



Installation, Operation, and Maintenance

Water Source Heat Pump

Axiom™ Horizontal/Vertical —

EXH/EXV, DXH/DXV

0.5 to 6 Tons – 60 Hz, High Efficiency and Two-Stage High Efficiency



Model Numbers:

DXHF 024-070 - 60 Hz

DXVG 024-070 - 60 Hz

EXHF 006-070 - 60 Hz

EXVG 009-070 - 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.

June 2022

WSHP-SVX014H-EN

TRANE
TECHNOLOGIES™



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:



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



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/national electrical codes.

⚠ 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 Labelling 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

This document and the information in it are the property of Trane, and may not be used or reproduced in whole or in part without written permission. Trane reserves the right to revise this publication at any time, and to make changes to its content without obligation to notify any person of such revision or change.

Trademarks

All trademarks referenced in this document are the trademarks of their respective owners.

Revision History

- Updated Thermostats and Zone Sensors section in Installation chapter.
- Updated Airflow Adjustment section in Installation chapter.
- Updated Electrical Data chapter.



Table of Contents

Model Number Description	6	Low Voltage Wiring (AC)	
EXV/DXV Models	7	Requirements	25
Overview of Manual	8	Filter Installation	25
Unit Nameplate	8	Supply-Air Ductwork	26
Compressor Nameplate	8	Return-Air Ductwork	26
Model Number Description	8	Ducted Panel	26
General Information	9	Ducted Filter Rack	27
Unit Description	9	Dual Filtration (DXH 2 to 6 tons)(EXH 0.5 to 6 ton)	28
Air-to-Refrigerant Coil	9	Sound Attenuation Pad	28
Water-to-Refrigerant Coil	9	Hanging the Horizontal Unit	28
Controls	9	Condensate Drain Connection	29
System Input Devices and Functions	9	Supply Pipe Connections	29
Deluxe 24V Controls (option)	9	Cleaning and Flushing the Water Loop	29
Tracer® UC400(B) (option)	9	Field Installed Power Wiring	30
Tracer® ZN524 Controls (option)	9	Main Unit Power Wiring	30
Pump Module (Field Installed Accessory)	9	Control Power Transformer	30
Waterside Economizer (Option)	9	Thermostat Location	30
Boilerless Control/Electric Heat (Option)	10	Thermostats and Zone Sensors	31
Pre-Installation	11	Controls Using 24 Vac	34
Unit Inspection Checklist	11	External Smoke Detection Wiring to Unit	36
Jobsite Inspection Checklist	11	Deluxe Controller	36
Jobsite Storage	11	UC400B Controller	36
Unit Dimensions	13	ZN524 Controller	36
Service Clearances	13	Hole Plug Installation	36
Unit Dimensions	14	Airflow Adjustment	36
Weights	24	Horizontal - Units with Deluxe 24V or Tracer® ZN524 controls	36
Weight Distribution for Hanging the DXH and EXH Model	24	Vertical - Units with Deluxe 24V or Tracer® ZN524 controls	37
Installation	25	Waterside Economizer Installation	38
General Installation Checks	25	Waterside Economizer Installation for Vertical Units	41
Main Electrical	25	Waterside Economizer Start-Up	
Electric Heat Requirements	25	Sequence	44
		Electrical Data	46
		Pre-Start Checklist	52

Start Up	53	Condensate Trap	70
Initial Unit Start-Up	53	Troubleshooting	71
Start-Up Checklist and Log	53	Deluxe Controls	71
Operating Pressures	53	Wiring Diagrams	74
Water Pressure Drop	66	Warranty Information	82
Water Volume	67	Standard Warranty	82
Maintenance	69	Extended Warranty	82
Preventative Maintenance	69		



Model Number Description

Digits 1–3 — Unit Configuration

EXH = High Efficiency Horizontal
DXH = Two-stage High Efficiency Horizontal

Digit 4 — Development Sequence

F

Digits 5–7 — Nominal Capacity

006 = 0.5 Tons (EX only)
009 = 0.75 Tons (EX only)
012 = 1 Tons (EX only)
015 = 1.25 Tons (EX only)
018 = 1.5 Tons (EX only)
024 = 2 Tons
030 = 2.5 Tons (EX only)
036 = 3 Tons
042 = 3.5 Tons (EX only)
048 = 4 Tons
060 = 5 Tons
070 = 6 Tons

Digit 8 — Voltage (Volts/Hz/Phase)

1 = 208/60/1
2 = 230/60/1
3 = 208/60/3
4 = 460/60/3
7 = 265/60/1
8 = 230/60/3

Digit 9 — Heat Exchanger

1 = Copper-Water Coil
2 = Cupro-Nickel Water Coil
7 = Insulated Copper-Water Coil/Suction Line
8 = Insulated Cupro-Nickel Water Coil/Suction Line

Digit 10 — Current Design Sequence

Digit 11 — Refrigeration Circuit

0 = Heating and Cooling Circuit
2 = Heating and Cooling Circuit with Hot Gas Reheat (EX only)
3 = Heating and Cooling Circuit with Waterside Economizer (Horizontal only)

Digit 12 — Blower Configuration

3 = ECM Motor

Digit 13 — Freeze Protection

A = 20°F Freezestat (For Glycol Loop)
B = 35°F Freezestat (For Water Loop)

Digit 14 — Open Digit = 0

Digit 15 — Supply-Air Arrangement

B = Back Supply-Air Arrangement
L = Left Supply-Air Arrangement
R = Right Supply-Air Arrangement
T = Top Supply-Air Arrangement

Digit 16 — Return-Air Arrangement

L = Left Return-Air Arrangement
R = Right Return-Air Arrangement

Digit 17 — Control Types

D = Deluxe 24V Controls
B = Tracer® ZN524 Controls
F = UC400
G = UC400 w/Wireless Comm

Digit 18 — Tstat/Sensor Location

0 = Wall Mounted Location

Digit 19 — Fault Sensors

1 = Condensate Overflow Sensor
3 = Condensate Overflow and Filter Maintenance Timer
6 = Condensate Overflow and Fan Status
J = Fan Status, Filter Maintenance Timer and Condensate Overflow Sensor

Digit 20 — Temperature Sensor

0 = No Additional Temperature Sensor
1 = Entering Water Sensor

Digit 21 — Insulation

1 = Standard Fiberglass Insulation
2 = Foil Faced Insulation in Airstream

Digit 22 — Electric Heat

0 = No Electric Heat
1 = Internal Boilerless Electric Heat
4 = External Boilerless Electric Heat

Digit 23 — ON/OFF Switch

0 = No “ON”/“OFF” Switch
1 = “ON”/“OFF” Switch (Not available with boilerless electric heat option)

Digit 24 — Filter Type

1 = 1" Throwaway Filter
2 = 2" Throwaway Filter
4 = 2" MERV 8
5 = 2" MERV 13

Digit 25 — Acoustic Arrangement

0 = Enhanced Sound Attenuation
1 = Deluxe Sound Attenuation

Digits 26–34 — Does Not Apply to EXH/V, DXH/V

0000000000 = Digits 26-34 are not applicable to the EXH/V or DXH/V products

Digit 35 — Unit Drain Pan Option

A = Polymer Drain Pan
B = Stainless Steel Drain Pan

Model Number Notes

Note: 20°F Freezestat is typically used in a geothermal application. 35°F Freezestat is typically used in a boiler/tower application.

EXV/DXV Models

Digits 1–3 — Unit Configuration

EXV = High Efficiency Vertical
DXV = Two-stage High Efficiency Vertical

Digit 4 — Development Sequence

G

Digits 5–7 — Nominal Size (MBH)

009 = 9.0 MBH (EX only)
012 = 12.0 MBH (EX only)
015 = 15.0 MBH (EX only)
018 = 18.0 MBH (EX only)
024 = 24.0 MBH
030 = 30.0 MBH (EX only)
036 = 36.0 MBH
042 = 42.0 MBH (EX only)
048 = 48.0 MBH
060 = 60.0 MBH
070 = 70.0 MBH

Digit 8 — Voltage (Volts/Hz/Phase)

4 = 460/60/3
7 = 265/60/1
A = 208-230/60/1
B = 208-230/60/3

Digit 9 — Heat Exchanger

1 = Copper-Water Coil
2 = Cupro-Nickel Water Coil
7 = Insulated Copper-Water Coil/Suction Line
8 = Insulated Cupro-Nickel Water Coil/Suction Line

Digit 10 — Design Sequence

A = First Design Sequence

Digit 11 — Refrigeration Circuit

0 = Heating and Cooling Circuit
2 = Heating and Cooling Circuit with Hot Gas Reheat
3 = Heating and Cooling Circuit with Waterside Economizer
4 = Heating and Cooling Circuit with Waterside Economizer, Hot Gas Reheat

Digit 12 — Blower Configuration

K = Variable ECM Motor, Constant Torque

Digit 13 — Freeze Protection²

A = 20°F Freezestat (For Glycol Loop)
B = 35°F Freezestat (For Water Loop)

Digit 14 — Open Digit = 0

Digit 15 — Supply-Air Arrangement

T = Top Supply-Air Arrangement
B = Back Supply-Air Arrangement

Digit 16 — Return-Air Arrangement

L = Left Return-Air Arrangement
R = Right Return-Air Arrangement

Digit 17 — Control Types

B = Tracer® ZN524 Controls
D = Deluxe 24V Controls
H = UC400/B
J = UC400B w/Air-Fi® Wireless Communications

Digit 18 — Tstat/Sensor Location

0 = Wall Mounted Location

Digit 19 — Fault Sensors

1 = Condensate Overflow Sensor
3 = Condensate Overflow and Filter Maintenance Timer
6 = Condensate Overflow and Fan Status
J = Fan Status, Filter Maintenance Timer and Condensate Overflow Sensor

Digit 20 — Temperature Sensor

0 = No Additional Temperature Sensor
1 = Entering Water Sensor

Digit 21 — Insulation

1 = Matte Faced Insulation
2 = Foil Faced Insulation

Digit 23 — Unit Mounted Disconnect

0 = No Unit Mounted Disconnect
2 = Unit Mounted Disconnect

Digit 24 — Filter Type

1 = 1-inch Throwaway Filter
2 = 2-inch Throwaway Filter
4 = 2-inch MERV 8
5 = 2-inch MERV 13

Digit 25 — Acoustic Arrangement

1 = Standard Sound Attenuation
2 = Deluxe Sound Attenuation

Digits 26–36 — Does Not Apply

0000000000 = Digits 26-36 are not applicable to the EXV or DXV products

Digit 37 — Ducted Filter Rack

0 = Non-ducted filter rack
A = Ducted Filter Rack Side Access/LH-RH
C = Ducted Filter Rack (Bottom/Top Access)

Digit 38 — Isolation Valve

0 = No Isolation Valve
1 = Factory Mounted Isolation Valve

Digit 39 — Power Connection

1 = Single Point
2 = Dual Point (Electric Heat Power Separate from Unit)

Digit 40 — Drain Pan

A = Polymer Drain Pan
B = Stainless Steel Drain Pan

Model Number Note:

Notes:

1. Back Supply, Electric Heat and Deluxe Sound options to be available at later product release.
2. 20°F Freezestat is typically used in a geothermal application. 35°F Freezestat is typically used in a boiler/tower application



Overview of Manual

Note: *One copy of this document ships inside the control panel of each unit and is customer property. It must be retained by the unit's maintenance personnel.*

This booklet describes proper installation, operation, and maintenance procedures for air cooled systems.

By carefully reviewing the information within this manual and following the instructions, the risk of improper operation and/or component damage will be minimized.

It is important that periodic maintenance be performed to help assure trouble free operation. A maintenance schedule is provided at the end of this manual.

Should equipment failure occur, contact a qualified service organization with qualified, experienced HVAC technicians to properly diagnose and repair this equipment.

Unit Nameplate

The unit nameplate is located on the outside of the control box access panel 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.

Model Number Description

All products are identified by a multiple-character model number that precisely identifies a particular type of unit. Its use will enable the owner/operator, installing contractors, and service engineers to define the operation, specific components, and other options for any specific unit.

When ordering replacement parts or requesting service, be sure to refer to the specific model number and serial number printed on the unit nameplate.



General Information

Unit Description

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

Air-to-Refrigerant Coil

The air-to-refrigerant coil is aluminum fin, mechanically bonded to the copper tubing.

Water-to-Refrigerant Coil

The water-to-refrigerant coil is a copper or cupro-nickel (option) and steel tube (tube-within-a-tube) design, leak tested to assure there is no cross leakage between the water tube (copper/cupro-nickel) and refrigerant gas (steel tube).

Table 1. High/low pressure switch

	Trip	Recover	Unit
LP	40 +/-4	56 +/-4	psig
HP	650 +/-10	550 +/-10	psig

Controls

The available control type is a Deluxe 24V control option, a Tracer® ZN524, LonTalk® certified control option or a Tracer® UC400(B) BACnet® control option for all unit sizes.

All power wiring to the equipment is made at the unit's compressor contactor or optional disconnect switch for the EXH/V 0.5 to 6 ton units and the DXH/V 2 to 6 ton units. For units without the disconnect switch, the power wiring needs to be connected to the screw terminals of the compressor contactor. All low-voltage wiring is made at the unit's low voltage terminal board or terminal plug. EXH 460V and DXH 460V units require a neutral wire.

System Input Devices and Functions

A thermostat, zone sensor, or building automation system is required to operate the water-source heat pump. The flexibility of having several mode capabilities depends upon the type of sensor and/or remote panel selected.

Troubleshooting and connection diagrams for the 24V control systems may be located in the back of this manual. All digital control troubleshooting tips and connection diagrams are located in BAS-SVX20*-EN.

Deluxe 24V Controls (option)

Units containing 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, condensate overflow, unit safety control, diagnostics, and a generic relay (which may be available for field use).

Tracer® UC400(B) (option)

The Tracer® UC400(B) is a BTL Listed BACnet® controller that can operate stand- alone or within a Building Automation System (BAS) such as Tracer® SC+. For installation, operation, and maintenance, see BAS-SVX065*-EN.

Tracer® ZN524 Controls (option)

The digital ZN524 controller is designed to support the 2 to 6 ton water-source heat pumps as a standalone or full building automation (open protocol) system.

For installation, operation and diagnostics see CNT-SVX11*-EN (ZN524).

Pump Module (Field Installed Accessory)

The pump module shall consist of either a single or dual 1/6 HP bronze pump and a brass three-way shut-off valve. Cast iron pumps are also available. The pump module kits shall contain the necessary components for the installation, operation and maintenance of the water circuit of a closed-loop distributed pumping application.

Waterside Economizer (Option)

Instructions for mechanical connection of the waterside economizer to the water-source heat pump may be found in the dimensional section of this manual.

The waterside economizer is designed to begin economizing mode when water temperatures fall below the field adjustable temperature of 25, 35, 45, 55 or 60°F (for the Deluxe control option), or below the programmed set-point (for the ZN524 or UC400 control option).

When the temperature is less than the setpoint, fluid will flow into the economizing coil, while simultaneously halting mechanical operation of the compressor. Mechanical cooling will continue on a call for a second stage from the thermostat or system control. Entering water temperature sensor is factory provided for field installation on the entering water side of the coil.

Boilerless Control/Electric Heat (Option)

This option targets building designs that do not incorporate a boiler to heat the loop system. During a heavy heating load, the loop temperature may begin to fall. As the loop temperature decreases, the heating capacity of the heat pump will also decrease. In the heating mode, when the loop temperature falls below 55°F (factory setting), the electric heater is energized, and the compressor is locked out. The system's electric heat source will continue to be utilized for primary heating until the loop temperature rises above 60°F. Once the loop temperature rises above 60°F, the boilerless controller returns the unit to normal compressor heating operation and locks out the electric heater.

For the EXV and DXV models, the electric heat can be factory installed or field installed by the contractor.

For the EXH and DXH models, the internal electric heat must be factory installed, the external electric heat must be field installed by the contractor.

Note: Note: The boilerless controller has a field adjustable entering water temperature setting of 25, 35, 45, 55, and 60 degrees. The compressor operation will return to normal operation when the loop temperature rises 5 degrees above the setpoint.

Table 2. Refrigerant charge (EXH/EXV)

Model (60 Hz)	Heat Pump (oz)/Kg	Heat Pump w/ HGR (oz)/Kg
EXHF006	25.3 / 0.717	26.8 / 0.760
EXHF009	26.0 / 0.737	27.5 / 0.780
EXHF012	28.5 / 0.808	30.5 / 0.865
EXHF015	29.0 / 0.822	30.5 / 0.865
EXHF018	45.0 / 1.276	48.0 / 1.361
EXHF024	50.5 / 1.432	53.0 / 1.503
EXHF030	53.0 / 1.503	56.0 / 1.588
EXHF036	70.0 / 1.984	73.0 / 2.070
EXHF042	81.0 / 2.296	85.5 / 2.424

Table 2. Refrigerant charge (EXH/EXV) (continued)

Model (60 Hz)	Heat Pump (oz)/Kg	Heat Pump w/ HGR (oz)/Kg
EXHF048	83.0 / 2.353	87.5 / 2.481
EXHF060	114.0 / 3.232	118.5 / 3.359
EXHF070	122.0 / 3.459	127.0 / 3.600
EXVG009	35 / 0.992	37 / 1.049
EXVG012	35 / 0.992	37 / 1.049
EXVG015	39.5 / 1.12	42.5 / 1.205
EXVG018	56 / 1.588	59.5 / 1.687
EXVG024	60 / 1.701	64 / 1.814
EXVG030	67 / 1.899	72.5 / 2.055
EXVG036	68 / 1.928	74 / 2.098
EXVG042	83 / 2.353	90.5 / 2.566
EXVG048	87 / 2.466	95 / 2.693
EXVG060	101 / 2.863	111 / 3.147
EXVG070	122 / 3.459	132 / 3.742

Table 3. Refrigerant charge (DXH/DXV)

Model (60 Hz)	Heat Pump (oz)/Kg	Heat Pump w/ HGR (oz)/Kg
DXHF024	54.5 / 1.545	————
DXHF036	71 / 2.013	————
DXHF048	89 / 2.523	————
DXHF060	106 / 3.005	————
DXHF070	118 / 3.345	————
DXVG024	59 / 1.673	63 / 1.786
DXVG036	64 / 1.814	70 / 1.984
DXVG048	86 / 2.438	94 / 2.665
DXVG060	101 / 2.863	111 / 3.147
DXVG070	123 / 3.487	133 / 3.77



Pre-Installation

⚠ WARNING

Fiberglass Wool!

Exposure to glass wool fibers without all necessary PPE equipment could result in cancer, respiratory, skin or eye irritation, which could result in death or serious injury. 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.

You **MUST** wear all necessary Personal Protective Equipment (PPE) including gloves, eye protection, a NIOSH approved dust/mist respirator, long sleeves and pants when working with products containing fiberglass wool.

Precautionary Measures:

- Avoid breathing fiberglass dust.
- Use a NIOSH approved dust/mist respirator.
- Avoid contact with the skin or eyes. Wear long-sleeved, loose-fitting clothing, gloves, and eye protection.
- Wash clothes separately from other clothing; rinse washer thoroughly.
- Operations such as sawing, blowing, tear-out, and spraying may generate fiber concentrations requiring additional respiratory protection. Use the appropriate NIOSH approved respirator.

First Aid Measures:

- Eye Contact - Flush eyes with water to remove dust. If symptoms persist, seek medical attention.
- Skin Contact - Wash affected areas gently with soap and warm water after handling.

- Do not remove damaged material from the receiving location. Take photos of the damage, if possible. The owner must provide reasonable evidence that the damage did not occur after delivery.
- Notify the carrier's terminal of damage immediately by phone and by mail. Request an immediate joint inspection of the damage by the carrier and the consignee.
- Do not attempt to repair any damaged parts until the parts are inspected by the carrier's representative.

Jobsite Inspection Checklist

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.

Jobsite Storage

NOTICE

Microbial Growth!

Failure to follow instructions below could result in odors and damage to the equipment and building materials.

The floor or foundation must be level and the condensate drain at the proper height for proper drainage and condensate flow. Standing water and wet surfaces inside the equipment can become an amplification site for microbial growth (mold). If there is evidence of microbial growth on the interior insulation, it should be removed and replaced prior to operating the system.

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 water proof tarp to protect them from the elements.

Unit Inspection Checklist

- Unpack all components of the kit.
- Check carefully for any shipping damage. If any damage is found it must be reported immediately and a claim made against the transportation company.

Important: Equipment is shipped FOB (Free on Board) at the manufacturer. Therefore, freight claims for damages against the carrier must be initiated by the receiver.

- Visually inspect the components for shipping damage as soon as possible after delivery, before it is stored. Concealed damage must be reported within 15 days.
- If concealed damage is discovered, stop unpacking the shipment.



Pre-Installation

- 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.
- Horizontal units may be stacked no more than three units high. Do not stack the vertical unit configurations.

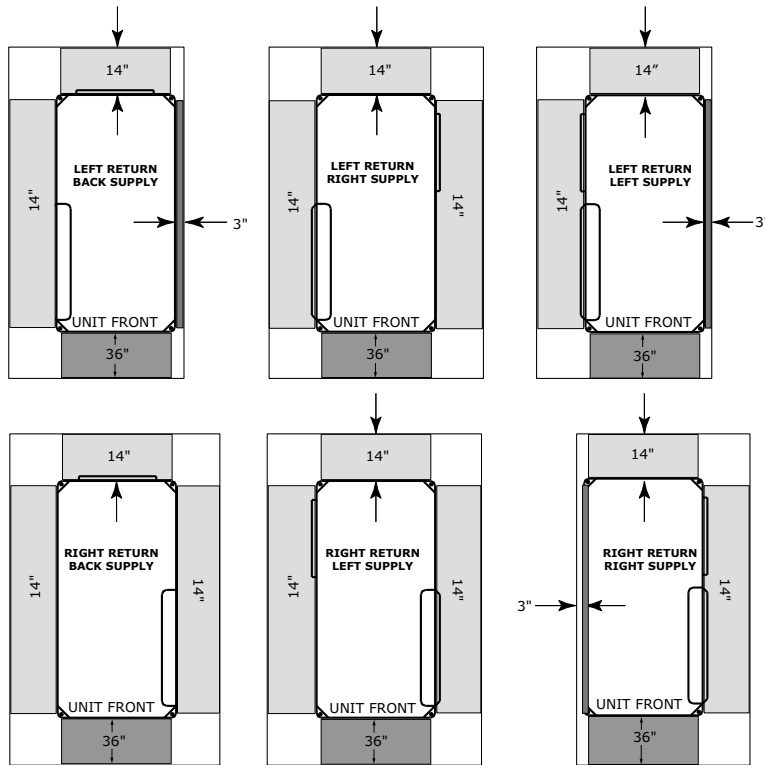
Unit Dimensions

Service Clearances

Per NEC requirements, 36 inches of access and working space shall be provided and maintained around all control boxes and electrical equipment to permit ready and safe

operation and maintenance of such equipment. Local codes may require more clearance to electrical equipment. Check all code requirements prior to unit installation.

Figure 1. Clearances - EXHF/DXHF 0.5 to 6 tons

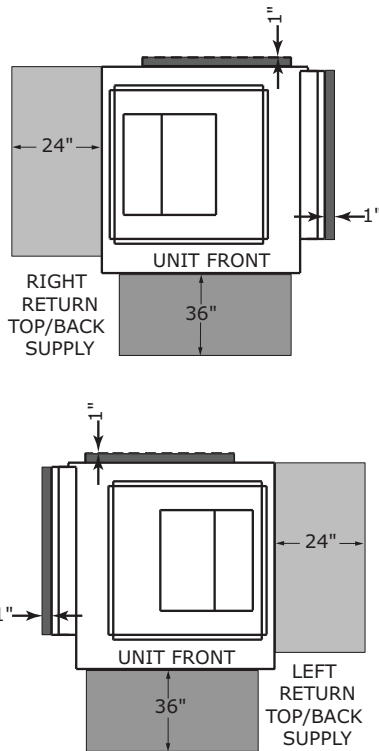


A minimum 14-inch clearance for servicing the unit is required for all EXH 0.5 to 6 tons configurations from other mechanical and electrical equipment (where shown) to enable panel removal from the unit for service/maintenance ability. The optimum clearance required is 20 inches. Equipment containing a same-side supply/return combination requires a 3 inches limitation on one side. Access to the TXV may not be possible with this 3 inches clearance. This configuration is typically applied in a corridor installation, where space limitations force the left or right side of the unit against a wall.



Unit Dimensions

Figure 2. Clearance – EXVG/DXVG 0.75 to 6 Tons



A 24-inch clearance from other mechanical and electrical equipment (where shown) is recommended for most unit configurations. This will enable panel removal from the unit for service/maintenance.

The 24 inch side clearance on EXVG/DXVG 0.75-6T models is for optimal access only. Side clearance is not a requirement as most components can be accessed from the front of the unit.

A 1-inch minimum clearance between the filter rack and any obstacle is required for units in a free return application to provide proper air flow to the air-to-refrigerant coil. A 12 inch minimum clearance between the filter rack and any obstacle should be provided to properly attached ductwork.

The 1-inch dimension shown in the back of the unit represents the supply duct collar for the back supply option. This clearance is needed to clear these flanges.

Unit Dimensions

Figure 3. Left return/left supply (EXHF/DXHF)

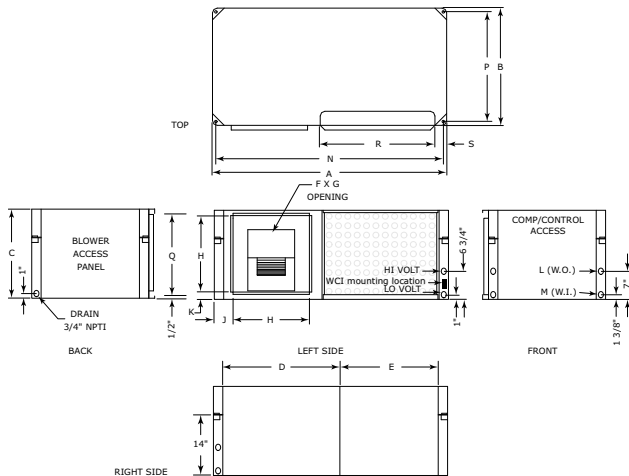


Table 4. Left return/left supply (EXHF/DXHF)

Unit	A	B	C	D ^(a)	E	F x G	H	J	K	L NPTI	M NPTI	N	P	Q	R ^(b)	S
EXHF006-009	40	20	15	20	15	6-7/8 x 8	11-1/2	4-1/2	1-3/4	1/2	1/2	38-3/4	18-3/4	13-5/8	18-1/2	3-1/4
EXHF012-015	40	20	15	20	15	8-1/4 x 9-3/4	11-1/2	4-1/4	3/4	1/2	1/2	38-3/4	18-3/4	13-5/8	18-1/2	3-1/4
EXHF018 EXHF/DXHF024	46	23	18	23	18	8-1/4 x 11-3/8	13-1/2	4-3/4	1-3/8	3/4	3/4	44-3/4	21-3/4	16-5/8	18-1/2	4-1/4

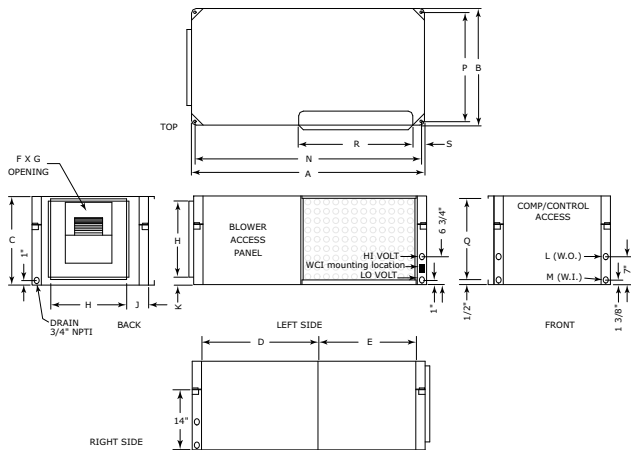
Table 4. Left return/left supply (EXHF/DXHF) (continued)

Unit	A	B	C	D ^(a)	E	F x G	H	J	K	L NPTI	M NPTI	N	P	Q	R ^(b)	S
EXHF030 EXHF/DXHF036	50	25	19	25	20	10-1/2 x 13-1/2	17	4	1	3/4	3/4	48-3/4	23-3/4	17-5/8	23-1/2	3-1/4
EXHF042-060 DXHF048-060	58	33	21	29-1/2	23-1/2	13-7/8 x 13-7/8	18	5-1/4	1-1/2	1	1	56-3/4	31-3/4	19-5/8	23-1/2	5-1/2
EXHF/DXHF070	58	39	21	29-1/2	23-1/2	13-7/8 x 13-7/8	18	5-1/4	1-1/2	1	1	56-3/4	37-3/4	19-5/8	23-1/2	5-1/2

Note: Equipment containing a same-side supply/return combination requires a 3 in. clearance on one side. Access to the TXV may not be possible with this 3 in. clearance.

(a) Return air opening dimension.

(b) Filter rack dimension.

Figure 4. Left return/back supply (EXH/DXH)

Table 5. Dimensional data left return/back supply (EXH/DXH)

Unit	A	B	C	D ^(a)	E	F x G	H	J	K	L NPTI	M NPTI	N	P	Q	R ^(b)	S
EXHF006-009	40	20	15	20	15	6-7/8 x 8	11-1/2	4-1/2	1-3/4	1/2	1/2	38-3/4	18-3/4	13-5/8	18-1/2	3-1/4
EXHF012-015	40	20	15	20	15	8-1/4 x 9-3/4	11-1/2	4-1/4	3/4	1/2	1/2	38-3/4	18-3/4	13-5/8	18-1/2	3-1/4
EXHF018 EXHF/ DXHF024 EXHF030	46	23	18	23	18	8-1/4 x 11-3/8	13-1/2	4-3/4	1-3/8	3/4	3/4	44-3/4	21-3/4	16-5/8	18-1/2	4-1/4
EXHF/ DXHF036	50	25	19	25	20	10-1/2 x 13-1/2	17	4	1	3/4	3/4	48-3/4	23-3/4	17-5/8	23-1/2	3-1/4
EXHF042-060 DXHF048-060	58	33	21	29-1/2	23-1/2	13-7/8 x 13-7/8	18	5-1/4	1-1/2	1	1	56-3/4	31-3/4	19-5/8	23-1/2	5-1/2
EXHF/ DXHF070	58	39	21	29-1/2	23-1/2	13-7/8 x 13-7/8	18	5-1/4	1-1/2	1	1	56-3/4	37-3/4	19-5/8	23-1/2	5-1/2

Note: Equipment containing a same-side supply/return combination requires a 3 in. clearance on one side. Access to the TXV may not be possible with this 3 in. clearance.

(a) Return air opening dimension.

(b) Filter rack dimension.

Figure 5. Left return/right supply (EXH/DXH)

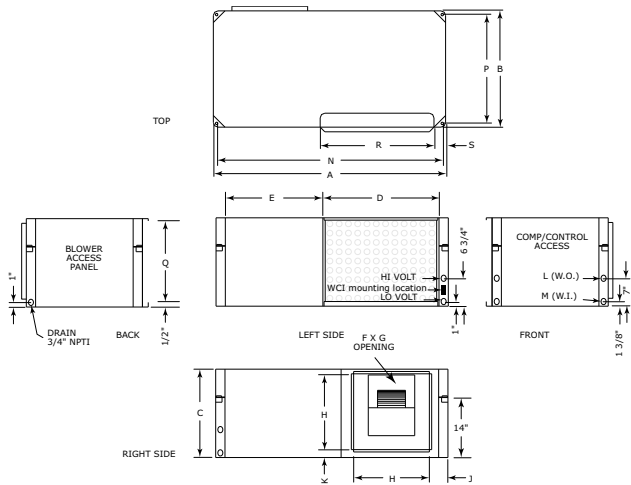


Table 6. Dimensional data left return/right supply (EXH/DXH)

Unit	A	B	C	D ^(a)	E	F x G	H	J	K	L NPTI	M NPTI	N	P	Q	R ^(b)	S
EXHF006-009	40	20	15	20	15	6-7/8 x 8	11-1/2	4-1/2	1-3/4	1/2	1/2	38-3/4	18-3/4	13-5/8	18-1/2	3-1/4
EXHF012, 015	40	20	15	20	15	8-1/4 x 9-3/4	11-1/2	4-1/4	3/4	1/2	1/2	38-3/4	18-3/4	13-5/8	18-1/2	3-1/4
EXHF018, EXHF/DXHF024	46	23	18	23	18	8-1/4 x 11-3/8	13-1/2	4-3/4	1-3/8	3/4	3/4	44-3/4	21-3/4	16-5/8	18-1/2	4-1/4
EXHF030, EXHF/DXHF036	50	25	19	25	20	10-1/2 x 13-1/2	17	4	1	3/4	3/4	48-3/4	23-3/4	17-5/8	23-1/2	3-1/4
EXHF042-060, DXHF048-060	58	33	21	29-1/2	23-1/2	13-7/8 x 13-7/8	18	5-1/4	1-1/2	1	1	56-3/4	31-3/4	19-5/8	23-1/2	5-1/2
EXHF/DXHF070	58	39	21	29-1/2	23-1/2	13-7/8 x 13-7/8	18	5-1/4	1-1/2	1	1	56-3/4	37-3/4	19-5/8	23-1/2	5-1/2

Note: Equipment containing a same-side supply/return combination requires a 3 in. clearance on one side. Access to the TXV may not be possible with this 3 in. clearance.

(a) Return air opening dimension.

(b) Filter rack dimension.

Figure 6. Right return/left supply (EXH/DXH)

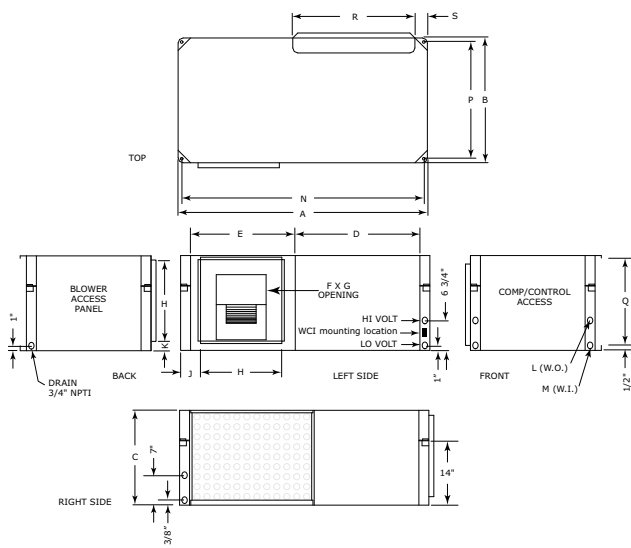


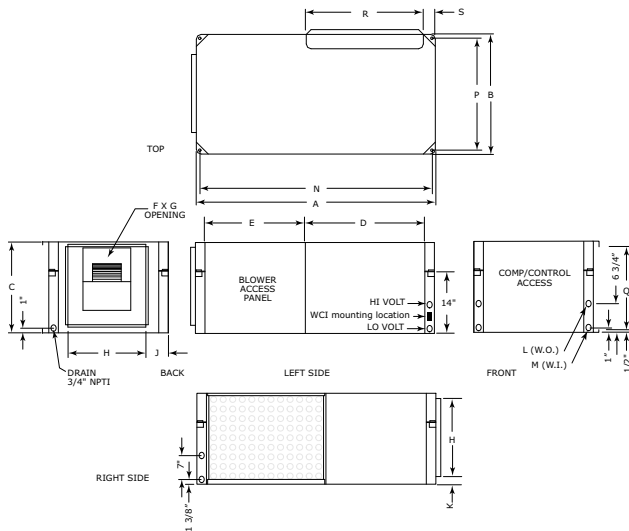
Table 7. Dimensional data right return/left supply (EXH/DXH)

Unit	A	B	C	D ^(a)	E	F x G	H	J	K	L NPTI	M NPTI	N	P	Q	R ^(b)	S
EXHF006-009	40	20	15	20	15	6-7/8 x 8	11-1/2	4-1/2	1-3/4	1/2	1/2	38-3/4	18-3/4	13-5/8	18-1/2	3-1/4
EXHF012-015	40	20	15	20	15	8-1/4 x 9-3/4	11-1/2	4-1/4	3/4	1/2	1/2	38-3/4	18-3/4	13-5/8	18-1/2	3-1/4
EXHF018, EXHF/ DXHF024	46	23	18	23	18	8-1/4 x 11-3/8	13-1/2	4-3/4	1-3/8	3/4	3/4	44-3/4	21-3/4	16-5/8	18-1/2	4-1/4
EXHF030, EXHF/ DXHF036	50	25	19	25	20	10-1/2 x 13-1/2	17	4	1	3/4	3/4	48-3/4	23-3/4	17-5/8	23-1/2	3-1/4
EXHF042-060, DXHF048-060	58	33	21	29-1/2	23-1/2	13-7/8 x 13-7/8	18	5-1/4	1-1/2	1	1	56-3/4	31-3/4	19-5/8	23-1/2	5-1/2
EXHF/ DXHF070	58	39	21	29-1/2	23-1/2	13-7/8 x 13-7/8	18	5-1/4	1-1/2	1	1	56-3/4	37-3/4	19-5/8	23-1/2	5-1/2

Note: Equipment containing a same-side supply/return combination requires a 3 in. clearance on one side. Access to the TXV may not be possible with this 3 in. clearance.

(a) Return air opening dimension.

(b) Filter rack dimension.

Figure 7. Right return/back supply (EXH/DXH)

Table 8. Dimensional data right return/back supply (EXH/DXH)

Unit	A	B	C	D ^(a)	E	F x G	H	J	K	L NPTI	M NPTI	N	P	Q	R ^(b)	S
EXHF006-009	40	20	15	20	15	6-7/8 x 8	11-1/2	4-1/2	1-3/4	1/2	1/2	38-3/4	18-3/4	13-5/8	18-1/2	3-1/4
EXHF012-015	40	20	15	20	15	8-1/4 x 9-3/4	11-1/2	4-1/4	3/4	1/2	1/2	38-3/4	18-3/4	13-5/8	18-1/2	3-1/4
EXHF018, EXHF/ DXHF024	46	23	18	23	18	8-1/4 x 11-3/8	13-1/2	4-3/4	1-3/8	3/4	3/4	44-3/4	21-3/4	16-5/8	18-1/2	4-1/4
EXHF030, EXHF/ DXHF036	50	25	19	25	20	10-1/2 x 13-1/2	17	4	1	3/4	3/4	48-3/4	23-3/4	17-5/8	23-1/2	3-1/4
EXHF042-060, DXHF048-060	58	33	21	29-1/2	23-1/2	13-7/8 x 13-7/8	18	5-1/4	1-1/2	1	1	56-3/4	31-3/4	19-5/8	23-1/2	5-1/2
EXHF/ DXHF070	58	39	21	29-1/2	23-1/2	13-7/8 x 13-7/8	18	5-1/4	1-1/2	1	1	56-3/4	37-3/4	19-5/8	23-1/2	5-1/2

Note: Equipment containing a same-side supply/return combination requires a 3 in. clearance on one side. Access to the TXV may not be possible with this 3 in. clearance.

(a) Return air opening dimension.

(b) Filter rack dimension.

Figure 8. Right return/right supply (EXH/DXH)

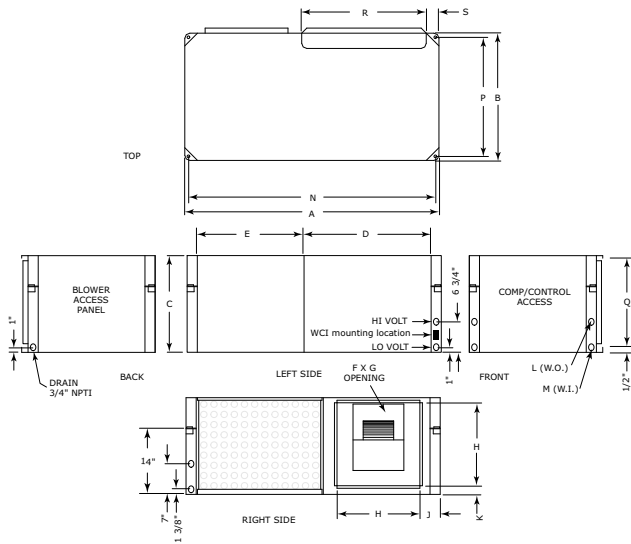


Table 9. Dimensional data right return/right supply (EXH/DXH)

Unit	A	B	C	D(a)	E	F x G	H	J	K	L NPTI	M NPTI	N	P	Q	R(b)	S
EXHF006-009	40	20	15	20	15	6-7/8 x 8	11-1/2	4-1/2	1-3/4	1/2	1/2	38-3/4	18-3/4	13-5/8	18-1/2	3-1/4
EXHF012-015	40	20	15	20	15	8-1/4 x 9-3/4	11-1/2	4-1/4	3/4	1/2	1/2	38-3/4	18-3/4	13-5/8	18-1/2	3-1/4
EXHF018, EXHF/DXHF024	46	23	18	23	18	8-1/4 x 11-3/8	13-1/2	4-3/4	1-3/8	3/4	3/4	44-3/4	21-3/4	16-5/8	18-1/2	4-1/4
EXHF030, EXHF/DXHF036	50	25	19	25	20	10-1/2 x 13-1/2	17	4	1	3/4	3/4	48-3/4	23-3/4	17-5/8	23-1/2	3-1/4
EXHF042-060, DXHF048-060	58	33	21	29-1/2	23-1/2	13-7/8 x 13-7/8	18	5-1/4	1-1/2	1	1	56-3/4	31-3/4	19-5/8	23-1/2	5-1/2
EXHF/DXHF070	58	39	21	29-1/2	23-1/2	13-7/8 x 13-7/8	18	5-1/4	1-1/2	1	1	56-3/4	37-3/4	19-5/8	23-1/2	5-1/2

Notes:

- When a horizontal model is ordered with the same side return and supply in a ducted application, bottom filter removal is required due to limited access on either side of the filter.
- Equipment containing a same-side supply/return combination requires a 3 in. clearance on one side. Access to the TXV may not be possible with this 3 in. clearance.

(a) Return air opening dimension.

(b) Filter rack dimension.

Figure 9. Left return/top supply (EXVG/DXVG)

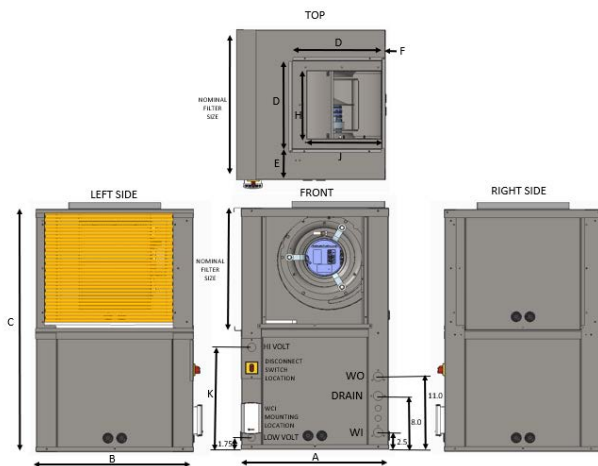
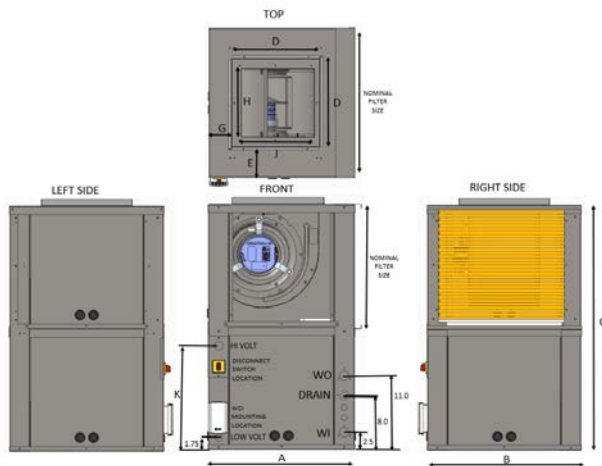


Table 10. Dimensional data left return/top supply (EXVG/DXVG)

Unit	Cabinet			Duct Collar	Duct Collar Location			Blower Opening		Hi Volt	Nominal Filter Size	W.I. NPTI	W.O. NPTI	Drain NPTI
	Width A	Depth B	Height C		E	F	G	H	J	K				
EXVG009-012	21.50	21.50	34.00	13.25	4.00	1.00	3.50	10.50	9.60	14.25	16 x 19	1/2	1/2	3/4
EXVG015	21.50	23.00	36.00	13.25	4.75	0.63	3.50	10.50	11.30	15.25	17 x 20	3/4	3/4	3/4
EXVG018, EXVG/ DXVG024	21.50	26.00	38.00	13.25	6.25	0.63	3.50	11.80	11.30	16.25	18 x 23	3/4	3/4	3/4
EXVG030, EXVG/ DXVG036	24.00	32.50	42.00	17.75	7.25	0.75	3.50	13.70	13.50	18.25	20 x 30	1	1	3/4
EXVG042, EXVG/ DXVG048	25.40	32.50	49.00	17.75	7.25	0.75	3.50	13.70	13.50	18.25	27 x 30	1	1	3/4
EXVG/ DXVG060-070	25.40	32.50	55.00	17.75	7.25	0.75	3.50	13.70	13.50	18.25	30 x 33	1	1	3/4

Note: Units in a free return application will require more than a 1 in. clearance to provide proper air flow to the unit's air-to-refrigerant coil.

Figure 10. Right return/top supply (EXVG/DXVG)

Table 11. Dimensional data right return/top supply (EXVG/DXVG)

Unit	Cabinet			Duct Collar	Duct Collar Location			Blower Opening		Hi Volt	Nominal Filter Size	W.I. NPTI	W.O. NPTI	Drain NPTI
	Width A	Depth B	Height C		E	F	G	H	J	K				
EXVG009-012	21.50	21.50	34.00	13.25	4.00	1.00	3.50	10.50	9.60	14.25	16 x 19	1/2	1/2	3/4
EXVG015	21.50	23.00	36.00	13.25	4.75	0.63	3.50	10.50	11.30	15.25	17 x 20	3/4	3/4	3/4
EXVG018, EXVG/ DXVG024	21.50	26.00	38.00	13.25	6.25	0.63	3.50	11.80	11.30	16.25	18 x 23	3/4	3/4	3/4
EXVG030, EXVG/ DXVG036	24.00	32.50	42.00	17.75	7.25	0.75	3.50	13.70	13.50	18.25	20 x 30	1	1	3/4
EXVG042, EXVG/ DXVG048	25.40	32.50	49.00	17.75	7.25	0.75	3.50	13.70	13.50	18.25	27 x 30	1	1	3/4
EXVG/ DXVG060-070	25.40	32.50	55.00	17.75	7.25	0.75	3.50	13.70	13.50	18.25	30 x 33	1	1	3/4

Note: Units in a free return application will require more than a 1 in. clearance to provide proper air flow to the unit's air-to-refrigerant coil.

Unit Dimensions

Figure 11. Waterside economizer¹ (EXHF/DXHF)

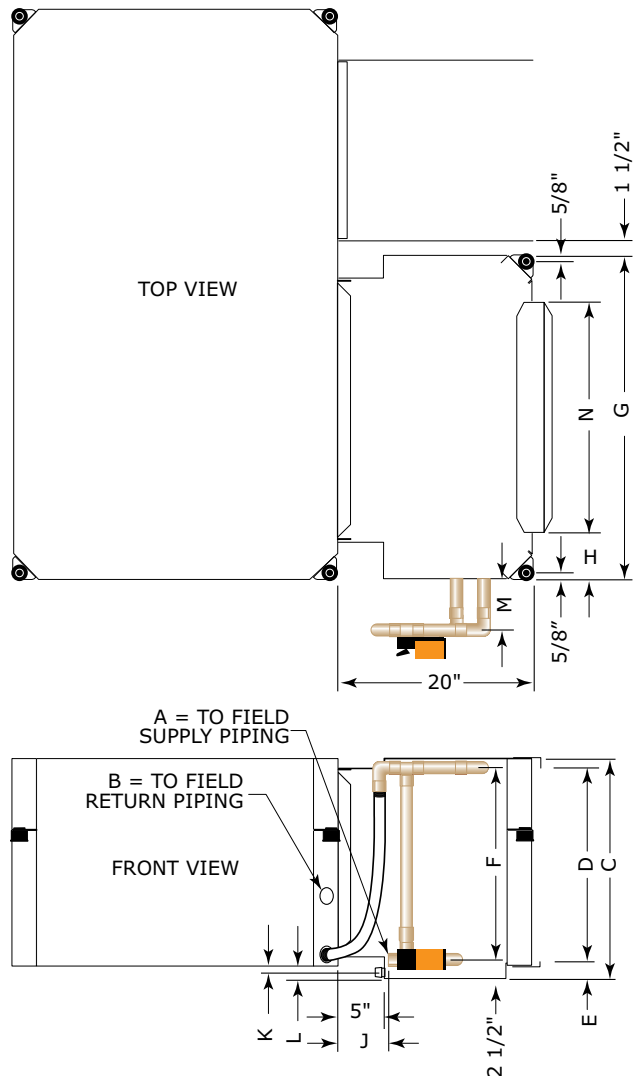


Table 12. Dimensional data waterside economizer (EXHF/DXHF)

Unit	A NPTI	B NPTI	C	D	E	F	G	H	J	K	L	M	N
EXHF006-015	1/2	1/2	16-7/8	13-1/2	2-3/4	10	23-1/2	2-1/2	6-4/8	1	1-7/8	4	18-1/2
EXHF018, EXHF/DXHF024	3/4	3/4	20-7/8	16-5/8	3-1/4	14	25-1/2	3-1/2	6-3/8	2	3	4	18-1/2
EXHF030, EXHF/DXHF036	3/4	3/4	20-7/8	17-1/2	2-1/4	14	29-1/2	2-1/4	6-3/8	1-1/8	2	4	23-1/2
EXHF042-060, DXHF048-060, EXHF/DXHF070	1	1	22-7/8	19-5/8	2-3/4	16-1/2	33-1/2	5	6-1/8	1-1/8	2	4-3/8	23-1/2

¹ Waterside economizer installation requires field piping.

Technical drawings of the unit showing front and top views with dimensions A, B, and C.

The front view shows the unit with labels "LEFT RETURN" and "RIGHT RETURN". Dimensions A and C are indicated. A red vertical bar on the right side of the front view is labeled "2" & 4" FILTER BACK ACCESSORY".

The top view shows the unit with dimension B indicated. A red vertical bar on the right side of the top view is labeled "2" & 4" FILTER BACK ACCESSORY".

Dimension A is the width of the unit. Dimension B is the depth of the unit. Dimension C is the height of the unit.

"C" DIMENSION WILL BE SAME AS UNIT DEPTH

Unit	Cabinet	WSE Dimensions		
		A (Width)	B (Depth)	C (Height)
EXVG009-012	B	8.5	21.5	18.25
EXVG015	C	8.5	23.0	19.25
EXVG018-024, DXVG024	D	8.5	26.0	22.25
EXVG030-036, DXVG036	E	8.5	32.5	22.25
EXVG042-048, DXVG048	F	8.5	32.5	29.25
EXVG/DXVG060-070	G	8.5	32.5	35.25

Figure 13. Waterside economizer (EXVG/DXVG)

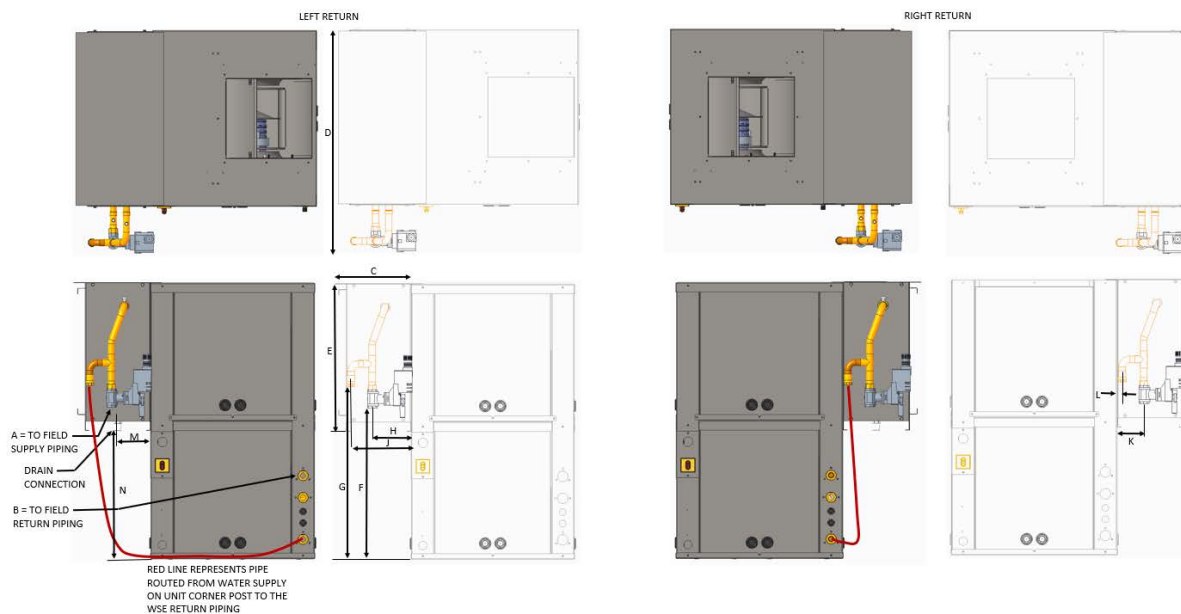


Table 14. Dimensional data waterside economizer (EXVG/DXVG)

Unit	Cabinet	Pipe Size		WSE Size			Piping Location						Drain	
		A NPTI	B NPTI	C Width	D Depth	E Height	F Height	G Height	H Width	J Width	K Width	L Width	M Width	N Height
EXVG009-012	B	1/2	1/2	8.5	27.5	18.25	17.75	20.75	5.0	7.88	3.5	0.63	4.25	15.75
EXVG015	C	3/4	3/4	8.5	29.0	19.25	19.75	22.75	5.0	7.88	3.5	0.63	4.25	16.75
EXVG018-024, DXVG024	D	3/4	3/4	8.5	32.0	21.75	21.75	24.75	5.0	7.88	3.5	0.63	4.25	15.75
EXVG030-036, DXVG036	E	1	1	8.5	38.5	22.75	22.75	25.75	5.0	8	3.5	0.5	4.25	19.75
EXVG042-048, DXVG048	F	1	1	8.5	38.5	22.75	22.75	25.75	5.0	8	3.5	0.5	4.25	19.75
EXVG/ DXVG060-070	G	1	1	8.5	38.5	22.75	22.75	25.75	5.0	8	3.5	0.5	4.25	19.75

Figure 14. Hanging unit waterside economizer (EXHF/DXHF)

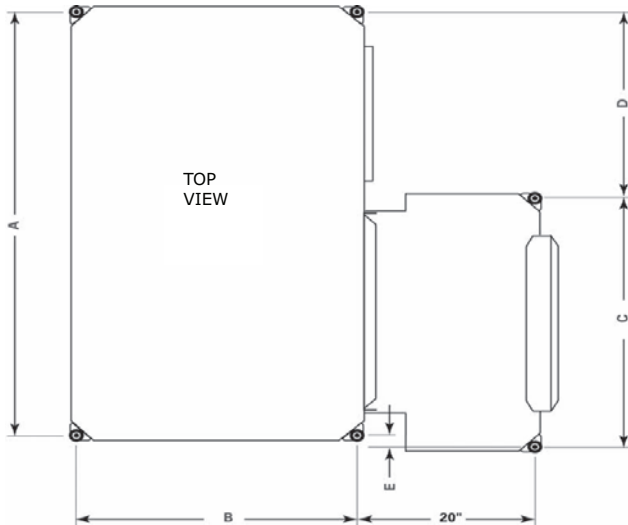


Table 15. Dimensional data hanging unit waterside economizer (EXHF/DXHF)

Unit	A	B	C	D	E	Hanging Weight	Shipping Weight
EXHF006-015	38-3/4	18-3/4	22-1/8	17-1/2	7/8	44 lbs	95 lbs
EXHF018, EXHF/DXHF024	44-3/4	21-3/4	24-1/8	20-3/4	0	52 lbs	103 lbs
EXHF030, EXHF/DXHF036	48-3/4	23-3/4	28-1/8	20-5/8	0	56 lbs	107 lbs
EXHF042-060, DXHF048-060, EXHF/DXHF070	56-3/4	31-3/4	32-1/8	24-3/4	1/8	64 lbs	113 lbs

Weights

Table 16. Unit weights DXH 2 to 6 tons (Approximate)

DXH	Shipping Weight with pallet (lbs)	Unit Weight without pallet (lbs)
024	301	269
036	343	313
048	454	424
060	474	444
070	514	484

Table 17. Unit weights DXVG 2 to 6 tons (Approximate)

DXV	Shipping Weight with pallet (lbs)	Unit Weight without pallet (lbs)
024	296	236
036	342	279
048	419	354
060	440	371
070	506	437

Table 18. Unit weights EXVG 0.75 to 6 tons (Approximate)

EXV (60 Hz)	Shipping Weight with pallet (lbs)	Unit Weight without pallet (lbs)
009	207	152
012	207	152
015	246	188
018	282	222
024	296	236
030	343	280
036	344	281
042	394	329
048	410	374
060	436	394
070	501	432

Table 19. Unit weights EXH 0.5 to 6 tons (Approximate)

EXH (60 Hz)	Shipping Weight with pallet (lbs)	Unit Weight without pallet (lbs)
006	195	165
009	195	165
012	203	173

Table 19. Unit weights EXH 0.5 to 6 tons (Approximate) (continued)

EXH (60 Hz)	Shipping Weight with pallet (lbs)	Unit Weight without pallet (lbs)
015	203	173
018	284	264
024	301	269
030	329	299
036	343	313
042	461	431
048	454	424
060	474	444
070	514	484

Weight Distribution for Hanging the DXH and EXH Model

⚠ WARNING

Improper Unit Lift!

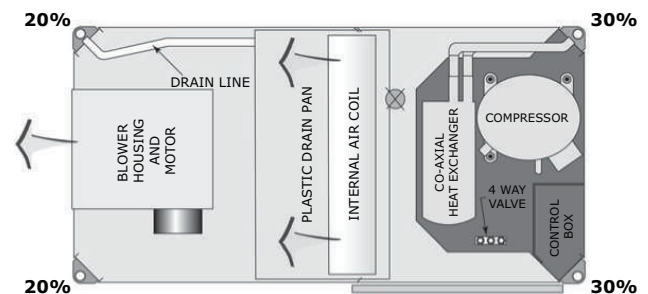
Failure to properly lift unit in a LEVEL position could result in unit dropping and possibly crushing operator/technician which could result in death or serious injury, and equipment or property-only damage.

Test lift unit approximately 24 inches (61 cm) to verify proper center of gravity lift point. To avoid dropping of unit, reposition lifting point if unit is not level.

Approximate weight distribution for proper hanging of the unit is indicated by weight distribution in the figure below.

Tolerance on the weights determined are $\pm 15\%$.

Figure 15. Weight distribution DXH 2 to 6 tons; EXH 0.5 to 6 tons





Installation

⚠ 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/national electrical codes.

General Installation Checks

The checklist below is a summary of the steps required to successfully install a commercial unit. This checklist is intended to acquaint the installing personnel with what is required in the installation process. It does not replace the detailed instructions that are 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.

The EXHF 0.75 to 6 tons and DXHF 2 to 6 ton units have been anchored to the skid by (2) shipping bolts. The removal of these bolts will require a 3/8 (9.7 mm) ratchet with a 0.5 (12.7 mm) socket.

The EXVG 0.75 to 6 tons and DXVG 2 to 6 tons have been anchored to the skid with (4) angle brackets. Remove these brackets before lifting unit into place.
2. Verify the correct model, options and voltage from the unit nameplate.
3. Pull out all field attached parts (i.e. filter rack, duct collar, filter and mounting screws) from the unit packaging for field mounting.
4. Verify the installation location of the unit will provide the required clearance for proper operation.
5. Remove refrigeration access panel and inspect the unit. Be certain the refrigerant tubing has clearance from adjacent parts.
6. Fabricate and install duct work
7. Install and connect a condensate drain line and trap to the drain connection.

Main Electrical

⚠ WARNING

Hazardous Voltage!

Failure to disconnect power before servicing could result in death or serious injury.

Disconnect all electric power, including remote disconnects before servicing. Follow proper lockout/tagout procedures to ensure the power can not be inadvertently energized. Verify that no power is present with a voltmeter.

1. Verify the power supply complies with the unit nameplate specifications.
2. Inspect all control panel components; tighten any loose connections.
3. Connect properly sized and protected power supply wiring to a field-supplied/installed disconnect switch and to the main compressor contactor/power block 1K1 for DXH/V 2 to 6 tons and EXH/V 0.5 to 6 ton units.
4. Install proper grounding wires to an earth ground. DXH and EXH 460 V units require a neutral (a four wire system).

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

Electric Heat Requirements

1. Verify that the power supply complies with the electric heater specifications on the unit and heater nameplate.
2. Inspect the heater junction box and control panel; tighten any loose connections.
3. Check electric heat circuits for continuity.

Low Voltage Wiring (AC) Requirements

1. Install the zone sensor or thermostat.
2. Connect properly sized control wiring to the proper termination points between the zone thermostat or sensor and the unit control panel.

Filter Installation

Each unit ships with 1 (25.4 mm) standard, 2 (50.8 mm) standard, 2 in. MERV 8 or 2 in. MERV 13 filter. The quantity of filters is determined by unit size. The EXH and DXH units require field installation of the 1" or 2" filters rack. All sheet metal bracket, filter and hardware are in a box located on the side of the unit within the unit packaging. All vertical units ship with the filter rack and filters factory installed.

Note: Do not operate the unit without filters.

Supply-Air Ductwork

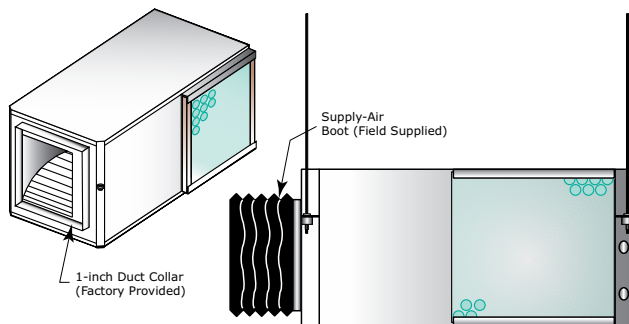
Horizontal DXH and EXH units require duct flanges to be field installed. The duct flange ships in a box on the side of the unit. Install the flange with (8) 3/8 in. (213 mm) factory supplied screws.

Install the 1 in. (25.4 mm) supply-air duct flange to the vertical and horizontal equipment with the (8) 5/16 in. (7.94 mm) factory-supplied head screws. The duct collar assembly for each unit is shipped with the unit in the same box where the IOM manual is located.

When attaching the field ductwork to the unit, provide a watertight flexible connector at the unit to prevent operating sounds from transmitting through the ductwork (See the figure below).

Elbows with turning vanes or splitters are recommended to minimize air noise due to turbulence and to reduce static pressure.

Figure 16. Flexible supply-air connector (field provided)



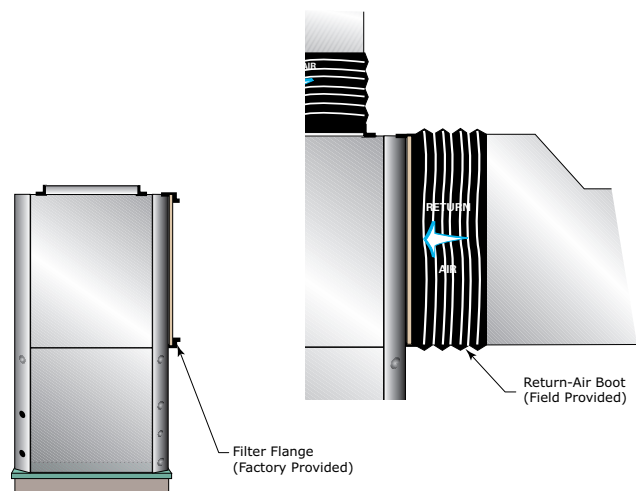
Return-Air Ductwork

Install the 1/2 (25.4 mm/50.8 mm) adjustable filter rack to the horizontal equipment only with the use of (4) 5/16 in. (7.94 mm) factory supplied head screws. The vertical equipment factory ships with the filter rack and filter(s) installed.

When attaching the field ductwork to the unit, provide a water-tight flexible connector at the unit to prevent operating sounds from transmitting through the ductwork.

Elbows with turning vanes or splitters are recommended to minimize air noise due to turbulence and to reduce static pressure.

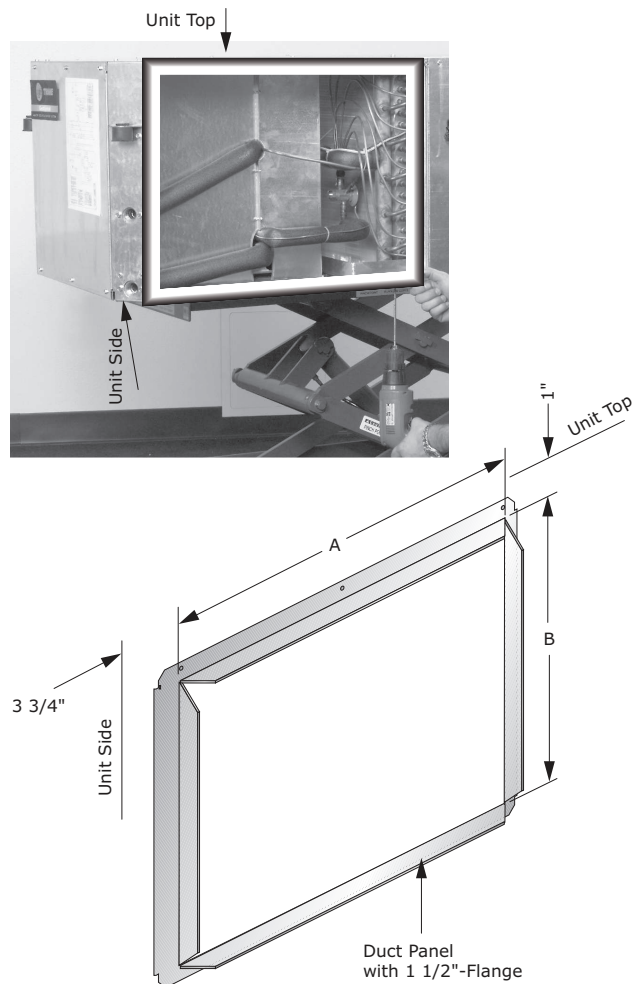
Figure 17. Flexible return-air connector (field provided)



Ducted Panel

The return-air arrangement may be easily converted from a free return-air system, to a ducted return-air system with the addition of a return-air side panel. By replacing the filter racks with the return-air panel, a complete seal from the duct to the unit is possible. The 1.5 duct flange facilitates ease of field connection to the duct system. This accessory is typically used when the return-air filter is placed in a built-in ceiling grille, or placed within a field provided filter rack assembly.

Install the return-air duct panel to the return-air opening with the six screws provided for the filter rack assembly.

Figure 18. Return-air duct panel

Table 20. Opening size and part number EXHF/DXHF

Unit Size (60 hz)	A (in.)	B (in.)	Duct Collar Part Number
006-015	17.5 in.	13 in.	447411330100
018-024	20.5 in.	16 in.	447456280100
030-036	22.5 in.	17 in.	447411350100
042-070	26.5 in.	19 in.	447411360100

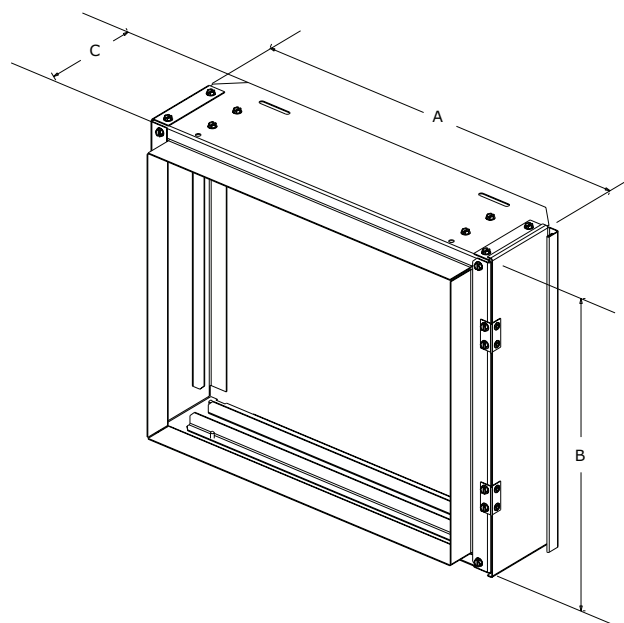
Table 21. Opening size and part number EXVG/DXVG

Unit Size (60 hz)	A (in.)	B (in.)	Duct Collar Part Number
EXVG009-012	18.5 in.	16.5 in.	WSHPPN-D00002
EXVG015	20 in.	17.5 in.	WSHPPN-D00003
EXVG018-024, DXVG024	23 in.	18.5 in.	WSHPPN-D00004
EXVG030-036, DXVG036	29.5 in.	20.5 in.	WSHPPN-D00005

Table 21. Opening size and part number EXVG/DXVG (continued)

Unit Size (60 hz)	A (in.)	B (in.)	Duct Collar Part Number
EXVG042-048, DXVG048	29.5 in.	27.25 in.	WSHPPN-D00006
EXVG060-070, DXVG070	29.5 in.	33.25 in.	WSHPPN-D00007

Ducted Filter Rack



When it is necessary to have filter access at the unit in a ducted return, a ducted filter rack is available. This option allows access to the filter at the unit. Vertical unit filter racks are available in right or left access configurations. Horizontal units are available in top, bottom or side access configurations.

Table 22. Ducted filter opening size DXHF

Unit Size	A (in.)	B (in.)	C (in.)
DXH 024	24.5	18.4	5.6
DXH 036	26.4	19.4	5.5
DXH 048-070	30.7	21.4	5.5

Table 23. Ducted filter opening size EXHF

Unit Size	A (in.)	B (in.)	C (in.)
EXH 006-015	21.1	15.4	5.4
EXH 018-030	24.5	18.4	5.6
EXH 036-042	26.4	19.4	5.5
EXH 048-070	30.7	21.4	5.5

Table 24. Ducted filter opening size EXVG/DXVG

Unit Size	A (in.)	B (in.)	C (in.)
EXVG009-012	19.0	16.25	6.6
EXVG015	20.5	17.25	6.6
EXVG018-024, DXVG024	23.5	18.25	6.6
EXVG030-036, DXVG036	30.0	20.25	6.6
EXVG042-048, DXVG048	30.0	27.0	6.6
EXVG060-070, DXVG060-070	30.0	32.75	6.6

Note: All dimensions in inches. EXVG/DXVG dimensions are for accessory 2 or 4" Filter Rack.

Dual Filtration (DXH 2 to 6 tons) (EXH 0.5 to 6 ton)

Note: The dual-filtration design is typically used in a free-return application.

The horizontal, DX and EXH model, allows the installer flexibility in design applications such as a dual filtration option. With the dual filtration design, the unit will contain a lower static which translates into a decrease in filter maintenance. For installation of a dual filtration accessory for the DX and EXH model, verify that an extra set of return-air filter racks and filter have been ordered from the factory. This accessory will be shipped separate from the unit, and should be located in a separate box than the unit.

1. Remove the return-air side panel from the DXH and EXH unit. This panel is held in place by screws.
2. Install the top/bottom filter rack at the new opening. The 1/2 (25.4 mm/50.8 mm) adjustable filter rack is held in place with four screws that once held the panel.
3. Install the 1/2 (25.4 mm/50.8 mm) filter.

Sound Attenuation Pad

For sound-sensitive installations, a vibration pad (field provided) should be placed beneath the horizontal or vertical equipment. For the horizontal unit, the pad should be approximately twice the size of the unit foot print. For the vertical unit, the pad should be 0.5 in. (12.7 mm) thick, and equal to the overall unit foot print.

Hanging the Horizontal Unit

⚠ WARNING

Proper Structural Support Required!

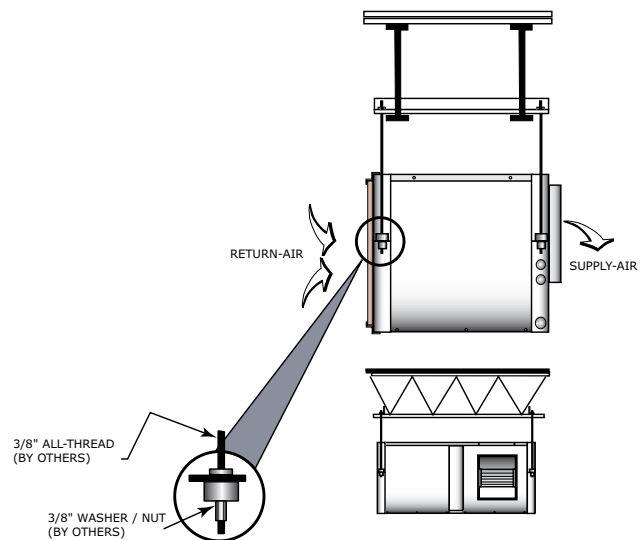
Failure to ensure proper structural ceiling support could result in unit falling from its location which could result in death or serious injury.

Ceiling structure must be strong enough to support the weight of the unit and any accessories. If unsure, check with a structural engineer.

To hang the horizontal configuration (see the figure below):

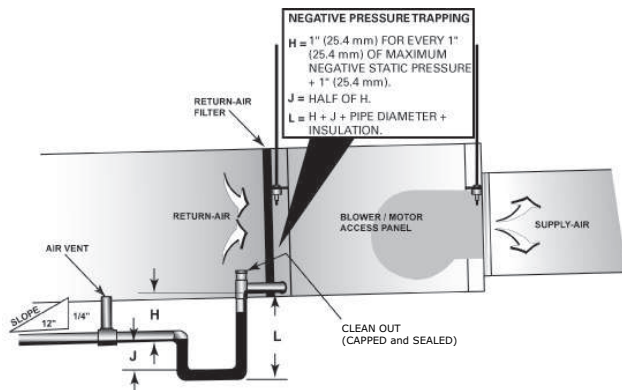
1. Install the hanging isolators (located in the return-air section of the unit) into the four hanging brackets.
2. Secure the equipment to a joist, concrete, etc. with the use of 3/8 in. (9.7 mm) field provided (all-thread) rod. Each corner should contain field provided nuts and washers to complete the hanging installation.
3. Slope horizontal units in two directions. The unit should contain a dual 0.25-12 pitch toward the drain connection. This will insure proper drainage of the unit. All plumbing to the unit should conform per national and local codes and is the responsibility of the contractor.

Figure 19. Hanging the unit



Condensate Drain Connection

Figure 20. Negative pressure system



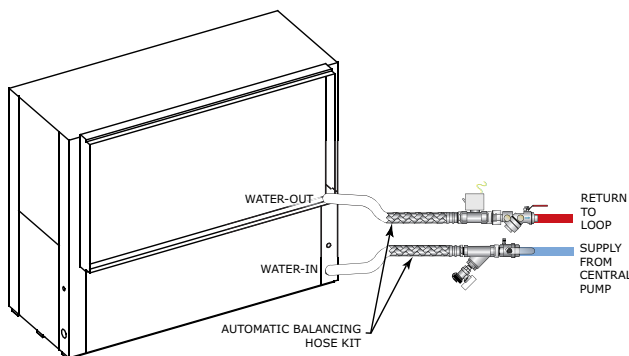
Install proper trapping to the equipment. The unit drain connection is 0.75 in. NPT for all DXH, DXV, and EXH/V 0.5 to 6 ton models.

When designing the condensate trap for the water-source system, it is important to consider the unit draw-thru design requiring negative pressure trapping.

In a properly trapped system, when condensate forms during normal operation, the water level in the trap rises until there is a constant flow. It is imperative to maintain water in the trap and not allow the trap to dry out during heating season. Keeping trap primed at all times will enable the water to flow properly. See the figure above for appropriate dimensions required in a negative pressure system.

Supply Pipe Connections

Figure 21. Supply/return pipe connections



Connect the supply and return hoses to the water-inlet (from supply) and water-outlet (to return) 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. Figure above shows connection of a Hays Mesurflo® balancing hose kit to the water-in and water-out of a vertical unit.

Note: Above figure example incorporates the Hays Mesurflo® balancing hose kit and a 2-position isolation valve into the system design. An isolation valve is often used in variable speed pumping applications. The isolation valve is designed to stop water flow to the unit during non operation times. This allows the loop water pumps to run only when a requirement for pumping is needed for greater energy efficiency of the overall system design.

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 condenser). An extra pipe may be necessary to connect the hose kits.

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

Note: Air vents should be open 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 (boiler) 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.

Field Installed Power Wiring

⚠ 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/national electrical codes.

NOTICE

Use Copper Conductors Only!

Failure to use copper conductors could result in equipment damage as the equipment was not designed or qualified to accept other types of conductors.

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

⚠ 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/national electrical codes.

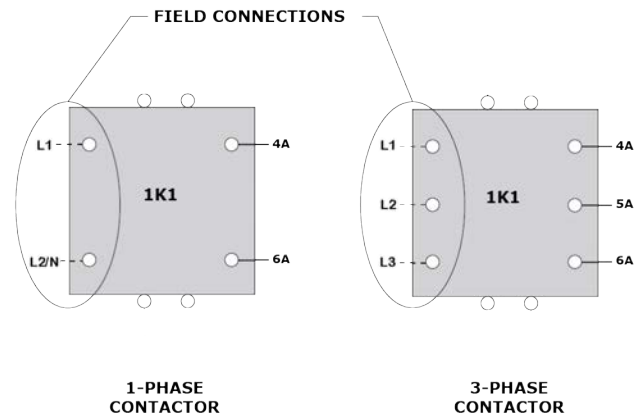
A field supplied disconnect switch must be installed at or near the unit in accordance with the National Electric Code (NEC latest edition).

Location of the applicable electric service entrance for HIGH (line voltage) may be found in the Dimensions section of this manual.

The high-voltage connection is made at the 1K1 contactor or 1TB power block inside the unit control box (See the figure below). 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 22. Power wiring example



Control Power Transformer

The 24 V control power transformers are to be used only with the accessories called out in this manual. A 50 VA transformer is externally fused. Transformers rated greater than 50 VA are equipped with circuit breakers. If a circuit breaker trips, turn OFF all power to the unit before attempting to reset it.

⚠ WARNING

Hazardous Voltage!

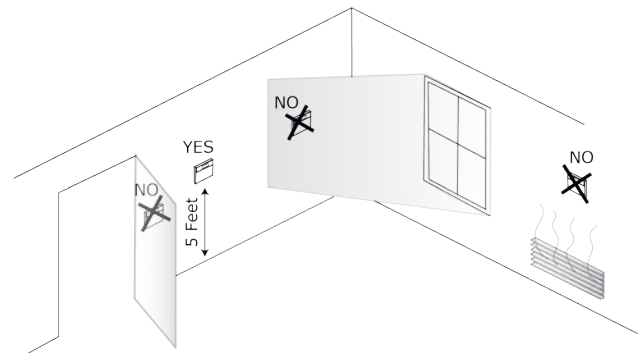
Failure to disconnect power before servicing could result in death or serious injury.

Disconnect all electric power, including remote disconnects before servicing. Follow proper lockout/tagout procedures to ensure the power can not be inadvertently energized. Verify that no power is present with a voltmeter.

The transformer is located in the control panel.

Thermostat Location

Figure 23. Thermostat/sensor location



Location of the thermostat or zone sensor is an important element of effective room control.

Areas where the thermostat or zone sensor should not be located include:

- Behind doors or corners
- Near hot or cold air ducts
- Near radiant heat (heat emitted from appliances or the sun)
- Near concealed pipes or chimneys
- On outside walls or other non conditioned surfaces
- In airflows from adjacent zones or other units.

Thermostats and Zone Sensors

Table 25. Thermostat selection for use with the Deluxe controller





Thermostat	Part Number	Description
	X13511535010	1 Heat/1 Cool, non-programmable commercial thermostat for conventional air conditioners and heat pumps that are configured without auxiliary heat <ul style="list-style-type: none"> • 1 H/1 C
	X13511536010	3 Heat/2 Cool, non-programmable commercial thermostat for conventional air conditioners and heat pumps that are configured with or without auxiliary heat. <ul style="list-style-type: none"> • 3 H/2 C
	X13511537010	3 Heat/2 Cool, programmable commercial thermostat for conventional (rooftop) air conditioners and heat pumps that are configured with or without auxiliary heat. <ul style="list-style-type: none"> • 3 H/2 C
	X13511538010	3Heat/2 Cool, programmable touch screen thermostat for conventional air conditioners and heat pump systems. The thermostat will provide the human interface, zone temperature sensing both local and optional remote temperature sensing, and set point scheduling on a daily/weekly basis. This thermostat can also display humidity with a control signal for dehumidification with a local humidity sensor or optional remote humidity sensor. <ul style="list-style-type: none"> • 3 H/2 C

Table 25. Thermostat selection for use with the Deluxe controller (continued)



Thermostat	Part Number	Description
	Pivot — BAYSTAT814A-W.	Pivot Smart Thermostat is a Wi-Fi/ethernet thermostat for commercial applications. It has a very simple interface for occupants to adjust the thermostat. Cooling and heating control of multiple systems is made even easier and faster when connected to the Pivot App. Supports 2 stage heat pump with auxiliary heat.
	XL824 - TCONT824AS52DB.	The XL824 Smart thermostat is a Wi-Fi/ethernet thermostat for Residential applications such as single family homes, condominiums and apartments. Supports 2 stage heat pump with auxiliary heat. The XL824 can be connected to the Nexia Home App and other home automation systems.

Table 26. Zone sensor selection for use with Tracer® ZN524 and UC400 controller





Sensor	Part Number	Description
	X13790886010	Wired temperature sensor with an LCD display <ul style="list-style-type: none"> Allows an occupant to control the temperature setpoint, request timed override of system operation, and provides a COMM module to service technicians. Tracer® ZN524 and UC400 Compatible
	X13651467020	Communication Module <ul style="list-style-type: none"> Sold in packs of 12 Provides local RJ22 connection to Trane® service tools for easy, low cost maintenance.
	X13511529010	Zone Sensor <ul style="list-style-type: none"> Tracer® UC400 and ZN524 compatible External setpoint adjustment wheel
	X13511527010	Zone Sensor <ul style="list-style-type: none"> Tracer® UC400 and ZN524 compatible External setpoint adjustment wheel ON and CANCEL buttons

Table 26. Zone sensor selection for use with Tracer® ZN524 and UC400 controller (continued)








Sensor	Part Number	Description
	X1379084501	Zone Sensor <ul style="list-style-type: none"> Tracer® UC400 and ZN524 compatible External setpoint adjustment wheel ON and CANCEL buttons Fan switch AUTO-OFF
	X1379044401	Temperature and relative humidity sensor <ul style="list-style-type: none"> Tracer® UC400 and ZN524 compatible
	X13790993001	Commercial Touch Screen Programmable Zone Sensor <ul style="list-style-type: none"> Supports Standby, Occupied, and Unoccupied 7 day, 5+2 day, and 5+1+1 day Cannot be used with BAS as sensor ties up BACnet link. For use with factory-programmed UC400. <p>Note: Additional configuration is needed in the field to use the Programmable zone sensors (to put BAS points in service on UC400).</p>
	X13790992001	Residential Touch Screen Programmable Zone Sensor <ul style="list-style-type: none"> Supports Awake, Away, Home, and Sleep 7 day, 5+2 day, and 5+1+1 day Cannot be used with BAS as sensor ties up BACnet link. For use with factory-programmed UC400. <p>Note: Additional configuration is needed in the field to use the Programmable zone sensors (to put BAS points in service on UC400).</p>

Table 27. Wireless zone sensor selection for use with Tracer® UC400 controller

Sensor	Part Number	Description
	X13790955010	Trane Air-Fi® WCS-SD (display) <ul style="list-style-type: none"> Tracer® UC400 Compatible Easy-to-use interface for clear and simple monitoring and control
	X13790956010	Trane Air-Fi® WCS-SB (base) <ul style="list-style-type: none"> Tracer® UC400 Compatible Simplicity Eliminates local temperature control when higher control level is required.
	X13790973030	Wireless communications sensor accessory—2% relative humidity (RH) sensor module (WCS-SH) The optional RH sensor module plugs in to any WCS model, further simplifying installation by eliminating the needed for additional wiring.

Controls Using 24 Vac

Before installing any wire, refer to the electrical access locations in the Unit Dimensions and Weights sections of this manual.

Ensure that the AC control wiring between the controls and the unit termination point does not exceed 3 Ohms/ conductor for the length of the run.

NOTICE

Component Failure!

Resistance in excess of 3 ohms per conductor could result in component failure due to insufficient AC voltage supply.

Do not exceed three (3) ohms per conductor for the length of the run.

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 28. 24V AC conductors

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

Low-voltage connection diagrams for deluxe 24 V control packages mounted on 0.5-6 ton equipment sizes are shown in the figure below.

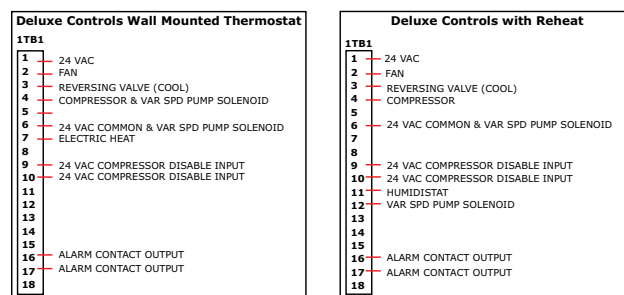
Figure 24. Low-voltage connection (DXH/V 2 to 6 tons equipment) (EXH/V 0.5 to 6 ton equipment)


Figure 25. Deluxe controls

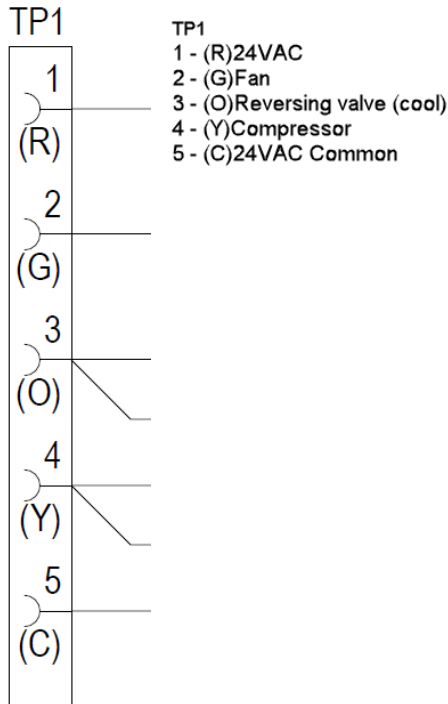


Figure 26. Deluxe controls with WSE or DX two-stage

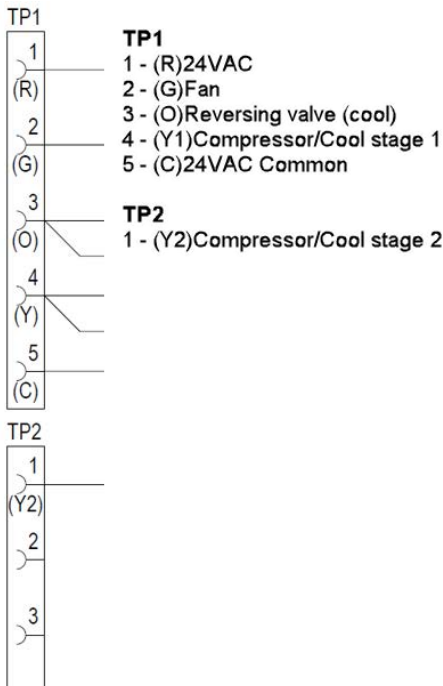


Figure 27. Deluxe controls humidistat connections between wires H1 and H2 in control box

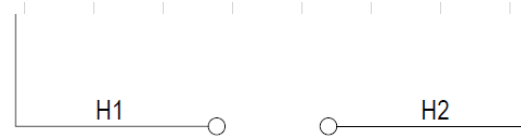
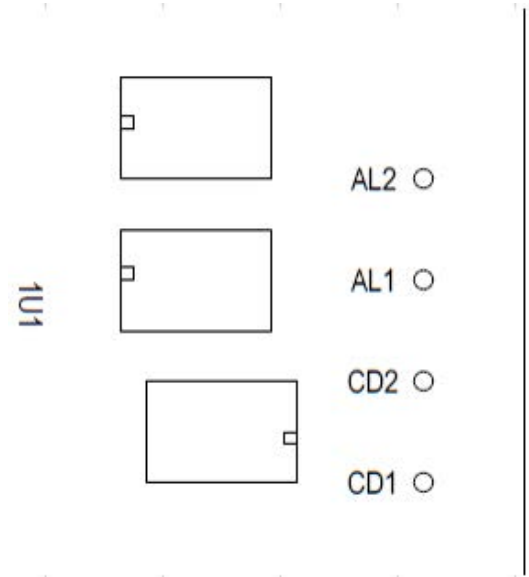


Figure 28. Deluxe controls general alarm and compressor disable



Deluxe board (1U1) connections

AL1, AL2 - Alarm Contact output

CD1, CD2 - Compressor Disable input (24VAC)

For controls using DC analog input/outputs, see appropriate installation, operation and diagnostic manuals for connection, CNT-SVX11*-EN (ZN524). For installation, operation and programming see BAS-SVX065*-EN (UC400).

⚠ WARNING

Hazardous Voltage!

Failure to disconnect power before servicing could result in death or serious injury.

Disconnect all electric power, including remote disconnects before servicing. Follow proper lockout/tagout procedures to ensure the power can not be inadvertently energized. Verify that no power is present with a voltmeter.

⚠ 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/national electrical codes.

External Smoke Detection Wiring to Unit

Deluxe Controller

To inhibit operation of the compressor and fan for a safety shutdown, it is necessary to break the wire (21X) from the 24Volt transformer to the 1TB1 terminal block. This can be done with the dry contacts of a relay. When that connection is opened, it terminates voltage to both the deluxe controller and the thermostat, which stops/prevents all control function to the fan and compressor.

UC400B Controller

To inhibit operation of the compressor and fan for a safety shutdown, it is necessary to break the wire (21A) from the 24Volt transformer to the UC400B (1U1). This can be done with the dry contacts of a relay. When that connection is opened, it terminates the power voltage to the controller, which stops/prevents all control function including the fan and compressor.

ZN524 Controller

To inhibit operation of the compressor and fan for a safety shutdown, it is necessary to break the wire (21X) from the 24Volt transformer to the 1TB1 terminal block. This can be done with the dry contacts of a relay. When that connection is opened, it terminates the power voltage to the controller which stops/prevents all control function including the fan and compressor.

Hole Plug Installation

1. Locate two Hayco plastic plugs enclosed with the Installation, Operation and Maintenance manual.
2. Use these plugs to plug the two shipping bolt holes in the bottom of the units after shipping bolt removal.

Airflow Adjustment

⚠ WARNING

Rotating Components!

Failure to disconnect power before servicing could result in rotating components cutting and slashing technician which could result in death or serious injury.

During installation, testing, servicing and troubleshooting of this product it may be necessary to work with live and exposed rotating components. Have a qualified or licensed service individual who has been properly trained in handling exposed rotating components, perform these tasks.

Horizontal - Units with Deluxe 24V or Tracer® ZN524 controls

For horizontal sizes EXHF 006-070 and DXHF 024-070, the ECM is programmed for constant CFM over a range of static pressures. The DIP switch on the ECM control board allows for a quick fan speed adjustment to optimize unit performance. The factory default setting is Profile B.

Figure 29. ECM control board



To adjust the cfm, set the DIP switch located in the control box to the desired profile setting.

Profile A = 110% of rated airflow

Profile B = 100% of rated airflow

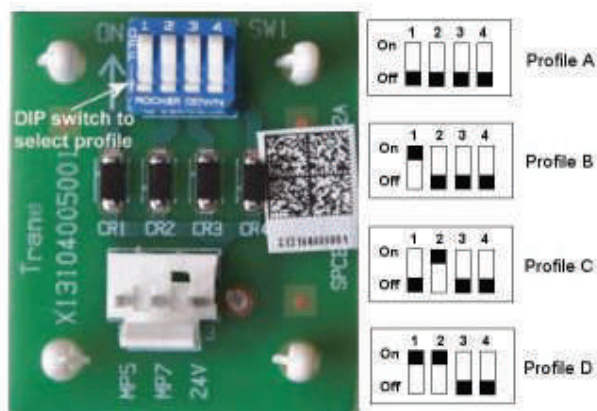
Profile C = 90% of rated airflow

Profile D = 80% of rated airflow

Installation at higher altitudes may require an adjustment to the fan speed setting to achieve proper airflow. Use profile C or D to get lower airflow. If a lower CFM is needed, then set DIP switch 4 to ON.

Note: ECM control board is only on units with Deluxe 24V and Tracer® ZN524 controls. Tracer® TU is used to adjust fan speed on units with UC400-B controls.

Figure 30. Units with UC400 controls and ECM motors -DIP switch settings



Installations at altitudes above 2000 feet may require an adjustment to the fan speed setting to achieve the proper airflow. To adjust the airflow to get the desired CFM, set the DIP switches located in the control box to the proper profile setting. Tracer® TU can be used to make further adjustments to the fan speed.

Use the following table to select the correct profile to use.

Table 29. Profiles for altitude range

Profile	Altitude (Feet)
A	0–2000
B	2000–4000
C	4000–6000
D	Above 6000

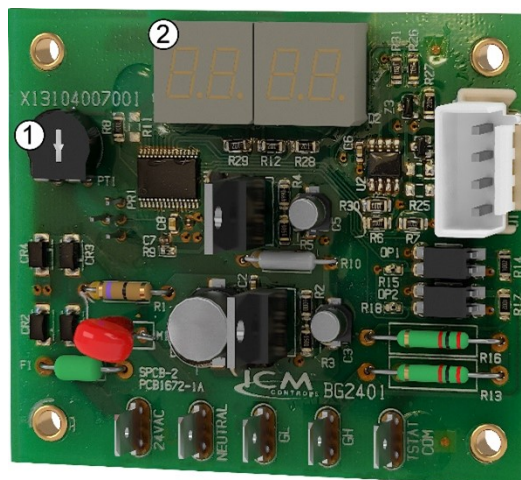
Vertical - Units with Deluxe 24V or Tracer® ZN524 controls

For vertical sizes EXVG 009-070 and DXVG 024-070, the ECM is programmed for constant torque and delivers airflow similar to a PSC motor while operating at a higher efficiency.

Figure 31. ECM control box



Figure 32. ECM control board



1. Potentiometer will be used to adjust the PWM output
2. Seven segment display

Using a screwdriver, the potentiometer will be used to adjust the PWM output from 20% to 100% PWM. Increasing the PWM will increase the motor speed. When setting the airflow for air balancing, the high-speed terminal (GH) must have 24 Vac signal. This will ensure that the PWM output will be adjusted for the full load airflow.

The display will show the commanded motor speed percentage. If running on low speed (GL), the low-speed value will be displayed. If running in GH the high-speed value will be displayed. If both GH and GL input signals are present, the PWM output value will be the GH value.

Note: ECM control board is only on units with Deluxe 24V and Tracer® ZN524 controls. Tracer® TU is used to adjust fan speed on units with UC400-B controls.

Waterside Economizer Installation

⚠ WARNING

Hazardous Voltage!

Failure to disconnect power before servicing could result in death or serious injury.

Disconnect all electric power, including remote disconnects before servicing. Follow proper lockout/tagout procedures to ensure the power can not be inadvertently energized. Verify that no power is present with a voltmeter.

⚠ WARNING

Proper Field Wiring and Grounding Required!

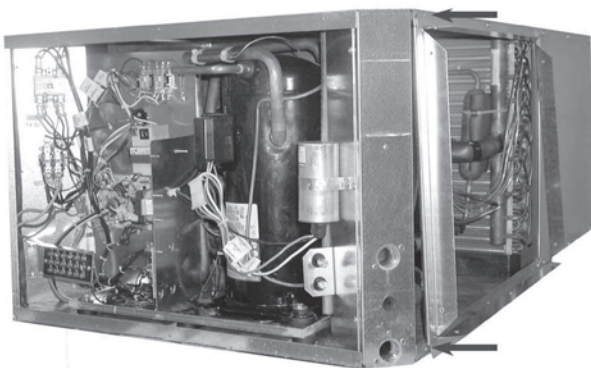
Failure to follow code could result in death or serious injury.

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/national electrical codes.

The following steps were sequenced to aid in the installation and mating of a water side economizer to a water-source heat pump (DXH/V 2 to 6 ton units) (EXH 0.5 to 6 ton units).

1. Remove the control side service panel of the water-source heat pump unit.
2. Remove rubber isolation grommets from the return-air section. Place them in a convenient location.
3. Attach ducted panel to the water-source heat pump unit with six factory provided screws. This panel is shipped loose with the water-source heat pump but must be field installed to the unit.

Figure 33. Step 3

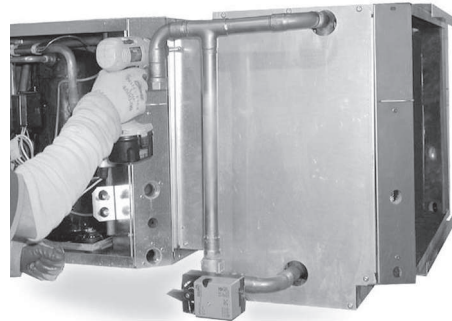


4. Attach the water side economizing unit to the ducted panel of the water-source heat pump with 10-factory

provided screws. The economizing package fits to the outside of the of the water-source heat pump. Trane recommends the mating of the systems be made via 3-screws spaced evenly across the top, 3-screws spaced evenly across the bottom (installed immediately after hanging the unit), and 2-screws on each side.

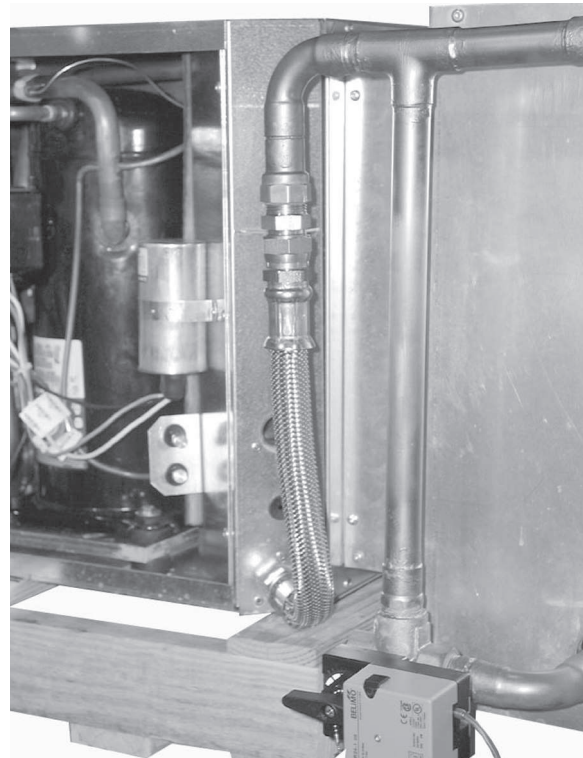
Note: Waterside economizer option is configured for right return. Left return requires additional field piping.

Figure 34. Step 4



5. Install the 18-inch steel braided hose between the upper most piping connection of the economizer, and the water-in of the heat pump. The hose is shipped loose with the water-side economizer.

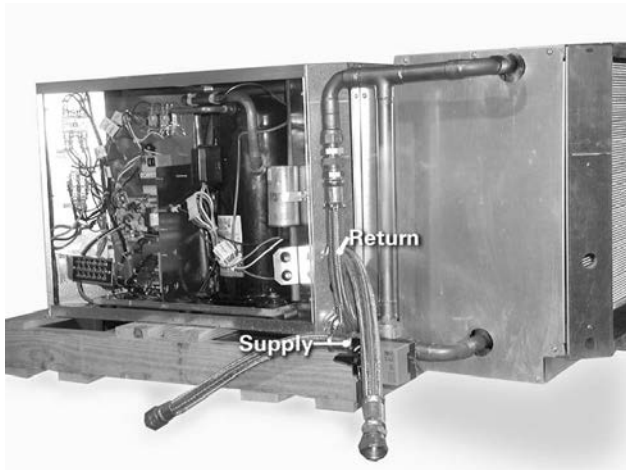
Figure 35. Step 5



6. Install the SUPPLY and RETURN hoses to the:
 - a. position valve's threaded connection.

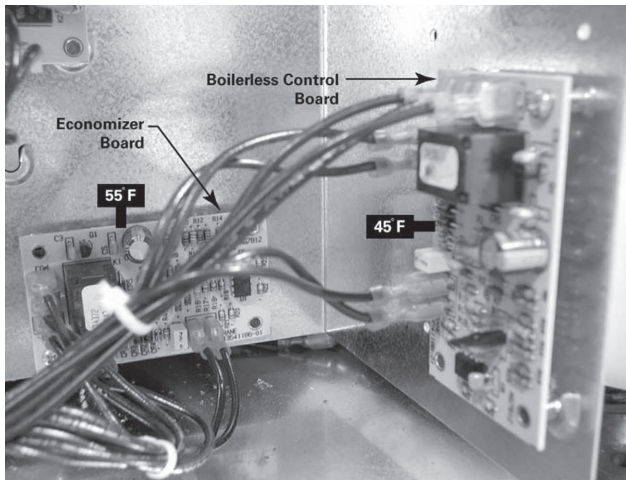
- b. water-out threaded connection of the water-source heat pump.

Figure 36. Step 6



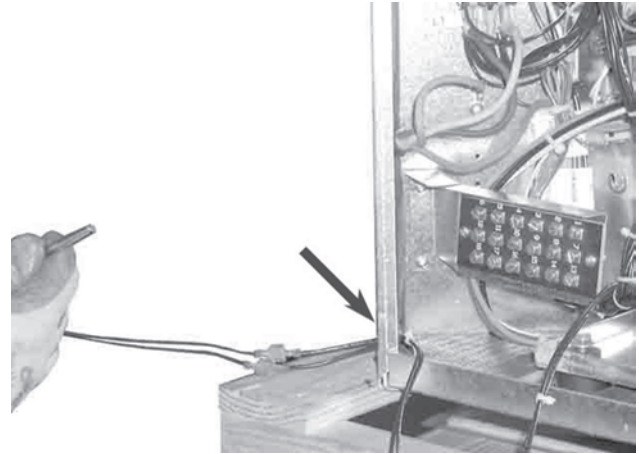
7. Verify the control board for the water side economizer is located at the back of the control box. The temperature rating of this board is factory set to 55°F. For units with boilerless (electric heat) control and water side economizer, the boilerless control board is factory set to 45°F.

Figure 37. Step 7



8. Thread the bulb and wire through the low voltage hole of the water-source heat pump. Refer the figure below.

Figure 38. Step 8

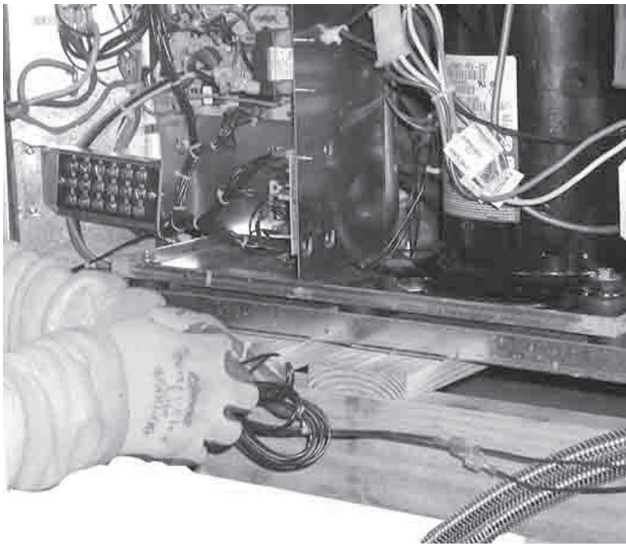


9. Wire-tie the sensor to the water SUPPLY side of the piping (ON, or BEFORE) the 2-position valve. Refer the figure below.

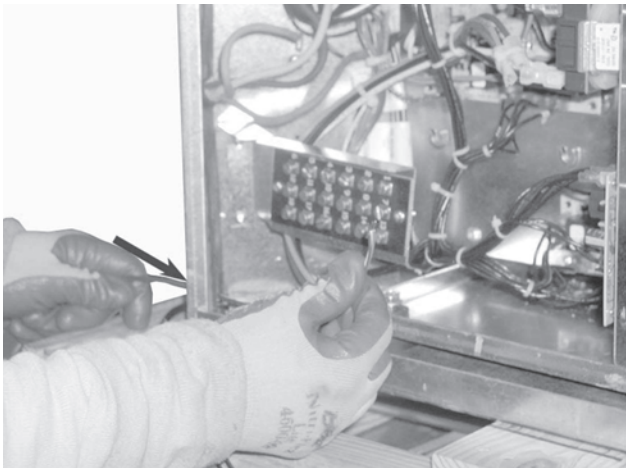
Figure 39. Step 9



10. Bundle excess sensor wire, and wire tie the bundle neatly. Refer the figure below.

Figure 40. Step 10


11. Thread the valve's wire lead through the low voltage hole of the heat pump. Refer the figure below.

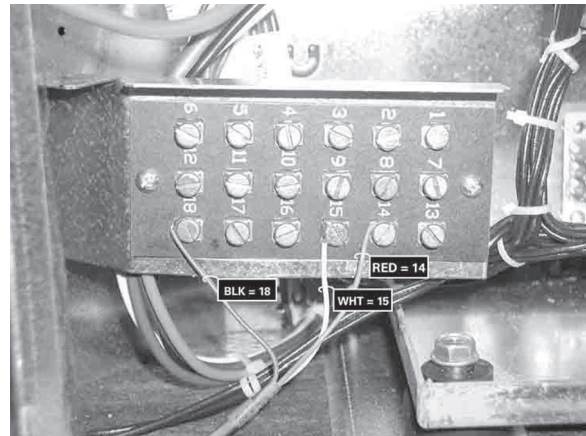
Figure 41. Step 11


12. Wire the valve to the terminal strip according to the unit wire diagram located on the service control panel.

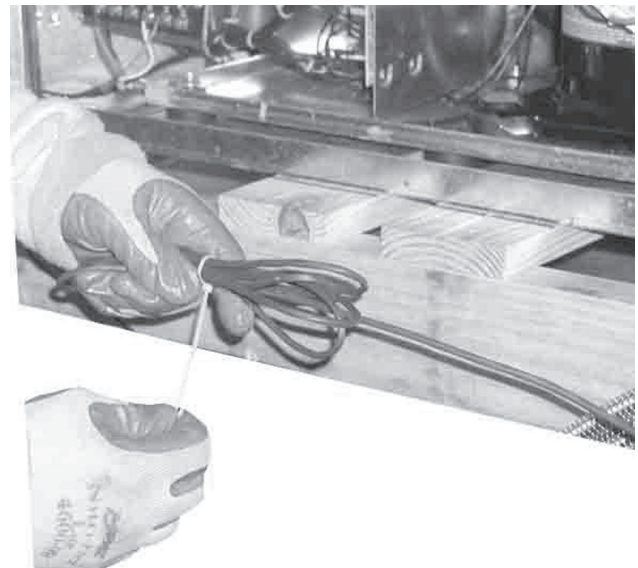
RED = 1TB1-14

BLK = 1TB1-18

WHT = 1TB1-15

Figure 42. Step 12


13. Bundle excess valve wire, and wire tie the bundle neatly.

Figure 43. Step 13


14. Install control side service panel.

15. Install the hanging isolation grommets (refer the figure below) into the hanging brackets. The unit isolators were located in the return-air section of the unit. See Step 2. Isolators for the economizing package are located with the economizer.

Figure 44. Step 15



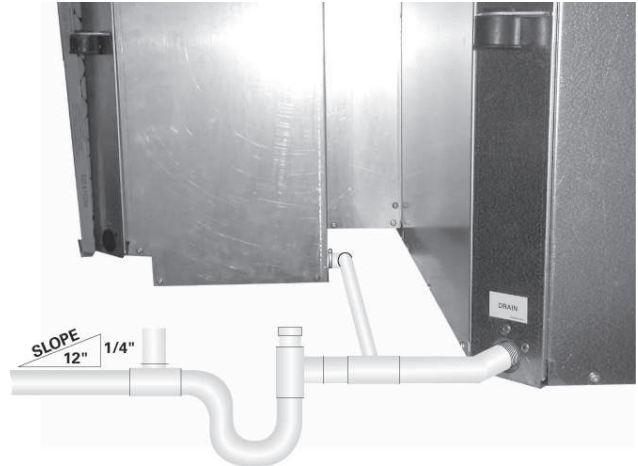
16. Insulate the economizing piping package and the supply/return/by-pass hoses (3-hoses) via field provided pipe insulation. Insulating the piping will stop condensation from forming on the pipe and dripping onto the ceiling tiles.

Notes:

- *Trane does not provide insulation on the economizing piping package. This insulation must be field provided and field installed.*
- *Trane does not provide condensate overflow protection of the waterside economizer. This must be field provided and installed.*

17. Install filter rack (top and bottom) to the economizing package. The filter rack is located in the unit's packaging along with the filter.
18. Hang unit. See [Figure 21, p. 29](#) for hanging of the packaged unit. Bottom screws referenced in Step 4 must be installed at this time.
19. Field pipe the drain lines of the waterside economizer and water-source heat pump together prior to installing a condensate trap (see "[Condensate Drain Connection](#)," p. 29) for proper trapping of condensation.

Figure 45. Step 19

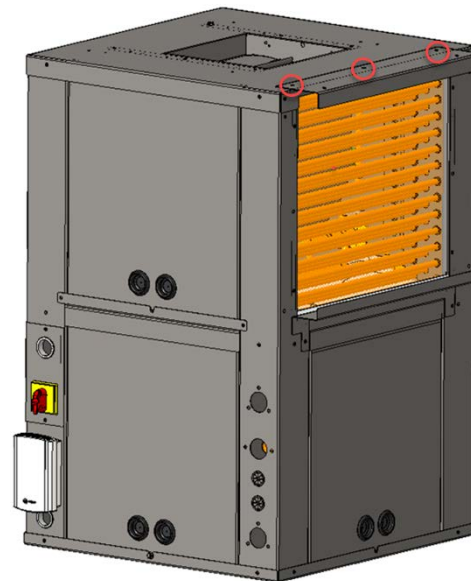


Waterside Economizer Installation for Vertical Units

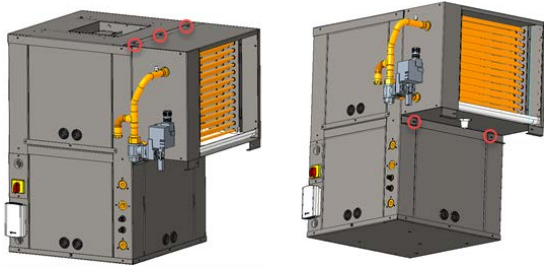
The following steps were sequenced to aid in the installation and pairing of a water side economizer to a EXV and DXV water source heat pump.

1. Remove the filter bracket from the unit. It is secured by five screws: three on top (circled) and two on the bottom (not shown). Do not discard the filter brackets.

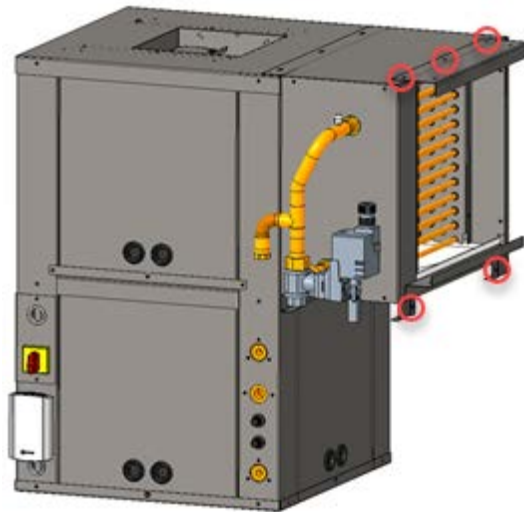
Figure 46. Step 1



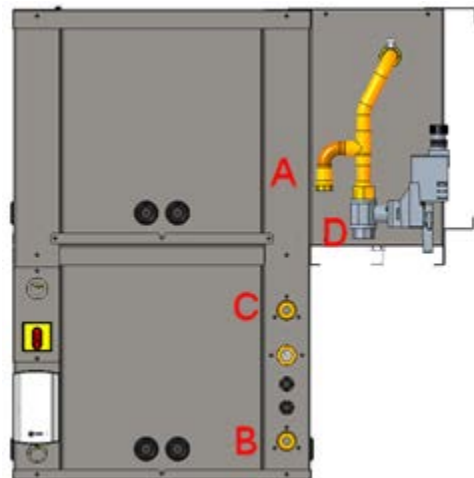
2. Mount the waterside economizer to the unit. It is secured to the unit using the five engagement holes that were used for the filter brackets: three on top and two on the bottom.

Figure 47. Step 2


3. Attach the filter brackets to the waterside economizer using five screws. Install the air filter.

Figure 48. Step 3


4. Install the braided hose connecting point A (leaving the WSE) to point B (entering the WSHP). Connect the supply water to point D and the return water to point C.

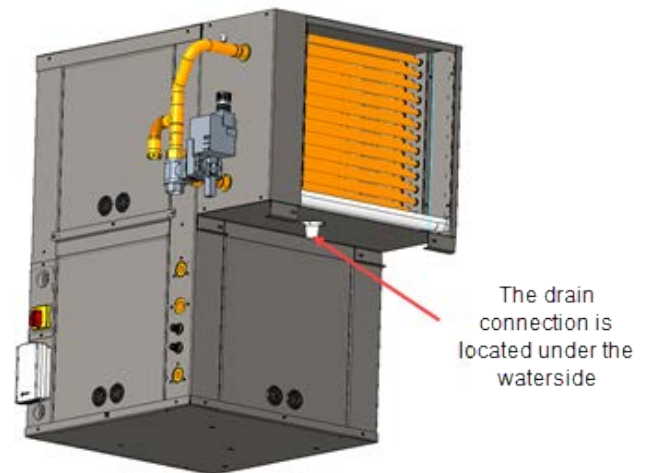
Figure 49. Step 4


5. Locate the entering water sensor that is located behind the unit's control box, and wire tie it to the water SUPPLY side of the piping. The sensor must be mounted before the two-position valve. Attaching the sensor anywhere else will cause the WSE to not operate correctly. Bundle up any excess sensor wire and wire tie the bundle neatly.
6. Locate the WSE valve wires (35B (COM), 36B (OPEN), 37B (CLOSE)) behind control box, and connect to the valve actuator. Bundle up any excess wire and wire tie the bundle neatly. Direction of rotation is reversible with switch.
7. Insulate the economizing piping package and the associated hoses via field pipe insulation. Insulating the piping will prevent condensation from forming on the pipe and dripping on the floor.

Notes:

- Trane does not provide insulation on the economizing piping package. This insulation must be field provided and field installed.
- Trane does not provide condensate overflow protection of the waterside economizer. This must be field provided and installed.

8. Field pipe the drain lines of the waterside economizer and water-source heat pump together prior to installing a condensate trap for proper trapping of condensation (see Figure 45, p. 41). The vertical units will be piped similar to the horizontal units.

Figure 50. Step 8

Table 30. Economizer part numbers

EXH Unit 60 Hz	Waterside Economizer Part Number
006-015	4476 1418 0001
018-024	4476 1419 0001
030-036	4476 1420 0001
042-070	4476 1421 0001

EXVG/DXVG Unit 60 Hz	Waterside Economizer Part Number
009–012	WSHPECN00002
015	WSHPECN00003
018–024	WSHPECN00004

EXVG/DXVG Unit 60 Hz	Waterside Economizer Part Number
030–036	WSHPECN00005
042–048	WSHPECN00006
060–070	WSHPECN00007



Waterside Economizer Start-Up Sequence

1. Set the thermostat to the highest position.
2. Set the thermostat system switch to COOL with the fan control to AUTO. The compressor should NOT run.
3. Reduce the thermostat setting until the compressor, reversing valve, solenoid valve, and loop pump are energized. Adjust water flow utilizing pressure/temperature plugs and comparing to tables contained in specification sheet data. Water leaving the heat exchanger should be warmer than the entering water temperature (approximately 9-12°F); blower operation should be smooth; compressor and blower amps should be within data plate ratings; the suction line should be cool with no frost observed in the refrigerant circuit.

4. Check the cooling refrigerant pressures against values in "Operating Pressures," p. 53.

Note: If cooling mode is activated, and the entering water temperature of the heat pump falls below 55°F, the 2-position, water side economizing valve will become energized (open) and compressor operation will halt allowing for free cooling in the space.

5. Turn the thermostat system 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. Turn the thermostat to the lowest setting.
8. Set the thermostat system switch to the HEAT position.
9. Adjust the temperature setting upward until the unit is energized. Warm air should blow from the register. A water temperature decrease of approximately 5-9°F leaving the heat exchanger should be noted. The blower and compressor operation should be smooth with no frost observed in the refrigeration circuit.
10. Check the heating refrigerant pressures against values in "Operating Pressures," p. 53.

Note: For units with boilerless electric heat option: In heating mode, if the entering water temperature of the heat pump falls below 45°F, the electric heater will be energized, and compressor operation will halt. Once the entering water temperature rises above 50°F, the boilerless controls returns the unit.

11. Set the thermostat to maintain the desired space temperature.
12. Instruct the owner on system operation.

Table 31. Waterside economizing three-way valve specifications (DXHF/DXVG units)

Unit Size	Valve Conn. Size	Valve Pres. Rating	Valve Close-off pressure	Valve Temp. Range	Actuator
DXHF/DXVG 024	3/4 FPT	600 psi	200 psi	0°F to 212°F -18°C to 121°C	Non-spring return type 24 Vac +/- 20% 135 second stroke time 24 Cv at full port
DXHF/DXVG 036-070	1 FPT	600 psi	200 psi	0°F to 212°F -18°C to 121°C	Non-spring return type 24 Vac +/- 20% 135 second stroke time 30 Cv at full port

Note: The valve body is constructed from forged brass with nickel plating, with the ball and stem constructed of stainless steel. For other information pertaining to the economizing water valve, see the valve's data plate.

Table 32. Waterside economizing three-way valve specifications (EXHF/EXVG units)

Unit Size	Valve Conn. Size	Valve Pres. Rating	Valve Close-off pressure	Valve Temp. Range	Actuator
EXHF 006-015	1/2 FPT	600 psi	200 psi	0°F to 250°F -18°C to 121°C	Non-spring return type 24 Vac +/- 20% 135 second stroke time 10 Cv at full port
EXHF 018-036 EXVG 009-024	3/4 FPT	600 psi	200 psi	0°F to 250°F -18°C to 121°C	Non-spring return type 24 Vac +/- 20% 135 second stroke time 24 Cv at full port

Waterside Economizer Start-Up Sequence

Table 32. Waterside economizing three-way valve specifications (EXHF/EXVG units) (continued)

Unit Size	Valve Conn. Size	Valve Pres. Rating	Valve Close-off pressure	Valve Temp. Range	Actuator
EXHF 042-070 EXVG 030-070	1 FPT	600 psi	200 psi	0°F to 250°F -18°C to 121°C	Non-spring return type 24 Vac +/- 20% 135 second stroke time 30 Cv at full port

Note: The valve body is constructed from forged brass with nickel plating, with the ball and stem constructed of stainless steel. For other information pertaining to the economizing water valve, see the valve's data plate.



Electrical Data

Table 33. Electrical data - 0.5 to 6 tons, EX*006-070

Model No.	Unit Volts	Total Unit FLA	Comp RLA	Comp LRA	Blower Motor FLA	Blower Motor HP	Minimum Circuit Ampacity	Maximum Overcurrent Protective Device	Electric Heat kW	Electric Heat Amps
EXHF006	208/60/1	3.70	3.3	14.0	0.40	1/3	4.53	15	0.0	0.0
EXHF006	208/60/1	4.34	3.3	14.0	0.40	1/3	5.43	15	0.8	3.9
EXHF006	230/60/1	3.60	3.2	15.0	0.40	1/3	4.40	15	0.0	0.0
EXHF006	230/60/1	4.75	3.2	15.0	0.40	1/3	5.93	15	1.0	4.3
EXHF006	265/60/1	2.90	2.5	11.0	0.40	1/3	3.53	15	0.0	0.0
EXHF006	265/60/1	5.42	2.5	11.0	0.40	1/3	6.77	15	1.3	5.0
EXHF009	208/60/1	4.30	3.7	16.0	0.60	1/3	5.23	15	0.0	0.0
EXHF009	208/60/1	6.51	3.7	16.0	0.60	1/3	8.14	15	1.2	5.9
EXHF009	230/60/1	4.10	3.5	17.0	0.60	1/3	4.98	15	0.0	0.0
EXHF009	230/60/1	7.12	3.5	17.0	0.60	1/3	8.90	15	1.5	6.5
EXHF009	265/60/1	3.40	2.8	13.0	0.60	1/3	4.10	15	0.0	0.0
EXHF009	265/60/1	8.15	2.8	13.0	0.60	1/3	10.18	15	2.0	7.5
EXHF012	208/60/1	7.02	6.3	30.0	0.72	1/3	8.60	15	0.0	0.0
EXHF012	208/60/1	8.56	6.3	27.0	0.72	1/3	10.70	15	1.6	7.8
EXHF012	230/60/1	7.02	6.3	30.0	0.72	1/3	8.60	15	0.0	0.0
EXHF012	230/60/1	9.42	6.3	30.0	0.72	1/3	11.77	15	2.0	8.7
EXHF012	265/60/1	5.72	5.0	23.0	0.72	1/3	6.97	15	0.0	0.0
EXHF012	265/60/1	10.72	5.0	23.0	0.72	1/3	13.40	15	2.7	10.0
EXHF015	208/60/1	8.79	7.9	36.0	0.89	1/3	10.77	15	0.0	0.0
EXHF015	208/60/1	10.51	7.9	36.0	0.89	1/3	13.13	15	2.0	9.6
EXHF015	230/60/1	8.79	7.9	36.0	0.89	1/3	10.77	15	0.0	0.0
EXHF015	230/60/1	11.76	7.9	36.0	0.89	1/3	14.70	15	2.5	10.9
EXHF015	265/60/1	7.29	6.4	30.0	0.89	1/3	8.89	15	0.0	0.0
EXHF015	265/60/1	13.34	6.4	30.0	0.89	1/3	16.68	20	3.3	12.5
EXHF018	208/60/1	11.10	9.6	42.0	1.50	1/2	13.50	20	0.0	0.0
EXHF018	208/60/1	13.33	9.6	42.0	1.50	1/2	16.66	20	2.5	11.8
EXHF018	230/60/1	11.10	9.6	42.0	1.50	1/2	13.50	20	0.0	0.0
EXHF018	230/60/1	14.54	9.6	42.0	1.50	1/2	18.18	20	3.0	13.0
EXHF018	265/60/1	9.00	7.7	35.0	1.30	1/2	10.93	15	0.0	0.0
EXHF018	265/60/1	16.39	7.7	35.0	1.30	1/2	20.49	25	4.0	15.1
EXHF024	208/60/1	15.70	13.5	58.3	2.20	1/2	19.08	30	0.0	0.0
EXHF024	208/60/1	17.87	13.5	58.3	2.20	1/2	22.34	30	3.3	15.7
EXHF024	230/60/1	15.70	13.5	58.3	2.20	1/2	19.08	30	0.0	0.0
EXHF024	230/60/1	19.59	13.5	58.3	2.20	1/2	24.49	30	4.0	17.4
EXHF024	265/60/1	10.10	9.0	54.0	1.10	1/2	12.35	20	0.0	0.0
EXHF024	265/60/1	21.10	9.0	54.0	1.10	1/2	26.38	30	5.3	20.0
EXHF030	208/60/1	17.30	14.1	77.0	3.20	1/2	20.83	30	0.0	0.0
EXHF030	208/60/1	26.76	14.1	77.0	3.20	1/2	33.45	35	4.9	23.6
EXHF030	230/60/1	17.30	14.1	77.0	3.20	1/2	20.83	30	0.0	0.0

Table 33. Electrical data - 0.5 to 6 tons, EX*006-070 (continued)

Model No.	Unit Volts	Total Unit FLA	Comp RLA	Comp LRA	Blower Motor FLA	Blower Motor HP	Minimum Circuit Ampacity	Maximum Overcurrent Protective Device	Electric Heat kW	Electric Heat Amps
EXHF030	230/60/1	29.29	14.1	77.0	3.20	1/2	36.61	40	6.0	26.1
EXHF030	265/60/1	13.70	10.9	60.0	2.80	1/2	16.43	25	0.0	0.0
EXHF030	265/60/1	32.80	10.9	60.0	2.80	1/2	41.00	45	8.0	30.0
EXHF036	208/60/1	18.10	14.1	77.0	4.00	3/4	21.63	35	0.0	0.0
EXHF036	208/60/1	27.56	14.1	77.0	4.00	3/4	34.45	35	4.9	23.6
EXHF036	230/60/1	18.10	14.1	77.0	4.00	3/4	21.63	35	0.0	0.0
EXHF036	230/60/1	30.09	14.1	77.0	4.00	3/4	37.61	40	6.0	26.1
EXHF036	265/60/1	15.70	12.2	72.0	3.50	3/4	18.75	30	0.0	0.0
EXHF036	265/60/1	33.50	12.2	72.0	3.50	3/4	41.88	45	8.0	30.0
EXHF036	208/60/3	13.00	9.0	71.0	4.00	3/4	15.25	20	0.0	0.0
EXHF036	208/60/3	17.60	9.0	71.0	4.00	3/4	22.00	25	4.9	13.6
EXHF036	230/60/3	13.00	9.0	71.0	4.00	3/4	15.25	20	0.0	0.0
EXHF036	230/60/3	19.06	9.0	71.0	4.00	3/4	23.83	25	6.0	15.1
EXHF036	460/60/3	9.10	5.6	38.0	3.50	3/4	10.50	15	0.0	0.0
EXHF036	460/60/3	13.48	5.6	38.0	3.50	3/4	16.85	20	8.0	10.0
EXHF042	208/60/1	22.30	17.9	112.0	4.40	3/4	26.78	40	0.0	0.0
EXHF042	208/60/1	35.65	17.9	112.0	4.40	3/4	44.56	45	6.5	31.3
EXHF042	230/60/1	22.30	17.9	112.0	4.40	3/4	26.78	40	0.0	0.0
EXHF042	230/60/1	39.18	17.9	112.0	4.40	3/4	48.98	50	8.0	34.8
EXHF042	208/60/3	17.60	13.2	88.0	4.40	3/4	20.90	30	0.0	0.0
EXHF042	208/60/3	22.44	13.2	88.0	4.40	3/4	28.05	30	6.5	18.0
EXHF042	230/60/3	17.60	13.2	88.0	4.40	3/4	20.90	30	0.0	0.0
EXHF042	230/60/3	24.48	13.2	88.0	4.40	3/4	30.60	35	8.0	20.1
EXHF042	460/60/3	9.80	6.0	44.0	3.80	3/4	11.30	15	0.0	0.0
EXHF042	460/60/3	17.10	6.0	44.0	3.80	3/4	21.38	25	10.6	13.3
EXHF048	208/60/1	25.00	19.9	109.0	5.10	3/4	29.98	45	0.0	0.0
EXHF048	208/60/1	36.35	19.9	109.0	5.10	3/4	45.44	50	6.5	31.3
EXHF048	230/60/1	25.00	19.9	109.0	5.10	3/4	29.98	45	0.0	0.0
EXHF048	230/60/1	39.88	19.9	109.0	5.10	3/4	49.85	50	8.0	34.8
EXHF048	208/60/3	18.20	13.1	83.1	5.10	3/4	21.48	30	0.0	0.0
EXHF048	208/60/3	23.14	13.1	83.1	5.10	3/4	28.93	30	6.5	18.0
EXHF048	230/60/3	18.20	13.1	83.1	5.10	3/4	21.48	30	0.0	0.0
EXHF048	230/60/3	25.18	13.1	83.1	5.10	3/4	31.48	35	8.0	20.1
EXHF048	460/60/3	10.50	6.1	41.0	4.40	3/4	12.03	15	0.0	0.0
EXHF048	460/60/3	17.70	6.1	41.0	4.40	3/4	22.13	25	10.6	13.3
EXHF060	208/60/1	34.40	26.4	134.0	8.00	1	41.00	60	0.0	0.0
EXHF060	208/60/1	39.25	26.4	134.0	8.00	1	49.06	60	6.5	31.3
EXHF060	230/60/1	34.40	26.4	134.0	8.00	1	41.00	60	0.0	0.0
EXHF060	230/60/1	42.78	26.4	134.0	8.00	1	53.48	60	8.0	34.8
EXHF060	208/60/3	24.00	16.0	110.0	8.00	1	28.00	40	0.0	0.0
EXHF060	208/60/3	26.04	16.0	110.0	8.00	1	32.55	40	6.5	18.0



Electrical Data

Table 33. Electrical data - 0.5 to 6 tons, EX*006-070 (continued)

Model No.	Unit Volts	Total Unit FLA	Comp RLA	Comp LRA	Blower Motor FLA	Blower Motor HP	Minimum Circuit Ampacity	Maximum Overcurrent Protective Device	Electric Heat kW	Electric Heat Amps
EXHF060	230/60/3	24.00	16.0	110.0	8.00	1	28.00	40	0.0	0.0
EXHF060	230/60/3	28.08	16.0	110.0	8.00	1	35.10	40	8.0	20.1
EXHF060	460/60/3	14.70	7.8	52.0	6.90	1	16.65	20	0.0	0.0
EXHF060	460/60/3	20.20	7.8	52.0	6.90	1	25.26	30	10.6	13.3
EXHF070	208/60/1	35.30	28.3	178.0	7.00	1	42.38	70	0.0	0.0
EXHF070	208/60/1	38.30	28.3	178.0	7.00	1	47.81	70	6.5	31.3
EXHF070	230/60/1	35.30	28.3	178.0	7.00	1	42.38	70	0.0	0.0
EXHF070	230/60/1	41.80	28.3	178.0	7.00	1	52.23	70	8.0	34.8
EXHF070	208/60/3	26.20	19.2	136.0	7.00	1	31.00	50	0.0	0.0
EXHF070	208/60/3	26.20	19.2	136.0	7.00	1	31.30	50	6.5	18.0
EXHF070	230/60/3	26.20	19.2	136.0	7.00	1	31.00	50	0.0	0.0
EXHF070	230/60/3	27.10	19.2	136.0	7.00	1	33.85	50	8.0	20.1
EXHF070	460/60/3	14.80	8.7	66.1	6.10	1	16.98	25	0.0	0.0
EXHF070	460/60/3	19.40	8.7	66.1	6.10	1	24.26	25	10.6	13.3
EXVG009	208-230/60/1	4.2	3.6	27.0	0.6	1/3	6/6	15/15	0.0	0.0
EXVG009	265/60/1	3.5	3.0	22.0	0.5	1/3	5	15	0.0	0.0
EXVG012	208-230/60/1	6.6	5.7	27.0	0.9	1/3	8/8	15/15	0.0	0.0
EXVG012	265/60/1	5.3	4.5	32.0	0.8	1/3	7	15	0.0	0.0
EXVG015	208-230/60/1	8.1	7.3	36.0	0.8	1/3	10/10	15/15	0.0	0.0
EXVG015	265/60/1	5.5	4.8	30.0	0.7	1/3	7	15	0.0	0.0
EXVG018	208-230/60/1	9.8	8.5	38.0	1.3	1/2	12/12	20/20	0.0	0.0
EXVG018	265/60/1	7.9	6.8	35.0	1.1	1/2	10	15	0.0	0.0
EXVG024	208-230/60/1	15.2	13.5	58.3	1.7	1/2	19/19	30/30	0.0	0.0
EXVG024	265/60/1	10.5	9.0	54.0	1.5	1/2	13	20	0.0	0.0
EXVG024	208-230/60/3	8.8	7.1	55.4	1.7	1/2	11/11	15/15	0.0	0.0
EXVG024	460/60/3	4.4	3.5	28.0	0.9	1/2	6	15	0.0	0.0
EXVG030	208-230/60/1	15.6	14.1	73.0	1.5	3/4	20/20	30/30	0.0	0.0
EXVG030	265/60/1	12.5	11.2	60.0	1.3	3/4	16	25	0.0	0.0
EXVG030	208-230/60/3	10.4	8.9	58.0	1.5	3/4	13/13	20/20	0.0	0.0
EXVG030	460/60/3	5.0	4.2	28.0	0.8	3/4	7	15	0.0	0.0
EXVG036	208-230/60/1	18.0	16.0	77.0	2.0	3/4	23/23	35/35	0.0	0.0
EXVG036	265/60/1	13.9	12.2	72.0	1.7	3/4	17	25	0.0	0.0
EXVG036	208-230/60/3	12.0	10.0	71.0	2.0	3/4	15/15	20/20	0.0	0.0
EXVG036	460/60/3	5.7	4.7	38.0	1.0	1	7	15	0.0	0.0
EXVG042	208-230/60/1	19.9	16.7	79.0	3.2	3/4	25/25	40/40	0.0	0.0
EXVG042	208-230/60/3	13.6	10.4	73.0	3.2	3/4	17/17	25/25	0.0	0.0
EXVG042	460/60/3	7.4	5.8	38.0	1.6	1	9	15	0.0	0.0
EXVG048	208-230/60/1	20.5	17.9	112.0	2.6	1	25/25	40/40	0.0	0.0
EXVG048	208-230/60/3	16.1	13.5	88.0	2.6	1	20/20	30/30	0.0	0.0
EXVG048	460/60/3	7.3	6.0	44.0	1.3	1	9	15	0.0	0.0
EXVG060	208-230/60/1	25.2	21.4	135.0	3.8	1	31/31	50/50	0.0	0.0

Table 33. Electrical data - 0.5 to 6 tons, EX*006-070 (continued)

Model No.	Unit Volts	Total Unit FLA	Comp RLA	Comp LRA	Blower Motor FLA	Blower Motor HP	Minimum Circuit Ampacity	Maximum Overcurrent Protective Device	Electric Heat kW	Electric Heat Amps
EXVG060	208-230/60/3	18.3	14.5	98.0	3.8	1	22/22	35/35	0.0	0.0
EXVG060	460/60/3	8.2	6.3	55.0	1.9	1	10	15	0.0	0.0
EXVG070	208-230/60/1	31.4	26.4	134.0	5.0	1	39/39	60/60	0.0	0.0
EXVG070	208-230/60/3	21.0	16.0	110.0	5.0	1	26/26	40/40	0.0	0.0
EXVG070	460/60/3	10.3	7.8	52.0	2.5	1	13	20	0.0	0.0

Table 34. Electrical data - 2 to 6 tons, DX*024-070

Model No.	Unit Volts	Total Unit FLA	Comp RLA	Comp LRA	Blower Motor FLA	Blower Motor HP	Minimum Circuit Ampacity	Maximum Overcurrent Protective Device	Electric Heat kW	Electric Heat Amps
DXHF024	208/60/1	15.0	13.0	58.3	2.0	1/3	18.25	30	0.0	0.0
DXHF024	208/60/1	17.7	13.0	58.3	2.0	1/3	22.09	30	3.3	15.7
DXHF024	230/60/1	15.0	13.0	58.3	2.0	1/3	18.25	30	0.0	0.0
DXHF024	230/60/1	19.4	13.0	58.3	2.0	1/3	24.24	30	4.0	17.4
DXHF024	265/60/1	12.1	10.1	54.0	2.0	1/3	14.63	20	0.0	0.0
DXHF024	265/60/1	22.0	10.1	54.0	2.0	1/3	27.50	30	5.3	20.0
DXHF024	208/60/3	9.2	7.2	55.4	2.0	1/3	11.00	15	0.0	0.0
DXHF024	208/60/3	11.0	7.2	55.4	2.0	1/3	13.81	15	3.3	9.0
DXHF024	230/60/3	9.2	7.2	55.4	2.0	1/3	11.00	15	0.0	0.0
DXHF024	230/60/3	12.0	7.2	55.4	2.0	1/3	15.05	20	4.0	10.0
DXHF024	460/60/3	5.9	3.9	28.0	2.0	1/3	6.88	15	0.0	0.0
DXHF024	460/60/3	8.7	3.9	28.0	2.0	1/3	10.82	15	5.3	6.7
DXHF036	208/60/1	19.7	17.0	83.0	2.7	3/4	23.95	40	0.0	0.0
DXHF036	208/60/1	26.3	17.0	83.0	2.7	3/4	32.82	40	4.9	23.6
DXHF036	230/60/1	19.7	17.0	83.0	2.7	3/4	23.95	40	0.0	0.0
DXHF036	230/60/1	28.8	17.0	83.0	2.7	3/4	35.98	40	6.0	26.1
DXHF036	265/60/1	17.2	14.5	72.0	2.7	3/4	20.83	35	0.0	0.0
DXHF036	265/60/1	32.7	14.5	72.0	2.7	3/4	40.88	45	8.0	30.0
DXHF036	208/60/3	15.6	12.9	73.0	2.7	3/4	18.83	30	0.0	0.0
DXHF036	208/60/3	16.3	12.9	73.0	2.7	3/4	20.38	30	4.9	13.6
DXHF036	230/60/3	15.6	12.9	73.0	2.7	3/4	18.83	30	0.0	0.0
DXHF036	230/60/3	17.8	12.9	73.0	2.7	3/4	22.20	30	6.0	15.1
DXHF036	460/60/3	9.1	6.4	38.0	2.7	3/4	10.70	15	0.0	0.0
DXHF036	460/60/3	12.7	6.4	38.0	2.7	3/4	15.85	20	8.0	10.0
DXHF048	208/60/1	26.5	23.6	104.0	2.9	3/4	32.40	50	0.0	0.0
DXHF048	208/60/1	34.2	23.6	104.0	2.9	3/4	42.69	50	6.5	31.3
DXHF048	230/60/1	26.5	23.6	104.0	2.9	3/4	32.40	50	0.0	0.0
DXHF048	230/60/1	37.7	23.6	104.0	2.9	3/4	47.10	50	8.0	34.8
DXHF048	208/60/3	18.5	15.6	83.1	2.9	3/4	22.40	35	0.0	0.0
DXHF048	208/60/3	20.9	15.6	83.1	2.9	3/4	26.18	35	6.5	18.0
DXHF048	230/60/3	18.5	15.6	83.1	2.9	3/4	22.40	35	0.0	0.0



Electrical Data

Table 34. Electrical data - 2 to 6 tons, DX*024-070 (continued)

Model No.	Unit Volts	Total Unit FLA	Comp RLA	Comp LRA	Blower Motor FLA	Blower Motor HP	Minimum Circuit Ampacity	Maximum Overcurrent Protective Device	Electric Heat kW	Electric Heat Amps
DXHF048	230/60/3	23.0	15.6	83.1	2.9	3/4	28.73	35	8.0	20.1
DXHF048	460/60/3	10.0	7.1	41.0	2.9	3/4	11.78	15	0.0	0.0
DXHF048	460/60/3	16.2	7.1	41.0	2.9	3/4	20.26	25	10.6	13.3
DXHF060	208/60/1	36.2	30.2	152.9	6.0	1	43.75	70	0.0	0.0
DXHF060	208/60/1	37.3	30.2	152.9	6.0	1	46.56	70	6.5	31.3
DXHF060	230/60/1	36.2	30.2	152.9	6.0	1	43.75	70	0.0	0.0
DXHF060	230/60/1	40.8	30.2	152.9	6.0	1	50.98	70	8.0	34.8
DXHF060	208/60/3	24.4	18.4	110.0	6.0	1	29.00	45	0.0	0.0
DXHF060	208/60/3	24.4	18.4	110.0	6.0	1	30.05	45	6.5	18.0
DXHF060	230/60/3	24.4	18.4	110.0	6.0	1	29.00	45	0.0	0.0
DXHF060	230/60/3	26.1	18.4	110.0	6.0	1	32.60	45	8.0	20.1
DXHF060	460/60/3	14.1	8.1	52.0	6.0	1	16.13	20	0.0	0.0
DXHF060	460/60/3	19.3	8.1	52.0	6.0	1	24.13	25	10.6	13.3
DXHF070	208/60/1	39.8	33.1	179.2	6.7	1	48.08	80	0.0	0.0
DXHF070	208/60/1	39.8	33.1	179.2	6.7	1	48.08	80	6.5	31.3
DXHF070	230/60/1	39.8	33.1	179.2	6.7	1	48.08	80	0.0	0.0
DXHF070	230/60/1	41.5	33.1	179.2	6.7	1	51.85	80	8.0	34.8
DXHF070	208/60/3	26.3	19.6	136.0	6.7	1	31.20	50	0.0	0.0
DXHF070	208/60/3	26.3	19.6	136.0	6.7	1	31.20	50	6.5	18.0
DXHF070	230/60/3	26.3	19.6	136.0	6.7	1	31.20	50	0.0	0.0
DXHF070	230/60/3	26.8	19.6	136.0	6.7	1	33.48	50	8.0	20.1
DXHF070	460/60/3	16.1	9.4	66.1	6.7	1	18.45	25	0.0	0.0
DXHF070	460/60/3	20.0	9.4	66.1	6.7	1	25.01	30	10.6	13.3
DXVG024	208-230/60/1	13.3	11.7	58.3	1.6	1/2	17/17	25/25	0.0	0.0
DXVG024	265/60/1	10.5	9.1	54.0	1.4	1/2	13	20	0.0	0.0
DXVG024	208-230/60/3	8.1	6.5	55.4	1.6	1/2	10/10	15/15	0.0	0.0
DXVG024	460/60/3	4.3	3.5	28.0	0.8	1/2	6	15	0.0	0.0
DXVG036	208-230/60/1	15.1	13.1	73.0	2.0	3/4	19/19	30/30	0.0	0.0
DXVG036	265/60/1	11.9	10.2	60.0	1.7	3/4	15	20	0.0	0.0
DXVG036	208-230/60/3	10.7	8.7	58.0	2.0	3/4	13/13	20/20	0.0	0.0
DXVG036	460/60/3	5.3	4.3	28.0	1.0	1	7	15	0.0	0.0
DXVG048	208-230/60/1	20.4	17.9	96.0	2.5	1	25/25	40/40	0.0	0.0
DXVG048	208-230/60/3	16.7	14.2	88.0	2.5	1	21/21	30/30	0.0	0.0
DXVG048	460/60/3	7.5	6.2	44.0	1.3	1	10	15	0.0	0.0
DXVG060	208-230/60/1	25.0	21.2	104.0	3.8	1	31/31	50/50	0.0	0.0
DXVG060	208-230/60/3	17.8	14.0	83.1	3.8	1	22/22	35/35	0.0	0.0
DXVG060	460/60/3	8.3	6.4	41.0	1.9	1	10	15	0.0	0.0
DXVG070	208-230/60/1	31.9	26.9	139.9	5.0	1	39/39	60/60	0.0	0.0
DXVG070	208-230/60/3	21.5	16.5	110.0	5.0	1	26/26	40/40	0.0	0.0
DXVG070	460/60/3	9.7	7.2	52.0	2.5	1	12	15	0.0	0.0

Table 35. Electrical data - minimum and maximum

Digit 8	Rated Voltage	Hz	Ph	Minimum Utilization Voltage	Maximum Utilization Voltage
1	208	60	1	197	229
2	230	60	1	207	253
3	208	60	3	187	229
4	460	60	3	414	506
7	265	60	1	239	292
8	230	60	3	207	253
A	208-230	60	1	197	253
B	208-230	60	3	187	253



Pre-Start 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 phasing of the unit correct per compressor rotation (scroll compressor only)?
- 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 in Unit Dimensions and Weights).
- Are the low/high-side pressure temperature caps secure and in place?
- Are all the unit access panels secure and in place?
- Is the thermostat in the OFF position?
- Is the water flow established and circulating through all the units?
- Is the duct work correctly sized, run, taped, insulated and weather proofed with proper unit arrangement?
- Is the condensate line properly sized, run, trapped, pitched and primed?
- Is the zone sensor correctly wired and in a good location?
- Does the indoor blower turn freely without rubbing?
- 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 application?



Start Up

Initial Unit Start-Up

Note: Start-up with the heat pump thermostat is included below:

1. Set the thermostat to the highest position.
2. Set the thermostat system switch to COOL with the fan control to AUTO. The compressor should NOT run.
3. Reduce the thermostat setting until the compressor, reversing valve, solenoid valve, and loop pump are energized. Adjust water flow utilizing pressure/temperature plugs and comparing to tables contained in specification sheet data.
4. Water leaving the heat exchanger should be warmer than the entering water temperature (approximately 9-12°F); blower operation should be smooth; compressor and blower amps should be within data plate ratings; the suction line should be cool with no frost observed in the refrigerant circuit.
5. Check the cooling refrigerant pressures against values in "Operating Pressures," p. 53.
6. Turn the thermostat system switch to the OFF position. Unit should stop running and the reversing valve should de-energize.
7. Leave unit off for approximately FIVE minutes to allow for pressure equalization.
8. Turn the thermostat to the lowest setting.
9. Set the thermostat system switch to the HEAT position.
10. Adjust the temperature setting upward until the unit is energized. Warm air should blow from the register. A water temperature decrease of approximately 5-9°F leaving the heat exchanger should be noted. The blower and compressor operation should be smooth with no frost observed in the refrigeration circuit.
11. Check the heating refrigerant pressures against values in "Operating Pressures," p. 53.
12. Set the thermostat to maintain the desired space temperature.
13. Instruct the owner on system operation.

Table 36. Checklist

MODE	Heat	Cool
Entering fluid temperature	_____F	_____F
Leaving fluid temperature	_____F	_____F
Temperature differential	_____F	_____F
Return-air temperature DB/WB	_____F	_____F

Table 36. Checklist (continued)

MODE	Heat	Cool
Supply-air temperature DB/WB	_____F	_____F
Temperature differential	_____F	_____F
Water coil heat exchanger (Water Pressure IN)	_____PSIG	_____PSIG
Water coil heat exchanger (Water Pressure OUT)	_____PSIG	_____PSIG
Pressure Differential	_____PSIG	_____PSIG
COMPRESSOR		
Amps		
Volts		
Discharge line temperature (after 10 minutes)	_____F	_____F

Start-Up Checklist and Log

Installing Contractor: Use this checklist 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).

Job Name:	
Model Number:	
Date:	
Serial Number:	

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

Operating Pressures

There are many variables (airflow, air temperatures) in an air conditioning system that will affect operating refrigerant pressures and temperatures. The charts below shows approximate conditions and is based on air flow at the rated SCFM, entering air at 80.6°F (DB), 66.2°F (WB) in cooling, 68°F (DB) in heating. (+)Heating data with 35°F EWT is based on the use of an anti-freeze solution having a freezing point 20°F lower than the minimum expected entering temperature.

Table 37. Operating pressures in cooling/heating for DX* units

Model	Entering Water Temp Entering Water Temp (°F)	Water Flow (GPM)	Operating Data							
			Cooling				Heating			
			Suction Pressure (psig)	Discharge Pressure (pgig)	Water Temp Rise (°F)	Air Temp Drop (°F DB)	Suction Pressure (psig)	Discharge Pressure (psig)	Water Temp Drop (°F)	Air Temp Rise (°F DB)
DXHF024	35	4.50	—	—	—	—	81-93	270-344	6-7	19-28
DXHF024	35	5.60	—	—	—	—	83-96	272-346	5-6	19-29
DXHF024	45	4.50	118-136	162-206	14-17	23-28	96-111	292-371	7-9	23-33
DXHF024	45	5.60	116-133	155-198	11-14	23-28	99-114	295-375	6-8	24-34
DXHF024	55	4.50	124-142	190-242	13-17	22-28	112-129	315-400	8-11	28-38
DXHF024	55	5.60	124-142	183-233	11-14	22-28	116-133	319-406	7-9	28-39
DXHF024	65	4.50	129-148	220-280	13-17	22-28	128-147	332-422	10-12	32-42
DXHF024	65	5.60	129-148	212-270	11-14	22-28	132-152	337-429	8-10	33-43
DXHF024	75	4.50	130-150	253-322	13-17	22-27	147-169	354-450	11-14	35-46
DXHF024	75	5.60	130-150	245-311	10-13	22-27	153-176	360-458	9-11	37-48
DXHF024	85	4.50	133-153	289-368	13-16	21-27	169-195	376-479	12-15	39-51
DXHF024	85	5.60	133-152	280-357	10-13	21-27	176-203	383-487	10-13	40-52
DXHF024	95	4.50	135-155	328-418	12-16	20-26	—	—	—	—
DXHF024	95	5.60	135-155	320-407	10-13	20-26	—	—	—	—
DXHF036	35	6.70	—	—	—	—	80-92	287-366	6-8	20-29
DXHF036	35	8.40	—	—	—	—	82-94	293-372	5-6	20-30
DXHF036	45	6.70	119-137	166-212	13-17	21-27	94-108	308-392	8-10	25-35
DXHF036	45	8.40	119-137	160-203	10-13	21-27	97-111	314-399	6-8	26-36
DXHF036	55	6.70	121-139	193-246	13-17	21-27	109-125	330-420	9-11	29-39
DXHF036	55	8.40	121-139	186-236	10-13	22-27	112-129	336-427	7-9	29-40
DXHF036	65	6.70	123-141	223-284	13-16	21-27	125-144	354-451	10-12	32-42
DXHF036	65	8.40	123-141	215-274	10-13	21-27	130-149	359-458	8-10	32-43
DXHF036	75	6.70	125-143	257-326	13-16	21-26	144-165	380-483	11-14	35-47
DXHF036	75	8.40	124-143	248-316	10-13	21-26	149-171	385-490	9-11	36-48
DXHF036	85	6.70	126-145	293-373	12-16	20-26	164-189	407-518	12-15	40-51
DXHF036	85	8.40	126-145	285-362	10-13	20-26	171-197	412-525	10-13	40-52
DXHF036	95	6.70	128-147	333-423	12-15	19-25	—	—	—	—
DXHF036	95	8.40	128-147	324-413	10-12	20-25	—	—	—	—
DXHF048	35	9.00	—	—	—	—	78-89	274-348	6-8	19-29
DXHF048	35	11.20	—	—	—	—	79-91	276-352	5-6	20-30
DXHF048	45	9.00	122-141	165-209	13-17	23-28	93-107	292-372	7-9	24-33
DXHF048	45	11.20	122-141	158-201	11-14	22-28	95-110	295-376	6-8	24-34
DXHF048	55	9.00	124-143	190-242	13-17	22-28	110-126	311-396	8-11	27-37
DXHF048	55	11.20	124-143	183-233	11-13	22-28	113-130	315-400	7-9	28-38
DXHF048	65	9.00	126-145	219-279	13-16	22-27	128-147	333-424	9-12	30-41
DXHF048	65	11.20	126-145	211-269	10-13	22-27	132-152	337-429	8-10	31-42
DXHF048	75	9.00	128-148	252-320	13-16	21-27	146-168	359-457	11-14	35-46
DXHF048	75	11.20	128-148	244-310	10-13	21-27	151-174	365-464	9-11	36-47

Table 37. Operating pressures in cooling/heating for DX* units (continued)

Model	Entering Water Temp Entering Water Temp (°F)	Water Flow (GPM)	Operating Data							
			Cooling				Heating			
			Suction Pressure (psig)	Discharge Pressure (pgig)	Water Temp Rise (°F)	Air Temp Drop (°F DB)	Suction Pressure (psig)	Discharge Pressure (psig)	Water Temp Drop (°F)	Air Temp Rise (°F DB)
DXHF048	85	9.00	130-150	288-366	12-16	21-26	164-189	392-498	12-16	40-52
DXHF048	85	11.20	130-150	279-356	10-13	21-27	170-196	399-508	10-13	41-52
DXHF048	95	9.00	132-152	327-416	12-15	20-26	—	—	—	—
DXHF048	95	11.20	132-152	318-405	10-12	20-26	—	—	—	—
DXHF060	35	11.20	—	—	—	—	80-92	305-389	6-8	24-33
DXHF060	35	14.00	—	—	—	—	83-95	306-390	5-7	24-34
DXHF060	45	11.20	112-129	160-203	13-16	22-28	97-111	324-412	7-10	28-38
DXHF060	45	14.00	112-129	154-196	10-13	22-28	100-115	327-417	6-8	29-39
DXHF060	55	11.20	115-133	187-238	12-16	22-28	112-129	347-442	9-11	32-43
DXHF060	55	14.00	115-133	181-230	10-13	22-28	115-132	352-448	7-9	33-44
DXHF060	65	11.20	119-136	217-277	12-15	22-27	127-146	374-476	10-12	36-48
DXHF060	65	14.00	118-136	210-268	10-12	22-27	130-150	381-486	8-10	38-49
DXHF060	75	11.20	121-139	250-319	12-15	21-27	142-164	405-516	11-14	41-52
DXHF060	75	14.00	120-139	243-309	10-12	21-27	147-169	415-528	9-12	42-54
DXHF060	85	11.20	122-141	286-365	12-15	20-26	160-185	441-561	12-15	45-57
DXHF060	85	14.00	122-141	278-354	9-12	20-26	167-192	453-576	10-13	47-60
DXHF060	95	11.20	124-143	325-414	11-14	20-25	—	—	—	—
DXHF060	95	14.00	124-143	317-404	9-12	20-25	—	—	—	—
DXHF070	35	12.30	—	—	—	—	76-88	291-370	6-8	21-30
DXHF070	35	15.40	—	—	—	—	78-90	296-377	5-7	22-32
DXHF070	45	12.30	109-125	163-208	13-16	19-25	89-102	310-394	7-9	24-34
DXHF070	45	15.40	109-125	157-200	10-13	19-25	91-104	315-401	6-8	25-35
DXHF070	55	12.30	112-129	190-241	13-16	19-25	102-117	330-420	8-11	28-38
DXHF070	55	15.40	112-129	183-233	10-13	20-25	104-120	335-427	7-9	29-39
DXHF070	65	12.30	116-133	219-279	12-16	20-25	116-133	352-448	10-12	32-43
DXHF070	65	15.40	115-133	212-270	10-13	20-25	119-137	358-455	8-10	33-44
DXHF070	75	12.30	118-136	252-321	12-16	19-25	132-151	376-479	11-14	36-47
DXHF070	75	15.40	118-135	244-311	10-13	19-25	136-156	383-488	9-11	37-48
DXHF070	85	12.30	120-138	288-367	12-15	19-25	149-172	403-513	12-15	40-51
DXHF070	85	15.40	120-138	280-356	10-12	19-25	155-178	412-525	10-13	41-53
DXHF070	95	12.30	122-141	327-416	12-15	18-24	—	—	—	—
DXHF070	95	15.40	122-141	319-406	9-12	18-24	—	—	—	—
DXVG024	32	4.80	—	—	—	—	89-103	285-362	5-7	18-28
DXVG024	32	6.00	—	—	—	—	91-105	288-366	4-5	19-28
DXVG024	45	4.80	132-152	173-220	11-14	24-30	109-126	301-383	7-8	23-33
DXVG024	45	6.00	132-151	166-212	9-12	24-30	112-129	304-387	5-7	24-33
DXVG024	55	4.80	132-152	200-254	11-14	24-29	125-144	318-404	8-10	27-37
DXVG024	55	6.00	132-152	193-246	9-11	24-29	129-148	321-408	6-8	28-38

Table 37. Operating pressures in cooling/heating for DX* units (continued)

Model	Entering Water Temp Entering Water Temp (°F)	Water Flow (GPM)	Operating Data							
			Cooling				Heating			
			Suction Pressure (psig)	Discharge Pressure (pgig)	Water Temp Rise (°F)	Air Temp Drop (°F DB)	Suction Pressure (psig)	Discharge Pressure (psig)	Water Temp Drop (°F)	Air Temp Rise (°F DB)
DXVG024	68	4.80	136-156	239-305	11-14	23-29	149-172	342-436	9-12	32-42
DXVG024	68	6.00	136-156	232-296	9-11	23-29	154-177	345-439	7-10	33-43
DXVG024	75	4.80	139-159	263-335	11-14	23-28	164-188	354-451	10-13	34-45
DXVG024	75	6.00	138-159	256-326	9-11	23-29	169-195	357-455	8-10	35-46
DXVG024	86	4.80	143-164	303-386	11-14	22-28	190-218	373-475	11-14	38-49
DXVG024	86	6.00	143-164	296-376	9-11	23-28	197-226	376-478	9-11	39-50
DXVG024	95	4.80	145-167	339-432	11-14	22-28	—	—	—	—
DXVG024	95	6.00	145-167	331-422	9-11	22-28	—	—	—	—
DXVG036	32	7.20	—	—	—	—	90-104	262-333	5-6	16-24
DXVG036	32	9.00	—	—	—	—	92-105	263-335	4-5	16-25
DXVG036	45	7.20	138-159	177-225	11-14	24-29	109-125	278-354	6-7	19-28
DXVG036	45	9.00	138-159	170-217	9-11	24-29	111-128	280-357	5-6	20-29
DXVG036	55	7.20	140-161	204-260	11-14	23-29	125-143	293-373	7-9	22-32
DXVG036	55	9.00	140-161	198-251	9-11	23-29	128-147	295-376	5-7	23-32
DXVG036	68	7.20	143-164	243-310	10-13	22-28	148-170	314-399	8-10	27-37
DXVG036	68	9.00	143-164	237-301	8-11	23-28	152-175	317-403	7-8	27-37
DXVG036	75	7.20	145-166	265-338	10-13	22-28	163-187	326-415	9-11	29-39
DXVG036	75	9.00	145-166	259-330	8-10	22-28	168-193	329-419	7-9	30-40
DXVG036	86	7.20	147-170	304-387	10-13	22-27	190-218	346-440	10-12	33-44
DXVG036	86	9.00	147-169	298-379	8-10	22-27	196-225	350-446	8-10	34-45
DXVG036	95	7.20	149-172	341-433	10-13	21-27	—	—	—	—
DXVG036	95	9.00	149-172	334-425	8-10	21-27	—	—	—	—
DXVG048	32	9.60	—	—	—	—	87-100	260-331	5-6	16-25
DXVG048	32	12.00	—	—	—	—	89-102	262-333	4-5	16-25
DXVG048	45	9.60	135-155	179-227	11-14	24-29	105-121	278-353	6-8	20-29
DXVG048	45	12.00	135-155	172-219	9-11	24-29	108-124	280-356	5-6	20-30
DXVG048	55	9.60	137-157	206-262	11-14	23-28	121-139	292-372	7-9	23-33
DXVG048	55	12.00	137-157	200-254	9-11	23-29	124-142	294-375	6-7	24-34
DXVG048	68	9.60	141-162	246-313	10-13	22-28	143-165	312-398	8-11	28-38
DXVG048	68	12.00	140-162	239-305	8-11	22-28	147-169	316-402	7-9	29-39
DXVG048	75	9.60	142-164	268-341	10-13	22-27	157-181	324-412	9-12	30-41
DXVG048	75	12.00	142-164	261-333	8-10	22-28	162-186	328-417	7-9	31-42
DXVG048	86	9.60	145-167	307-391	10-13	21-27	183-211	343-437	10-13	34-45
DXVG048	86	12.00	145-166	301-383	8-10	21-27	189-218	348-443	8-11	35-46
DXVG048	95	9.60	146-168	343-437	10-13	21-27	—	—	—	—
DXVG048	95	12.00	146-168	337-428	8-10	21-27	—	—	—	—
DXVG060	32	12.00	—	—	—	—	87-101	285-363	5-6	15-24
DXVG060	32	15.00	—	—	—	—	89-103	288-366	4-5	16-24

Table 37. Operating pressures in cooling/heating for DX* units (continued)

Model	Entering Water Temp Entering Water Temp (°F)	Water Flow (GPM)	Operating Data							
			Cooling				Heating			
			Suction Pressure (psig)	Discharge Pressure (pgig)	Water Temp Rise (°F)	Air Temp Drop (°F DB)	Suction Pressure (psig)	Discharge Pressure (psig)	Water Temp Drop (°F)	Air Temp Rise (°F DB)
DXVG060	45	12.00	136-156	180-230	10-12	22-28	106-122	299-381	6-7	19-28
DXVG060	45	15.00	136-157	174-222	8-10	22-28	108-124	302-384	5-6	20-29
DXVG060	55	12.00	138-159	210-267	10-12	22-27	121-139	313-398	7-9	22-32
DXVG060	55	15.00	138-159	203-259	8-10	22-27	124-142	315-401	6-7	23-33
DXVG060	68	12.00	141-162	251-320	9-12	21-27	143-165	333-424	8-10	27-37
DXVG060	68	15.00	141-162	245-312	8-10	21-27	147-170	335-427	7-8	28-38
DXVG060	75	12.00	143-164	275-350	9-12	21-27	158-181	343-436	9-11	29-40
DXVG060	75	15.00	143-164	269-342	7-10	21-27	162-187	345-439	7-9	30-40
DXVG060	86	12.00	146-167	316-402	9-12	20-26	184-211	361-460	10-13	33-44
DXVG060	86	15.00	145-167	310-394	7-9	20-26	189-218	364-463	8-10	34-45
DXVG060	95	12.00	148-170	353-450	9-12	20-26	—	—	—	—
DXVG060	95	15.00	148-170	347-442	7-9	20-26	—	—	—	—
DXVG070	32	14.00	—	—	—	—	89-102	277-353	4-6	16-25
DXVG070	32	17.50	—	—	—	—	91-104	278-354	4-5	17-25
DXVG070	45	14.00	130-150	171-218	11-14	23-28	107-123	296-376	6-7	20-30
DXVG070	45	17.50	130-150	167-213	8-11	23-28	110-126	298-379	5-6	21-30
DXVG070	55	14.00	132-151	199-254	10-13	22-28	122-140	312-397	6-8	23-33
DXVG070	55	17.50	131-151	194-247	8-11	22-28	125-144	314-400	5-7	24-34
DXVG070	68	14.00	136-156	237-302	10-13	22-28	144-165	333-424	8-10	28-38
DXVG070	68	17.50	136-156	232-295	8-11	22-28	148-170	336-428	6-8	28-39
DXVG070	75	14.00	139-160	260-331	10-13	22-27	157-181	345-439	8-11	30-40
DXVG070	75	17.50	139-159	254-324	8-11	22-27	162-187	348-443	7-9	31-41
DXVG070	86	14.00	143-164	300-382	10-13	21-27	183-211	363-462	10-12	34-45
DXVG070	86	17.50	142-164	294-374	8-10	21-27	189-218	367-467	8-10	35-45
DXVG070	95	14.00	145-166	336-427	10-13	21-26	—	—	—	—
DXVG070	95	17.50	144-166	330-420	8-10	21-26	—	—	—	—

Table 38. Operating pressures in cooling/heating for EX* units

Model	Entering Water Temp Entering Water Temp (°F)	Water Flow (GPM)	Operating Data							
			Cooling				Heating			
			Suction Pressure (psig)	Discharge Pressure (pgig)	Water Temp Rise (°F)	Air Temp Drop (°F DB)	Suction Pressure (psig)	Discharge Pressure (psig)	Water Temp Drop (°F)	Air Temp Rise (°F DB)
EXHF006	35	1.40	—	—	—	—	94-108	279-355	6-8	23-29
EXHF006	35	1.70	—	—	—	—	96-110	281-357	5-6	23-29
EXHF006	45	1.40	143-165	190-243	13-16	24-30	110-127	297-377	7-9	26-34
EXHF006	45	1.70	143-164	184-235	11-13	24-31	113-130	300-382	6-8	27-34
EXHF006	55	1.40	145-167	217-277	13-16	23-30	128-147	317-404	8-10	30-39
EXHF006	55	1.70	144-166	210-268	11-13	24-30	131-151	320-407	7-9	31-39

Table 38. Operating pressures in cooling/heating for EX* units (continued)

Model	Entering Water Temp Entering Water Temp (°F)	Water Flow (GPM)	Operating Data							
			Cooling				Heating			
			Suction Pressure (psig)	Discharge Pressure (pgig)	Water Temp Rise (°F)	Air Temp Drop (°F DB)	Suction Pressure (psig)	Discharge Pressure (psig)	Water Temp Drop (°F)	Air Temp Rise (°F DB)
EXHF006	68	1.40	148-171	254-324	12-15	23-29	154-177	345-439	10-12	35-45
EXHF006	68	1.70	147-170	244-312	10-13	23-29	158-182	349-444	8-10	36-45
EXHF006	75	1.40	148-171	281-358	12-15	23-29	169-195	361-459	10-13	38-48
EXHF006	75	1.70	148-170	273-348	10-13	23-29	175-201	366-466	9-11	38-48
EXHF006	86	1.40	149-172	328-418	12-15	22-28	197-226	388-494	11-15	41-52
EXHF006	86	1.70	149-172	320-407	10-13	23-29	203-234	395-502	10-12	41-52
EXHF006	95	1.40	151-173	373-474	12-15	22-28	—	—	—	—
EXHF006	95	1.70	150-173	363-462	10-13	22-28	—	—	—	—
EXHF009	35	1.70	—	—	—	—	93-107	272-346	6-7	20-26
EXHF009	35	2.10	—	—	—	—	95-110	274-348	5-6	21-27
EXHF009	45	1.70	142-164	187-238	13-16	22-28	109-126	288-366	7-9	24-30
EXHF009	45	2.10	142-164	181-230	11-14	22-27	112-129	291-370	6-7	24-31
EXHF009	55	1.70	144-166	214-272	12-15	21-27	127-146	305-388	8-10	27-34
EXHF009	55	2.10	144-166	207-263	10-13	21-27	130-150	309-393	7-8	27-35
EXHF009	68	1.70	146-168	258-328	12-15	20-26	153-176	330-420	9-12	31-39
EXHF009	68	2.10	146-168	250-318	10-12	21-26	157-181	335-427	8-10	32-40
EXHF009	75	1.70	147-169	286-363	12-15	20-25	168-193	345-439	10-13	33-42
EXHF009	75	2.10	147-169	277-352	9-12	20-26	174-200	350-446	8-11	34-43
EXHF009	86	1.70	149-171	336-427	12-15	19-25	195-224	370-471	11-14	36-46
EXHF009	86	2.10	148-171	326-415	9-12	20-25	202-232	375-477	9-12	37-47
EXHF009	95	1.70	149-172	386-491	12-15	19-24	—	—	—	—
EXHF009	95	2.10	149-172	375-477	9-12	19-24	—	—	—	—
EXHF012	35	2.20	—	—	—	—	92-106	288-367	10-13	21-27
EXHF012	35	2.80	—	—	—	—	95-109	290-370	8-11	21-27
EXHF012	45	2.20	142-163	183-233	12-15	22-28	108-125	304-387	12-15	24-30
EXHF012	45	2.80	142-163	175-223	9-12	23-29	111-128	307-391	9-12	24-31
EXHF012	55	2.20	143-164	212-270	12-15	21-27	126-145	322-410	13-16	26-33
EXHF012	55	2.80	143-164	204-260	9-12	22-27	130-149	325-413	10-13	27-34
EXHF012	68	2.20	144-166	257-327	12-15	21-26	152-174	346-441	14-18	29-37
EXHF012	68	2.80	144-166	248-316	9-12	21-26	157-180	352-448	11-15	29-37
EXHF012	75	2.20	145-167	284-361	12-15	20-26	167-192	361-460	15-19	30-38
EXHF012	75	2.80	145-167	274-349	9-12	20-26	173-199	366-466	12-15	30-39
EXHF012	86	2.20	146-168	332-422	12-15	19-25	194-223	384-489	16-21	32-40
EXHF012	86	2.80	146-168	321-409	9-12	20-25	201-231	390-497	13-17	32-41
EXHF012	95	2.20	147-170	376-478	12-15	19-24	—	—	—	—
EXHF012	95	2.80	147-170	365-465	9-12	19-24	—	—	—	—
EXHF015	35	2.80	—	—	—	—	91-105	296-377	6-7	20-25
EXHF015	35	3.50	—	—	—	—	93-107	299-380	5-6	20-26

Table 38. Operating pressures in cooling/heating for EX* units (continued)

Model	Entering Water Temp Entering Water Temp (°F)	Water Flow (GPM)	Operating Data							
			Cooling				Heating			
			Suction Pressure (psig)	Discharge Pressure (pgig)	Water Temp Rise (°F)	Air Temp Drop (°F DB)	Suction Pressure (psig)	Discharge Pressure (psig)	Water Temp Drop (°F)	Air Temp Rise (°F DB)
EXHF015	45	2.80	138-159	180-230	11-14	22-28	107-123	313-398	7-8	23-29
EXHF015	45	3.50	138-158	174-221	9-11	22-27	109-126	316-402	5-7	23-30
EXHF015	55	2.80	139-159	210-267	11-14	21-27	124-143	332-423	8-10	26-33
EXHF015	55	3.50	138-159	203-258	9-11	21-27	128-147	336-427	6-8	27-34
EXHF015	68	2.80	140-161	254-324	11-14	20-26	150-172	358-456	9-11	30-38
EXHF015	68	3.50	140-161	246-313	9-11	21-26	154-178	364-463	7-9	30-39
EXHF015	75	2.80	141-162	281-358	11-14	20-25	165-190	373-475	10-12	32-40
EXHF015	75	3.50	140-162	272-347	9-11	20-26	171-196	379-483	8-10	32-41
EXHF015	86	2.80	142-163	328-417	11-14	19-25	191-220	399-508	11-14	34-43
EXHF015	86	3.50	142-163	318-405	9-11	20-25	198-228	405-515	9-11	34-44
EXHF015	95	2.80	143-165	371-472	11-14	19-24	—	—	—	—
EXHF015	95	3.50	143-165	361-459	9-11	19-24	—	—	—	—
EXHF018	35	3.30	—	—	—	—	91-104	282-357	6-7	21-26
EXHF018	35	4.20	—	—	—	—	93-107	285-360	5-6	21-27
EXHF018	45	3.30	143-164	158-206	12-15	23-29	106-122	306-385	7-9	24-30
EXHF018	45	4.20	142-164	151-197	9-12	23-29	109-125	309-388	5-7	24-31
EXHF018	55	3.30	142-164	186-242	12-15	23-29	123-141	323-407	8-10	27-34
EXHF018	55	4.20	143-164	179-233	9-12	23-29	127-146	326-411	6-8	27-35
EXHF018	68	3.30	143-164	226-294	12-15	22-28	148-171	357-447	9-12	31-39
EXHF018	68	4.20	142-164	218-283	9-12	22-28	153-176	361-452	8-10	32-40
EXHF018	75	3.30	143-164	252-326	12-15	21-27	164-188	370-464	10-13	33-42
EXHF018	75	4.20	143-164	243-315	9-12	21-27	169-195	375-470	8-10	34-43
EXHF018	86	3.30	143-165	295-382	12-15	20-26	191-219	389-488	11-14	36-46
EXHF018	86	4.20	143-165	286-370	9-12	20-26	198-228	392-492	9-11	37-47
EXHF018	95	3.30	144-166	336-433	12-15	19-24	—	—	—	—
EXHF018	95	4.20	144-166	326-421	9-12	19-25	—	—	—	—
EXHF024	35	4.40	—	—	—	—	84-97	276-348	5-7	21-27
EXHF024	35	5.60	—	—	—	—	86-99	278-350	4-5	22-28
EXHF024	45	4.40	134-154	164-214	12-15	23-30	99-114	296-372	6-8	25-32
EXHF024	45	5.60	132-152	157-205	9-12	23-30	101-116	298-375	5-6	26-32
EXHF024	55	4.40	134-154	191-249	12-15	22-28	115-132	311-391	7-9	29-36
EXHF024	55	5.60	134-154	184-239	9-12	22-29	118-136	314-395	6-7	29-37
EXHF024	68	4.40	135-156	231-300	12-15	21-27	139-160	342-428	9-11	33-42
EXHF024	68	5.60	135-155	224-290	9-12	22-28	143-165	346-433	7-9	33-42
EXHF024	75	4.40	136-157	256-331	12-15	21-27	153-176	355-444	9-12	35-44
EXHF024	75	5.60	136-156	248-321	9-12	21-27	159-182	360-450	8-10	35-45
EXHF024	86	4.40	137-158	298-385	11-14	20-26	178-205	376-471	11-13	37-47
EXHF024	86	5.60	137-158	289-374	9-11	20-26	185-213	380-476	9-11	38-48

Table 38. Operating pressures in cooling/heating for EX* units (continued)

Model	Entering Water Temp Entering Water Temp (°F)	Water Flow (GPM)	Operating Data							
			Cooling				Heating			
			Suction Pressure (psig)	Discharge Pressure (pgig)	Water Temp Rise (°F)	Air Temp Drop (°F DB)	Suction Pressure (psig)	Discharge Pressure (psig)	Water Temp Drop (°F)	Air Temp Rise (°F DB)
EXHF024	95	4.40	139-160	336-434	11-14	19-25	—	—	—	—
EXHF024	95	5.60	138-159	328-422	9-11	20-25	—	—	—	—
EXHF030	35	5.50	—	—	—	—	88-102	269-342	5-7	20-25
EXHF030	35	7.00	—	—	—	—	91-105	271-344	4-6	20-26
EXHF030	45	5.50	138-159	164-214	12-15	22-28	104-120	287-364	7-8	23-29
EXHF030	45	7.00	140-161	157-205	10-12	22-27	107-123	290-367	5-7	23-30
EXHF030	55	5.50	142-164	191-249	12-15	21-27	121-139	303-384	8-10	26-33
EXHF030	55	7.00	142-163	184-240	9-12	21-27	125-144	307-388	6-8	27-34
EXHF030	68	5.50	144-165	230-299	12-15	20-26	146-168	333-420	9-11	30-38
EXHF030	68	7.00	143-165	222-289	9-12	21-26	151-174	337-426	7-9	30-39
EXHF030	75	5.50	144-166	255-331	12-15	20-25	161-185	347-438	10-13	32-40
EXHF030	75	7.00	143-165	248-322	9-12	20-26	167-192	352-444	8-10	32-41
EXHF030	86	5.50	146-168	297-384	11-15	19-25	187-215	368-465	11-14	34-43
EXHF030	86	7.00	145-167	288-373	9-11	20-25	194-223	374-473	9-11	34-44
EXHF030	95	5.50	147-169	336-434	11-14	19-24	—	—	—	—
EXHF030	95	7.00	146-169	327-423	9-11	19-24	—	—	—	—
EXHF036	35	6.60	—	—	—	—	88-102	289-364	6-7	19-24
EXHF036	35	8.40	—	—	—	—	90-104	291-366	5-6	19-24
EXHF036	45	6.60	135-156	168-217	12-15	21-26	103-119	307-386	7-8	23-29
EXHF036	45	8.40	135-155	161-209	9-12	21-26	106-122	309-388	5-7	23-29
EXHF036	55	6.60	136-157	196-252	12-15	20-26	120-139	324-408	8-10	26-33
EXHF036	55	8.40	136-157	189-244	9-12	21-26	124-143	327-411	6-8	26-34
EXHF036	68	6.60	138-159	234-302	12-15	20-25	145-167	359-450	9-12	30-39
EXHF036	68	8.40	138-159	226-292	9-12	20-26	150-173	363-454	7-9	31-39
EXHF036	75	6.60	140-161	259-333	11-15	20-25	160-184	373-468	10-13	33-42
EXHF036	75	8.40	139-160	251-323	9-11	20-26	166-191	377-472	8-10	33-42
EXHF036	86	6.60	141-163	300-386	11-14	20-25	185-213	398-499	11-14	35-45
EXHF036	86	8.40	141-162	292-375	9-11	20-26	193-222	402-505	9-12	36-45
EXHF036	95	6.60	143-164	338-434	11-14	20-25	—	—	—	—
EXHF036	95	8.40	143-164	329-423	9-11	20-26	—	—	—	—
EXHF042	35	7.80	—	—	—	—	86-99	281-353	6-7	22-27
EXHF042	35	9.80	—	—	—	—	88-101	282-354	4-6	22-28
EXHF042	45	7.80	138-159	161-212	12-15	21-27	101-116	297-372	7-8	25-31
EXHF042	45	9.80	138-159	155-204	10-12	21-27	103-119	299-375	5-7	25-32
EXHF042	55	7.80	139-160	190-249	12-15	21-27	117-135	312-392	8-10	28-35
EXHF042	55	9.80	139-160	183-240	10-12	21-27	120-139	314-395	6-8	29-35
EXHF042	68	7.80	140-161	230-300	12-15	21-26	142-163	348-434	9-11	32-40
EXHF042	68	9.80	140-161	222-290	9-12	21-26	146-168	351-438	7-9	33-41

Table 38. Operating pressures in cooling/heating for EX* units (continued)

Model	Entering Water Temp Entering Water Temp (°F)	Water Flow (GPM)	Operating Data							
			Cooling				Heating			
			Suction Pressure (psig)	Discharge Pressure (pgig)	Water Temp Rise (°F)	Air Temp Drop (°F DB)	Suction Pressure (psig)	Discharge Pressure (psig)	Water Temp Drop (°F)	Air Temp Rise (°F DB)
EXHF042	75	7.80	141-162	255-332	12-15	20-26	156-180	361-450	10-12	35-43
EXHF042	75	9.80	141-162	247-322	9-12	20-26	161-186	365-456	8-10	35-44
EXHF042	86	7.80	143-164	298-387	11-14	19-25	181-209	384-480	11-14	37-46
EXHF042	86	9.80	142-164	290-376	9-12	19-25	188-216	388-485	9-11	37-47
EXHF042	95	7.80	144-166	337-437	11-14	19-24	—	—	—	—
EXHF042	95	9.80	144-165	329-426	9-11	19-24	—	—	—	—
EXHF048	35	8.80	—	—	—	—	88-101	287-362	6-7	20-25
EXHF048	35	11.20	—	—	—	—	90-103	289-364	5-6	20-26
EXHF048	45	8.80	136-156	173-224	12-15	21-27	103-118	303-382	7-9	23-29
EXHF048	45	11.20	136-156	167-215	10-12	22-28	106-122	305-385	5-7	23-30
EXHF048	55	8.80	137-158	202-261	12-15	21-27	120-138	319-402	8-10	26-33
EXHF048	55	11.20	137-158	195-251	9-12	21-27	123-142	323-407	6-8	27-34
EXHF048	68	8.80	139-160	245-315	12-15	20-26	145-166	353-443	9-12	30-38
EXHF048	68	11.20	139-160	237-305	9-12	21-26	150-172	357-448	7-9	31-39
EXHF048	75	8.80	140-161	270-347	12-15	20-25	159-183	367-461	10-13	32-40
EXHF048	75	11.20	140-161	262-337	9-12	20-26	165-190	371-466	8-10	32-41
EXHF048	86	8.80	142-163	312-401	11-14	19-25	185-213	392-492	11-14	33-42
EXHF048	86	11.20	142-163	303-390	9-11	19-25	192-221	398-500	9-12	34-43
EXHF048	95	8.80	144-165	351-451	11-14	19-24	—	—	—	—
EXHF048	95	11.20	143-165	342-440	9-11	19-24	—	—	—	—
EXHF060	35	11.60	—	—	—	—	88-102	314-395	6-7	21-27
EXHF060	35	14.00	—	—	—	—	90-103	315-397	5-6	21-27
EXHF060	45	11.60	130-150	171-221	12-15	21-27	103-119	340-426	7-8	24-31
EXHF060	45	14.00	130-150	166-214	10-13	21-26	106-122	341-428	6-7	24-31
EXHF060	55	11.60	132-152	199-256	12-15	20-26	121-139	360-452	8-10	27-35
EXHF060	55	14.00	132-151	193-249	10-12	21-26	123-142	364-457	6-8	28-35
EXHF060	68	11.60	134-154	237-306	11-15	20-26	146-168	398-499	9-12	31-40
EXHF060	68	14.00	134-154	231-298	9-12	20-26	150-172	402-503	8-10	32-40
EXHF060	75	11.60	135-155	262-337	11-14	20-25	161-185	416-521	10-12	33-42
EXHF060	75	14.00	135-155	256-330	9-12	20-26	165-190	421-528	8-11	34-43
EXHF060	86	11.60	137-157	304-391	11-14	20-25	186-214	449-564	11-14	36-45
EXHF060	86	14.00	137-157	298-383	9-12	20-25	192-221	454-570	9-12	36-46
EXHF060	95	11.60	138-159	342-440	11-14	19-24	—	—	—	—
EXHF060	95	14.00	138-159	335-431	9-11	19-25	—	—	—	—
EXHF070	35	12.30	—	—	—	—	85-98	296-373	6-7	20-25
EXHF070	35	15.40	—	—	—	—	87-100	298-375	5-6	20-26
EXHF070	45	12.30	132-151	167-216	12-16	22-28	100-115	322-403	7-8	23-29
EXHF070	45	15.40	132-151	161-209	10-12	22-28	103-118	324-406	5-7	23-30

Table 38. Operating pressures in cooling/heating for EX* units (continued)

Model	Entering Water Temp Entering Water Temp (°F)	Water Flow (GPM)	Operating Data							
			Cooling				Heating			
			Suction Pressure (psig)	Discharge Pressure (pgig)	Water Temp Rise (°F)	Air Temp Drop (°F DB)	Suction Pressure (psig)	Discharge Pressure (psig)	Water Temp Drop (°F)	Air Temp Rise (°F DB)
EXHF070	55	12.30	132-152	195-252	12-15	21-27	117-134	341-427	8-10	26-33
EXHF070	55	15.40	132-152	188-244	10-12	21-27	120-138	343-431	6-8	26-34
EXHF070	68	12.30	134-154	235-304	12-15	21-27	141-162	374-468	9-12	30-39
EXHF070	68	15.40	134-154	228-294	10-12	21-27	145-167	378-473	8-10	31-39
EXHF070	75	12.30	135-155	259-335	12-15	21-26	155-179	390-488	10-13	33-42
EXHF070	75	15.40	135-155	252-325	9-12	21-26	160-185	395-494	8-10	34-43
EXHF070	86	12.30	136-157	297-384	12-15	20-26	180-207	418-524	11-15	37-47
EXHF070	86	15.40	136-157	289-374	9-12	20-26	186-215	423-530	9-12	38-48
EXHF070	95	12.30	138-159	334-431	11-15	20-25	—	—	—	—
EXHF070	95	15.40	138-159	326-421	9-12	20-25	—	—	—	—
EXVG009	32	1.80	—	—	—	—	94-108	256-326	4-5	13-21
EXVG009	32	2.25	—	—	—	—	96-110	257-327	3-4	13-22
EXVG009	45	1.80	137-157	170-217	10-13	23-28	115-132	274-348	5-7	19-28
EXVG009	45	2.25	137-157	163-208	8-11	23-28	118-135	276-351	4-6	19-28
EXVG009	55	1.80	138-158	198-252	10-13	23-28	133-152	288-366	6-8	22-31
EXVG009	55	2.25	137-158	191-243	8-11	23-28	136-156	290-369	5-7	23-32
EXVG009	68	1.80	143-164	238-302	10-13	22-27	158-182	308-391	7-9	25-35
EXVG009	68	2.25	142-164	231-294	8-10	22-28	162-187	311-396	6-8	26-36
EXVG009	75	1.80	146-168	258-328	10-13	22-27	173-199	319-406	8-10	28-38
EXVG009	75	2.25	145-167	251-320	8-10	22-27	178-205	323-411	7-9	28-39
EXVG009	86	1.80	150-173	296-376	10-13	21-27	200-230	338-430	9-12	31-42
EXVG009	86	2.25	150-173	289-368	8-10	21-27	207-238	343-436	7-10	31-42
EXVG009	95	1.80	153-176	333-424	10-12	20-26	—	—	—	—
EXVG009	95	2.25	153-176	326-415	8-10	20-26	—	—	—	—
EXVG012	32	2.40	—	—	—	—	91-104	265-338	5-6	17-26
EXVG012	32	3.00	—	—	—	—	92-106	267-340	4-5	17-26
EXVG012	45	2.40	136-156	173-220	12-15	25-30	111-128	286-364	6-8	22-31
EXVG012	45	3.00	135-156	165-210	9-12	25-30	114-131	288-367	5-6	22-32
EXVG012	55	2.40	137-158	201-255	11-15	24-29	128-148	302-385	7-9	26-36
EXVG012	55	3.00	137-157	193-246	9-12	24-30	132-152	305-389	6-8	26-36
EXVG012	68	2.40	140-161	241-306	11-14	23-29	153-176	325-414	9-11	31-41
EXVG012	68	3.00	140-161	233-297	9-11	23-29	158-182	329-419	7-9	32-42
EXVG012	75	2.40	142-163	263-334	11-14	23-28	168-193	338-430	10-13	34-44
EXVG012	75	3.00	141-163	255-325	9-11	23-28	174-200	343-436	8-10	35-45
EXVG012	86	2.40	144-166	302-384	11-13	22-27	194-223	359-457	11-14	37-48
EXVG012	86	3.00	144-166	294-375	8-11	22-27	201-232	365-465	9-12	38-50
EXVG012	95	2.40	146-169	340-432	10-13	21-27	—	—	—	—
EXVG012	95	3.00	146-168	332-423	8-11	21-27	—	—	—	—

Table 38. Operating pressures in cooling/heating for EX* units (continued)

Model	Entering Water Temp Entering Water Temp (°F)	Water Flow (GPM)	Operating Data							
			Cooling				Heating			
			Suction Pressure (psig)	Discharge Pressure (pgig)	Water Temp Rise (°F)	Air Temp Drop (°F DB)	Suction Pressure (psig)	Discharge Pressure (psig)	Water Temp Drop (°F)	Air Temp Rise (°F DB)
EXVG015	32	3.00	—	—	—	—	89-103	268-341	5-6	18-27
EXVG015	32	3.75	—	—	—	—	91-105	270-343	4-5	18-27
EXVG015	45	3.00	131-151	176-224	12-16	24-29	109-126	287-365	6-8	22-32
EXVG015	45	3.75	131-151	169-215	10-12	24-29	112-128	289-367	5-6	23-32
EXVG015	55	3.00	134-154	207-263	12-15	23-29	125-144	301-383	7-9	26-36
EXVG015	55	3.75	134-154	199-253	10-12	23-29	129-148	304-387	6-8	26-36
EXVG015	68	3.00	138-159	247-315	12-15	23-28	149-172	321-409	9-11	31-41
EXVG015	68	3.75	138-159	240-305	10-12	23-28	154-177	325-413	7-9	32-42
EXVG015	75	3.00	140-161	268-341	12-15	23-28	164-189	333-424	10-12	33-44
EXVG015	75	3.75	140-161	260-331	9-12	23-28	169-194	337-429	8-10	34-45
EXVG015	86	3.00	143-164	306-389	12-15	22-28	190-218	354-451	11-14	38-49
EXVG015	86	3.75	143-164	298-380	9-12	22-28	196-226	359-457	9-12	39-50
EXVG015	95	3.00	145-166	345-439	11-14	22-27	—	—	—	—
EXVG015	95	3.75	145-166	337-429	9-12	22-27	—	—	—	—
EXVG018	32	3.60	—	—	—	—	92-105	274-349	5-6	17-26
EXVG018	32	4.50	—	—	—	—	93-107	276-351	4-5	17-26
EXVG018	45	3.60	133-153	175-223	12-15	25-31	111-128	294-374	6-8	22-32
EXVG018	45	4.50	133-153	168-213	10-12	26-31	114-131	296-376	5-6	23-32
EXVG018	55	3.60	134-155	203-259	12-15	25-30	127-146	311-396	7-9	26-36
EXVG018	55	4.50	134-154	196-249	10-12	25-31	130-150	314-400	6-8	27-36
EXVG018	68	3.60	138-159	243-310	12-15	24-30	150-173	336-428	9-11	31-41
EXVG018	68	4.50	138-159	236-300	9-12	24-30	155-178	340-433	7-9	32-42
EXVG018	75	3.60	141-162	266-338	12-15	24-29	165-190	350-445	10-12	34-45
EXVG018	75	4.50	141-162	258-328	9-12	24-29	170-196	354-451	8-10	35-45
EXVG018	86	3.60	144-166	304-388	12-15	23-29	191-220	371-472	11-14	38-49
EXVG018	86	4.50	144-166	297-378	9-12	23-29	198-228	376-479	9-12	39-50
EXVG018	95	3.60	146-168	340-433	11-14	22-28	—	—	—	—
EXVG018	95	4.50	146-168	333-424	9-12	23-28	—	—	—	—
EXVG024	32	4.80	—	—	—	—	89-102	280-356	5-6	17-26
EXVG024	32	6.00	—	—	—	—	90-104	282-359	4-5	18-27
EXVG024	45	4.80	133-153	176-224	12-15	23-28	109-125	302-384	7-8	23-33
EXVG024	45	6.00	133-153	171-217	9-12	23-28	111-128	305-388	5-7	24-33
EXVG024	55	4.80	133-153	203-258	12-15	22-28	125-144	321-408	8-10	27-37
EXVG024	55	6.00	133-153	197-250	9-12	22-28	128-148	324-412	6-8	28-38
EXVG024	68	4.80	136-157	243-310	11-14	22-28	149-171	346-440	9-12	32-42
EXVG024	68	6.00	136-157	236-300	9-12	22-28	153-176	350-445	7-10	33-43
EXVG024	75	4.80	139-159	267-340	11-14	22-27	163-188	359-457	10-13	35-46
EXVG024	75	6.00	138-159	260-331	9-12	22-28	169-194	363-463	8-10	35-46

Table 38. Operating pressures in cooling/heating for EX* units (continued)

Model	Entering Water Temp Entering Water Temp (°F)	Water Flow (GPM)	Operating Data							
			Cooling				Heating			
			Suction Pressure (psig)	Discharge Pressure (pgig)	Water Temp Rise (°F)	Air Temp Drop (°F DB)	Suction Pressure (psig)	Discharge Pressure (psig)	Water Temp Drop (°F)	Air Temp Rise (°F DB)
EXVG024	86	4.80	142-163	308-392	11-14	21-27	189-217	379-482	11-14	39-50
EXVG024	86	6.00	141-163	300-382	9-11	21-27	196-226	384-488	9-12	39-51
EXVG024	95	4.80	144-165	344-438	11-14	21-27	—	—	—	—
EXVG024	95	6.00	143-165	337-428	9-11	21-27	—	—	—	—
EXVG030	32	6.00	—	—	—	—	90-103	260-330	5-6	18-27
EXVG030	32	7.50	—	—	—	—	92-105	263-334	4-5	18-27
EXVG030	45	6.00	136-157	176-224	12-15	25-30	109-125	288-367	6-8	22-32
EXVG030	45	7.50	136-156	170-216	9-12	25-30	111-128	292-371	5-7	23-32
EXVG030	55	6.00	136-157	204-259	12-15	25-30	124-143	310-395	8-10	26-36
EXVG030	55	7.50	136-156	197-251	9-12	25-30	128-147	313-399	6-8	27-37
EXVG030	68	6.00	138-159	245-312	12-15	24-29	148-170	333-423	9-12	31-41
EXVG030	68	7.50	138-159	237-302	9-12	24-29	152-175	336-427	7-9	32-42
EXVG030	75	6.00	140-162	269-342	12-15	24-29	162-187	343-437	10-12	34-44
EXVG030	75	7.50	140-161	261-333	9-12	24-29	168-193	346-441	8-10	34-45
EXVG030	86	6.00	143-165	310-395	11-14	23-29	189-217	367-467	11-14	38-49
EXVG030	86	7.50	143-165	302-385	9-11	23-29	195-225	370-471	9-11	38-50
EXVG030	95	6.00	145-167	347-441	11-14	23-28	—	—	—	—
EXVG030	95	7.50	145-167	339-431	9-11	23-28	—	—	—	—
EXVG036	32	7.20	—	—	—	—	90-104	270-344	5-6	17-26
EXVG036	32	9.00	—	—	—	—	92-106	272-346	4-5	17-26
EXVG036	45	7.20	137-157	177-226	11-14	24-29	109-125	290-369	6-8	21-31
EXVG036	45	9.00	137-157	170-216	9-11	24-29	111-128	293-372	5-6	22-31
EXVG036	55	7.20	137-158	205-261	11-14	24-29	124-142	306-390	7-9	25-34
EXVG036	55	9.00	137-158	198-252	9-11	24-29	127-146	309-393	6-8	25-35
EXVG036	68	7.20	140-161	246-313	11-14	23-29	146-168	328-418	9-11	29-39
EXVG036	68	9.00	140-161	239-304	9-11	23-29	150-173	332-422	7-9	30-40
EXVG036	75	7.20	142-163	268-342	11-14	23-28	160-184	340-433	9-12	32-42
EXVG036	75	9.00	142-163	261-333	9-11	23-28	165-190	344-438	8-10	33-43
EXVG036	86	7.20	145-167	308-392	11-14	22-28	186-214	360-458	10-13	36-46
EXVG036	86	9.00	145-166	301-383	8-11	22-28	192-221	365-464	9-11	36-47
EXVG036	95	7.20	147-169	345-439	10-13	22-27	—	—	—	—
EXVG036	95	9.00	147-169	338-430	8-11	22-27	—	—	—	—
EXVG042	32	8.40	—	—	—	—	89-102	256-326	4-6	15-24
EXVG042	32	10.50	—	—	—	—	91-104	257-327	4-5	15-24
EXVG042	45	8.40	138-158	173-220	11-13	23-29	108-124	274-348	6-7	19-29
EXVG042	45	10.50	138-158	168-213	8-11	23-29	110-127	276-351	5-6	20-29
EXVG042	55	8.40	138-159	201-256	10-13	23-28	123-142	289-368	7-9	23-33
EXVG042	55	10.50	138-159	195-249	8-11	23-28	126-145	292-371	6-7	24-33

Table 38. Operating pressures in cooling/heating for EX* units (continued)

Model	Entering Water Temp Entering Water Temp (°F)	Water Flow (GPM)	Operating Data							
			Cooling				Heating			
			Suction Pressure (psig)	Discharge Pressure (pgig)	Water Temp Rise (°F)	Air Temp Drop (°F DB)	Suction Pressure (psig)	Discharge Pressure (psig)	Water Temp Drop (°F)	Air Temp Rise (°F DB)
EXVG042	68	8.40	140-161	240-306	10-13	22-28	146-169	310-395	8-11	28-38
EXVG042	68	10.50	140-161	234-297	8-10	22-28	151-173	314-399	7-9	28-39
EXVG042	75	8.40	142-163	263-335	10-13	22-27	161-185	322-410	9-12	30-41
EXVG042	75	10.50	142-163	257-327	8-10	22-27	166-191	326-414	7-9	31-41
EXVG042	86	8.40	145-166	304-386	10-13	21-27	188-216	340-433	10-13	34-45
EXVG042	86	10.50	145-166	297-378	8-10	21-27	194-223	345-439	8-11	35-46
EXVG042	95	8.40	146-168	340-433	10-12	21-26	—	—	—	—
EXVG042	95	10.50	146-168	333-424	8-10	21-26	—	—	—	—
EXVG048	32	9.60	—	—	—	—	87-100	261-332	5-6	16-25
EXVG048	32	12.00	—	—	—	—	89-102	262-334	4-5	16-25
EXVG048	45	9.60	137-157	181-230	11-14	23-29	105-121	279-354	6-8	20-29
EXVG048	45	12.00	137-157	174-222	9-11	23-29	108-124	281-357	5-6	20-30
EXVG048	55	9.60	137-158	210-267	11-14	23-28	121-139	293-373	7-9	23-33
EXVG048	55	12.00	137-157	203-258	9-11	23-29	124-142	296-376	6-7	24-34
EXVG048	68	9.60	140-161	250-318	10-13	22-28	144-166	313-398	8-11	28-38
EXVG048	68	12.00	140-161	243-310	8-11	22-28	148-170	316-403	7-9	29-39
EXVG048	75	9.60	142-163	273-347	10-13	22-28	158-182	324-413	9-12	31-41
EXVG048	75	12.00	142-163	266-339	8-11	22-28	163-188	328-418	7-9	31-42
EXVG048	86	9.60	145-167	313-398	10-13	21-27	185-212	343-437	10-13	35-45
EXVG048	86	12.00	145-166	306-390	8-10	21-27	191-219	347-442	8-11	36-46
EXVG048	95	9.60	147-169	350-446	10-13	21-26	—	—	—	—
EXVG048	95	12.00	147-169	344-438	8-10	21-26	—	—	—	—
EXVG060	32	12.00	—	—	—	—	87-101	260-331	5-6	16-24
EXVG060	32	15.00	—	—	—	—	89-103	262-333	4-5	16-25
EXVG060	45	12.00	133-153	176-224	10-13	23-28	105-121	278-354	6-8	20-29
EXVG060	45	15.00	133-152	171-218	8-11	23-28	108-124	280-356	5-6	20-29
EXVG060	55	12.00	134-154	205-261	10-13	23-28	120-138	292-372	7-9	23-33
EXVG060	55	15.00	134-154	199-254	8-10	23-28	123-142	294-375	6-7	24-33
EXVG060	68	12.00	138-159	244-311	10-13	22-28	143-164	312-397	8-11	28-38
EXVG060	68	15.00	138-159	238-303	8-10	22-28	147-169	315-401	7-9	28-38
EXVG060	75	12.00	140-161	268-340	10-13	22-27	157-181	323-411	9-11	30-40
EXVG060	75	15.00	140-161	261-332	8-10	22-27	162-186	326-415	7-9	31-41
EXVG060	86	12.00	143-165	308-392	10-13	21-27	183-211	342-435	10-13	34-45
EXVG060	86	15.00	143-164	301-383	8-10	21-27	189-217	346-440	8-11	35-45
EXVG060	95	12.00	145-167	344-438	10-12	21-26	—	—	—	—
EXVG060	95	15.00	145-167	337-429	8-10	21-26	—	—	—	—
EXVG070	32	14.00	—	—	—	—	90-104	275-350	5-6	16-25
EXVG070	32	17.50	—	—	—	—	92-106	276-352	4-5	16-25

Table 38. Operating pressures in cooling/heating for EX* units (continued)

Model	Entering Water Temp Entering Water Temp (°F)	Water Flow (GPM)	Operating Data							
			Cooling				Heating			
			Suction Pressure (psig)	Discharge Pressure (pgig)	Water Temp Rise (°F)	Air Temp Drop (°F DB)	Suction Pressure (psig)	Discharge Pressure (psig)	Water Temp Drop (°F)	Air Temp Rise (°F DB)
EXVG070	45	14.00	132-152	172-219	10-13	22-28	108-124	296-376	6-8	20-29
EXVG070	45	17.50	132-151	168-214	8-10	22-28	111-127	298-379	5-6	20-30
EXVG070	55	14.00	134-154	200-255	10-13	22-28	123-141	313-398	7-9	23-32
EXVG070	55	17.50	134-154	195-249	8-10	22-28	126-145	315-401	6-7	23-33
EXVG070	68	14.00	138-158	239-304	10-13	22-27	144-166	335-427	8-10	27-37
EXVG070	68	17.50	138-158	233-296	8-10	22-27	148-171	338-431	7-8	28-38
EXVG070	75	14.00	140-161	261-333	10-12	22-27	158-182	347-442	9-11	30-40
EXVG070	75	17.50	140-161	256-325	8-10	22-27	163-187	350-446	7-9	30-41
EXVG070	86	14.00	143-164	301-383	10-12	21-27	184-212	365-465	10-13	33-44
EXVG070	86	17.50	143-164	295-376	8-10	21-27	190-219	369-470	8-10	34-45
EXVG070	95	14.00	145-167	337-429	10-12	21-26	—	—	—	—
EXVG070	95	17.50	145-167	331-421	8-10	21-26	—	—	—	—

Water Pressure Drop

Use the following tables to define feet of head/pressure drop. Please note the feet of pressure (ft/head) provided is at AHRI/ISO standard.

To calculate feet of head, when using gauges that read in PSIG, multiply PSI by 2.31.

Table 39. Cooling water pressure drop (WPD) in feet of head for DX* units

Unit Size	EWT °F	GPM	Ft. Pressure
DXHF024	85	5.6	6.0
DXHF036	85	8.4	5.4
DXHF048	85	11.2	8.3
DXHF060	85	14.0	7.1
DXHF070	85	15.4	6.2
DXVG024	86	6.0	3.0
DXVG036	86	9.0	6.0
DXVG048	86	12.0	6.4
DXVG060	86	15.0	11.2
DXVG070	86	17.5	9.4

Table 40. Cooling water pressure drop (WPD) in feet of head for EX* units

Unit Size (60 Hz)	EWT °F	GPM	Ft. Pressure
EXHF006	86	1.8	3.9
EXHF009	86	2.1	3.7

Table 40. Cooling water pressure drop (WPD) in feet of head for EX* units (continued)

Unit Size (60 Hz)	EWT °F	GPM	Ft. Pressure
EXHF012	86	2.8	3.8
EXHF015	86	3.5	5.4
EXHF018	86	4.2	4.1
EXHF024	86	5.6	6.1
EXHF030	86	7.0	9.2
EXHF036	86	8.4	5.5
EXHF042	86	9.8	7.8
EXHF048	86	11.2	8.2
EXHF060	86	14.0	7.2
EXHF070	86	15.4	6.3
EXVG009	86	2.3	3.4
EXVG012	86	3.0	5.9
EXVG015	86	3.8	8.2
EXVG018	86	4.5	1.9
EXVG024	86	6.0	3.0
EXVG030	86	7.5	4.1
EXVG036	86	9.0	5.8
EXVG042	86	10.5	4.9
EXVG048	86	12.0	5.9
EXVG060	86	15.0	10.6
EXVG070	86	17.5	9.3

Table 41. Heating water pressure drop (WPD) in feet of head for DX* units

Unit Size	EWT °F	GPM	Ft. Pressure
DXHF024	65	5.6	6.6
DXHF036	65	8.4	5.8
DXHF048	65	11.2	9.0
DXHF060	65	14.0	7.4
DXHF070	65	15.4	6.6
DXVG024	68	6.0	3.3
DXVG036	68	9.0	6.3
DXVG048	68	12.0	6.6
DXVG060	68	15.0	12.0
DXVG070	68	17.5	10.0

Table 42. Heating water pressure drop (WPD) in feet of head for EX* units

Unit Size (60 Hz)	EWT °F	GPM	Ft. Pressure
EXHF006	68	1.8	4.2
EXHF009	68	2.1	3.9
EXHF012	68	2.8	4.1
EXHF015	68	3.5	5.7
EXHF018	68	4.2	5.0
EXHF024	68	5.6	7.9
EXHF030	68	7.0	11.2
EXHF036	68	8.4	6.5
EXHF042	68	9.8	9.4
EXHF048	68	11.2	9.4
EXHF060	68	14.0	7.1
EXHF070	68	15.4	7.2
EXVG009	68	2.3	3.7
EXVG012	68	3.0	6.4
EXVG015	68	3.8	8.8
EXVG018	68	4.5	2.0
EXVG024	68	6.0	3.2
EXVG030	68	7.5	4.5
EXVG036	68	9.0	6.1
EXVG042	68	10.5	5.1
EXVG048	68	12.0	6.2
EXVG060	68	15.0	11.4
EXVG070	68	17.5	9.9

Water Volume

The information below is provided for use in calculating glycol requirements for the unit.

Table 43. Water volume for DX* units

Unit Size	Water Side Volume (in ³)	Water Side Volume (ft ³)	Water Side Volume (gallons)
DXHF024	89.8	0.052	0.389
DXHF036	171.2	0.099	0.741
DXHF048	200.8	0.116	0.869
DXHF060	331.2	0.192	1.434
DXHF070	331.2	0.192	1.434
DXVG024	118.6	0.069	0.513
DXVG036	118.6	0.069	0.513
DXVG048	196.5	0.114	0.851
DXVG060	222.6	0.129	0.964
DXVG070	284.0	0.164	1.229

Table 44. Water volume for EX* units

Unit Size (60 Hz)	Water Side Volume (in ³)	Water Side Volume (ft ³)	Water Side Volume (gallons)
EXHF006	13.6	0.008	0.059
EXHF009	13.6	0.008	0.059
EXHF012	28.4	0.016	0.123
EXHF015	36.0	0.021	0.156
EXHF018	89.8	0.052	0.389
EXHF024	89.8	0.052	0.389
EXHF030	89.8	0.052	0.389
EXHF036	171.2	0.099	0.741
EXHF042	200.8	0.116	0.869
EXHF048	200.8	0.116	0.869
EXHF060	331.2	0.192	1.434
EXHF070	331.2	0.192	1.434
EXVG009	34.6	0.02	0.15
EXVG012	34.6	0.02	0.15
EXVG015	41.0	0.024	0.177
EXVG018	118.6	0.069	0.513
EXVG024	118.6	0.069	0.513
EXVG030	118.6	0.069	0.513
EXVG036	118.6	0.069	0.513
EXVG042	196.5	0.114	0.851
EXVG048	196.5	0.114	0.851



Start Up

Table 44. Water volume for EX* units (continued)

Unit Size (60 Hz)	Water Side Volume (in ³)	Water Side Volume (ft ³)	Water Side Volume (gallons)
EXVG060	222.6	0.129	0.964

Table 44. Water volume for EX* units (continued)

Unit Size (60 Hz)	Water Side Volume (in ³)	Water Side Volume (ft ³)	Water Side Volume (gallons)
EXVG070	284.0	0.164	1.229

Maintenance

⚠ WARNING

Hazardous Service Procedures!

Failure to follow all precautions in this manual and on the tags, stickers, and labels 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 following instructions: 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.

Preventative Maintenance

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

Filter maintenance must be performed to assure proper operation of the equipment. Filters should be inspected at least every three months, and replaced when it is evident they are dirty. Filter sizing is shown below.

Table 45. Filter sizing DX* models

Size	Filter Size (Nominal) inches
DXHF	
024	18x24
036	19x26
048	21x30
060	21x30
070	21x30
DXVG	
024	18x23
036	20x30
048	27x30
060	30x33
070	30x33

Table 46. Filter sizing EX* models

Size (60 Hz)	Filter Size (Nominal) inches
Size (60 Hz)	Filter Size (Actual) inches
EXHF	

Table 46. Filter sizing EX* models (continued)

Size (60 Hz)	Filter Size (Nominal) inches
006	15 x 20
009	15 x 20
012	15 x 20
015	15 x 20
018	18 x 24
024	18 x 24
030	19 x 26
036	19 x 26
042	21 x 30
048	21 x 30
060	21 x 30
070	21 x 30
EXVG	
009	16x19
012	16x19
015	17x20
018	18x23
024	18x23
030	20x30
036	20x30
042	27x30
048	27x30
060	33x30
070	30x33

Check the contactors and relays within the control panel at least once a year. It is good practice to check the tightness of the various wiring connections within the control panel.

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!

Failure to follow this safety precaution could result in death or serious injury. Coil cleaning agents can be either acidic or highly alkaline and can burn severely if contact with skin or eyes 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.

It should be noted that the water quality should be checked periodically (See below).

Table 47. Water quality

Scaling	Amount
Calcium and magnesium (total hardness)	Less than 350 ppm
Corrosion	
pH	7-9.5
Hydrogen Sulfide	Less than 1 ppm

Table 47. Water quality (continued)

Scaling	Amount
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

Condensate Trap

For units incorporating a negative trap design, ensure that the condensate system is primed with water at all times. Allowing a negative, pressure condensate system to run dry could cause a break in the condensate seal allowing the fan to draw water from the condensate line to spray moisture into the mechanical system. By maintaining a primed condensate trap, a seal will be created and will help prevent these complications.

Troubleshooting

⚠ WARNING

Hazardous Service Procedures!

Failure to follow all precautions in this manual and on the tags, stickers, and labels 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 following instructions: 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.

Deluxe Controls

Troubleshooting units which contain the deluxe control option may be made easy by using the three LEDs (light emitting diodes). These LEDs are provided for indicating the operating mode of the controller. The LEDs are intended to aid in troubleshooting. The LEDs are labeled on the circuit board with numbers as referenced in the table below.

Table 48. Diagnostic LEDs

Color: Green	Color: Red		Controller Mode
LED1	LED2	LED3	
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	ON	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

Table 49. Troubleshooting table

Problem	Heat- ing	Cool- ing	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

Table 49. Troubleshooting table (continued)

Problem	Heat- ing	Cool- ing	Cause	Correction
Blower runs, but compressor does not	X	X	Defective compressor overload	Replace (if external)
	X	X	Defective compressor contactor	Replace
	X	X	Supply Voltage too low	Correct
	X	X	Defective compressor capacitor	Replace
	X	X	Defective windings	Replace
	X	X	Limit switches open	Check cause/Replace or repair
Insufficient capacity	X	X	Dirty filter	Replace/clean
	X	X	Blower RPM too low	Correct
	X	X	Loss of conditioned air due to leaks in ductwork	Repair leaks
		X	Introduction of excessively hot return-air	Correct
	X		Introduction of excessively cold return-air	Correct
	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-IOM-# 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
	X	X	Filter drier blocked	Replace
	X	X	Defective reversing valve	Check or replace
High pressure switch open		X	Inadequate GPM	Increase water flow to unit
		X	Water too hot	Decrease temperature
	X		Inadequate air flow	Check, clean blower and coil
	X		Dirty filter	Clean/replace
	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
	X		Dirty filter	Clean / replace
	X		Inadequate air flow	Check, clean blower and coil

Table 49. Troubleshooting table (continued)

Problem	Heat- ing	Cool- ing	Cause	Correction
Low suction pressure	X	X	Undercharged	Locate leak, repair and recharge
	X	X	Restricted thermal expansion valve	Repair / replace
		X	Inadequate air flow	Check, clean blower and coil
		X	Dirty filter	Clean/replace
	X		Inadequate GPM	Increase GPM
Low pressure switch open	X		Inadequate GPM	Increase GPM
	X		Water too cold	Increase temperature
		X	Inadequate air flow	Increase CFM
		X	Dirty filter	Clean/replace
	X	X	Undercharged with refrigerant	Increase charge
	X	X	Defective pressure switch	Replace
	X	X	Heat transfer fluid too cold	Raise water temperature



Wiring Diagrams

This section contains wiring diagrams² and isolation valve wiring connections.

Note: Wiring diagrams can be accessed via e-Library by entering the diagram number in the literature order number search field or by calling technical support.

Table 50. Isolation valve wiring connections

Control Type	3-wire Honeywell isolation valve connections		
	Blue	Brown	Black
Deluxe 24V	1TB1-6	1TB1-1	1TB1-4
ZN524	1TB1-18	1TB2-3	1TB1-16

Table 51. Wiring diagram matrix for GEVG, EXVG, and DXVG Models

Wiring Diagram Number	Unit Description	Model
231158450001	DELUXE CONTROLS 2 STAGE HEAT PUMP w/ECM MOTOR, SINGLE PHASE	DXVG Only
231158460001	DELUXE CONTROLS HEAT PUMP w/HOT GAS REHEAT AND ECM MOTOR, SINGLE PHASE	GEVG or EXVG
231158470001	DELUXE CONTROLS HEAT PUMP w/WATER SIED ECONOMIZER AND ECM MOTOR, SINGLE PHASE	GEVG or EXVG
231158480001	DELUXE CONTROLS HEAT PUMP w/ECM MOTOR, SINGLE PHASE	GEVG or EXVG
231158490001	DELUXE CONTROLS 2 STAGE HEAT PUMP w/ECM MOTOR, THREE PHASE	DXVG Only
231158500001	DELUXE CONTROLS HEAT PUMP w/HOT GAS REHEAT AND ECM MOTOR, THREE PHASE	GEVG or EXVG
231158510001	DELUXE CONTROLS HEAT PUMP w/WATER SIED ECONOMIZER AND ECM MOTOR, THREE PHASE	GEVG or EXVG
231158520001	DELUXE CONTROLS HEAT PUMP w/ECM MOTOR, THREE PHASE	GEVG or EXVG
231158530001	ZN524 CONTROLS 2 STAGE HEAT PUMP w/ECM MOTOR, SINGLE PHASE	DXVG Only
231158540001	ZN524 CONTROLS HEAT PUMP w/HOT GAS REHEAT AND ECM MOTOR, SINGLE PHASE	GEVG or EXVG
231158550001	ZN524 CONTROLS HEAT PUMP w/WATER SIED ECONOMIZER AND ECM MOTOR, SINGLE PHASE	GEVG or EXVG
231158560001	ZN524 CONTROLS HEAT PUMP w/ECM MOTOR, SINGLE PHASE	GEVG or EXVG
231158570001	ZN524 CONTROLS 2 STAGE HEAT PUMP w/ECM MOTOR, THREE PHASE	DXVG Only
231158580001	ZN524 CONTROLS HEAT PUMP w/HOT GAS REHEAT AND ECM MOTOR, THREE PHASE	GEVG or EXVG
231158590001	ZN524 CONTROLS HEAT PUMP w/WATER SIED ECONOMIZER AND ECM MOTOR, THREE PHASE	GEVG or EXVG
231158600001	ZN524 CONTROLS HEAT PUMP w/ECM MOTOR, THREE PHASE	GEVG or EXVG
231158610001	UC400B CONTROLS w/ECM MOTOR, SINGLE PHASE	GEVG, EXVG, or DXVG
231158620001	UC400B CONTROLS w/ECM MOTOR, THREE PHASE	GEVG, EXVG, or DXVG

² Wiring diagrams provided are generic. A unit specific As Built wiring diagram is located on the unit control panel.

Figure 51. DXH Units ZN524 control — 1 ph

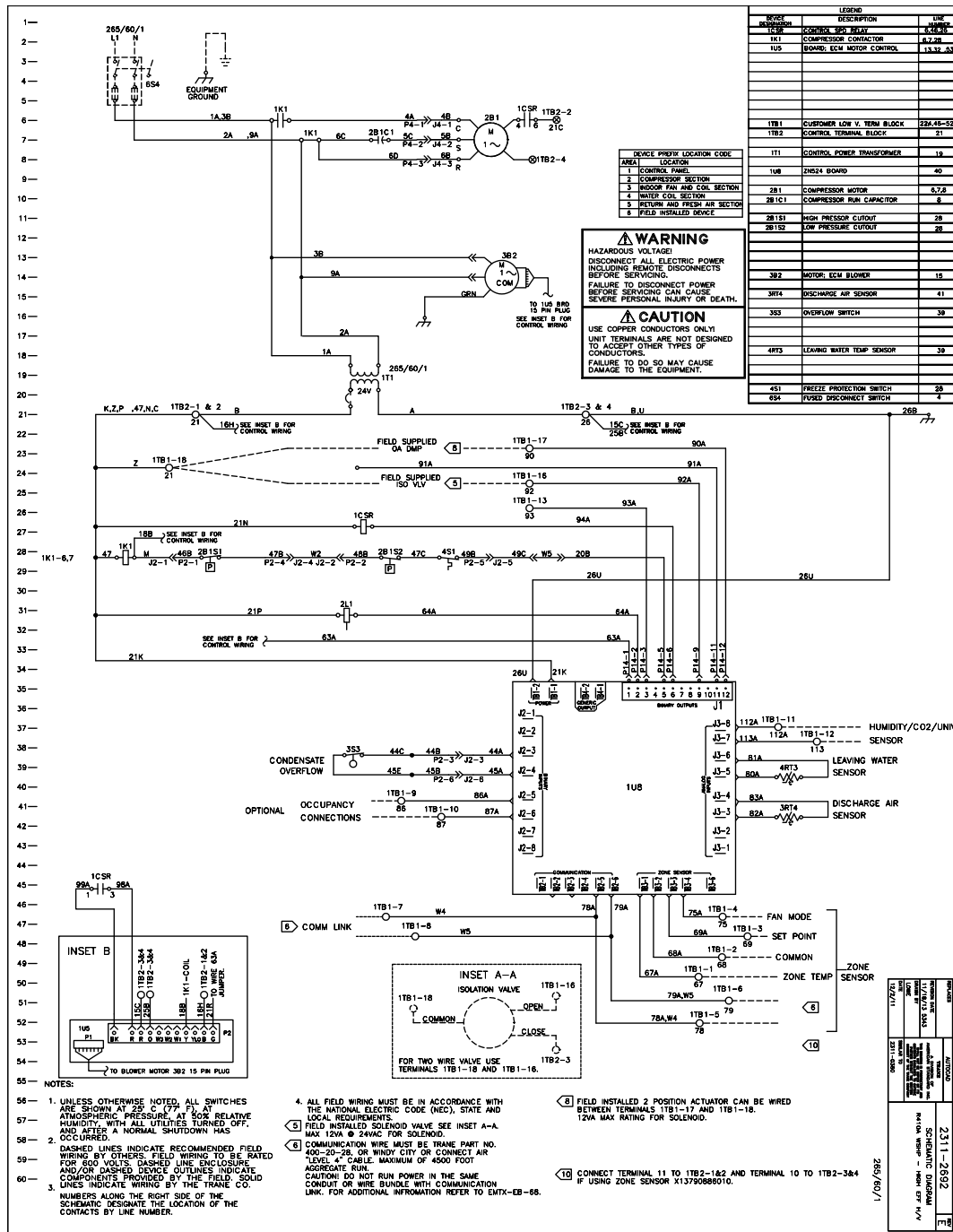


Figure 52. DXH Units Deluxe 24V control — 1 ph

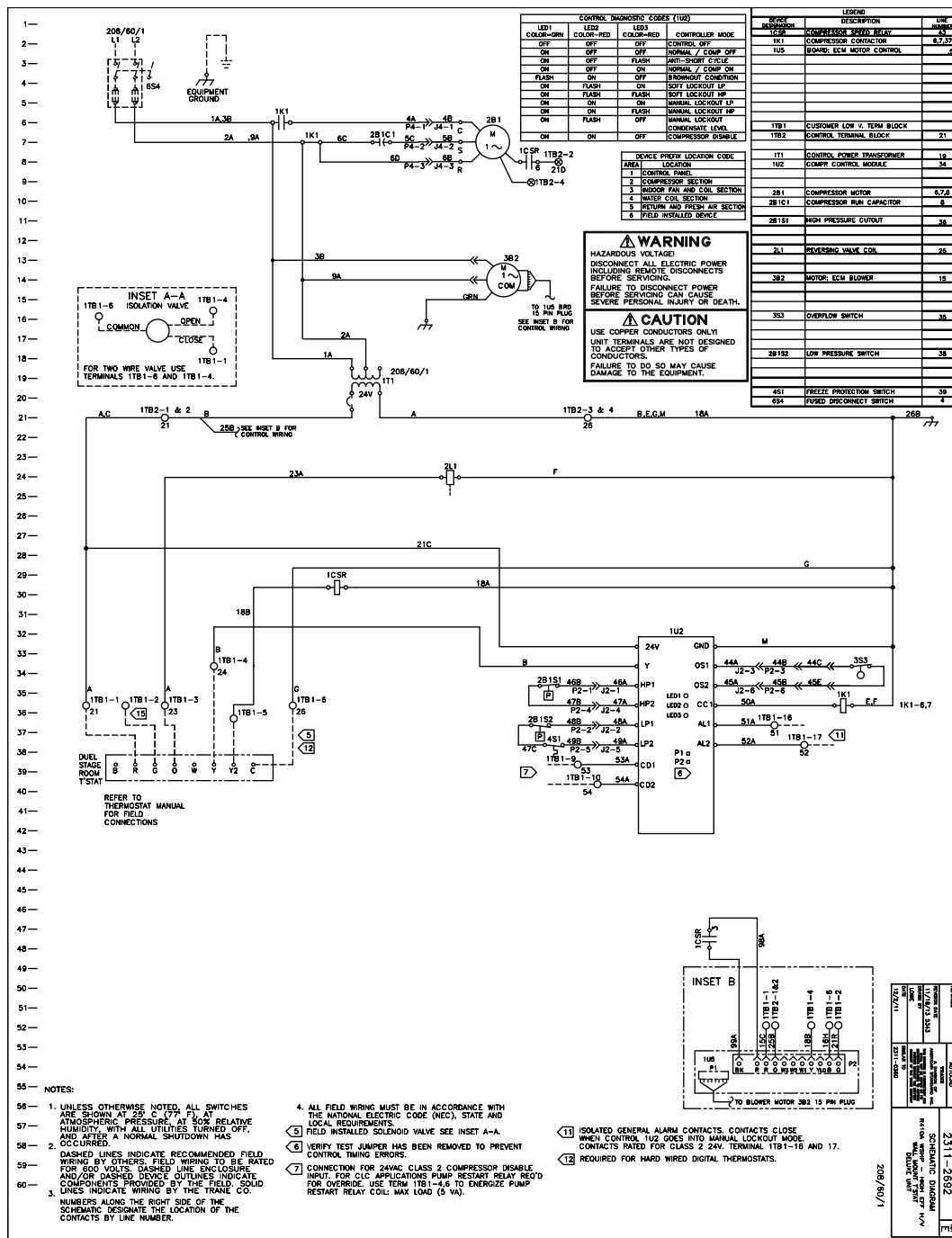


Figure 53. DXH Units ZN524 control — 3 ph

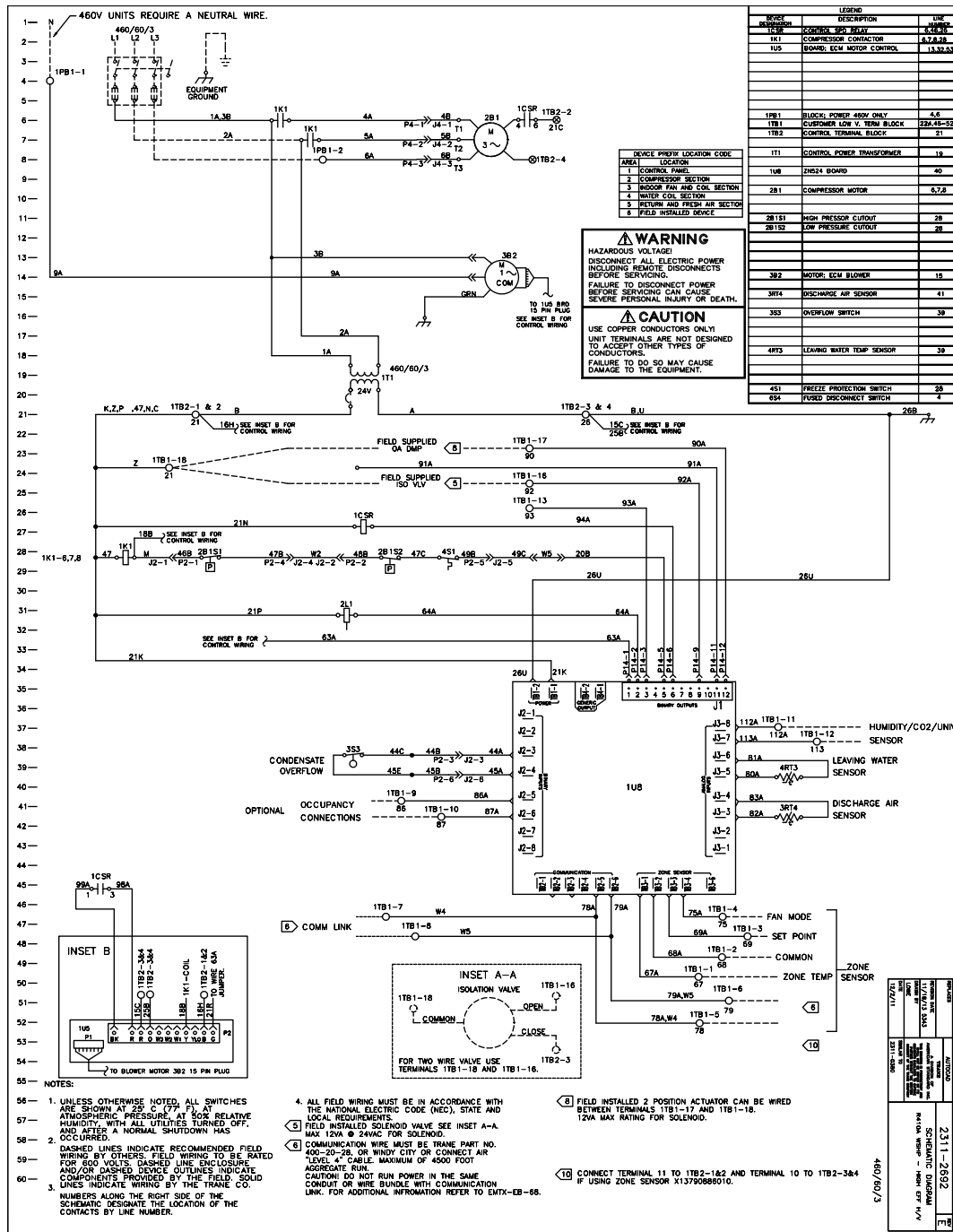




Figure 55. DXH Units UC400

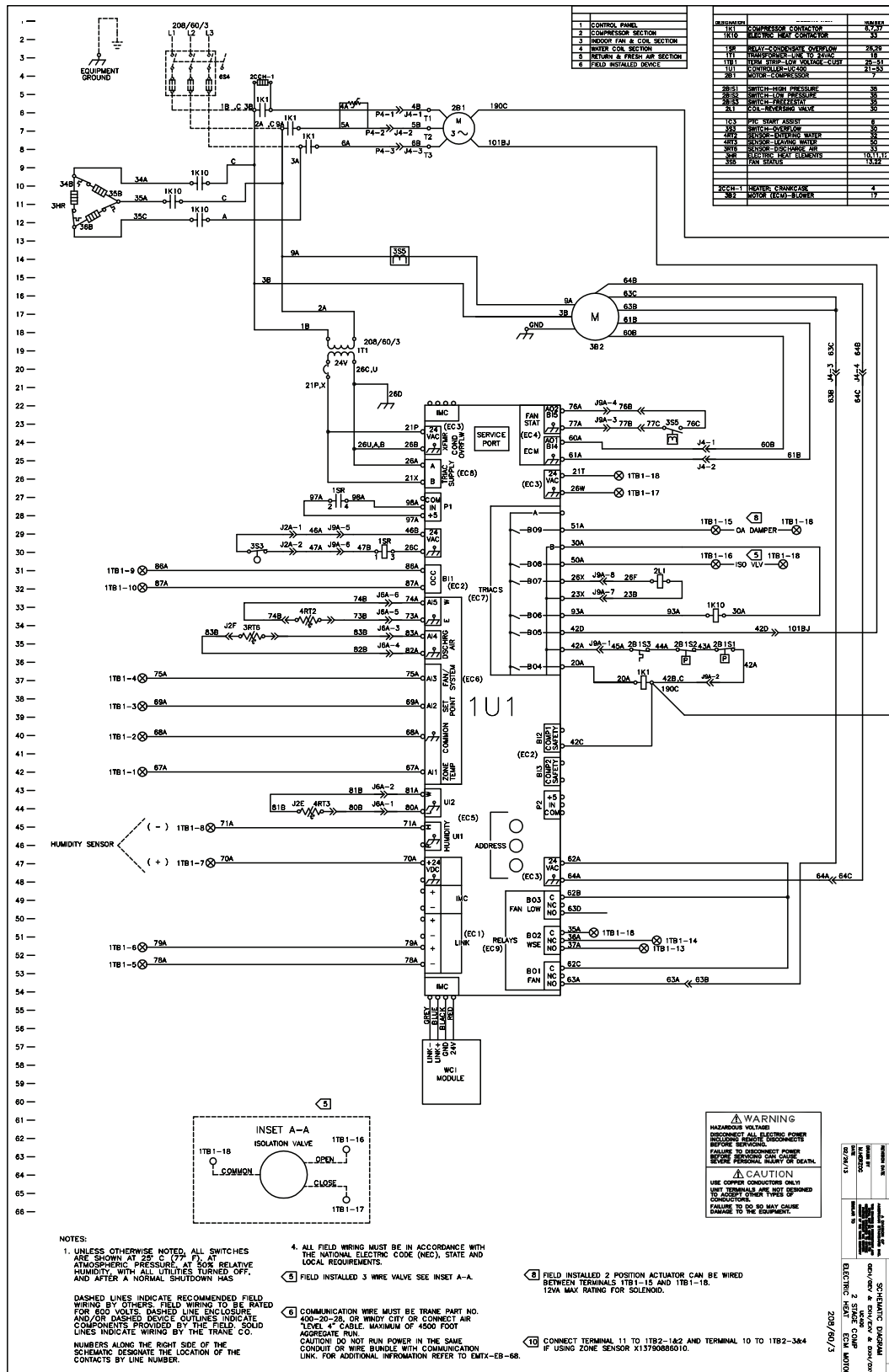
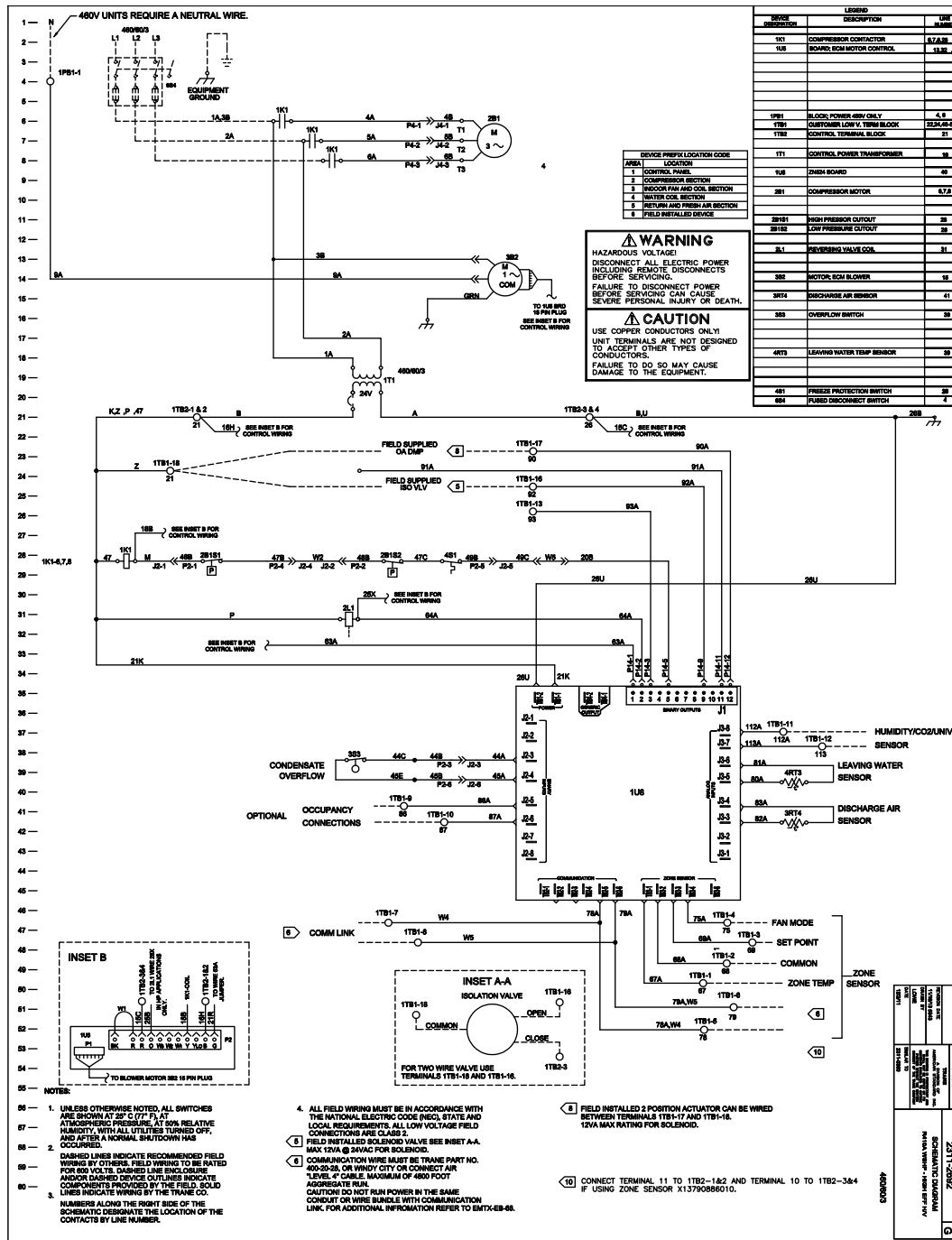




Figure 57. EXH- Tracer® ZN524 460V - 60 Hz - 3 ph(a) - (ECM motor wiring diagram)





Warranty Information

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.

There is a standard 5-year compressor warranty.

Extended Warranty

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

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

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

Trane has a policy of continuous product and product data improvements and reserves the right to change design and specifications without notice. We are committed to using environmentally conscious print practices.