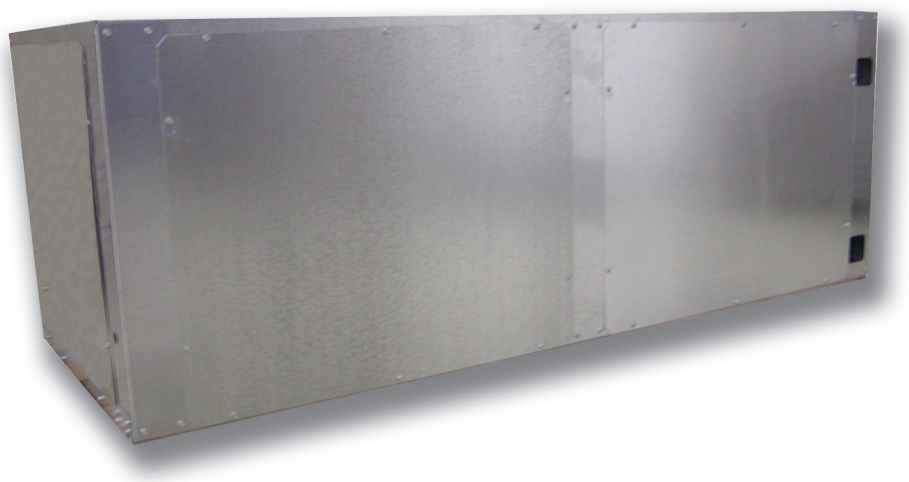
Installation, Operation, and Maintenance

Water Source Heat Pump
Axiom™ Water-to-Water — EXW
5–20 Tons — 60 Hz



⚠ SAFETY WARNING

Only qualified personnel should install and service the equipment. The installation, starting up, and servicing of heating, ventilating, and air-conditioning equipment can be hazardous and requires specific knowledge and training. Improperly installed, adjusted or altered equipment by an unqualified person could result in death or serious injury. When working on the equipment, observe all precautions in the literature and on the tags, stickers, and labels that are attached to the equipment.

March 2020 **WSHP-SVX02C-EN**

Introduction

Read this manual thoroughly before operating or servicing this unit.

Warnings, Cautions, and Notices

Safety advisories appear throughout this manual as required. Your personal safety and the proper operation of this machine depend upon the strict observance of these precautions.

The three types of advisories are defined as follows:

⚠WARNING Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

⚠CAUTION Indicates a potentially hazardous situation which, if not avoided, could result in minor or moderate injury. It could also be used to alert against unsafe practices.

NOTICE Indicates a situation that could result in equipment or property-damage only accidents.

Important Environmental Concerns

Scientific research has shown that certain man-made chemicals can affect the earth's naturally occurring stratospheric ozone layer when released to the atmosphere. In particular, several of the identified chemicals that may affect the ozone layer are refrigerants that contain Chlorine, Fluorine and Carbon (CFCs) and those containing Hydrogen, Chlorine, Fluorine and Carbon (HCFCs). Not all refrigerants containing these compounds have the same potential impact to the environment. Trane advocates the responsible handling of all refrigerants-including industry replacements for CFCs and HCFCs such as saturated or unsaturated HFCs and HCFCs.

Important Responsible Refrigerant Practices

Trane believes that responsible refrigerant practices are important to the environment, our customers, and the air conditioning industry. All technicians who handle refrigerants must be certified according to local rules. For the USA, the Federal Clean Air Act (Section 608) sets forth the requirements for handling, reclaiming, recovering and recycling of certain refrigerants and the equipment that is used in these service procedures. In addition, some states or municipalities may have additional requirements that must also be adhered to for responsible management of refrigerants. Know the applicable laws and follow them.

⚠WARNING

Proper Field Wiring and Grounding Required!

Failure to follow code could result in death or serious injury. All field wiring MUST be performed by qualified personnel. Improperly installed and grounded field wiring poses FIRE and ELECTROCUTION hazards. To avoid these hazards, you MUST follow requirements for field wiring installation and grounding as described in NEC and your local/state electrical codes.

⚠WARNING

Contains Refrigerant!

System contains oil and refrigerant under high pressure. Recover refrigerant to relieve pressure before opening the system. See unit nameplate for refrigerant type. Do not use non-approved refrigerants, refrigerant substitutes, or refrigerant additives.

Failure to follow proper procedures or the use of nonapproved refrigerants, refrigerant substitutes, or refrigerant additives could result in death or serious injury or equipment damage.

⚠WARNING

Personal Protective Equipment (PPE) Required!

Failure to wear proper PPE for the job being undertaken could result in death or serious injury. Technicians, in order to protect themselves from potential electrical, mechanical, and chemical hazards, MUST follow precautions in this manual and on the tags, stickers, and labels, as well as the instructions below:

- **Before installing/servicing this unit, technicians MUST put on all PPE required for the work being undertaken (Examples; cut resistant gloves/sleeves, butyl gloves, safety glasses, hard hat/bump cap, fall protection, electrical PPE and arc flash clothing). ALWAYS refer to appropriate Safety Data Sheets (SDS) and OSHA guidelines for proper PPE.**
- **When working with or around hazardous chemicals, ALWAYS refer to the appropriate SDS and OSHA/GHS (Global Harmonized System of Classification and Labeling of Chemicals) guidelines for information on allowable personal exposure levels, proper respiratory protection and handling instructions.**
- **If there is a risk of energized electrical contact, arc, or flash, technicians MUST put on all PPE in accordance with OSHA, NFPA 70E, or other country-specific requirements for arc flash protection, PRIOR to servicing the unit. NEVER PERFORM ANY SWITCHING, DISCONNECTING, OR VOLTAGE TESTING WITHOUT PROPER ELECTRICAL PPE AND ARC FLASH CLOTHING. ENSURE ELECTRICAL METERS AND EQUIPMENT ARE PROPERLY RATED FOR INTENDED VOLTAGE.**

⚠WARNING

Follow EHS Policies!

Failure to follow instructions below could result in death or serious injury.

- **All Trane personnel must follow the company's Environmental, Health and Safety (EHS) policies when performing work such as hot work, electrical, fall protection, lockout/tagout, refrigerant handling, etc. Where local regulations are more stringent than these policies, those regulations supersede these policies.**
- **Non-Trane personnel should always follow local regulations.**

Copyright

Trademarks

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General Information

⚠WARNING

Fiberglass Wool!

Product contains fiberglass wool. Disturbing the insulation in this product during installation, maintenance or repair will expose you to airborne particles of glass wool fibers and ceramic fibers known to the state of California to cause cancer through inhalation. Glass wool fibers may also cause respiratory, skin or eye irritation.

Jobsite Inspection

Always perform the following checks before accepting a unit:

- Verify that the nameplate data matches the data on the sales order and bill of lading (including electrical data).
- Verify that the power supply complies with the unit nameplate specifications.
- Visually inspect the exterior of the unit, for signs of shipping damage. Do not sign the bill of lading accepting the unit(s) until inspection has been completed. Check for damage promptly after the unit(s) are unloaded. Once the bill of lading is signed at the jobsite, the unit(s) are now the property of the SOLD TO party and future freight claims MAY NOT be accepted by the freight company.
- Verify that the refrigerant charge has been retained during shipment by use of gauges. Access fittings are located internal to the cabinet on the 5-ton through 20-ton equipment.
- After assuring that charge has been retained, reinstall the caps to assure that refrigerant leakage does not occur.

⚠CAUTION

Microbial Growth!

Wet interior unit insulation can become an amplification site for microbial growth (mold), which may cause odors and damage to the equipment and building materials. If there is evidence of microbial growth (mold) on the interior insulation, the insulation should be removed and replaced prior to operating the system.

Jobsite Storage

This unit is intended for indoor use only. To protect the unit from damage due to the elements, and to prevent possible IAQ contaminant sources from growing, the unit should be stored indoors. If indoor storage is not possible, the following provisions for outdoor storage must be met:

- Place the unit(s) on a dry surface or raise above the ground to assure adequate air circulation beneath the unit.
- Cover the unit(s) with a waterproof tarp to protect them from the elements.
- Make provisions for continuous venting of the covered units to prevent moisture from standing on the unit(s) surfaces. Wet interior unit insulation can become an amplification site for microbial growth (mold) which has been determined to be a cause of odors and serious health related indoor air quality problems.
- Store units in the normal UP orientation to maintain oil in the compressor.
- Do not stack more than three units in total height for the EXWE 5 and 10-ton configurations, and no more than two units high for the EXWE configuration.

Unit Nameplate

The unit nameplate is located at the front of the unit. It includes the unit model number, serial number, electrical characteristics, refrigerant charge, and other pertinent unit data.

Compressor Nameplate

The nameplate for the compressors are located on the compressor shell.

Unit Description

Before shipment, each unit is leak tested, dehydrated, charged with refrigerant and run tested for proper control operation.

Water-to-Refrigerant Coils

The water-to-refrigerant heat exchangers are an inner copper tube or cupro-nickel (option available on the source-side only) and steel tube (tube-within-a-tube) design and are leak tested to assure there is no cross leakage between the water and refrigerant gas.

Water Connections

Water connections are located inside the unit and are accessible from the back of the unit. The fitting is a female pipe threaded connection. The size of the connection is 1″ for the 5 ton, 1½″ for the 10 ton and 2″ for the 20 ton unit.

Controls

The control system offered to control the unit is a deluxe 24 volt micro processing board.

All power wiring to the equipment is made at the power.

All low voltage wiring is made at the unit's low voltage terminal board.

Wiring Connections

Troubleshooting and connection diagrams for the equipment may be located in the back of this manual.

Deluxe 24V Controls

The Deluxe 24V control design will incorporate a microprocessor-based control board. The Trane microprocessor board is factory wired to a terminal strip to provide all necessary terminals for field connection. The deluxe board is equipped with a random start relay, anti-short cycle timer, brown out protection, compressor disable, unit safety control, diagnostics and a generic relay (which may be available for field use). See p. 15 for diagnostic information.

Access Fittings

Connections for the low and high side of the refrigeration system are located conveniently behind the refrigeration access panel.

Model Number Description

E	X	W	E	240	4	1	A	0	0	B	0	0	0	D	0
1	2	3	4	5-7	8	9	10	11	12	13	14	15	16	17	18

Digits 1-3: Unit Configuration

EXW = Water to Water Heat Pump

Digit 4: Development Sequence

E = R-410A

Digits 5-7: Nominal Size (Tons)

060 = 5 Tons
120 = 10 Tons
240 = 20 Tons

Digit 8: Voltage (Volts/Hz/Phase)

1 = 208/60/1
2 = 230/60/1
3 = 208/60/3
4 = 460/60/3
8 = 230/60/3

Digit 9: Heat Exchanger (Source Side)

1 = Copper-Water Coil
2 = Cupro-Nickel Water Coil

Note: *Heat Exchanger for the Load Side is Copper-Water Coil ONLY.*

Digit 10: Current Design Sequence

Digit 11: Refrigeration Circuit

0 = Heat Pump

Digit 12: Open Digit

Digit 13: Freeze Protection (Source Side)

A = 20°F
B = 35°F

Note: *The Load Side will have a 35°F Freeze Protection.*

Digit 14: Open Digit

Digit 15: Open Digit

Digit 16: Open Digit

Digit 17: Control Type

D = Deluxe 24 V Control

Digit 18: Tstat Location

0 = Field Supplied

Dimensions and Clearances

⚠WARNING

Improper Unit Lift!

Test lift unit approximately 24 inches to verify proper center of gravity lift point. To avoid dropping of unit, reposition lifting point if unit is not level. Failure to properly lift unit could result in death or serious injury or possible equipment or property-only damage.

Table 1. Unit weights

Size	Approximate Shipping Weight with pallet (lb)	Approximate Weight w/o pallet (lb)"
EXWE060	326	296
EXWE120	653	613
EXWE240	1222	1156

Unit Location and Clearances

Locate the unit in an indoor area. The ambient temperature surrounding the unit must not be less than 45°F. Do not locate the unit in areas subject to freezing. Attention should be given to service clearance and technician safety. The unit access panels may be easily removed. There must be enough space for service personnel to perform maintenance or repair. Provide sufficient room to make water, and electrical connection(s). Local and national codes should be followed in providing electrical power connections. See Figure 1 for mechanical clearances.

Figure 1.

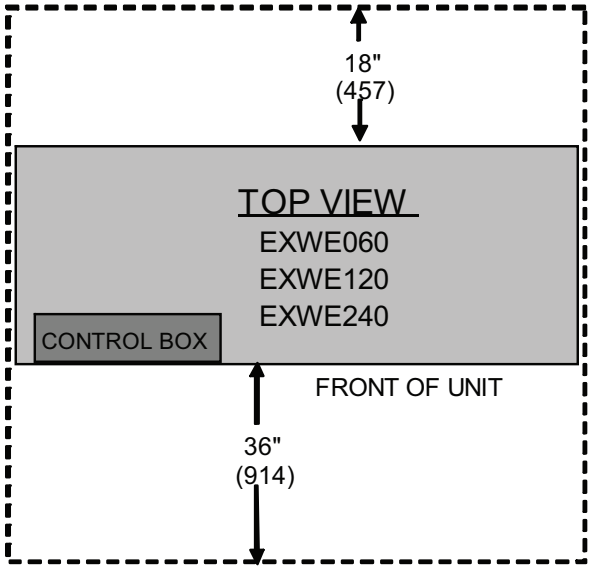


Figure 2. EXWE060

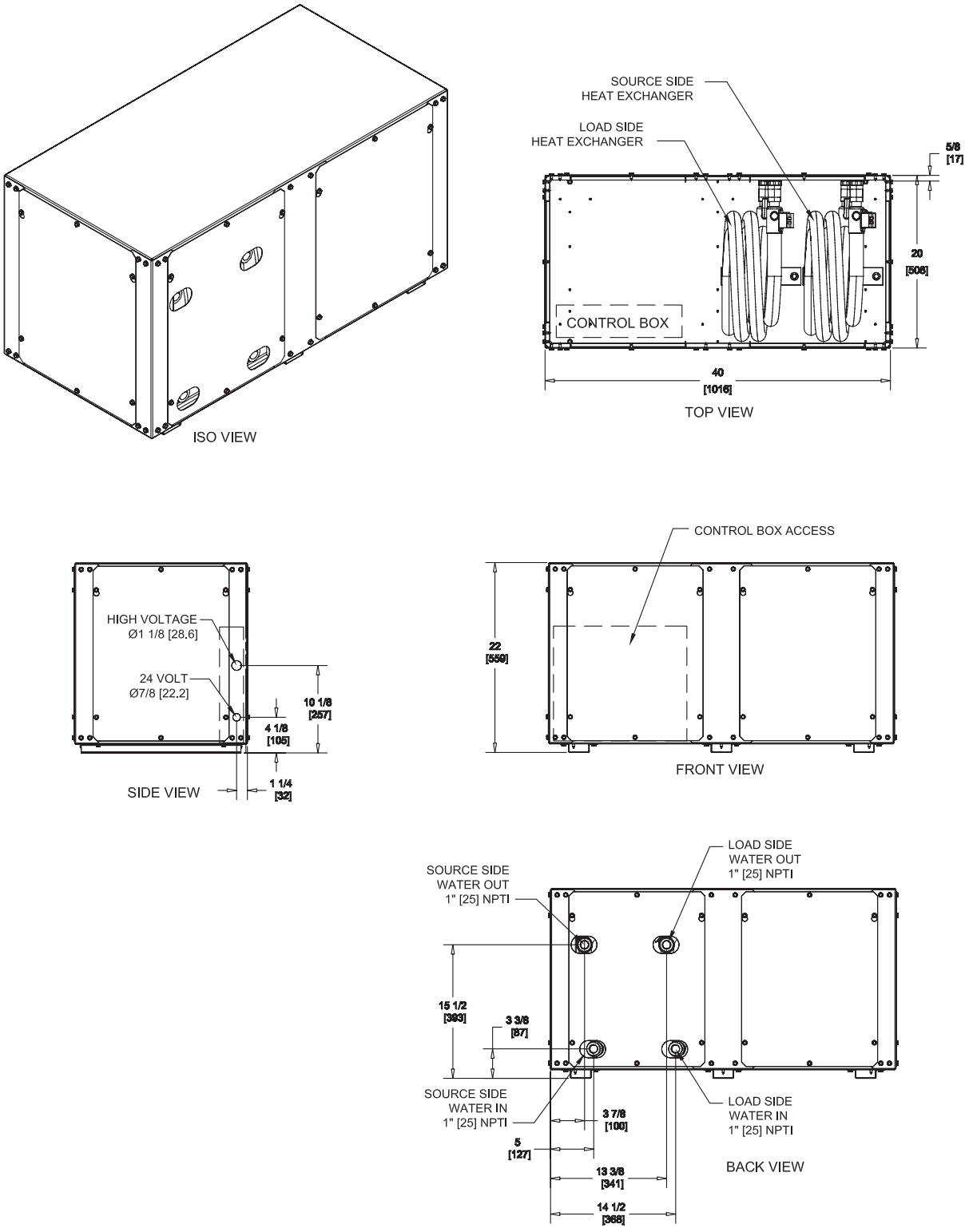


Figure 3. EXWE120

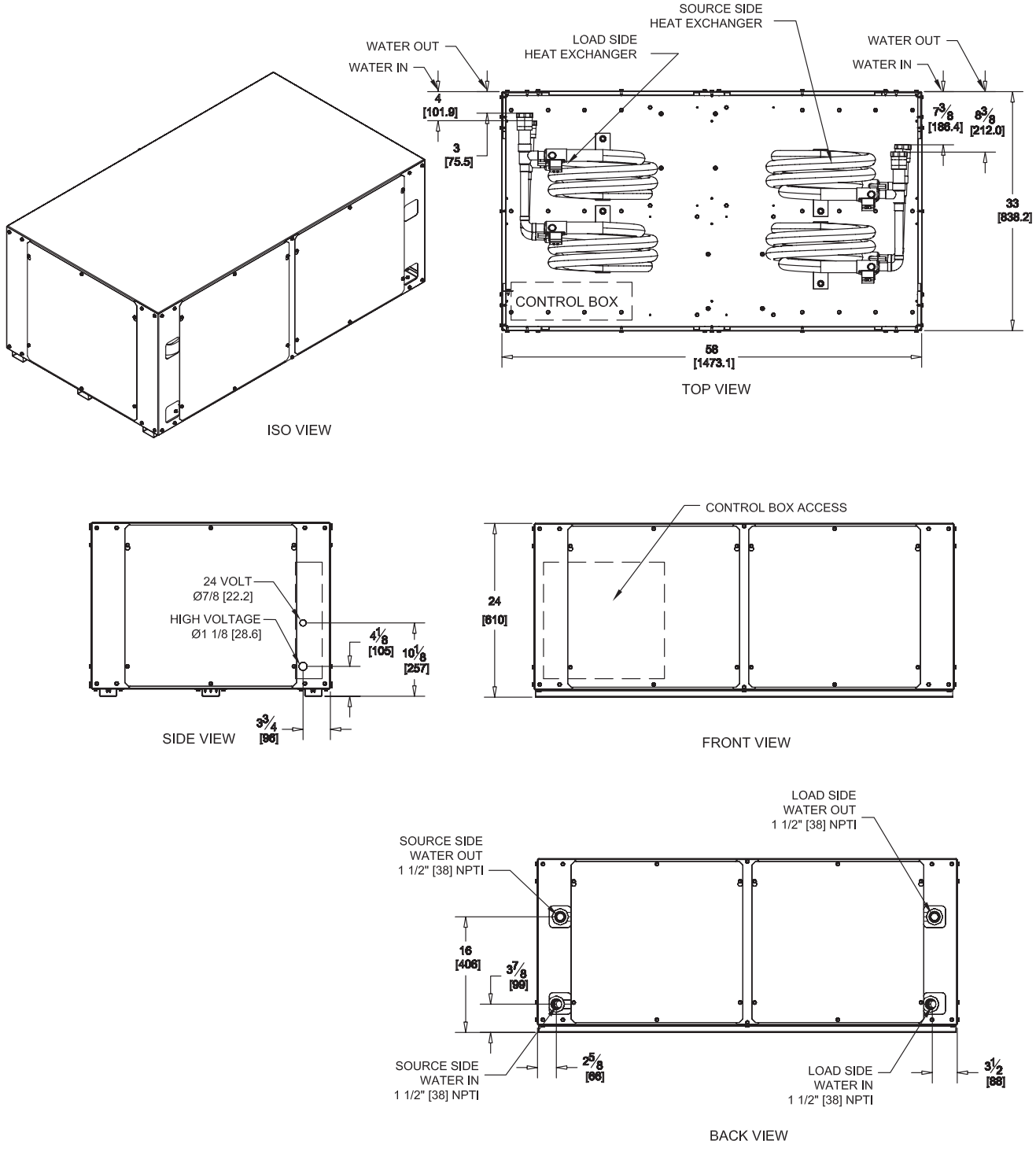
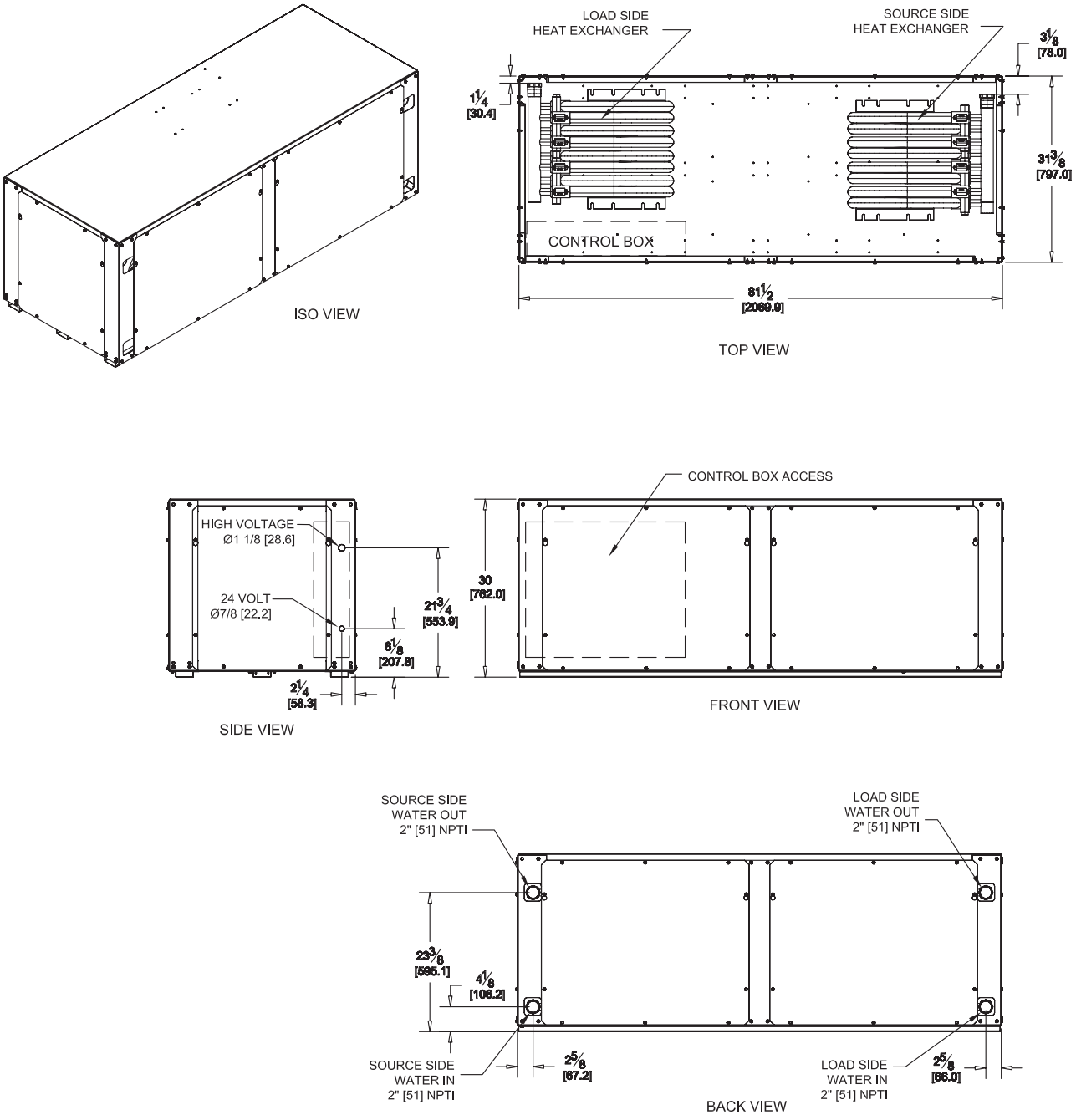


Figure 4. EXWE240



Installation

General Installation Checks

The checklist below is a summary of the steps required to successfully install a unit. This checklist is intended to acquaint the installing personnel with procedures required in the installation process. It does not replace the detailed instructions called out in the applicable sections of this manual.

1. Remove packaging and inspect the unit. Check the unit for shipping damage and material shortage; file a freight claim and notify appropriate sales representation.

Note: *The units have been tied to the skid by (4) angle brackets. Remove these brackets from the unit to slide unit from skid.*

2. Verify the correct model, options and voltage from the unit nameplate.
3. Verify the installation location of the unit will provide the required clearance for proper operation.
4. Remove refrigeration access panel and inspect the unit. Be certain the refrigerant tubing has clearance from adjacent parts.

⚠WARNING

Hazardous Voltage!

Disconnect all electric power, including remote disconnects before servicing. Follow proper lockout/tagout procedures to ensure the power can not be inadvertently energized. Failure to disconnect power before servicing could result in death or serious injury.

Main Electrical

5. Verify the power supply complies with the unit nameplate specifications.
6. Inspect all control panel components; tighten any loose connections.
7. Connect properly sized and protected power supply wiring to a field-supplied/installed disconnect switch and to the main power terminal block (1TB1) in the unit control box.
8. Install proper grounding wires to an earth ground.

Note: *All field-installed wiring must comply with NEC and applicable local codes.*

Low Voltage Wiring Requirements

9. Connect properly sized control wiring to the proper termination points between the field supplied thermostat and the terminal strip located in the equipment control box.

⚠WARNING

Improper Unit Lift!

Test lift unit approximately 24 inches to verify proper center of gravity lift point. To avoid dropping of unit, reposition lifting point if unit is not level. Failure to properly lift unit could result in death or serious injury or possible equipment or property-only damage.

Unit Placement

Units may be placed into a field supplied mechanical rack or placed on a finished floor. Loosen compressor bolts to release tension of the rubber grommets to help reduce vibration during operation. Sound proofing material (field supplied) is recommended to help attenuate noise generated by compressor vibration.

It is important to leave appropriate clearances around the unit to achieve maintenance and serviceability to the equipment. See p. 8 for service clearance dimensions.

Water Connection

Connect the source-side and load-side water-in/water-out from the water-to-water heat pump to the source system and the load system.

Note: *The source for a water-to-water heat pump is typically a boiler/cooling tower or geothermal loop. The load for a water-to-water heat pump is typically fresh-air unit(s), fan coil(s), hydronic coil(s), radiant heat, wall fin, or potable water.*

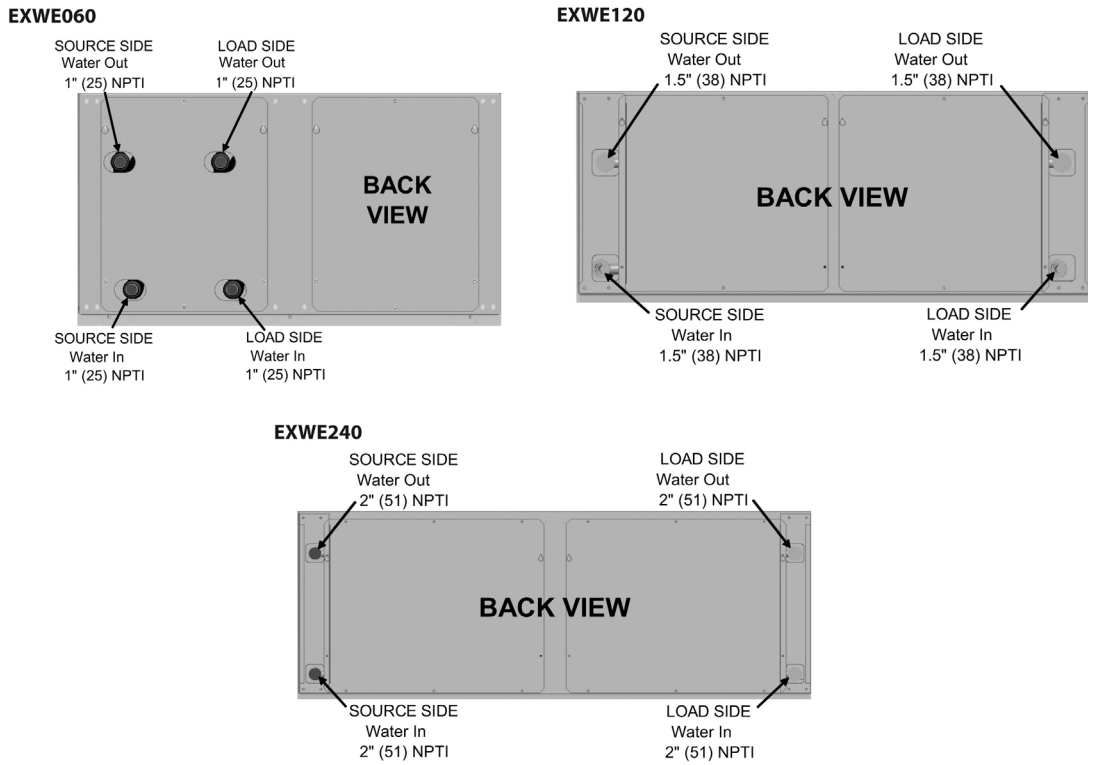
The source-side connection and the load-side connections are at the rear of the unit.

For vibration isolation, it is recommended that flexible steel braided hoses be installed instead of hard piping the equipment to the main loop system or mechanical device.

Additional accessories, such as a strainer are recommended for use to eliminate contaminants from entering the co-axial water-to-refrigerant heat exchangers.

Note: *Provide insulation on water and refrigerant piping on geothermal applications.*

Figure 5. Water connection



Cleaning and Flushing the Water Loop

After the piping system is complete, the flexible hose connectors should be doubled back to complete the water circuit external to the unit (avoiding trash settle-out in the water coils). Figure 6, p. 13. An extra pipe may be necessary to connect the hose kits. See Table 2, p. 14 for antifreeze/water mixture by volume.

1. Water circulation system should be filled with clean water using the water make up connections.

Note: *Air vents should be opened during filling.*

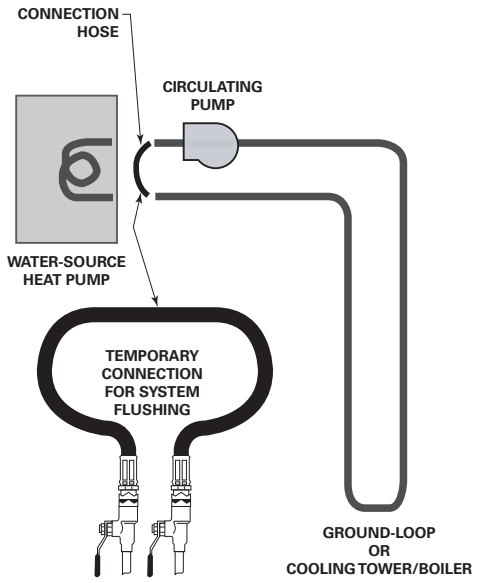
2. With the air vents closed, start the circulating pump and then crack the air vents to bleed off the trapped air, assuring circulation through all components of the system.

Note: *Make up water must be available to the system to replace the volume formerly occupied by the air that is bled off.*

3. With the air vented and the water circulating, the entire system should be checked for leaks with repairs made as required.
4. Operate the supplementary heat system making checks per manufacturer's instructions. During this operation, visual checks should be made for leaks that may have occurred due to increased heat. Repair as required.
5. Open the system at the lowest point for the initial blow down (making sure the make up water is equal to the water being dumped). Continue blow down until the water leaving the drain runs clear, but not less than 2 hours.
6. Shut down pumps and supplementary heat system. Reconnect the hoses placing the water-to-refrigerant heat exchanger in the water circulating system.

Note: *Vents should be open when the pumps and supplementary heat system are shut down.*

Figure 6. Flushing water loop



Using Antifreeze

In areas of the country where entering water temperatures drop below 45°F or where piping is being run through areas subject to freezing, the loop must be freeze protected by using an approved antifreeze solution to prevent the earth loop water from freezing inside the heat exchanger. Methanol and glycols are the most commonly used antifreeze solutions. Consult your geothermal unit supplier for locally approved solutions in your area.

Propylene glycol is not recommended in installations where the water temperature are expected to fall below 30°F. At extreme temperatures, the viscosity increases to the point where normal loop circulating pumps may not maintain proper flow.

If propylene glycol is the only locally approved solution for anti-freeze, good engineering practices should be used to achieve the desired flow.

Calculate the approximate volume of water in the system by using the requirements detailed in Table 13, p. 24. Add three gallons to this total to allow for the water contained in the hose kit and geothermal unit.

Table 2. Antifreeze requirements based on volume

Type of Antifreeze	Minimum Temperature for Freeze Protection				
	10°F	15°F	20°F	25°F	30°F
Methanol	25%	21%	16%	10%	3%
Propylene Glycol	—	—	—	—	6%

Cleaning and Flushing the Water Loop

All installations must be thoroughly flushed to remove air and dirt from the earth loop before running the system.

The loop must be flushed with a high volume of water at a minimum velocity of (2 feet per second) in both directions. See Table 3 for flow rates required to flush earth loops.

Table 3. System flushing flow rates

Pipe	Gallons per 100 Ft.	Minimum Flush GPM
¾" PE	3.02	3.8
1" PE	4.73	6.0
1¼" PE	7.55	9.5
1½ PE	9.93	13.0
2" PE	15.36	21.0

Field Installed Power Wiring

⚠WARNING

Hazardous Voltage!

Disconnect all electric power, including remote disconnects before servicing. Follow proper lockout/tagout procedures to ensure the power can not be inadvertently energized. Failure to disconnect power before servicing could result in death or serious injury.

⚠WARNING

Live Electrical Components!

During installation, testing, servicing and troubleshooting of this product, it may be necessary to work with live electrical components. Have a qualified licensed electrician or other individual who has been properly trained in handling live electrical components perform these tasks. Failure to follow all electrical safety precautions when exposed to live electrical components could result in death or serious injury.

NOTICE

Use Copper Conductors Only!

Unit terminals are not designed to accept other types of conductors. Failure to use copper conductors could result in equipment damage.

Verify that the power supply available is compatible with the unit's nameplate. Use only copper conductors to connect the power supply to the unit.

Main Unit Power Wiring

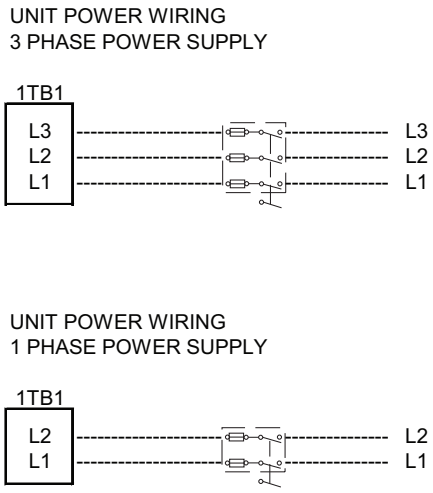
A field supplied disconnect switch must be installed at or near the unit in accordance with the National Electric Code (NEC latest edition).

Location of the applicable electric service entrance for HIGH (line voltage) may be found on the unit submittal at the front of this manual.

The high voltage connection is made at the 1TB1 terminal block. The terminal block is located inside the unit control box. Refer to the customer connection diagram that is shipped with the unit for specific termination points.

Provide proper grounding for the unit in accordance with the local and national codes.

Figure 7. Unit power wiring



Control Power Transformer

Transformers are equipped with internal circuit breakers. If a circuit breaker trips, turn OFF all power to the unit before attempting to reset it. The transformer is located in the control box.

Figure 8. Field connections - low voltage terminal board - EXWE060

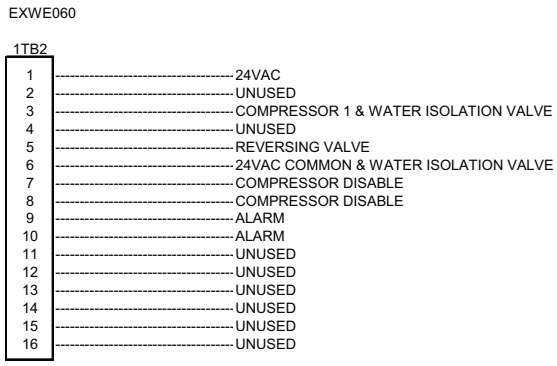
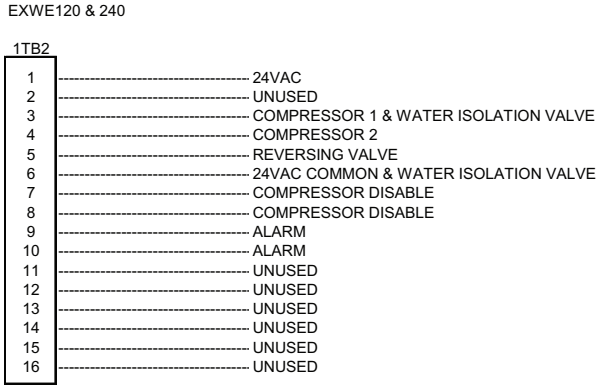


Figure 9. Field connections - low voltage terminal board - EXWE120 and EXWE240



Controls Using 24 VAC

Before installing any wire, refer to the electrical access locations on the unit dimensions starting on page p. 8.

- Ensure that the AC control wiring between the controls and the unit's termination point does not exceed three (3) ohms/conductor for the length of the run.

Note: *Resistance in excess of 3-ohms per conductor may cause component failure due to insufficient AC voltage supply.*

- Check all loads and conductors for grounds, shorts, and mis-wiring.
- Use copper conductors unless otherwise specified.
- Do not run the AC low voltage wiring in the same conduit with the high voltage power wiring.

Table 4. 24V AC conductors

Distance from unit to control	Recommended wire size
000-460 feet	18 gauge
461-732 feet	16 gauge
733-1000 feet	14 gauge

Table 5. Deluxe controller diagnostic LEDs

Color: Green	Color: Red		
LED1	LED2	LED3	Controller Mode
OFF	OFF	OFF	Control OFF
ON	OFF	OFF	Normal/Compressor OFF
ON	OFF	FLASH	Anti-short Cycle
ON	OFF	ON	Normal/Compressor ON
FLASH	ON	OFF	Brownout Condition
ON	FLASH	FLASH	Soft Lockout (low pressure)
ON	FLASH	FLASH	Soft Lockout (high pressure)
ON	ON	ON	Manual Lockout (low pressure)
ON	ON	FLASH	Manual Lockout (high pressure)
ON	FLASH	OFF	Manual Lockout (condensate overflow)
ON	ON	OFF	Compressor Disable

Electrical

Table 6. Electrical performance EXWE units

Model No.	VOLTS-AC/ HZ/PH	Minimum Utilization Voltage	Maximum Utilization Voltage	Total Unit FLA	Comp RLA (ea)	Comp LRA (ea)	No. of Compres.	Minimum Circuit Ampacity	Maximum Overcurrent Protective Device
EXWE060	208/60/1	197	229	27.6	27.6	158.0	1	34.5	60
	230/60/1	207	254	27.6	27.6	158.0	1	34.5	60
	208/60/3	187	229	18.1	18.1	137.0	1	22.6	40
	460/60/3	414	506	9.0	9.0	62.0	1	11.3	20
	230/60/3	207	254	18.1	18.1	137.0	1	22.6	40
EXWE120	208/60/1	197	229	55.2	27.6	158.0	2	62.1	80
	230/60/1	207	254	55.2	27.6	158.0	2	62.1	80
	208/60/3	187	229	36.2	18.1	137.0	2	40.7	50
	460/60/3	414	506	18.0	9.0	62.0	2	20.3	25
	230/60/3	207	254	36.2	18.1	137.0	2	40.7	50
EXWE240	208/60/3	187	229	60.2	30.1	225.0	2	67.7	90
	460/60/3	414	506	33.4	16.7	114.0	2	37.6	50
	230/60/3	207	254	60.2	30.1	225.0	2	67.7	90

Pre-Start

Pre-Start-up Checklist

Before energizing the unit, the following system devices must be checked:

- Is the high voltage power supply correct and in accordance with the nameplate ratings?
- Is the field wiring and circuit protection the correct size?
- Is the low voltage control circuit wiring correct per the unit wiring diagram?
- Is the piping system clean/complete and correct? (A recommendation of all system flushing of debris from the water-to-refrigerant heat exchanger, along with air purging from the water-to-refrigerant heat exchanger be done in accordance with the Closed-Loop/Ground Source Heat Pump Systems Installation Guide).
- Is vibration isolation provided? (i.e. unit isolation pad, hose kits)
- Is unit serviceable? (See clearance specifications on p. 8).
- Are the low/high-side pressure temperature caps secure and in place?
- Are all the unit access panels secure and in place?
- Is the water flow established and circulating through all the units?
- Has all work been done in accordance with applicable local and national codes?
- Has heat transfer fluid been added in the proper mix to prevent freezing in closed system app.

Unit Start-Up

Start-up with the system controls is included below:

1. Set the system control to the cooling mode of operation.
2. Turn on the circulation pumps. The compressor should NOT run.
3. Reduce the temperature control setting until the compressor, reversing valve and solenoid valve are energized. Verify system flow rate is the same as what was selected on the unit. Refer to "Operating Data," p. 19 for the water temperature change for the load and source side. Compressor amps should be within data plate ratings, and the suction line should be cool with no frost observed in the refrigerant circuit.
4. Check the cooling refrigerant pressures against values in "Operating Data," p. 19.
5. Turn the system control switch to the OFF position. Unit should stop running and the reversing valve should de-energize.
6. Leave unit off for approximately FIVE minutes to allow for pressure equalization.
7. Set system control to the heating mode of operation.
8. Adjust the temperature setting upward until the unit is energized. Refer to Operating Pressures starting on p. 19. for the water temperature change for the load and source side. The compressor operation should be smooth with no frost observed in the refrigeration circuit.
9. Check the heating refrigerant pressures against values in starting on p. 19.
10. Set the system control to maintain the desired space temperature.
11. Instruct the owner on system operation.

Operating Data

Table 7. Operating data for cooling EXWE060

	Source				Load				Compressor	
Unit Model	EWT °F	Flow GPM	WPD FT	Water Temp Rise °F	EWT °F	Flow GPM	WPD FT	Water Temp Drop °F	Suction Pressure PSIG	Discharge Pressure PSIG
EXWE060	70	10.0	4.1	12 - 16	60	10.0	5.7	10 - 13	92 - 105	235 - 299
		15.0	8.4	8 - 11		10.0	5.7	11 - 13	91 - 105	224 - 285
		10.0	4.1	13 - 17		15.0	11.5	7 - 9	99 - 113	238 - 303
		15.0	8.4	9 - 11		15.0	11.5	8 - 10	98 - 113	226 - 288
		10.0	4.1	14 - 18	70	10.0	5.5	12 - 15	109 - 125	243 - 309
		15.0	8.4	9 - 12		10.0	5.5	12 - 16	108 - 124	230 - 292
		10.0	4.1	15 - 19		15.0	11.1	9 - 11	118 - 135	247 - 314
		15.0	8.4	10 - 13		15.0	11.1	9 - 11	117 - 135	232 - 296
		10.0	4.1	16 - 20	80	10.0	5.3	14 - 18	127 - 147	251 - 320
		15.0	8.3	11 - 14		10.0	5.3	14 - 18	127 - 146	236 - 300
		10.0	4.1	17 - 22		15.0	10.8	10 - 13	139 - 159	256 - 326
		15.0	8.3	11 - 15		15.0	10.8	10 - 13	138 - 158	240 - 305
	90	10.0	3.8	12 - 15	60	10.0	5.7	10 - 12	97 - 111	312 - 397
		15.0	7.8	8 - 10		10.0	5.7	10 - 12	96 - 111	300 - 382
		10.0	3.8	13 - 16		15.0	11.5	7 - 9	103 - 119	315 - 401
		15.0	7.8	8 - 11		15.0	11.5	7 - 9	103 - 118	302 - 384
		10.0	3.8	14 - 17	70	10.0	5.5	11 - 14	115 - 132	320 - 408
		15.0	7.8	9 - 12		10.0	5.5	11 - 14	114 - 132	306 - 389
		10.0	3.8	14 - 18		15.0	11.1	8 - 10	123 - 142	324 - 413
		15.0	7.8	10 - 12		15.0	11.1	8 - 10	122 - 141	309 - 393
		10.0	3.8	15 - 20	80	10.0	5.3	13 - 16	135 - 155	330 - 420
		15.0	7.8	10 - 13		10.0	5.3	13 - 17	134 - 154	313 - 398
		10.0	3.8	16 - 21		15.0	10.7	9 - 12	145 - 167	335 - 426
		15.0	7.7	11 - 14		15.0	10.7	9 - 12	144 - 166	316 - 403

Table 8. Operating data for heating EWXE060

	Source				Load				Compressor	
Unit Model	EWT °F	Flow GPM	WPD FT	Water Temp Drop °F	EWT °F	Flow GPM	WPD FT	Water Temp Rise °F	Suction Pressure PSIG	Discharge Pressure PSIG
EXWE060	55	10.0	5.2	10 - 13	70	10.0	5.6	12 - 15	86 - 99	237 - 301
		15.0	10.6	7 - 9		10.0	5.6	13 - 16	92 - 106	239 - 304
		10.0	5.2	10 - 13		15.0	11.5	8 - 10	86 - 99	230 - 293
		15.0	10.6	7 - 9		15.0	11.5	8 - 11	92 - 106	232 - 295
		10.0	5.2	9 - 11	90	10.0	5.3	12 - 15	89 - 102	314 - 400
		15.0	10.5	6 - 8		10.0	5.3	12 - 15	94 - 108	316 - 402
		10.0	5.2	9 - 12		15.0	10.8	8 - 10	88 - 102	308 - 392
		15.0	10.5	6 - 8		15.0	10.8	8 - 10	94 - 108	309 - 394
		10.0	5.2	8 - 10	110	10.0	5.0	11 - 14	91 - 105	408 - 520
		15.0	10.5	6 - 7		10.0	5.0	11 - 15	97 - 111	410 - 522
		10.0	5.2	8 - 10		15.0	10.2	7 - 9	91 - 105	403 - 513
		15.0	10.5	6 - 7		15.0	10.2	8 - 10	97 - 111	404 - 515
	75	10.0	4.7	13 - 16	70	10.0	5.6	15 - 19	115 - 132	251 - 320
		15.0	9.6	9 - 12		10.0	5.6	16 - 20	124 - 143	256 - 325
		10.0	4.7	13 - 17		15.0	11.5	10 - 13	114 - 131	239 - 305
		15.0	9.6	9 - 12		15.0	11.5	11 - 14	124 - 142	242 - 308
		10.0	4.7	12 - 15	90	10.0	5.3	14 - 18	118 - 136	330 - 419
		15.0	9.5	8 - 11		10.0	5.2	15 - 19	127 - 146	334 - 424
		10.0	4.7	12 - 15		15.0	10.8	10 - 12	117 - 135	317 - 404
		15.0	9.5	8 - 11		15.0	10.8	10 - 13	126 - 146	320 - 407
		10.0	4.7	10 - 13	110	10.0	5.0	14 - 17	121 - 140	423 - 538
		15.0	9.5	7 - 9		10.0	5.0	14 - 18	130 - 149	426 - 543
		10.0	4.7	10 - 13		15.0	10.2	9 - 12	121 - 139	412 - 524
		15.0	9.5	7 - 9		15.0	10.2	10 - 12	129 - 149	414 - 527

Table 9. Operating data for cooling EWXE120

	Source				Load				Compressor	
Unit Model	EWT °F	Flow GPM	WPD FT	Water Temp Rise oF	EWT °F	Flow GPM	WPD FT	Water Temp Drop °F	Suction Pressure PSIG	Discharge Pressure PSIG
EXWE120	70	10.0	6.5	23 - 30	60	10.0	8.0	21 - 27	95 - 109	237 - 302
		15.0	13.2	16 - 20		10.0	8.0	22 - 27	94 - 109	224 - 285
		10.0	6.4	25 - 31		15.0	16.1	15 - 19	102 - 117	239 - 305
		15.0	13.2	17 - 21		15.0	16.1	15 - 19	102 - 117	226 - 287
		10.0	6.4	27 - 34	70	10.0	7.7	25 - 31	112 - 129	245 - 312
		15.0	13.2	18 - 23		10.0	7.7	25 - 32	112 - 129	230 - 292
		10.0	6.4	28 - 36		15.0	15.5	18 - 22	122 - 140	248 - 316
		15.0	13.2	19 - 24		15.0	15.6	18 - 23	121 - 139	232 - 295
		10.0	6.4	30 - 39	80	10.0	7.5	28 - 36	131 - 151	254 - 323
		15.0	13.2	20 - 26		10.0	7.5	29 - 37	131 - 150	236 - 300
		10.0	6.4	33 - 41		15.0	15.1	20 - 26	143 - 164	259 - 329
		15.0	13.2	22 - 28		15.0	15.1	21 - 26	142 - 164	240 - 305
	90	10.0	6.0	22 - 28	60	10.0	8.0	19 - 25	98 - 112	312 - 397
		15.0	12.3	15 - 19		10.0	8.0	20 - 25	97 - 112	298 - 379
		10.0	6.0	23 - 29		15.0	16.1	14 - 17	105 - 120	314 - 400
		15.0	12.3	15 - 20		15.0	16.1	14 - 18	104 - 120	299 - 381
		10.0	6.0	25 - 32	70	10.0	7.7	22 - 29	116 - 133	320 - 408
		15.0	12.3	17 - 21		10.0	7.7	23 - 29	115 - 133	304 - 387
		10.0	6.0	26 - 33		15.0	15.5	16 - 20	125 - 143	323 - 411
		15.0	12.3	18 - 23		15.0	15.5	16 - 21	124 - 143	306 - 389
		10.0	6.0	28 - 36	80	10.0	7.4	26 - 33	136 - 156	330 - 420
		15.0	12.3	19 - 24		10.0	7.4	26 - 34	135 - 155	312 - 397
		10.0	6.0	30 - 38		15.0	15.0	18 - 23	147 - 169	334 - 425
		15.0	12.2	20 - 26		15.0	15.0	19 - 24	146 - 168	314 - 400

Table 10. Operating data for heating EXWE120

	Source				Load				Compressor	
Unit Model	EWT °F	Flow GPM	WPD FT	Water Temp Drop °F	EWT °F	Flow GPM	WPD FT	Water Temp Rise °F	Suction Pressure PSIG	Discharge Pressure PSIG
EXWE120	55	10.0	7.7	21 - 27	70	10.0	6.9	23 - 30	85 - 98	250 - 318
		15.0	15.6	15 - 19		10.0	6.9	25 - 31	92 - 105	251 - 320
		10.0	7.7	22 - 27		15.0	14.1	16 - 20	85 - 98	237 - 301
		15.0	15.6	15 - 19		15.0	14.1	16 - 21	91 - 105	237 - 302
		10.0	7.7	20 - 25	90	10.0	6.5	22 - 29	88 - 101	329 - 418
		15.0	15.6	14 - 18		10.0	6.5	23 - 30	93 - 107	330 - 420
		10.0	7.7	20 - 25		15.0	13.2	15 - 19	87 - 100	315 - 401
		15.0	15.6	14 - 18		15.0	13.2	16 - 20	93 - 107	316 - 402
		10.0	7.7	18 - 23	110	10.0	6.1	21 - 27	90 - 104	420 - 534
		15.0	15.6	13 - 16		10.0	6.1	22 - 28	96 - 110	421 - 536
		10.0	7.7	18 - 23		15.0	12.5	14 - 18	90 - 104	406 - 517
		15.0	15.6	13 - 16		15.0	12.5	15 - 19	95 - 110	407 - 518
	75	10.0	7.0	26 - 33	70	10.0	6.8	28 - 36	112 - 129	258 - 329
		15.0	14.1	18 - 24		10.0	6.8	30 - 38	122 - 140	261 - 333
		10.0	7.0	26 - 34		15.0	14.0	19 - 24	112 - 129	242 - 309
		15.0	14.1	19 - 24		15.0	14.0	20 - 25	121 - 139	244 - 311
		10.0	6.9	24 - 31	90	10.0	6.4	27 - 34	116 - 133	337 - 429
		15.0	14.0	17 - 22		10.0	6.4	28 - 36	124 - 143	340 - 433
		10.0	6.9	24 - 31		15.0	13.2	18 - 23	115 - 133	321 - 408
		15.0	14.0	17 - 22		15.0	13.2	19 - 24	124 - 142	323 - 411
		10.0	6.9	22 - 28	110	10.0	6.1	25 - 32	119 - 137	427 - 543
		15.0	14.0	15 - 20		10.0	6.1	27 - 34	127 - 146	429 - 547
		10.0	6.9	22 - 28		15.0	12.5	17 - 22	119 - 137	411 - 523
		15.0	14.0	16 - 20		15.0	12.5	18 - 23	127 - 146	413 - 525

Table 11. Operating data for cooling EXWE240

	Source				Load				Compressor	
Unit Model	EWT °F	Flow GPM	WPD FT	Water Temp Rise °F	EWT °F	Flow GPM	WPD FT	Water Temp Drop°F	Suction Pressure PSIG	Discharge Pressure PSIG
EXWE240	70	10.0	4.6	47 - 60	60	40.0	5.0	10 - 13	91 - 105	236 - 300
		15.0	9.4	31 - 40		40.0	5.0	10 - 13	91 - 105	223 - 284
		10.0	4.6	49 - 63		60.0	10.2	7 - 9	97 - 112	238 - 303
		15.0	9.4	33 - 42		60.0	10.2	7 - 9	97 - 111	224 - 285
		10.0	4.6	54 - 68	70	40.0	4.9	12 - 15	108 - 125	244 - 310
		15.0	9.4	36 - 45		40.0	4.9	12 - 15	108 - 124	229 - 291
		10.0	4.6	56 - 72		60.0	9.8	8 - 10	116 - 133	246 - 313
		15.0	9.4	38 - 48		60.0	9.8	8 - 10	115 - 133	230 - 293
		10.0	4.6	61 - 77	80	40.0	4.7	13 - 17	127 - 146	252 - 321
		15.0	9.4	41 - 52		40.0	4.7	13 - 17	126 - 146	235 - 299
		10.0	4.6	65 - 82		60.0	9.5	9 - 12	137 - 158	256 - 326
		15.0	9.3	43 - 55		60.0	9.5	10 - 12	136 - 157	238 - 302
	90	10.0	4.3	45 - 58	60	40.0	5.0	9 - 12	94 - 108	312 - 397
		15.0	8.8	30 - 38		40.0	5.0	9 - 12	94 - 108	298 - 380
		10.0	4.3	47 - 60		60.0	10.1	6 - 8	100 - 115	314 - 399
		15.0	8.8	31 - 40		60.0	10.1	6 - 8	99 - 114	299 - 381
		10.0	4.3	52 - 66	70	40.0	4.8	11 - 13	112 - 129	321 - 408
		15.0	8.8	34 - 44		40.0	4.8	11 - 14	112 - 128	305 - 388
		10.0	4.3	54 - 69		60.0	9.8	7 - 9	119 - 137	322 - 410
		15.0	8.8	36 - 46		60.0	9.8	7 - 10	119 - 137	306 - 389
		10.0	4.3	58 - 74	80	40.0	4.7	12 - 16	131 - 151	330 - 420
		15.0	8.8	39 - 50		40.0	4.7	12 - 16	131 - 151	312 - 396
		10.0	4.3	62 - 78		60.0	9.5	9 - 11	141 - 162	334 - 425
		15.0	8.8	41 - 52		60.0	9.5	9 - 11	140 - 161	314 - 399

Table 12. Operating data for heating EWXE240

Unit Model	Source				Load				Compressor	
	EWT °F	Flow GPM	WPD FT	Water Temp Drop °F	EWT °F	Flow GPM	WPD FT	Water Temp Rise °F	Suction Pressure PSIG	Discharge Pressure PSIG
EXWE240	55	10.0	5.8	36 - 45	70	40.0	4.4	11 - 14	84 - 97	241 - 307
		15.0	11.8	25 - 32		40.0	4.4	11 - 14	89 - 102	243 - 310
		10.0	5.8	36 - 46		60.0	9.0	7 - 9	84 - 97	231 - 294
		15.0	11.8	25 - 32		60.0	9.0	8 - 10	89 - 102	233 - 296
		10.0	5.8	32 - 41	90	40.0	4.1	10 - 13	87 - 100	320 - 407
		15.0	11.8	22 - 29		40.0	4.1	11 - 14	91 - 105	321 - 409
		10.0	5.8	33 - 42		60.0	8.4	7 - 9	87 - 100	309 - 393
		15.0	11.8	23 - 29		60.0	8.4	7 - 9	91 - 105	310 - 395
		10.0	5.8	28 - 36	110	40.0	3.9	10 - 13	90 - 103	412 - 525
		15.0	11.8	20 - 25		40.0	3.9	10 - 13	94 - 108	414 - 527
		10.0	5.8	29 - 37		60.0	8.0	7 - 9	90 - 103	401 - 511
		15.0	11.8	20 - 25		60.0	8.0	7 - 9	94 - 108	403 - 513
	75	10.0	4.8	46 - 59	70	40.0	4.4	14 - 17	115 - 132	256 - 326
		15.0	9.8	33 - 42		40.0	4.4	14 - 18	124 - 142	260 - 331
		10.0	4.8	47 - 60		60.0	9.0	9 - 12	114 - 131	243 - 309
		15.0	9.8	34 - 43		60.0	9.0	10 - 12	123 - 142	245 - 312
		10.0	4.8	42 - 54	90	40.0	4.1	13 - 16	118 - 135	335 - 426
		15.0	9.8	30 - 38		40.0	4.1	14 - 17	126 - 145	339 - 431
		10.0	4.8	43 - 54		60.0	8.5	9 - 11	117 - 135	321 - 408
		15.0	9.8	30 - 39		60.0	8.5	9 - 12	126 - 145	324 - 412
		10.0	4.8	37 - 47	110	40.0	3.9	12 - 16	121 - 139	428 - 544
		15.0	9.8	26 - 33		40.0	3.9	13 - 16	129 - 148	431 - 549
		10.0	4.8	38 - 48		60.0	8.0	8 - 11	121 - 139	414 - 527
		15.0	9.8	27 - 34		60.0	8.0	9 - 11	128 - 148	416 - 530

Table 13. Water volume

Unit Size	Water Side Volume Cubic in.	Water Side Volume Cubic Ft.	Water Side Volume Gallons
EXWE060	171	0.099	0.740
EXWE120	342	0.198	1.481
EXWE240	779	0.451	3.372

Flow Checks

For the operating temperature drop (heating) and rise (cooling), refer to Table 7 through Table 12 for the proper water temperature change. Depending on the unit size entering water temperature and water flow rate, the cooling temperature rise is from 8°F-16°F. Based on the same criteria for heating, the temperature drop is from 2°F-13°F.

Pressure

Using the P/T ports and one 0-60 psi pressure gauge with the P/T port adapter, measure the pressure difference between the water-in and water-out connections. Compare the pressure differential to Table 7 through Table 12 to determine flow.

Start-up Checklist and Log

In order to minimize troubleshooting and costly system failures, complete the following checks and data entries before the system is put into full operation.

Job Name:

Model Number:

Date:

Serial Number:

Installing Contractor: Use this form to thoroughly check-out the system and units before and during start-up. (This form need not be returned to the factory unless requested during technical service support).

	Heat		Cool	
MODE	**Source**	**Load**	**Source**	**Load**
Entering fluid temperature	°F	°F	°F	°F
Leaving fluid temperature	°F	°F	°F	°F
Temperature differential	°F	°F	°F	°F
Water coil heat exchanger (Water Pressure IN)	°F	°F	°F	°F
Water coil heat exchanger (Water Pressure OUT)	°F	°F	°F	°F
Pressure Differential	°F	°F	°F	°F
COMPRESSOR				
Amps				
Volts				
Discharge line temperature *(after 10 minutes)*	°F	°F	°F	°F

Maintenance

Preventive Maintenance

Maintenance on the unit is simplified with the following preventive suggestions:

⚠WARNING

Hazardous Voltage!

Disconnect all electric power, including remote disconnects before servicing. Follow proper lockout/tagout procedures to ensure the power can not be inadvertently energized. Failure to disconnect power before servicing could result in death or serious injury.

A strainer (60 mesh or greater) must be used on an open loop system to keep debris from entering the unit heat exchanger and to ensure a clean system.

For units on well water, it is important to check the cleanliness of the water-to-refrigerant heat exchanger. Should it become contaminated with dirt and scaling as a result of bad water, the heat exchanger will have to be back flushed and cleaned with a chemical that will remove the scale. This service should be performed by an experienced service person.

⚠WARNING

Hazardous Chemicals!

Coil cleaning agents can be either acidic or highly alkaline and can burn severely if contact with skin occurs. Handle chemical carefully and avoid contact with skin. ALWAYS wear Personal Protective Equipment (PPE) including goggles or face shield, chemical resistant gloves, boots, apron or suit as required. For personal safety refer to the cleaning agent manufacturer's Materials Safety Data Sheet and follow all recommended safe handling practices. Failure to follow all safety instructions could result in death or serious injury.

It should be noted that the water quality should be checked periodically. See Table 14.

Table 14. Water quality table

Scaling	
Calcium and magnesium (total hardness)	Less than 350 ppm
Corrosion	
pH	7-9.5
Hydrogen Sulfide	Less than 1 ppm
Sulfates	Less than 25 ppm
Chlorides	Less than 125 ppm
Carbon Dioxide	Less than 75 ppm
Total dissolved solids (TDS)	Less than 1000 ppm
Biological Growth	
Iron Bacteria	Low
Erosion	
Suspended Solids	Low

Troubleshooting

⚠WARNING

Hazardous Service Procedures!

The maintenance and troubleshooting procedures recommended in this manual could result in exposure to electrical, mechanical or other potential safety hazards. Always refer to the safety warnings provided throughout this manual concerning these procedures. Unless specified otherwise, disconnect all electrical power including remote disconnect and discharge all energy storing devices such as capacitors before servicing. Follow proper lockout/tagout procedures to ensure the power can not be inadvertently energized. When necessary to work with live electrical components, have a qualified licensed electrician or other individual who has been trained in handling live electrical components perform these tasks. Failure to follow all of the recommended safety warnings provided, could result in death or serious injury.

Preliminary Trouble Inspection

If operational difficulties are encountered, be sure to perform the preliminary checks before referring to the troubleshooting chart on p. 27.

- Verify that the unit is receiving electric supply power.
- Ensure that the fuses in the fused disconnect (field installed) are intact.

After completing the preliminary checks, inspect the unit for other obvious problems such as leaking connection, broken or disconnected wires, etc. If everything appears to be in order, but the unit still fails to operate properly, refer to the troubleshooting chart on p. 27.

General Operation

The standard model is designed for indoor installation. When the unit is installed in an unconditioned space, the unit may not start in cool weather (approximately 45°F). It may then be necessary to start the unit in the cooling mode for three to five minutes. The unit may then be shut-off (there will be a two minute time-out of the unit), and restarted in the heating mode. The freeze protection thermostat should also be checked as it may be adversely affected by ambient temperature.

Like any other type of mechanical equipment, the unit performs best when it is well maintained.

Table 15. Troubleshooting checklist

Problem	Heating	Cooling	Cause	Correction
No response to any thermostat setting	X	X	Main power off	Check fuses
	X	X	Defective control transformer	Replace
	X	X	Broken or loose connection	Repair
	X	X	Defective thermostat	Replace
	X	X	Transformer	Reset Transformer
Unit short cycles	X	X	Thermostat or sensor improperly located	Relocate
Insufficient capacity	X	X	Low on refrigerant charge	Locate leak, repair and recharge by weight (not by superheat)
	X	X	Restricted thermal expansion valve	Replace
	X	X	Defective reversing valve	See WSHP-SVXXX-EN for touch test chart
	X	X	Thermostat improperly located	Relocate
	X	X	Unit undersized	Recalculate heat gains/losses
	X	X	Inadequate water flow	Increase GPM
	X	X	Scaling in heat exchanger	Clean or replace
		X	Water too hot	Decrease temperature
	X		Water too cold	Increase temperature
High pressure switch open		X	Inadequate GPM	Increase water flow to unit
		X	Water too hot	Decrease temperature
	X	X	Overcharged with refrigerant	Decrease charge
	X	X	Defective pressure switch	Check or replace
High head pressure		X	Trash in heat exchanger	Backflush
		X	Low water flow	Increase GPM
	X	X	Overcharge of refrigerant	Decrease charge
	X	X	Non-condensable in system	Evacuate and recharge by weight
	X	X	Water too hot	Decrease temperature

Table 15. Troubleshooting checklist (continued)

Problem	Heating	Cooling	Cause	Correction
Low suction pressure	X	X	Undercharged	Locate leak, repair and recharge
	X	X	Restricted thermal expansion valve	Repair / replace
	X		Inadequate GPM	Increase GPM
Low Pressure switch open	X		Inadequate GPM	Increase GPM
	X		Water too cold	Increase temperature
	X	X	Undercharged with refrigerant	Increase charge
	X	X	Defective pressure switch	Replace
	X	X	Heat transfer fluid too cold	Raise water temperature
Freezestat open	X		Inadequate GPM	Increase GPM
	X		Water too cold	Increase GPM
	X	X	Defective freezestat	Replace freezestat
	X		Heat transfer fluid too cold	Replace freezestat

Wiring

Figure 10. Deluxe 24V - single circuit - single phase

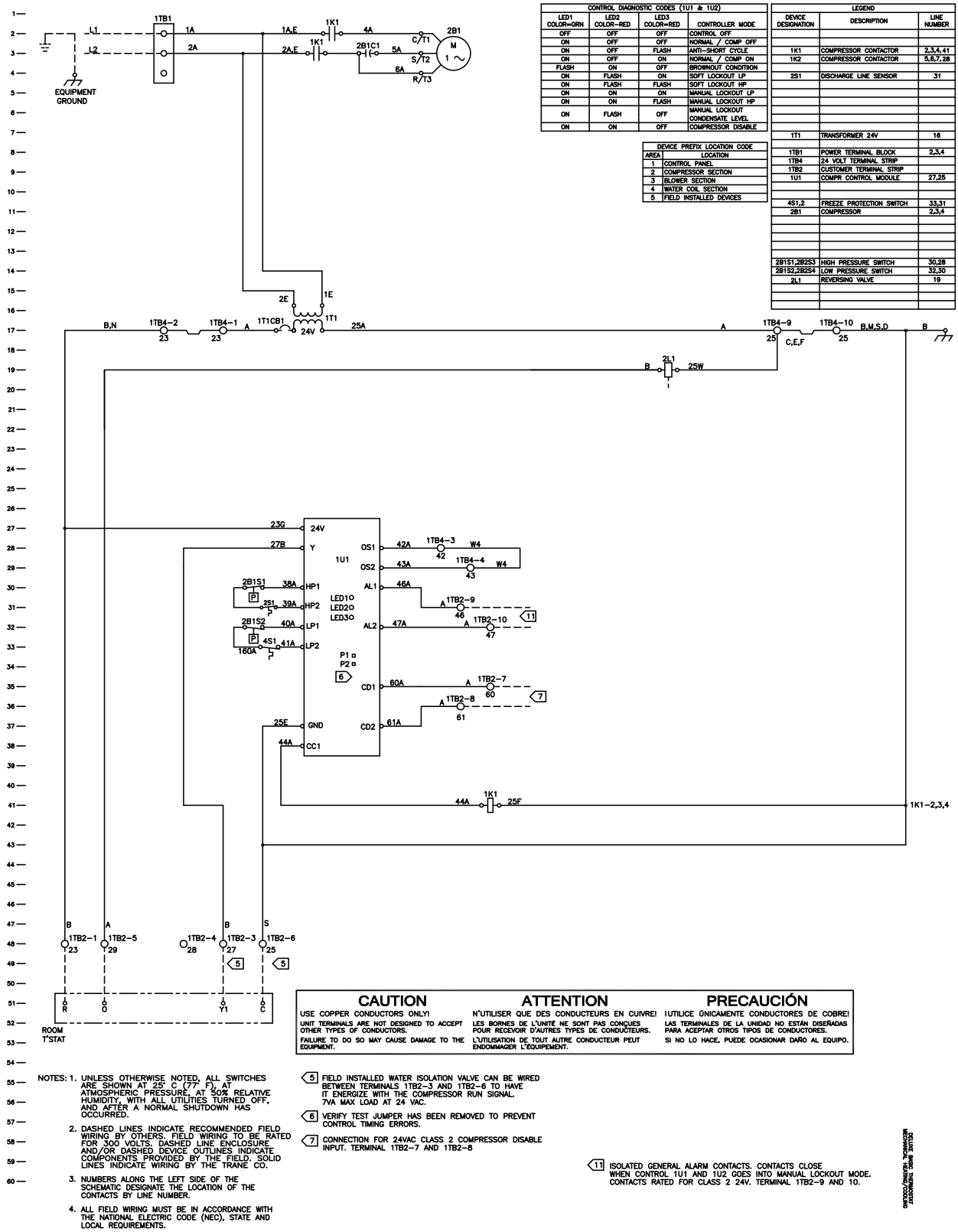
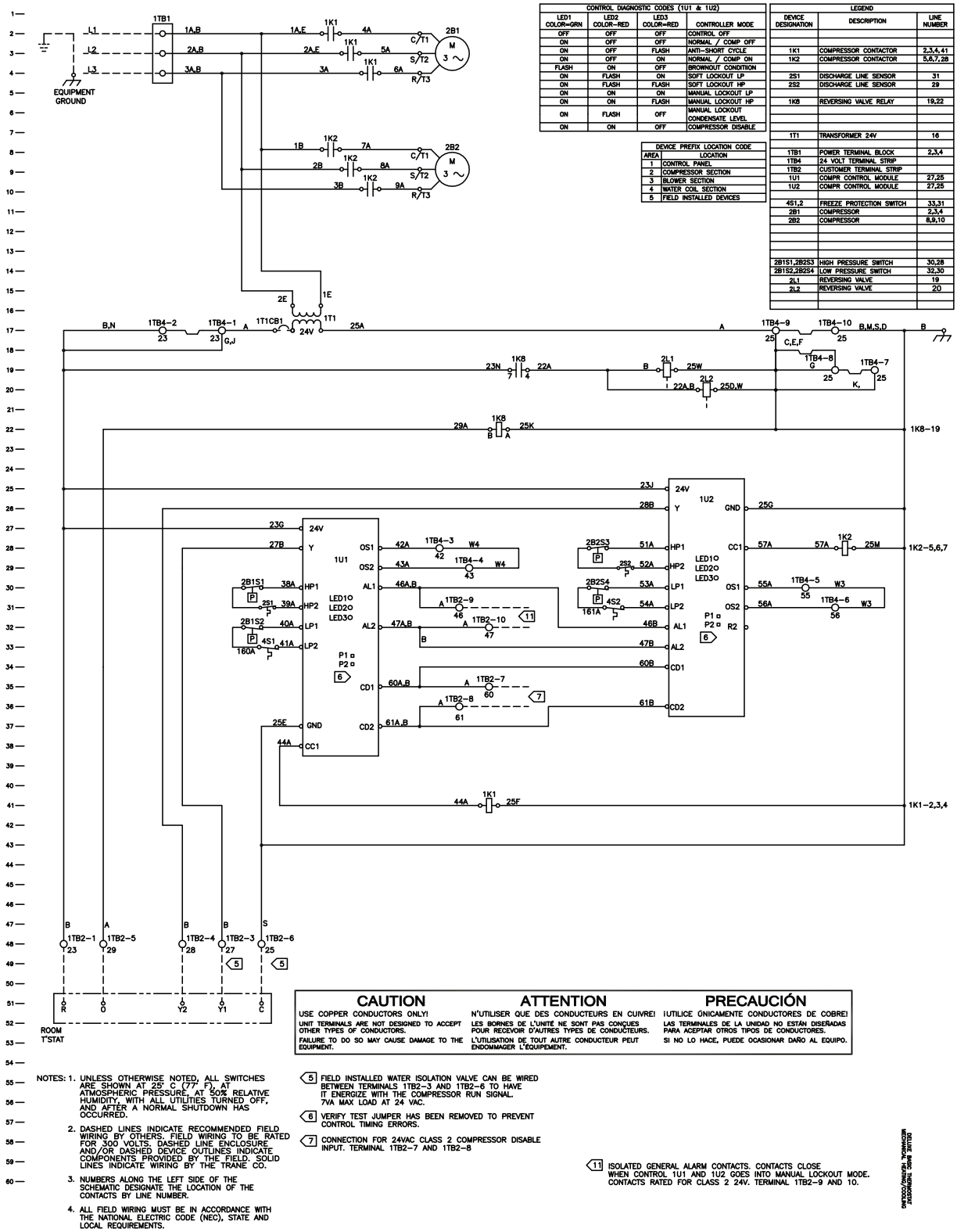


Figure 11. Deluxe 24V - dual circuit - three phase



Warranty

Standard Warranty

The standard water-source heat pump warranty is Trane's parts-only warranty, running 12-months from startup, not to exceed 18-months from shipment.

Extended Warranty

The optional extended warranty is a second through fifth year warranty. The time starts at the end of standard 1-year coverage through the fifth year.

These extended warranties apply only to new equipment installed in domestic Trane sales territories and must be ordered prior to start-up.

Trane - by Trane Technologies (NYSE: TT), a global climate innovator - creates comfortable, energy efficient indoor environments for commercial and residential applications. For more information, please visit trane.com or tranetechnologies.com.

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