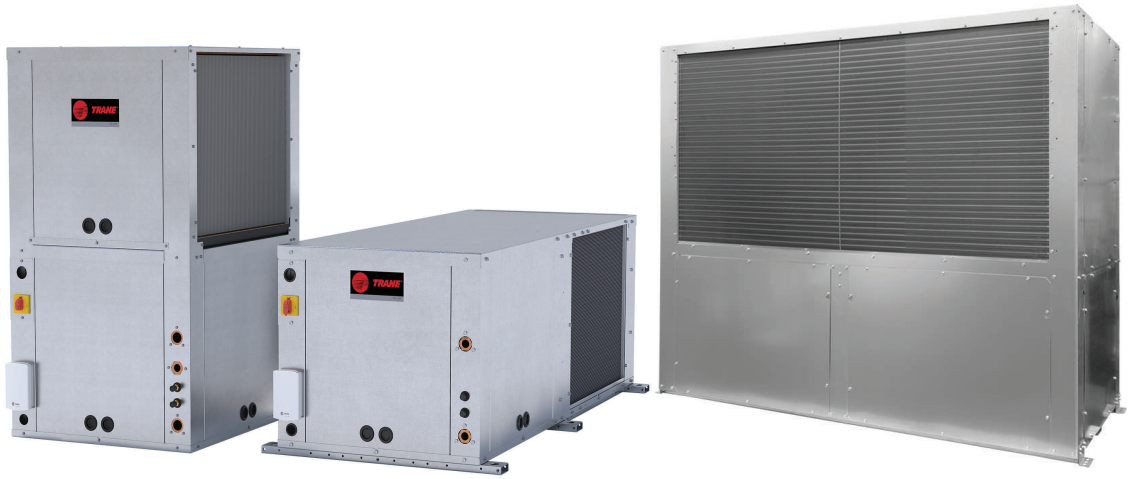
Installation, Operation, and Maintenance

Water Source Heat Pump Axiom™ Horizontal/Vertical — GEH/V*

0.5 to 25 Tons, 50/60 Hz



Model Numbers:
GEHK 006-060 - 60 Hz
GEVK 006-060 - 60 Hz
GEHK 072-180 - 50/60 Hz
GEVK 072-300 - 50/60 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.

February 2025 **WSHP-SVX018C-EN**

Introduction

Read this manual thoroughly before operating or servicing this unit.

Warnings, Cautions, and Notices

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

The three types of advisories are defined as follows:

⚠ WARNING	Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.
⚠ CAUTION	Indicates a potentially hazardous situation which, if not avoided, could result in minor or moderate injury. It could also be used to alert against unsafe practices.
NOTICE	Indicates a situation that could result in equipment or property-damage only accidents.

Important Environmental Concerns

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

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.**

⚠ WARNING

R-454B Flammable A2L Refrigerant!

Failure to use proper equipment or components as described below could result in equipment failure, and possibly fire, which could result in death, serious injury, or equipment damage.

The equipment described in this manual uses R-454B refrigerant which is flammable (A2L). Use ONLY R-454B rated service equipment and components. For specific handling concerns with R-454B, contact your local representative.

⚠ WARNING

Electrical Shock Hazard!

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

Properly connect the system's oversized protective earthing (grounding) terminal(s).

Copyright

Trademarks

Product Safety Information

This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety. Children should be supervised to ensure that they do not play with the appliance.

Maximum altitude of use 3000 meters.

This appliance incorporates an earth connection for functional purposes only.

Revision History

- Updated A2L chapter.
- Added a warning for storage in Job Storage section.
- Removed duplicate data.

Table of Contents

Model Number Description

GEV/GEH 072–300 Models

Digits 1–3 — Unit Configuration

GEH = Standard Efficiency Horizontal 6 to 15 Tons
GEV = Standard Efficiency Vertical 6 to 25 Tons

Digit 4 — Development Sequence

K = R-454B

Digits 5–7 — Nominal Capacity

072 = 6 Tons
090 = 7.5 Tons
120 = 10 Tons
150 = 12.5 Tons
180 = 15 Tons
240 = 20 Tons
300 = 25 Tons

Digit 8 — Voltage (Volts/Hz/Phase)

1 = 208/60/1
2 = 230/60/1
3 = 208/60/3
4 = 460/60/3
5 = 575/60/3
8 = 230/60/3
9 = 380–415/50/3

Digit 9 — Heat Exchanger

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

Digit 10 — Current 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 HGR and WSE

Digit 12 — Blower Configuration

A = Drive Package A
B = Drive Package B
C = Drive Package C
D = Drive Package D
E = Drive Package E
F = Drive Package F
G = Drive Package G
H = Drive Package H
J = Drive Package J
1* = 2 Speed Drive Package A
2* = 2 Speed Drive Package B
3 = 2 Speed Drive Package C
4 = 2 Speed Drive Package D
5 = 2 Speed Drive Package E
6 = 2 Speed Drive Package F
7 = 2 Speed Drive Package G
8 = 2 Speed Drive Package H
9 = 2 Speed Drive Package J

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
F = Front Supply-Air Arrangement
L = Left Supply-Air Arrangement
R = Right Supply-Air Arrangement
T = Top Supply-Air Arrangement

Digit 16 — Return-Air Arrangement

B = Back Return-Air Arrangement
F = Front Return-Air Arrangement
L = Left Return-Air Arrangement
R = Right Return-Air Arrangement

Digit 17 — Control Types

D = Deluxe 24V Controls
F = Symbio™ 500
G = Symbio 500/with 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 Temperature Sensor
1 = Entering Water Sensor

Digit 21 — Insulation

1 = Standard Fiberglass Insulation

Digit 22 — Electric Heat

0 = No Electric Heat
4 = External Boilerless Electric Heat
5 = External Supplemental Electric Heat

Digit 23 — ON/OFF Switch

0 = No **ON**/**OFF** Switch

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

0 = Enhanced Sound Attenuation

Digits 26–34 — Does Not Apply to GEH or GEV
00000000000 = Digits 26-36 are not applicable to the GEH or GEV products

Digits 35 — Unit Drain Pan Option

A = Polymer Drain Pan
B = Stainless Steel Drain Pan

Model Number Notes
Notes:

1. **1**. 20°F Freezestat is typically used in a geothermal application. 35°F Freezestat is typically used in a boiler/tower application.
2. **2**. Only available on vertical units

GEV/GEH 006–060 Models

Digits 1–3 — Unit Configuration

GEH = Standard Efficiency Horizontal
GEV = Standard Efficiency Vertical

Digit 4 — Development Sequence

K = R-454B

Digits 5–7 — Nominal Size (MBh)

006 = 6.0 MBh
009 = 9.0 MBh
012 = 12.0 MBh
015 = 15.0 MBh
018 = 18.0 MBh
024 = 24.0 MBh
030 = 30.0 MBh
036 = 36.0 MBh
042 = 42.0 MBh
048 = 48.0 MBh
060 = 60.0 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 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

T = Top Supply-Air Arrangement
B = Back Supply-Air Arrangement
L = Left Supply-Air Arrangement
R = Right 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
H = Symbio 400-B
J = Symbio 400-B/with 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 22 — Electric Heat Option

0 = No Electric Heat
6 = Field Mounted External Boilerless LOW Electric Heat
7 = Field Mounted External Boilerless MED Electric Heat
8 = Field Mounted External Boilerless HIGH Electric Heat
9 = Boilerless Electric Heat Ready

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

00000000000 = Digits 26-36 are not applicable to the GEH or GEV products

Digit 37 — Ducted Filter Rack

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

Digit 38 — Isolation Valve

0 = No Isolation Valve
1 = Factory Mounted Isolation Valve

Digit 39 — Power Connection

1 = Single Point
2 = Electric Heat Power Separate from Unit

Digit 40 — Drain Pan

A = Polymer Drain Pan
B = Stainless Steel Drain Pan

Model Number Note:
Notes:

1. Deluxe Sound option to be made available in 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 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 confirm 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	600 +/-10	550 +/-10	psig

Additives like glycol can be added to reduce the freezing point of the water. Units are not intended to be connected to sanitary water.

- Entering water temperatures range from 25°F to 120°F.
- Leaving water temperature deltas range from 10°F to 15°F.
- Maximum water pressure allowed in system is 400 psi.

Controls

The available control type is a Deluxe 24V control option, a LonTalk® certified control option or Symbio™ 400-B/500 BACnet® control option for all unit sizes.

All power wiring to the equipment is made at the unit's compressor contactor or the optional disconnect switch for GEH/V 0.5 to 5 ton. For units without the disconnect switch, the power wiring needs to be connected to the screw terminals of the compressor contactor. For the GEH/V 6 to 25 tons units all power wiring is made to the high voltage terminal block. All low-voltage wiring is made at the unit's low voltage terminal board or terminal plug.

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-SVX092*-EN (Symbio™ 400-B/500).

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 or terminal plug 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).

Symbio™ 400-B/500 (option)

The Symbio 400-B/500 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-SVX092*-EN (Symbio 400-B/500).

Pump Module (Field Installed Accessory)

The pump module consists 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 contains 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 Symbio™ 400-B/500 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 also decreases. 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 is 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.

The electric heat must be field installed by the contractor.

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. This electric heat option is designed for primary heat only, not to run as supplemental heat to the heating function of the heat pump.*

Supplemental or Boilerless Electric Heat (Option)

Only available on GEH/V 6 to 25 ton units.

Supplemental heat turns on automatically when heat pump cannot provide sufficient heat to meet the heating load. The electric heat is energized to supplement the heating provided by the heat pump. The heater is external to the equipment. For the GEH/V 6 to 25 ton units, the electric heat must be field installed by the contractor.

Hot Gas Reheat (Option)

With the reheat option, the return-air from the space is conditioned by the air-to-refrigerant coil, then reheated by the reheat coil to control not only the space temperature, but to also reduce the relative humidity of the space. When operating in the reheat mode, the humidistat signals the reheat relay coil to energize, allowing the high pressure refrigerant gas to flow from the compressor through the reheat valve, into the reversing valve and reheat coil.

A switching is provided for the reheat application to adjust the blower motor from normal operation to low speed when the hot gas reheat is energized (for 0.5 to 5 ton equipment only).

Note: *Units containing the hot gas reheat option should not be used as a make-up air unit.*

2-Speed Blower Motor (Option)

The 6 to 25 ton GEH/V models have indoor blowers that are available with 2 speed motors, selectable in the model number (Digit 12, drive packages one to nine). High speed airflow matches the single speed motor airflow, referenced in the Fan Performance tables. Low fan speed airflow is approximately 50% of high fan speed airflow.

The 6 to 25 ton GEH/V two-speed blower motors are available with the following options: Deluxe 24V or Symbio™ 500 controls, Heat Pump (HP) or HP w/Hot Gas Reheat or HP w/Waterside Economizer. They are not available with Boilerless or Supplemental Electric Heat.

Table 2. 6 to 25 ton GEH/V fan speed for two-speed drive packages one to nine

RV State	Fan	Compressor 1	Compressor 2	Fan Speed
Heat	OFF	OFF	OFF	OFF
Heat	ON	OFF	OFF	LOW
Heat	ON	ON	OFF	HIGH
Heat	ON	ON	ON	HIGH
Cool	OFF	OFF	OFF	OFF
Cool	ON	OFF	OFF	LOW
Cool	ON	ON	OFF	LOW
Cool	ON	ON	ON	HIGH

Table 3. Refrigerant charge

Model (60 Hz)	Heat Pump (oz)/(kg)		Heat Pump with HGR (oz)/(kg)	
	Circuit 1	Circuit 2	Circuit 1	Circuit 2
GEH/V006	26.5 / 0.75	-	27.5 / 0.77	-
GEH/V009	27.5 / 0.77	-	28.5 / 0.80	-
GEH/V012	28.0 / 0.79	-	29.0 / 0.82	-

Table 3. Refrigerant charge (continued)

Model (60 Hz)	Heat Pump (oz)/(kg)		Heat Pump with HGR (oz)/(kg)	
	Circuit 1	Circuit 2	Circuit 1	Circuit 2
GEH/V015	33.5 / 0.94	-	35.0 / 0.99	-
GEH/V018	34.5 / 0.97	-	36.0 / 1.02	-
GEH/V024	39.5 / 1.11	-	41.5 / 1.17	-
GEH/V030	40.0 / 1.13	-	42.0 / 1.19	-
GEH/V036	48.0 / 1.36	-	50.0 / 1.41	-
GEH/V042	53.0 / 1.50	-	55.0 / 1.55	-
GEH/V048	57.5 / 1.63	-	60.5 / 1.71	-
GEH/V060	67.0 / 1.89	-	70.0 / 1.98	-
GEHK072	47.3 / 1.34	47.3 / 1.34	50.7 / 1.44	47.3 / 1.34
GEHK090	55.0 / 1.55	46.4 / 1.32	58.5 / 1.66	46.4 / 1.32
GEHK120	74.0 / 2.09	74.0 / 2.10	77.4 / 2.19	74 / 2.10
GEHK150	116.8 / 3.31	116.8 / 3.31	123.7 / 3.51	116.8 / 3.31
GEHK180	108.4 / 3.07	108.4 / 3.07	115.3 / 3.27	108.4 / 3.07
GEVK072	49.9 / 1.41	49.9 / 1.41	53.3 / 1.51	49.9 / 1.41
GEVK090	74.4 / 2.10	64.5 / 1.83	74.8 / 2.12	64.5 / 1.83
GEVK120	75.7 / 2.15	75.7 / 2.15	79.1 / 2.24	75.7 / 2.15
GEVK150	105.0 / 2.98	105.0 / 2.98	111.9 / 3.17	105.0 / 2.98
GEVK180	110.1 / 3.12	110.1 / 3.12	117.0 / 3.32	110.1 / 3.12
GEVK240	244.2 / 6.92	244.2 / 6.92	251.1 / 7.12	244.2 / 6.92
GEVK300	223.6 / 6.34	223.6 / 6.34	230.5 / 6.53	223.6 / 6.34

Operating Limits

Table 4. Operating limits - 0.5 to 25 tons

Operating Limits	Cooling	Heating
Air Limits		
Min. ambient air DB	45°F (7°C)	
Max. ambient air DB	130°F (54.4°C)	
Min. EAT DB/WB	70.0/50.0°F (21.1/10.0°C)	55.0°F/- (12.8°C/-)
Max. EAT DB/WB	85.0/78.0°F (29.4/25.6°C)	80.0°F/- (26.6°C/-)
Airflow range	285 to 450 CFM/ton[a]	
Water Limits		
Min. entering water temperature	45°F (7°C)	25°F (-4°C)
Max. entering water temperature	120°F (49°C)	86°F (30°C)
Max. water pressure	400 PSIG (2758 kPa)	
Water flow range	1.55 to 3.50 GPM/ton[a]	

[a] This value is an average and varies per model. See performance tables for each model number's rated values.

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.**

Unit Inspection Checklist

Note: *The packaging for these units are tested per, and compliant with, the requirements of NMFC Item 180 Certified Packaged Products.*

- 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.
- 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

⚠ WARNING

Risk of Fire — Flammable Refrigerant!

Failure to follow instructions below could result in death or serious injury, and equipment damage.

The equipment shall be stored in a room without continuously operating ignition sources.

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:

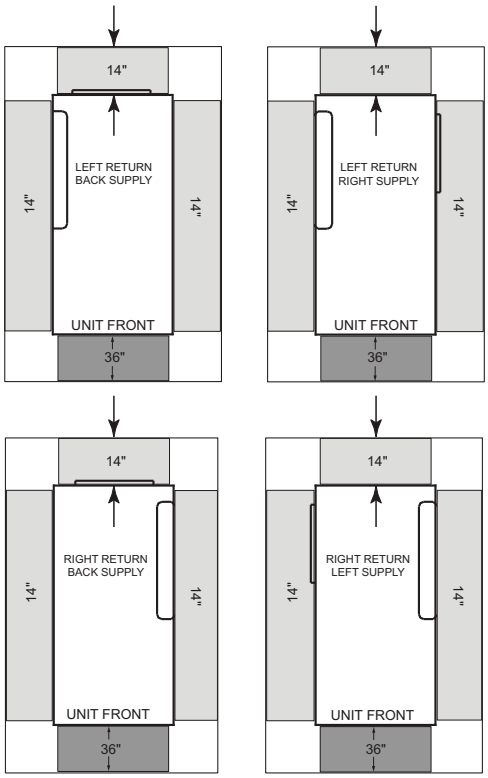
- Place the unit(s) on a dry surface or raise above the ground to assure adequate air circulation beneath the unit.
- Cover the unit(s) with a water proof tarp to protect them from the elements.
- Make provisions for continuous venting of the covered units to prevent moisture from standing on the unit(s) 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.
- Stack horizontal units 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 is 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 - GEH 0.5 to 5 tons

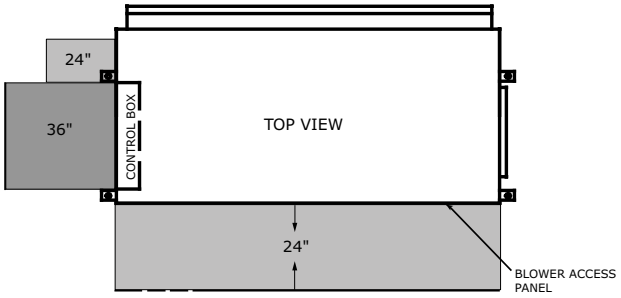


A minimum 14–inch clearance for servicing the unit is required for all 0.5 to 5 tons configurations from other mechanical and electrical equipment (where shown) to enable panel removal from the unit for service/maintenance ability. The optimum clearance required is 20 inches.

Notes:

- *Return air direction (left-hand or right hand) is NOT field convertible. Units must be ordered with correct return air side.*
- *For horizontal models, be sure to allow enough clearance between the condensate drain and the ceiling to allow for pitching of the condensate line. See for pitching requirements.*

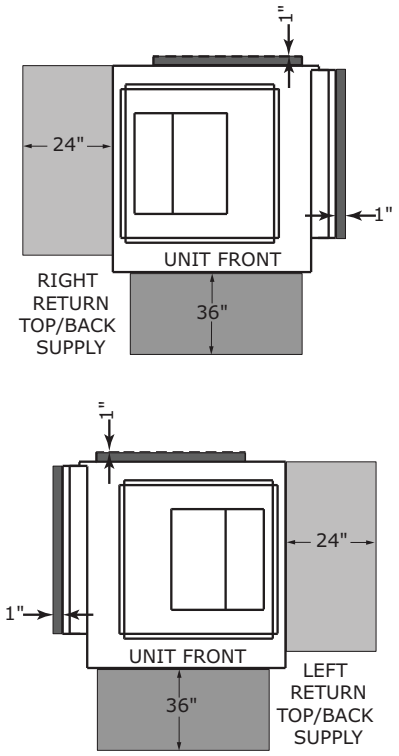
Figure 2. Clearance - GEH 6 to 15 tons



Service clearance dimensions for the GEH 6 to15 tons horizontal includes a two-side access appropriate for control and blower motor/wheel access.

Note: *For horizontal models, confirm enough clearance between the condensate drain and the ceiling for pitching of the condensate line. See for pitching requirements.*

Figure 3. Clearance – GEV 0.5 to 5 tons



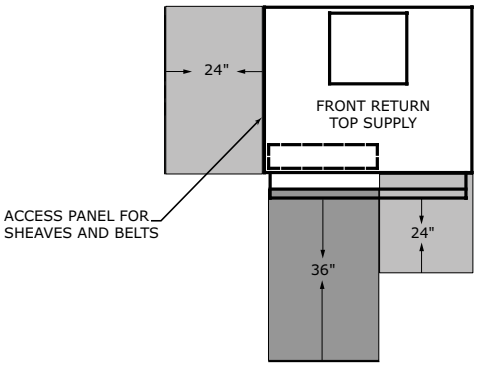
A 24–inch clearance from other mechanical and electrical equipment (where shown) is recommended for most unit configurations. This will enable panel removal from the unit for service/maintenance.

The 24–inch side clearance on GEVK 0.5 to 5T 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.

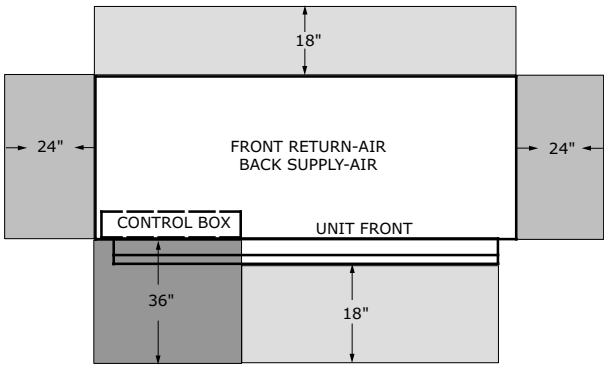
The 1–inch dimension shown in the back of the unit represents the supply duct collar for the back supply option. This clearance is needed to clear these flanges.

Figure 4. Clearance - GEV 6 to 10 tons



A 24–inch clearance from other mechanical and electrical equipment (where shown) is recommended for all configurations. The unit may be serviced through the front access panel or remaining open sides.

Figure 5. Clearance - GEV 12.5 to 25 tons



A 24–inch clearance from other mechanical and electrical equipment (where shown) is recommended for all configurations. The unit may be serviced through the front access panel.

Dimensional Data

Figure 6. Left return/back supply (GEHK)

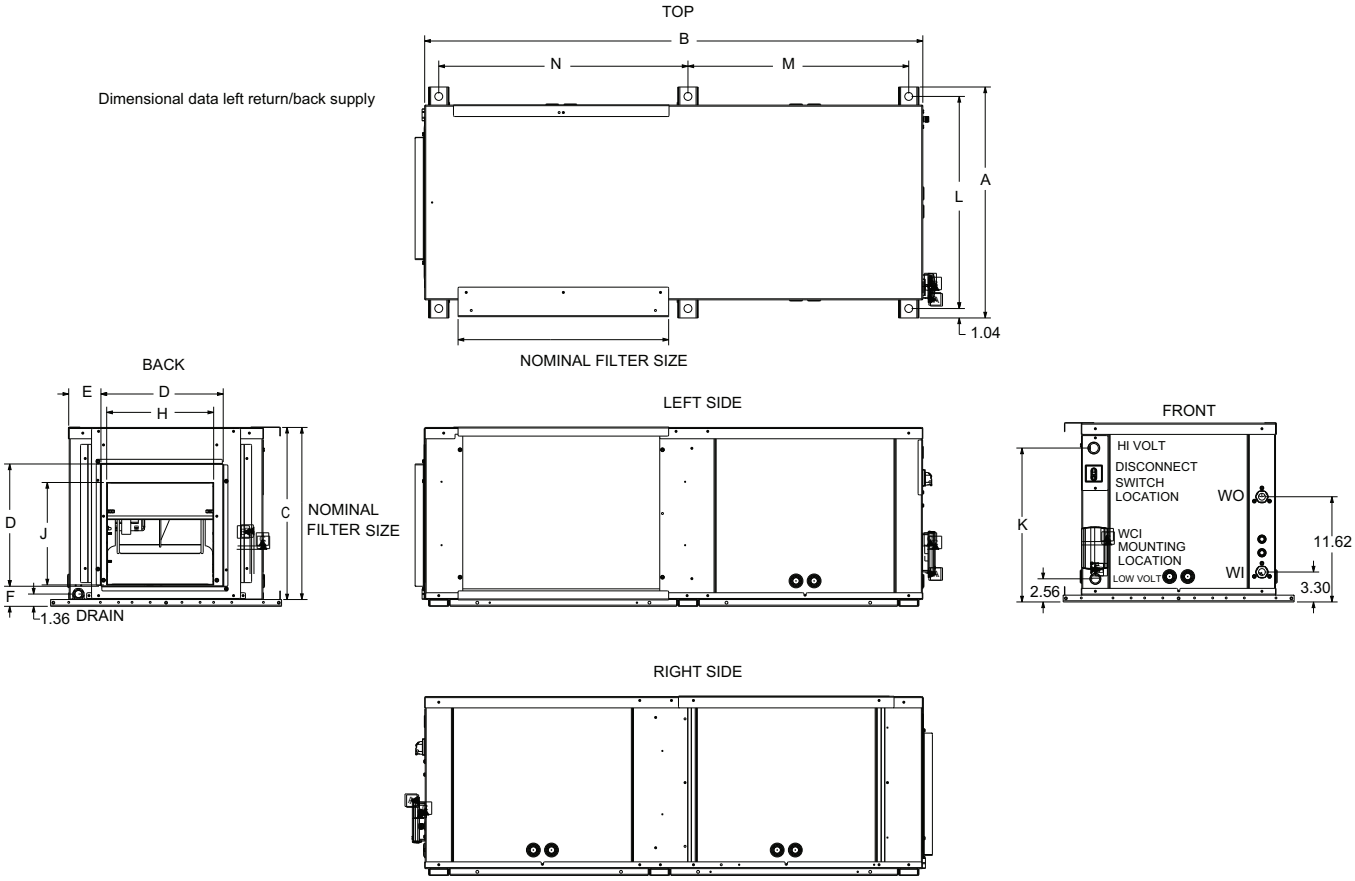


Table 5. Dimensional data left return/back supply (GEHK)

Cab Size	GEHK	Width	Depth	Height	Duct Collar	Duct Collar Location		Blower Opening		Hi Volt	Unit hanging location			Nominal Filter Size	W.I. NPTI	W.O. NPTI	DRAIN NPTI
		A	B	C	D	E	F	H	J	K	L	M	N				
A	006-012	23.00	41.00	15.75	11.50	3.50	2.25	7.88	7.63	13.00	21.00	17.50	20.50	14 x 16	0.50	0.50	0.75
B	015, 018	25.50	46.00	17.75	13.50	3.50	2.00	10.13	9.38	15.00	23.50	19.88	23.00	16 x 19	0.50	0.50	0.75
C	024, 030	25.50	49.00	18.75	13.50	3.88	2.25	10.50	11.25	16.00	23.50	21.38	24.50	17 x 20	0.75	0.75	0.75
D	036, 042	25.50	55.00	19.75	13.50	3.50	2.25	11.75	11.25	17.00	23.50	24.38	27.50	18 x 23	0.75	0.75	0.75
E	048, 060	28.00	68.00	21.75	16.50	3.63	2.13	13.88	13.50	19.00	26.00	30.88	34.00	20 x 30	1.00	1.00	0.75

Note: Dimensions represent unit hanging dimensions including base rails for hanging.

Figure 7. Left return/right supply (GEHK)

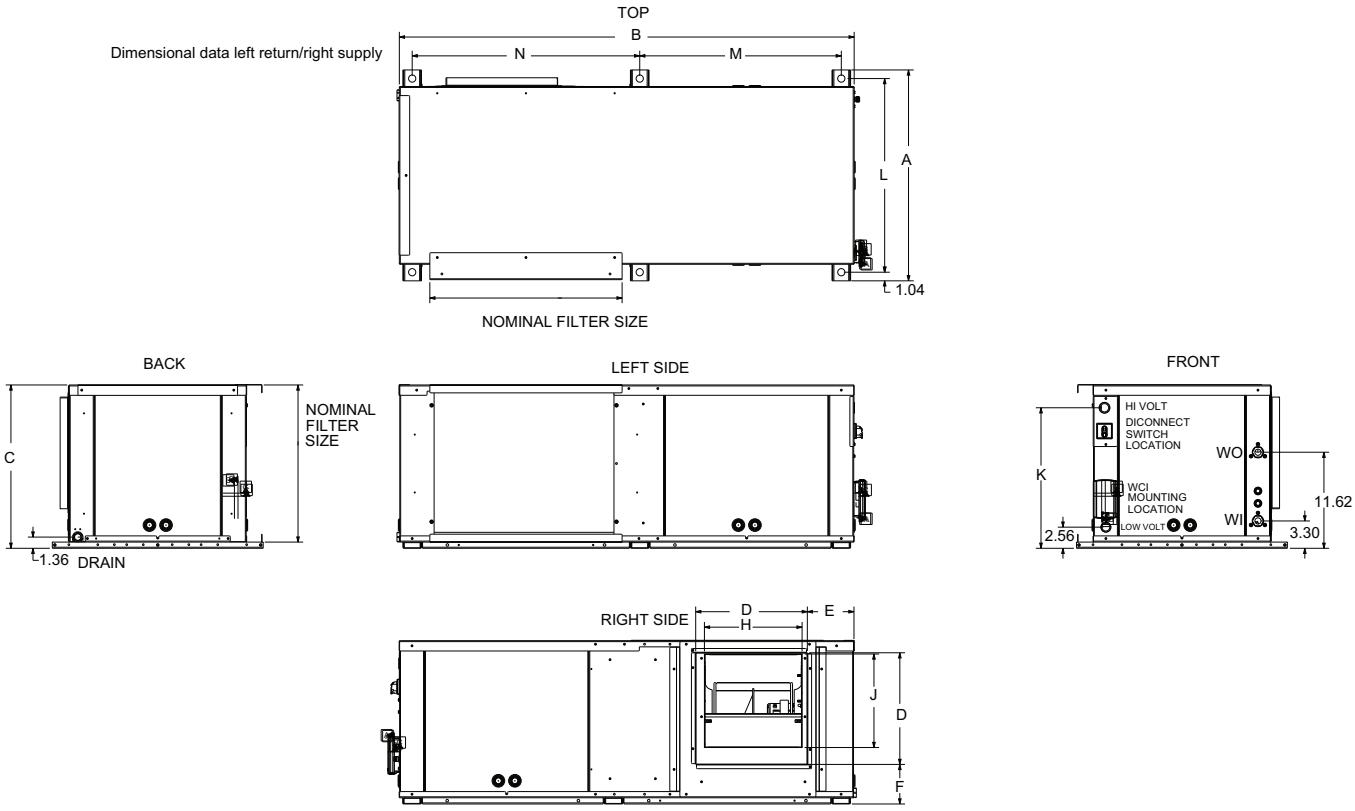


Table 6. Dimensional data left return/right supply (GEHK)

Cab Size	GEHK	Width	Depth	Height	Duct Collar	Duct Collar Location		Blower Opening		Hi Volt	Unit hanging location			Nominal Filter Size	W.I. NPTI	W.O. NPTI	DRAIN NPTI
		A	B	C	D	E	F	H	J	K	L	M	N				
A	006-012	23.00	41.00	15.75	11.50	5.75	3.00	7.88	7.63	13.00	21.00	17.50	20.50	14 x 16	0.50	0.50	0.75
B	015, 018	25.50	46.00	17.75	13.50	3.38	3.00	10.13	9.38	15.00	23.50	19.88	23.00	16 x 19	0.50	0.50	0.75
C	024, 030	25.50	49.00	18.75	13.50	5.88	4.00	10.50	11.25	16.00	23.50	21.38	24.50	17 x 20	0.75	0.75	0.75
D	036, 042	25.50	55.00	19.75	13.50	5.63	4.75	11.75	11.25	17.00	23.50	24.38	27.50	18 x 23	0.75	0.75	0.75
E	048, 060	28.00	68.00	21.75	16.50	5.63	3.88	13.88	13.50	19.00	26.00	30.88	34.00	20 x 30	1.00	1.00	0.75

Note: Dimensions represent unit hanging dimensions including base rails for hanging.

Unit Dimensions

Figure 8. Right return/left supply (GEHK)

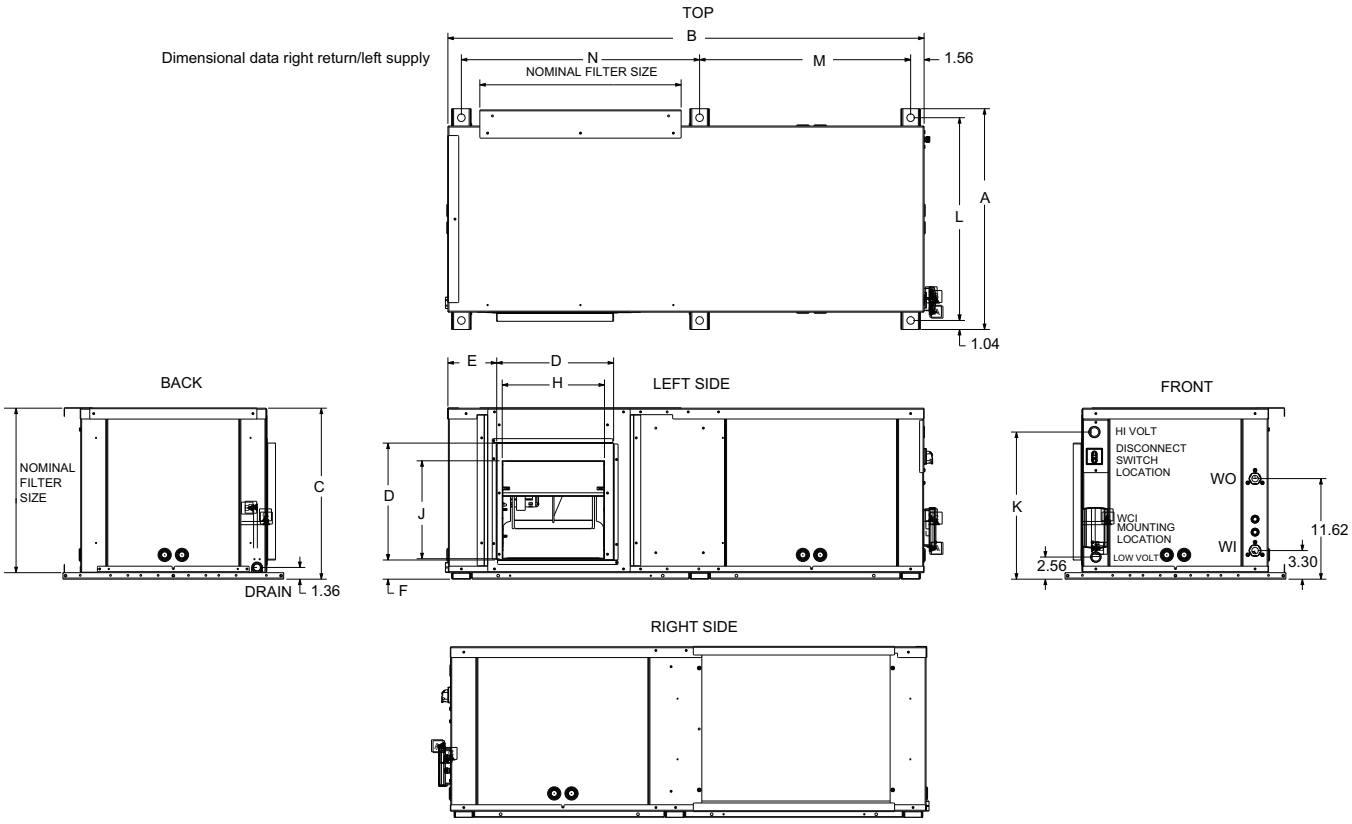


Table 7. Dimensional data right return/left supply (GEHK)

Cab Size	GEHK	Width	Depth	Height	Duct Collar	Duct Collar Location		Blower Opening		Hi Volt	Unit hanging location			Nominal Filter Size	W.I. NPTI	W.O. NPTI	DRAIN NPTI
		A	B	C	D	E	F	H	J	K	L	M	N				
A	006-012	23.00	41.00	15.75	11.50	5.75	2.25	7.88	7.63	13.00	21.00	17.50	20.50	14 x 16	0.50	0.50	0.75
B	015, 018	25.50	46.00	17.75	13.50	5.50	2.00	10.13	9.38	15.00	23.50	19.88	23.00	16 x 19	0.50	0.50	0.75
C	024, 030	25.50	49.00	18.75	13.50	5.88	2.25	10.50	11.25	16.00	23.50	21.38	24.50	17 x 20	0.75	0.75	0.75
D	036, 042	25.50	55.00	19.75	13.50	5.63	2.25	11.75	11.25	17.00	23.50	24.38	27.50	18 x 23	0.75	0.75	0.75
E	048, 060	28.00	68.00	21.75	16.50	5.63	2.13	13.88	13.50	19.00	26.00	30.88	34.00	20 x 30	1.00	1.00	0.75

Note: Dimensions represent unit hanging dimensions including base rails for hanging.

Figure 9. Right return/back supply (GEHK)

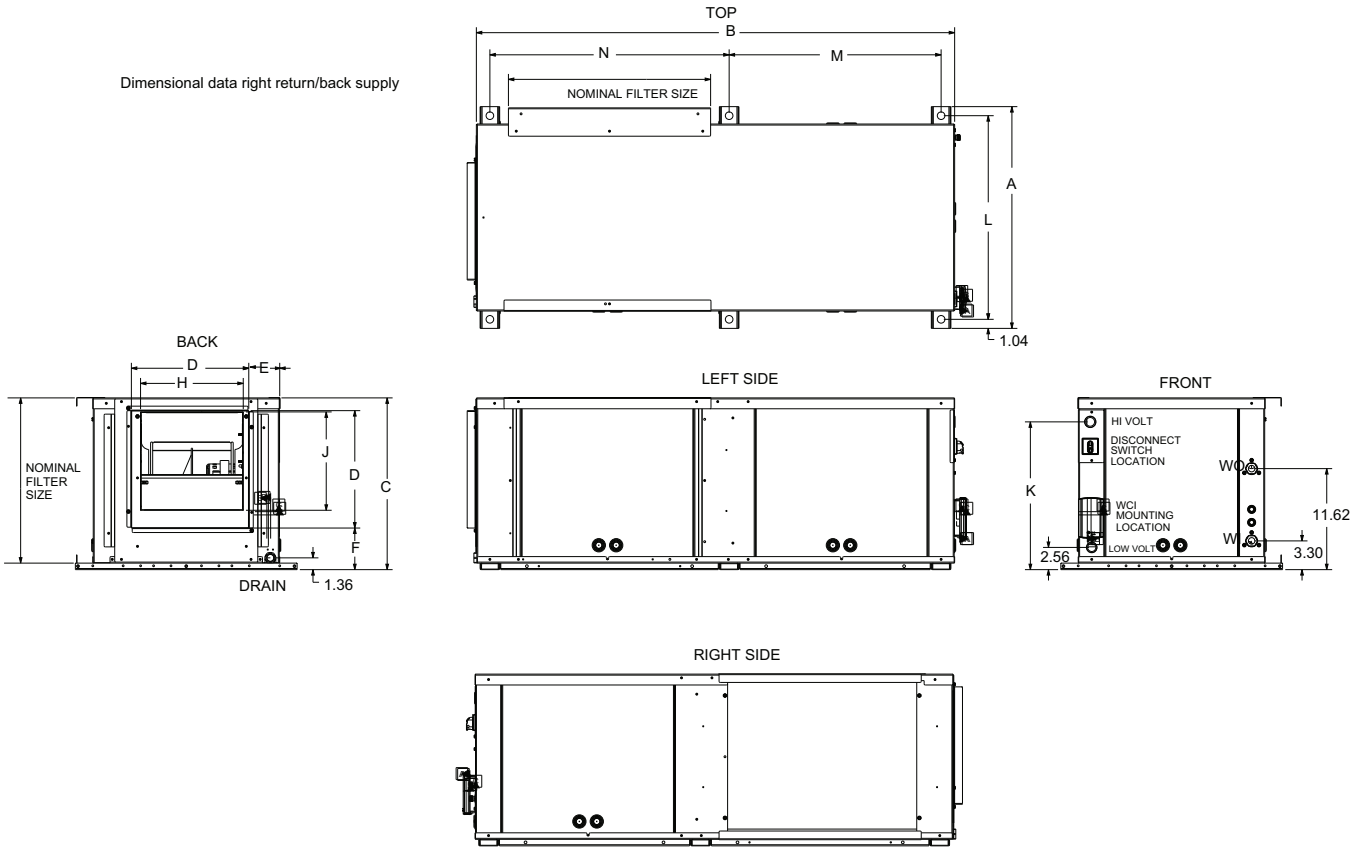


Table 8. Dimensional data right return/back supply (GEHK)

Cab Size	GEHK	Width	Depth	Height	Duct Collar	Duct Collar Location		Blower Opening		Hi Volt	Unit hanging location			Nominal Filter Size	W.I. NPTI	W.O. NPTI	DRAIN NPTI
		A	B	C	D	E	F	H	J	K	L	M	N				
A	006-012	23.00	41.00	15.75	11.50	3.50	3.00	7.88	7.63	13.00	21.00	17.50	20.50	14 x 16	0.50	0.50	0.75
B	015, 018	25.50	46.00	17.75	13.50	3.25	3.00	10.13	9.38	15.00	23.50	19.88	23.00	16 x 19	0.50	0.50	0.75
C	024, 030	25.50	49.00	18.75	13.50	3.88	4.00	10.50	11.25	16.00	23.50	21.38	24.50	17 x 20	0.75	0.75	0.75
D	036, 042	25.50	55.00	19.75	13.50	3.50	4.75	11.75	11.25	17.00	23.50	24.38	27.50	18 x 23	0.75	0.75	0.75
E	048, 060	28.00	68.00	21.75	16.50	3.63	3.88	13.88	13.50	19.00	26.00	30.88	34.00	20 x 30	1.00	1.00	0.75

Note: Dimensions represent unit hanging dimensions including base rails for hanging.

Figure 10. Left return/top supply (GEVK)

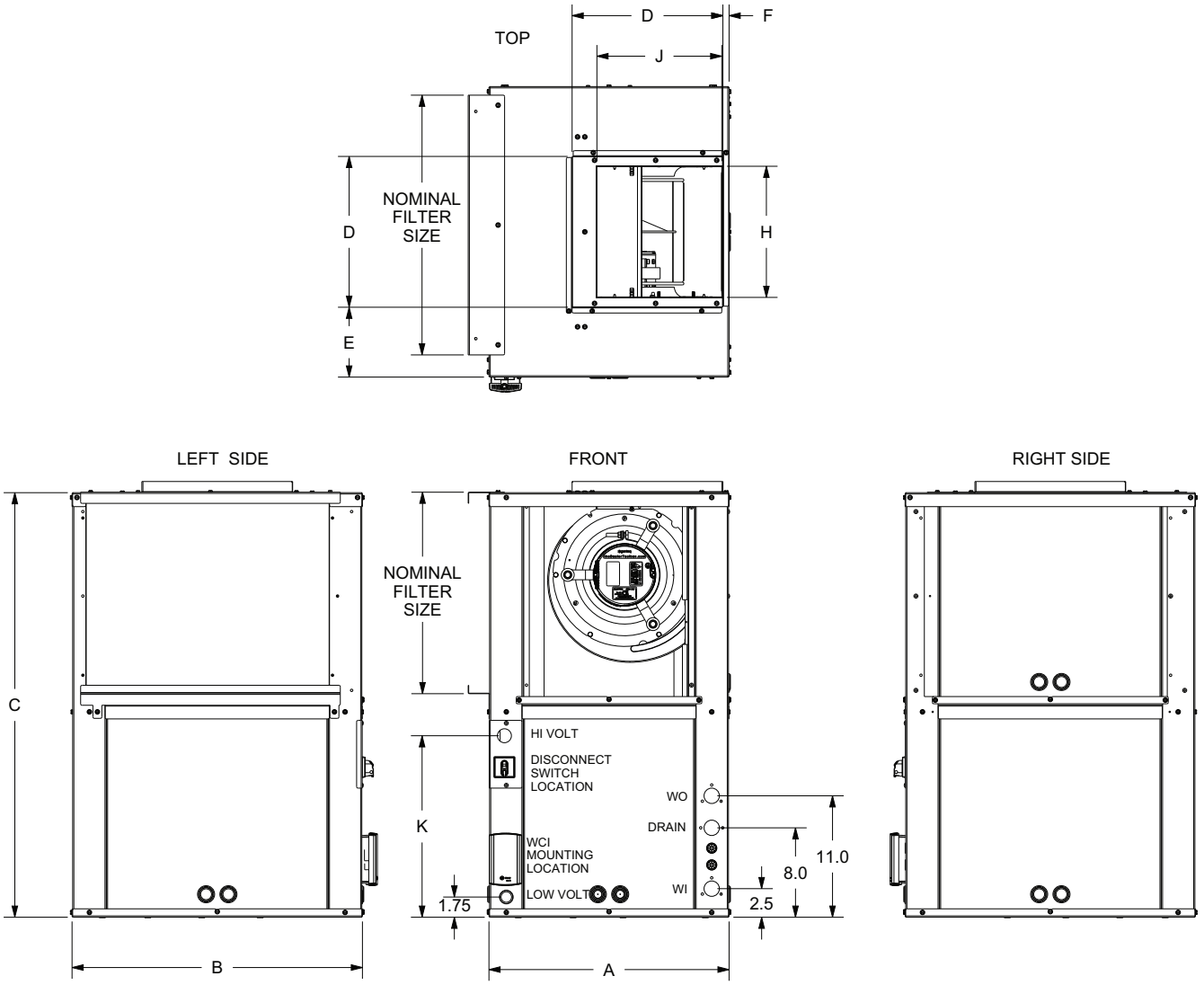


Table 9. Dimensional data left return/top supply (GEVK)

Cab Size	GEVK	Width	Depth	Height	Duct Collar	Duct Collar Location			Blower Opening		Hi Volt	Nominal Filter Size	W.I. NPTI	W.O. NPTI	Drain NPTI
		A	B	C	D	E	F	G	H	J	K				
A	006-012	19.00	19.00	30.00	11.38	3.70	1.40	3.50	8.00	7.70	12.25	14 x 16	0.50	0.50	0.75
B	015-018	21.50	21.50	34.00	13.25	4.00	1.00	3.50	10.50	9.60	14.25	16 x 19	0.50	0.50	0.75
C	024-030	21.50	23.00	36.00	13.25	4.75	0.63	3.50	10.50	11.30	15.25	17 x 20	0.75	0.75	0.75
D	036-042	21.50	26.00	38.00	13.25	6.25	0.63	3.50	11.80	11.30	16.25	18 x 23	0.75	0.75	0.75
E	048-060	24.00	32.50	42.00	16.50	7.25	0.75	3.50	13.70	13.50	18.25	20 x 30	1	1	0.75

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 11. Right return/top supply (GEVK)

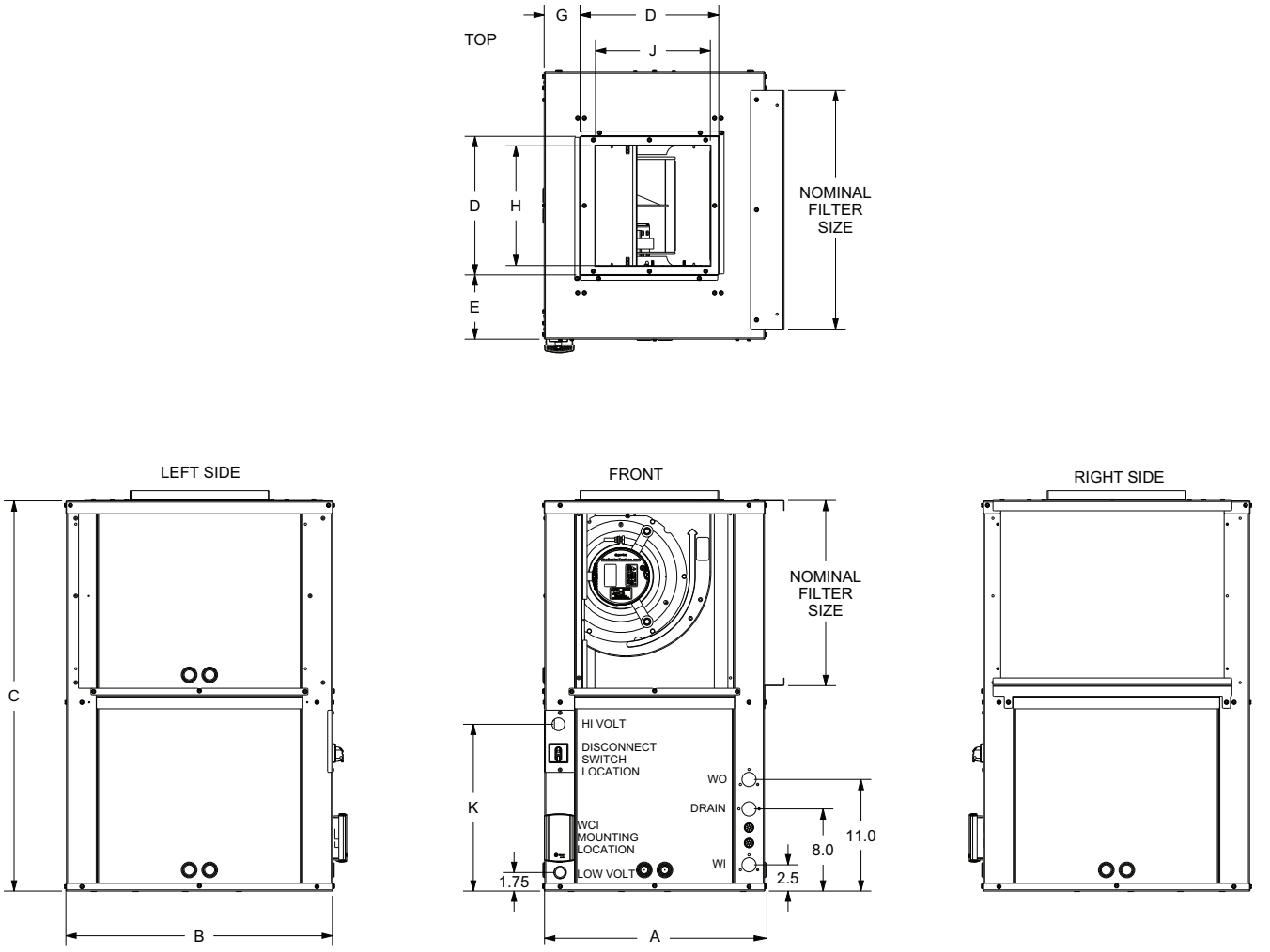


Table 10. Dimensional data right return/top supply (GEVK)

Cab Size	GEVK	Width	Depth	Height	Duct Collar	Duct Collar Location			Blower Opening		Hi Volt	Nominal Filter Size	W.I. NPTI	W.O. NPTI	Drain NPTI
		A	B	C	D	E	F	G	H	J	K				
A	006-012	19.00	19.00	30.00	11.38	3.70	1.40	3.50	8.00	7.70	12.25	14 x 16	0.50	0.50	0.75
B	015-018	21.50	21.50	34.00	13.25	4.00	1.00	3.50	10.50	9.60	14.25	16 x 19	0.50	0.50	0.75
C	024-030	21.50	23.00	36.00	13.25	4.75	0.63	3.50	10.50	11.30	15.25	17 x 20	0.75	0.75	0.75
D	036-042	21.50	26.00	38.00	13.25	6.25	0.63	3.50	11.80	11.30	16.25	18 x 23	0.75	0.75	0.75
E	048-060	24.00	32.50	42.00	16.50	7.25	0.75	3.50	13.70	13.50	18.25	20 x 30	1	1	0.75

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 12. Left return/back supply (GEVK)

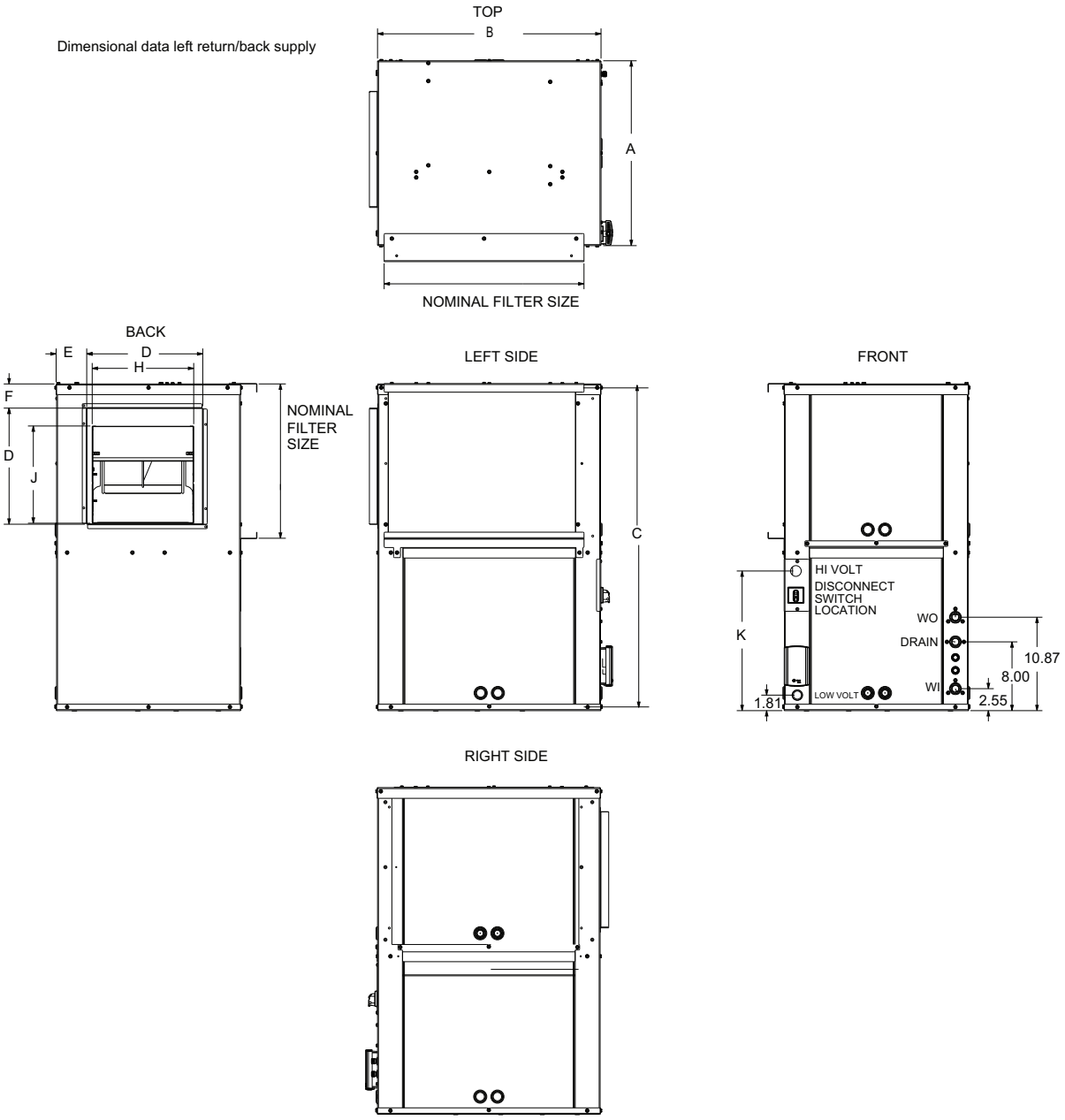


Table 11. Dimensional data left return/back supply (GEVK)

Cab Size	GEVK	Width	Depth	Height	Duct Collar	Duct Collar Location		Blower Opening		Hi Volt	Nominal Filter Size	W.I. NPTI	W.O. NPTI	Drain NPTI
		A	B	C	D	E	F	H	J	K				
A	006-012	19.00	19.00	30.00	11.50	3.50	2.25	7.88	7.63	12.25	14 x 16	0.50	0.50	0.75
B	015,018	21.50	21.50	34.00	13.50	3.50	2.00	10.13	9.38	14.25	16 x 19	0.50	0.50	0.75
C	024,030	21.50	23.00	36.00	13.50	3.88	2.25	10.50	11.25	15.25	17 x 20	0.75	0.75	0.75
D	036,042	21.50	26.00	38.00	13.50	3.50	2.75	11.75	11.25	16.25	18 x 23	0.75	0.75	0.75
E	048,060	24.00	32.50	42.00	16.50	3.63	2.13	13.88	13.50	18.25	20 x 30	1	1	0.75

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 13. Right return/back supply (GEVK)

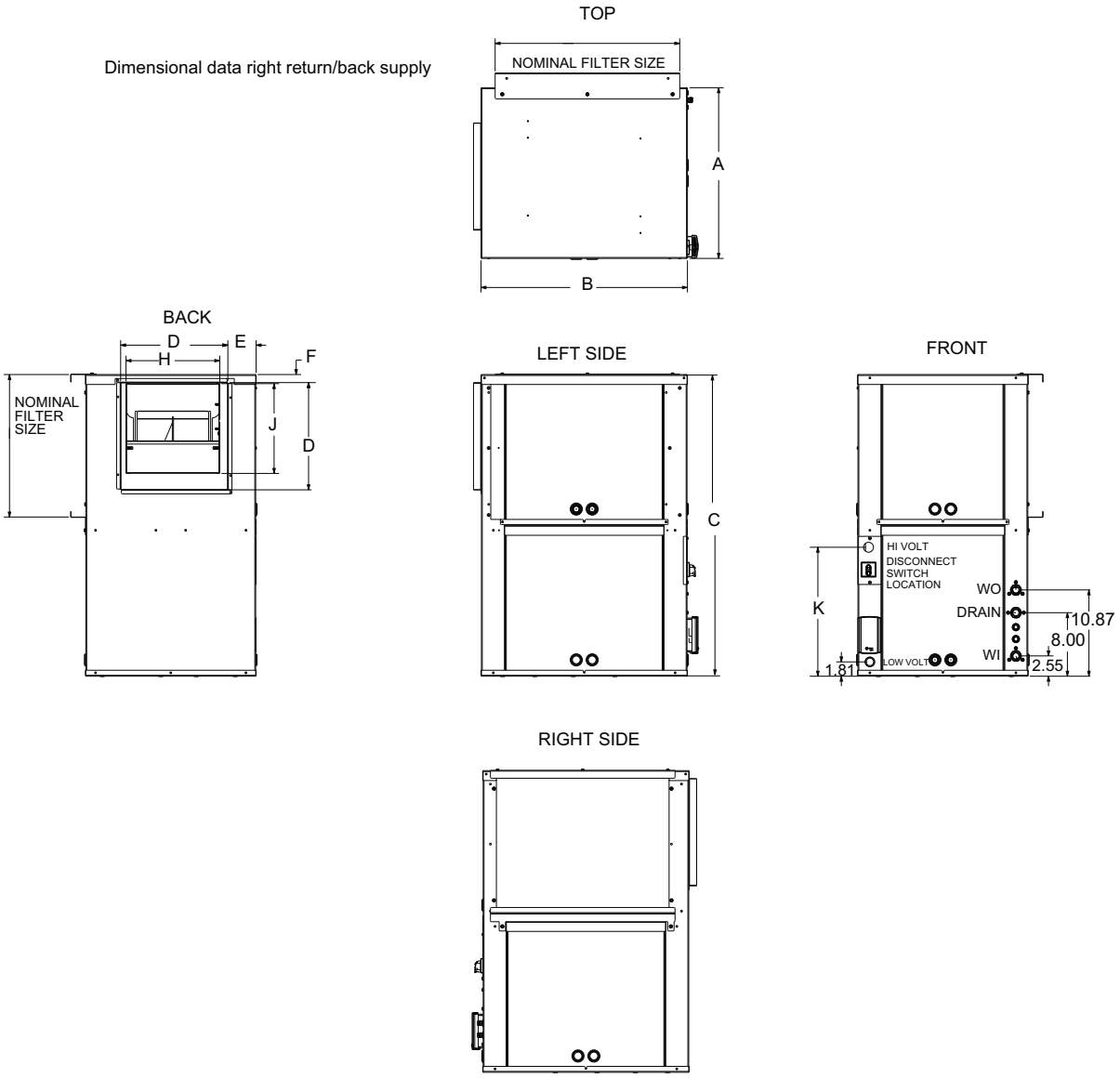


Table 12. Dimensional data right return/back supply (GEVK)

Cab Size	GEVK	Width	Depth	Height	Duct Collar	Duct Collar Location		Blower Opening		Hi Volt	Nominal Filter Size	W.I. NPTI	W.O. NPTI	Drain NPTI
		A	B	C	D	E	F	H	J	K				
A	006-012	19.00	19.00	30.00	11.50	3.50	1.00	7.88	7.63	12.25	14 x 16	0.50	0.50	0.75
B	015,018	21.50	21.50	34.00	13.50	3.25	1.00	10.13	9.38	14.25	16 x 19	0.50	0.50	0.75
C	024,030	21.50	23.00	36.00	13.50	3.88	1.00	10.50	11.25	15.25	17 x 20	0.75	0.75	0.75
D	036,042	21.50	26.00	38.00	13.50	3.50	1.00	11.75	11.25	16.25	18 x 23	0.75	0.75	0.75
E	048,060	24.00	32.50	42.00	16.50	3.63	1.00	13.88	13.50	18.25	20 x 30	1	1	0.75

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 14. Right return/left supply - GEHK 6 to 10 tons (60 Hz); GEHK 6 to 7.5 tons (50 Hz)

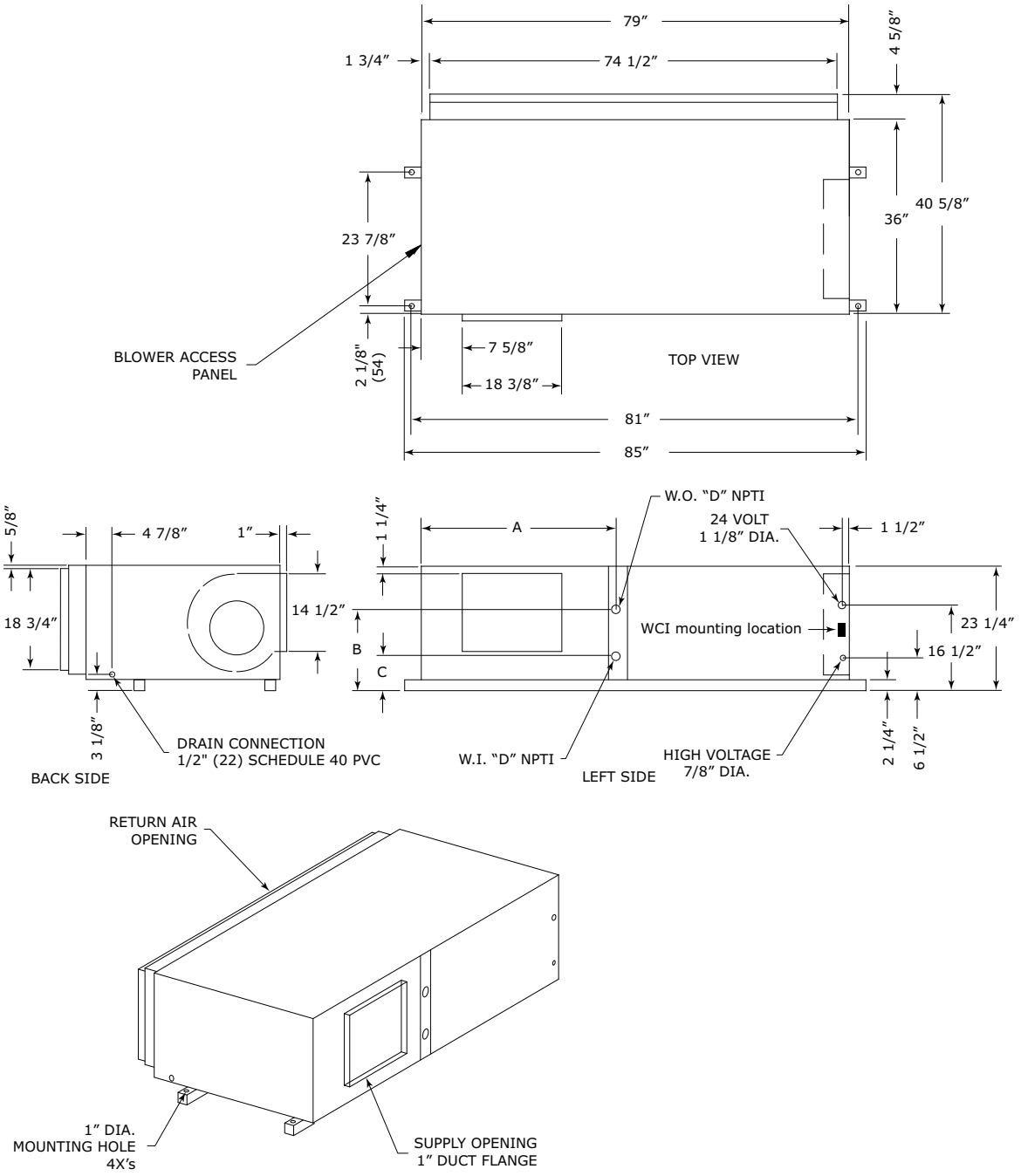


Table 13. Dimensional data right return/left supply - GEHK 6 to 10 tons (60 Hz); GEHK 6 to 7.5 tons (50 Hz)

GEH (60 Hz)	GEH (50 Hz)	A	B	C	D
72	—	36-1/4 in.	15-5/8 in.	6-5/8 in.	1-1/4 in.
90	72	36-1/8 in.	12-3/4 in.	6-3/4 in.	1-1/4 in.
120	90	36-1/8 in.	13 in.	7-1/4 in.	1-1/2 in.

Figure 15. Right return/back supply - GEHK 6 to 10 tons (60 Hz); GEHK 6 to 7.5 tons (50 Hz)

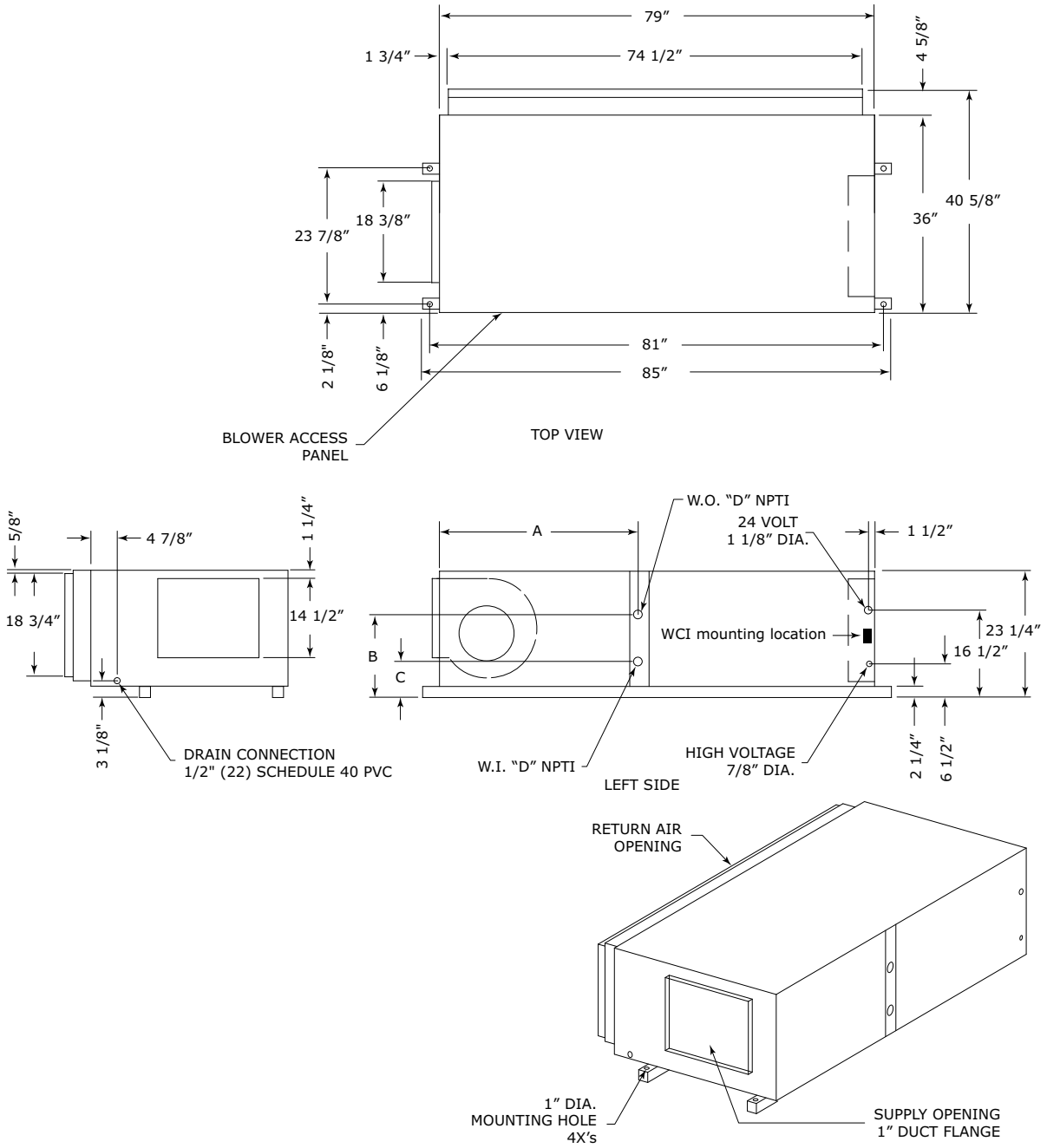


Table 14. Dimensional data right return/back supply - GEHK 6 to 10 tons (60 Hz); GEHK 6 to 7.5 tons (50 Hz)

GEH (60 Hz)	GEH (50 Hz)	A	B	C	D
72	—	36-1/4 in.	15-5/8 in.	6-5/8 in.	1-1/4 in.
90	72	36-1/8 in.	12-3/4 in.	6-3/4 in.	1-1/4 in.
120	90	36-1/8 in.	13 in.	7-1/4 in.	1-1/2 in.

Figure 16. Left return/right supply GEHK 6 to 10 tons (60 Hz); GEHK 6 to 7.5 tons (50 Hz)

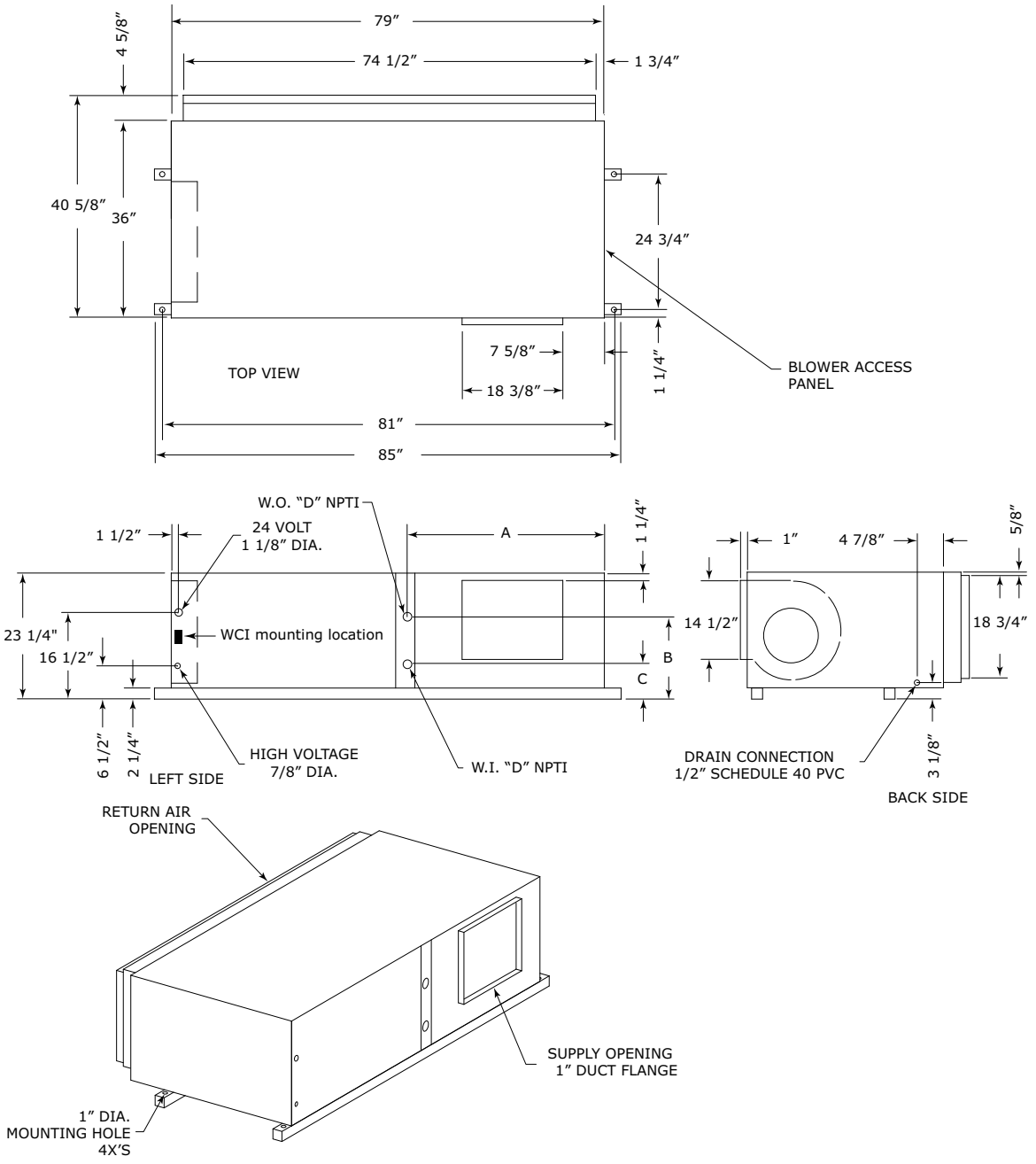


Table 15. Dimensional data left return/right supply - GEHK 6 to 10 tons (60 Hz); GEHK 6 to 7.5 tons (50 Hz)

GEH (60 Hz)	GEH (50 Hz)	A	B	C	D
72	—	36-1/8 in.	17 in.	8 in.	1-1/4 in.
90	72	36-1/8 in.	13-3/4 in.	7-3/4 in.	1-1/4 in.
120	90	36-1/8 in.	13 in.	7-1/4 in.	1-1/2 in.

Figure 17. Left return/back supply GEHK 6 to 10 tons (60 Hz); GEHK 6 to 7.5 tons (50 Hz)

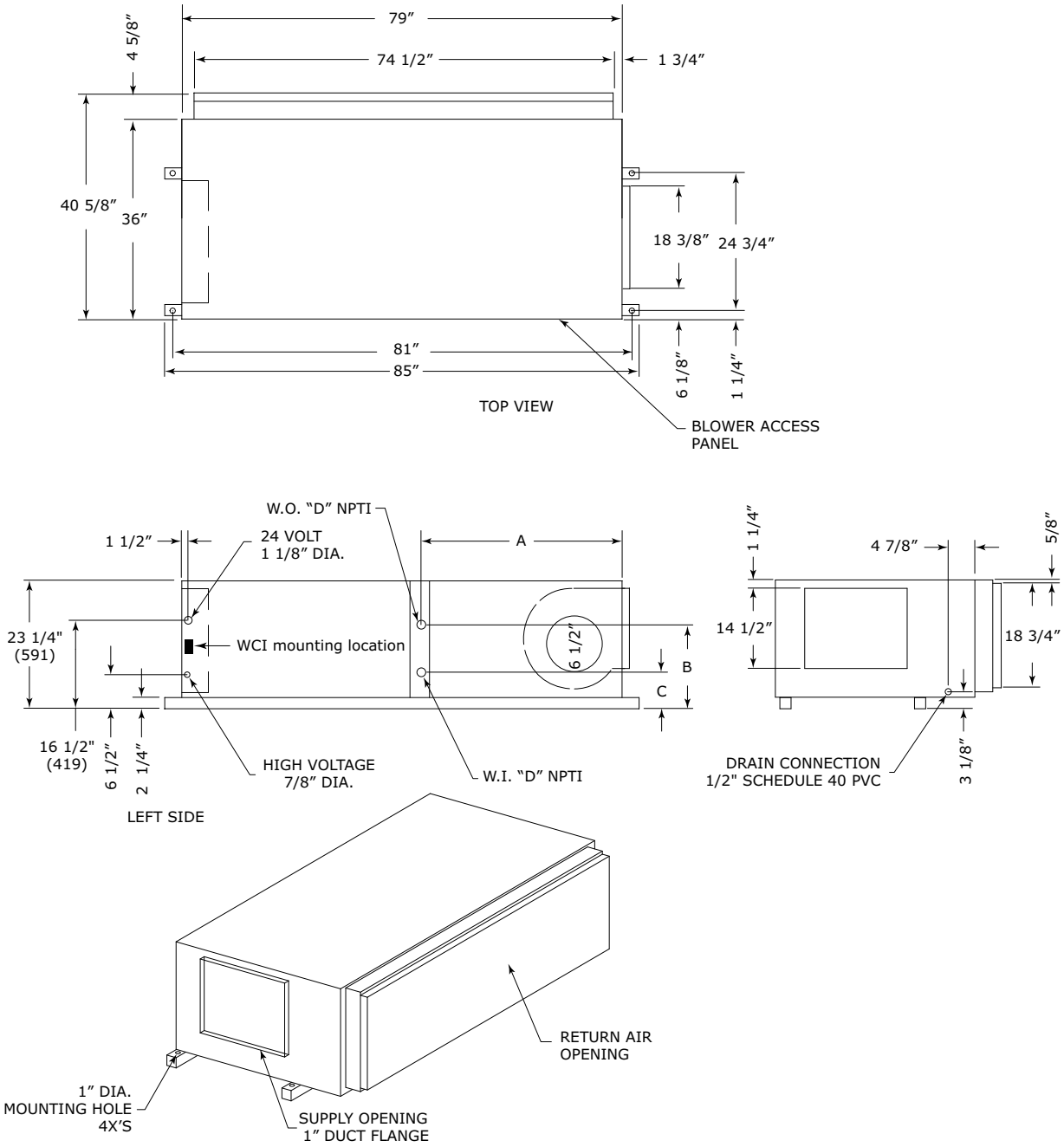


Table 16. Dimensional data left return/back supply GEHK 6 to 10 tons (60 Hz); GEHK 6 to 7.5 tons (50 Hz)

GEH (60 Hz)	GEH (50 Hz)	A	B	C	D
72	—	36-1/8 in.	17 in.	8 in.	1-1/4 in.
90	72	36-1/8 in.	13-3/4 in.	7-3/4 in.	1-1/4 in.
120	90	36-1/8 in.	13 in.	7-1/4 in.	1-1/2 in.

Figure 18. Right return/back supply GEHK 12.5 to 15 tons (60 Hz); GEHK 10 to 12.5 tons (50 Hz)

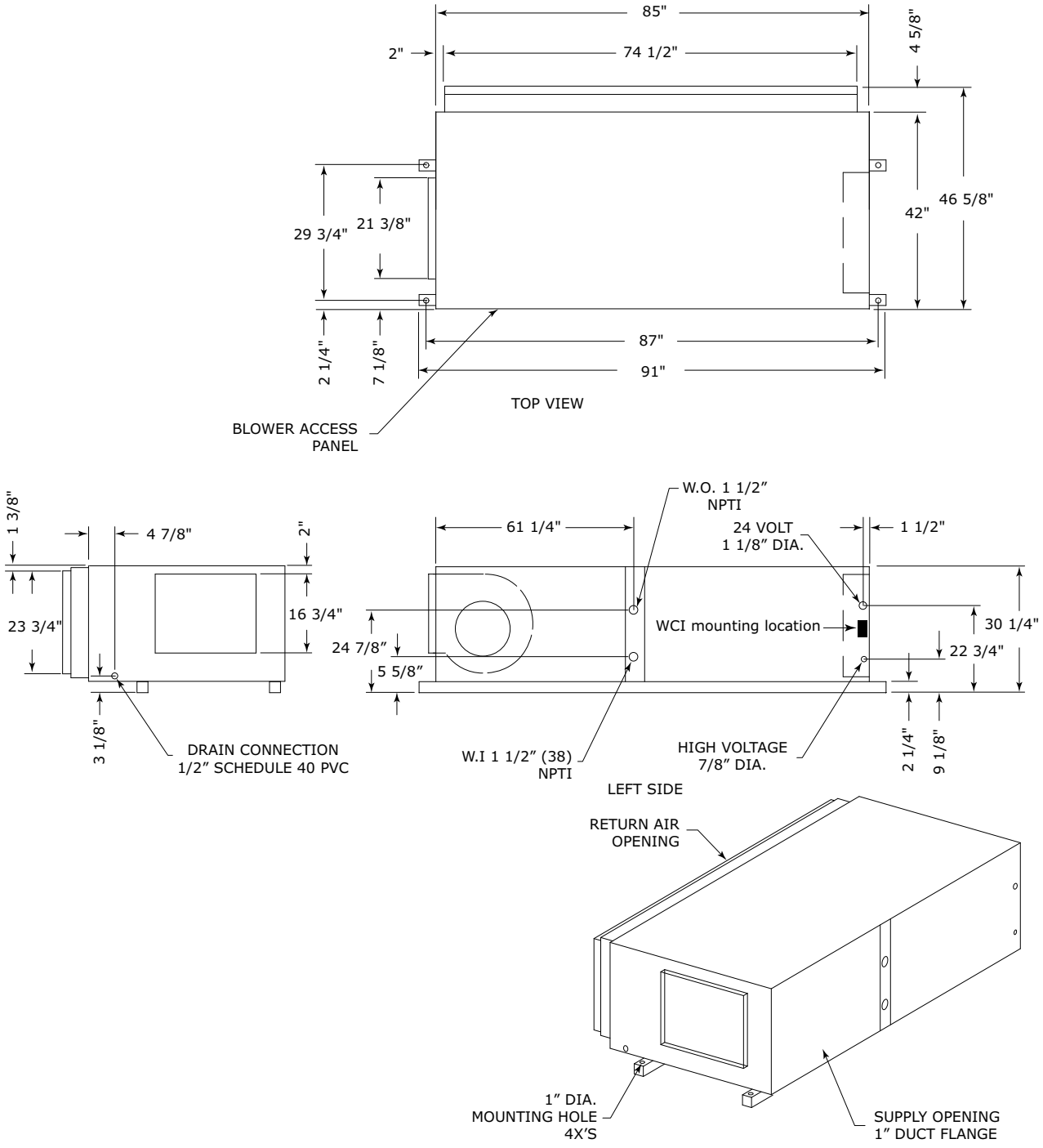
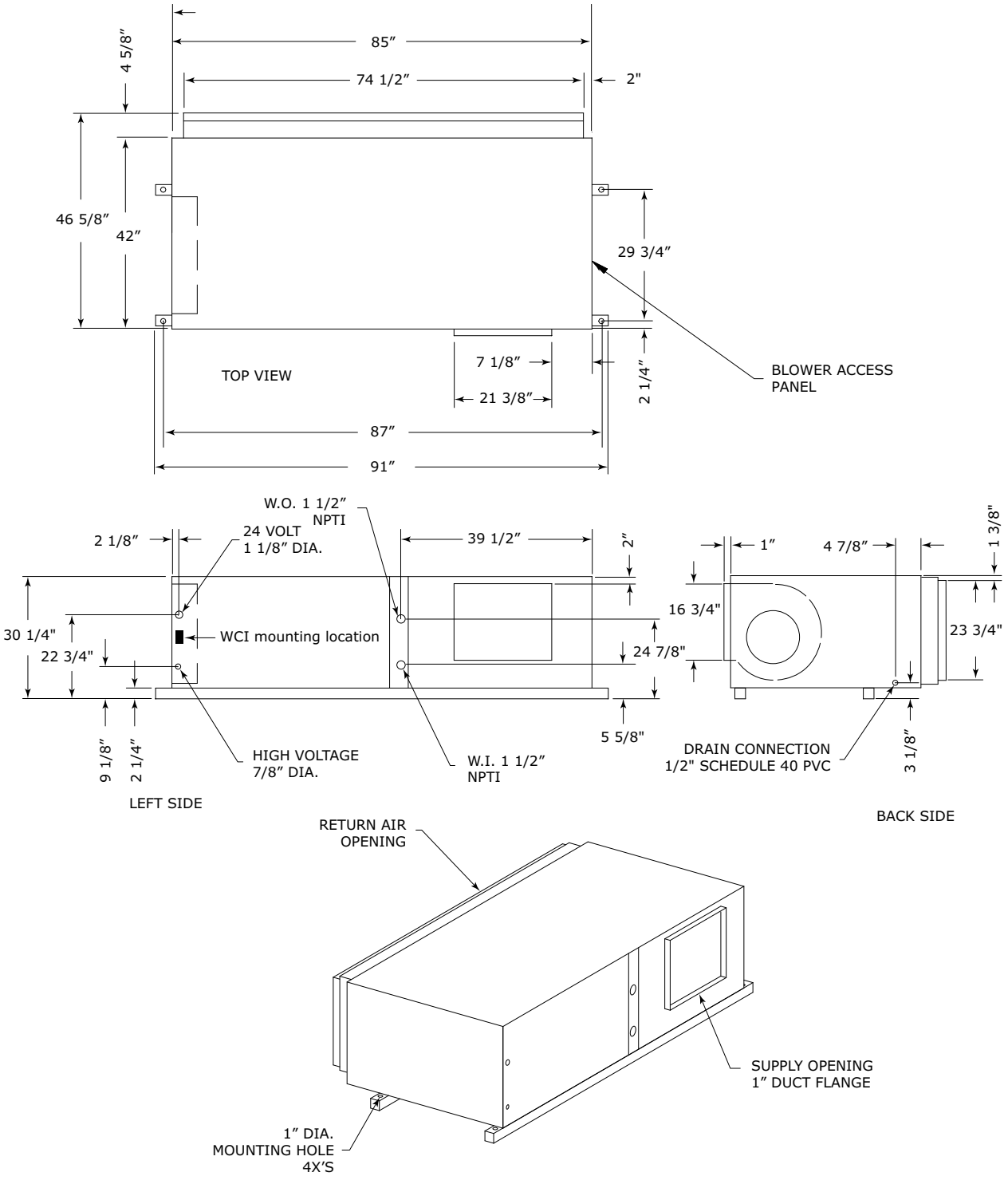


Figure 19. Left return/right supply GEHK 12.5 to 15 tons (60 Hz); GEHK 10 to 12.5 tons (50 Hz)



Unit Dimensions

Figure 20. Left return/back supply GEHK 12.5 to 15 tons (60 Hz); GEHK 10 to 12.5 tons (50 Hz)

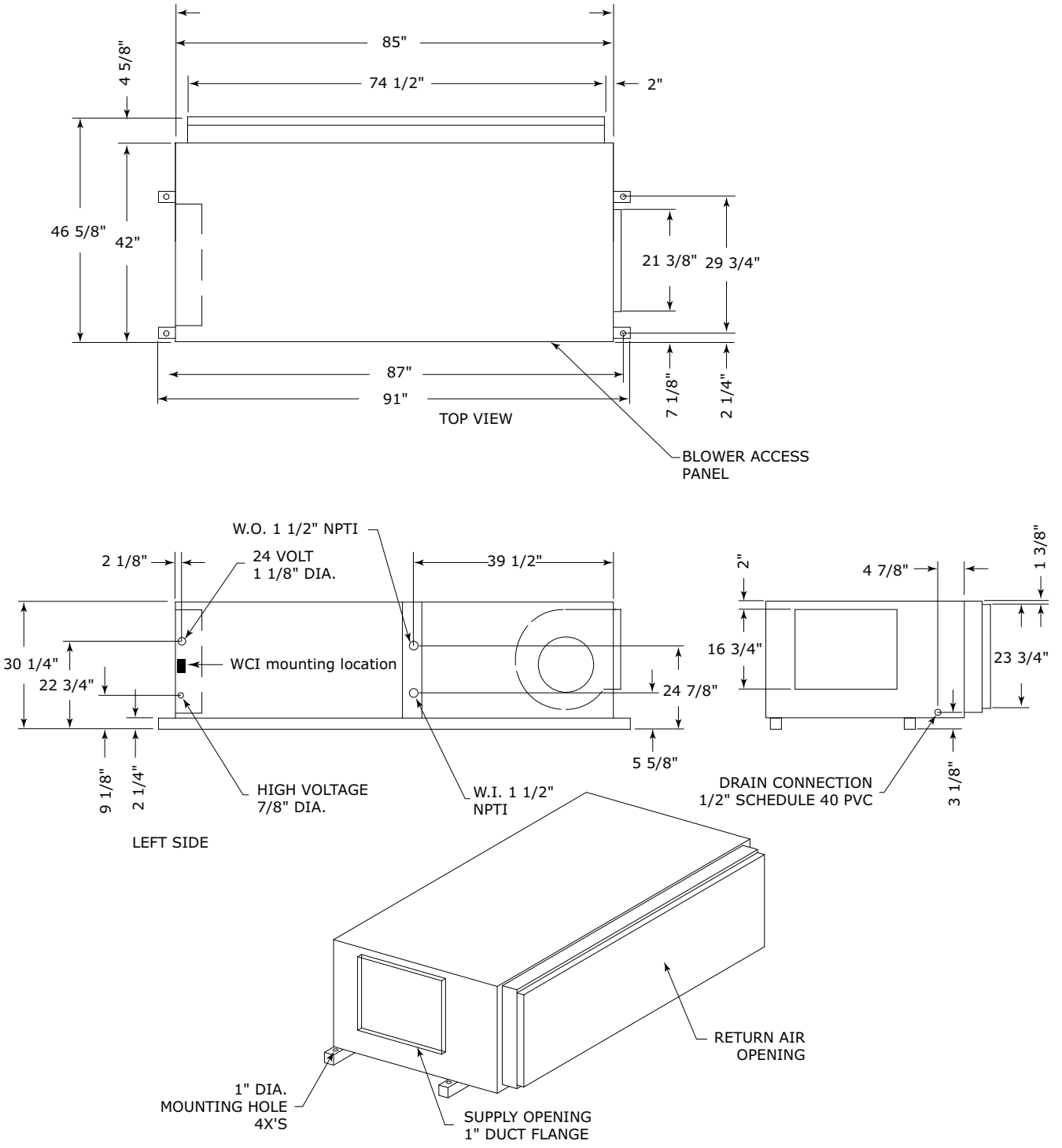


Figure 21. Front return/back supply[1] GEVK 6 to 10 tons (60 Hz); 6 and 7.5 tons (50 Hz)

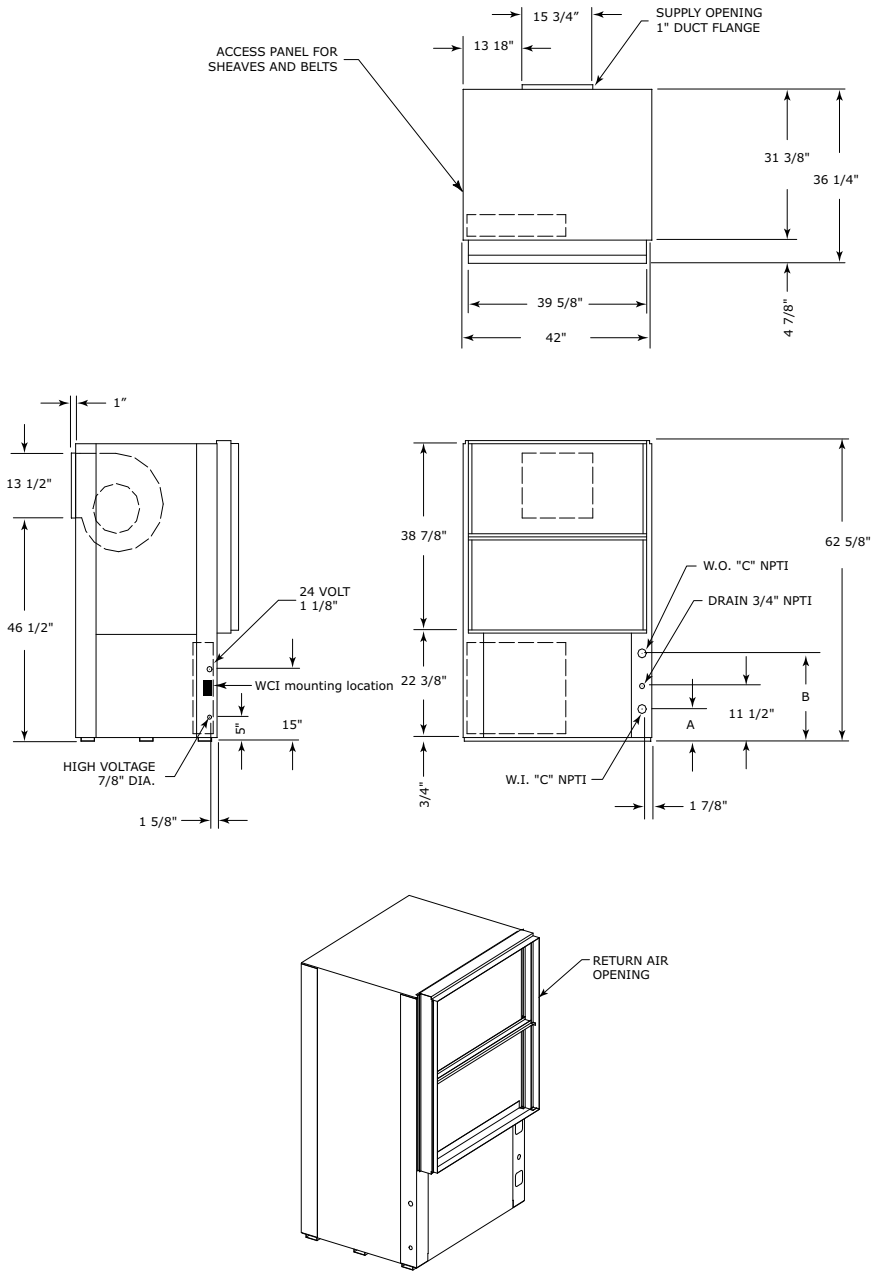


Table 17. Dimensional data front return/back supply GEVK 6 to 10 tons (60 Hz); 6 and 7.5 tons (50 Hz)

Unit (60 Hz)	Unit (50 Hz)	A	B	C
6.0 tons	—	6-5/8 in.	18-3/8 in.	1-1/4 in.
7.5 tons	6.0 tons	6-5/8 in.	18-3/8 in.	1-1/4 in.
10.0 tons	7.5 tons	6-1/2 in.	18-1/2 in.	1-1/2 in.

1. *NEC requires that the GEV072-300 front return must be a non-ducted return.*

Figure 22. Front return/top supply[2] GEVK 6 to 10 tons (60 Hz); 6 and 7.5 tons (50 Hz)

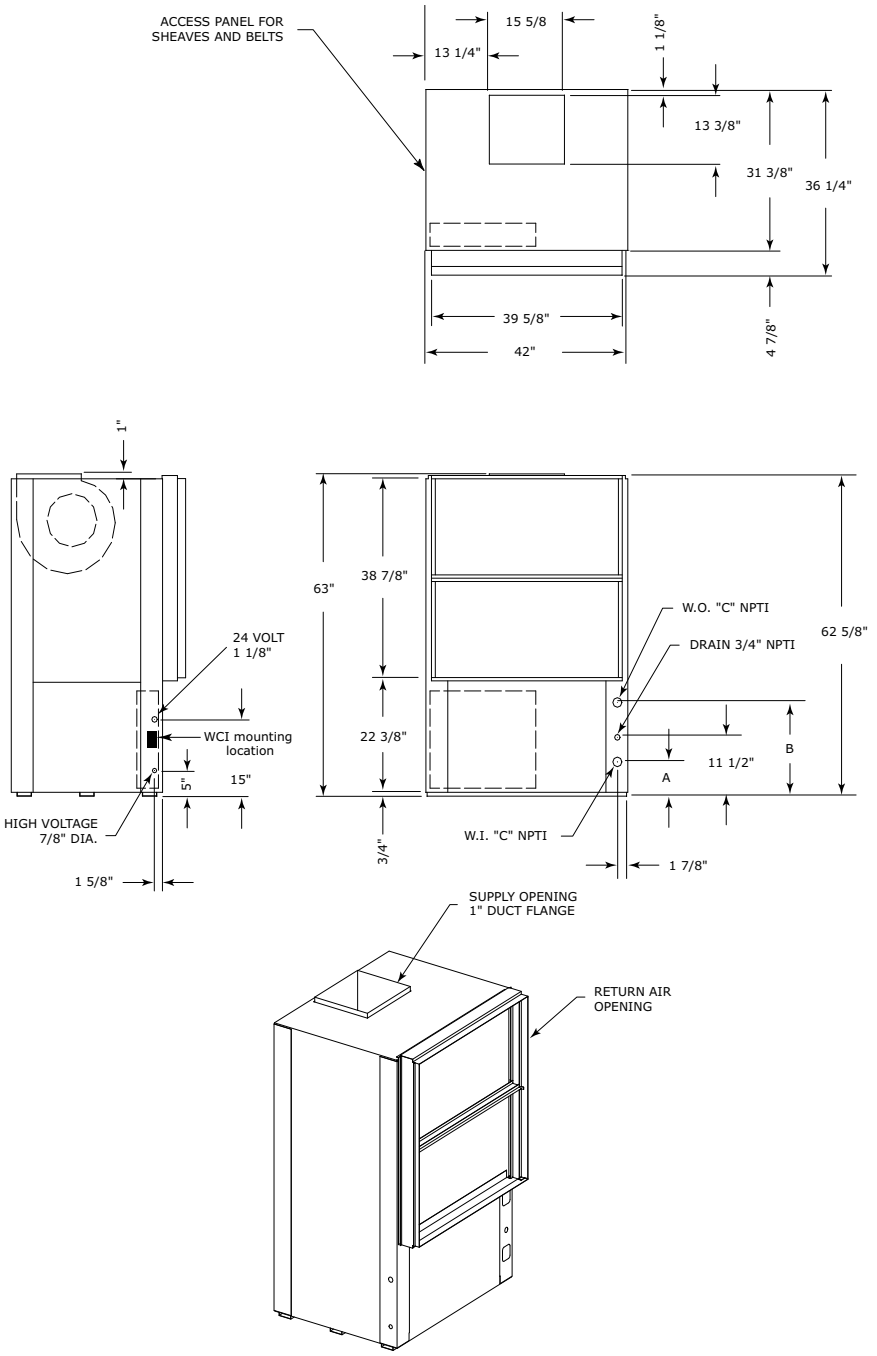


Table 18. Dimensional data front return/top supply GEVK 6 to 10 tons (60 Hz); 6 and 7.5 tons (50 Hz)

Unit (60 Hz)	Unit (50 Hz)	A	B	C
6.0 tons	—	6-5/8 in.	18-3/8 in.	1-1/4 in.
7.5 tons	6.0 tons	6-5/8 in.	18-3/8 in.	1-1/4 in.
10.0 tons	7.5 tons	6-1/2 in.	18-1/2 in.	1-1/2 in.

2. *NEC requires that the GEV072-300 front return must be a non-ducted return.*

Figure 23. Back return/front supply[3] GEVK 6 to 10 tons (60 Hz); 6 and 7.5 tons (50 Hz)

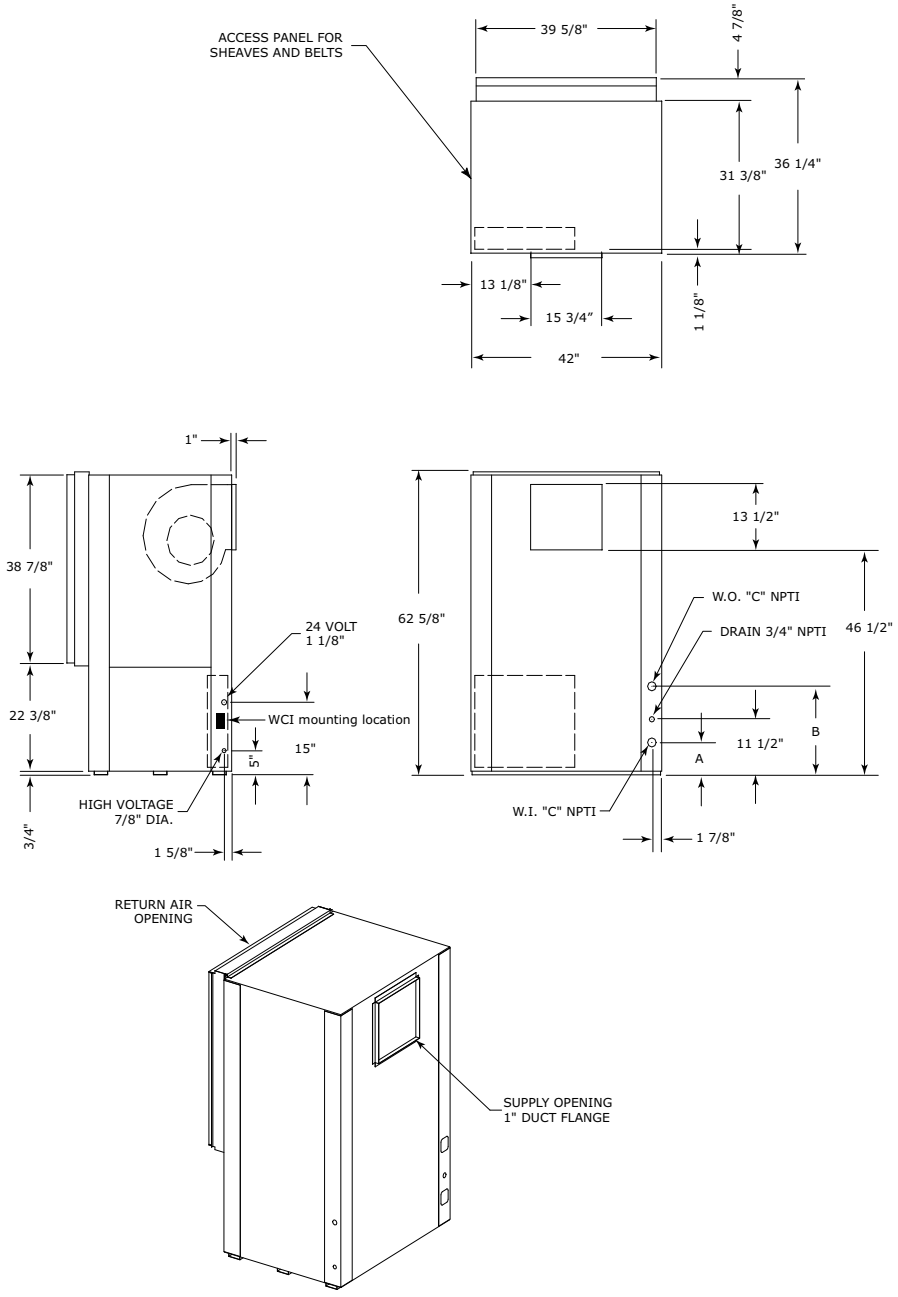


Table 19. Dimensional data back return/front supply GEVK 6 to 10 tons (60 Hz); 6 and 7.5 tons (50 Hz)

Unit (60 Hz)	Unit (50 Hz)	A	B	C
6.0 tons	—	6-5/8 in.	18-3/8 in.	1-1/4 in.
7.5 tons	6.0 tons	6-5/8 in.	18-3/8 in.	1-1/4 in.
10.0 tons	7.5 tons	6-1/2 in.	18-1/2 in.	1-1/2 in.

3. *NEC requires that the GEV072-300 front return must be a non-ducted return.*

Figure 24. Back return/top supply[4] GEVK 6 to 10 tons (60 Hz); 6 and 7.5 tons (50 Hz)

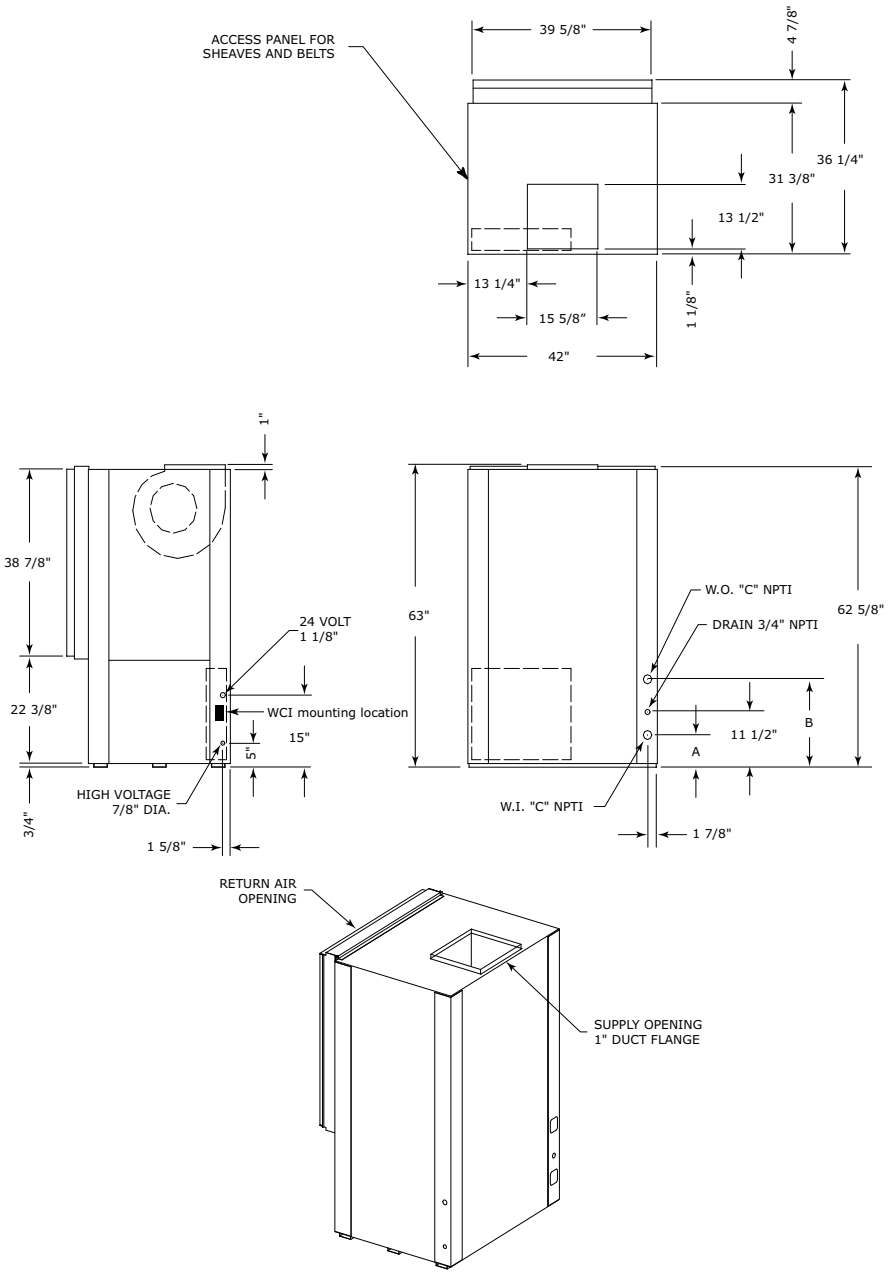
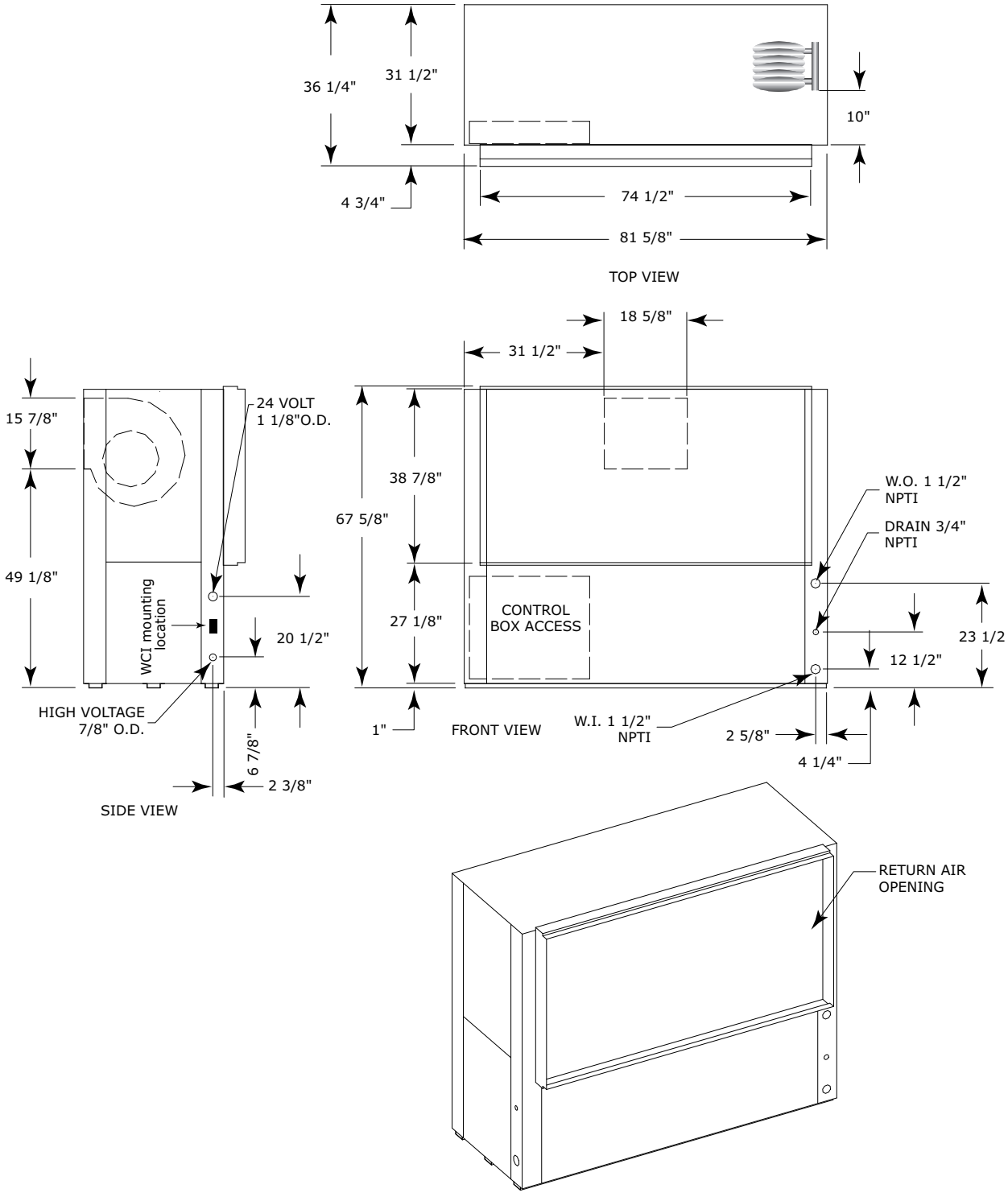


Table 20. Dimensional data back return/top supply GEVK 6 to 10 tons (60 Hz); 6 and 7.5 tons (50 Hz)

Unit (60 Hz)	Unit (50 Hz)	A	B	C
6.0 tons	—	6-5/8 in.	18-3/8 in.	1-1/4 in
7.5 tons	6.0 tons	6-5/8 in.	18-3/8 in.	1-1/4 in.
10.0 tons	7.5 tons	6-1/2 in.	18-1/2 in.	1-1/2 in.

4. *NEC requires that the GEV072-300 front return must be a non-ducted return.*

Figure 25. Front return/back supply[5] GEVK 12.5 to 15 tons (60 Hz); GEVK 10 and 12.5 tons (50 Hz)



5. *NEC requires that the GEV072-300 front return must be a non-ducted return.*

Figure 26. Back return/front supply GEVK 12.5 to 15 tons (60 Hz); GEVK 10 and 12.5 tons (50 Hz)

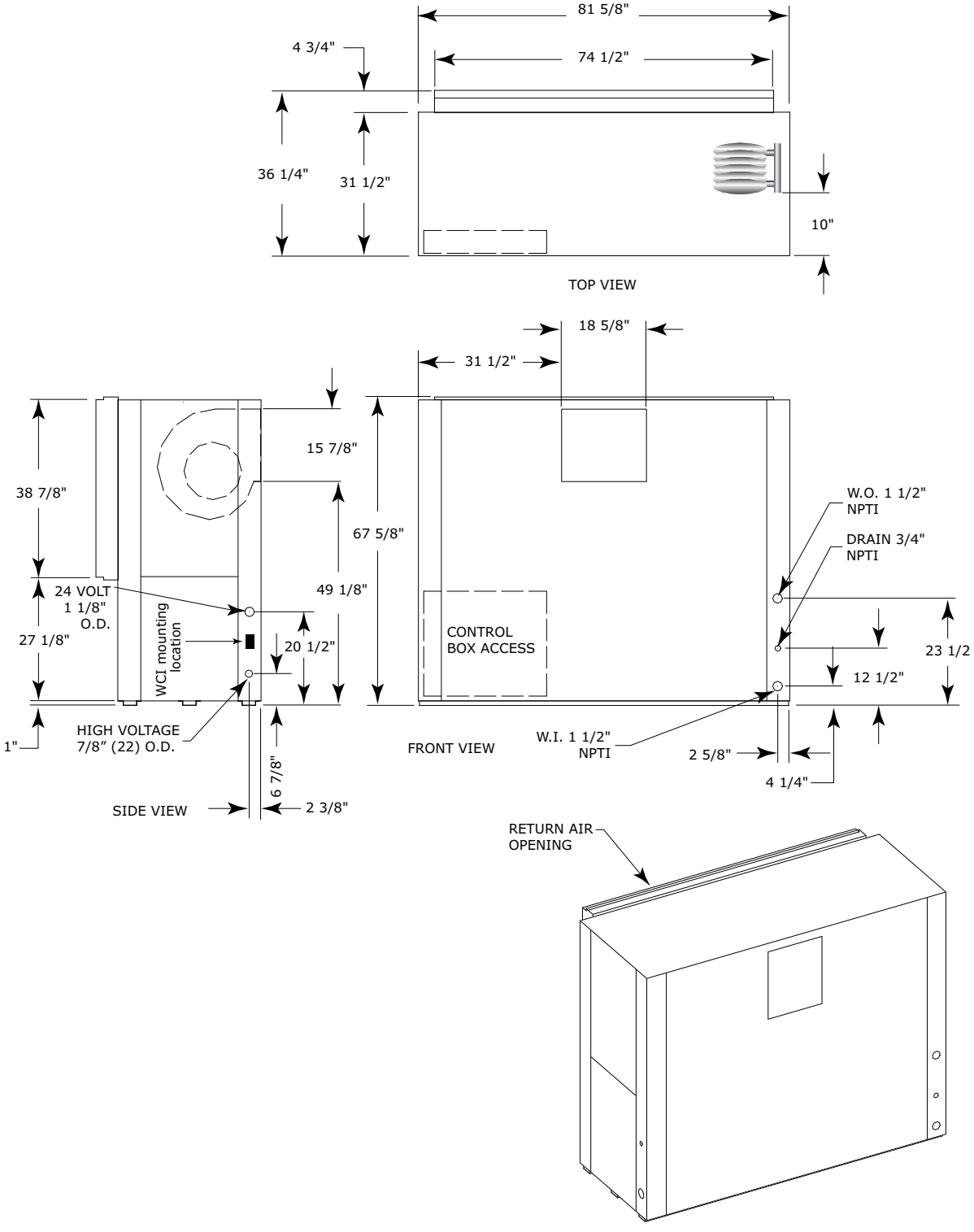
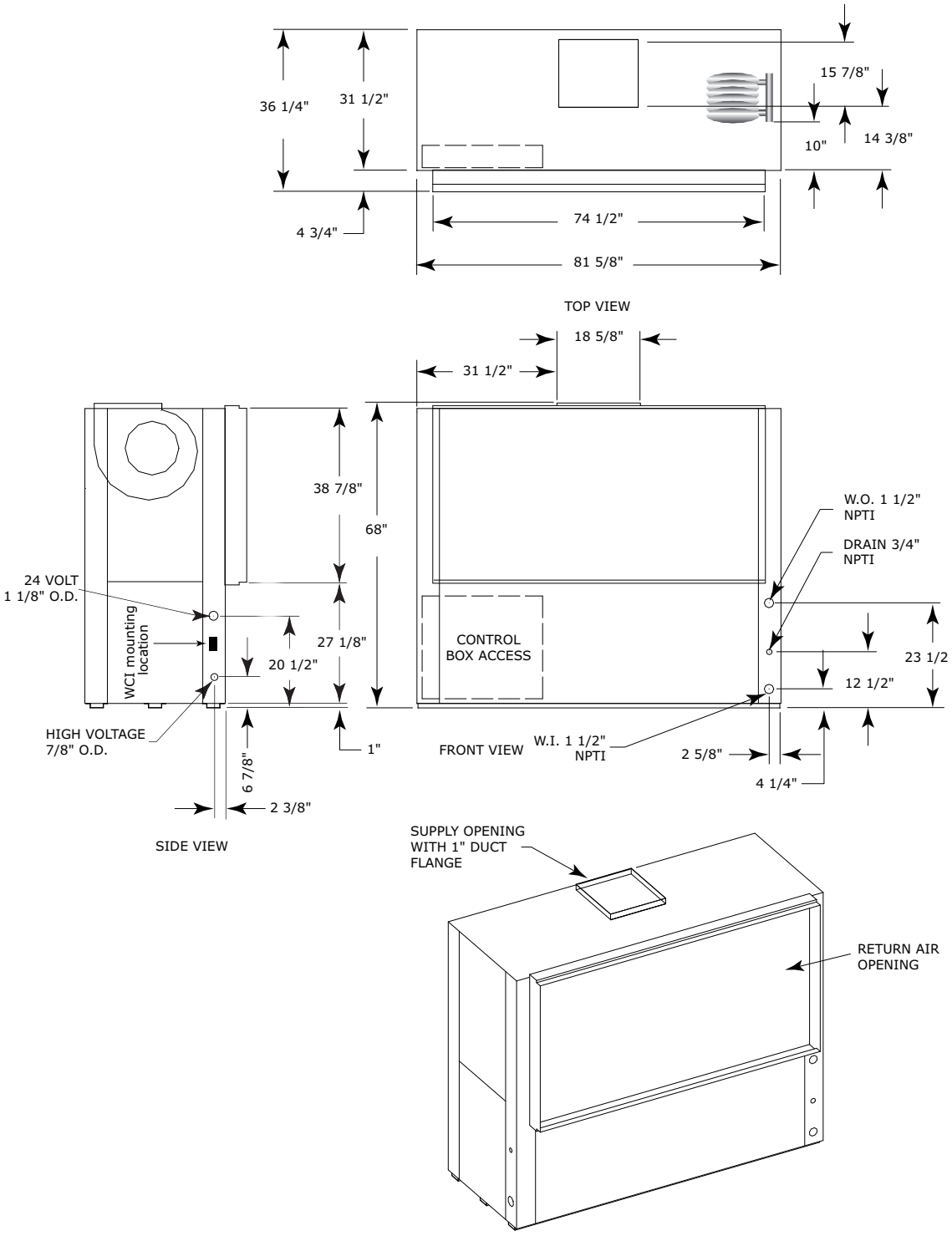
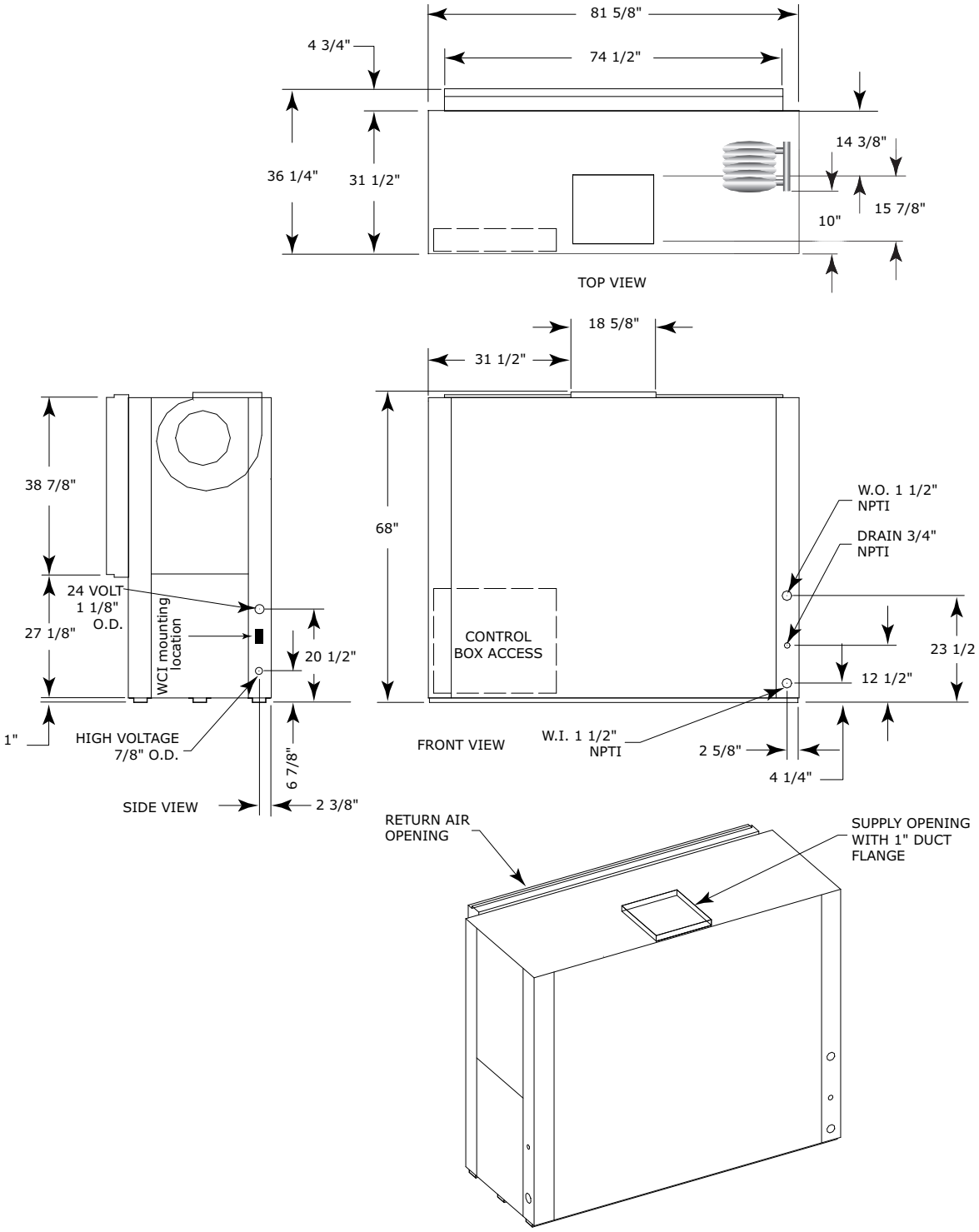


Figure 27. Front return/top supply[6] GEVK 12.5 to 15 tons (60 Hz); GEVK 10 and 12.5 tons (50 Hz)



6. *NEC requires that the GEV072-300 front return must be a non-ducted return.*

Figure 28. Back return/top supply[7] GEVK 12.5 to 15 tons (60 Hz); GEVK 10 and 12.5 tons (50 Hz)



[7] *NEC requires that the GEV072-300 front return must be a non-ducted return.*

Figure 29. Front return/back supply[8] GEVK 20 and 25 tons (60 Hz); GEVK 15 and 20 tons (50 Hz)

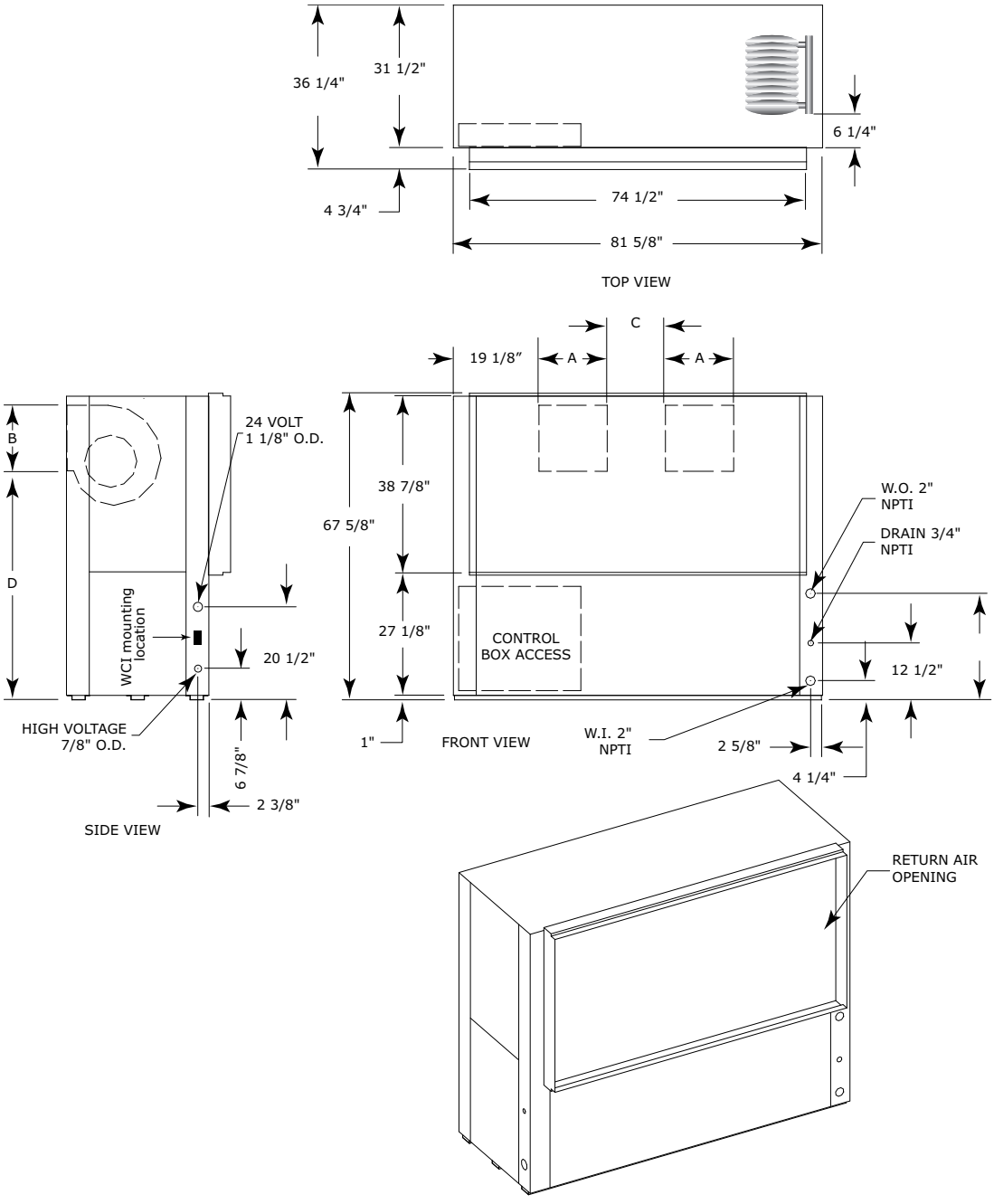


Table 21. Dimensional data front return/back supply GEVK 20 and 25 tons (60 Hz); GEVK 15 and 20 tons (50 Hz)

Unit (60 Hz)	Unit (50 Hz)	A	B	C	D	E
20 tons	15 tons	15-5/8 in.	13-1/2 in.	12 in.	51-5/8 in.	20-7/8 in.
25 tons Std Static	20 tons Std Static	14-3/4 in.	15-7/8 in.	13-7/8 in.	49-1/8 in.	23-1/2 in.
25 tons High Static	20 tons High Static	15-5/8 in.	13-1/2 in.	12 in.	51-5/8 in.	23-1/2 in.

8. *NEC requires that the GEV072-300 front return must be a non-ducted return.*

Figure 30. Back return/front supply[9] GEVK 20 and 25 tons (60 Hz); GEVK 15 and 20 tons (50 Hz)

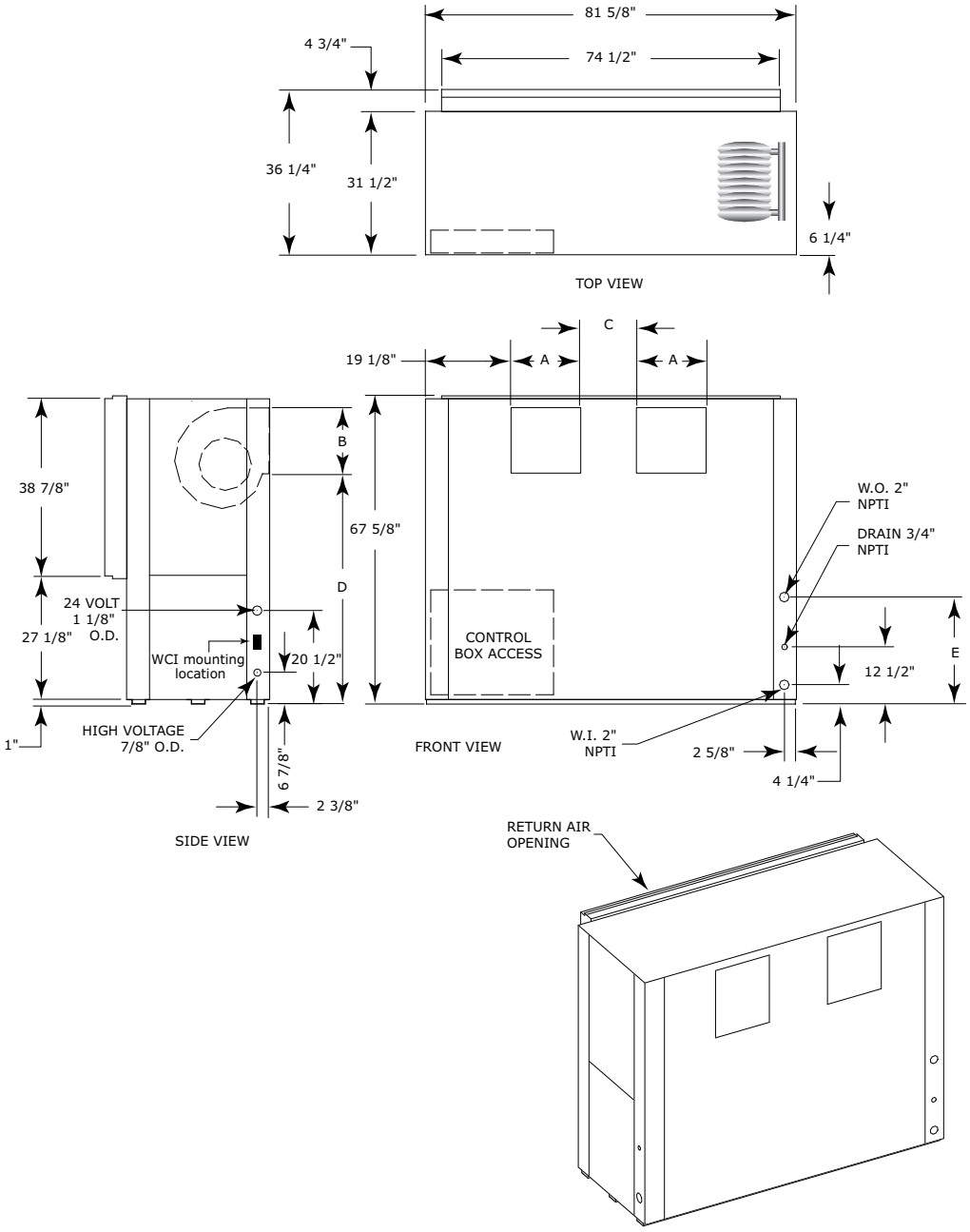


Table 22. Dimensional data back return/front supply GEVK 20 and 25 tons (60 Hz); GEVK 15 and 20 tons (50 Hz)

Unit (60 Hz)	Unit (50 Hz)	A	B	C	D	E
20 tons	15 tons	15-5/8 in.	13-1/2 in.	12 in.	51-5/8 in.	20-7/8 in.
25 tons Std Static	20 tons Std Static	14-3/4 in.	15-7/8 in.	13-7/8 in.	49-1/8 in.	23-1/2 in.
25 tons High Static	20 tons High Static	15-5/8 in.	13-1/2 in.	12 in.	51-5/8 in.	23-1/2 in.

[9] *NEC requires that the GEV072-300 front return must be a non-ducted return.*

Figure 31. Front return/top supply[10] GEVK 20 and 25 tons (60 Hz); GEVK 15 and 20 tons (50 Hz)

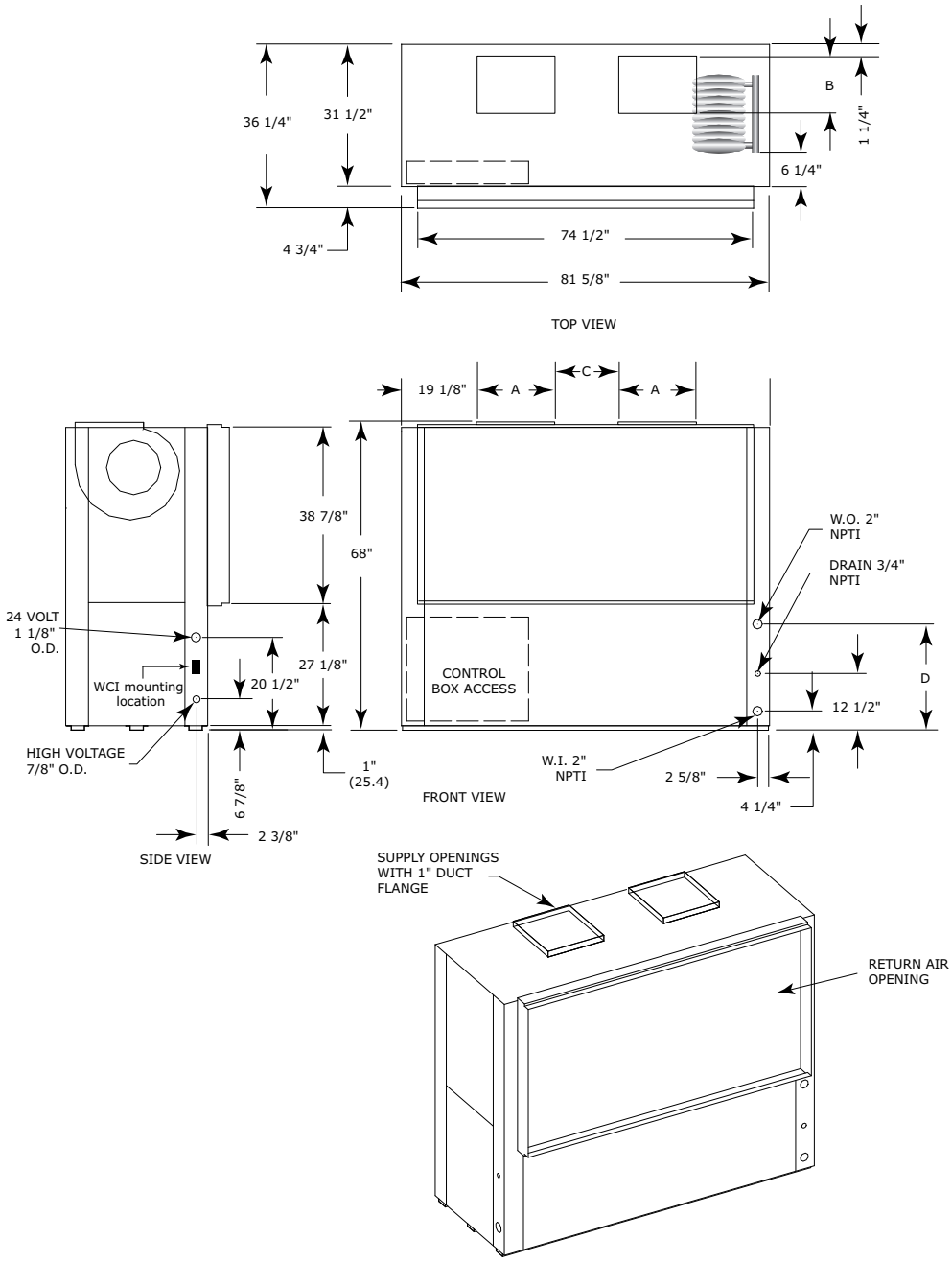


Table 23. Dimensional data front return/top supply GEVK 20 and 25 tons (60 Hz); GEVK 15 and 20 tons (50 Hz)

Unit (60 Hz)	Unit (50 Hz)	A	B	C	D
20 tons	15 tons	15-5/8 in.	13-1/2 in.	12 in.	20-7/8 in.
25 tons Std Static	20 tons Std Static	14-3/4 in.	15-7/8 in.	13-7/8 in.	23-1/2 in.
25 tons High Static	20 tons High Static	15-5/8 in.	13-1/2 in.	12 in.	23-1/2 in.

[10] *NEC requires that the GEV072-300 front return must be a non-ducted return.*

Figure 32. Back return/top supply[11] GEVK 20 and 25 tons (60 Hz); GEVK 15 and 20 tons (50 Hz)

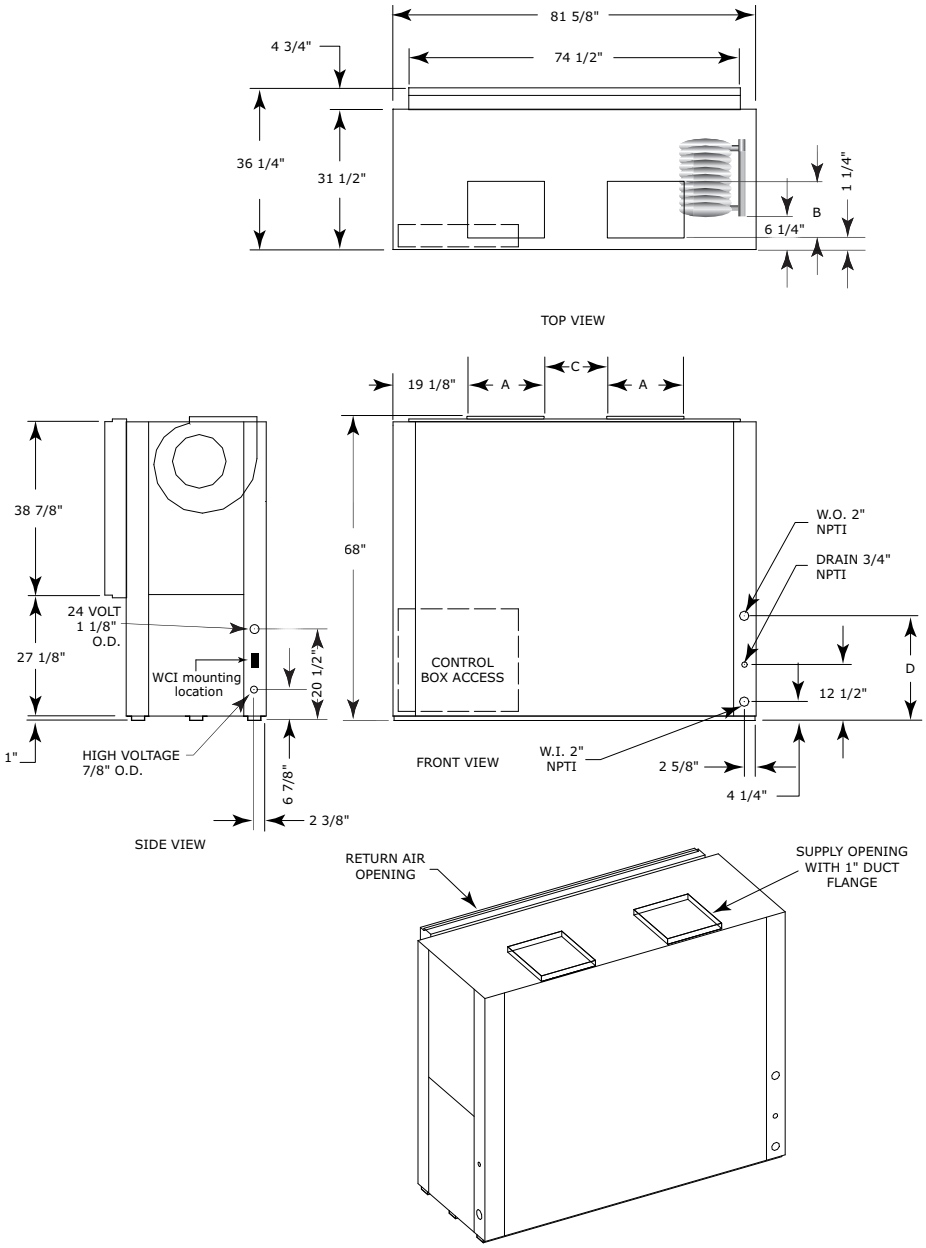


Table 24. Dimensional data back return/top supply GEVK 20 and 25 tons (240 and 300) 60 Hz; GEVK 15 and 20 tons (180 and 240) 50 Hz

Unit (60 Hz)	Unit (50 Hz)	A	B	C	D
20 tons	15 tons	15-5/8 in.	13-1/2 in.	12 in.	20-7/8 in.
25 tons Std Static	20 tons Std Static	14-3/4 in.	15-7/8 in.	13-7/8 in.	23-1/2 in.
25 tons High Static	20 tons High Static	15-5/8 in.	13-1/2 in.	12 in.	23-1/2 in.

[11] *NEC requires GEV072-300 front return must be non-ducted return.*

Figure 33. Waterside economizer[12] (GEHK)

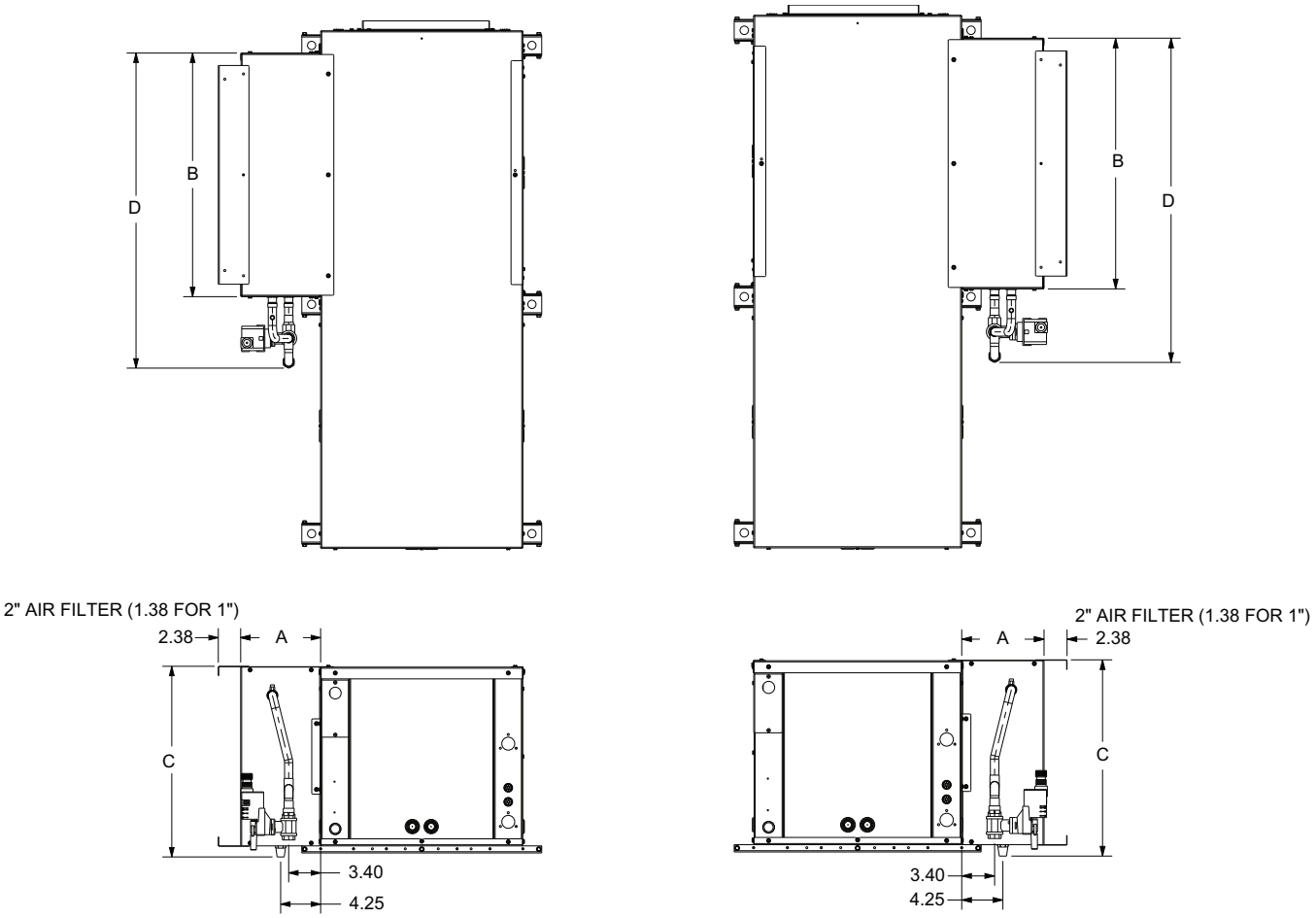


Table 25. Dimensional data waterside economizer (GEHK)

Cab	Unit			WSE Dimensions				Pipe Size	
				Width	Depth	Height	Depth W/Piping	A	B
	GEHK			A	B	C	D	NPTI	NPTI
A	006	009	012	8.5	19.0	16.25	26.50	0.50	0.50
B	015	018	–		21.5	18.25	29.00	0.50	0.50
C	024	030	–		23.0	19.25	30.50	0.75	0.75
D	036	042	–		26.0	22.25	33.50	0.75	0.75
E	048	060	–		32.5		38.25	1	1

Table 26. Waterside economizer weights and part numbers - horizontal

Unit Model	Waterside Economizer	Weight w/out H_2O	Weight w/H_2O
GEHK006-012 LR	WSHPECN00015	23	26
GEHK015-018 LR	WSHPECN00016	27	30
GEHK024-030 LR	WSHPECN00017	29	33
GEHK036-042 LR	WSHPECN00018	35	40
GEHK048-060 LR	WSHPECN00019	41	48

[12] *Waterside economizer installation requires field piping.*

Table 26. Waterside economizer weights and part numbers - horizontal (continued)

Unit Model	Waterside Economizer	Weight w/out H_2O	Weight w/H_2O
GEHK006-012 RR	WSHPECN00022	23	26
GEHK015-018 RR	WSHPECN00023	27	30
GEHK024-030 RR	WSHPECN00024	29	33
GEHK036-042 RR	WSHPECN00025	35	40
GEHK048-060 RR	WSHPECN00026	41	48

Figure 34. Waterside economizer (GEVK)

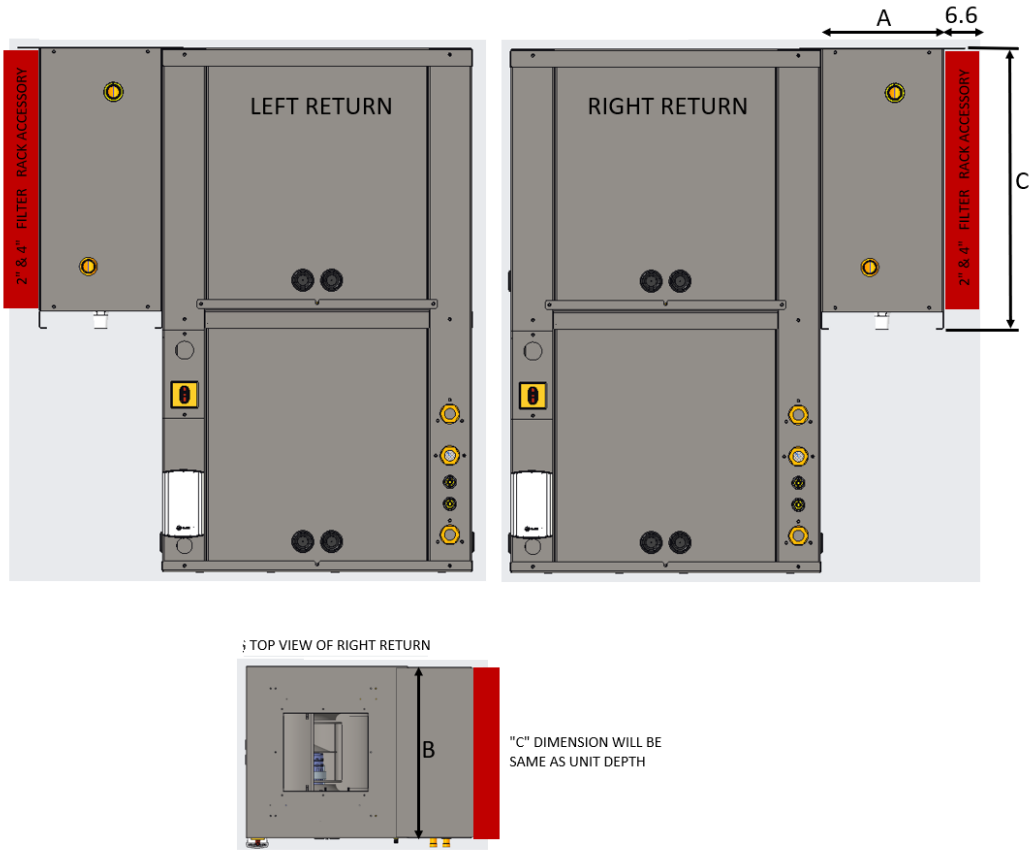


Table 27. Dimensional data waterside economizer (GEVK)

Unit	Cabinet	WSE Dimensions		
		A (Width)	B (Depth)	C (Height)
GEVK006-012	A	8.5	19.0	16.25
GEVK015-018	B	8.5	21.5	18.25
GEVK024-030	C	8.5	23.0	19.25
GEVK036-042	D	8.5	26.0	22.25
GEVK048-060	E	8.5	32.5	22.25

Figure 35. Waterside economizer (GEVK)

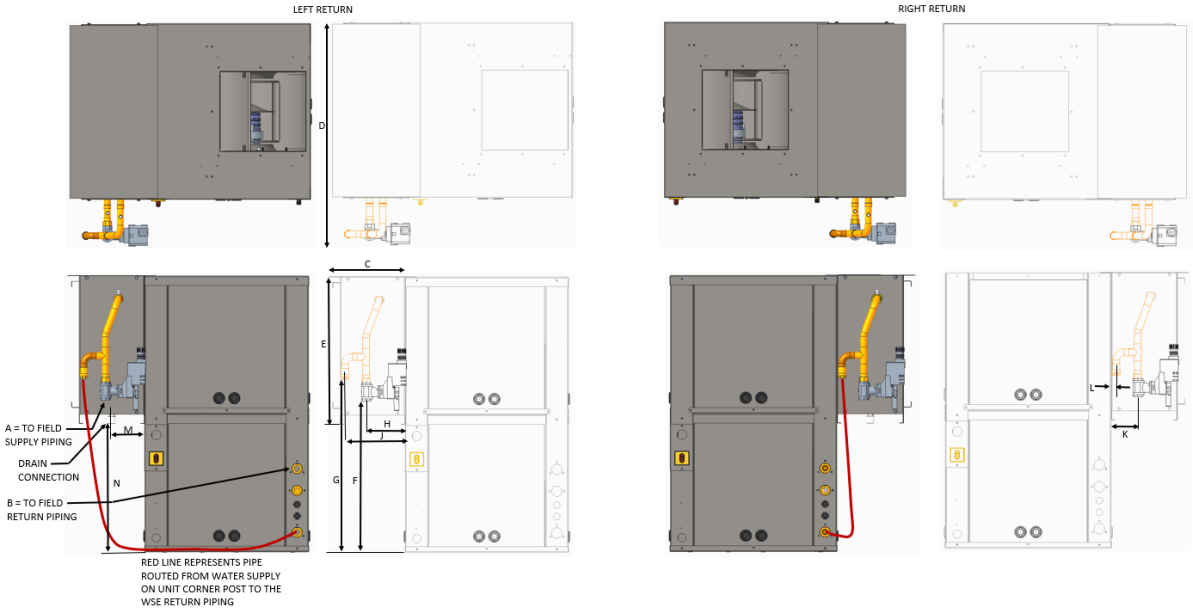


Table 28. Dimensional data waterside economizer (GEVK)

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
GEVK006-012	A	0.50	0.50	8.5	25.0	16.25	15.75	18.75	5.0	7.5	3.5	0.75	4.25	13.75
GEVK015-018	B	0.50	0.50	8.5	27.5	18.25	17.75	20.75	5.0	7.88	3.5	0.63	4.25	15.75
GEVK024-030	C	0.75	0.75	8.5	29.0	19.25	19.75	22.75	5.0	7.88	3.5	0.63	4.25	16.75
GEVK036-042	D	0.75	0.75	8.5	32.0	21.75	21.75	24.75	5.0	7.88	3.5	0.63	4.25	15.75
GEVK048-060	E	1.00	1.00	8.5	38.5	22.75	22.75	25.75	5.0	8.00	3.5	0.50	4.25	19.75

Table 29. Waterside economizer weights and part numbers - vertical

Unit Model	Waterside Economizer	Weight w/out H_2O (lbs)	Weight w/H_2O (lbs)
GEVK006-012 LR	WSHPECN00001	23	26
GEVK015-018 LR	WSHPECN00002	27	30
GEVK024-030 LR	WSHPECN00003	29	33
GEVK036-042 LR	WSHPECN00004	35	40
GEVK048-060 LR	WSHPECN00005	41	48
GEVK006-012 RR	WSHPECN00008	23	26
GEVK015-018 RR	WSHPECN00009	27	30
GEVK024-030 RR	WSHPECN00010	29	33
GEVK036-042 RR	WSHPECN00011	35	40
GEVK048-060 RR	WSHPECN00012	41	48

Figure 36. GEHK 6 to 10 tons (60 Hz), GEHK 6 to 7.5 tons (50 Hz) - right return with waterside economizer[13]

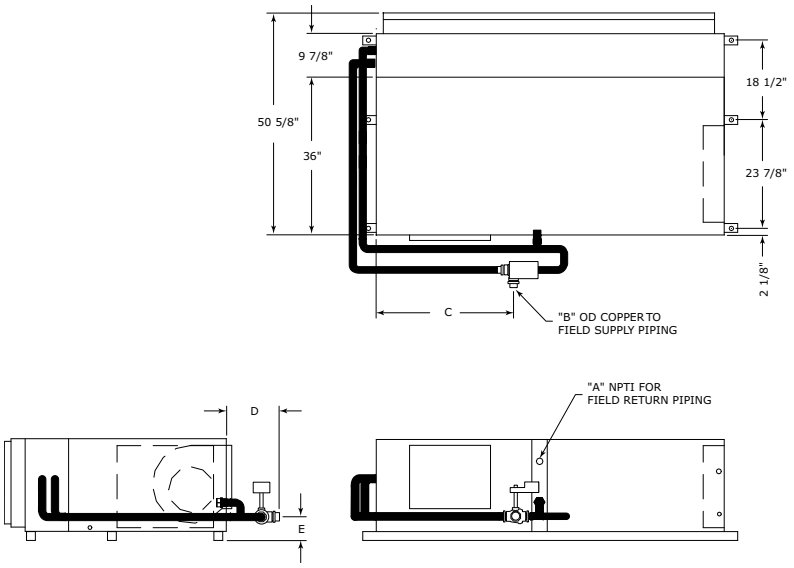


Figure 37. GEHK 6 to 10 tons (60 Hz), GEHK 6 to 7.5 tons (50 Hz) - left return with waterside economizer[13]

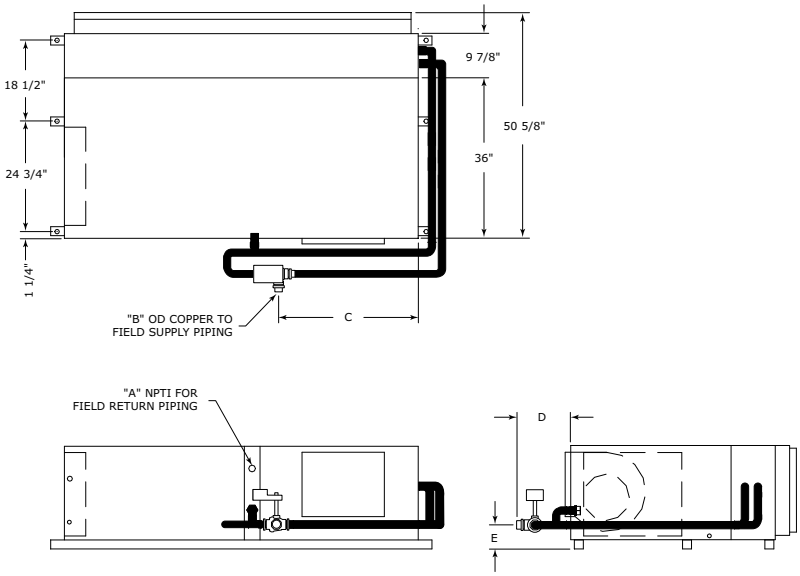


Table 30. Dimensional data GEHK 6 to 10 tons (60 Hz), GEHK 6 to 7.5 tons (50 Hz), waterside economizer

GEH (60 Hz)	GEH (50 Hz)	A	B	C	D	E	Hanging Weight	Shipping Weight
72	—	1-1/4	1-3/8	31	9-7/8	3-7/8	138 lbs	168 lbs
90	72	1-1/4	1-3/8	31	9-7/8	3-7/8	144 lbs	174 lbs
120	90	1-1/2	1-5/8	30-3/4	12-1/2	4-1/2	166 lbs	196 lbs

[13] *Field piping required on waterside economizer.*

Figure 38. GEHK 12.5 to 15 tons (60 Hz), GEHK 10 to 12.5 tons (50 Hz), right return with waterside economizer[14]

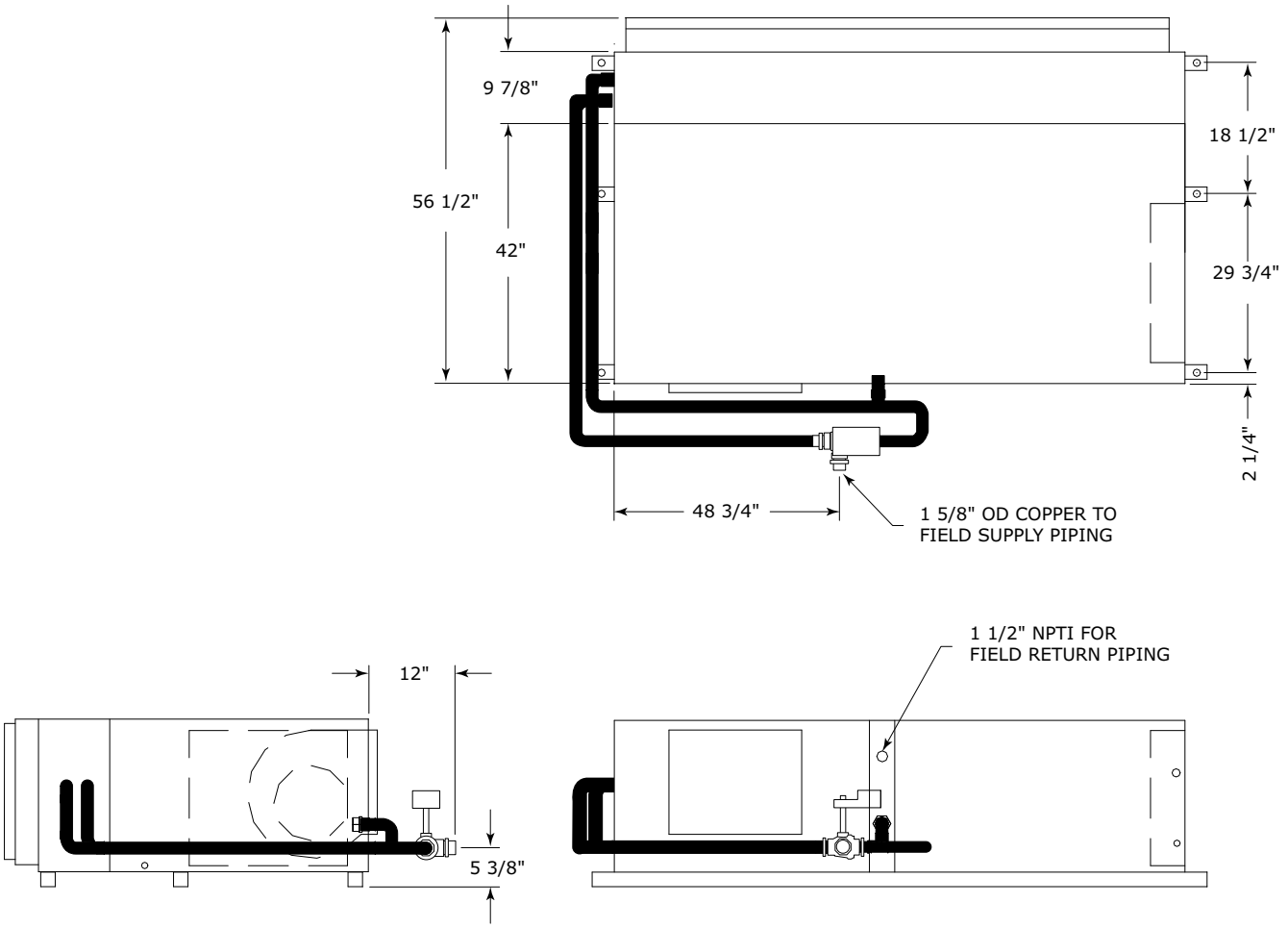


Table 31. Dimensional data GEHK 12.5 to 15 tons (60 Hz), GEHK 10 to 12.5 tons (50 Hz), right return with waterside economizer

GEHK (60 Hz)	GEHK (50 Hz)	Hanging Weight	Shipping Weight
150	120	138 lbs	168 lbs
180	150	144 lbs	174 lbs

[14] *Field piping required on waterside economizer.*

Figure 39. GEHK 12.5 to 15 tons (60 Hz), GEHK 10 to 12.5 tons (50 Hz), left return with waterside economizer[15]

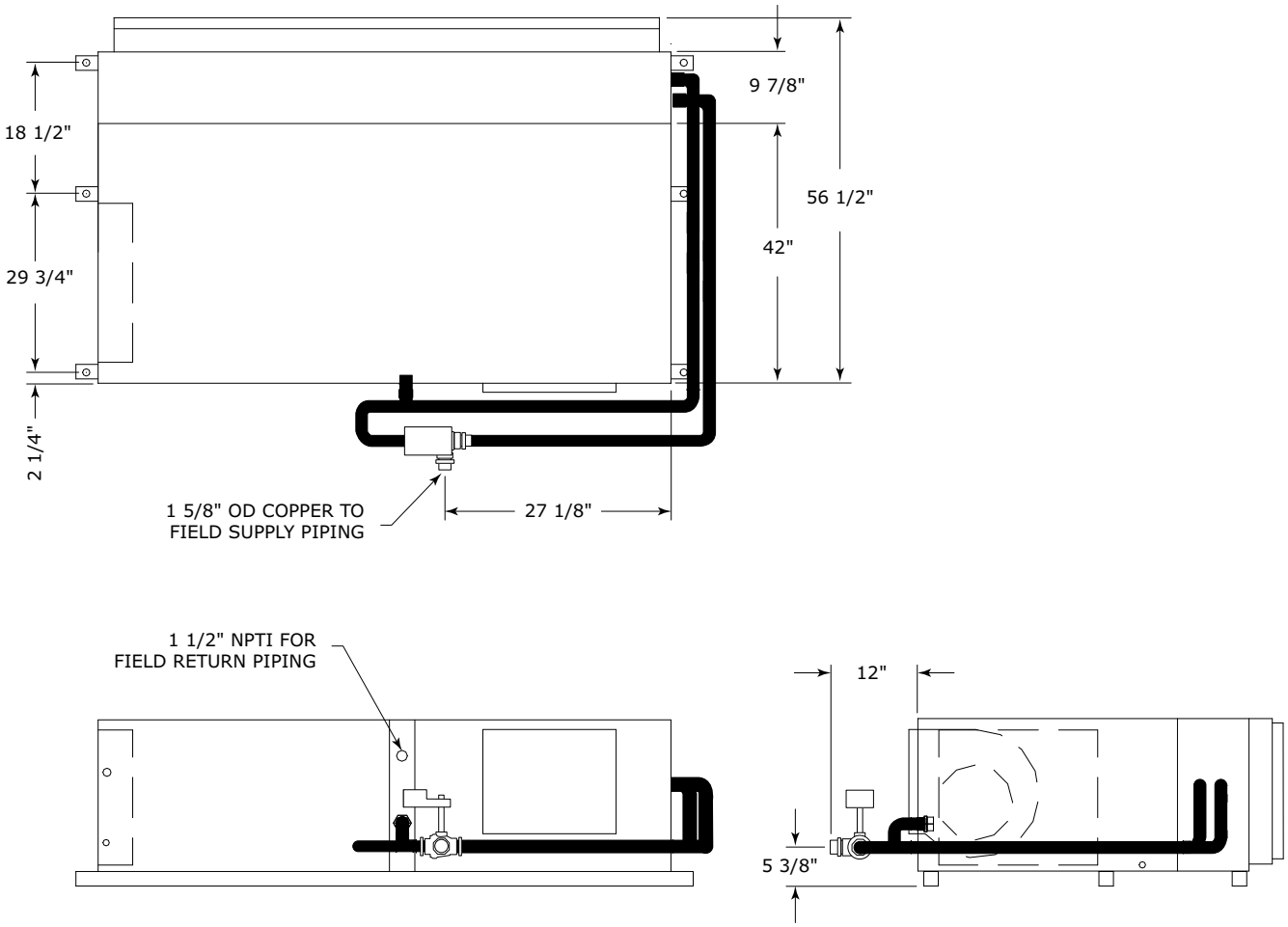


Table 32. Dimensional data GEHK 12.5 to 15 tons (60 Hz), GEHK 10 to 12.5 tons (50 Hz) - left return with waterside economizer

GEHK (60 Hz)	GEHK (50 Hz)	Hanging Weight	Shipping Weight
150 - 180	120-150	213 lbs	243 lbs

Table 33. Waterside economizer part numbers - horizontal

Unit Model	Waterside Economizer
GEHK072 LR	447705070001
GEHK090 LR	447705080001
GEHK120 LR	447705090001
GEHK150 LR	447705100001
GEHK180 LR	447705100001
GEHK072 RR	447705110001
GEHK090 RR	447705120001
GEHK120 RR	447705130001
GEHK150 RR	447705140001
GEHK180 RR	447705140001

[15] *Field piping required on waterside economizer.*

Figure 40. GEVK 6 to 10 tons (60 Hz), 6 and 7.5 tons (50 Hz) - waterside economizer

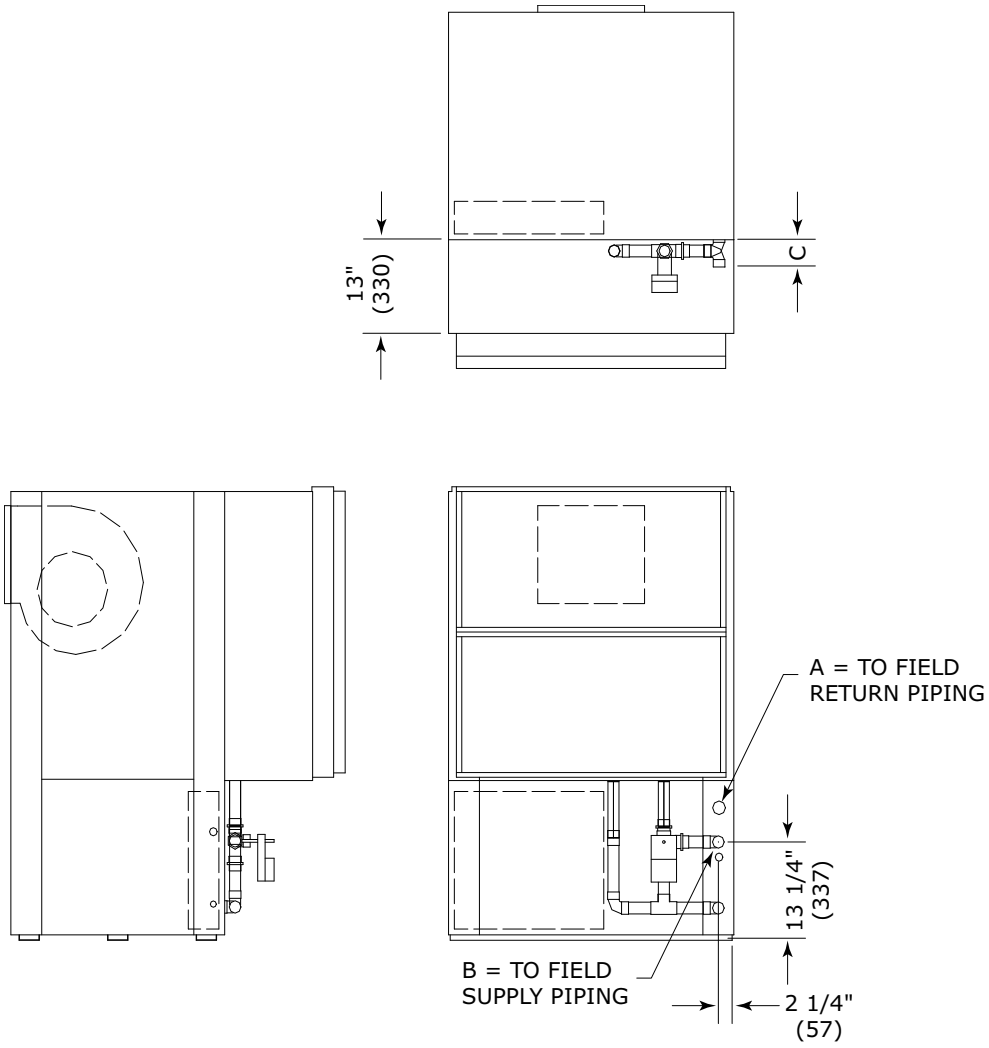


Table 34. Dimensional data GEVK 6 to 10 tons (60 Hz), 6 and 7.5 tons (50 Hz) - waterside economizer

Unit (60 Hz)	Unit (50 Hz)	A	B	C	Hanging Weight	Shipping Weight
72	—	1-1/4	1-3/8	4	148 lbs	178 lbs
90	72	1-1/4	1-1/4	4	168 lbs	198 lbs
120	90	1-1/2	1-5/8	4-3/8	207 lbs	237 lbs

Figure 41. GEVK 12.5 to 25 tons - waterside economizer

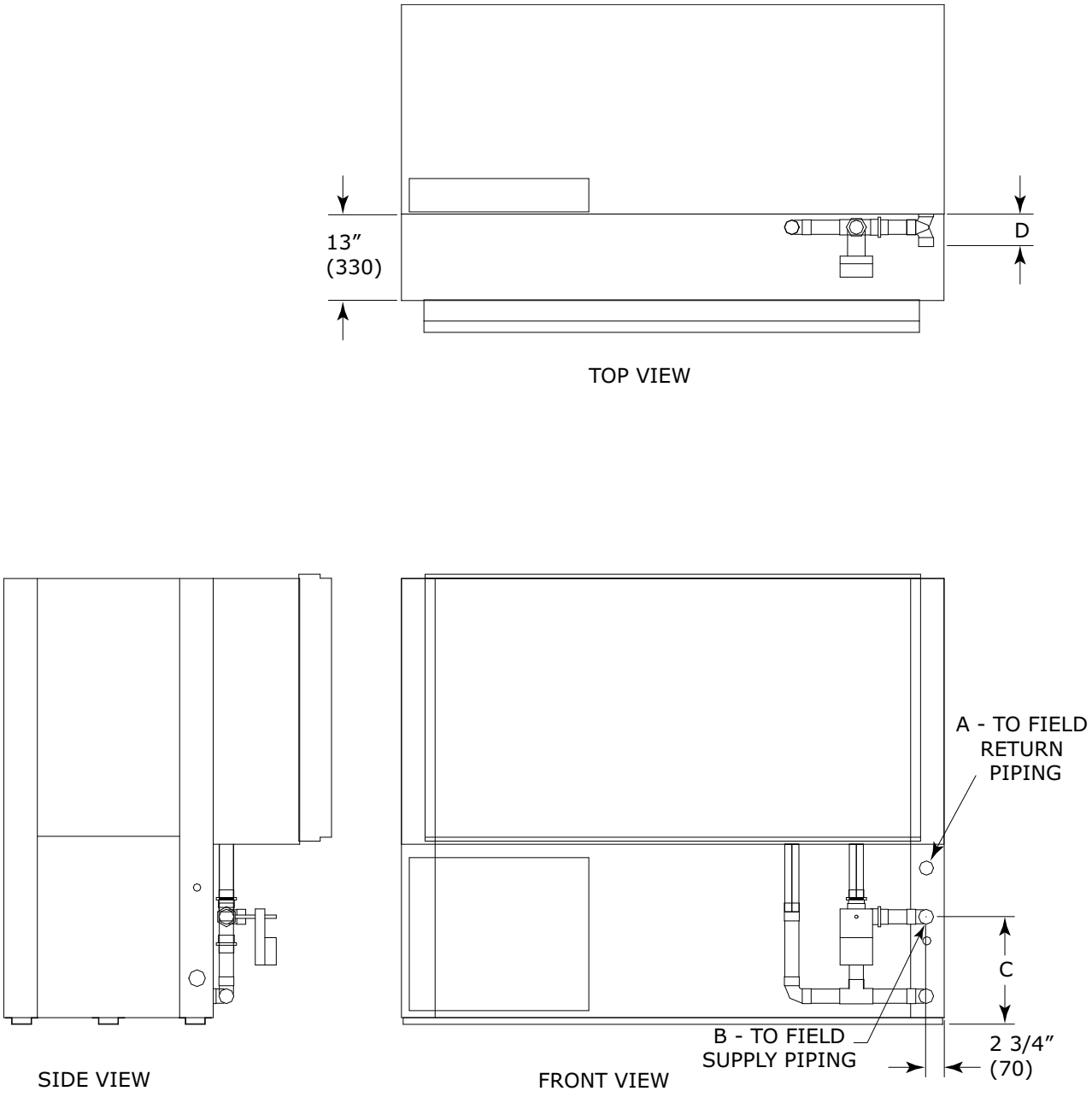


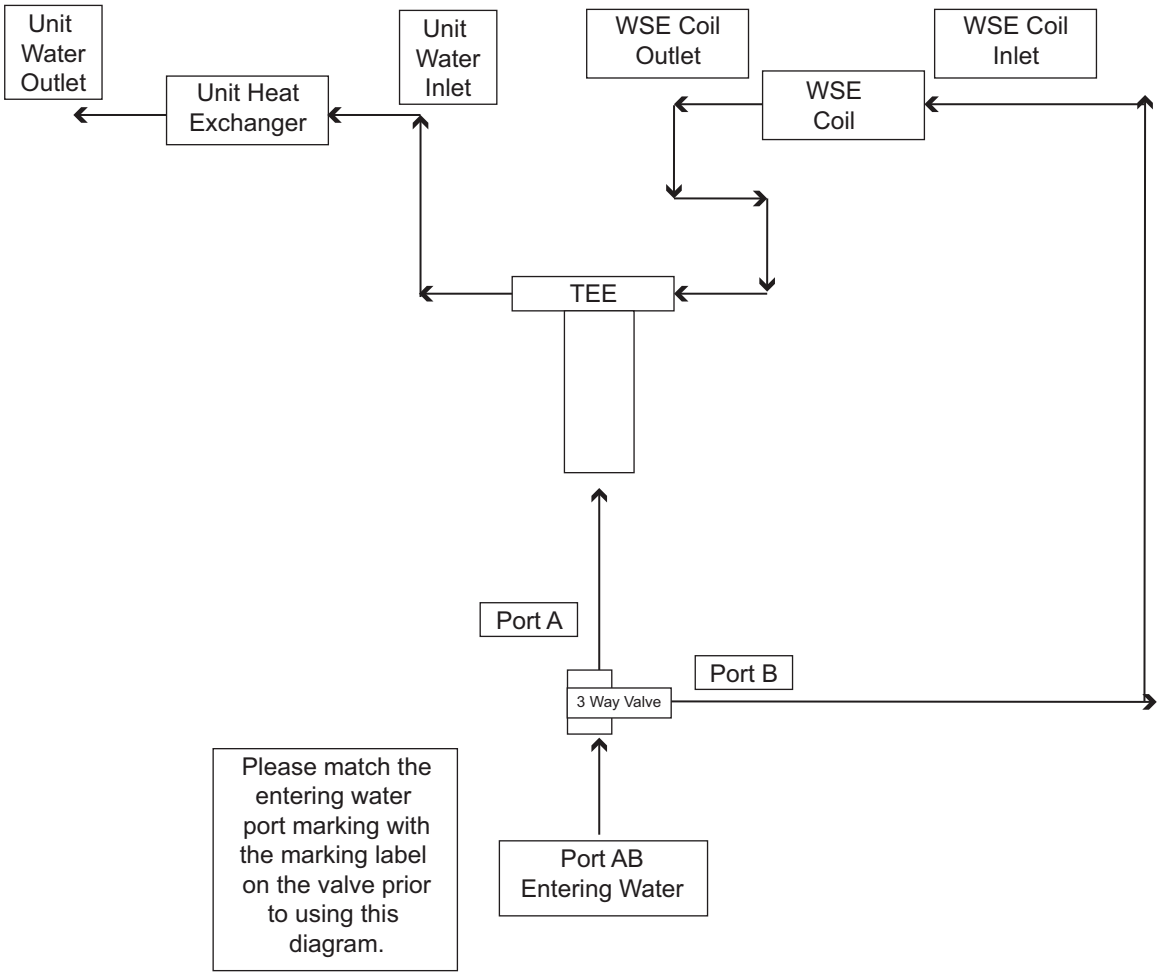
Table 35. Dimensional data GEVK 12.5 to 25 tons - waterside economizer

GEVK (60 Hz)	GEVK (50 Hz)	A - NPTI	B - I.D.	C	D	Hanging Weight	Shipping Weight
150-180	120-150	1-1/2	1-5/8	15-7/8	4-3/8	275 lbs	305 lbs
240	180	2	2-1/8	16-1/4	4-7/8	310 lbs	340 lbs
300	240	2	2-1/8	16-1/4	4-7/8	395 lbs	425 lbs

Table 36. Waterside economizer part numbers - vertical

Unit Model	Waterside Economizer
GEVK072	447705040001
GEVK090	447705050001
GEVK120	447705060001
GEVK150	447705010001
GEVK180	447705010001
GEVK240	447705020001
GEVK300	447705030001

Figure 42. Waterside economizer coil piping diagram



Weights

Table 37. Unit weights GEH 0.5 to 5 tons (Approximate)

GEH (60 Hz)	Shipping Weight with pallet (lbs)	Unit Weight without pallet (lbs)
006	255	165
009	255	165
012	255	165
015	297	173
018	297	173
024	393	269
030	393	269
036	437	313
042	437	313
048	526	381
060	539	394

Table 38. Unit weights GEV 0.5 to 5 tons (Approximate)

GEV (60 Hz)	Shipping Weight with pallet (lbs)	Unit Weight without pallet (lbs)
006	201	149
009	201	149
012	201	149
015	210	155
018	212	157
024	268	210
030	272	214
036	280	220
042	312	252
048	343	280
060	348	285

Weight Distribution for Hanging the GEH 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 ±15%.

Figure 43. Weight distribution GEH 0.5 to 5 tons

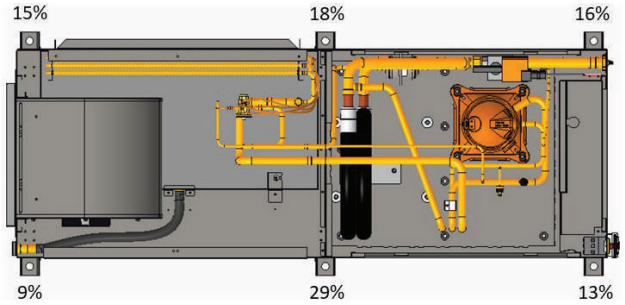
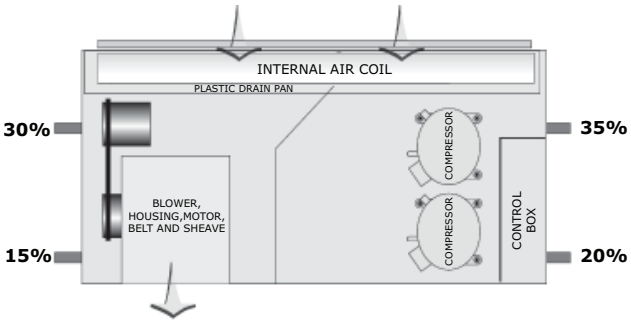


Figure 44. Weight distribution GEH 6 to 15 tons



A2L Information and Installation Requirements

Installation/Code Compliance Requirements

Building level controls may need to be upgraded/modified to demand leak mitigation actions as described in “Leak Detection System (Refrigerant charge greater than 3.91 lb per circuit),” p. 58. Those actions include, but are not limited to, fully opening damper and VAV boxes (if present), and disabling electric heat in VAV boxes (if present).

Verify the equipment refrigerant charge is in accordance with the room area limitation as described in Minimum Room Area Limits section.

Ensure that there are labels on the equipment stating it contains a flammable refrigerant.

A2L Work Procedures

⚠ WARNING

Risk of Fire — Flammable Refrigerant!

Failure to follow instructions below could result in death or serious injury, and equipment damage.

- **To be repaired only by trained service personnel.**
- **Do not puncture refrigerant tubing.**
- **Dispose of properly in accordance with federal or local regulations.**
- **The equipment shall be stored in a room without continuously operating ignition sources.**

⚠ WARNING

Refrigerant under High Pressure!

Failure to follow instructions below could result in an explosion which could result in death or serious injury or equipment damage.

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

⚠ 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 units described in this manual use R-454B refrigerant. Use ONLY R-454B rated service equipment or components with these units. For specific handling concerns with R-454B, contact your local Trane representative.

Installation, repair, removal, or disposal should be performed by trained service personnel.

At all times, Trane’s maintenance and service guidelines shall be followed. If in doubt, contact Trane technical support for assistance.

Servicing

Prior to initiating work on equipment, check the area with an appropriate refrigerant detector. Ensure the service personnel are properly trained regarding work in potentially toxic or flammable atmospheres. Ensure that the leak detection equipment being used is suitable for use with all applicable refrigerants, i.e. non-sparking, adequately sealed, or intrinsically safe. Be aware that the refrigerant does not contain an odor.

If any hot work is to be conducted on the refrigerating equipment or any associated parts, appropriate fire extinguishing equipment shall be available on hand. A dry powder or CO_2 fire extinguisher should be located adjacent to the charging area.

At all times, Trane’s maintenance and service guidelines shall be followed. If in doubt, contact Trane technical support for assistance.

All maintenance staff and others working in the local area shall be instructed on the nature of the work being carried out. Work in confined spaces shall be avoided.

Ignition Source Mitigation

Do not use any sources of ignition when working on the refrigeration system.

Keep all ignition sources, including cigarette smoking, away from the site of installation, repair, removal or disposal, during which refrigerant can potentially be released to the surrounding space.

Survey the area around the equipment before initiating work to ensure no flammable hazards or ignition risks are present.

“No Smoking” signs shall be displayed.

Do not use devices that can be a source of ignition to accelerate defrosting of components. Use only defrost and cleaning procedures recommended by Trane. Do not pierce or burn.

Ventilation

Ensure that the area is in the open or that it is adequately ventilated before breaking into the system or conducting any hot work. A degree of ventilation shall continue during the period that the work is carried out. The ventilation should safely disperse any released refrigerant and preferably expel it externally into the atmosphere. If present, check that the ventilation system, including outlets, are operating adequately and are not obstructed.

Refrigerating Equipment

Refrigerant piping or components should not be installed in locations where substances which may corrode them are present.

Check that equipment hazard markings are visible and legible. Replace them if they are not.

For equipment using secondary fluids, like water or glycol, check that refrigerant is not present in the secondary fluid loop before conducting any hot work.

Electrical Devices

Do not apply power to the circuit if a fault exists which compromises safety. If the fault cannot be corrected immediately, but it is necessary to continue operation, an adequate temporary solution shall be used. This shall be reported to the owner of the equipment, so all parties are advised.

Initial safety checks shall include:

- Cabling is not subject to wear, corrosion, excessive pressure, vibration, sharp edges, or any other adverse environmental effects. Account for the effects of aging or continual vibration from sources such as compressors or fans.
- Capacitors are discharged. This shall be done in a safe manner to avoid possibility of sparking.
- No live electrical components and wiring are exposed while charging, recovering, or purging the system.
- Verify continuity of earth bonding.
- Replace electrical components with Trane replacement parts, or those meeting the same ratings and qualified for flame arrest protection, UL LZGH2 category.

Leak Detection

Never use an open flame to detect leaks. A halide torch should not be used. Use only approved leak detection methods per this instruction manual.

The following leak detection methods are deemed acceptable for all refrigerant systems.

Electronic leak detectors may be used to detect refrigerant leaks but, in the case of flammable refrigerants, the sensitivity may not be adequate, or may need re-calibration. (Detection equipment shall be calibrated in a refrigerant-free area.) Ensure that the detector is not a potential source of ignition and is suitable for the refrigerant used. Leak detection equipment shall be set at a percentage of the LFL gas (25% maximum) is confirmed.

Leak detection fluids are also suitable for use with most refrigerants but the use of detergents containing chlorine shall be avoided as the chlorine may react with the refrigerant and corrode the copper pipe-work.

Examples of leak detection fluids are:

- Bubble method
- Fluorescent method agents

If a leak is suspected, all naked flames shall be removed/ extinguished.

If a refrigerant leak is found which requires brazing, all refrigerant shall be recovered from the system, or isolated (by means of shut off valves) in a part of the system remote from the leak.

Refrigerant Removal and Evacuation

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

When breaking into the refrigerant circuit to make repairs – or for any other purpose – conventional procedures shall be used. However, for flammable refrigerants it is important that best practice be followed, since flammability is a consideration.

The following procedure shall be adhered to:

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

Prior to refrigerant removal, open all appropriate valves, including solenoid and electronic expansion valves (EXVs). Use control settings, where available. When not available, manually open all electronically controlled valves using acceptable service procedures.

The recovery equipment shall be in good working order with instructions available. Equipment shall be suitable for the recovery of the flammable refrigerant. For specific handling concerns, contact the manufacturer. Ensure all hose connections are checked for tightness to avoid refrigerant leaks.

In addition, a set of calibrated weighing scales shall be available and in good working order.

The refrigerant shall be recovered into the correct recovery cylinders if venting is not allowed by local and national codes. Do not mix refrigerants in recovery unit and especially not in cylinders.

Refrigerant recovery unit should be purged with an inert gas after each use or before using with a different refrigerant Class – for example, A2L to A1.

If compressors or compressor oils are to be removed, ensure that they have been evacuated to an acceptable level to make certain that flammable refrigerant does not remain within the lubricant. The compressor body shall not be heated by an open flame or other ignition sources to accelerate this process. When oil is drained from a system, it shall be carried out safely.

The system shall be purged with oxygen-free nitrogen to render the appliance safe for flammable refrigerants. This process might need to be repeated several times. Compressed air or oxygen shall not be used for purging refrigerant systems.

The system shall be vented down to atmospheric pressure to enable work to take place.

The outlet for the vacuum pump shall not be close to any potential ignition sources, and ventilation shall be available.

Refrigerant Charging

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

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

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

Prior to refrigerant charging, open all appropriate valves, including solenoid and electronic expansion valves (EXVs). Use control settings, where available. When not available, manually open all electronically controlled valves using acceptable service procedures.

Verify the equipment refrigerant charge is in accordance with the room area limitation as described in Minimum Room Area Limits section.

Decommissioning

Before carrying out the decommissioning procedure, it is essential that the trained service personnel is completely familiar with the equipment and all its details. It is recommended good practice that all refrigerants are recovered safely. Prior to the task being carried out, an oil and refrigerant sample shall be taken in case analysis is required prior to re-use of recovered refrigerant. It is essential that electrical power is available before the task is commenced.

1. Become familiar with the equipment and its operation.
2. Isolate system electrically.
3. Before attempting the procedure, ensure that:
    a. Mechanical handling equipment is available, if required, for handling refrigerant cylinders.
    b. All personal protective equipment is available and being used correctly.
    c. The recovery process is supervised at all times by a competent person.
    d. Recovery equipment and cylinders conform to the appropriate standards.
4. Pump down refrigerant system, if possible.
5. If a vacuum is not possible, make a manifold so that refrigerant can be removed from various parts of the system.
6. Make sure that cylinder is situated on the scales before recovery takes place.
7. Start the recovery machine and operate in accordance with instructions.
8. Do not overfill cylinders (no more than 80% volume liquid charge).
9. Do not exceed the maximum working pressure of the cylinder, even temporarily.
10. When the cylinders have been filled correctly and the process completed, make sure that the cylinders and the equipment are removed from site promptly and all isolation valves on the equipment are closed off.
11. Recovered refrigerant shall not be charged into another refrigerating system unless it has been cleaned and checked.
12. When equipment has been decommissioned, attach a signed and dated label stating it has been decommissioned and emptied of refrigerant.
13. Ensure that there are labels on the equipment stating it contains flammable refrigerant.

A2L Application Considerations

This product is listed to UL standard 60335-2-40, Household and Similar Electrical Appliances – Safety – Part 2-40: Particular Requirements for Electrical Heat Pumps, Air-Conditioners and Dehumidifiers, which defines safe design and use strategies for equipment using A2L

refrigerants. This standard limits the refrigerant concentration in a space in the event of a refrigerant leak. To meet the requirements, the UL standard defines minimum room area, refrigerant charge limit, minimum circulation airflow and/or ventilation airflow requirements, and limits the use of ignition sources in spaces. The standard may require a unit refrigerant leak detection system.

For equipment with R-454B and charge amounts less than or equal to 3.91 lbs per circuit, this UL standard does not prescribe a room area limit and does not require a refrigerant leak detection system or any circulation airflow or ventilation airflow mitigation strategies. However, ignition sources in ductwork must be evaluated.

Depending on the application, a specific requirement of ANSI/ASHRAE Standard 15, Safety Standard for Refrigeration Systems, could be more stringent than UL 60335-2-40 requirements. See *Refrigeration Systems and Machinery Rooms Application Considerations for Compliance with ASHRAE® Standard 15-2022 Application Engineering Manual* (APP-APM001*-EN) for more information.

Ignition Sources in Ductwork

Do not install open flames in the ductwork. Hot surfaces exceeding 700°C (1290°F) should not be installed in the ductwork unless the average airflow velocity is not less than 1.0 m\s (200 ft\min) across the heater and proof of airflow is verified before system is energized.

Electric heaters can exceed the surface temperature limit if airflow distribution is poor, or insufficient airflow is provided over the heater.

Surface temperatures of most gas heaters do not exceed the surface temperature limits due to ANSI construction requirements.

Ignition Sources in Unit

This unit does not contain any ignition sources. All potential ignition sources, (including factory or field installed accessory electric heaters, gas heaters, relays, and contactors) were evaluated during product UL listing.

Minimum Room Area Limits (Refrigerant charge greater than 3.91 lb per circuit)

Equipment with R–454B charge amounts greater than 3.91 lb per circuit may require additional circulation or ventilation airflow mitigation strategies. In this case, two minimum room area (A_{min}) thresholds:

- The first threshold defines when equipment serving a single room is required to provide circulation airflow, either continuous or activated by a leak detection system. A ducted system requires circulation airflow unless the smallest room it serves is larger than the adjusted A_{min} threshold. This product contains a leak detection system if a circuit charge is greater than 3.91 lbs. As a result, no further leak detection system evaluation is required.
- The second threshold defines when additional ventilation airflow is required. If the room area, A or TA, is below the adjusted A_{min} or TA_{min} threshold, additional ventilation is required to remove refrigerant in the event of a leak. Refer to UL 60335-2-40 Clause GG.8 and ANSI\ASHRAE Standard 15 Section 7 for natural and mechanical ventilation requirements.

Table 39. Minimum room area — vertical

Models	Minimum Room Area (m^2) 0.6 meters height	Minimum Room Area (ft^2) 1.9 feet height
GEVK006	8.8	94.5
GEVK009	9.1	97.9
GEVK012	9.3	99.7
GEVK015	11.2	120.3
GEVK018	11.5	123.7
GEVK024	13.2	142.6
GEVK030	13.4	144.3
GEVK036	16.0	171.8
GEVK042	17.6	189.0
GEVK048	19.3	207.9
GEVK060	22.3	240.5
GEVK072	17.0	183.1
GEVK090	23.9	257.3
GEVK120	25.3	272.2

Table 39. Minimum room area — vertical (continued)

Models	Minimum Room Area (m^2) 0.6 meters height	Minimum Room Area (ft^2) 1.9 feet height
GEVK150	35.7	384.3
GEVK180	37.3	401.9
GEVK240	80.2	863.2
GEVK300	73.6	792.3

Table 40. Minimum room area — horizontal

Models	Minimum Room Area (m^2) 2.2 meters height	Minimum Room Area (ft^2) 7.2 feet height
GEHK006	2.4	25.8
GEHK009	2.5	26.7
GEHK012	2.5	27.2
GEHK015	3.0	32.8
GEHK018	3.1	33.7
GEHK024	3.6	38.9
GEHK030	3.7	39.4
GEHK036	4.4	46.9
GEHK042	4.8	51.5
GEHK048	5.3	56.7
GEHK060	6.1	65.6
GEHK072	4.4	47.5
GEHK090	5.1	54.9
GEHK120	6.7	72.6
GEHK150	10.8	115.9
GEHK180	10.0	108.1

Minimum Room Area (A_{min}) Adjustments

Use equation below to adjust the minimum room area, as applicable, based on the unit's installation height, altitude, and occupancy level it serves.

$$A_{min.adj} = \text{Nameplate } A_{min} \times \text{Altitude Adj} \times \text{Height Adj} \times F_{occ}$$

Multiply the altitude adjustment factor in the table below by A_{min} listed on the unit nameplate or in the Installation, Operation, and Maintenance (IOM) manual.

Table 41. Altitude adjustment factor

Altitude (ft)	Sea Level to 2000	2001 to 4000	4001 to 6000	6001 to 8000	8001 to 10000	10001 to 12000	12001 to 14000	14001 to 15000	Over 15000
A_{min} Adjustment	1	1.05	1.11	1.17	1.24	1.32	1.41	1.51	1.57

In addition, A_{min} can be adjusted if the unit is installed in a room at a height that is higher than the minimum height shown on the unit. To adjust A_{min}, multiply by the ratio of the unit minimum release height (in meters) / actual release height (in meters). Use 0.6 m in the ratio for unit minimum installation heights less than or equal to 0.6 m.

For institutional occupancies, ASHRAE Standard 15 applies an additional adjustment factor F_{occ} to the amount of a charge allowed in a space. To calculate the adjusted A_{min} for institutional occupancies, multiply the A_{min} on the nameplate by two.

EXAMPLE 1: 20 Ton Packaged Rooftop Multi-Zone VAV System Serving an Institutional Occupancy Space

The packaged unit serves 7600 ft² of a nursing home located at an attitude of 4000 ft. The unit has two equally charged 10 ton refrigeration circuits. Each circuit has 12 lbs of refrigerant with a minimum room area requirement of 180 ft² with a 2.2 m release height.

$$TA_{min.adj} = 180\ ft^2 \times 1.05 \times 2 = 378\ ft^2$$

No additional ventilation is required.

EXAMPLE 2: 10 Ton Split System Serving a Single Commercial Occupancy Space

The split system serves a 1500 ft² manufacturing space at 5000 ft altitude. The final installed charge of the single circuit 10 ton unit is 20 lb. The unit has an open return with a release height of 1 m and ducted supply air. The unit A_{min} is 660 ft².

$$A_{min.adj} = 660\ ft^2 \times 1.11 = 733\ ft^2$$

No additional ventilation is required.

Determining Room Area (A or TA)

The room area (A) is the room area enclosed by the projection to the floor of the walls, partitions, and doors of the space that the equipment serves. For ducted systems, total room area (TA) of all rooms connected by ducts, may be used instead of A.

Rooms connected by drop ceilings only are not considered a single room.

Rooms on the same floor of the building, and connected by an open passageway, can be considered part of the same room if the passageway is a permanent opening, extends to the floor and is intended for people to walk through.

Adjacent rooms on the same floor of the building and connected by permanent openings in the walls and/or doors between rooms (including gaps between the wall and the floor), can be considered part of the same room if the openings meet the following criteria.

- The opening is permanent and cannot be closed.
- Openings extending to the floor, such as door gaps, need to be at least 20 mm above the floor covering surface.
- Natural ventilations opening areas must meet the requirements of ANSI\ASHRAE Standard 15-2022, Section 7.2.3.2.

Rooms that are connected by a mechanical ventilation system can be considered a single room area if the mechanical ventilation system meets the requirements of ANSI\ASHRAE Standard 15-2022, Section 7.6.4.

Leak Detection System (Refrigerant charge greater than 3.91 lb per circuit)

The leak detection system consists of one or more refrigerant detection sensors. When the system detects a leak, the following mitigation actions will be initiated until refrigerant has not been detected for at least 5 minutes:

- Energize the supply fan(s) to deliver a required minimum amount of circulation airflow.
- Disable compressor operation.
- Provide an output signal that can be used to fully open zone dampers and/or VAV boxes and disable electric heat in VAV boxes.
- Provide an output signal that can be used to energize additional mechanical ventilation (if needed).
- Units without airflow proving will disable electric heat sources.

Building fire and smoke systems may override this function.

If the refrigerant sensor has a fault, is at the end of its life, or is disconnected, the unit will initiate the mitigation actions. Mitigation actions may be verified by disconnecting the sensor.

The refrigerant sensors do not need service. Use only manufacturer-approved sensors when replacement is required.

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 GEH/V 0.5 to 5 ton and GEVE 6 to 25 ton units have been anchored to the skid with (4) angle brackets. Remove these brackets before lifting unit into place.

   The GEH 6 to 15 ton units are anchored to the cross brace of the skid with (4) wood screws. Remove these screws prior to lifting the 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 provides 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 (compressor contactor on the 0.5 to 5 ton) for GEH/V 0.5 to 5 ton or 1TB1 for GEH/V 6 to 25 ton equipment in the unit control panel .
4. Install proper grounding wires to an earth ground.

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 in. (25.4 mm) standard, 2 in. (50.8 mm) standard, 2 in. MERV 8 or 2 in. MERV 13 filter. The quantity of filters is determined by unit size. The GEH 0.5 to 5 ton units require field installation of the 1 in. or 2 in. 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 and GEH 6 to 15 ton horizontal units ship with the filter rack and filters factory installed.

Note: *Do not operate the unit without filters.*

Supply-Air Ductwork

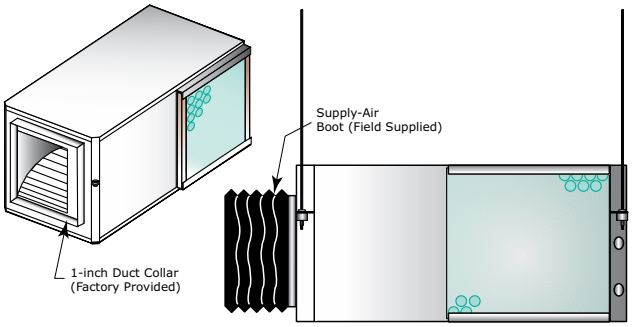
Horizontal 0.5 to 5 ton units require duct flanges to be field installed. The duct flange ships in a box on the side of the unit. Install the flange with (8) 3/8 in. (213 mm) factory supplied screws.

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 45. Flexible supply-air connector (field provided)



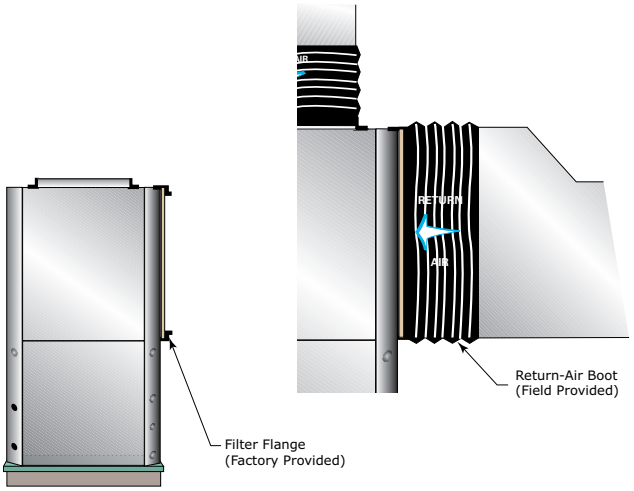
Return-Air Ductwork

Install the 1/2 in. (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 watertight 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 46. 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 47. Return-air duct panel

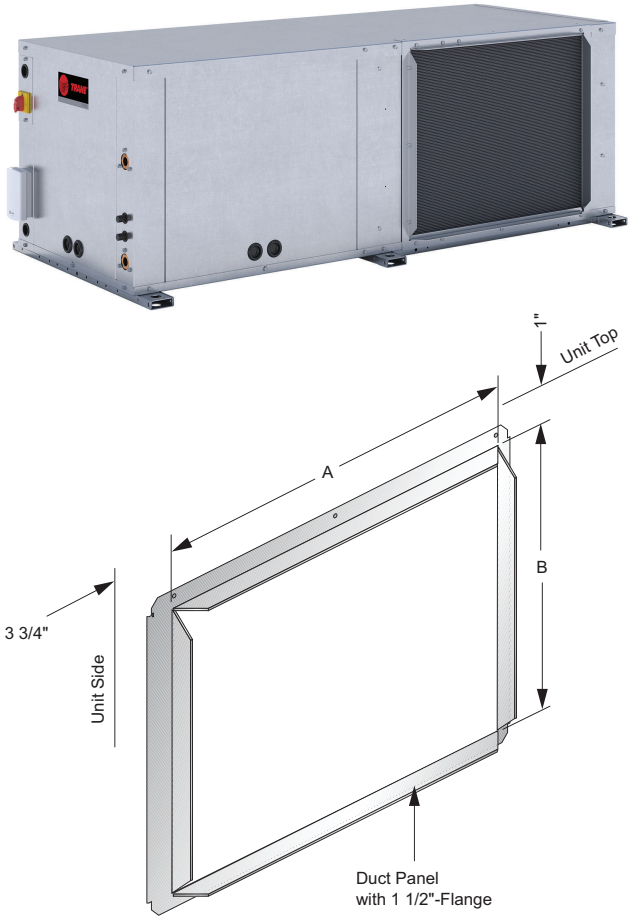


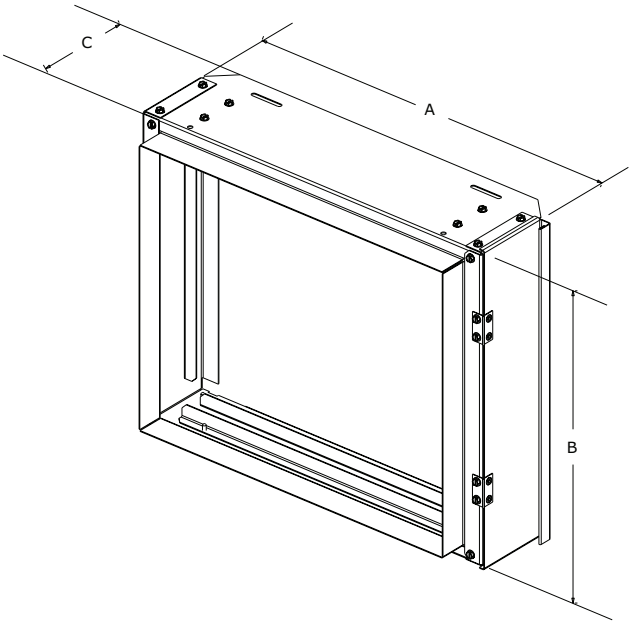
Table 42. Ducted panel - return air

Unit Size (60 Hz)	A (in.)	B (in.)	Duct Collar Part Number
GEVK006-012	16.00	14.50	WSHPPN-D00001
GEVK015-018	18.50	16.50	WSHPPN-D00002
GEVK024-030	20.00	17.50	WSHPPN-D00003
GEVK036-042	23.00	18.50	WSHPPN-D00004

Table 42. Ducted panel - return air (continued)

Unit Size (60 Hz)	A (in.)	B (in.)	Duct Collar Part Number
GEVK048-060	29.50	20.50	WSHPPN-D00005
GEHK006-012	16.00	14.50	WSHPPN-D00010
GEHK015-018	18.50	16.50	WSHPPN-D00011
GEHK024-030	20.00	17.50	WSHPPN-D00012
GEHK036-042	23.00	18.50	WSHPPN-D00013
GEHK048-060	29.50	20.50	WSHPPN-D00014

Ducted Filter Rack (0.5 to 5 tons only)



When filter access is needed at the unit in a ducted return, a ducted filter rack is available. Vertical unit filter racks are available in right or left access configurations. Horizontal units are available in bottom access configuration.

Table 43. Ducted filter opening size - 0.5 to 5 tons

Unit Size	A (in.)	B (in.)	C (in.)
GEH/V 006-012	16.50	14.25	6.60
GEH/V 015–018	19.00	16.25	6.60
GEH/V 024–030	20.50	17.25	6.60
GEH/V 036–042	23.50	18.50	6.60
GEH/V 048-060	30.00	20.25	6.60

Note: *All dimensions in inches. GEH/V dimensions are for accessory 2 or 4–inch Filter Rack.*

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.

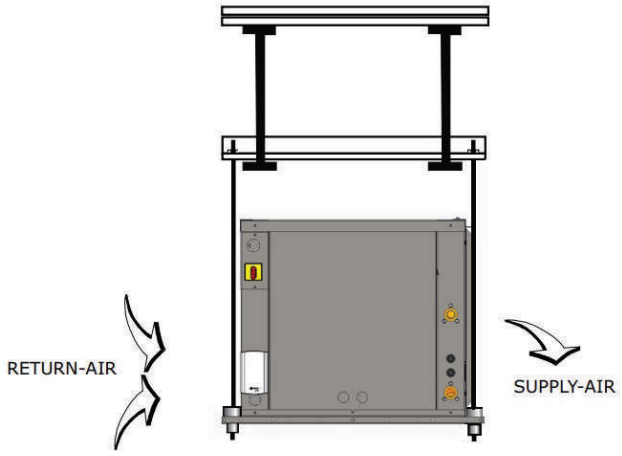
Ceiling structure must be strong enough to support the weight of the unit and any accessories. If unsure, check with a structural engineer.

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

1. Install the hanging isolators (located in the control box from factory) into the six hanging brackets.
2. Use a lift with a large supporting surface or a wooden structure supporting the base of the unit (hanging rails) when the unit is lifted for installation.
3. Secure the equipment to a joist, concrete, etc. with the use of 3/8 in. (9.7 mm) field provided (all-thread) rod. Each rod should contain field provided nuts and washers to complete the hanging installation.
4. Slope 6 to 25 ton horizontal units in two directions. The unit should contain a dual 0.25-12 pitch toward the drain connection. This confirms proper drainage of the unit. All plumbing to the unit should conform per national and local codes and is the responsibility of the contractor. The 0.5 to 5 ton horizontal models do not need to be sloped and must be installed level.

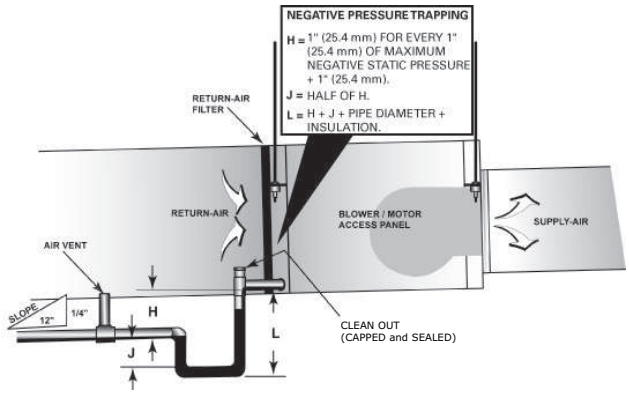
Note: *Rods must be perpendicular to the mounting holes in the base rail of the horizontal unit.*

Figure 48. Hanging the unit



Condensate Drain Connection

Figure 49. Negative pressure system



- For all GEV 0.5 to 25 ton and GEH 0.5 to 5 ton models, the drain connection is 0.75 in. NPT.
- For 6 to 15 ton GEH models, the drain connection is 0.5 in. PVC schedule 40 pipe.

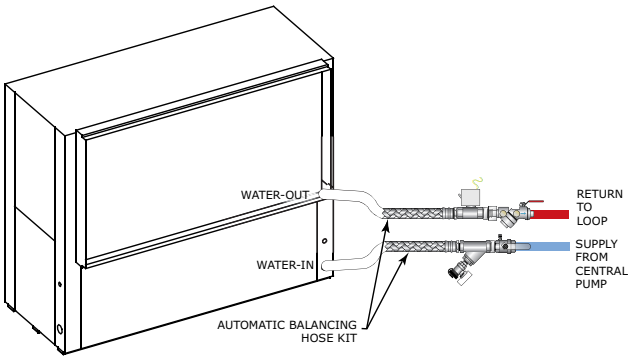
Install proper trapping to the equipment.

When designing the condensate trap for the water-source system, it is important to consider the unit draw-through 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 50. 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 and 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 to confirm 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 and repaired 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.

Units rated for dual voltage applications (208V/230V) are shipped with default voltage of 230V from factory. To convert to 208V, the primary lead on the transformer must be removed and switched to the 208V tap.

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.

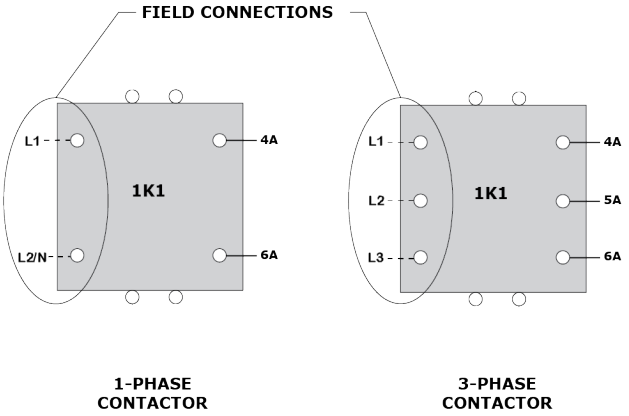
A field supplied disconnect switch must be installed at or near the unit in accordance with the National Electric Code (NEC latest edition).

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 51. 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!

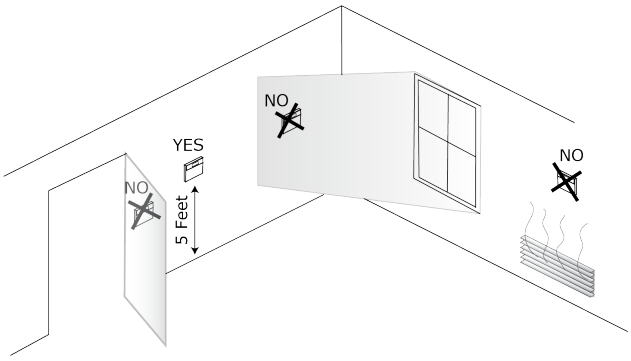
Failure to disconnect power before servicing could result in death or serious injury.

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 52. 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 44. 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 • 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. • 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. • 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. • 3 H/2 C
	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 45. Zone sensor selection for use with Symbio™ 400-B/500 controller

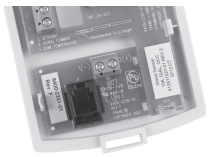
Sensor	Part Number	Description
	X13790886010	Wired temperature sensor with an LCD display • Allows an occupant to control the temperature setpoint, request timed override of system operation, and provides a COMM module to service technicians. Symbio 400-B/500 Compatible
	X13651467020	Communication Module • Sold in packs of 12 • Provides local RJ22 connection to Trane® service tools for easy, low cost maintenance.
	X13511529010	Zone Sensor • Symbio 400-B/500 compatible • External setpoint adjustment wheel
	X13511527010	Zone Sensor • Symbio 400-B/500 compatible • External setpoint adjustment wheel • ON and CANCEL buttons
	X1379084501	Zone Sensor • Symbio 400-B/500 compatible • External setpoint adjustment wheel • ON and CANCEL buttons • Fan switch AUTO-OFF
	X1379044401	Temperature and relative humidity sensor • Symbio 400-B/500 compatible

Table 45. Zone sensor selection for use with Symbio™ 400-B/500 controller (continued)

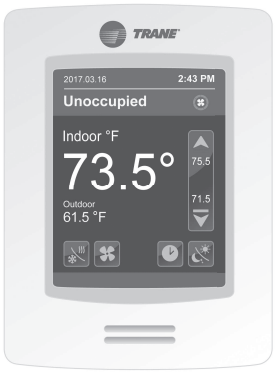
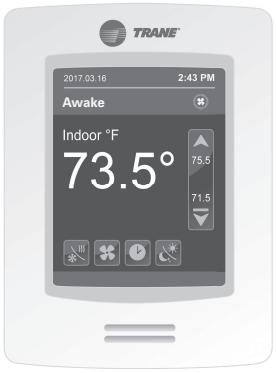
Sensor	Part Number	Description
	X13790993001	Commercial Touch Screen Programmable Zone Sensor • Supports Standby, Occupied, and Unoccupied • 7 day, 5+2 day, and 5+1+1 day • Cannot be used with BAS as sensor ties up BACnet link. For use with factory-programmed Symbio 400-B/500. ***Notes:*** • *Adjusting the rotary switch on Symbio 400-B/500 may be required to correspond address configuration in the sensor. See the installation manual for more information.* • *Additional configuration is needed in the field to use the Programmable zone sensors (to put BAS points in service on Symbio 400-B/500).*
	X13790992001	Residential Touch Screen Programmable Zone Sensor • 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 Symbio 400-B/500. ***Notes:*** • *Adjusting the rotary switch on Symbio 400-B/500 may be required to correspond address configuration in the sensor. See the installation manual for more information.* • *Additional configuration is needed in the field to use the Programmable zone sensors (to put BAS points in service on Symbio 400-B/500).*

Table 46. Wireless zone sensor selection for use with Symbio 400-B/500 controller

Sensor	Part Number	Description
	X13790955010	Trane Air-Fi® WCS-SD (display) • Symbio 400-B/500 Compatible • Easy-to-use interface for clear and simple monitoring and control
	X13790956010	Trane Air-Fi WCS-SB (base) • Symbio 400-B/500 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.

The AC control wiring between the controls and the unit termination point must 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 47. 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 for these thermostats mounted on 6 to 25 ton equipment sizes are shown in the figures below.

Figure 53. Low-voltage connection (GEH/V 6 to 25 ton)

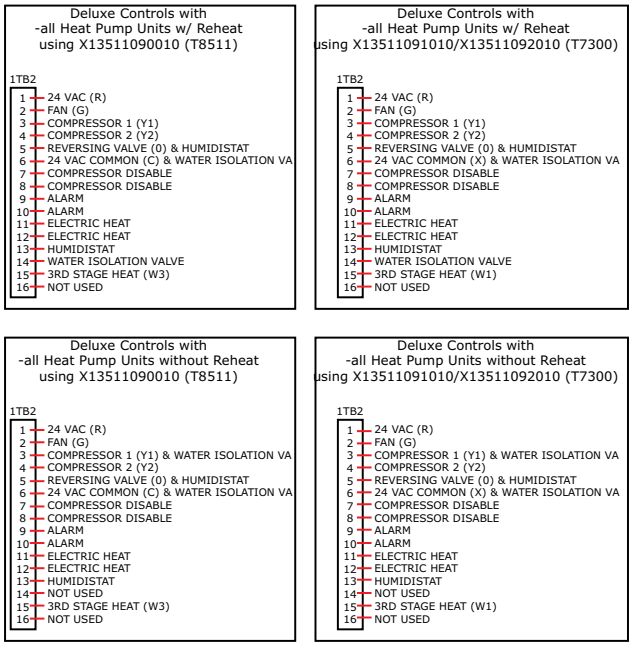


Figure 54. Low voltage wire connection (GEH/V 0.5 to 5 ton)

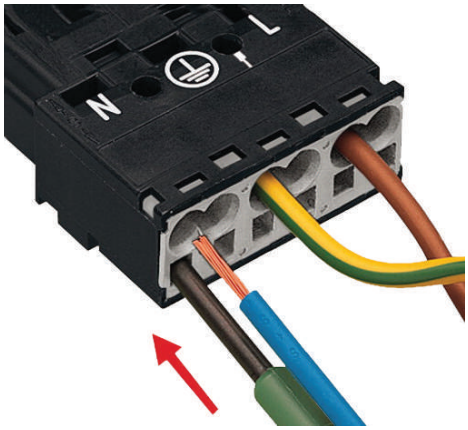
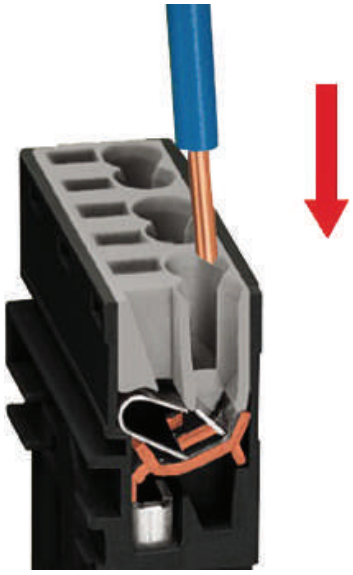
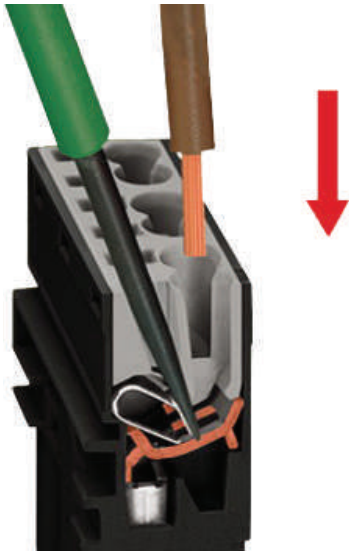


Figure 55. Low voltage single wire connection (GEH/V 0.5 to 5 ton)



Make connection for a single-wire by inserting a single wire after stripping off the coating.

Figure 56. Low voltage stranded wire connection (GEH/V 0.5 to 5 ton)



Follow the steps to connect the stranded wire:

1. Release the spring with a dedicated screwdriver (blade width 2.5 mm)
2. Insert the stripped cable as far as it gets inserted.
3. Complete the connection by removing the screwdriver.

Figure 57. Deluxe controls low voltage connection (0.5 to 5 ton)

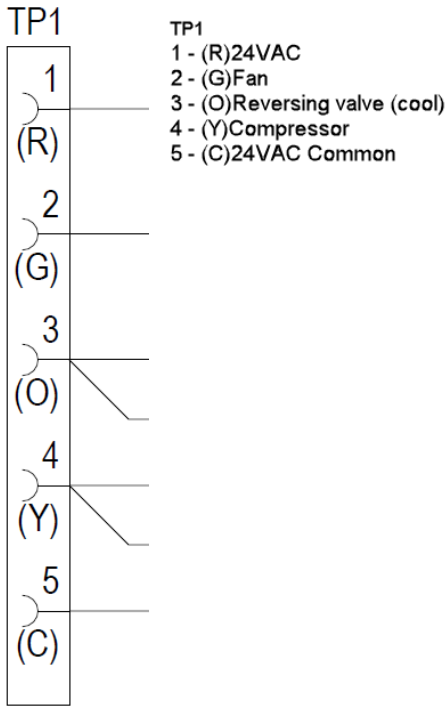
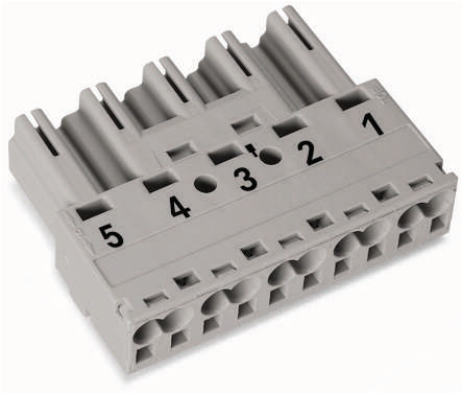


Figure 58. TP1 connection type



Present on all 0.5 to 5 ton H/V units.

Figure 59. Deluxe controls with WSE two-stage low voltage connection (0.5 to 5 ton)

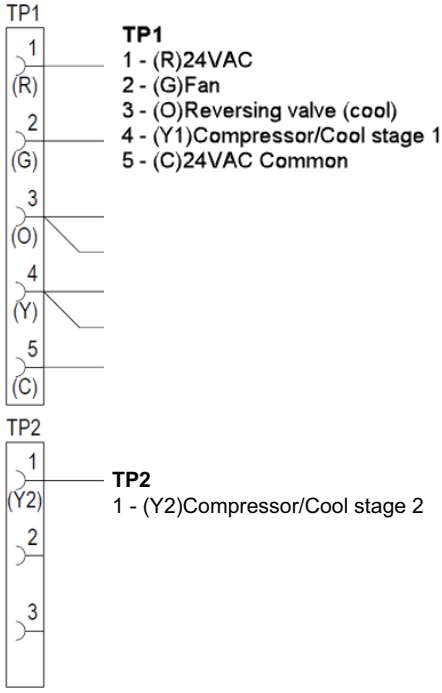


Figure 60. TP2 connection type

Only present on units with Deluxe 24V controls and either 2-speed compressor (DXV/H) or water side economizer (WSE) coil DX and WSE on DLX.

Figure 61. Deluxe controls humidistat connections between wires H1 and H2 in control box low voltage connection (0.5 to 5 ton)

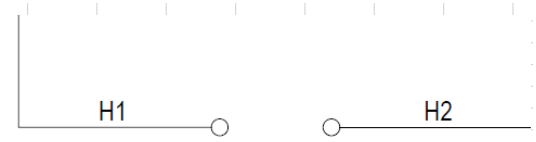
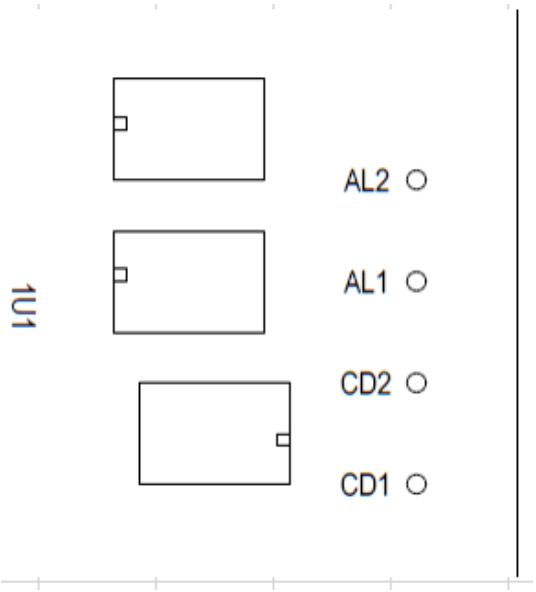


Figure 62. Deluxe controls general alarm and compressor disable (0.5 to 5 ton)



Deluxe board (1U1) connections

AL1, AL2 - Alarm Contact output

CD1, CD2 - Compressor Disable input (24Vac)

For installation, operation and programming see BAS-SVX092*-EN (Symbio™ 400-B/500).

⚠ 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 24 Volt 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.

Symbio™ 400-B/500 Controller

To inhibit operation of the compressor and fan for a safety shutdown, it is necessary to break the wire (21A) from the 24 Volt transformer to the Symbio 400-B/500 (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.

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.

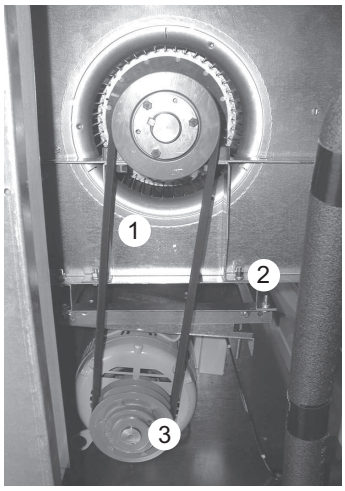
During installation, testing, servicing and troubleshooting of this product it may be necessary to work with live and exposed rotating components. Have a qualified or licensed service individual who has been properly trained in handling exposed rotating components, perform these tasks.

Note: *GEH/V 6 to 25 ton units only.*

- To increase cfm, loosen the turns open set screw on the sheave, and turn the sheave clockwise.
- To decrease cfm, loosen the turns open set screw on the sheave, and turn the sheave counterclockwise.
- To increase belt tension, loosen the adjustment bolt and pull motor mounting plate back until the belt is tight. Tighten the adjustment bolt after the belt has reached the desired tension.

See the figure below for fan motor and sheave adjustment.

Figure 63. Fan motor and sheave adjustment



1. Belt
2. Adjustment Bolt and Plate
3. Sheave

GEV/H 0.5 to 5 tons - Units with Deluxe 24V controls

For sizes 006-060, the ECM is programmed for constant torque and delivers airflow similar to a PSC motor while operating at a higher efficiency.

Figure 64. ECM control box

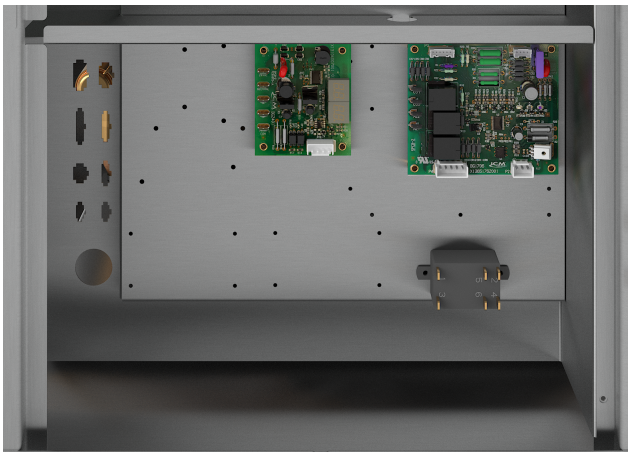
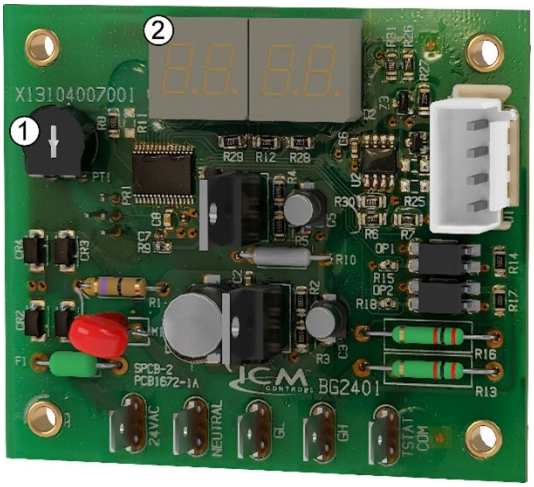


Figure 65. ECM control board



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

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

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

Note: *ECM control board is only on units with Deluxe 24V controls. Tracer® TU is used to adjust fan speed on units with Symbio™ 400-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.

Waterside Economizer Installation for Horizontal 0.5 to 5 Ton Units

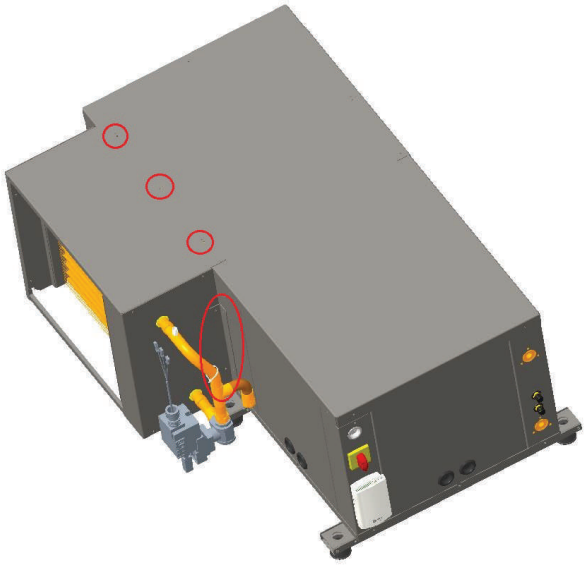
The following steps were sequenced to aid in the installation and pairing of a water side economizer to a 0.5 to 5 ton horizontal water source heat pump.

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

Figure 66. Step 1

2. Mount the waterside economizer to the unit. It is secured to the unit using the three engagement holes used for the filter bracket on the top. Secure the sides of the economizer using the two L-Brackets on each side by lining up the engagement holes for the fasteners (total of four for each bracket). The engagement hole locations and L-Bracket can be seen in the Figure 67, p. 72 .

Figure 67. Step 2



3. Attach the filter bracket to the waterside economizer using the five screws removed earlier. Install the air filter.
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 68. 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. The 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. Both the WSE and unit condensate drains must be separately trapped for proper handling of condensation (see Figure 69, p. 73). Both Vertical and Horizontal units will be piped similar to each other. The drain connection is located on the bottom side of the economizing coil.

Figure 69. Step 8

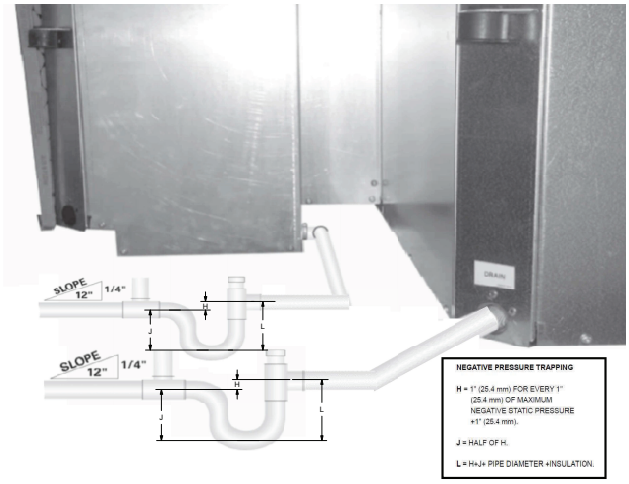


Table 48. Economizer part numbers

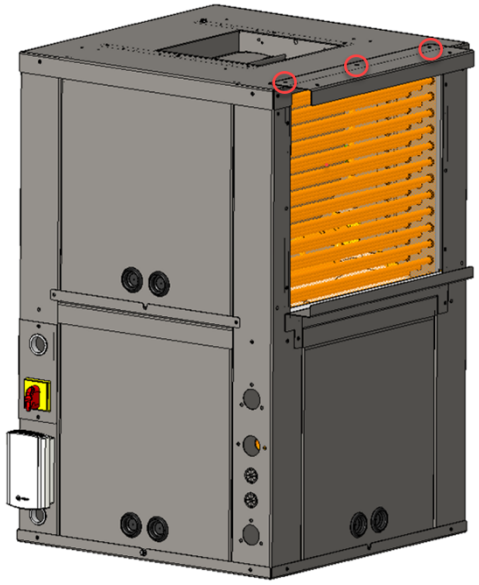
Supply-Air Arrangement	Unit	Part Number
Left Supply	GEVK006-012	WSHPECN00015
	GEVK015-018	WSHPECN00016
	GEVK024-030	WSHPECN00017
	GEVK036-042	WSHPECN00018
	GEVK048-060	WSHPECN00019
Right Supply	GEVK006-012	WSHPECN00022
	GEVK015-018	WSHPECN00023
	GEVK024-030	WSHPECN00024
	GEVK036-042	WSHPECN00025
	GEVK048-060	WSHPECN00026

Waterside Economizer Installation for Vertical 0.5 to 5 Ton Units

The following steps were sequenced to aid in the installation and pairing of a water side economizer to a 0.5 to 5 ton vertical water source heat pump.

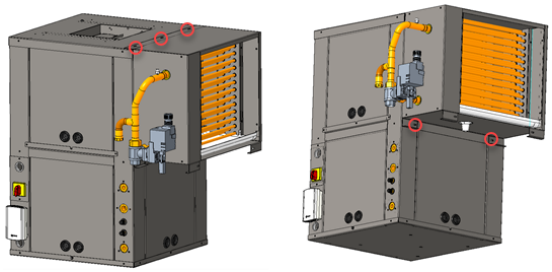
1. Remove the filter bracket from the unit. It is secured by five screws: three on top (circled) and two on the bottom (not shown). Do not discard the filter brackets.

Figure 70. Step 1



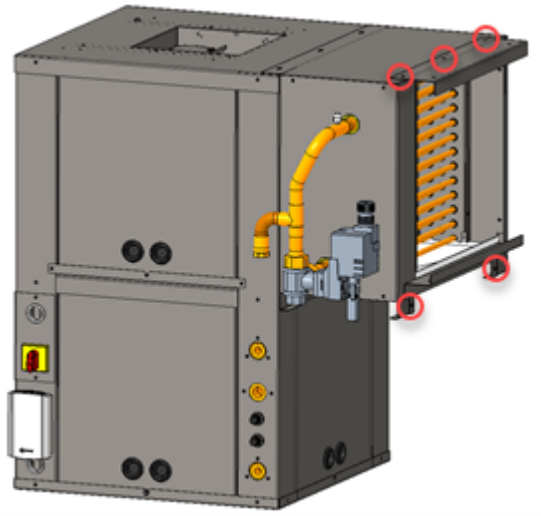
2. Mount the waterside economizer to the unit. It is secured to the unit using the five engagement holes that were used for the filter brackets: three on top and two on the bottom.

Figure 71. Step 2



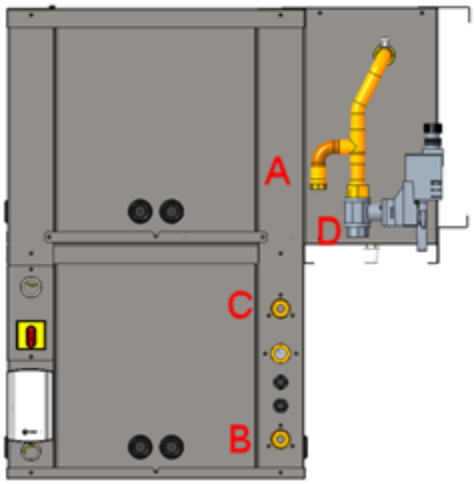
3. Attach the filter brackets to the waterside economizer using five screws. Install the air filter.

Figure 72. 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 73. Step 4



5. Locate the entering water sensor that is located inside 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). The vertical units will be piped similar to the horizontal units.

Figure 74. Step 8

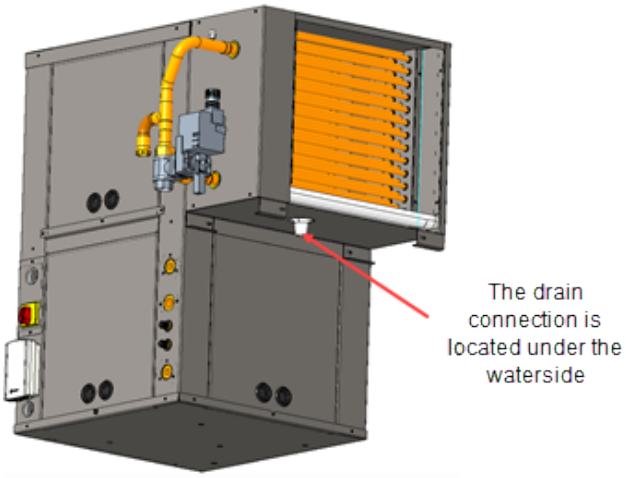


Table 49. Economizer part numbers

Supply-Air Arrangement	Unit	Part Number
Left Supply	GEVK006-012	WSHPECN00001
	GEVK015-018	WSHPECN00002
	GEVK024-030	WSHPECN00003
	GEVK036-042	WSHPECN00004
	GEVK048-060	WSHPECN00005
Right Supply	GEVK006-012	WSHPECN00008
	GEVK015-018	WSHPECN00009
	GEVK024-030	WSHPECN00010
	GEVK036-042	WSHPECN00011
	GEVK048-060	WSHPECN00012

Waterside Economizer Installation for GEH and GEV 6 to 25 Ton Models

⚠ 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.

1. Remove the filter frame from the unit.
2. Remove the waterside service panel from the unit.
3. Remove the control box service panel from the unit.
4. Remove the economizer and miscellaneous mounting parts from it's packaging.
5. GEV ONLY: Mount the economizer support angle (4475 1637 0100) found in the economizer packaging in the same holes of the return air filter frame removed in Step 1. The support angle screws into the unit roof.
6. GEV ONLY: Hang the economizer assembly from the economizer support angle mounted in Step 5.
7. Secure the economizer to the unit using the four plates (4475 1630 0100) found in the economizer packaging. Two plates should be applied to each economizer side. GEV ONLY: Secure the bracket on the bottom of the economizer cabinet to the unit compressor compartment center post.
8. Install the field portion of the water piping and the 3-way valve together.
9. Verify the control board for the waterside economizer is located inside the unit. The temperature rating of this board is factory set to 55ºF.
10. Thread the economizer's entering water temperature sensor (4RT1) through the water-in line of the water-source heat pump upstream from the valve. This sensor is used by the economizer's 3-way valve to determine if water flow should be directed through the waterside economizing coil.
11. Tie wrap the thermistor to the water line (supply side) upstream of the water pipe to the economizer. The thermistor must be situated so that the thermistor is capable of reading the actual entering water temperature regardless of the economizer's on or off situation.
12. Insulate the thermistor with tubing insulation.
13. Tie wrap each end of the tubing insulation to prevent air filtration. The tie wraps and insulation are located in a bag and shipped inside of the unit.
14. Route the factory wire harness through the low voltage hole of the heat pump to the 3-way valve's wire harness.
15. Connect the factory installed wire harness to the wire harness supplied with the 3-way valve.
16. Bundle excess valve wire, and wire tie the bundle neatly.
17. Install control side service panel to the heat pump.
18. Install the unit filter frame to the economizing inlet.
19. Insulate the economizing piping package with field supplied pipe insulation. Insulating the piping will help stop condensation from forming on the pipe.

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 field installed.*

20. Install waterside service panel to the heat pump.

The economizer condensate line must be trapped prior to the unit's drain line. This helps prevent air from being sucked through the drain line causing condensate to spit or build-up in the economizer or unit drain pans. 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 for proper trapping of condensation.

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 to 12ºF); 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 “,”.

Note: *If cooling mode is activated, and the entering water temperature of the heat pump falls below 55ºF, 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 to 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 “,”.

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

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

Table 50. Waterside economizing three-way valve specifications (GEH/V units)

Unit Size (60 Hz)	Unit Size (50 Hz)	Valve Conn. Size	Valve Pres. Rating	Valve Close-off pressure	Valve Temp. Range	Actuator
GEHK 006-015 GEVK 006-012		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
GEHK 018-042 GEVK 015-042		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
GEHK 048-060 GEVK 048-060		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
GEVK/GEHK 6 to 7.5 Ton	GEVK 6 Ton	1-1/4 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 33 Cv at full port
GEVK/GEHK 10 to 15 Ton	GEVK/GEHK 7.5 to 12.5 Ton	1.5 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 37 Cv at full port

Table 50. Waterside economizing three-way valve specifications (GEH/V units) (continued)

Unit Size (60 Hz)	Unit Size (50 Hz)	Valve Conn. Size	Valve Pres. Rating	Valve Close-off pressure	Valve Temp. Range	Actuator
GEVK 20 and 25 Ton	GEVK 15 and 20 Ton	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 57 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.*

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 9-12ºF); 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 “,”.
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 5-9ºF 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 “,”.
12. Set the thermostat to maintain the desired space temperature.
13. Instruct the owner on system operation.

Table 51. 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 51. 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 52. Operating pressures in cooling/heating for GE units

Operating Data										
Model	Entering Water Temp (°F)	Water Flow (GPM)	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)
GEV/H006	32	1.20	—	—	—	—	65-80	264-322	7-8	22-27
GEV/H006	32	1.50	—	—	—	—	67-82	266-325	5-7	23-28
GEV/H006	45	1.20	99-122	164-200	15-19	28-34	81-99	287-351	8-10	29-36
GEV/H006	45	1.50	99-121	155-190	12-15	28-34	84-103	290-355	7-8	30-37
GEV/H006	55	1.20	101-124	193-236	15-18	27-33	97-118	306-374	9-12	33-41
GEV/H006	55	1.50	101-123	185-226	12-15	27-33	100-122	311-380	8-10	34-42
GEV/H006	68	1.20	104-127	230-281	15-18	26-31	119-146	334-408	12-14	41-50
GEV/H006	68	1.50	104-127	222-271	12-14	26-32	124-152	340-415	10-12	42-52
GEV/H006	75	1.20	111-135	252-308	14-18	25-31	132-162	349-427	13-16	44-54
GEV/H006	75	1.50	110-135	243-297	12-14	26-31	138-169	356-435	11-13	45-55
GEV/H006	86	1.20	113-138	291-355	14-17	25-30	155-189	374-457	14-18	48-59
GEV/H006	86	1.50	112-137	282-344	11-14	25-30	162-198	381-466	12-15	50-61
GEV/H006	95	1.20	115-141	323-395	14-17	24-29	—	—	—	—
GEV/H006	95	1.50	115-140	315-385	11-13	24-29	—	—	—	—
GEV/H009	32	1.80	—	—	—	—	71-86	240-293	5-6	18-21
GEV/H009	32	2.25	—	—	—	—	72-88	242-295	4-5	18-22
GEV/H009	45	1.80	107-131	155-189	11-13	23-28	89-109	258-315	6-8	23-28
GEV/H009	45	2.25	107-131	148-181	9-11	23-28	91-112	260-317	5-6	23-29
GEV/H009	55	1.80	109-133	185-226	11-13	22-27	106-129	272-333	8-9	26-32
GEV/H009	55	2.25	109-133	179-219	9-11	22-27	109-133	275-336	6-8	27-33
GEV/H009	68	1.80	111-136	221-270	11-13	21-26	122-149	288-352	9-11	30-37
GEV/H009	68	2.25	111-135	216-264	8-10	21-26	126-154	291-356	7-9	31-37
GEV/H009	75	1.80	117-142	240-293	11-13	21-26	136-166	300-366	10-12	32-40
GEV/H009	75	2.25	116-142	234-286	8-10	22-26	141-172	303-371	8-10	33-40
GEV/H009	86	1.80	120-146	278-339	10-13	21-25	159-195	318-389	11-14	36-44
GEV/H009	86	2.25	120-146	271-332	8-10	21-25	165-202	322-393	9-11	37-45
GEV/H009	95	1.80	121-148	310-379	10-12	20-24	—	—	—	—
GEV/H009	95	2.25	121-148	304-371	8-10	20-25	—	—	—	—
GEV/H012	32	2.40	—	—	—	—	65-79	244-298	5-6	17-21
GEV/H012	32	3.00	—	—	—	—	66-81	245-300	4-5	17-21
GEV/H012	45	2.40	101-124	156-191	11-13	22-27	84-103	262-320	6-7	22-27
GEV/H012	45	3.00	101-123	151-184	8-10	22-27	87-106	264-322	5-6	23-28
GEV/H012	55	2.40	103-126	184-225	10-13	22-27	101-123	277-338	7-9	26-31
GEV/H012	55	3.00	103-126	179-219	8-10	22-27	103-126	279-341	6-7	26-32
GEV/H012	68	2.40	107-130	220-269	10-12	21-25	118-144	296-362	9-11	30-37
GEV/H012	68	3.00	106-130	215-263	8-10	21-26	122-149	300-366	7-9	31-38
GEV/H012	75	2.40	112-137	239-292	10-13	21-26	131-161	308-377	10-12	33-40
GEV/H012	75	3.00	112-136	233-285	8-10	21-26	136-166	312-382	8-10	33-41
GEV/H012	86	2.40	115-141	280-342	10-12	20-25	154-189	328-401	11-13	36-44
GEV/H012	86	3.00	115-140	274-335	8-10	21-25	160-195	333-407	9-11	37-45
GEV/H012	95	2.40	117-143	312-381	10-12	20-24	—	—	—	—
GEV/H012	95	3.00	117-143	306-374	8-10	20-24	—	—	—	—

Table 52. Operating pressures in cooling/heating for GE units (continued)

Operating Data										
Model	Entering Water Temp (°F)	Water Flow (GPM)	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)
GEV/H015	32	3.00	—	—	—	—	65-80	250-306	6-7	20-25
GEV/H015	32	3.75	—	—	—	—	67-82	252-308	5-6	21-25
GEV/H015	45	3.00	102-124	157-192	12-14	23-29	86-105	277-339	7-9	26-32
GEV/H015	45	3.75	101-124	151-185	9-11	24-29	88-108	280-342	6-7	26-32
GEV/H015	55	3.00	103-126	187-228	12-14	23-28	102-124	295-360	8-10	29-36
GEV/H015	55	3.75	103-126	181-221	9-11	23-28	105-128	298-364	7-8	30-37
GEV/H015	68	3.00	106-129	224-274	11-14	22-27	120-147	312-381	10-12	34-41
GEV/H015	68	3.75	105-129	218-267	9-11	22-27	124-152	316-386	8-10	35-42
GEV/H015	75	3.00	109-133	246-301	11-14	22-27	133-163	325-398	11-13	36-45
GEV/H015	75	3.75	109-133	240-293	9-11	22-27	138-169	330-403	9-11	37-46
GEV/H015	86	3.00	113-138	287-350	11-14	22-26	156-191	347-424	12-15	40-49
GEV/H015	86	3.75	113-138	280-342	9-11	22-27	162-199	352-430	10-12	41-51
GEV/H015	95	3.00	115-140	319-389	11-13	21-26	—	—	—	—
GEV/H015	95	3.75	114-140	312-381	9-11	21-26	—	—	—	—
GEV/H018	32	3.60	—	—	—	—	66-81	258-315	6-7	21-25
GEV/H018	32	4.50	—	—	—	—	68-83	259-317	5-6	21-26
GEV/H018	45	3.60	99-121	154-188	11-14	23-28	85-104	280-342	7-9	25-31
GEV/H018	45	4.50	99-121	148-181	9-11	23-28	88-107	282-345	6-7	26-31
GEV/H018	55	3.60	101-123	183-223	11-14	23-28	101-124	297-363	8-10	29-35
GEV/H018	55	4.50	100-123	177-216	9-11	23-28	104-127	300-366	7-8	29-36
GEV/H018	68	3.60	103-126	221-270	11-13	22-27	122-149	317-388	10-12	34-41
GEV/H018	68	4.50	103-126	216-264	9-11	22-27	126-154	321-392	8-10	34-42
GEV/H018	75	3.60	107-131	245-300	11-14	22-27	136-166	330-403	11-13	36-44
GEV/H018	75	4.50	107-131	239-292	9-11	22-27	140-171	334-408	9-11	37-45
GEV/H018	86	3.60	111-135	283-346	11-13	21-26	159-195	350-428	12-15	40-49
GEV/H018	86	4.50	111-135	277-338	9-11	22-26	165-201	354-432	10-12	40-49
GEV/H018	95	3.60	113-138	315-385	11-13	21-25	—	—	—	—
GEV/H018	95	4.50	113-138	309-378	9-11	21-26	—	—	—	—
GEV/H024	32	4.80	—	—	—	—	61-75	267-326	6-7	20-25
GEV/H024	32	6.00	—	—	—	—	63-77	269-329	5-6	21-25
GEV/H024	45	4.80	103-126	161-196	12-14	23-28	78-95	293-358	7-8	26-31
GEV/H024	45	6.00	103-125	155-190	9-11	23-29	80-98	295-361	6-7	26-32
GEV/H024	55	4.80	104-127	189-231	12-14	23-28	93-113	309-378	8-10	29-35
GEV/H024	55	6.00	104-127	183-223	9-11	23-28	96-117	312-382	7-8	30-36
GEV/H024	68	4.80	106-129	230-281	11-14	22-27	107-131	327-400	9-11	32-39
GEV/H024	68	6.00	106-129	223-273	9-11	22-27	111-136	331-405	8-9	33-40
GEV/H024	75	4.80	108-132	251-307	11-14	22-27	120-147	340-416	10-12	35-43
GEV/H024	75	6.00	108-132	244-298	9-11	22-27	124-152	345-421	8-10	36-44
GEV/H024	86	4.80	110-135	292-356	11-14	22-26	142-173	360-441	12-14	39-47
GEV/H024	86	6.00	110-135	284-347	9-11	22-26	147-180	365-446	10-12	40-48
GEV/H024	95	4.80	112-137	329-402	11-14	21-26	—	—	—	—
GEV/H024	95	6.00	112-136	321-393	9-11	21-26	—	—	—	—

Table 52. Operating pressures in cooling/heating for GE units (continued)

Operating Data										
Model	Entering Water Temp (°F)	Water Flow (GPM)	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)
GEV/H030	32	6.00	—	—	—	—	63-77	272-332	5-7	19-24
GEV/H030	32	7.50	—	—	—	—	65-79	274-334	4-5	20-24
GEV/H030	45	6.00	101-123	164-201	11-14	23-28	76-93	292-356	6-8	23-28
GEV/H030	45	7.50	100-123	159-194	9-11	23-28	78-95	294-359	5-6	24-29
GEV/H030	55	6.00	102-124	192-235	11-14	22-27	91-111	308-377	7-9	27-32
GEV/H030	55	7.50	102-124	186-228	9-11	22-27	94-114	311-381	6-7	27-33
GEV/H030	68	6.00	103-126	234-285	11-13	22-26	109-133	335-410	9-11	31-38
GEV/H030	68	7.50	103-126	227-277	9-11	22-27	112-137	339-414	7-9	32-39
GEV/H030	75	6.00	106-130	254-311	11-13	22-26	121-148	348-425	10-12	33-41
GEV/H030	75	7.50	106-130	248-303	9-11	22-26	126-154	351-430	8-10	34-42
GEV/H030	86	6.00	109-133	295-361	11-13	21-26	143-175	366-448	11-13	37-45
GEV/H030	86	7.50	109-133	288-352	9-11	21-26	149-182	371-453	9-11	38-46
GEV/H030	95	6.00	110-135	333-407	11-13	20-25	—	—	—	—
GEV/H030	95	7.50	110-135	325-398	9-10	21-25	—	—	—	—
GEV/H036	32	7.20	—	—	—	—	58-71	264-323	6-7	21-25
GEV/H036	32	9.00	—	—	—	—	59-73	266-325	5-6	21-26
GEV/H036	45	7.20	100-122	175-214	12-15	24-29	75-92	293-358	7-9	26-32
GEV/H036	45	9.00	99-121	168-206	10-12	24-29	78-95	295-361	6-7	27-33
GEV/H036	55	7.20	101-123	205-250	12-15	23-28	90-110	308-377	8-10	30-36
GEV/H036	55	9.00	101-123	198-242	10-12	23-29	93-114	311-380	7-8	30-37
GEV/H036	68	7.20	103-125	249-305	12-15	23-28	103-126	329-402	9-11	33-40
GEV/H036	68	9.00	103-125	241-295	10-12	23-28	107-131	332-406	8-9	34-41
GEV/H036	75	7.20	106-130	268-327	12-15	22-27	116-141	340-415	10-12	35-43
GEV/H036	75	9.00	106-129	260-317	10-12	22-27	120-147	343-419	8-10	36-44
GEV/H036	86	7.20	109-133	309-378	12-15	22-27	137-168	355-434	11-14	39-47
GEV/H036	86	9.00	109-133	301-367	10-12	22-27	143-174	358-437	9-11	39-48
GEV/H036	95	7.20	110-135	348-425	12-15	21-26	—	—	—	-
GEV/H036	95	9.00	110-135	339-414	10-12	21-26	-	-	—	—
GEV/H042	32	8.40	—	—	—	—	63-77	279-341	6-7	21-26
GEV/H042	32	10.50	—	—	—	—	65-79	281-344	5-6	22-27
GEV/H042	45	8.40	101-123	158-193	12-14	23-28	79-96	307-375	7-9	26-32
GEV/H042	45	10.50	101-123	152-186	9-11	23-28	81-99	310-379	6-7	27-33
GEV/H042	55	8.40	102-124	185-226	12-14	22-27	94-115	323-395	8-10	30-36
GEV/H042	55	10.50	102-124	179-218	9-11	22-27	97-118	326-399	7-8	30-37
GEV/H042	68	8.40	103-126	224-274	11-14	22-27	111-136	353-431	10-12	34-42
GEV/H042	68	10.50	103-126	218-266	9-11	22-27	115-141	356-435	8-10	35-43
GEV/H042	75	8.40	107-130	248-303	12-14	21-26	124-152	363-444	10-13	36-45
GEV/H042	75	10.50	107-130	240-294	9-11	22-26	129-157	367-448	9-11	37-46

Table 52. Operating pressures in cooling/heating for GE units (continued)

Operating Data										
Model	Entering Water Temp (°F)	Water Flow (GPM)	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)
GEV/H042	86	8.40	110-134	286-350	12-14	21-26	147-179	378-462	12-14	40-49
GEV/H042	86	10.50	110-134	279-340	9-11	21-26	153-187	381-466	10-12	41-50
GEV/H042	95	8.40	111-135	322-393	11-14	20-25	—	—	—	—
GEV/H042	95	10.50	111-135	314-384	9-11	20-25	—	—	—	—
GEV/H048	32	9.60	—	—	—	—	59-72	257-314	6-7	20-24
GEV/H048	32	12.00	—	—	—	—	60-74	259-317	5-6	20-25
GEV/H048	45	9.60	101-124	161-196	12-15	23-29	75-91	291-356	7-8	25-31
GEV/H048	45	12.00	101-124	155-190	10-12	23-29	77-94	294-360	6-7	25-31
GEV/H048	55	9.60	103-125	187-229	12-14	23-28	90-109	309-378	8-10	28-34
GEV/H048	55	12.00	102-125	181-222	9-11	23-28	92-113	312-382	6-8	29-35
GEV/H048	68	9.60	104-127	227-277	11-14	22-27	108-132	337-411	9-11	33-40
GEV/H048	68	12.00	104-127	220-269	9-11	22-27	112-137	340-416	8-9	34-41
GEV/H048	75	9.60	107-130	249-304	11-14	22-27	121-148	349-427	10-12	35-43
GEV/H048	75	12.00	107-130	241-295	9-11	22-27	125-153	353-431	8-10	36-44
GEV/H048	86	9.60	109-133	288-352	11-14	22-26	143-175	367-449	11-14	39-47
GEV/H048	86	12.00	109-133	280-343	9-11	22-27	149-182	371-454	9-11	39-48
GEV/H048	95	9.60	111-135	323-395	11-14	21-26	—	—	—	—
GEV/H048	95	12.00	110-135	316-386	9-11	21-26	—	—	—	—
GEV/H060	32	12.00	—	—	—	—	64-78	275-336	6-7	21-26
GEV/H060	32	15.00	—	—	—	—	65-80	278-339	5-6	22-26
GEV/H060	45	12.00	100-122	160-196	11-14	23-28	80-98	310-379	7-8	25-30
GEV/H060	45	15.00	99-121	155-189	9-11	23-28	83-101	313-382	5-7	25-31
GEV/H060	55	12.00	101-123	187-228	11-14	22-27	96-117	328-401	8-9	28-34
GEV/H060	55	15.00	101-123	181-221	9-11	22-27	99-121	331-405	6-8	29-35
GEV/H060	68	12.00	103-125	226-276	11-13	22-26	112-136	356-435	9-11	32-39
GEV/H060	68	15.00	102-125	220-268	9-11	22-27	116-141	359-439	7-9	33-40
GEV/H060	75	12.00	105-128	247-302	11-13	22-26	125-152	368-450	10-12	34-42
GEV/H060	75	15.00	105-128	241-294	9-11	22-26	129-158	372-455	8-10	35-43
GEV/H060	86	12.00	107-131	287-350	11-13	21-26	148-180	387-472	11-14	38-46
GEV/H060	86	15.00	107-131	280-342	9-11	21-26	153-187	390-477	9-11	39-47
GEV/H060	95	12.00	109-133	322-394	11-13	21-25	—	—	—	—
GEV/H060	95	15.00	109-133	315-385	8-10	21-25	—	—	—	—
GEH/V072 (60 Hz)	32	12.00	-	-	-	-	62-76	251-306	7-8	21-26
GEH/V072 (60 Hz)	32	18.00	-	-	-	-	66-80	252-309	5-6	22-27
GEH/V072 (60 Hz)	45	12.00	110-134	168-205	15-18	26-31	75-92	261-319	7-9	24-29
GEH/V072 (60 Hz)	45	18.00	109-133	156-190	10-12	26-32	79-97	265-324	5-6	25-30
GEH/V072 (60 Hz)	55	12.00	111-135	197-240	15-18	25-31	90-110	275-336	8-10	27-33
GEH/V072 (60 Hz)	55	18.00	110-135	184-224	10-12	25-31	95-116	280-342	6-7	28-34

Table 52. Operating pressures in cooling/heating for GE units (continued)

Operating Data										
Model	Entering Water Temp (°F)	Water Flow (GPM)	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)
GEH/V072 (60 Hz)	68	12.00	112-137	240-293	14-18	25-30	103-126	291-355	9-11	30-36
GEH/V072 (60 Hz)	68	18.00	112-137	225-275	10-12	25-30	110-134	297-362	6-8	31-38
GEH/V072 (60 Hz)	77	12.00	116-141	260-317	14-17	24-30	116-141	302-369	10-12	32-39
GEH/V072 (60 Hz)	77	18.00	115-141	245-299	9-12	25-30	123-150	308-377	7-9	33-41
GEH/V072 (60 Hz)	86	12.00	117-143	301-368	14-17	24-29	137-167	321-392	12-14	35-43
GEH/V072 (60 Hz)	86	18.00	116-142	285-349	9-11	24-29	146-179	328-401	8-10	37-45
GEH/V072 (60 Hz)	95	12.00	118-144	339-414	14-17	23-29	-	-	-	-
GEH/V072 (60 Hz)	95	18.00	118-144	323-395	9-11	24-29	-	-	-	-
GEH/V090 (60 Hz) GEH/V072 (50 Hz)	32	15.00	-	-	-	-	64-78	254-311	6-8	21-26
GEH/V090 (60 Hz) GEH/V072 (50 Hz)	32	22.50	-	-	-	-	66-80	273-334	4-5	22-27
GEH/V090 (60 Hz) GEH/V072 (50 Hz)	45	15.00	112-137	167-204	14-17	24-29	78-95	293-358	7-9	25-31
GEH/V090 (60 Hz) GEH/V072 (50 Hz)	45	22.50	112-136	156-190	9-11	24-30	82-101	299-365	5-6	26-32
GEH/V090 (60 Hz) GEH/V072 (50 Hz)	55	15.00	113-138	195-238	14-17	24-29	93-113	311-380	9-10	28-34
GEH/V090 (60 Hz) GEH/V072 (50 Hz)	55	22.50	113-138	183-223	9-11	24-29	98-120	317-387	6-7	29-35
GEH/V090 (60 Hz) GEH/V072 (50 Hz)	68	15.00	115-140	237-290	14-17	23-28	110-134	342-418	10-12	32-39
GEH/V090 (60 Hz) GEH/V072 (50 Hz)	68	22.50	114-140	223-273	9-11	23-28	118-144	349-427	7-8	33-41
GEH/V090 (60 Hz) GEH/V072 (50 Hz)	77	15.00	116-142	262-320	14-17	23-28	123-150	354-433	11-13	34-42
GEH/V090 (60 Hz) GEH/V072 (50 Hz)	77	22.50	116-141	247-302	9-11	23-28	132-161	362-442	8-9	35-43
GEH/V090 (60 Hz) GEH/V072 (50 Hz)	86	15.00	117-142	304-372	13-16	22-27	145-177	373-455	12-15	38-46
GEH/V090 (60 Hz) GEH/V072 (50 Hz)	86	22.50	116-142	289-353	9-11	22-27	157-191	381-465	8-10	39-47
GEH/V090 (60 Hz) GEH/V072 (50 Hz)	95	15.00	118-144	343-419	13-16	22-27	-	-	-	-
GEH/V090 (60 Hz) GEH/V072 (50 Hz)	95	22.50	118-144	327-399	9-11	22-27	-	-	-	-
GEH/V120 (60 Hz) GEH/V090 (50 Hz)	32	20.00	-	-	-	-	63-77	254-310	7-8	23-28

Table 52. Operating pressures in cooling/heating for GE units (continued)

Operating Data										
Model	Entering Water Temp (°F)	Water Flow (GPM)	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)
GEH/V120 (60 Hz) GEH/V090 (50 Hz)	32	30.00	-	-	-	-	66-81	257-314	5-6	23-28
GEH/V120 (60 Hz) GEH/V090 (50 Hz)	45	20.00	110-134	166-202	14-17	24-30	76-93	270-330	8-9	26-31
GEH/V120 (60 Hz) GEH/V090 (50 Hz)	45	30.00	109-134	154-188	10-12	24-30	81-98	274-335	5-6	27-33
GEH/V120 (60 Hz) GEH/V090 (50 Hz)	55	20.00	111-136	194-237	14-17	24-29	91-111	285-348	9-11	29-35
GEH/V120 (60 Hz) GEH/V090 (50 Hz)	55	30.00	111-135	181-222	9-12	24-29	97-118	290-354	6-7	30-37
GEH/V120 (60 Hz) GEH/V090 (50 Hz)	68	20.00	113-138	236-288	14-17	23-28	106-130	302-369	10-12	32-39
GEH/V120 (60 Hz) GEH/V090 (50 Hz)	68	30.00	112-137	222-271	9-11	23-29	113-138	308-376	7-8	33-41
GEH/V120 (60 Hz) GEH/V090 (50 Hz)	77	20.00	114-139	258-315	14-17	23-28	119-145	313-382	11-13	34-42
GEH/V120 (60 Hz) GEH/V090 (50 Hz)	77	30.00	114-139	243-297	9-11	23-28	127-155	319-390	7-9	35-43
GEH/V120 (60 Hz) GEH/V090 (50 Hz)	86	20.00	116-142	298-364	14-17	22-27	141-172	329-403	12-15	38-46
GEH/V120 (60 Hz) GEH/V090 (50 Hz)	86	30.00	116-142	282-345	9-11	23-28	151-184	337-411	8-10	39-47
GEH/V120 (60 Hz) GEH/V090 (50 Hz)	95	20.00	118-144	335-409	14-17	22-27	-	-	-	-
GEH/V120 (60 Hz) GEH/V090 (50 Hz)	95	30.00	118-144	319-389	9-11	22-27	-	-	-	-
GEH/V150 (60 Hz) GEH/V120 (50 Hz)	32	25.00	-	-	-	-	62-76	256-313	7-8	23-28
GEH/V150 (60 Hz) GEH/V120 (50 Hz)	32	37.50	-	-	-	-	65-80	259-317	5-6	23-29
GEH/V150 (60 Hz) GEH/V120 (50 Hz)	45	25.00	108-132	169-207	15-18	25-30	76-93	281-343	8-10	27-33
GEH/V150 (60 Hz) GEH/V120 (50 Hz)	45	37.50	108-132	157-192	10-12	25-30	80-98	285-349	6-7	28-34
GEH/V150 (60 Hz) GEH/V120 (50 Hz)	55	25.00	110-134	198-242	14-18	24-29	90-110	295-361	9-11	30-37
GEH/V150 (60 Hz) GEH/V120 (50 Hz)	55	37.50	109-134	185-226	10-12	24-30	96-117	301-367	6-8	31-38

Table 52. Operating pressures in cooling/heating for GE units (continued)

Operating Data										
Model	Entering Water Temp (°F)	Water Flow (GPM)	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)
GEH/V150 (60 Hz) GEH/V120 (50 Hz)	68	25.00	111-136	240-293	14-17	24-29	106-130	317-387	11-13	35-42
GEH/V150 (60 Hz) GEH/V120 (50 Hz)	68	37.50	111-136	225-275	9-11	24-29	113-138	323-394	7-9	36-44
GEH/V150 (60 Hz) GEH/V120 (50 Hz)	77	25.00	112-137	263-322	14-17	23-28	118-144	327-399	11-14	37-45
GEH/V150 (60 Hz) GEH/V120 (50 Hz)	77	37.50	112-137	248-303	9-11	23-28	126-154	333-407	8-10	38-46
GEH/V150 (60 Hz) GEH/V120 (50 Hz)	86	25.00	115-140	304-371	14-17	23-28	138-169	343-419	13-16	40-49
GEH/V150 (60 Hz) GEH/V120 (50 Hz)	86	37.50	114-140	288-352	9-11	23-28	148-181	350-427	9-11	41-50
GEH/V150 (60 Hz) GEH/V120 (50 Hz)	95	25.00	116-142	341-417	14-17	22-27	-	-	-	-
GEH/V150 (60 Hz) GEH/V120 (50 Hz)	95	37.50	116-142	325-397	9-11	22-27	-	-	-	-
GEH/V180 (60 Hz) GEH/V150 (50 Hz)	32	30.00	-	-	-	-	57-69	257-314	6-8	22-27
GEH/V180 (60 Hz) GEH/V150 (50 Hz)	32	45.00	-	-	-	-	59-72	259-317	5-6	23-28
GEH/V180 (60 Hz) GEH/V150 (50 Hz)	45	30.00	106-129	174-213	15-18	24-30	72-88	281-344	8-9	27-33
GEH/V180 (60 Hz) GEH/V150 (50 Hz)	45	45.00	105-129	162-198	10-12	25-30	76-93	286-349	5-7	28-34
GEH/V180 (60 Hz) GEH/V150 (50 Hz)	55	30.00	107-131	203-248	15-18	24-29	86-105	297-364	9-11	30-37
GEH/V180 (60 Hz) GEH/V150 (50 Hz)	55	45.00	107-130	190-232	10-12	24-30	91-111	303-371	6-8	31-38
GEH/V180 (60 Hz) GEH/V150 (50 Hz)	68	30.00	109-133	245-300	14-18	24-29	103-126	323-395	10-13	35-42
GEH/V180 (60 Hz) GEH/V150 (50 Hz)	68	45.00	109-133	230-282	10-12	24-29	109-134	329-403	7-9	36-44
GEH/V180 (60 Hz) GEH/V150 (50 Hz)	77	30.00	110-134	269-329	14-17	23-28	115-141	335-410	11-14	37-45
GEH/V180 (60 Hz) GEH/V150 (50 Hz)	77	45.00	110-134	254-310	10-12	23-28	123-150	342-418	8-10	38-47
GEH/V180 (60 Hz) GEH/V150 (50 Hz)	86	30.00	113-138	310-378	14-17	23-28	136-167	354-433	13-15	40-49

Table 52. Operating pressures in cooling/heating for GE units (continued)

Operating Data										
Model	Entering Water Temp (°F)	Water Flow (GPM)	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)
GEH/V180 (60 Hz) GEH/V150 (50 Hz)	86	45.00	112-137	293-359	9-12	23-28	146-178	361-442	9-11	42-51
GEH/V180 (60 Hz) GEH/V150 (50 Hz)	95	30.00	114-140	347-424	14-17	22-27	-	-	-	-
GEH/V180 (60 Hz) GEH/V150 (50 Hz)	95	45.00	114-139	330-404	9-11	22-27	-	-	-	-
GEH/V240 (60 Hz) GEH/V180 (50 Hz)	32	40.00	-	-	-	-	58-71	244-299	6-8	21-26
GEH/V240 (60 Hz) GEH/V180 (50 Hz)	32	60.00	-	-	-	-	60-74	250-305	4-5	22-27
GEH/V240 (60 Hz) GEH/V180 (50 Hz)	45	40.00	111-136	166-202	15-18	24-30	72-88	266-325	7-9	25-31
GEH/V240 (60 Hz) GEH/V180 (50 Hz)	45	60.00	111-136	153-188	10-12	24-30	76-93	270-330	5-6	26-32
GEH/V240 (60 Hz) GEH/V180 (50 Hz)	55	40.00	113-138	194-238	14-18	24-29	86-106	280-342	8-10	28-35
GEH/V240 (60 Hz) GEH/V180 (50 Hz)	55	60.00	112-137	181-221	10-12	24-29	92-112	285-348	6-7	29-36
GEH/V240 (60 Hz) GEH/V180 (50 Hz)	68	40.00	114-140	236-289	14-17	23-29	104-128	303-370	10-12	33-40
GEH/V240 (60 Hz) GEH/V180 (50 Hz)	68	60.00	114-140	222-271	9-12	23-29	111-136	309-377	7-8	34-41
GEH/V240 (60 Hz) GEH/V180 (50 Hz)	77	40.00	116-141	261-319	14-17	23-28	117-143	314-383	11-13	35-42
GEH/V240 (60 Hz) GEH/V180 (50 Hz)	77	60.00	115-141	246-300	9-12	23-28	125-152	320-392	8-9	36-44
GEH/V240 (60 Hz) GEH/V180 (50 Hz)	86	40.00	118-144	301-368	14-17	23-28	139-169	331-404	12-15	38-46
GEH/V240 (60 Hz) GEH/V180 (50 Hz)	86	60.00	118-144	285-348	9-11	23-28	149-182	337-412	8-10	39-48
GEH/V240 (60 Hz) GEH/V180 (50 Hz)	95	40.00	119-146	338-414	14-17	22-27	-	-	-	-
GEH/V240 (60 Hz) GEH/V180 (50 Hz)	95	60.00	119-146	322-393	9-11	22-27	-	-	-	-
GEH/V300 (60 Hz) GEH/V240 (50 Hz)	32	50.00	-	-	-	-	57-70	255-312	6-8	22-27
GEH/V300 (60 Hz) GEH/V240 (50 Hz)	32	75.00	-	-	-	-	59-72	261-319	4-5	23-28

Table 52. Operating pressures in cooling/heating for GE units (continued)

Operating Data										
Model	Entering Water Temp (°F)	Water Flow (GPM)	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)
GEH/V300 (60 Hz) GEH/V240 (50 Hz)	45	50.00	108-132	171-209	15-18	24-30	68-83	278-339	7-9	26-32
GEH/V300 (60 Hz) GEH/V240 (50 Hz)	45	75.00	108-132	158-193	10-12	25-30	72-88	282-344	5-6	27-33
GEH/V300 (60 Hz) GEH/V240 (50 Hz)	55	50.00	110-134	199-243	15-18	24-29	82-101	293-358	9-10	30-36
GEH/V300 (60 Hz) GEH/V240 (50 Hz)	55	75.00	109-134	185-226	10-12	24-30	87-106	298-364	6-7	31-37
GEH/V300 (60 Hz) GEH/V240 (50 Hz)	68	50.00	112-137	240-293	15-18	23-29	102-125	318-389	10-13	34-42
GEH/V300 (60 Hz) GEH/V240 (50 Hz)	68	75.00	111-136	225-275	10-12	24-29	108-133	325-397	7-9	36-44
GEH/V300 (60 Hz) GEH/V240 (50 Hz)	77	50.00	113-138	262-321	14-18	23-28	114-139	330-403	11-14	37-45
GEH/V300 (60 Hz) GEH/V240 (50 Hz)	77	75.00	112-137	247-302	10-12	23-28	122-149	337-412	8-9	38-47
GEH/V300 (60 Hz) GEH/V240 (50 Hz)	86	50.00	115-140	303-370	14-18	23-28	135-165	348-425	12-15	40-49
GEH/V300 (60 Hz) GEH/V240 (50 Hz)	86	75.00	114-140	287-351	10-12	23-28	145-177	354-433	9-10	41-50
GEH/V300 (60 Hz) GEH/V240 (50 Hz)	95	50.00	117-143	339-414	14-17	22-27	-	-	-	-
GEH/V300 (60 Hz) GEH/V240 (50 Hz)	95	75.00	116-142	323-394	9-12	22-27	-	-	-	-

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 53. Cooling water pressure drop (WPD) in feet of head for GE* units

Unit Size (60 Hz)	Unit Size (50 Hz)	EWT °F	GPM	Ft. Pressure
GEV/H006	—	86	1.5	1.8
GEV/H009	—	86	2.3	2.6
GEV/H012	—	86	3.0	5.4
GEV/H015	—	86	3.8	8.6

Table 53. Cooling water pressure drop (WPD) in feet of head for GE* units (continued)

Unit Size (60 Hz)	Unit Size (50 Hz)	EWT °F	GPM	Ft. Pressure
GEV/H018	—	86	4.5	11.8
GEV/H024	—	86	6.0	6.2
GEV/H030	—	86	7.5	7.9
GEV/H036	—	86	9.0	11.7
GEV/H042	—	86	10.5	8.5
GEV/H048	—	86	12.0	13.8
GEV/H060	—	86	15.0	12.4
GEV072	—	86	18.0	12.0
GEV090	GEV072	86	22.5	13.4

Table 53. Cooling water pressure drop (WPD) in feet of head for GE* units (continued)

Unit Size (60 Hz)	Unit Size (50 Hz)	EWT °F	GPM	Ft. Pressure
GEV120	GEV090	86	30.0	14.1
GEV150	GEV120	86	37.5	13.4
GEV180	GEV150	86	45.0	18.2
GEV240	GEV180	86	60.0	14.0
GEV300	GEV240	86	75.0	13.2

Table 54. Heating water pressure drop (WPD) in feet of head for * GE units

Unit Size (60 Hz)	Unit Size (50 Hz)	EWT °F	GPM	Ft. Pressure
GEH072	—	68	18.0	13.9
GEH090	GEH072	68	22.5	15.7
GEH120	GEH090	68	30.0	16.0
GEH150	GEH120	68	37.5	14.8
GEH180	GEH150	68	45.0	20.3
GEV/H006	—	68	1.5	1.9
GEV/H009	—	68	2.3	2.9
GEV/H012	—	68	3.0	5.9
GEV/H015	—	68	3.8	9.5
GEV/H018	—	68	4.5	12.8
GEV/H024	—	68	6.0	6.4
GEV/H030	—	68	7.5	8.5
GEV/H036	—	68	9.0	12.6
GEV/H042	—	68	10.5	9.0
GEV/H048	—	68	12.0	14.1
GEV/H060	—	68	15.0	12.6
GEV072	—	68	18.0	13.9
GEV090	GEV072	68	22.5	15.3
GEV120	GEV090	68	30.0	16.0
GEV150	GEV120	68	37.5	14.8

Table 54. Heating water pressure drop (WPD) in feet of head for * GE units (continued)

Unit Size (60 Hz)	Unit Size (50 Hz)	EWT °F	GPM	Ft. Pressure
GEV180	GEV150	68	45.0	20.3
GEV240	GEV180	68	60.0	16.0
GEV300	GEV240	68	75.0	14.8

Water Volume

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

Table 55. Water volume for GE* units

Unit Size (60 Hz)	Unit Size (50 Hz)	Water Side Volume (in^3)	Water Side Volume (ft^3)	Water Side Volume (gallons)
GEV/H006	—	27.5	0.016	0.119
GEV/H009	—	27.5	0.016	0.119
GEV/H012	—	27.5	0.016	0.119
GEV/H015	—	34.6	0.02	0.15
GEV/H018	—	41.0	0.024	0.177
GEV/H024	—	41.0	0.024	0.177
GEV/H030	—	62.9	0.036	0.272
GEV/H036	—	62.9	0.036	0.272
GEV/H042	—	118.6	0.069	0.513
GEV/H048	—	118.6	0.069	0.513
GEV/H060	—	196.5	0.114	0.851
GEV/H072	—	181.0	0.105	0.783
GEV/H090	GEV/H072	214.0	0.125	0.927
GEV/H120	GEV/H090	390.0	0.227	1.69
GEV/H150 GEV/H180	GEV/H120 GEV/H150	508.0	0.296	2.201
GEV/H240	GEV/H180	779.0	0.453	3.374
GEV/H300	GEV/H240	1057.0	0.615	4.576

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.

These units are intended to only be serviced or manipulated by approved personnel.

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 56. Filter sizing GE* models

Size (60 Hz)	Size (50 Hz)	Filter Size (Nominal) inches
GEH		
006	—	14 x 16
009	—	14 x 16
012	—	14 x 16
015	—	16 x 19
018	—	16 x 19
024	—	17 x 20
030	—	17 x 20
036	—	18 x 23
042	—	18 x 23
048	—	20 x 30
060	—	20 x 30
072	—	20 x 25 (3)
090	072	20 x 25 (3)
120	090	20 x 25 (3)

Table 56. Filter sizing GE* models (continued)

Size (60 Hz)	Size (50 Hz)	Filter Size (Nominal) inches
150	120	20 x 25 (3)
180	150	20 x 25 (3)
GEV		
006	—	14 x 16
009	—	14 x 16
012	—	14 x 16
015	—	16 x 19
018	—	16 x 19
024	—	17 x 20
030	—	17 x 20
036	—	18 x 23
042	—	18 x 23
048	—	20 x 30
060	—	20 x 30
072	—	20 x 20 (4)
090	072	20 x 20 (4)
120	090	20 x 20 (4)
150	120	20 x 25 (6)
180	150	20 x 25 (6)
240	180	20 x 25 (6)
300	240	20 x 25 (6)

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 confirm 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 57. 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 57. 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, confirm 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 is created that prevents 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 containing the deluxe control option is easy using the three light emitting diodes (LEDs). These LEDs are provided for indicating the operating mode of the controller and are labeled on the circuit board with numbers as referenced in the table below.

Table 58. 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 59. Troubleshooting table

Problem	Heating	Cooling	Cause	Correction
No response to any thermostat setting				
	X	X	Main power off	Check fuses
	X	X	Defective control transformer	Replace
	X	X	Broken or loose connection	Repair
	X	X	Defective thermostat	Replace
	X	X	Transformer	Reset Transformer
Unit short cycles	X	X	Thermostat or sensor improperly located	Relocate

Table 59. 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 59. 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 diagrams and isolation valve wiring connections.

Table 60. Isolation valve wiring connections (0.5 to 5 tons)

Control Type	3-Wire Isolation Valve Connections (0.5 to 5 tons)		
	Common	Close	Open
Deluxe 24V	93B	92B	91B

Note: *For field installed valves, wires 91B, 92B and 93B are coiled behind control box. For field-provided two wire valves connect to wires 91B and 93B.*

Table 61. Isolation valve wiring connections (6 to 25 tons)

Control Type	3-Wire Honeywell Isolation Valve Connections (6 to 25 tons)		
	Blue	Brown	Black
Deluxe 24V	1TB1-6	1TB1-1	1TB1-4

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 62. Wiring diagram matrix for 0.5 to 6 tons GEV/H, EXV/H, and DXV/H models

Number	Unit Description	Model
23115845	DELUXE CONTROLS 2 STAGE HEAT PUMP w/ECM MOTOR, SINGLE PHASE	DX only
23115846	DELUXE CONTROLS HEAT PUMP w/HOT GAS REHEAT AND ECM MOTOR, SINGLE PHASE	EX/GE
23115847	DELUXE CONTROLS HEAT PUMP w/WATER SIDE ECONOMIZER AND ECM MOTOR, SINGLE PHASE	EX/GE
23115848	DELUXE CONTROLS HEAT PUMP w/ECM MOTOR, SINGLE PHASE	EX/GE
23115849	DELUXE CONTROLS 2 STAGE HEAT PUMP w/ECM MOTOR, THREE PHASE	DX only
23115850	DELUXE CONTROLS HEAT PUMP w/HOT GAS REHEAT AND ECM MOTOR, THREE PHASE	EX/GE
23115851	DELUXE CONTROLS HEAT PUMP w/WATER SIDE ECONOMIZER AND ECM MOTOR, THREE PHASE	EX/GE
23115852	DELUXE CONTROLS HEAT PUMP w/ECM MOTOR, THREE PHASE	EX/GE
23115861	SYMBIO™ 400-B CONTROLS w/ECM MOTOR, SINGLE PHASE	EX/DX/GE
23115862	SYMBIO™ 400-B CONTROLS w/ECM MOTOR, THREE PHASE	EX/DX/GE
23116088	DELUXE CONTROLS 2 STAGE HEAT PUMP w/HOT GAS REHEAT, SINGLE PHASE	DXV/H
23116089	DELUXE CONTROLS 2 STAGE HEAT PUMP w/HOT GAS REHEAT, THREE PHASE	DXV/H
23116151	DELUXE CONTROLS HEAT PUMP w/BOILERLESS ELECTRIC HEAT, SINGLE PHASE	EX/GE
23116152	DELUXE CONTROLS HEAT PUMP w/BOILERLESS ELECTRIC HEAT, THREE PHASE	EX/GE
23116153	400-B CONTROLS HEAT PUMP w/BOILERLESS ELECTRIC HEAT CONTROL, SINGLE PHASE	EX/DX/GE
23116154	400-B CONTROLS HEAT PUMP w/BOILERLESS ELECTRIC HEAT CONTROL, THREE PHASE	EX/DX/GE

Table 62. Wiring diagram matrix for 0.5 to 6 tons GEV/H, EXV/H, and DXV/H models (continued)

23116156	400-B CONTROLS HEAT PUMP AND HOT GAS REHEAT w/BOILERLESS ELEC HEAT CONTROL, SINGLE PHASE	EX/DX/GE
23116157	400-B CONTROLS HEAT PUMP AND HOT GAS REHEAT w/BOILERLESS ELEC HEAT CONTROL, THREE PHASE	EX/DX/GE

Figure 75. GEH-V (6 to 25 tons) - deluxe 208V 60 Hz - 3 ph

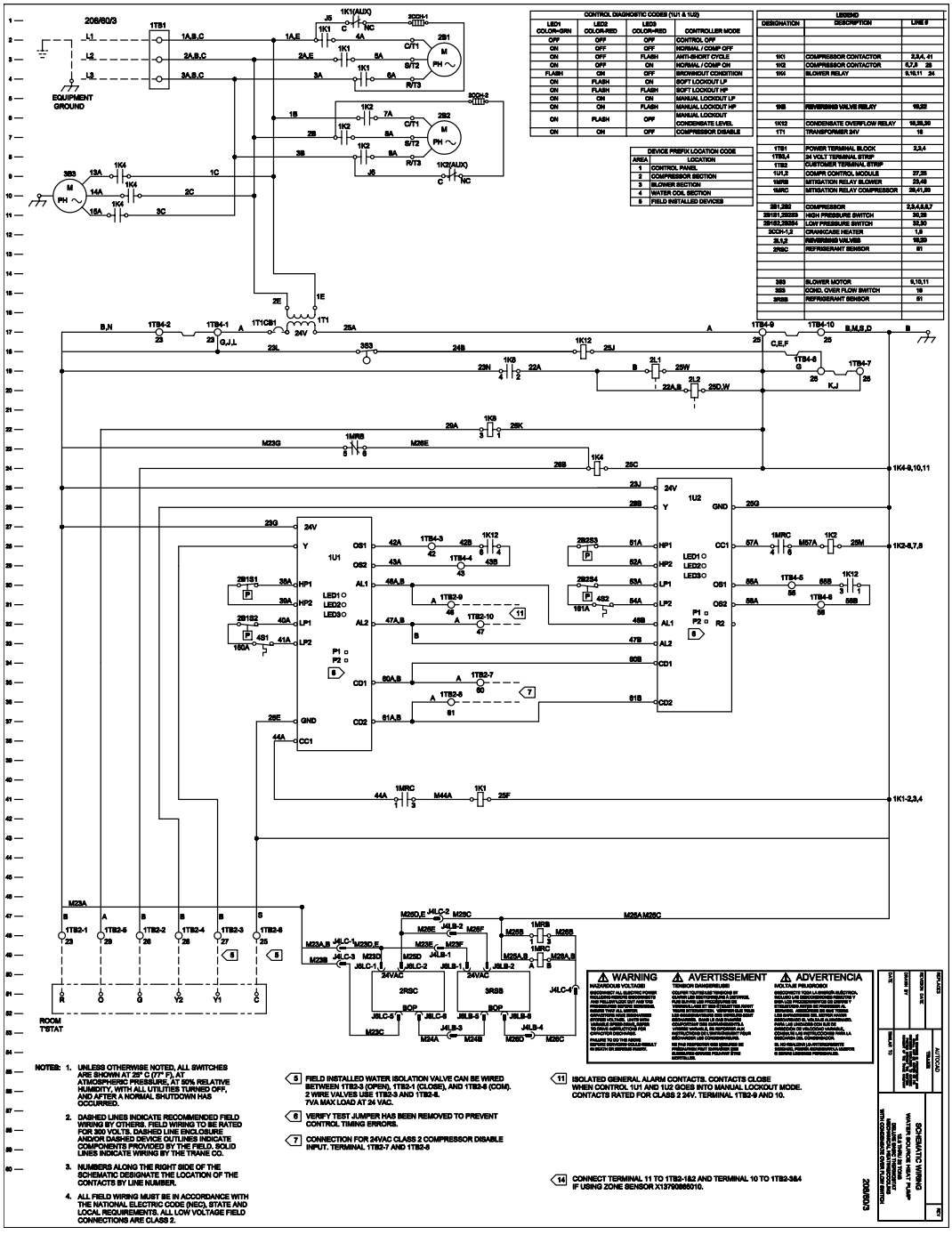
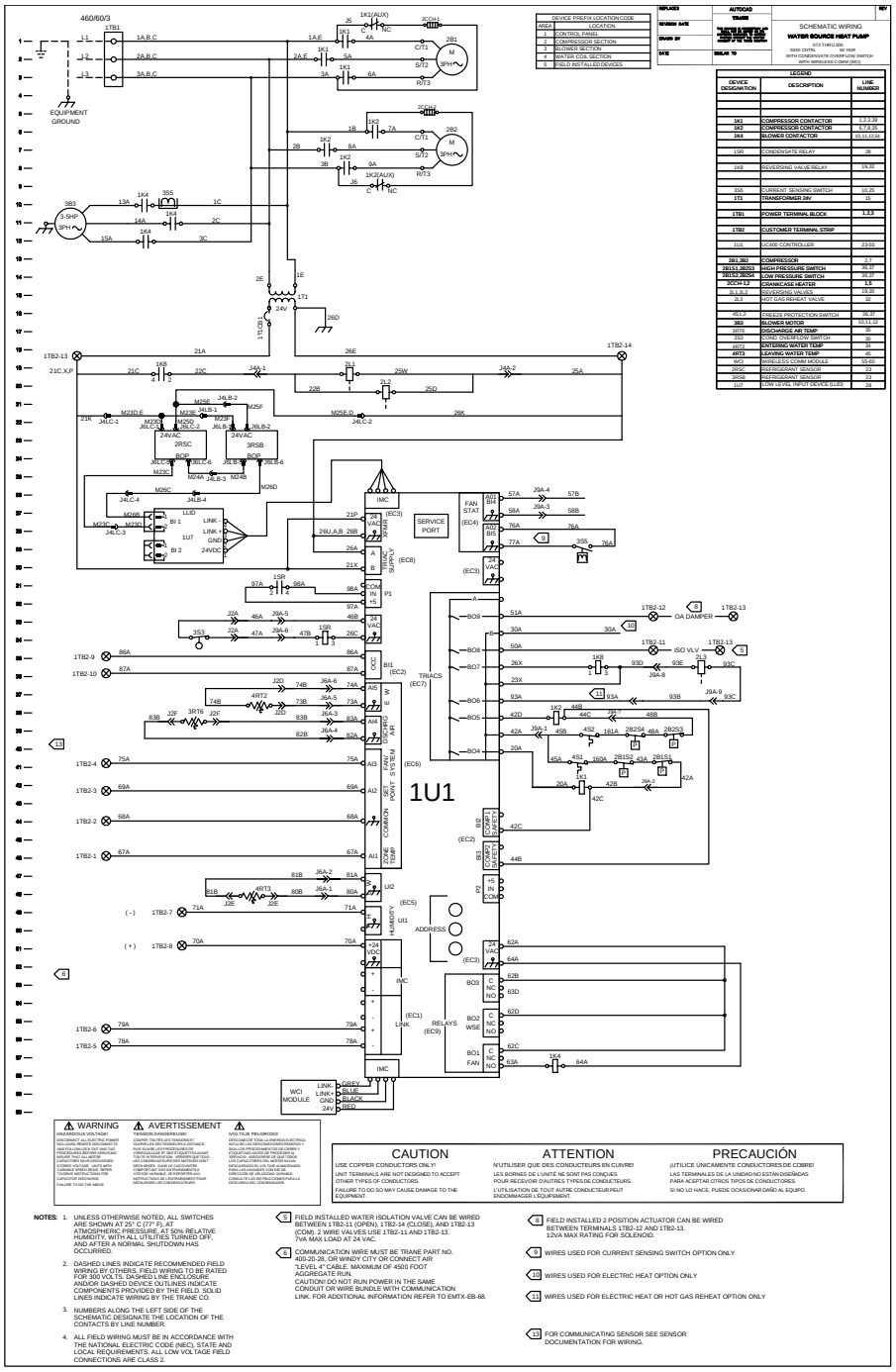


Figure 76. GEH_V (6 to 25 tons) - Symbio™ 500



DEVICE DESIGNATION	DESCRIPTION	LINE NUMBER
1K1	COMPRESSOR CONTACTOR	1,2,3,39
1K2	COMPRESSOR CONTACTOR	4,7,8,39
1K4	BLOWER CONTACTOR	10,11,12,39
1SR	CONDENSATE RELAY	28
1K8	REVERSING VALVE RELAY	19,32
3SS	CURRENT SENSING SWITCH	10,25
1T1	TRANSFORMER 24V	15
1TB1	POWER TERMINAL BLOCK	1,2,3
1TB2	CUSTOMER TERMINAL STRIP	
1U1	UC400 CONTROLLER	23-55
2S1,2S2	COMPRESSOR	2,7
2S1S1,2S2S2	HIGH PRESSURE SWITCH	36,37
2S1S2,2S2S4	LOW PRESSURE SWITCH	35,37
2CCH-12	CRANKCASE HEATER	1,5
2L1,2L2	REVERSING VALVES	19,20
2L3	HOT GAS REHEAT VALVE	32
4S1,2	FREEZE PROTECTION SWITCH	36,37
3B3	BLOWER MOTOR	10,11,12
2S1S	DISCHARGE AIR TEMP	35
3S3	COND. OVERFLOW SWITCH	30
4S13	ENTERING WATER TEMP	37
4S13	LEAVING WATER TEMP	45
WCI	WIRELESS COMM MODULE	55-60
2S1C	REFRIGERANT SENSOR	23
2S1S8	REFRIGERANT SENSOR	23
1U7	LOW LEVEL INPUT DEVICE (LLID)	28

NOTES:

1. UNLESS OTHERWISE NOTED, ALL SWITCHES ARE SHOWN AT 25° C (77° F), AT ATMOSPHERIC PRESSURE, AT 50% RELATIVE HUMIDITY, WITH ALL UTILITIES TURNED OFF, AND AFTER A NORMAL SHUTDOWN HAS OCCURRED.
2. DASHED LINES INDICATE RECOMMENDED FIELD WIRING BY OTHERS. FIELD WIRING TO BE RATED FOR 300 VOLTS. DASHED LINE ENCLOSURE AND/OR DASHED DEVICE OUTLINES INDICATE COMPONENTS PROVIDED BY THE FIELD. SOLID LINES INDICATE WIRING BY THE TRANE CO.
3. NUMBERS ALONG THE LEFT SIDE OF THE SCHEMATIC DESIGNATE THE LOCATION OF THE CONTACTS BY LINE NUMBER.
4. ALL FIELD WIRING MUST BE IN ACCORDANCE WITH THE NATIONAL ELECTRIC CODE (NEC), STATE AND LOCAL REQUIREMENTS. ALL LOW VOLTAGE FIELD CONNECTIONS ARE CLASS 2.

5. FIELD INSTALLED WATER ISOLATION VALVE CAN BE WIRED BETWEEN 1TB2-11 (OPEN), 1TB2-14 (CLOSE), AND 1TB2-13 (COM). 2 WIRE VALVES USE 1TB2-11 AND 1TB2-13. 7VA MAX LOAD AT 24 VAC.
6. COMMUNICATION WIRE MUST BE TRANE PART NO. 400-20-28, OR WINDY CITY OR CONNECT AIR "LEVEL 4" CABLE. MAXIMUM OF 4500 FOOT AGGREGATE RUN. CAUTION! DO NOT RUN POWER IN THE SAME CONDUIT OR WIRE BUNDLE WITH COMMUNICATION LINK. FOR ADDITIONAL INFORMATION REFER TO EMTX-EB-68.
8. FIELD INSTALLED 2 POSITION ACTUATOR CAN BE WIRED BETWEEN TERMINALS 1TB2-12 AND 1TB2-13. 12VA MAX RATING FOR SOLENOID.
9. WIRES USED FOR CURRENT SENSING SWITCH OPTION ONLY
10. WIRES USED FOR ELECTRIC HEAT OPTION ONLY
11. WIRES USED FOR ELECTRIC HEAT OR HOT GAS REHEAT OPTION ONLY
13. FOR COMMUNICATING SENSOR SEE SENSOR DOCUMENTATION FOR WIRING.

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.

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