the complete unit and for the compressors is shown in Tables 12-20. See Fig. 61-65 for field wiring connections. A field-supplied branch circuit disconnect switch that can be locked in either OPEN or OFF position **must** be installed.

Check that cabling will not be subject to wear, corrosion, excessive pressure, vibration, sharp edges or any other adverse environmental effects. The check shall also take into account the effects of aging or continual vibration from sources such as compressors or fans.

⚠ CAUTION

Failure to follow these instructions may result in unit damage. When wiring the 30MP chiller to its associated 30MPE distribution panel, it is important to connect each chiller to its corresponding circuit breaker in the panel.

Each circuit breaker has been sized for its particular chiller. Proper installation is critical to ensure appropriate wire sizing, hazard avoidance, and compliance with local code(s). Consult submittal information.

30MPA, MPW, MPQ CONTROL BOX

30MPA, MPW, MPQ Controls Section

This section contains the following components:

- Carrier input/output board (CIOB)
- PIC6 controller/display
- optional energy management module
- control-circuit breakers for 24-v circuits
- control-circuit ON-OFF switch
- unit Enable/Off/Remote contact switch
- unit Alarm/Alert indicator light

30MPA, MPW, MPQ Control Wiring (Factory-Wired)

The control wiring circuit power is 24-v on all units. Factory-installed control transformer (TRAN1) uses line voltage for all units. All control transformers are factory-installed and wired. For 208/230-3-60 units operating at 208-3-60 line voltage, TRAN1 primary connections must be moved to terminals H1 and H2.

Inside the control box are terminals for field power and ground (earth) wiring. A ground wire must be installed with each field power supply. Compressors are wired for across-the-line start. Refer to Tables 12-21 for electrical data.

30MPA, MPW, MPQ Control Wiring (Field-Wired)

The control wiring is found in the 30MPA, MPW control box which contains the low-voltage, field-wiring terminal strip TB5 and TB6 (EMM). All low-voltage field-wiring connections are made to this terminal block; see Fig. 64. Three 7/8 in. (22 mm) knockouts are provided for field wiring in this section.

Connections for condenser flow switch, chilled fluid pump interlock, condenser pump interlock, remote alarm output, condenser output, and dual chiller thermistor accessory are made at these locations. Connections for the multi-unit controller accessory network are made to the PIC6 controller.

The unit has the capability to control field-supplied devices. They are: alarm signal, condenser pump or condenser fan output, and chilled water pump output. The unit provides 24-v power with a maximum 5 va rating per output allowed.

Table 12 — Electrical Data — 30MP Single Point Power R-32, Standard

30MP UNIT SIZE	UNIT VOLTAGE	UNIT			
	Voltage (v-Ph)	MCA	MOCP	ICF	REC FUSE SIZE
017	208/230	48.2	70	282	60
	380	35.6	50	185	45
	460	24.1	35	139	30
	575	20.8	30	101	25
021	208/230	75.4	100	299	90
	380	41.5	50	191	50
	460	35.2	50	156	40
	575	26.3	35	119	30
031	208/230	115.5	150	415	150
	380	66.3	90	255	80
	460	54.8	70	206	70
	575	43.8	60	165	50
033	208/230	94.5	125	406	110
	380	66.3	90	255	80
	460	47.3	60	203	60
	575	43.8	60	165	50
041	208/230	157.3	200	432	175
	380	82.3	100	220	90
	460	68.5	80	183	80
	575	54.8	70	147	60
046	208/230	166.9	200	467	200
	380	95.8	125	285	110
	460	79.2	100	231	90
	575	63.3	80	185	70
051	208/230	177.3	250	653	200
	380	92.3	125	358	110
	460	83.7	110	300	100
	575	66.4	90	242	80
056	208/230	170.1	225	650	200
	380	104.0	150	363	125
	460	90.9	125	303	110
	575	69.3	100	243	80
066	208/230	235.1	350	900	300
	380	131.1	175	525	150
	460	125.3	175	429	150
	575	90.9	125	334	110
080	208/230	287.1	400	952	350
	380	152.8	200	547	175
	460	152.8	200	457	175
	575	108.2	150	351	125

LEGEND

ICF —Maximum instantaneous current flow during starting.
MCA —Minimum Circuit Amps (for wire sizing). Complies with NEC, Section 430-24.
MOCP —Maximum Overcurrent Protection
REC FUSE —Recommended dual element fuse amps (150% of compressor RLA). Size up to the next standard fuse size.

Table 13 — Electrical Data — 30MP Single Point Power R-32, Digital Option

30MP UNIT SIZE	UNIT VOLTAGE				UNIT			
	Voltage (v-Ph)	Hz	SUPPLIED		MCA	MOCP	ICF	REC FUSE SIZE
			Min.	Max.				
017	208/230	60	187	253	48.2	70	257	60
	380	60	342	418	33.6	50	147	40
	460	60	414	506	24.1	35	139	30
	575	60	518	633	20.6	30	101	25
021	208/230	60	187	253	73.6	100	297	90
	380	60	342	418	42.2	60	191	50
	460	60	414	506	36.0	50	156	45
	575	60	518	633	27.2	35	119	35
031	208/230	60	187	253	123.1	175	415	150
	380	60	342	418	65.1	90	254	80
	460	60	414	506	55.5	80	206	70
	575	60	518	633	47.5	60	165	60
033	208/230	60	187	253	106.2	150	406	125
	380	60	342	418	65.1	90	254	80
	460	60	414	506	51.4	70	203	60
	575	60	518	633	47.5	60	165	60
041	208/230	60	187	253	155.0	200	430	175
	380	60	342	418	83.1	100	220	90
	460	60	414	506	70.6	90	192	80
	575	60	518	633	56.6	70	147	70
046	208/230	60	187	253	174.4	225	467	200
	380	60	342	418	94.6	110	284	110
	460	60	414	506	79.9	100	231	90
	575	60	518	633	67.0	80	185	80
051	—	—	—	—	—	—	—	—
	—	—	—	—	—	—	—	—
	—	—	—	—	—	—	—	—
	—	—	—	—	—	—	—	—
056	—	—	—	—	—	—	—	—
	—	—	—	—	—	—	—	—
	—	—	—	—	—	—	—	—
	—	—	—	—	—	—	—	—
066	—	—	—	—	—	—	—	—
	—	—	—	—	—	—	—	—
	—	—	—	—	—	—	—	—
	—	—	—	—	—	—	—	—
080	—	—	—	—	—	—	—	—
	—	—	—	—	—	—	—	—
	—	—	—	—	—	—	—	—
	—	—	—	—	—	—	—	—

LEGEND

ICF —Maximum instantaneous current flow during starting.
MCA —Minimum Circuit Amps (for wire sizing). Complies with NEC, Section 430-24.
MOCP —Maximum Overcurrent Protection
REC FUSE —Recommended dual element fuse amps (150% of compressor RLA). Size up to the next standard fuse size.

Table 14 — 30MP Compressor Electrical Data for R-32 Units, Standard

30MP UNIT SIZE	V(3 Ph)	Hz	COMPRESSORS											
			A1			A2			A3			B1		
			Ton	RLA	LRA	Ton	RLA	LRA	Ton	RLA	LRA	Ton	RLA	LRA
017	208/230	60	9	25	265	6	17	166	—	—	—	—	—	—
	380	60	9	19	173	6	12	94	—	—	—	—	—	—
	460	60	9	12	130	6	9	75	—	—	—	—	—	—
	575	60	9	11	94	6	7	54	—	—	—	—	—	—
021	208/230	60	10	34	265	10	34	265	—	—	—	—	—	—
	380	60	10	18	173	10	18	173	—	—	—	—	—	—
	460	60	10	16	140	10	16	140	—	—	—	—	—	—
	575	60	10	12	108	10	12	108	—	—	—	—	—	—
031	208/230	60	15	51	364	15	51	364	—	—	—	—	—	—
	380	60	15	29	226	15	29	226	—	—	—	—	—	—
	460	60	15	24	182	15	24	182	—	—	—	—	—	—
	575	60	15	19	146	15	19	146	—	—	—	—	—	—
033	208/230	60	15	42	364	—	—	—	—	—	—	15	42	364
	380	60	15	29	226	—	—	—	—	—	—	15	29	226
	460	60	15	21	182	—	—	—	—	—	—	15	21	182
	575	60	15	19	146	—	—	—	—	—	—	15	19	146
041	208/230	60	13	48	336	13	48	336	13	48	336	—	—	—
	380	60	13	25	169	13	25	169	13	25	169	—	—	—
	460	60	13	21	141	13	21	141	13	21	141	—	—	—
	575	60	13	17	113	13	17	113	13	17	113	—	—	—
046	208/230	60	15	51	364	15	51	364	15	51	364	—	—	—
	380	60	15	29	226	15	29	226	15	29	226	—	—	—
	460	60	15	24	182	15	24	182	15	24	182	—	—	—
	575	60	15	19	146	15	19	146	15	19	146	—	—	—
051	208/230	60	25	79	574	25	79	574	—	—	—	—	—	—
	380	60	25	41	317	25	41	317	—	—	—	—	—	—
	460	60	25	37	263	25	37	263	—	—	—	—	—	—
	575	60	25	30	212	25	30	212	—	—	—	—	—	—
056	208/230	60	27	76	574	27	76	574	—	—	—	—	—	—
	380	60	27	46	317	27	46	317	—	—	—	—	—	—
	460	60	27	40	263	27	40	263	—	—	—	—	—	—
	575	60	27	31	212	27	31	212	—	—	—	—	—	—
066	208/230	60	27	76	574	40	128	824	—	—	—	—	—	—
	380	60	27	46	317	40	68	479	—	—	—	—	—	—
	460	60	27	40	263	40	68	389	—	—	—	—	—	—
	575	60	27	31	212	40	48	303	—	—	—	—	—	—
080	208/230	60	40	128	824	40	128	824	—	—	—	—	—	—
	380	60	40	68	479	40	68	479	—	—	—	—	—	—
	460	60	40	68	389	40	68	389	—	—	—	—	—	—
	575	60	40	48	303	40	48	303	—	—	—	—	—	—

LEGEND

LRA —Locked Rotor Amps
RLA —Rated Load Amps

Table 15 — 30MP Compressor Electrical Data for R-32 Units, Digital Option

30MP UNIT SIZE	V(3 Ph)	Hz	COMPRESSORS											
			A1			A2			A3			B1		
			Ton	RLA	LRA	Ton	RLA	LRA	Ton	RLA	LRA	Ton	RLA	LRA
017	208/230	60	9	25	240	6	17	166	—	—	—	—	—	—
	380	60	9	17	135	6	12	94	—	—	—	—	—	—
	460	60	9	12	130	6	9	75	—	—	—	—	—	—
	575	60	9	11	94	6	7	54	—	—	—	—	—	—
021	208/230	60	10	32	240	10	34	265	—	—	—	—	—	—
	380	60	10	19	152	10	18	173	—	—	—	—	—	—
	460	60	10	16	140	10	16	140	—	—	—	—	—	—
	575	60	10	12	108	10	12	108	—	—	—	—	—	—
031	208/230	60	15	57	340	15	51	364	—	—	—	—	—	—
	380	60	15	28	196	15	29	226	—	—	—	—	—	—
	460	60	15	25	173	15	24	182	—	—	—	—	—	—
	575	60	15	22	132	15	19	146	—	—	—	—	—	—
033	208/230	60	15	42	340	—	—	—	—	—	—	15	51	364
	380	60	15	28	196	—	—	—	—	—	—	15	29	226
	460	60	15	21	173	—	—	—	—	—	—	15	24	182
	575	60	15	22	132	—	—	—	—	—	—	15	19	146
041	208/230	60	13	46	300	13	48	336	13	48	336	—	—	—
	380	60	13	26	139	13	25	169	13	25	169	—	—	—
	460	60	13	23	150	13	21	141	13	21	141	—	—	—
	575	60	13	18	109	13	17	113	13	17	113	—	—	—
046	208/230	60	15	57	340	15	51	364	15	51	364	—	—	—
	380	60	15	28	196	15	29	226	15	29	226	—	—	—
	460	60	15	25	173	15	24	182	15	24	182	—	—	—
	575	60	15	22	132	15	19	146	15	19	146	—	—	—
051	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	—	—	—	—	—	—	—	—	—	—	—	—	—	—
056	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	—	—	—	—	—	—	—	—	—	—	—	—	—	—
066	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	—	—	—	—	—	—	—	—	—	—	—	—	—	—
080	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	—	—	—	—	—	—	—	—	—	—	—	—	—	—

LEGEND

LRA —Locked Rotor Amps
RLA —Rated Load Amps

Table 16 — 30MP Compressor RLA Data for R-32 Units, Standard and Digital Option

SIZE TONS	VOLTAGE	R-32			R-32 DIGITAL		
		RLA	LRA	MCC	RLA	LRA	MCC
6	208/230	21.7	166.2	33.9	23.7	164.0	37.0
	380	12.0	93.9	18.7	11.5	73.0	17.9
	460	11.7	75.0	18.3	11.7	75.0	18.3
	575	7.2	54.0	11.2	6.9	54.0	10.7
9	208/230	32.8	265.0	45.9	29.2	240.0	45.6
	380	18.9	172.8	29.5	17.3	135.0	27.0
	460	13.7	130.0	21.4	14.0	130.0	21.9
	575	10.9	93.7	17.0	10.7	93.7	16.7
10	208/230	33.5	265.0	52.3	31.7	240.0	49.4
	380	18.5	172.8	28.8	19.0	152.0	29.6
	460	15.6	140.0	24.4	16.3	140.0	25.4
	575	11.7	107.6	18.2	12.4	107.6	19.4
11	208/230	41.0	294.0	64.0	45.3	245.0	70.6
	380	24.6	176.4	38.4	21.4	145.0	33.4
	460	20.5	147.0	32.0	19.3	125.0	30.1
	575	16.4	117.6	25.6	14.5	100.0	22.6
13	208/230	48.4	335.5	75.5	46.2	300.0	72.0
	380	25.3	169.2	39.5	26.0	139.0	40.5
	460	21.1	141.0	32.9	22.8	150.0	35.5
	575	16.9	112.8	26.3	18.3	109.0	28.6
15	208/230	51.3	364.0	80.1	57.4	340.0	89.5
	380	29.5	226.0	46.0	28.2	196.0	44.0
	460	24.4	182.0	38.0	24.9	173.0	38.9
	575	19.5	145.6	30.4	22.4	132.0	35.0
25	208/230	78.8	574.0	123.0	—	—	—
	380	41.0	317.0	64.0	—	—	—
	460	37.2	263.0	58.0	—	—	—
	575	29.5	212.0	46.0	—	—	—
27	208/230	75.6	574.0	118.0	—	—	—
	380	46.2	317.0	72.0	—	—	—
	460	40.4	263.0	63.0	—	—	—
	575	30.8	212.0	48.0	—	—	—
40	208/230	127.6	824.0	199.0	—	—	—
	380	67.9	479.0	106.0	—	—	—
	460	67.9	389.0	106.0	—	—	—
	575	48.1	303.0	75.0	—	—	—

LEGEND

LRA —Locked Rotor Amps
RLA —Rated Load Amps
MCC—Maximum Continuous Current

Table 17 — Crankcase Heaters Voltage and Wattage

UNIT VOLTAGE	Hz	CRANKCASE HEATER, watts	HEATER, amps
208	60	90	0.4
380	60	90	0.2
460	60	90	0.2
575	60	90	0.2

Table 18 — Crankcase Heaters Electrical Data

30MP UNIT SIZE	VOLTAGE	NUMBER OF COMPRESSORS	HEATER LOAD
017	**208/230**	0.0	0.0
	380	0.0	0.0
	460	0.0	0.0
	575	0.0	0.0
021	**208/230**	0.0	0.0
	380	0.0	0.0
	460	0.0	0.0
	575	0.0	0.0
031	**208/230**	2.0	0.8
	380	2.0	0.4
	460	2.0	0.4
	575	2.0	0.4
033	**208/230**	0.0	0.0
	380	0.0	0.0
	460	0.0	0.0
	575	0.0	0.0
041	**208/230**	3.0	1.2
	380	3.0	0.6
	460	3.0	0.6
	575	3.0	0.6
046	**208/230**	3.0	1.2
	380	3.0	0.6
	460	3.0	0.6
	575	3.0	0.6
051	**208/230**	2.0	0.8
	380	2.0	0.4
	460	2.0	0.4
	575	2.0	0.4
056	**208/230**	2.0	0.8
	380	2.0	0.4
	460	2.0	0.4
	575	2.0	0.4
066	**208/230**	2.0	0.8
	380	2.0	0.4
	460	2.0	0.4
	575	2.0	0.4
080	**208/230**	2.0	0.8
	380	2.0	0.4
	460	2.0	0.4
	575	2.0	0.4

Table 19 — R-32 Compressors

30MP UNIT SIZE	CIRCUIT A							CIRCUIT B	
	A1			A2		A3		B1	
	SIZE	MODEL	MODEL DIGITAL (A1 Only)	SIZE	MODEL	SIZE	MODEL	SIZE	MODEL
017	9	YP104K	YPD110K	6	YP72K	—	—	—	—
021	10	YP122K	YPD129K	10	YP122K	—	—	—	—
031	15	YP182K	YPD192K	15	YP182K	—	—	—	—
033	15	YP182K	YPD192K	—	—	—	—	15	YP182K
041	13	YP154K	YPD163K	13	YP154K	13	YP154K	—	—
046	15	YP182K	YPD192K	15	YP182K	15	YP182K	—	—
051	25	DFS295	—	25	DFS295	—	—	—	—
056	27	DFS325	—	27	DFS325	—	—	—	—
066	27	DFS325	—	40	DFS485	—	—	—	—
080	40	DFS485	—	40	DFS485	—	—	—	—

Table 20 — Compressor Model Number Reference

SIZE, TONS	EMERSON MODEL NUMBER Non Digital
6	YP72K
9	YP104K
10	YP122K
11	YP137K
13	YP154K
15	YP182K

SIZE, TONS	DANFOSS MODEL NUMBER
25	DFS295
27	DFS325
40	DFS485

SIZE, TONS	EMERSON MODEL NUMBER Digital
6	YPD76K
9	YPD110K
10	YPD129K
11	YPD145K
13	YPD163K
15	YPD192K

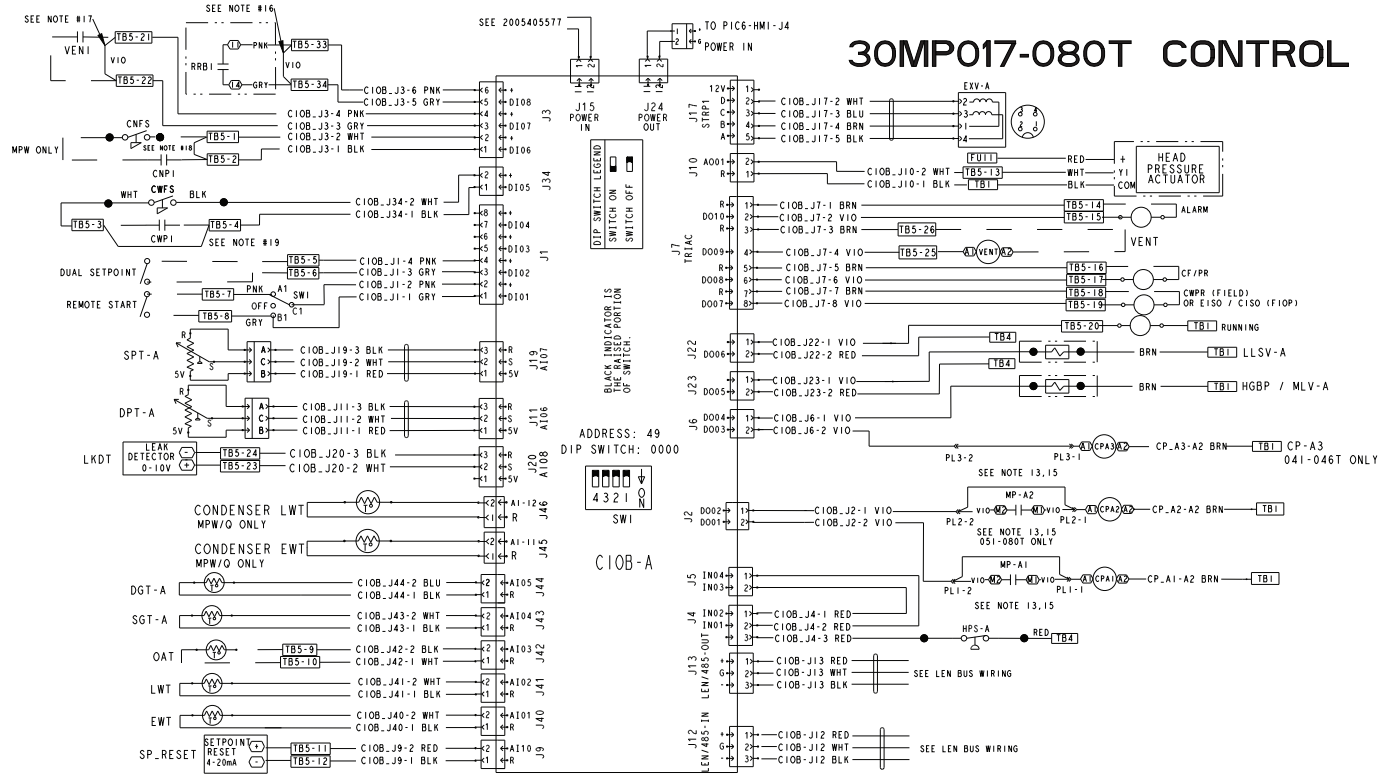
Table 21 — Standard Ampere Ratings per NEC 240-6

MOCP	REC. FUSE
15	15
20	20
25	25
30	30
35	35
40	40
45	45
50	50
60	60
70	70
80	80
90	90
100	100
110	110
125	125
150	150
175	175
200	200
225	225
250	250
300	300
350	350
400	400
450	450
500	500
600	600
700	700
800	800
1000	1000
1200	1200
1600	1600
2000	2000
2500	2500
3000	3000
4000	4000
5000	5000
6000	6000

LEGEND

MOCP —Maximum Overcurrent Protection

REC FUSE —Recommended dual element fuse amps (150% of compressor RLA). Size up to the next standard fuse size.



NOTES:

1. FIELD-SUPPLIED CONTROL CONDUCTORS TO BE AT LEAST 18AWG (AMERICAN WIRE GAGE) OR LARGER. THE CONTROL CABINET SHOULD ONLY BE USED FOR LOW VOLTAGE FIELD WIRING (50-V MAXIMUM.)
2. EACH DIGITAL OUTPUT LOOP SHALL BE LIMITED TO A MAXIMUM OF 1A AC RMS STEADY-STAT @ 24VAC. LIGHT LOAD RELAY IS RECOMMENDED AND THE COIL VOLTAGE OF RELAY IS 24VAC. POWER SUPPLY SHALL BE PROVIDED BY CUSTOMER FUSED TRANSFORMER.
3. EACH DISCRETE INPUT LOOP IS POWERED BY INTERNAL 24VAC POWER SUPPLY. FIELD OPTIONAL CONTACTS OR SWITCH MUST HAVE 24VAC RATING, MAX CURRENT IS 60MA. NOMINAL CURRENT IS 10MA. SWITCHES WITH GOLD PLATED BIFURCATED CONTACTS ARE RECOMMENDED.
4. THE ANALOG INPUTS SUPPORT 5K/10K NTC THERMISTORS, 0/4-20MA SENSORS AND 5VDC SENSORS. IF 100K IS USED IT WILL REQUIRE A SOFTWARE CONVERSION TABLE TO CONVERT TO 10K. FOR DETAILS REFER TO THE CONTROLS, OPERATIONS, AND TROUBLE SHOOTING MANUAL AND MATCH WITH SOFTWARE.
5. EACH ANALOG OUTPUT LOOP SUPPORTS 0/4-20MA OR 0/2-10VDC VOLTAGE OUTPUT. THE ANALOG OUTPUT LOOP IS POWERED BY IOB BOARD. DO NOT SUPPLY EXTERNAL POWER. FOR DETAILS REFER TO THE CONTROLS, OPERATIONS, AND TROUBLE SHOOTING MANUAL AND MATCH WITH SOFTWARE.
6. DRY TYPE CONTACT, RATED SWITCHING LOAD 230VAC/5A OR 24VDC/5A.
7. GROUND SHIELDS AT SIGNAL GENERATING DEVICES
8. ALL FIELD INTERLOCK CONTACTS MUST HAVE A MINIMAL RATING OF 2A@24VAC SEALED.
9. IF MOTOR PROTECTOR IS USED REMOVE JUMPER FROM ASSOCIATED TERMINAL BLOCKS
10. IF CHILLED WATER PUMP INTERLOCK OR CONDENSER PUMP INTERLOCK IS USED REMOVE JUMPER ACROSS ASSOCIATED TERMINAL BLOCKS
11. FACTORY INSTALLED WIRING MUST MEET REQUIREMENTS OF UL 60335/ UL 1995, ANY FIELD INSTALLED MUST ALSO FOLLOW THE APPLIANCE CODES, ALL WIRING MUST BE RATED 75 DEGREE C
12. COMPRESSOR AND FAN MOTORS ARE THERMALLY PROTECTED - THREE PHASE MOTORS PROTECTED AGAINST PRIMARY SINGLE PHASE CONDITIONS
13. CORESENSE COMPRESSOR PROTECTION MODULE IS USED ON THE FOLLOWING UNITS: A1 COMPRESSOR- DIGITAL OPTION- 031,033,041,046T (ALL VOLTAGES) A1,A2 COMPRESSOR- 051,056,066,080T (ALL VOLTAGES). JUMPER USED ON ALL OTHER COMPRESSORS.
14. FOR FUSE REPLACEMENT TABLE REFERENCE 2003716045 SHEET 2
15. IF MP IS USED, REMOVE THE JUMPER
16. JUMPER TB5-33 AND TB5-34 IF PHASE MONITOR, RRBI, OPTION NOT USED
17. JUMPER TB5-21 AND TB5-22 IF REFRIGERANT LEAK DETECTOR SYSTEM IS NOT REQUIRED. SEE INSTALLATION MANUAL FOR REQUIREMENTS.
18. REMOVE JUMPER BETWEEN TB5-1 AND TB5-2 IF CNFS/CNPI OPTION IS USED.
19. REMOVE JUMPER BETWEEN TB5-3 AND TB5-4 IF CWPI OPTION IS USED.

LEGEND

- DENOTES TEMPERATURE SENSOR
- DENOTES PRESSURE SENSOR
- DENOTES RELAY COIL
- DENOTES SHIELDED CABLE
- DENOTES SOLENOID
- DENOTES CONTACT
- DENOTES FLOAT SWITCH
- DENOTES SWITCH
- DENOTES FIELD WIRING
- DENOTES INTERNAL WIRING HARNESS

ABBREVIATION LISTING

CF	CONDENSER FAN	DGS	DISCHARGE GAS TEMPERATURE	LLSV	LIQUID LINE SOLENOID VALVE
CP	COMPRESSOR	DP	DISCHARGE PRESSURE	LWT	LEAVING WATER TEMPERATURE
CWFS	CHILLER WATER FLOW SWITCH	DUS	DIGITAL UNLOAD SOLENOID	MP	MOTOR PROTECTOR
CWPI	CHILLED WATER PUMP INTERLOCK	EXV	EXPANSION VALVE	OAT	OUTDOOR AIR TEMPERATURE
CNPI	CONDENSER PUMP INTERLOCK	EWT	ENTERING WATER TEMPERATURE	PR	CONDENSER PUMP RELAY
CNFS	CONDENSER FLOW SWITCH	EISOR	EVAPORATOR ISOLATOR RELAY	SP	SUCTION PRESSURE
CWP	CHILLED WATER PUMP	HPS	HIGH PRESSURE SWITCH	SUCT	SUCTION TEMPERATURE
CWPR	CHILLED WATER PUMP RELAY	HGBP	HOT GASBYPASS	VENI	VENTILATION INTERLOCK
CIOB	CARRIER INPUT/OUTPUT BOARD			VENT	VENTILATION OUTPUT

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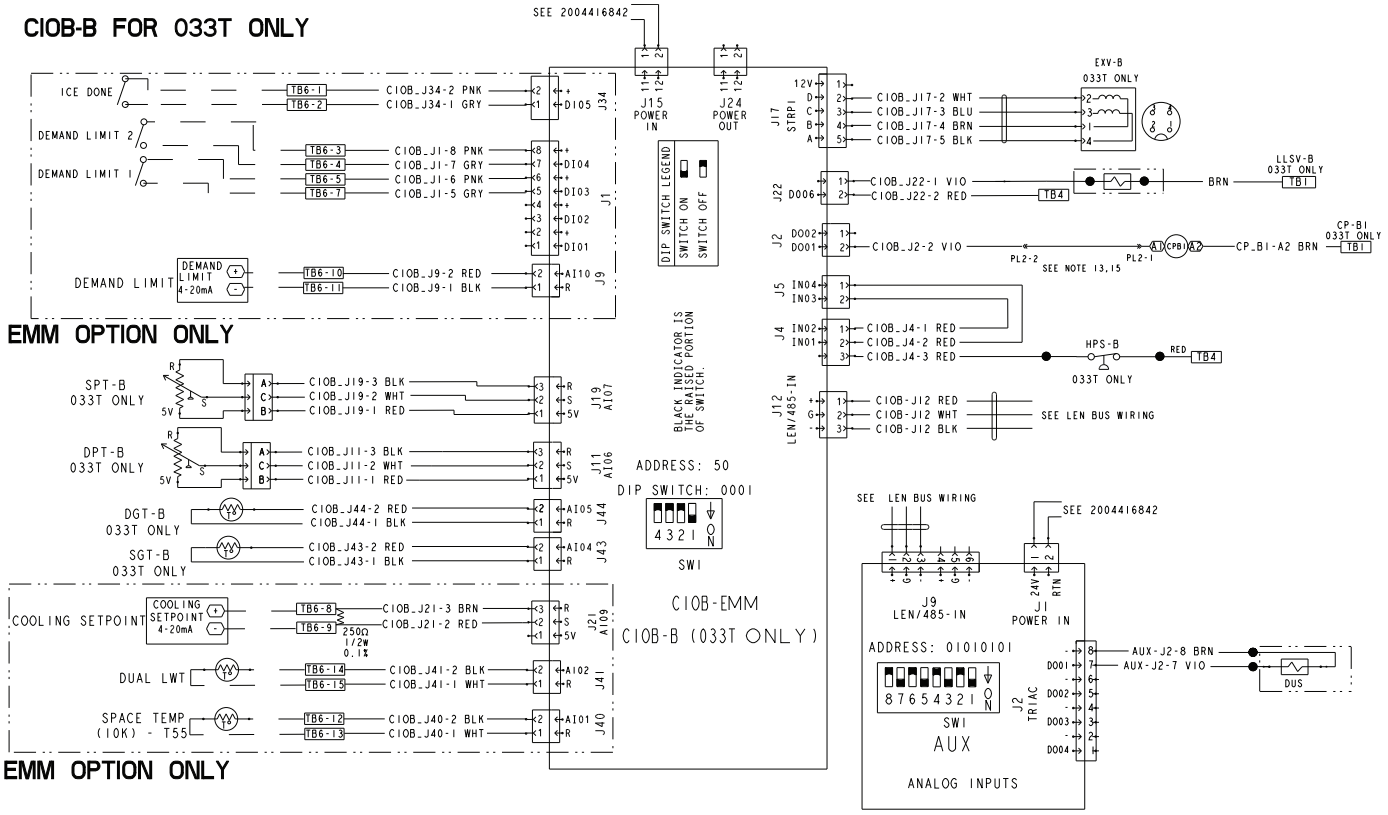
Fig. 61 — Controls Component Arrangements (30MP Sizes 017-080)



NOTES:
1. FIELD-SUPPLIED CONTROL CONDUCTORS TO BE AT LEAST 18AWG (AMERICAN WIRE GAGE) OR LARGER. THE CONTROL CABINET SHOULD ONLY BE USED FOR LOW VOLTAGE FIELD WIRING (50-V MAXIMUM.)
2. EACH DIGITAL OUTPUT LOOP SHALL BE LIMITED TO A MAXIMUM OF 1A AC RMS STEADY-STAT @ 24VAC. LIGHT LOAD RELAY IS RECOMMENDED AND THE COIL VOLTAGE OF RELAY IS 24VAC. POWER SUPPLY SHALL BE PROVIDED BY CUSTOMER FUSED TRANSFORMER.
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4. THE ANALOG INPUTS SUPPORT 5K/10K NTC THERMISTORS, 0/4-20MA SENSORS AND 5VDC SENSORS. IF 100K IS USED IT WILL REQUIRE A SOFTWARE CONVERSION TABLE TO CONVERT TO 10K. FOR DETAILS REFER TO THE CONTROLS, OPERATIONS, AND TROUBLE SHOOTING MANUAL AND MATCH WITH SOFTWARE.
5. EACH ANALOG OUTPUT LOOP SUPPORTS 0/4-20MA OR 0/2-10VDC VOLTAGE OUTPUT. THE ANALOG OUTPUT LOOP IS POWERED BY 10B BOARD. DO NOT SUPPLY EXTERNAL POWER. FOR DETAILS REFER TO THE CONTROLS, OPERATIONS, AND TROUBLE SHOOTING MANUAL AND MATCH WITH SOFTWARE.
6. DRY TYPE CONTACT, RATED SWITCHING LOAD 230VAC/5A OR 24VDC/5A.
7. GROUND SHIELDS AT SIGNAL GENERATING DEVICES
8. ALL FIELD INTERLOCK CONTACTS MUST HAVE A MINIMAL RATING OF 2A@24VAC SEALED.
9. IF MOTOR PROTECTOR IS USED REMOVE JUMPER FROM ASSOCIATED TERMINAL BLOCKS
10. IF CHILLED WATER PUMP INTERLOCK OR CONDENSER PUMP INTERLOCK IS USED REMOVE JUMPER ACROSS ASSOCIATED TERMINAL BLOCKS
11. FACTORY INSTALLED WIRING MUST MEET REQUIREMENTS OF UL 60335/ UL 1995, ANY FIELD INSTALLED MUST ALSO FOLLOW THE APPLIANCE CODES, ALL WIRING MUST BE RATED 75 DEGREE C
12. COMPRESSOR AND FAN MOTORS ARE THERMALLY PROTECTED - THREE PHASE MOTORS PROTECTED AGAINST PRIMARY SINGLE PHASE CONDITIONS
13. CORESENSE COMPRESSOR PROTECTION MODULE IS USED ON THE FOLLOWING UNITS: A1 COMPRESSOR- DIGITAL OPTION- 031,033,041,046T (ALL VOLTAGES) A1,A2 COMPRESSOR- 051,056,066,080T (ALL VOLTAGES). JUMPER USED ON ALL OTHER COMPRESSORS.
14. FOR FUSE REPLACEMENT TABLE REFERENCE 2003716045 SHEET 2
15. IF MP IS USED, REMOVE THE JUMPER
16. JUMPER TB5-33 AND TB5-34 IF PHASE MONITOR, RRB1, OPTION NOT USED
17. JUMPER TB5-21 AND TB5-22 IF REFRIGERANT LEAK DETECTOR SYSTEM IS NOT REQUIRED. SEE INSTALLATION MANUAL FOR REQUIREMENTS.
18. REMOVE JUMPER BETWEEN TB5-1 AND TB5-2 IF CNFS/CNPI OPTION IS USED.
19. REMOVE JUMPER BETWEEN TB5-3 AND TB5-4 IF CWPI OPTION IS USED.

LEGEND

- DENOTES TEMPERATURE SENSOR
- DENOTES PRESSURE SENSOR
- DENOTES RELAY COIL
- DENOTES SHIELDED CABLE
- DENOTES SOLENOID
- DENOTES CONTACT
- DENOTES FLOAT SWITCH
- DENOTES SWITCH
- DENOTES FIELD WIRING
- DENOTES INTERNAL WIRING HARNESS

ABBREVIATION LISTING

CF	CONDENSER FAN	DGS	DISCHARGE GAS TEMPERATURE	LLSV	LIQUID LINE SOLENOID VALVE
CP	COMPRESSOR	DP	DISCHARGE PRESSURE	LWT	LEAVING WATER TEMPERATURE
CWFS	CHILLER WATER FLOW SWITCH	DUS	DIGITAL UNLOAD SOLENOID	MP	MOTOR PROTECTOR
CWPI	CHILLED WATER PUMP INTERLOCK	EXV	EXPANSION VALVE	OAT	OUTDOOR AIR TEMPERATURE
CNPI	CONDENSER PUMP INTERLOCK	EWT	ENTERING WATER TEMPERATURE	PR	CONDENSER PUMP RELAY
CNFS	CONDENSER FLOW SWITCH	EISOR	EVAPORATOR ISOLATOR RELAY	SP	SUCTION PRESSURE
CWP	CHILLED WATER PUMP	HPS	HIGH PRESSURE SWITCH	SUCT	SUCTION TEMPERATURE
CWPR	CHILLED WATER PUMP RELAY	HGBP	HOT GASBYPASS	VENI	VENTILATION INTERLOCK
C10B	CARRIER INPUT/OUTPUT BOARD			VENT	VENTILATION OUTPUT

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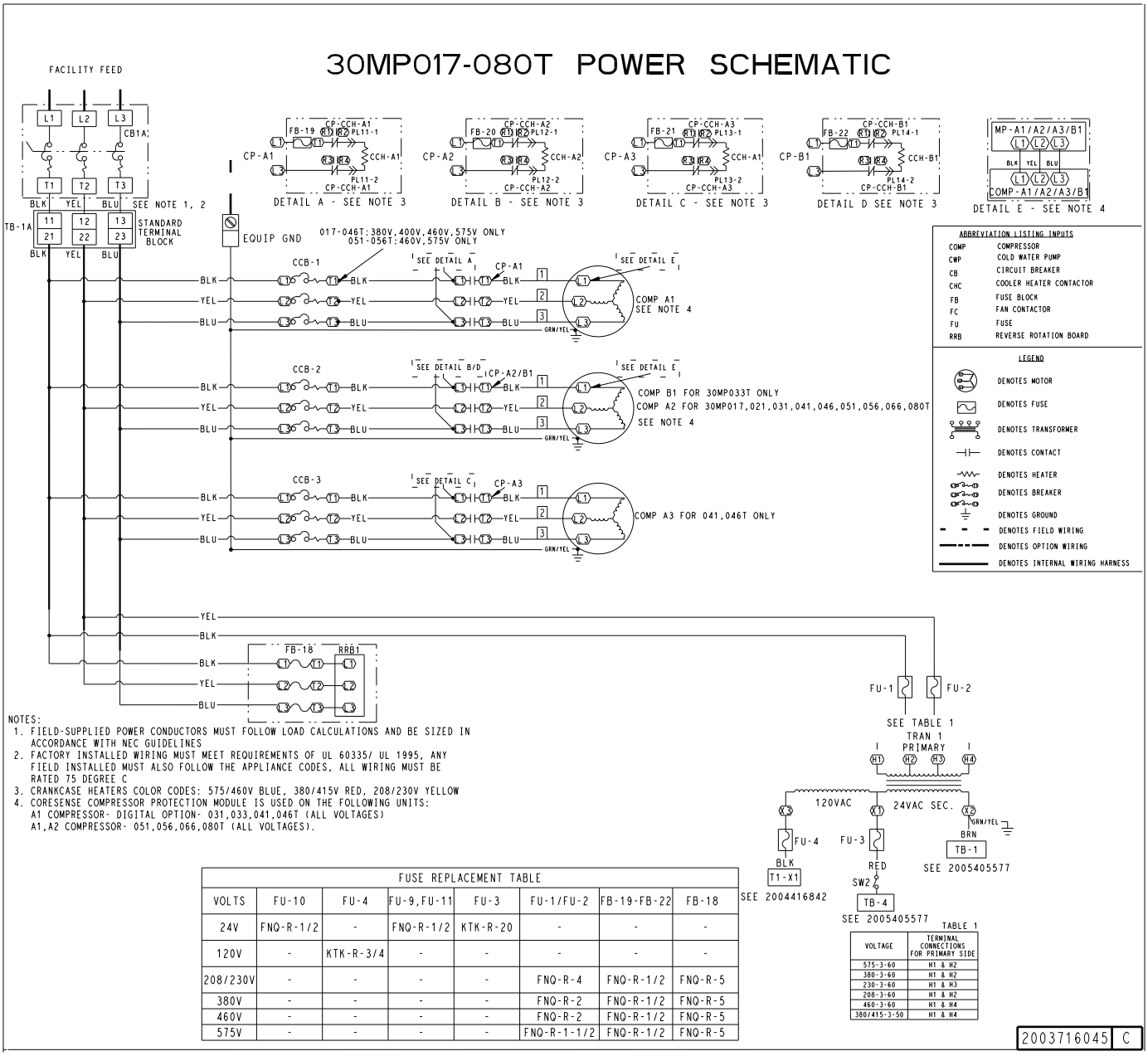
Fig. 61 — Controls Component Arrangements (30MP Sizes 017-080) cont



FUSE REPLACEMENT TABLE

VOLTS	FU-10	FU-4	FU-9,FU-11	FU-3	FU-1/FU-2	FB-19-FB-22	FB-18
24V	FNQ-R-1/2	-	FNQ-R-1/2	KTK-R-20	-	-	-
120V	-	KTK-R-3/4	-	-	-	-	-
208/230V	-	-	-	-	FNQ-R-4	FNQ-R-1/2	FNQ-R-5
380V	-	-	-	-	FNQ-R-2	FNQ-R-1/2	FNQ-R-5
460V	-	-	-	-	FNQ-R-2	FNQ-R-1/2	FNQ-R-5
575V	-	-	-	-	FNQ-R-1-1/2	FNQ-R-1/2	FNQ-R-5

Fig. 62 — Power Schematic (30MP Sizes 017-080)

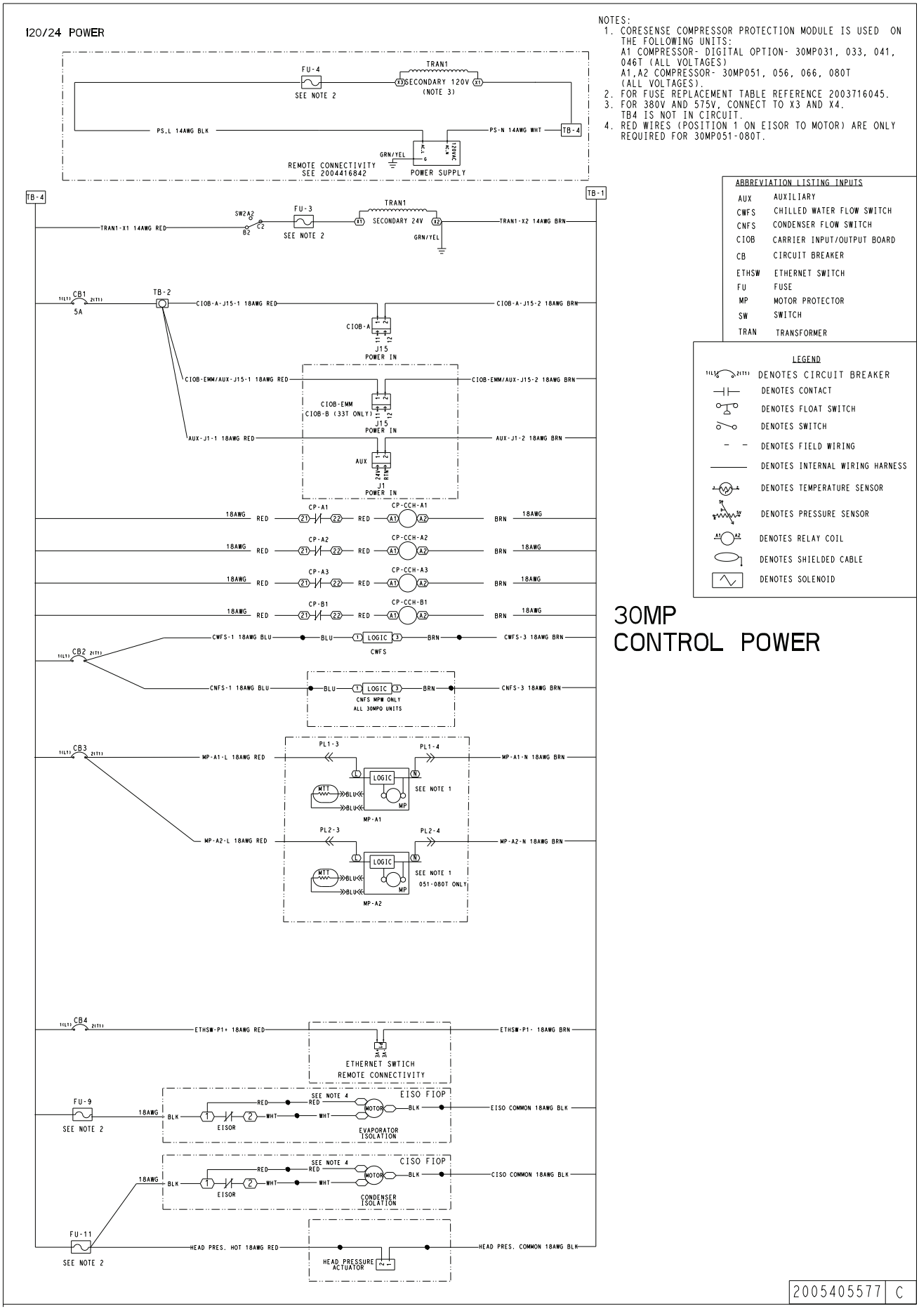
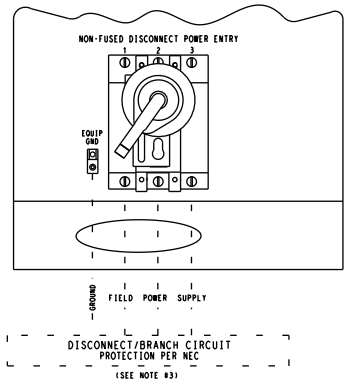


Fig. 63 — Power Control Electrical Wiring Schematic (30MP Sizes 017-080)

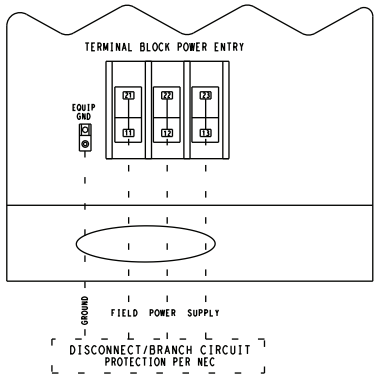
NOTES:
1. FACTORY WIRING IS IN ACCORDANCE WITH UL 60335-40-2 STANDARDS. FIELD MODIFICATIONS MUST BE IN COMPLIANCE WITH ALL APPLICABLE CODES.
2. ALL UNITS OR MODULES HAVE SINGLE POINT PRIMARY POWER CONNECTION. MAIN POWER MUST BE SUPPLIED FROM A FIELD OR FACTORY SUPPLIED DISCONNECT.
3. WIRING FOR MAIN FIELD SUPPLY MUST BE RATED 75C. USE COPPER CONDUCTORS ONLY.

CONNECTION TYPE	MCA RANGE	WIRE SIZE RANGE	MAXIMUM NUMBER OF WIRES PER PHASE	HIGH SCCR FUSE TYPE
TERMINAL BLOCK	MCA UP TO 175	14 AWG TO 2/0 AWG	1	J, T, RK1, RK5, G, CC
	MCA 175.1 TO 420	2 AWG TO 600kcmil	1	J, T, RK1, RK5, G, CC
NON-FUSED DISCONNECT	MCA UP TO 125	14 AWG - 3/0 AWG	1	-
	MCA 125.1 TO 225	4 AWG TO 4/0	1	-
	MCA 225.1 TO 400	2/0 AWG TO 500kcmil	1	-
		2/0 AWG TO 250kcmil	2	-

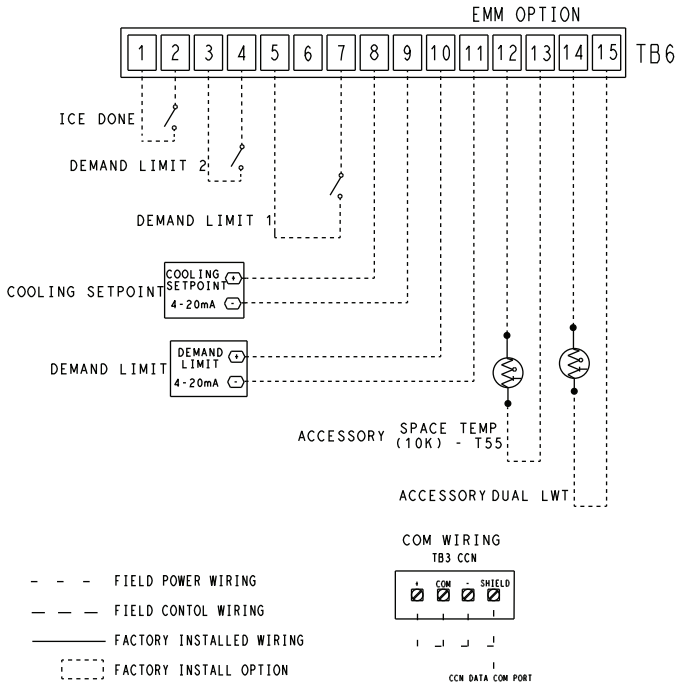
4. REFER TO CERTIFIED DIMENSIONAL DRAWINGS FOR EXACT LOCATIONS OF THE MAIN POWER AND CONTROL POWER ENTRANCE LOCATION.
5. TB5-18 AND TB5-19 ARE FOR CONTROL OF CHILLED WATER PUMP. TB5-16 AND TB5-17 ARE FOR CONTROL OF CONDENSER WATER PUMP. THE MAXIMUM LOAD ALLOWED FOR THE CHILLED WATER PUMP RELAY IS 5 VA SEALED, 10 VA INRUSH AT 24 V. FIELD POWER SUPPLY IS NOT REQUIRED.
6. TERMINALS TB5-20 AND TB5-14,15 ARE FOR RUNNING AND ALARM RELAYS. THE MAXIMUM LOAD ALLOWED FOR THE ALARM RELAY IS 5 VA SEALED. 10 VA INRUSH AT 24V. FIELD POWER SUPPLY IS NOT REQUIRED.
7. THE CONNECTION FOR DEMAND LIMIT AND ICE DONE OPTIONS MUST BE RATED FOR DRY CIRCUIT APPLICATION CAPABLE OF HANDLING A 24VAC LOAD UP TO 50 MA. INSTALLATION OF OPTIONAL ENERGY MANAGEMENT BOARD REQUIRED.
8. REMOVE FACTORY INSTALLED JUMPER BETWEEN TERMINALS TB5-3 AND 4 WHEN FIELD CWPI IS INSTALLED.
9. TB5-7 AND 8 OF TB5 ARE FOR FIELD EXTERNAL CONNECTIONS FOR REMOTE ON-OFF THE CONTACTS MUST BE RATED FOR DRY CIRCUIT APPLICATION CAPABLE OF HANDLING A 24VAC LOAD UP 50MA.
10. REMOVE FACTORY INSTALLED JUMPER BETWEEN TERMINALS TB5-1 AND TB5-2 WHEN FIELD CNPI IS INSTALLED.
11. REMOVE FACTORY INSTALLED JUMPER BETWEEN TERMINALS TB5-21 AND TB5-22 WHEN FIELD VENI IS INSTALLED.

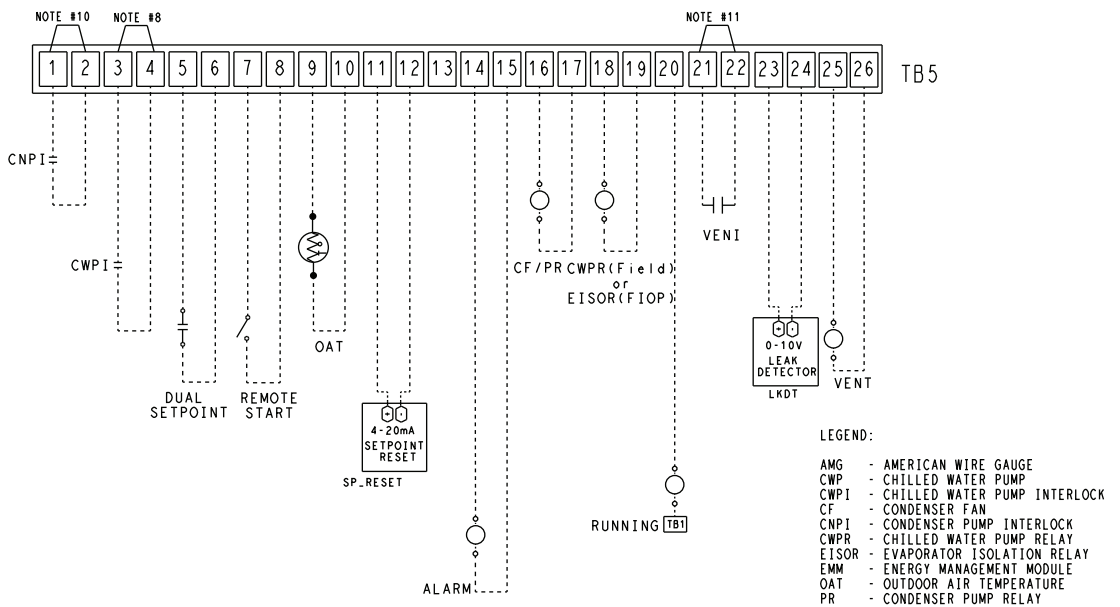


DISCONNECT



TERMINAL BLOCK





TYPICAL MAIN POWER & CONTROL CONNECTIONS

ITC CLASSIFICATION	SHEET	DATE	SUPERCEDES	30MP 017-080T ELECTRICAL	30MP60000600	REV
U.S. ECCN:EAR99	1 OF 1	05/07/24	-	-		A

Fig. 64 — Typical Low Voltage Field Wiring

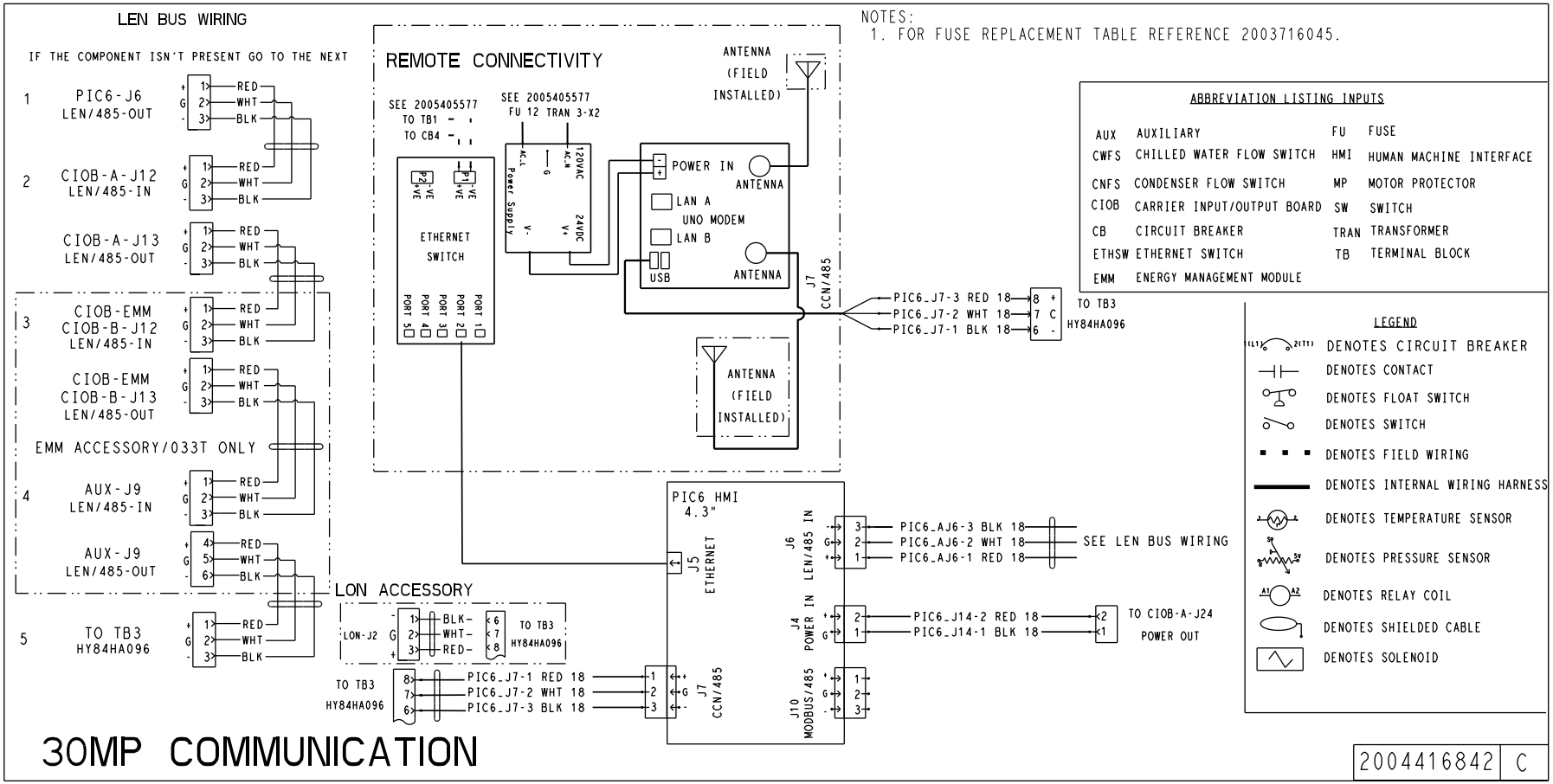


Fig. 65 — Communication Accessory Wiring Schematic (30MP)

30MPA, MPW, MPQ Power Section

The power section supplies power to the 30MPA, MPW, MPQ unit. The electrical power supply is brought in through the top left-hand side of the control box. Pressure-lug connections on the terminal blocks are suitable for only for copper conductors.

The control box power section contains components:

- power terminal block
- optional disconnect switch
- compressor circuit breaker(s)
- compressor contactor(s)
- control transformer
- ground lug
- crankcase heater relay (30MPA all units, 30MPW/MPQ031-080)
- fuses

Flow Switches

Flow switches are provided on all units to provide a proof of evaporator flow and are factory-installed and wired. A condenser flow switch is available as an accessory for all 30MPW units, and can be field-installed. The Carrier flow switch accessory (part no. 30MP-900---004) is available for this purpose. Flow switch wiring terminals are located in the field wiring compartment of the control box. The flow switch should be wired between terminals TB5-1 and 2 for all units. Condenser water flow switch cannot be used if a condenser water regulating valve is installed.

30MPE DISTRIBUTION PANEL

Inside the panel are terminals for field power and ground (earth) wiring. A ground connection is available, and must be connected, in the 30MPE panel for each chiller.

30MPE Distribution Panel (Power Section)

The distribution panel provides power to the 30MPE distribution panel. The electrical power supply is brought in through the top of the 30MPE distribution panel. Pressure-lug connections on the terminal blocks or bus bar are suitable for copper conductors only. The distribution panel power section contains the following components:

- power terminal blocks or bus bar
- circuit breakers
- ground lugs

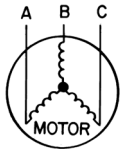
UNBALANCED 3-PHASE SUPPLY VOLTAGE

Use the following formula to determine the percent voltage imbalance:

% Voltage Imbalance =

$$100 \times \frac{\text{max voltage deviation from average voltage}}{\text{average voltage}}$$

EXAMPLE: Supply voltage is 240-3-60.



AB = 243-v
BC = 236-v
AC = 238-v

$$\text{Average Voltage} = \frac{243 + 236 + 238}{3}$$

$$= 239\text{-v}$$

Determine maximum deviation from average voltage:

(AB) 243 – 239 = 4-v

(BC) 239 – 236 = 3-v

(AC) 239 – 238 = 1-v

Maximum deviation is 4-v.

Determine percent voltage imbalance:

$$\text{\% Voltage Imbalance} = 100 \times \frac{4}{239}$$

$$= 1.7\%$$

This amount of phase imbalance is satisfactory as it is below the maximum allowable 2%.

IMPORTANT: If the supply voltage phase imbalance is more than 2%, contact your local utility company immediately.