



High Efficiency Horizontal and Vertical Water-Source Comfort System

Axiom™
1/2 - 5 Tons — 60 HZ — Model GEH/GEV



March 2005

WSHP-PRC001-EN



Introduction

Imagine a full range of comfort utilizing efficiency, sound attenuation, integrated controls, and superior maintenance accessibility... Trane imagined it, and designed an advanced mechanical system. Introducing models GEH and GEV water source comfort solutions.

Model GEH (*pictured below*) is a ceiling hung product that provides a sleek, innovative shape, along with convertibility of the supply-air and the return-air arrangement; serviceability to maintenance components; indoor air quality standards; sound attenuation; and best of all, higher efficiencies with certified ARI-ISO 13256-1 performance and ASHRAE 90.1 standards.

Trane's new design incorporates system advantages such as:

- 1** Maximum return-air and supply-air flexibility
- 2** Superior maintenance accessibility
- 3** Dual-sloped, plastic drain pan
- 4** Multi-speed motor
- 5** Insulated enclosure for quiet unit design
- 6** Integrated controls
- 7** Orifice ring motor mounting device as standard *for ease of motor service*
- 8** High and low pressure safeties as standard
- 9** Internal air-to-refrigerant coil (horizontal design)

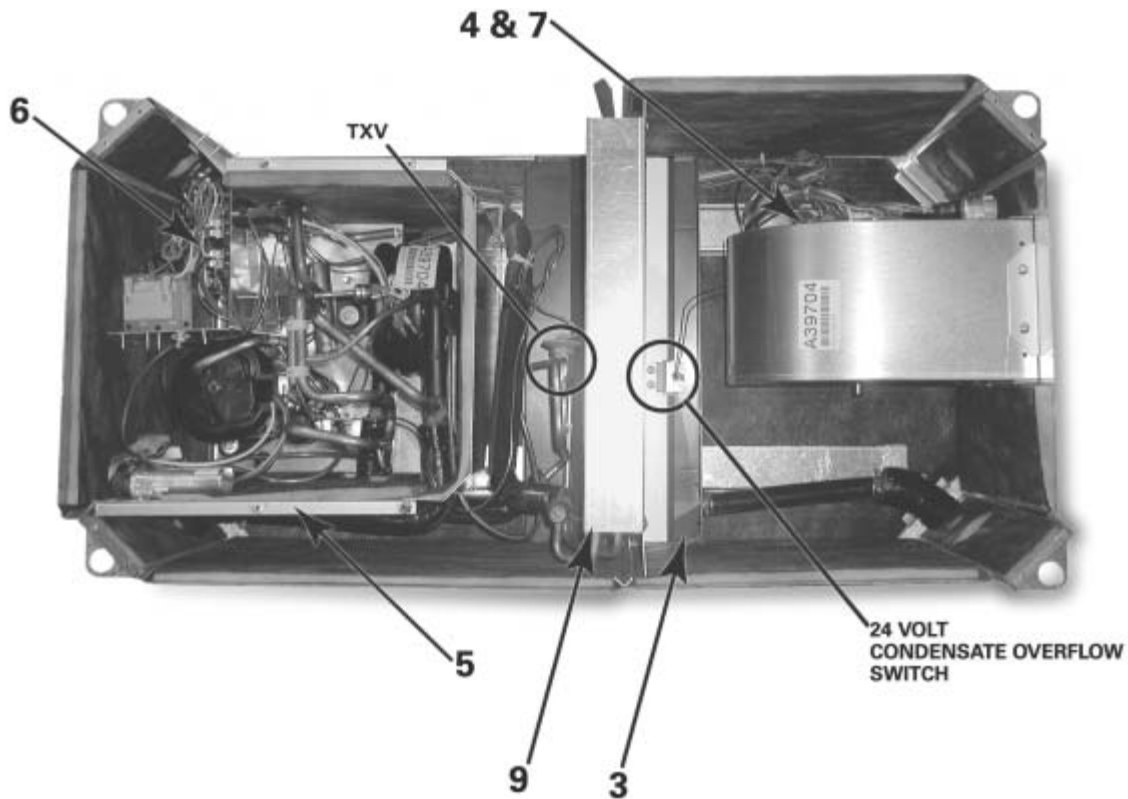


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Features and Benefits

Design Advantages

The horizontal and vertical configurations range in capacities from 1/2 to 5 tons.

The innovative designs offers superior field flexibility at the jobsite along with service accessibility.

Model GEH Cabinet

The GEH cabinet design includes a modular platform that utilizes similar parts and assemblies throughout the product line. It is constructed of heavy gauge (non-painted) galvanized metal for maximum durability and corrosive resistive exterior.

The cabinet front allows service access for the controls and refrigeration circuitry. Water-in/out connection and high/low voltage hook-up is accomplished at the 45-degree corners on the front-side of the equipment.

The unit offers six product variations of return-air and supply-air combinations which may be order-specific or job-site modified. See Figure 1 component platform location.

Model GEV Cabinet

The vertical design, model GEV includes a 3 1/3-ton configuration physically sized for condominium installations.

The cabinet design contains a modular platform utilizing similar parts and assemblies to the horizontal to provide a repetitious look and feel for installation and maintenance personnel. It is constructed of heavy gauge (non-painted) galvanized metal for maximum durability and corrosive resistive exterior.

The cabinet front allows service access for the controls and refrigeration circuitry. Water-in/out connection, drain connection, and high/low voltage hook-up is accomplished at the 45-degree chamfered corners on the front-side of the equipment. The vertical design offers four product variations of return-air and supply-air combinations.

The GEV model's supply air arrangement may be field converted through a service kit to aid in stocking of a single unit variation. See Figure 2 for component platform location.

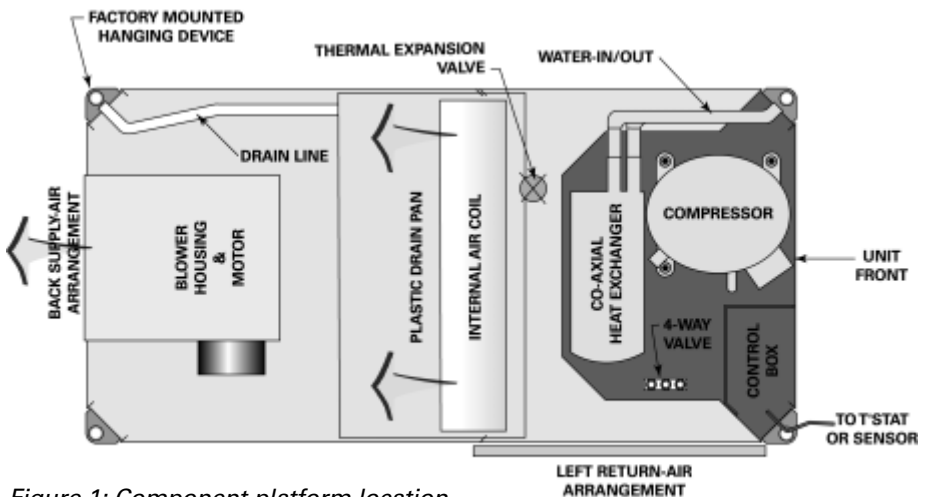


Figure 1: Component platform location

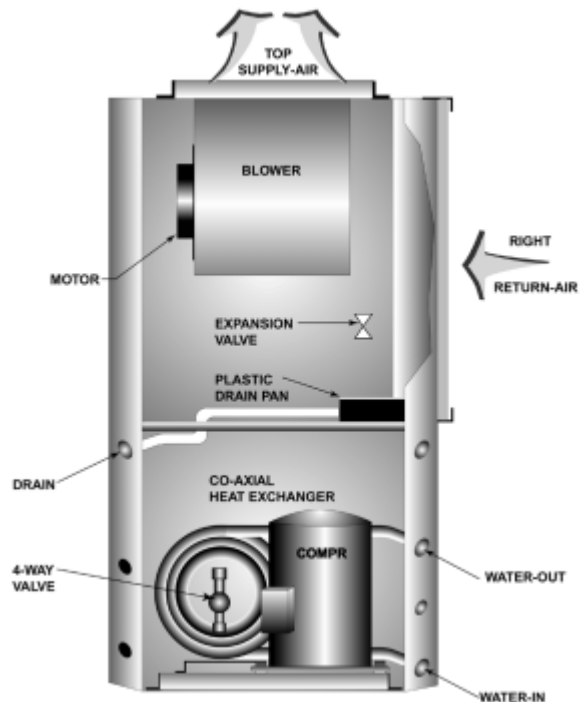


Figure 2: Component platform location

Features and Benefits

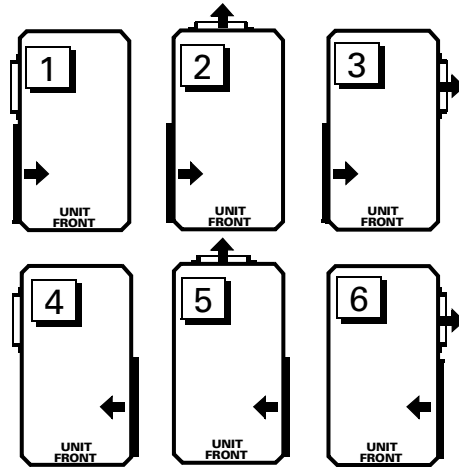


Figure 3: Airflow combinations of GEH 1/2 through 5-tons

Supply/Return Air Combinations
The GEH model configuration may be built to order or modified on-site to meet unique installation requirements. The *six combinations* include:

- 1 Left return-air with left supply-air combination
- 2 Left return-air with rear supply-air combination
- 3 Left return-air with right supply-air combination
- 4 Right return-air with left supply-air combination
- 5 Right return-air with rear supply-air combination
- 6 Right return-air with right supply-air combination

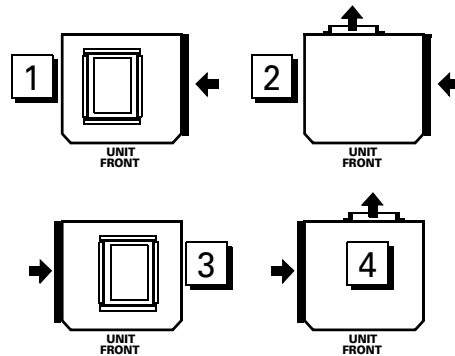


Figure 4: Airflow combinations of GEV 1/2 through 5-ton

See Figure 3 for the six field convertible combinations.

GEV Flexibility

The GEV model is also capable of on-site modifications. With the vertical configuration, the supply-air is easily converted from a top supply-air to a back supply-air *with a service retrofit kit*. The return-air option is order specific. The *four combinations* include:

- 1 Right return-air with top supply-air combination
- 2 Right return-air with back supply-air combination
- 3 Left return-air with top supply -air combination
- 4 Left return-air with back supply-air combination

See Figure 4 for the four supply-air/return-air combinations.

Features and Benefits

Hangings Device

The hanging bracket resides in the chamfered corner of the horizontal 1/2 to 5 ton equipment. This partially-concealed bracket design eliminates added height, width, or length to the product. The brackets are factory mounted to shorten job installation requirements.

The structural integrity of the design helps assure no bracket deflection or unit bowing from the unit's weight.

Field return-air hook-up and filter maintenance are more simplistic. Isolation for the hanging bracket is provided with a neoprene rubber grommet design. This isolation device helps prevent sound vibration from reaching the structural support members of the building during compressor start and stop. See *Figure 5* for isolation device.

Drain Pan

The unit drain pan is composed of plastic, corrosive resistive material. The pan is positively sloped to comply with ASHRAE 62 for (IAQ) indoor air quality conformity.

Access to the drain pan is provided through two access panels for cleaning purposes. See *Figure 6* for plastic drain pan.

Cabinet Insulation

The cabinet insulation design meets UL 181 requirements. The air stream surface of the insulation is fabricated of a non-biodegradable source.

Refrigeration Piping

The unit's copper tubing is created from a 99% pure copper formation that conforms to the American Society of Testing (ASTM) B743 for seamless, light-annealed processing.

The unit's copper refrigeration system is designed to be free from contaminants and conditions such as drilling fragments, dirt, or oil. This excludes the possibility of these contaminants from damaging the compressor motor.

Compressor

The unit's design includes a wide variety of compressor motors to accommodate dedicated voltages and tonnage sizes. The 1/2 ton through 1 1/2 ton products embody a rotary compressor design, where as unit sizes ranging from 2 ton through 4 ton include a reciprocating compressor style, while the 5 ton unit contains a scroll compressor. These different styles allow Trane to provide the voltage variations along with noise reduction required in today's applications. See *Figure 7* for reciprocating compressor.

Schrader Connections

The connections for the low and high side of the refrigeration system are located directly beside the control box at the front, service access panel. See *Figure 8* for schrader connection location.



Figure 5: Hanging bracket design



Figure 6: Plastic drain pan



Figure 7: Reciprocating compressor



Figure 8: Schrader connections

Features and Benefits



Figure 9: Coaxial water coil



Figure 10: Water connection device



Figure 11: Thermal expansion valve



Figure 12: Reversing valve

Co-axial Water-to-Refrigerant Coil

The unit's internal heat exchanging water coil is engineered for maximum heat transfer.

The copper or cupro-nickel seamless tubing is a tube within a tube design. The inner-water tube contains a deep fluted curve to enhance heat transfer and minimize fouling and scaling. It is available in either copper or cupro-nickel (selectable option) coil. The outer refrigerant gas tube is made from steel material. The coil is leak tested to assure there is no cross leakage between the water tube and the refrigerant gas (steel tube) coil. *Co-axial heat exchangers are more tolerant to freeze rupture.* See Figure 9 for co-axial water coil.

Compressor and Co-axial Coil Isolation

Vibration isolation of the compressor and co-axial water coil is accomplished by increasing the rigidity and stiffness at the base. The platform provides double isolation to the compressor and single isolation to the co-axial water coil for additional attenuation during compressor start and stop.

Water Connections

The water-in/water-out connections to the co-axial water coil are located on the right-hand chamfered corner of the unit. The fittings are mounted flush to the chamfered wall to help limit shipping damage.

The water connection devices are constructed of copper or bronze material and include a National Female Pipe Thread (NFPT) junction. The connections are attached to the unit's chamfer corner to alleviate the need for a back-up wrench during installation. See Figure 10 for water connection device.

Expansion Valve

All Trane water-source systems include an expansion valve flow metering device.

This thermal expansion valve (TXV) al-

lows the unit to operate with an entering fluid temperature from 25 F to 110 F, and entering air temperatures from 40 F to 90 F. The valve is designed to meter refrigerant flow through the circuitry to achieve desired heating or cooling.

The expansion valve device allows the exact amount of refrigerant required to meet the coil load demands. This precise metering by the TXV increases the efficiency of the unit. See Figure 11 for thermal expansion valve.

Reversing Valve

A system reversing valve (4-way valve) is included with all heating/cooling units. This valve is piped to be energized in the cooling mode to allow the system to provide heat if valve failure were to occur. Once the valve is energized for cooling, it will remain energized until the control system is turned to the OFF position, or a heating cycle is initiated.

Units with the cooling only option will not receive a reversing valve. See Figure 12 for reversing valve.

Features and Benefits

Blower Motor

The supply-air (blower) motor is a multi-speed motor with internal thermal overload protection. The motor bearings are permanently lubricated and sealed. Standard motors are rated from .20 ESP. *Optional* high static motors are rated from .40 to 1.40 ESP. All motors are factory wired to the option selected. A high, medium, and low speed tap is provided for field customization on most voltages. The speed tap modification can be made in the control box of the unit. See *Figure 13* for blower motor.

Note: The 380, 415, 460 and 575 volt designs are provided in a dual or three-speed version only. See fan performance section for factory ratings (Page 66).

Serviceability to the motor is made through either of the two air-side access doors for the horizontal configuration, and through one air-side access door on vertical configuration. The motor and blower wheel are removable by an orifice ring mounted to the fan housing.

Blower Housing

The blower housing is constructed of non-corrosive galvanized steel. A factory-mounted orifice ring is provided for ease of motor serviceability on the 1/2 through 5-ton direct drive units. All air-side panels are interchangeable with one another for ease of field convertibility of the supply-air on the GEH model.

Air-Side Filter

The air-side filter incorporates a 1-inch thick (nominal) or 2-inch thick (nominal) disposable fiberglass option. These filters include an average synthetic dust weight arrestance of approximately 75%. This dust holding capability includes a colorless, odorless adhesive to retain dirt particles within the filter media after fiber contact. See *Figure 14* for filter media.

Air-to-Refrigerant Coil

The air-to-refrigerant heat exchanger is constructed of staggered copper tubes with die-formed corrugated lanced aluminum fins. The fins are then mechanically bonded to the tubes through expansion.

The coil is placed internal of the unit design for the GEH model to provides an optional dual filtration application. With dual filtration to the GEH unit, maintenance to the filter is significantly less than with a single filtration system. This design also offers maximum flexibility of the supply and return air configurations.

The maximum working pressure for both the GEH and GEV coils is 450 psig. It is designed for maximum capacity with an additional benefit of physical unit size reduction.

Coil specifications for both GEH and GEV models may be found on in the General Data section on page 36 of this catalog. See *Figure 15* for internal air to refrigerant coil placement.



Figure 13: Blower motor (direct drive)

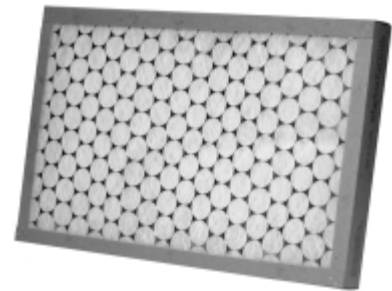


Figure 14: Filter media



Figure 15: Internal air-to-refrigerant coil placement (model GEH)

Features and Benefits

The sound package for the horizontal unit includes:

Table 1: Sound Package (GEH units ONLY)

Enhanced Sound Attenuation Package (Standard)	Deluxe Sound Attenuation Package (Option)
18-gauge compressor enclosure	16-gauge compressor enclosure
18-gauge single wall front panel	16-gauge single wall front panel
lined compressor enclosure with 1/2-inch cabinet insulation	lined compressor enclosure with 1/2-inch cabinet insulation
compressor discharge muffler	compressor discharge muffler
12-gauge compressor/water-to-refrigerant heat exchanger pan with second stage of vibration isolation	12-gauge compressor/water-to-refrigerant heat exchanger pan with second stage of vibration isolation
compressor vibration isolation	compressor vibration isolation
water-to-refrigerant heat exchanger vibration isolation	water-to-refrigerant heat exchanger vibration isolation
lengthwise unit base stiffeners	lengthwise unit base stiffeners
	3/32-inch foam gasket sealant placed around the compressor and end panel perimeter

Sound Attenuation Package

Testing of conventional units has identified that the sound radiated by the casing of the unit is an important component of the sound that reaches occupants, especially when the unit is located directly over the occupied space.

This sound reduction package reduces radiated noise from the cabinet. Trane double-isolates the compressor and single-isolates the co-axial coil in the unit. This design absorbs the vibration that contributes to radiated sound. For sound critical spaces, an enhanced sound package as described in Table 1 provides additional attenuation.

Complete sound data taken in accordance with ARI 260 is available for all units. The test data reflects multi-speed fan motor along a single system curve.

Dual Filtration

Flexibility of the GEH allows for *dual filtration* in a free return application. With the field installed dual filtration accessory, filter maintenance of the unit is significantly less.

The accessory package includes both the bottom and top filter rack, and one, 1-inch or 2-inch filter. Table 2 provides dual filtration accessory numbers appropriate to unit size.

Table 2: Dual filter accessory kit numbers

Unit Size	1-inch Filter Kit Part No.	2-inch Filter Kit Part No.
006-015	4474 0630 0100	4474 0634 0100
018-030	4474 0631 0100	4474 0635 0100
036, 042	4474 0632 0100	4474 0636 0100
048, 060	4474 0633 0100	4474 0637 0100

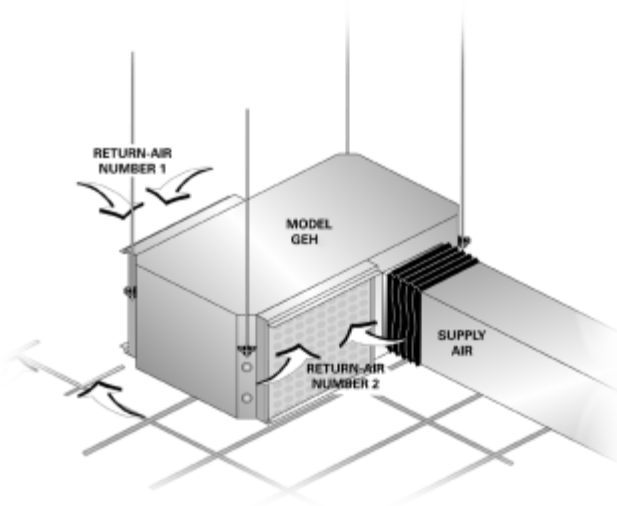


Figure 16: Dual filtration accessory

Features and Benefits

Boilerless Control/Electric Heat

(option)

In cooling dominant regions where heat may be used 15 to 30 days out of the winter season, eliminating the boiler may be an economical advantage to the building owner. Eliminating a boiler from the system reduces costs associated with the mechanical system installation, as well as the maintenance and service of the boiler.

How can heat be provided for the few days of the year when heat is necessary? Through the water-source heat pump of course. The advantage of the water-source heat pump is it's ability to provide heat recovery within the closed water-loop. While some WSHPs may be extracting heat from the closed water loop, other WSHPs may be adding heat to the closed water loop. This creates a perfect system balance for heat sharing or movement from one space to another.

But when water temperatures fall in a boilerless system, and no further heat recovery may be made via the closed loop, heat may be added to the space through a boilerless control electric heat option. See *Figure 17* for the boilerless control, electric heat system diagram.

With the boilerless electric heat option, the heat pump encompasses an internal nichrome open wire heating element (factory mounted and wired). It is comprised of a single stage of electric heat designed to invoice an electric heater in place of the compressor in the event entering water temperature falls below 55 F or a field adjusted temperature setting between 25 F to 60 F.

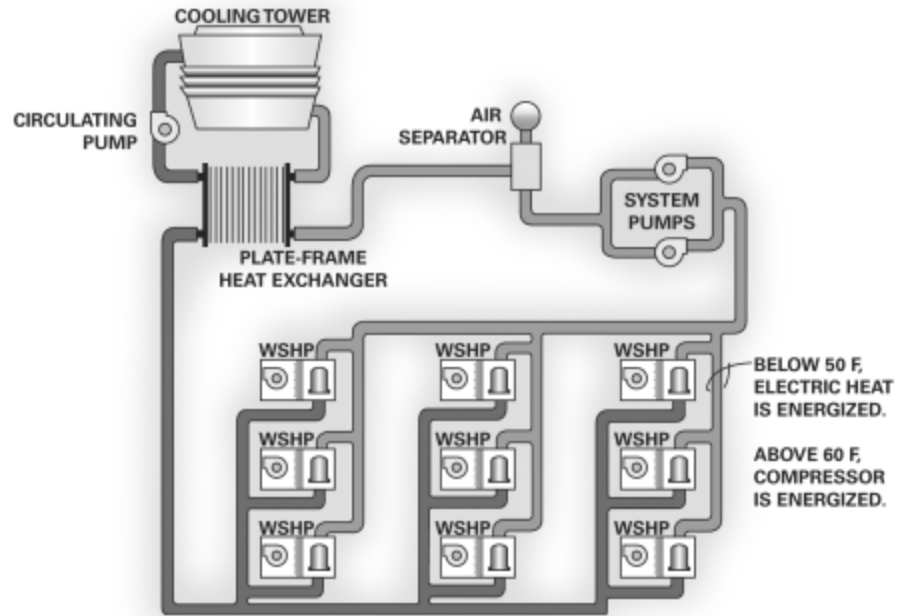


Figure 17: Boilerless control, electric heat system

What is NOT available with the boilerless electric heat option?

- 1 Hot gas reheat
- 2 Basic 24 volt controls
- 3 Tracer™ ZN510 controls
- 4 115 and 575 volt ratings
- 5 Supplemental or emergency heat applications

Features and Benefits

Boilerless Control/Electric Heat Heating/Cooling Mode

In heating mode, when the water temperature falls below 55 F (factory setting), the electric heater is energized, locking out the compressor. The systems electric heat source will continue to be utilized for primary heating until the loop temperature rises above 60 F. Once the entering water temperature rises above 60 F, the boilerless controller returns the unit to normal compressor heating operation and locks out the electric heater. This maximizes efficiency from the unit during the few days requiring heat from the mechanical system. See *Figure 18* for the factory mounted and wired boilerless control electric heat water-source heat pump. Available as a single point power connection.

If the unit employs a cooling only unit design, the electric heat contactor is wired directly to the thermostat for primary heating, and the compressor contactor for cooling.

Note: For geothermal applications, the boilerless controller has an adjustable setting of 25, 35, 45, 55 and 60 degrees.

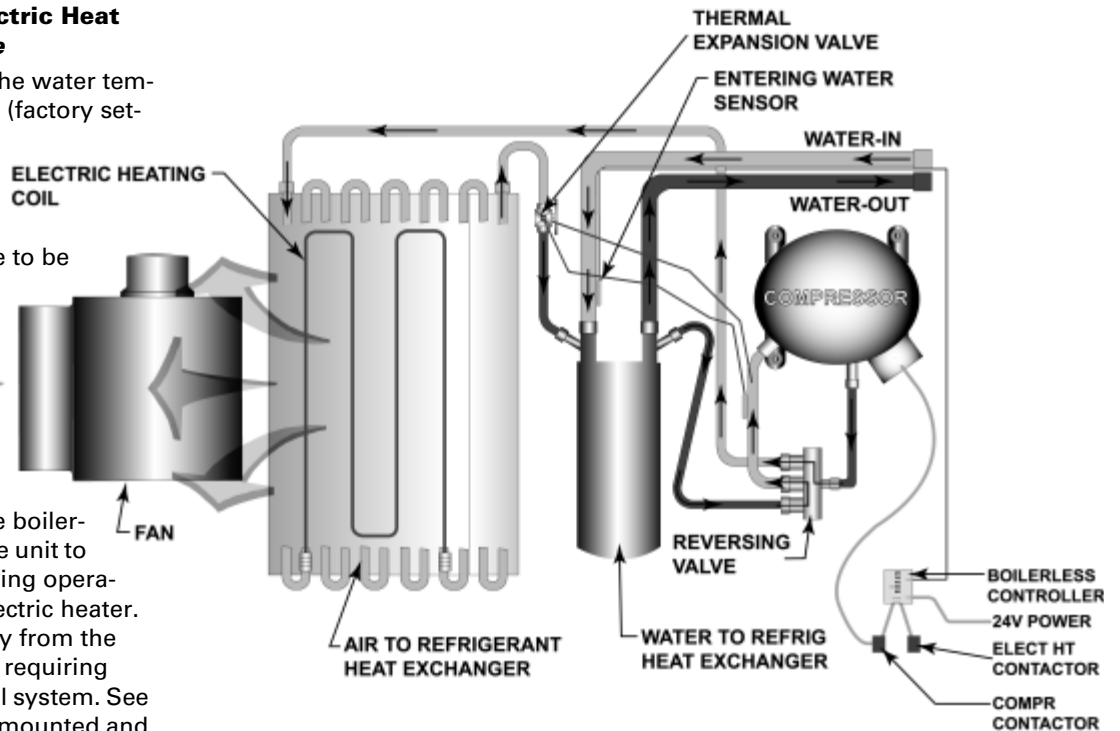


Figure 18: Boilerless control, electric heat water-source heat pump

Features and Benefits

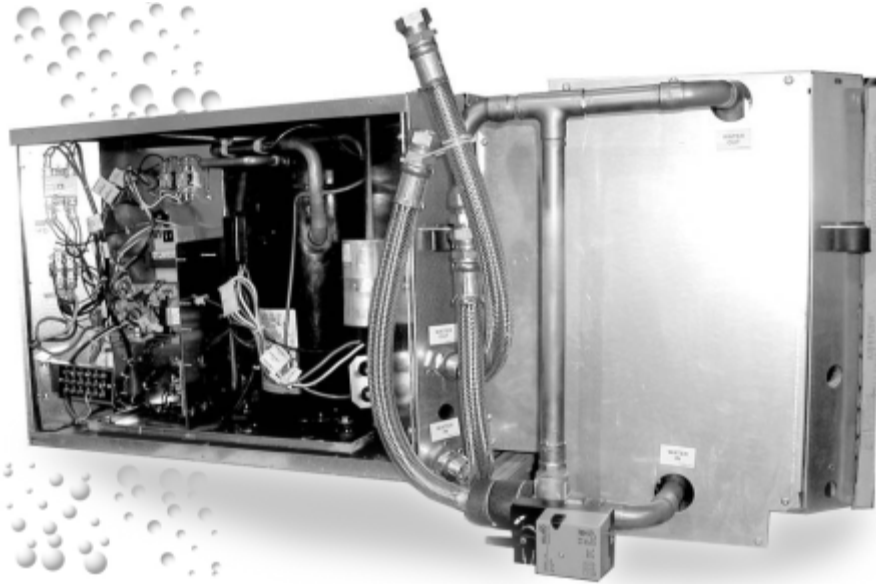


Figure 19: Model GEH with waterside economizer package

Note: Condensate overflow is not available with the waterside economizer option.

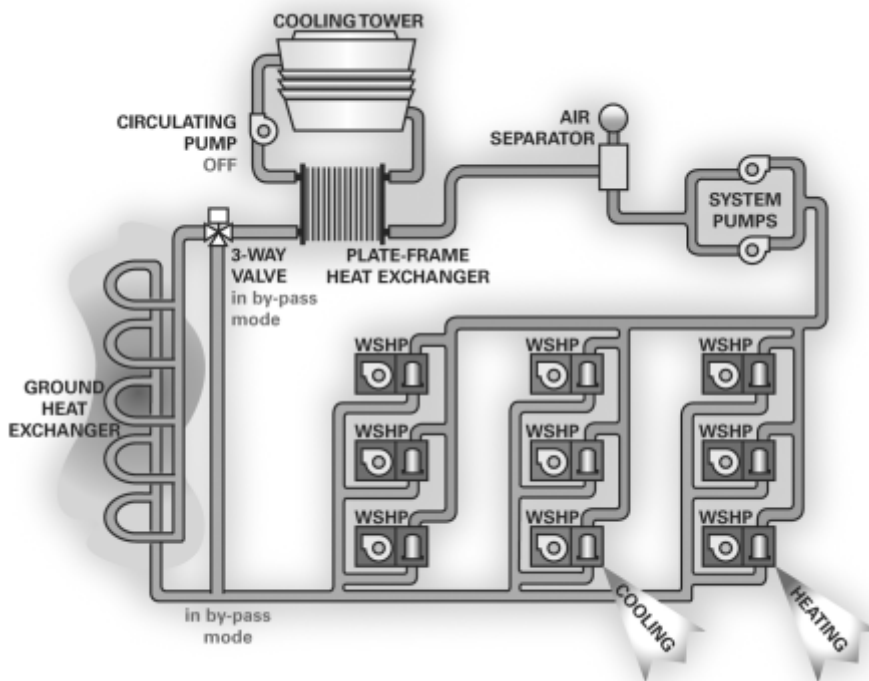


Figure 20: Waterside economizer system

Waterside Economizer (option)

The beauty of the waterside economizer is its ability to take advantage of any loop condition that results in cool water temperatures. A prime example would be during fall, winter and spring when cooling towers have more capacity than required and could be controlled to lower temperatures for economizer support.

Another more common inexpensive means of free comfort cooling includes buildings systems where perimeter heating and core cooling are needed. In this system, the perimeter units extract heat from the building loop while in the heating mode, forcing the building loop temperature to drop. Where as, the core are of a building may require cooling in summer or in winter based upon lighting, people and equipment.

If the water-source system design contained an economizing coil option, the moderate temperature loop water circulated through a core water-source system can provide an inexpensive means to satisfy room comfort without operating the water-source heat pump's compressor.

During economizer mode, fluid enters the unit, and passes by a water temperature sensing bulb. This temperature sensing bulb determines whether the two position, three-way valve will direct the water through the waterside economizing coil, and to the heat pump condenser, or through the condenser only. If the water temperature is 55 F or less, fluid will flow into the economizing coil, while simultaneously halting mechanical operation of the compressor. Mechanical cooling will continue on a call for second stage from the thermostat.

The factory built waterside economizer is available on all 1/2 to 5 ton GEH models. The 1/2 through 5-ton GEV may be ordered to accept a field provided waterside economizing package.

Features and Benefits

Hot Gas Reheat (option)

For space conditioning and climate control, Trane provides an accurate and cost effective dehumidification control through a hot gas reheat option. This option is designed to accommodate unit sizes 012, 036, 048, and 060

With this 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. The moisture removal capability of a specific heat pump is determined by the units latent capacity rating.

When operating in the reheat mode (meaning the sensible temperature has been met in the space), the humidistat signals the reheat relay coil to energize, allowing the high pressure refrigerant gas to flow from the (1) compressor, through the (2) reheat valve, into the (3) reversing valve, or through the (4) reheat coil for dehumidification. A switching relay has been provided for the reheat application to adjust the blower motor from normal operation to low speed when hot gas reheat is energized.

Note: Trane places an air separation space between the air-to-refrigerant coil, and the reheat coil to allow for maximum moisture removal.

Common Reheat Applications

The hot gas reheat option is designed to support building applications requiring fresh-air ventilation units delivering unconditioned-air directly to the space. It also provides dehumidifi-

cation to large latent load spaces such as auditoriums, theaters and classrooms, or anywhere humidity control is a problem.

Do's and Don'ts in Design

The factory installed hot gas reheat option is only available with Deluxe or ZN524 controls packages.

A high static blower motor option will be required to support the hot gas reheat option for the 1/2 through 5 ton equipment.

Water regulating valves should not be used with the hot gas reheat option.

Trane places a thermal expansion valve on all water-source heat pumps, as well as ground-source heat pumps, to regulate refrigerant flow vs. water flow, making the heat pump more efficient to run.

Water-source heat pumps with hot gas reheat should not be used as a make-up air unit.

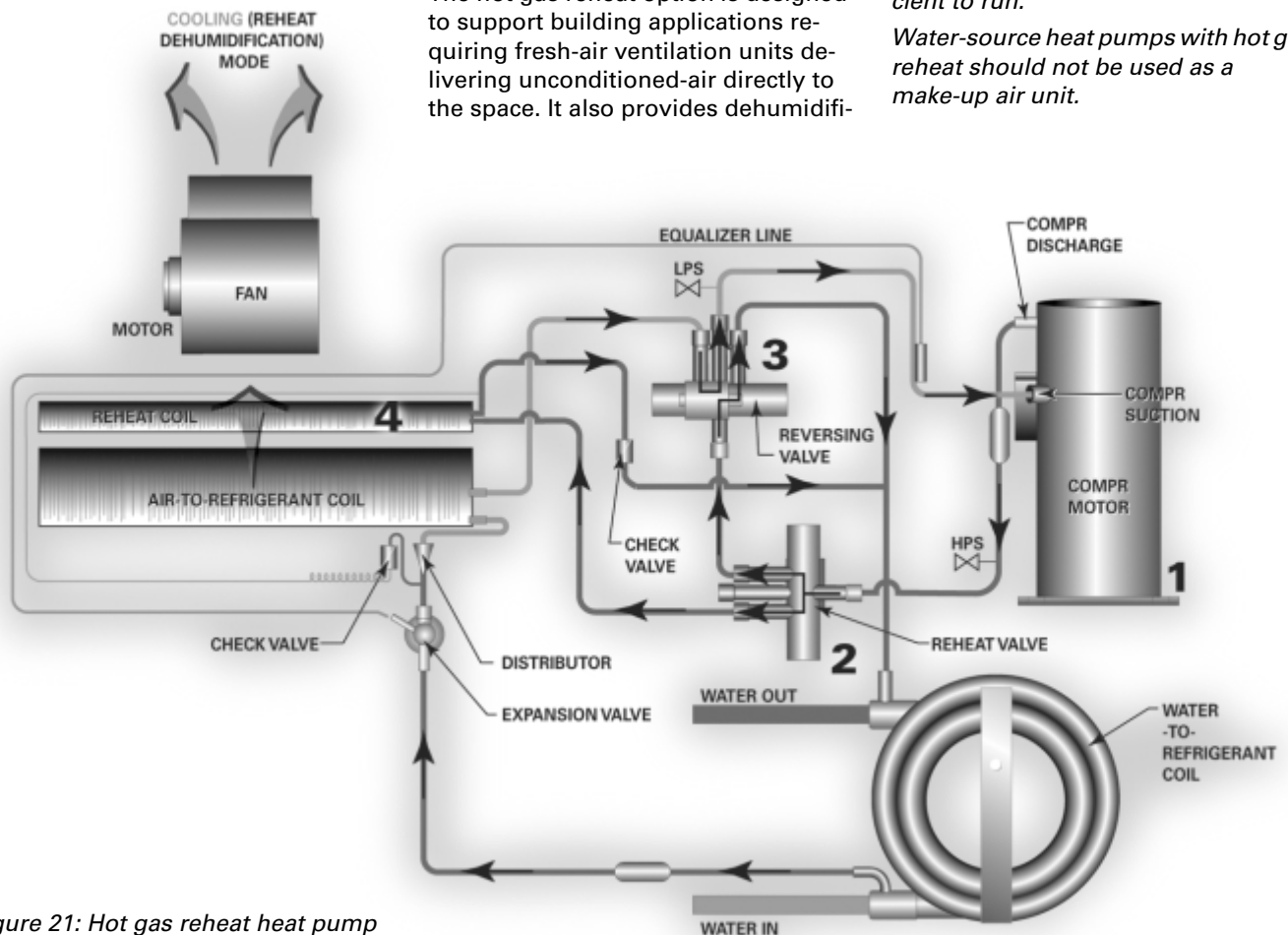





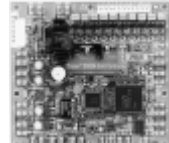


Figure 21: Hot gas reheat heat pump



Features and Benefits Controls

Controls by Trane

Whether involved in a retrofit or new construction application, Trane has the control design to fit your system requirement. Our control options provide a broad range of packages from the most cost efficient 24 volt standalone to a complete building automation solution, Trane is the right choice in comfort gratification. The following chart provides a brief overview in the different control combinations.

	Graphic	Description	Application	ICS	Protocol	Where to find
Basic 24V		Compressor lock-out relay, low and high pressure switches.	Retrofit market where single and multiple unit replacement occurs. New building design where field provided controls are specified.	No	Non Applicable	Page 15
Deluxe 24V		24 volt microprocessor designed to provide control of the entire unit, as well as multiple relay offerings to maximize system performance. Can connect to a 24V thermostat.	Retrofit market where single and multiple unit replacement occurs. Multi-unit installation where units may be daisy-chained directly to the Trane Tracer™ Loop Controller.	No	Non Applicable	Page 16
Tracer ZN510™		Direct Digital Control board designed to provide control of the entire unit as well as outputs for unit status and fault detection.	Retrofit market where overall system upgrade is specified. Multi-unit (100+) installation where units are linked by a common twisted pair of wire for a communication link.	Yes	SCC LonTalk® open protocol (Comm5)	Page 18
Tracer ZN524™ Used in single circuited WSHPs with HGR, WSE, or BEH.		Direct Digital Control board designed to provide control of the entire unit as well as outputs for unit status and fault detection.	Retrofit market where overall system upgrade is specified. Multi-unit (100+) installation where units are linked by a common twisted pair of wire for a communication link.	Yes	SCC LonTalk open protocol (Comm5)	Page 18
Tracer™ Loop Controller		Microprocessor-based controller that coordinates the water side (boiler, pumps, cooling tower, etc.) of a water-source heat pump system.	Wherever the Tracer ZN510 controls or 24 volt electro-mechanical controls are specified for complete control of the water loop and pumps.	Yes	LonTalk compatible (Comm5)	WSHP-MG-3
Tracer Summit®		Microprocessor based controller that coordinates full building automation from HVAC to lighting.	Where any controller is specified.	Yes	BACnet (Comm 2,3,4,5)	EMTW-SVN01B-EN EMTW-SVP01B-EN EMTW-SVU01B-EN

HGR = Hot Gas Reheat

WSE = Waterside Economizer

BEH = Boilerless Electric Heat

Features and Benefits

Basic Controls

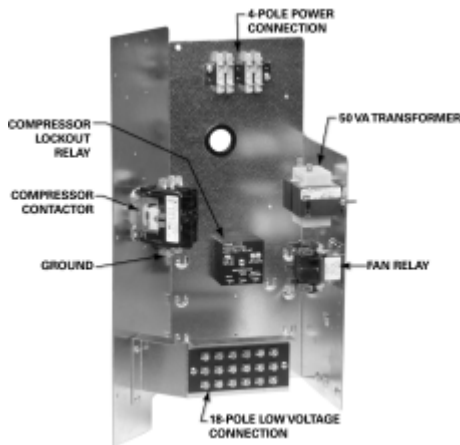


Figure 22: Basic 24 volt control box



Figure 23: Safety devices



Figure 24: 24 volt stand-alone system

Basic 24 Volt Controls

The basic 24 V electro-mechanical unit control provides component protection devices for maximum system reliability. Each device is factory mounted, wired and tested. See *Figure 22* for the unit control box.

Features Include:

- 50 VA transformer
- Compressor contactor
- Compressor run capacitor (for single phase units)
- General alarm
- Low pressure safety
- High pressure switch
- Lockout relay
- Reversing valve coil (for heating and cooling units)
- Multi-speed fan motor
- 18-pole terminal strip (for low voltage field wiring)
- *Optional: Condensate overflow*

Safety Devices

System safety devices are provided through the use of low/high pressure switches in the refrigeration circuit to help prevent compressor damage.

The switch and sensor are set to activate at refrigerant pressures of 20 psig to fit most applications.

In cases where a low charge, or excessive loss of charge occurs, each compressor comes equipped with an external overload device to halt the compressor operation.

The high pressure switch prevents compressor operation during high or

excessive discharge pressures that exceed 395 psig.

A lockout relay provides the mechanical communication of the low and high pressure switches to prevent compressor operation if the unit is under low or high refrigerant circuit pressure, or during a condensate overflow condition. The lockout relay may be reset at the thermostat, or by cycling power to the unit.

General alarm is accomplished through the lockout relay and is used in driving light emitting diodes. This feature will drive dry contacts only, and cannot be used to drive field installed control inputs.

See *Figure 23* for unit safety devices on the basic 24V control unit.

Stand-alone System

The 24 volt electro-mechanical design may be applied as a stand-alone control system. The stand-alone design provides accurate temperature control directly through a wall-mounted mercury bulb or electronic thermostat. This system set-up may be utilized in a replacement design where a single unit retrofit is needed. It may be easily interfaced with a field provided control system by way of the factory installed 18-pole terminal strip.

This stand-alone control is frequently utilized on small jobs where a building controller may not be necessary, or where field installed direct digital controls are specified. This type of control design does require a constant flow of water to the water source heat pump. With a positive way to sense flow to the unit, the units safety devices will trigger the unit off.

The stand-alone system design provides a low cost option of installation while still allowing room control for each unit. See *Figure 24* for 24 volt stand-alone system controls.

Features and Benefits Deluxe Controls

Deluxe 24V Electronic Controls

The deluxe 24V electronic unit control provides component protection devices similar to the basic design, but contains upgraded features to maximize system performance to extend the system life. Each device, is factory mounted, wired, and tested in the unit. See *Figure 25* for unit control box.

Features Include:

- 75 VA transformer
- Compressor contactor
- Compressor lockout relay
- Compressor run capacitor (for 1-phase units only)
- Anti-short cycle compressor protection
- Random start delay
- Brown-out protection
- Low pressure time delay
- Low pressure switch
- High pressure switch
- Compressor delay on start
- Reversing valve coil (for heating and cooling units)
- Multi-speed fan motor
- Soft lockout mode
- 18-pole terminal strip (for low voltage field wiring)
- *Optional: Condensate Overflow*
- *Optional: Night setback*
- *Optional: Hot gas reheat (for dehumidification)*
- *Optional: Electric heat*
- *Optional: Compressor enable*

Small Building Control

The deluxe 24V electro-mechanical design may be applied as a stand-alone control system or as a multi-unit installation system. With a stand-alone design, units run independently of one another with a mercury bulb or electronic digital thermostat.

With a multiple unit installation, the units may be daisy-chained directly to the Trane Tracer loop controller (TLC), pump(s), boiler, and tower for a complete networked water-source system. The TLC provides a night setback output, and a pump request

input for system optimization. See *Figure 26* for 24 volt deluxe control system.

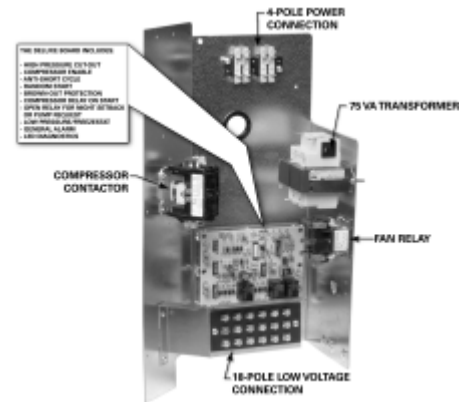


Figure 25: Deluxe 24 volt control box

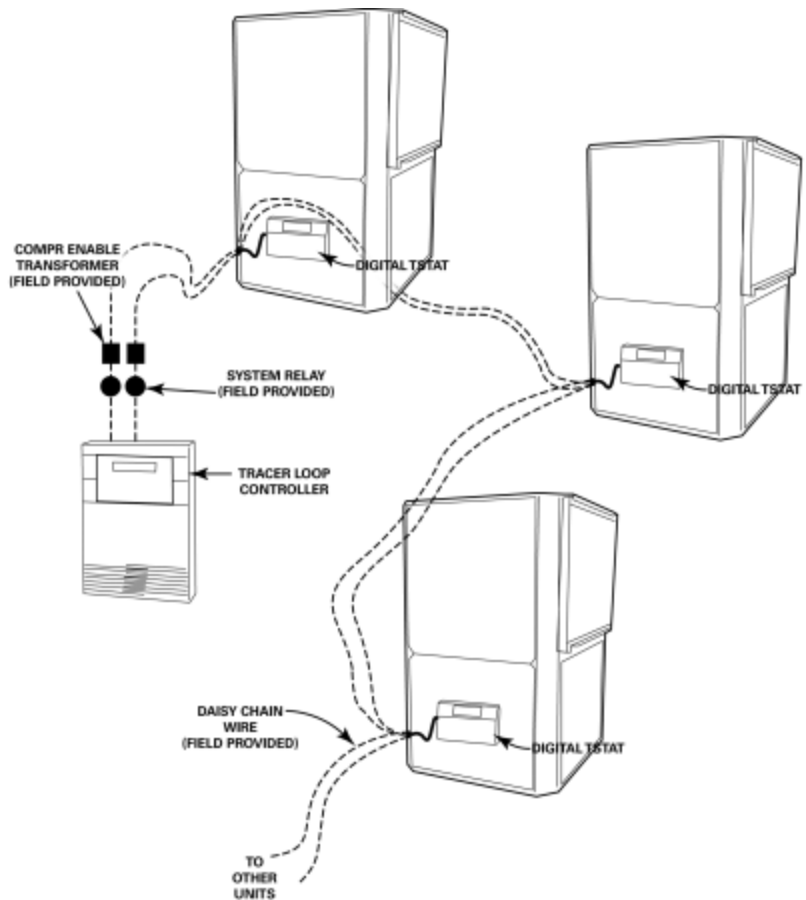


Figure 26: 24 volt deluxe control system

Features and Benefits Deluxe Controls

Microprocessor Design

The 24 volt deluxe design is a microprocessor-based control board conveniently located in the control box. The board is unique to Trane water-source products and is designed to control the unit as well as provide outputs for unit status and fault detection.

The Trane microprocessor board is factory wired to a terminal strip to provide all necessary terminals for field connections. See *Figure 27* for the deluxe 24V control board.

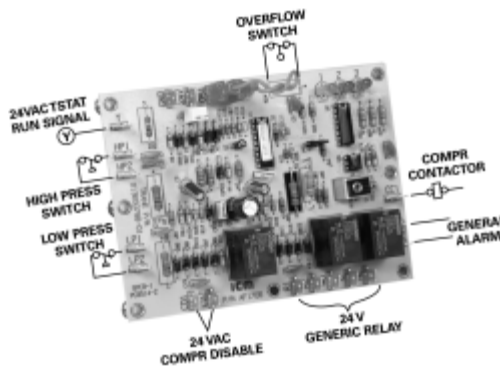


Figure 27: Deluxe 24V control board

Deluxe 24V features include:

Random Start

The random start relay provides a time delay start-up of the compressor when cycling in the occupied mode. A new start delay time between 3 and 10 seconds is applied each time power is enabled to the unit.

Anti-short Cycle Timer

The anti-short cycle timer provides a three minute time delay between compressor stop and compressor restart.

Brown-out Protection

The brown-out protection function measures the input voltage to the controller and halts the compressor operation. Once a brown-out situation has occurred, the anti-short cycle timer will become energized. The general fault contact will not be affected by this condition. The voltage

will continue to be monitored until the voltage increases. The compressors will be enabled at this time if all start-up time delays have expired, and all safeties have been satisfied.

Compressor Disable

The compressor disable relay provides a temporary disable in compressor operation. The signal would be provided from a water loop controller in the system. It would disable the compressor because of low water flow, peak limiting or if the unit goes into an unoccupied state. Once the compressor has been disabled, the anti-short cycle time period will begin. Once the compressor disable signal is no longer present, and all safeties are satisfied, the control will allow the compressor to restart.

Generic Relay

The generic relay is provided for field use. Night setback or pump restart are two options that may be wired to the available relay. (*Note: Night setback is available as factory wired*). An external Class II 24VAC signal will energize the relay coil on terminals R1 and R2. Terminals C (common), NO (normally open), and NC (normally closed) will be provided for the relay contacts.

Safety Control

The deluxe microprocessor receives separate input signals from the refrigerant high pressure switch, low suction pressure switch and condensate overflow.

In a high pressure situation, the compressor contactor is de-energized, which suspends compressor operation. The control will go into *soft lockout* mode initializing a three minute time delay and a random start of 3 to 10 second time delays. Once these delays have expired, the unit will be allowed to run. If a high pressure situation occurs within one hour of the first situation, the control will be placed into a *manual lockout* mode, halting compressor operation, and initiating the general alarm.

In a low temperature situation, the low pressure switch will transition open after the compressor starts. If the switch is open for 45 seconds during compressor start, the unit will go into *soft lockout* mode initializing a three minute time delay and a random start of 3 to 10 second time delays. Once these delays have expired, the unit will be allowed to run. If the low pressure situation occurs again within 30 minutes, and the device is open for more than 45 seconds, the control will be placed into a *manual lockout* mode, halting compressor operation, and initiating the general alarm.

In a condensate overflow situation, the control will go into *manual lockout* mode, halting compressor operation, and initiating the general alarm.

The general alarm is initiated when the control goes into a *manual lockout* mode for either high pressure, low pressure or condensate overflow conditions.

Diagnostics

Component device connections to the microprocessor board are referenced in *Figure 27*. Three LEDs (light emitting diodes) are provided for indicating the operating mode of the controller. See the unit IOM for diagnostics or troubleshooting through the use of the LEDs.

Features and Benefits ZN510 & ZN524 Controls

ZN510 & ZN524 Features Include:

- 75 VA transformer
- Compressor contactor
- Compressor lockout relay
- Compressor run capacitor (for 1-phase units only)
- Random start delay
- Heating/cooling status
- Occupied/unoccupied mode
- Low pressure switch
- High pressure switch
- Fan and filter status
- Reversing valve coil (for heating and cooling units)
- Multi-speed fan motor
- 18-pole terminal strip (for low voltage field wiring)
- *Optional: Condensate Overflow*

Additional Features of the ZN524 Include:

- 75VA or 100 VA transformer
- Water isolation valve support (for variable speed pumping)
- *Optional: Boilerless control for electric heat*
- *Optional: WaterSide economizer*
- *Optional: Hot gas reheat (for dehumidification)*

Tracer ZN510 & ZN524 Controls

The Tracer ZN510 and ZN524 are direct digital control (DDC) systems specifically designed for single and dual circuited water-source equipment to provide control of the entire unit, as well as outputs for unit status and fault detection. Each device is factory installed, commissioned, and tested to ensure the highest level of quality in unit design.

Each of the controller's features and options were selected to coordinate with the unit hardware to provide greater energy efficiency and equipment safety to prolong the equipment life.

In addition to being factory configured for control of the unit fan, compressor and reversing valve, the ZN510 and ZN524 controllers are designed to coordinate the waterside of the water-source system through the Tracer Loop Controller (TLC). If applied in a peer-to-peer communication environment, data between similar controllers may be exchanged without requiring a building automation system.

By teaming the ZN510 and ZN524 with the TLC, a low first-cost for the mechanical equipment, water loop, and water pump optimization is provided to the owner.

For owners who require a full building integrated "open protocol" system, The ZN510/ZN524/TLC application is upgradable to support complete building control through Tracer Summit. Because the ZN510 and ZN524 is LonTalk certified, it is capable of working with, and talking to other LonTalk cer-

tified controllers providing the building owner more choices, and the design engineers more flexibility to meet the challenges of building automation. See *Figure 28* for ZN510 control box.

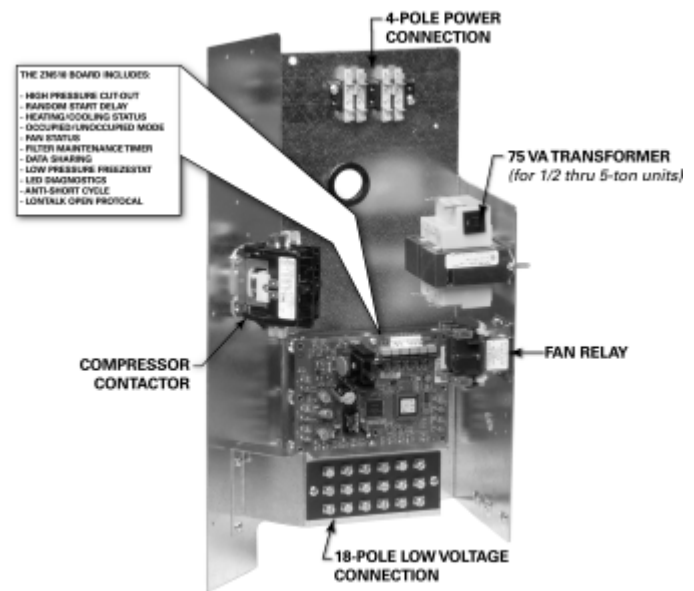


Figure 28: ZN510 control box

Features and Benefits

ZN510 & ZN524 Controls

Direct Digital Controls

When the ZN510 or ZN524 controller is linked directly to the Tracer Summit, each Tracer Summit building automation system can connect a maximum of 120 Tracer ZN510 or ZN524 controllers. See *Figure 29* for the Tracer ZN524 board.

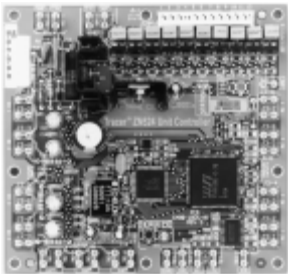


Figure 29: Tracer ZN524 controller

Tracer ZN510 and ZN524 functions include:

Compressor Operation

The compressor is cycled on and off to meet heating or cooling zone demands. Single and dual compressor units use the unit capacity and pulse width modulation (PWM) logic along with minimum on/off timers to determine the compressor's operation. The compressor is controlled ON for longer periods as capacity increases and shorter periods as capacity decreases.

Random Start

To prevent all of the units in a building from energizing major loads at the same time, the controller observes a random start from 0 to 25 seconds. This timer halts the controller until the random start time expires.

Reversing Valve Operation

For cooling, the reversing valve output is energized simultaneously with the compressor. It will remain energized until the controller turns on the compressor for heating. At this time, the reversing valve moves to a de-energized state. In the event of a power failure or controller OFF situation, the reversing valve output

will default to the heating (de-energized) state.

Fan Operation

The supply air fan operates at the factory wired speed in the occupied or occupied standby mode. When switch is set to AUTO, the fan is configured for cycling ON with heating or cooling. In heat mode, the fan will run for 30 seconds beyond compressor shutdown in both occupied and unoccupied mode.

Fan Run Timer

The controller's filter status is based on the unit fan's cumulative run hours. The controller compares the fan run time against an adjustable fan run hours limit and recommends unit maintenance as required.

Data Sharing

The Tracer ZN510/ZN524 controller is capable of sending or receiving data (setpoints, fan request, or space temperature) to and from other controllers on the communication link. This allows multiple units to share a common space temperature sensor in both stand-alone and building automation applications.

Night Setback

The four operations of the Tracer ZN510/ZN524 controller include occupied, occupied standby, occupied bypass and unoccupied.

In an occupied situation, the controller uses occupied heating and cooling setpoints to provide heating and cooling to the building. This occupied operation is normally used during the daytime hours when the building is at the highest occupancy level.

In an occupied standby situation, the controllers heating and cooling setpoints are usually wider than the occupied setpoints. This occupied standby operation is used during daytime hours when people are not present in the space (such as lunchtime or recess). To determine the space occupancy, an occupancy sensor is applied.

In an unoccupied situation, the controller assumes the building is vacant, which normally falls in evening hours when a space may be empty. In the unoccupied mode, the controller uses the default unoccupied heating and cooling setpoints stored in the controller. When the building is in unoccupied mode, individual units may be manually placed into timed override of the unoccupied mode at the units wall sensor. During timed override, the controller interprets the request and initiates the occupied setpoint operation, then reports the effective occupancy mode as occupied bypass.

In the occupied bypass mode, the controller applies the occupied heating and cooling setpoint for a 120 minute time limit.

High and Low Pressure Safety Controls

The Tracer ZN510/ZN524 controller detects the state of the high pressure or low pressure switches. When a fault is sensed by one of these switches, the corresponding message is sent to the controller to be logged into the fault log. When the circuit returns to normal, the high pressure control and low pressure control automatically reset. If a second fault is detected within a thirty-minute time span, the unit must be manually reset.

Condensate Overflow

When condensate reaches the trip point, a condensate overflow signal generates a diagnostic which disables the fan, unit water valves (if present), and compressor. The unit will remain in a halted state until the condensation returns to a normal level. At this time, the switch in the drain pan will automatically reset. However, the controller's condensate overflow diagnostic must be manually reset to clear the diagnostic and restart the unit.



Features and Benefits

ZN510 & ZN524 Controls

Additional Functions of the ZN524 Controller

When the building owners choice is Trane Tracer controls, the ZN524 controller is required when any of the following applications are selected on a single and dual circuited equipment.

- Waterside Economizer
- Hot Gas Reheat (for Dehumidification)
- Boilerless Control for Electric Heat
- Water Isolation Valve Control (for Variable Speed Pumping)

Entering Water Temperature Sampling

The ZN524 controller will sample the entering water temperature to determine proper control action for units equipped with *boilerless electric heat* or *waterside economizer*.

Waterside Economizer: Entering water temperature (EWT) sampling will automatically occur at power up when the unit is equipped with a waterside economizer (WSE). The EWT is used to determine if economizing is feasible. When the conditions are met, the isolation valve(s) are driven open for three minutes and the EWT reading is taken. The determination as to whether or not the economizer can be enabled will be made and the controller will take appropriate action. The isolation valve will remain open regardless if the WSE or the DX cooling is enabled.

The unit's waterside economizer will contain a 2-position water valve wired to the ZN524. The economizing water coil will be optimized to provide 100% of the unit capacity at 80.6 F/66.2 F return air temperature with 45 F entering water. The flow rate is established at 86 F entering water temperature and 96 F leaving water temperature.

Low leaving air protection will be furnished to protect the unit against delivering air that is cold enough to sweat discharge air grilles. Coil icing protection will also be provided.

Waterside economizer cooling will be active during occupied, unoccupied and standby cooling modes.

Boilerless Control Electric Heat and Supplemental Electric Heat:

The ZN524 supports a single stage of boilerless electric heat operation or concurrent heating.

When the unit is configured for boilerless control, the EWT will be used to determine whether DX heating should be disabled and the electric heater enabled. When these conditions are met, the isolation valve(s) are driven open for three minutes and the entering water temperature reading is taken. The determination as to whether or not to utilize electric heat will be made and the controller will take appropriate action. If boilerless electric heat is enabled, then the isolation valve will be closed, shutting down the water flow to the unit.

When the unit is configured for concurrent operation of DX heating (compressor in heat pump mode) and electric heat, the electric heat will act as a second stage of heat for single compressor units, and a third stage of heat for dual compressor units. *Note: With concurrent (or supplemental) electric heat, the electric heater is field provided.*

Water Isolation Valves

Variable speed pumping systems are supported by the ZN524 controller when water isolation valves are present. Up to two isolation valves are supported by the controller (one for each compressor circuit).

The valves are normally closed unless DX heating, DX cooling, waterside economizer or dehumidification is requested. When the isolation valves are driven open for operation, the outputs will be driven for 20 seconds to ensure

adequate water flow before the compressor outputs are energized. Once an isolation valve has been opened, it will remain open for a 10 minute minimum to reduce excessive cycling of the valve.

Dehumidification

Dehumidification for the single and dual circuited water-source heat pump is applicable with the ZN524 controller. The controller is capable of directing one stage of DX cooling in conjunction with one stage of reheat (hot gas reheat).

Dehumidification can only occur when the controller is in the cooling mode. A humidity transmitter is used to measure the zone's relative humidity (RH), then compares the zone relative humidity to the relative humidity enable/disable setpoint parameters. The default values for dehumidification enable is 60% RH with the disable point at 52% RH. These values are configurable.

Features and Benefits ZN510 & ZN524 Controls

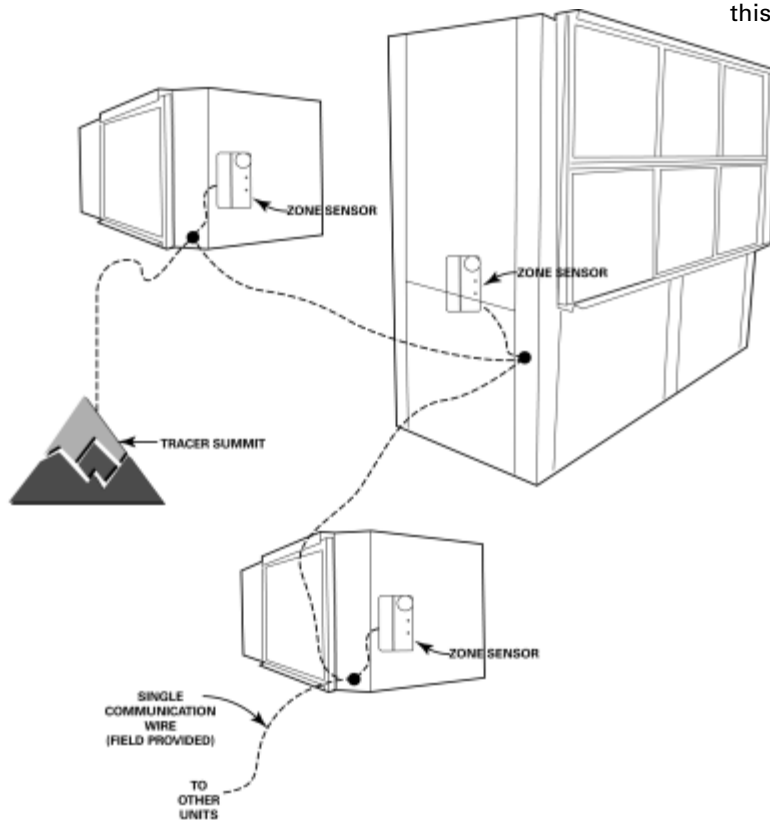
Building Control Advantages

The Tracer ZN510/ZN524 controller has the ability to share information with one or several units on the same communication link. This sharing of information is made possible via a twisted pair of wire and a building automation system or through Trane's Rover™ service tool .

An advantage of installing a ZN510/ZN524 is its capability to work with other Lon-Talk certified controllers. This provides greater flexibility to the building owner, as well as greater flexibility in design.

Integrating the ZN510/ZN524 on water-source equipment, and tying it to a Tracer Summit system provides a complete building management system. Each Tracer Summit can connect to a maximum of 120 controllers. With the ICS system, the Tracer can initiate an alarm on a loss of performance on equipment malfunctions; allowing problems to be handled in a timely manner before compromising comfort.

This type of application would most commonly be used for a large space(s) that may require more than one unit. In addition to



this application design, the Tracer ZN510/ZN524 controller provides a way for units located within the same space to share the same zone sensor to prevent units from simultaneously heating and cooling in the same space. See *Figure 30* for Tracer ZN510/ZN524 controller system.

Figure 30: Tracer ZN510/ZN524 controller system

Application Considerations

Flexibility

The high efficiency vertical and horizontal water-source heat pump system is versatile for installation in boiler/cooling tower applications, as well as ground-source (geothermal) applications. The system design may employ either a central pumping design, or a distributed pumping design.

A *central pumping* design involves a single pump design, usually located within a basement or mechanical room to fulfill pumping requirements for the entire building system. An auxiliary pump is typically applied to lessen the likelihood of system downtime if the main pump malfunctions.

A *distributed pumping* system contains a single pump module connected directly to the units supply and return. This module is field installed and piped to the unit. This design requires individual pump modules specifically sized for each water-source heat pump.

Advantages of Geothermal

The advantages of a geothermal heat pump system could literally cut a business' heating and cooling costs by 30 to 40-percent. The units are durable, and typically last longer than conventional systems because they are protected from harsh outdoor weather conditions, and because the unit is installed indoors and the loop underground. (According to ASHRAE, the estimated service life for a commercial water-to-air heat pump is 19-years.) Geothermal heat pumps have fewer mechanical components, making them more reliable and less prone to failure. Manufacturers of the loop materials guarantee their products for up to 25-years, with no maintenance required.

Geothermal heat pumps work toward the preservation of the environment by reducing the environmental impacts of electric power generation.

A ground source (geothermal) system consist of a:

- A ground water heat pump
- A closed loop ground heat exchanger made of high density polyethylene pipe (guaranteed 25- years or more by many manufacturers); and
- A low wattage circulating pump(s)

The fluctuating temperatures of fluid from the earth are more stable than air, allowing the equipment to operate at a lower discharge pressure and use fewer kilowatts. The constant earth temperature will heat or cool the fluid running through buried high density polyethylene pipe to provide heating and cooling to a building.

A geothermal loop can be installed either horizontally or vertically. Vertical loops require less overall land area to reject (i.e., sink) the excess heat from the building. Horizontal loops require trenches in the ground spanning a larger overall land area.

Although external piping is the responsibility of the installer and/or piping manufacturer, many electric utilities and rural electric cooperatives are offering monetary incentives to install geothermal systems. Utility companies offer the incentives because of reduced peak loads that flatten out their demand curve over time, and save them money. These savings are ultimately transferred to the consumer. See *Figure 31* for geothermal energy recovery loop.

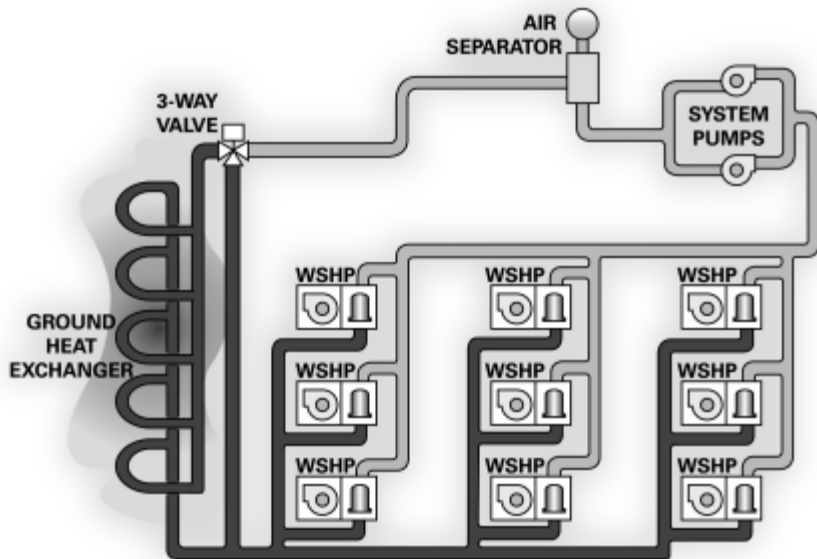


Figure 31: Geothermal energy recovery loop

Application Considerations

Central Pumping System

Units that employ a central pumping system contain single or dual pumps to fulfill pumping requirements for the entire building system.

The central system's supply and return lines should be sized to handle the required flow with a minimum pressure drop.

The water-source heat pump (in this case a *high efficiency GEH*) may include add-on accessories to help aid in system balancing, acoustics and safety requirements. Some of these items may be ordered from the factory, then field installed. Many are provided by the contractor.

1 Hose kits are used to connect the water supply and return line to the water inlets and outlets. Trane offers various hose kit combinations to better facilitate system flow balancing. These flexible hoses also aid in the reduction of vibration between the unit and the rigid central piping system.

A two position isolation valve is often applied to systems which incorporate variable frequency pumping. This valve is capable of stopping/starting water flow to the unit, which in-turn reduces the pumping requirements for the entire system.

2 The unit's (item 2) 3/4-inch high voltage and (item 3) 1/2-inch low voltage connections are located on the left chamfered corner of the unit. They are designed to accept conduit.

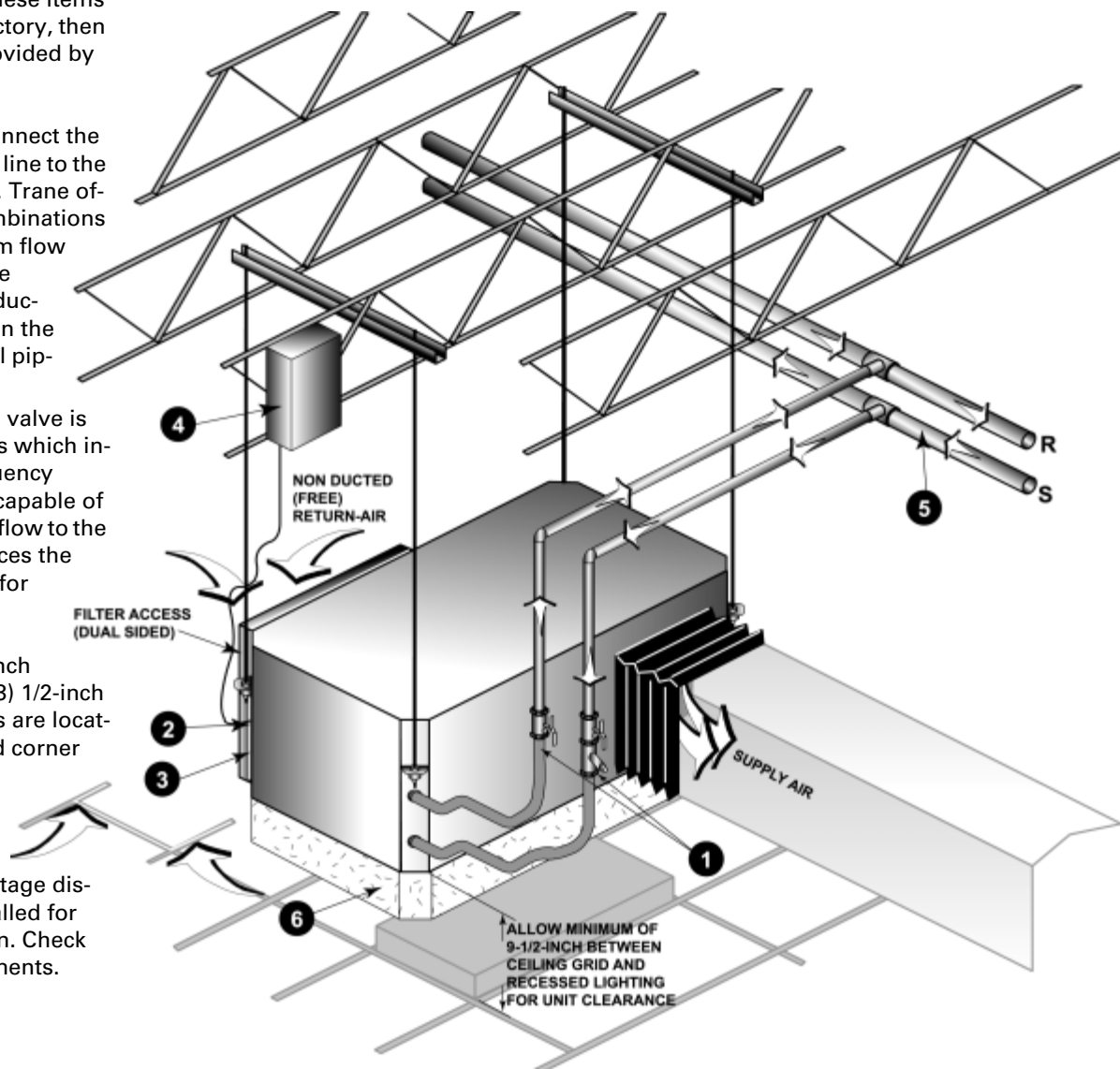
4 A field supplied line voltage disconnect should be installed for branch circuit protection. Check local codes for requirements.

5 The central system supply and return lines should be sized to handle the required flow with a minimum pressure drop.

Note: Pipe will sweat if low temperature water is below the dew point of the surrounding space. Trane recommends that these lines be insulated to prevent damage from condensation when condenser loop is designed to be below 60 F. Equipment installed in attic/crawl space temperatures be-

low 40°F may require antifreeze in the water loop.

6 For acoustically sensitive areas, a six-inch deep fiberglass insulation is recommended to be field installed below the horizontal unit. This field supplied insulation should be approximately twice the footprint size of the unit. It provides sound damping of the unit while in operation.



Application Considerations

Distributed Pumping System

A distributed pumping system contains either a single or dual pump module, specifically sized for each water-source heat pump, then connected directly to the units supply and return lines.

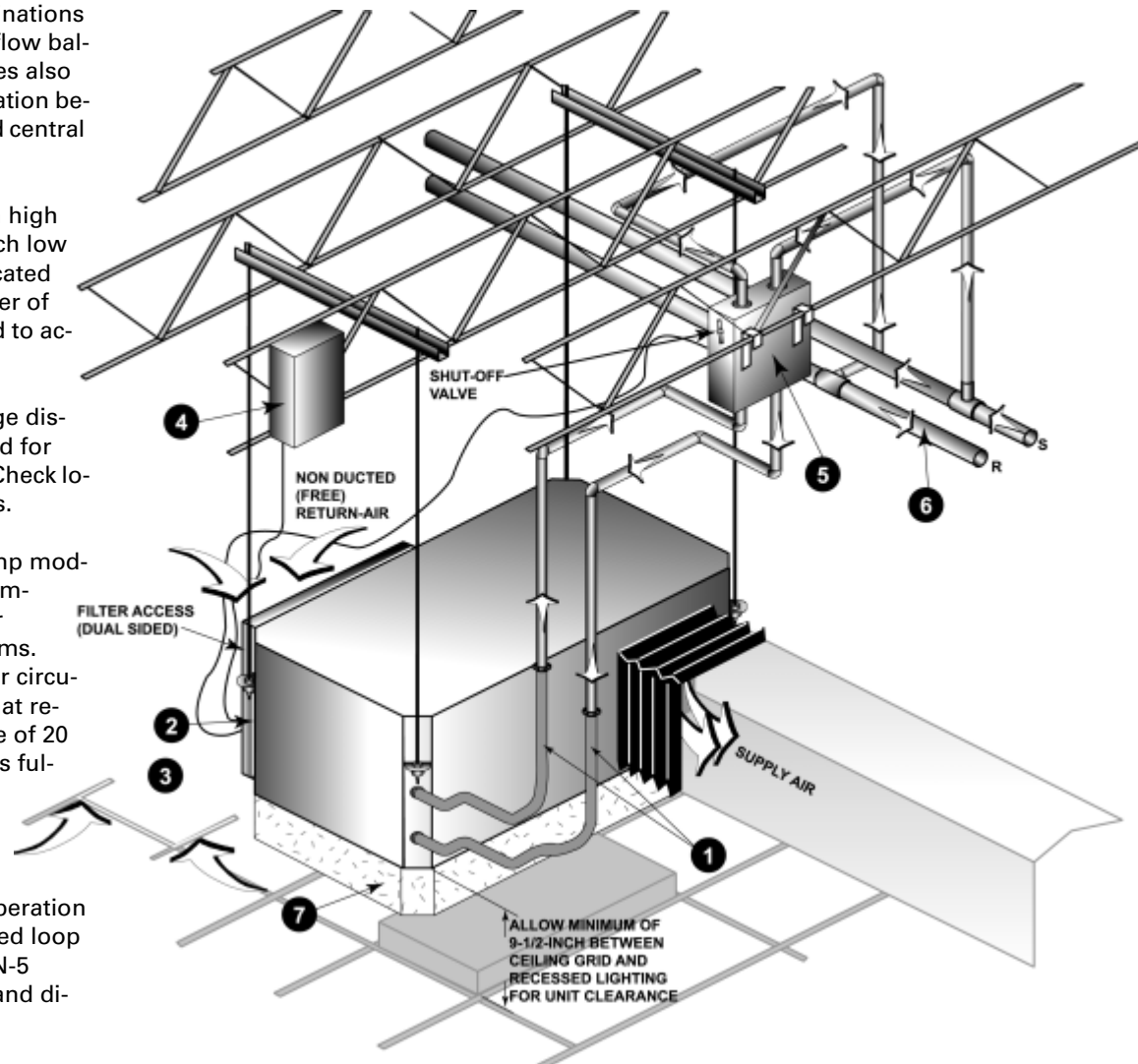
The distributed system's supply and return lines should be sized to handle the required flow with a minimum pressure drop.

- 1 Hose kits are used to connect the water supply and return line to the water inlets and outlets. Trane offers various hose kit combinations to better facilitate system flow balancing. These flexible hoses also aid in the reduction of vibration between the unit and the rigid central piping system.
- 2 The unit's (item 2) 3/4-inch high voltage and (item 3) 1/2-inch low voltage connections are located on the left chamfered corner of the unit. They are designed to accept conduit.
- 4 A field supplied line voltage disconnect should be installed for branch circuit protection. Check local codes for requirements.
- 5 Trane's self-contained pump module and hose kit make a complete pumping package for distributed pumping systems. The module is designed for circulating commercial loops that require a maximum flow rate of 20 gpm. Each pump module is fully assembled for connection to water and electrical points. The kit contains all of the necessary components for the installation, operation and maintenance of a closed loop application. See WSHPC-IN-5 (72-9006-03) for electrical and dimensional requirements

- 6 The distributed pumping system supply and return lines should be sized to handle the required flow with a minimum pressure drop.

Note: Pipe will sweat if low temperature water is below the dew point of the surrounding space. Trane recommends that these lines be insulated to prevent damage from condensation when condenser loop is designed to be below 60 F. Equipment installed in attic/crawl space temperatures below 40°F may require antifreeze in the water loop.

- 7 For acoustically sensitive areas, a six-inch deep fiberglass insulation is recommended to be field installed below the horizontal unit. This field supplied insulation should be approximately twice the footprint size of the unit. It provides sound damping of the unit while in operation.

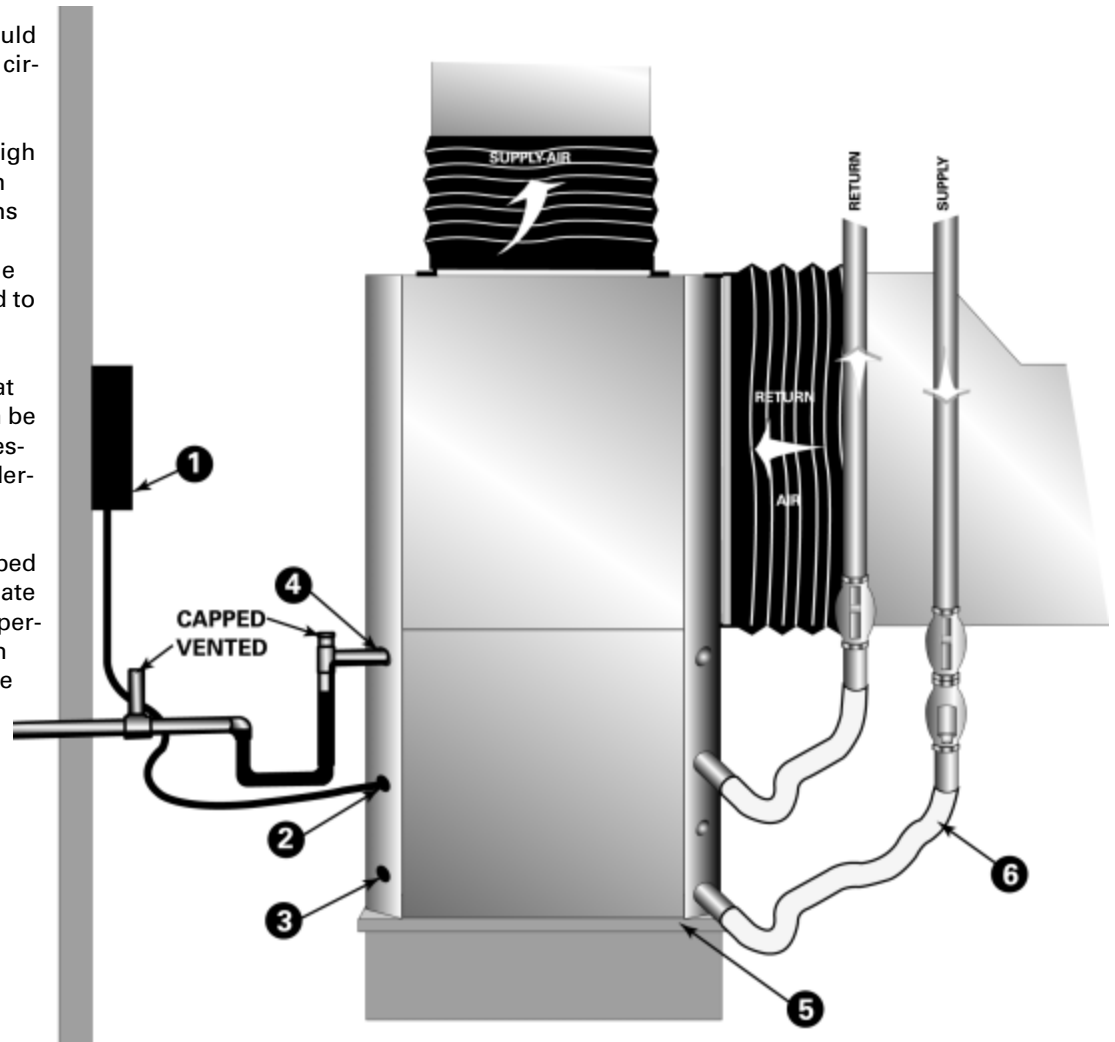


Application Considerations

Installation of the 1/2 through 5-Ton Vertical

Whether securing the 1/2 through 5-ton GEV to a central pumping system, or a distributed pumping system, Trane recommends a few accessory considerations to the system installation.

- 1 The field supplied line voltage disconnect should be installed for branch circuit protection.
- 2 The units (2) 3/4-inch high voltage and (3) 1/2-inch low voltage connections are located on the left chamfered corner of the unit. They are designed to accept conduit.
- 4 Trane recommends that the condensate system be set-up per negative pressure trapping in consideration of the unit's draw-through design. With this properly trapped system, when condensate forms during normal operation, the water level in the trap rises until there is a constant outflow.



- 5 For acoustically sensitive areas, a 1/2-inch thick field provided vibration pad should be installed below the vertical unit. This field provided piece should be equal to the overall foot-print size of the unit to provide sound damping of the unit while in operation.

- 6 Hose kits are used to connect the water supply and return lines to the water inlet and outlets. Trane includes various hose kit combinations to better facilitate system flow balancing. These flexible hoses, reduce vibration between the unit and the rigid piping system.

Application Considerations

Installation Made Easy

Installing a horizontal unit inside a corridor to enhance sound attenuation provides value to duct design. Trane takes this fact one step further.

The new GEH design offers same side return-air/supply-air access to the unit. This access is contained within the overall dimension of the units length as shown in *Figure 32*. The duct access to the unit allows the unit to be installed closely against a corridor wall, while at the same time eliminating space required for the duct design.

Most horizontal unit designs provide an opposite supply air from the return air arrangement, or an end supply arrangement option. See *Figure 33* for end-supply example. An end-supply design increases the overall unit length of the system to accommodate a 90-degree duct turn. This not only requires added space, but also adds cost in both materials and installation.

Additional value to the design is acquired through the same side supply/return-air design. This design eliminates a requirement for a four sided service access. When installing the same side return/supply-air access, a brief 3-inch minimum is all that is required between the unit and the wall.

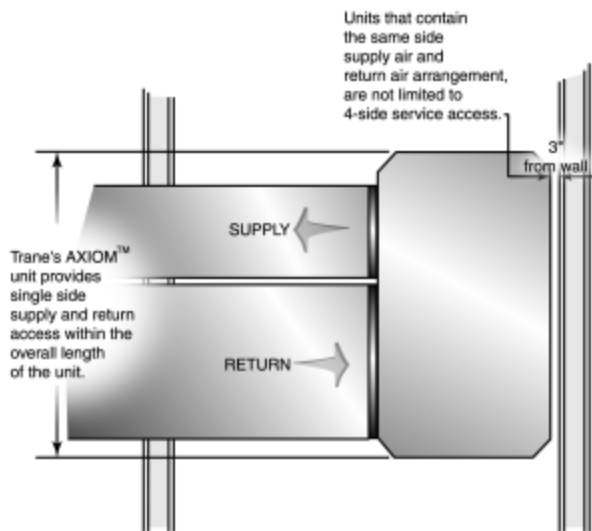


Figure 32: Same-side supply/return-air

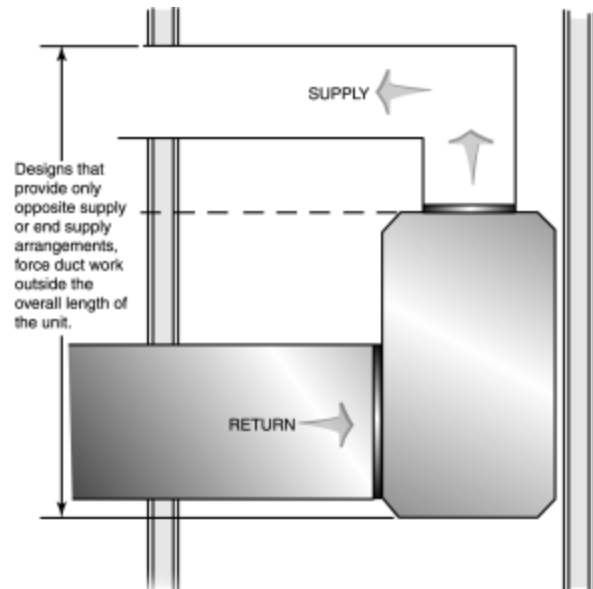


Figure 33: End supply arrangement/ductwork

Application Considerations

Duct Design for Noise Control

Proper acoustics are often a design requirement. Most of the problems that are associated with HVAC generated sound can be avoided by properly selecting and locating the components of the system. Acoustical modeling should be used to find the lowest cost design to meet a specific sound requirement, however, there are some general do's and don'ts that should be observed.

Figure 34 shows a supply air duct that is placed too close to the blower to provide substantial noise attenuation. It also, represents the effects on sound that a short supply branch connected to the discharge may produce. Avoid these forms of connections when designing ductwork where noise attenuation is critical.

The following suggestions will reduce the amount of sound that reaches the occupied space:

- Design the duct run with two 90-degree turns
- Line the first 5 feet of the supply trunk
- Line elbows and transition pieces, as well as a short distance upstream and downstream of the fittings
- Use flexible connections to isolate vibrations
- Provide multiple discharges
- Keep duct velocity low

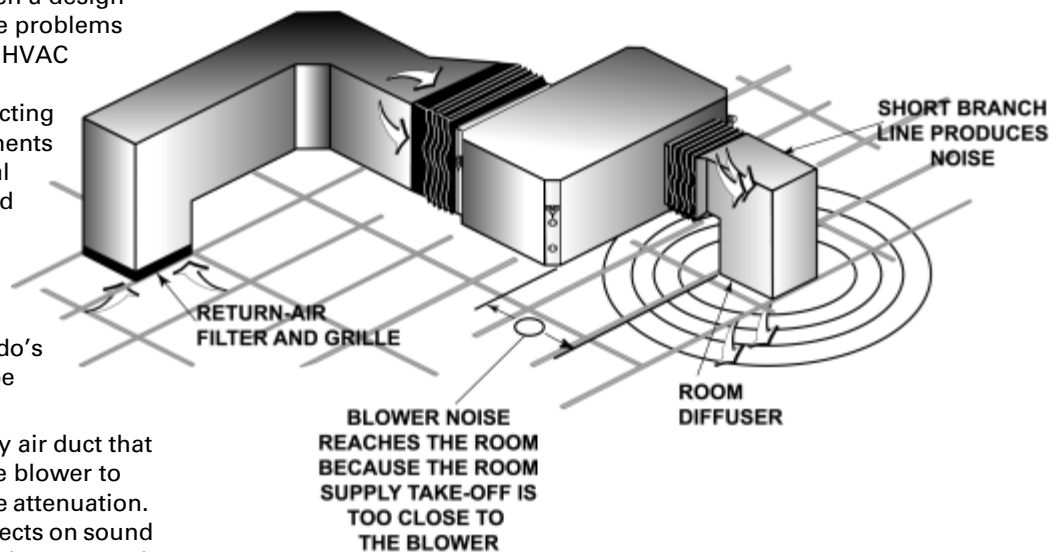


Figure 34: Improper supply-air ducting

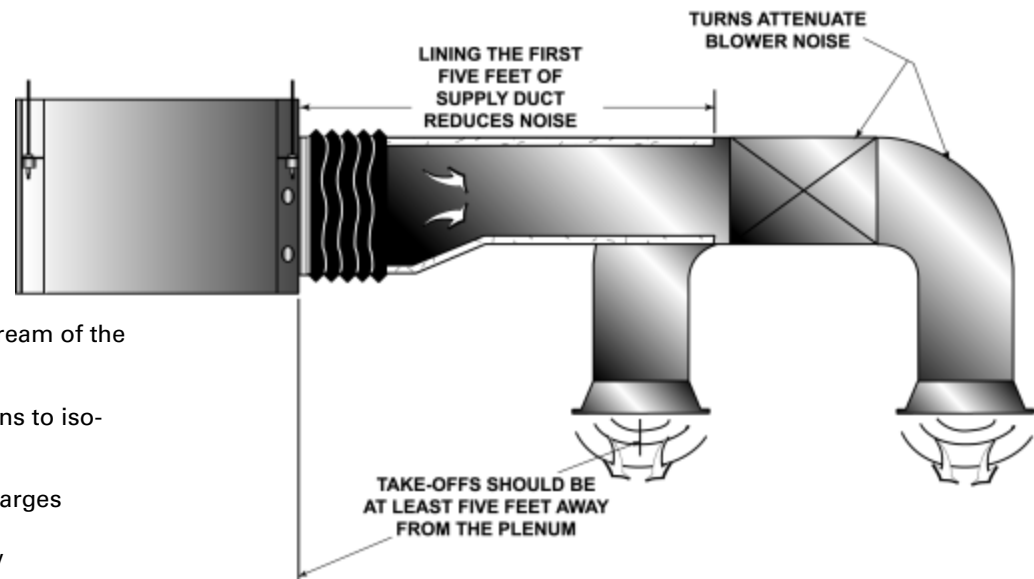


Figure 35: Desired supply-air ducting

See Figure 35 for a positive representation of supply duct work design for noise attenuation on units over 1 1/2 tons.

Application Considerations

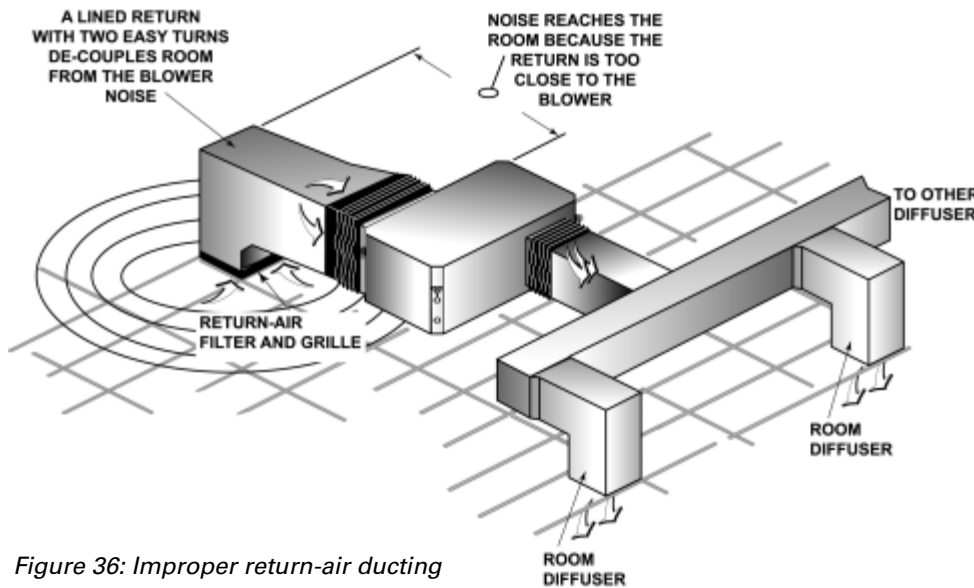


Figure 36: Improper return-air ducting

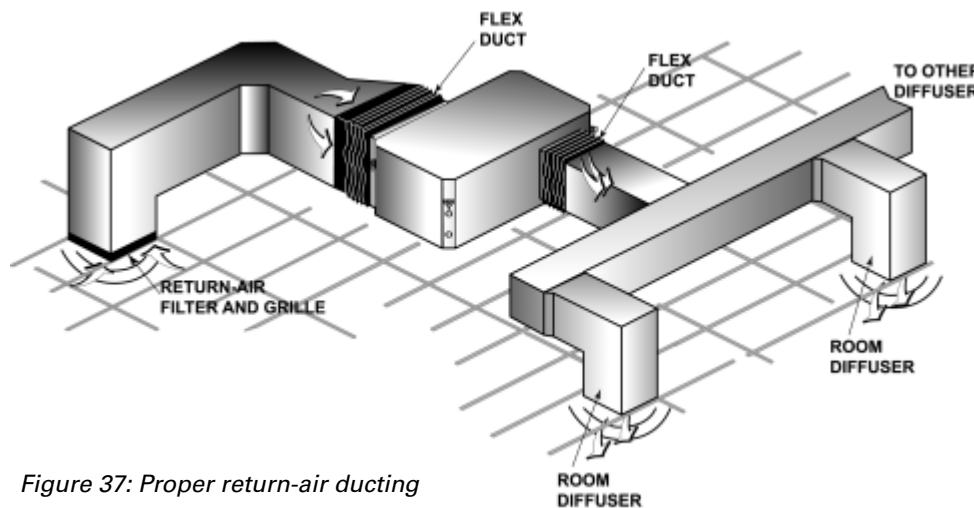


Figure 37: Proper return-air ducting

Sound control applies to the return side of the duct design as well as the supply side. *Figure 36*, demonstrates a poor installation. Note that the return air opening is close to the cabinet of the unit.

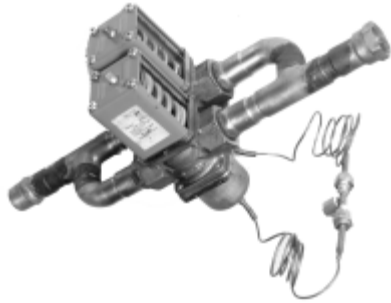
Figure 37 graphic represents proper installation of return-air duct. This includes

- Two 90-degree bends prior to the intake
- Lining the first 10 feet of the return air duct
- Locating the return-air intake away from the unit blower

A duct system with noise control in-mind can be designed by:

- Keeping air flow velocities low
- Using aerodynamic fittings
- Using a duct liner if metal duct is applied
- Avoiding line-of-sight connections between a noise source and an outlet
- Avoiding line-of-sight connection between a noise source and an inlet
- By properly locating balancing dampers
- Sealing cracks, seams and joints in the duct run and equipment panels
- Blocking transmission through walls, ceiling and floors
- Mounting and supporting the ductwork with isolation devices that absorb vibration
- Using flexible duct connections
- Using flexible braided hoses on the water connections

Application Considerations



Using Water Regulating Valves

The function of the water regulating valve assembly is to minimize the amount of water which flows through the water-source heat pump. These valves are most often used in systems where the water is wasted, but may also be used in boiler/cooling tower involving *variable speed pumping*. In a variable speed application, the valves are used to meter desirable water flow through the unit when the unit is running, and to stop water flow when the unit is not running (*but may not include a 100% shut-off*).

The water regulating valve assembly consists of two valves piped in parallel. When the water-source heat pump's compressor is de-energized, both valves are closed, allowing no water to flow through the unit. But, when the unit compressor is energized, one of the valves is closed and the other valve will allow water flow through the unit.

In *cooling mode*, the valve controlling the water flow is referred to as a direct acting valve. As the spring tension increases, the head pressure will also increase. This is due to the decrease in water flow through the unit. Note, the valve is being controlled by the head pressure. As the head pressure increases, the water flow increases, and vice versa. The valve is controlled by two pressures. The refrigerant pressure in the high side of the system, and the spring pressure, acting on the opposite side of the valve.

Note: The spring tension on the direct acting valve may be adjusted to maintain a desired head pressure.

When the unit is OFF, or is in the heating mode, the valve closes. This is because the pressure acting on the valve is out of the spring set-range.

In the *heating mode*, the valve controlling the water flow is referred to as a reverse acting valve. As the spring tension increases, the suction pressure will increase. This is due to the increase in water flow through the unit. Note, the valve is being controlled by the suction pressure. As the suction pressure decreases, the water flow increases, and vice versa. The valve is controlled by two pressures. The refrigerant pressure in the low side of the system, and the spring pressure, acting on the opposite side of the valve.

Note: The spring tension on the reverse acting valve may be adjusted to maintain a desired suction pressure.

When the unit is OFF, or is in the cooling mode, the valve closes. This is because the pressure acting on the valve is out of the spring set-range.

Both the direct acting and the reverse acting valves should be tapped into the same refrigerant line via a schraeder connection. This line must be a high pressure line when the unit is in the cooling mode, and a low pressure line when the unit is in the heating mode. The only line that will accommodate this condition is the vapor line running between the reversing valve and the water-to-refrigerant heat exchanger.

Note: In many applications, a water regulating valve may be used to meter water flow to the equipment instead of metering refrigerant flow to the equipment. This is typically applied when the equipment does not contain a thermal expansion refrigerant metering device. Trane places a thermal expansion valve on all water-source and ground-source heat pumps to provide maximum performance of the equipment. Capillary tube assemblies are not used on Trane water-source or ground-source heat pump equipment. Therefore, a water regulating valve is not required on most equipment applications.

Application Considerations

Types of Applications

In systems that use a boiler/cooling tower design, water pumps are placed between the auxiliary equipment (boiler, cooling tower, etc.) and the WSHPs to ensure positive water pressure throughout the system. Through this placement, the pump is able to pressurize the piping that serves the units, allowing the regulated makeup water to pressurize the pump section.

With this application, the cooling tower is used to dissipate heat from the condensing process. The condensing water is cooled for recirculation back to the water-to-refrigerant heat exchanger by using a combination of heat and mass transfer by evaporation. The type of cooling tower chosen for the application may include an open-circuit cooling tower with a

gasket-plate heat exchanger to close the loop, or a closed-circuit fluid cooler design.

Hybrid Systems

Some systems have evolved into a hybrid (combination) system due to building additions/phases or new requirements.

A hybrid system may have begun with a geothermal ground loop heat exchanger used to extract or add heat to the building. As additional rooms or buildings were added onto the system, the ground loop design became undersized for the new demand. A cooling tower may be the solution to off-load the peak demand of the new building addition. This may be an inexpensive means of tempering the loop to its appropriate working conditions. The cooling tower may be used in conjunction with the loop to lower loop temperatures during off-peak hours (at night) to support the peak load of the loop during the day.

Other additions may include a requirement for fresh-air ventilation. A fresh-air, air handler, along with a chiller may be introduced to the closed loop system to allow tempered fresh-air into the building.

The buildings heating and cooling needs are not based off of one type of component, but perform harmonious of each other. Because the loop is closed, heat recovery from the loop itself can be shared with the other major components.

The heat pumps are capable of heating or cooling a space independent of one another to provide individual heating and cooling needs.

A hybrid system should be considered on existing building design when an offset of cooling energy is a requirement. See *Figure 38* for hybrid system design.

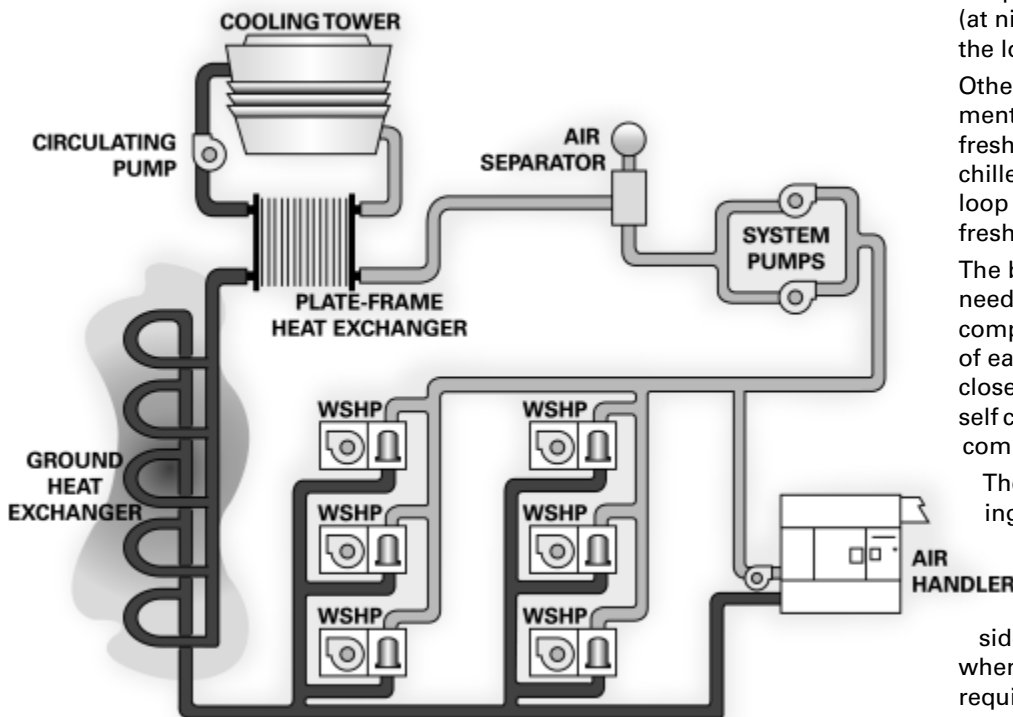


Figure 38: Hybrid system design

Selection Procedure

The performance standard ARI/ISO 13256-1 became effective Jan. 1, 2000. It replaces ARI standards 320, 325 and 330. This new standard has three major categories: Water Loop (ARI 320), Ground Water (ARI 325), Ground Loop (ARI 330). Although these standards are similar there are some differences. The cooling efficiency is measured in EER but includes a Watt-per-Watt unit of measure similar to the traditional COP measurement.

The entering water temperature has changed to reflect the centigrade temperature scale. For instance the water loop heating test is performed with 68-degree F (20-degree C) water instead of 70-degree F. The cooling tests are performed with 80.6-degree F (27-degree C) dry bulb and 66.2-degree F (19-degree C) wet bulb entering air instead of the traditional 80-degree F dry bulb, and 67-degree F wet bulb entering air temperatures. This data (80.6/66.2) may be converted to 80/67 by using the entering air correction table.

A pump power correction has been added onto the existing power consumption. Within each model, only one water flow rate is specified for each performance category, and pumping watts are calculated utilizing the pump power correction formula: $(\text{gpm} \times 0.0631) \times \text{press drop} \times 2990) / 300$.

Note: gpm relates to water flow, and press drop relates to the drop through the unit heat exchanger at rated water flow in feet of head.

The fan power is corrected to zero external static pressure. The nominal airflow is rated at a specific external static pressure. This effectively reduces the power consumption of the unit, and increases cooling capacity but decreases heating capacity. These watts are significant enough in most cases to increase EER and COP over ARI 320, 325, and 330 ratings.

Cooling Dominated Applications

If humidity levels are moderate to high in a cooling dominated application, the heat pump should be selected to meet or exceed the calculated sensible load. Also, the unit's sensible capacity should be no more than 115% of the total cooling load (sensible + latent), unless the calculated latent load is less than the latent capacity of the unit.

The sensible-to-total cooling ratio can be adjusted with airflow. If the airflow is lowered, the unit latent capacity will increase. When less air is pulled across the DX coil, more moisture will condense from the air.

Heating Dominated Applications

Unit sizing in heating dominated applications is based upon humidity levels for the climate, and goals for operating cost and installation costs.

If humidity levels are moderate, the heat pump should be selected with the heating capacity equal to 125% of the cooling load.

If humidity levels are low in the application and low operating cost is important, the heat pump and ground loop should be sized for 90% to 100% of the heating load.

If humidity levels are low and lower initial cost is important, then the heat pump and ground loop should be sized for 70% to 85% of the heating load, with the remaining load to be treated with electric resistance heat.

Installation cost will be reduced in this approach because of the smaller heat pump selection and less loop materials.

In general, the system will not use enough electric heat to offset the higher installation costs associated with a fully sized or oversized system.

Finally, a unit sized for the entire heating load in a heating dominated application will be oversized in cooling. Comfort is reduced from increased

room humidity caused by short-run times. Short cycling will also shorten the life expectancy of the equipment and increase power consumption and operating cost.

Many rebate incentives require the heat pump and ground loop to be sized for the entire heating load. Check with your local utility for their requirements.

Selection Program

All WSHP products should be selected through the Trane Official Product Selection System, **TOPSS**.



If this program has not been made available, ask a local Trane sales engineer to supply the desired selections or provide a copy of the program.

Required Fields

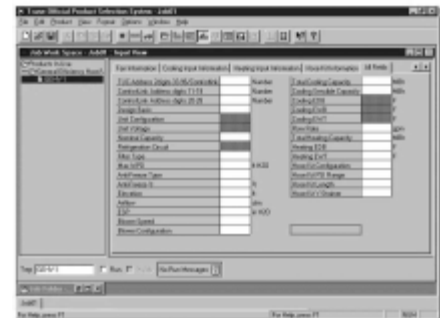
The first step in the selection is to determine either:

Total cooling capacity

Sensible capacity

Heating capacity

The maximum allowable water pressure drop and selection ranges can also be identified.





Model Number

Horizontal/Vertical Water-Source Comfort System

G E H B 036 1 1 D 0 1 1 0 D L D 0 1 0 N 0 0 1 1 0 0 0 1 0 0 0 0 0 0 0

5
10
15
20
25
30

DIGITS 1-3: UNIT CONFIGURATION

GEH = High Efficiency Horizontal
GEV = High Efficiency Vertical

DIGIT 4: DEVELOPMENT SEQUENCE B

DIGITS 5-7: NOMINAL CAPACITY

006 = 1/2 Ton 048 = 4 Ton
009 = 3/4 Ton 060 = 5 Ton
012 = 1 Ton
015 = 1 1/4 Ton
018 = 1 1/2 Ton
024 = 2 Ton
030 = 2 1/2 Ton
036 = 3 Ton
040 = 3 1/3 Ton
(vertical ONLY)
042 = 3 1/2 Ton

DIGIT 8: VOLTAGE (Volts/Hz/Phase)

0 = 115/60/1 6 = 220-240/50/1
1 = 208/60/1 7 = 265/60/1
2 = 230/60/1 8 = 230/60/3
3 = 208/60/3 9 = 380-415/50/3
4 = 460/60/3
5 = 575/60/3

DIGITS 9: HEAT EXCHANGER

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

DIGITS 10: CURRENT DESIGN SEQUENCE

DIGITS 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
A = Cooling ONLY Circuit
C = Cooling ONLY Circuit with Hot Gas Reheat

D = Cooling ONLY Circuit with Waterside Economizer
E = Cooling ONLY Circuit with HGR and WSE

DIGITS 12: BLOWER CONFIGURATION

1 = Standard Blower Motor
2 = High Static Blower Motor

DIGIT 13: CUSTOMER CHANNEL

1 = Boiler/Tower Design for Trane Commercial Group
2 = Geothermal Design for Trane Commercial Group
5 = Trane International Group

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

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

DIGIT 17: CONTROL TYPES

0 = Basic 24 V Controls
D = Deluxe 24 V Controls
C = Tracer ZN510 Controls
B = Tracer ZN524 Controls

DIGITS 18: TSTAT/SENSOR LOCATION

0 = Wall Mounted Location
1 = Unit Mounted Location with Standard Entry
2 = Unit Mounted Location with Keylock Entry

DIGITS 19: FAULT SENSORS

0 = No Fault Sensor
1 = Condensate Overflow Sensor
2 = Filter Maintenance Timer
3 = Condensate Overflow and Filter Maintenance Timer
4 = Fan Status Sensor
6 = Condensate Overflow and Fan Status
H = Fan Status and Filter Maintenance Timer
J = Fan Status, Filter Maintenance Timer and Condensate Overflow Sensor

DIGITS 20: TEMPERATURE SENSOR

0 = No Additional Temperature Sensor
1 = Entering Water Sensor

DIGITS 21: NIGHT SETBACK CONTROL

0 = No Night Setback Relay
N = Night Setback Relay

DIGITS 22: ELECTRIC HEAT

0 = No Electric Heat
1 = Internal Boilerless Electric Heat



Model Number

**DIGITS 23: UNIT MOUNTED
DISCONNECT**

0 = No Unit Mounted Disconnect

DIGITS 24: FILTER TYPE

0 = 1" Filter; No Duct Flange

1 = 1" Throwaway Filter

2 = 2" Throwaway Filter

**DIGITS 25: ACOUSTIC
ARRANGEMENT**

0 = Enhanced Sound Attenuation

1 = Deluxe Sound Attenuation

**DIGITS 26: FACTORY
CONFIGURATION**

0 = Standard Factory Configuration

DIGITS 27: PAINT COLOR

0 = No Paint Selection Available

DIGITS 28: OUTSIDE AIR

0 = No Outside Air Option Available

**DIGITS 29: PIPING
ARRANGEMENT**

0 = Standard Piping Arrangement

1 = Standard Piping with Schrader
Connection for Water Regulating
Valve

**DIGITS 30-36: DOES NOT APPLY
TO GEH or GEV**

0000000 = Digits 30-36 are not
applicable to the GEH or
GEV products



General Data

Table G1: General data about the units

Model GEH		006	009	012	015	018	024
Unit Size	Length (in)	40	40	40	40	46	46
	Height (in)	15	15	15	15	17	17
	Width (in)	20	20	20	20	23	23
Compressor Type		Rotary	Rotary	Rotary	Rotary	Rotary	Reciprocating
Approximate Weight	with Pallet (lb)	188	188	188	188	278	278
Approximate Weight	without Pallet (lb)	158	158	158	158	248	248
Filter Size	Actual (in)	14 5/8 x 20 1/4	14 5/8 x 20 1/4	14 5/8 x 20 1/4	14 5/8 x 20 1/4	16 3/8 x 23 5/8	16 3/8 x 23 5/8
Water in/out size (FPT)	inches	1/2	1/2	1/2	1/2	3/4	3/4
Condensate size (NPTI)	inches	3/4	3/4	3/4	3/4	3/4	3/4
Blower Wheel Size	Direct Drive (in)	9 x 4	9 x 4	9 x 4	9 x 4	9 x 6	10 x 6

Table G2: General data about the units (continued)

Model GEH		030	036	042	048	060
Unit Size	Length (in)	46	50	50	58	58
	Height (in)	17	19	19	21	21
	Width (in)	23	25	25	33	33
Compressor Type		Reciprocating	Reciprocating	Reciprocating	Reciprocating	Scroll
Approximate Weight	with Pallet (lb)	278	318	318	428	428
Approximate Weight	without Pallet (lb)	248	288	288	398	398
Filter Size	Actual (in)	16 3/8 x 23 5/8	18 5/8 x 25 3/8	18 5/8 x 25 3/8	20 5/8 x 29 3/4	20 5/8 x 29 3/4
Water in/out size (FPT)	inches	3/4	3/4	1	1	1
Condensate size (NPTI)	inches	3/4	3/4	3/4	3/4	3/4
Blower Wheel Size	Direct Drive (in)	10 x 6	12 x 8	12 x 8	12 x 11	12 x 11

General Data

Table G4: General data about the units

Model GEV		006	009	012	015	018
Unit Size	Length (in)	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2
	Height (in)	31 1/4	31 1/4	31 1/4	31 1/4	39 1/4
	Width (in)	19 1/2	19 1/2	19 1/2	19 1/2	21 1/2
Compressor Type		Rotary	Rotary	Rotary	Rotary	Reciprocating
Approximate Weight	with Pallet (lb)	178	178	178	178	268
Approximate Weight	without Pallet (lb)	158	158	158	158	248
Filter Size	Actual (in)	15 7/8 x 19 7/8	15 7/8 x 19 7/8	15 7/8 x 19 7/8	15 7/8 x 19 7/8	17 7/8 x 24 7/8
Water in/out size (FPT)	inches	1/2	1/2	1/2	1/2	3/4
Condensate size (NPTI)	inches	3/4	3/4	3/4	3/4	3/4
Blower Wheel Size	Direct Drive (in)	9 x 4	9 x 4	9 x 4	9 x 4	9 x 6

Table G5: General data about the units (continued)

Model GEV		024	030	036	040	042
Unit Size	Length (in)	21 1/2	21 1/2	26 1/2	21 1/2	26 1/2
	Height (in)	39 1/4	39 1/4	41 7/8	39 1/4	41 7/8
	Width (in)	21 1/2	21 1/2	24 1/2	21 1/2	24 1/2
Compressor Type		Reciprocating	Reciprocating	Reciprocating	Reciprocating	Reciprocating
Approximate Weight	with Pallet (lb)	268	268	308	268	308
Approximate Weight	without Pallet (lb)	248	248	288	248	288
Filter Size	Actual (in)	17 7/8 x 24 7/8	17 7/8 x 24 7/8	19 7/8 x 24 7/8	17 7/8 x 24 7/8	19 7/8 x 24 7/8
Water in/out size (FPT)	inches	3/4	3/4	3/4	3/4	3/4
Condensate size (NPTI)	inches	3/4	3/4	3/4	3/4	3/4
Blower Wheel Size	Direct Drive (in)	10 x 6	10 x 6	10 x 6	10 x 6	12 x 8

Table G6: General data about the units (continued)

Model GEV		048	060
Unit Size	Length (in)	30 1/2	30 1/2
	Height (in)	46 7/8	46 7/8
	Width (in)	26 1/2	26 1/2
Compressor Type		Reciprocating	Scroll
Approximate Weight	with Pallet (lb)	396	396
Approximate Weight	without Pallet (lb)	348	348
Filter Size	Actual (in)	27 7/8 x 29 7/8	27 7/8 x 29 7/8
Water in/out size	inches	1 FPT	1 FPT
Condensate size (NPTI)	inches	3/4	3/4
Blower Wheel Size and quantity		10 x 10 (DD)-Std 12 x 11 (DD)-Hi	12 x 11 (DD)



General Data

Air-to-Refrigerant Coils

Table G8: GEH/GEV 006, 009

Working Pressure	425
Tubes High	14
Tubes Deep	2
No. of Circuits	1
Finned vol. (h,w,d)	14 x 16 x 1.734
Coil Surface Area (Ft ²)	1.56
Fins Per Inch	12
Tube Material	Copper
Tube OD (in)	3/8
Wall Thickness	0.014
Return Bends	Copper

Table G9: GEH/GEV 012

Working Pressure	425
Tubes High	14
Tubes Deep	3
No. of Circuits	2
Finned vol. (h,w,d)	14 x 16 x 2.598
Coil Surface Area (Ft ²)	1.56
Fins Per Inch	12
Tube Material	Copper
Tube OD (in)	3/8
Wall Thickness	0.014
Return Bends	Copper

Table G10: GEH/GEV 015

Working Pressure	425
Tubes High	14
Tubes Deep	3
No. of Circuits	1
Finned vol. (h,w,d)	14 x 16 x 2.598
Coil Surface Area (Ft ²)	1.56
Fins Per Inch	12
Tube Material	Copper
Tube OD (in)	3/8
Wall Thickness	0.014
Return Bends	Copper

Table G11: GEH 018, 024, 030

Working Pressure	425
Tubes High	16
Tubes Deep	4
No. of Circuits	4
Finned vol. (h,w,d)	16 x 19 x 3.464
Coil Surface Area (Ft ²)	2.11
Fins Per Inch	12
Tube Material	Copper
Tube OD (in)	3/8
Wall Thickness	0.014
Return Bends	Copper

Table G12: GEV 018, 024, 030, 040

Working Pressure	425
Tubes High	21
Tubes Deep	4
No. of Circuits	4
Finned vol. (h,w,d)	21 x 16 x 3.464
Coil Surface Area (Ft ²)	2.33
Fins Per Inch	12
Tube Material	Copper
Tube OD (in)	3/8
Wall Thickness	0.014
Return Bends	Copper

Table G13: GEH/GEV 036, 042

Working Pressure	425
Tubes High	18
Tubes Deep	4
No. of Circuits	6
Finned vol. (h,w,d)	18 x 21 x 3.464
Coil Surface Area (Ft ²)	2.63
Fins Per Inch	12
Tube Material	Copper
Tube OD (in)	3/8
Wall Thickness	0.014
Return Bends	Copper

Table G14: GEH 048, 060

Working Pressure	425
Tubes High	20
Tubes Deep	4
No. of Circuits	8
Finned vol. (h,w,d)	20 x 29 x 3.464
Coil Surface Area (Ft ²)	4.03
Fins Per Inch	12
Tube Material	Copper
Tube OD (in)	3/8
Wall Thickness	0.014
Return Bends	Copper

Table G15: GEV 048, 060

Working Pressure	425
Tubes High	24
Tubes Deep	4
No. of Circuits	8
Finned vol. (h,w,d)	24 x 25 x 3.464
Coil Surface Area (Ft ²)	4.17
Fins Per Inch	12
Tube Material	Copper
Tube OD (in)	3/8
Wall Thickness	0.014
Return Bends	Copper

Performance Data ARI-ISO (WLHP/GLHP)

Table P1: ARI-ISO WLHP and GLHP Performance

Unit Size	Rated Water Flow (GPM)	Rated Air Flow (SCFM)	Cooling Capacity WLHP (BTUH)	EER WLHP	Heating Capacity WLHP (BTUH)	COP WLHP	Cooling Capacity GLHP (BTUH)	EER GLHP	Heating Capacity GLHP (BTUH)	COP GLHP
006	1.5	190	7060	13.0	8160	4.3	6980	14.4	4690	3.1
009	2.1	285	8760	12.85	10900	4.6	8710	14.5	6100	3.1
012	2.8	380	12500	13.15	13200	4.35	12400	14.2	8700	3.2
015	3.5	460	14100	14.0	17200	4.8	14200	16.0	10200	3.45
018	4.2	570	19100	13.5	21600	4.45	18900	14.9	13000	3.15
024	5.5	760	25800	12.6	30400	4.35	26000	13.8	17800	3.25
030	6.9	900	28500	12.5	33100	4.25	28700	13.5	19800	3.1
036	8.3	1140	36000	13.7	41800	4.7	35200	14.5	22200	3.25
GEV 040	9.2	1200	38500	12.75	44200	4.2	38500	13.6	26100	3.1
042	9.7	1330	40200	12.05	47500	4.2	41700	13.4	27400	3.1
048	11.0	1520	49000	12.75	55300	4.25	49000	13.65	32000	3.1
060	14.5	1900	59300	12.8	72300	4.4	58500	13.75	43300	3.1



Rated in accordance with ISO Standard 13256-1: 1998 (Water Loop Heat Pumps and Ground Loop Heat Pumps).

Certified conditions are 86°F EWT, 80.6°F DB/66.2°F WB EAT in cooling and 68°F EWT, 68°F DB/59°F WB EAT in heating. Data shown is for application performance only, as these conditions are typical for WSHP systems.

Models with capacities greater than 135,000 BTUH are not included in the ARI water-to-air and brine-to-air heat pump certification program.



Performance Data 006-Cooling

Table P2: GEH/GEV 006 Cooling Performance

Cooling performance data is tabulated at 80.6 F DB/66.2 F WB entering air at ARI/ISO 13256-1 rated CFM. For ARI/ISO 13256-1 certified ratings, see Table P1. See Performance correction tables to correct performance at conditions other than those tabulated. Data shown is for unit performance only. Interpolation is permissible. Extrapolation is not.

Rated GPM: 1.5
Rated CFM: 190

Maximum CFM: 152
Maximum CFM: 228

EWT	GPM	Total Mbtuh	Sen Mbtuh	SHR	Power kW	EER	Reject Mbtuh	LWT	Feet Head
45	1.0	8.4	5.5	0.66	0.46	18.3	10.0	65.0	1.5
45	1.2	8.4	5.6	0.66	0.45	18.8	10.0	61.6	2.1
45	1.4	8.5	5.6	0.66	0.45	18.8	10.0	59.3	2.7
45	1.5	8.5	5.6	0.66	0.44	19.3	10.0	58.3	3.0
45	1.6	8.5	5.6	0.66	0.44	19.3	10.0	57.5	3.4
45	1.7	8.5	5.6	0.66	0.43	19.7	10.0	56.7	3.7
45	1.8	8.5	5.6	0.66	0.43	19.8	10.0	56.1	4.1
55	1.0	8.0	5.4	0.68	0.46	17.3	9.5	74.1	1.4
55	1.2	8.0	5.4	0.68	0.45	17.8	9.5	70.9	2.0
55	1.4	8.0	5.5	0.68	0.45	17.9	9.6	68.7	2.6
55	1.5	8.1	5.5	0.68	0.44	18.3	9.6	67.8	2.9
55	1.6	8.1	5.5	0.68	0.44	18.4	9.6	67.0	3.2
55	1.7	8.1	5.5	0.68	0.44	18.4	9.6	66.3	3.5
55	1.8	8.1	5.6	0.69	0.43	18.8	9.6	65.6	3.9
68	1.0	7.4	5.3	0.71	0.50	14.9	9.2	86.3	1.4
68	1.2	7.5	5.3	0.71	0.49	15.3	9.2	83.3	1.9
68	1.4	7.6	5.4	0.71	0.48	15.7	9.2	81.1	2.4
68	1.5	7.6	6.0	0.80	0.48	15.8	9.2	80.3	2.7
68	1.6	7.6	5.4	0.71	0.47	16.2	9.2	79.5	3.0
68	1.7	7.6	5.4	0.71	0.47	16.2	9.2	78.9	3.3
68	1.8	7.7	5.5	0.71	0.47	16.3	9.3	78.3	3.6
77	1.0	7.1	5.2	0.73	0.55	12.9	9.0	95.0	1.3
77	1.2	7.2	5.2	0.73	0.54	13.3	9.0	92.1	1.8
77	1.4	7.3	5.3	0.73	0.53	13.7	9.1	90.0	2.3
77	1.5	7.3	5.3	0.73	0.53	13.7	9.1	89.2	2.6
77	1.6	7.3	5.3	0.73	0.52	14.1	9.1	88.4	2.9
77	1.7	7.3	5.4	0.73	0.52	14.1	9.1	87.8	3.1
77	1.8	7.4	5.4	0.73	0.52	14.2	9.1	87.2	3.4
86	1.0	6.8	5.1	0.74	0.61	11.2	8.9	103.9	1.3
86	1.2	6.9	5.2	0.75	0.60	11.5	8.9	101.0	1.7
86	1.4	7.0	5.2	0.75	0.59	11.8	9.0	98.9	2.2
86	1.5	7.0	5.3	0.75	0.59	11.9	9.0	98.1	2.5
86	1.6	7.0	5.3	0.75	0.59	11.9	9.1	97.4	2.7
86	1.7	7.1	5.3	0.75	0.58	12.2	9.1	96.7	3.0
86	1.8	7.1	5.3	0.75	0.58	12.2	9.1	96.1	3.3
95	1.0	6.5	5.0	0.76	0.67	9.8	8.8	112.8	1.2
95	1.2	6.6	5.1	0.77	0.67	9.9	8.9	109.9	1.6
95	1.4	6.7	5.2	0.77	0.66	10.2	9.0	107.9	2.1
95	1.5	6.7	5.2	0.77	0.65	10.4	9.0	107.0	2.4
95	1.6	6.8	5.2	0.77	0.65	10.4	9.0	106.3	2.6
95	1.7	6.8	5.3	0.77	0.65	10.5	9.0	105.7	2.9
95	1.8	6.9	5.3	0.77	0.64	10.7	9.0	105.1	3.2
105	1.0	6.2	4.9	0.79	0.74	8.4	8.8	122.7	1.2
105	1.2	6.3	5.0	0.79	0.74	8.6	8.9	119.9	1.6
105	1.4	6.4	5.1	0.79	0.73	8.8	8.9	117.8	2.0
105	1.5	6.5	5.1	0.79	0.72	9.0	8.9	117.0	2.2
105	1.6	6.5	5.2	0.79	0.72	9.1	9.0	116.3	2.5
105	1.7	6.6	5.2	0.79	0.72	9.1	9.0	115.7	2.8
105	1.8	6.6	5.2	0.79	0.71	9.3	9.0	115.1	3.0
115	1.0	6.0	4.9	0.81	0.84	7.1	8.8	132.9	1.1
115	1.2	6.1	5.0	0.82	0.83	7.3	8.9	130.0	1.5
115	1.4	6.2	5.1	0.82	0.82	7.5	9.0	128.0	1.9
115	1.5	6.2	5.1	0.82	0.82	7.6	9.0	127.2	2.2
115	1.6	6.3	5.1	0.82	0.81	7.7	9.0	126.4	2.4
115	1.7	6.3	5.2	0.82	0.81	7.8	9.1	125.8	2.7
115	1.8	6.4	5.2	0.82	0.81	7.9	9.1	125.2	3.0
120	1.0	5.8	4.8	0.82	0.91	6.4	9.0	138.1	1.0
120	1.2	6.0	4.9	0.83	0.90	6.6	9.0	135.2	1.4
120	1.4	6.1	5.0	0.83	0.90	6.7	9.1	133.2	1.9
120	1.5	6.1	5.1	0.83	0.89	6.9	9.1	132.3	2.1
120	1.6	6.2	5.1	0.83	0.89	6.9	9.2	131.6	2.4
120	1.7	6.2	5.2	0.83	0.88	7.0	9.2	131.0	2.6
120	1.8	6.2	5.2	0.83	0.88	7.1	9.3	130.4	2.9



Performance Data 006-Heating

Table P3: GEH/GEV 006 Heating Performance

Heating performance data is tabulated at 68 F DB entering air at ARI/ISO 13256-1 rated CFM. For ARI/ISO 13256-1 certified ratings, see Table P1. See Performance correction tables to correct performance at conditions other than those tabulated. Data shown is for unit performance only. Interpolation is permissible. Extrapolation is not.

Rated GPM: 1.5
Rated CFM: 190

Maximum CFM: 152
Maximum CFM: 228

EWT	GPM	Htg Cap Mbtuh	Absorb Mbtuh	Power kW	COP	LWT	Feet Head
25	1.0	5.0	3.2	0.52	2.8	18.5	1.5
25	1.2	5.2	3.4	0.52	2.9	19.4	2.2
25	1.4	5.2	3.4	0.53	2.9	20.2	3.0
25	1.5	5.2	3.4	0.53	2.9	20.5	3.4
25	1.6	5.2	3.3	0.53	2.8	20.8	3.8
25	1.7	5.2	3.4	0.53	2.9	21.1	4.2
25	1.8	5.2	3.4	0.53	2.9	21.2	4.6
32	1.0	5.5	3.6	0.54	3.0	24.7	1.5
32	1.2	5.7	3.8	0.54	3.1	25.6	2.1
32	1.4	5.7	3.9	0.54	3.1	26.5	2.9
32	1.5	5.7	3.8	0.55	3.0	26.9	3.2
32	1.6	5.7	3.8	0.55	3.0	27.2	3.6
32	1.7	5.7	3.8	0.55	3.0	27.5	4.0
32	1.8	5.8	3.9	0.55	3.1	27.7	4.5
45	1.0	6.5	4.6	0.57	3.3	35.9	1.5
45	1.2	6.7	4.8	0.57	3.5	37.0	2.1
45	1.4	6.8	4.9	0.57	3.5	38.0	2.7
45	1.5	6.8	4.9	0.57	3.5	38.5	3.0
45	1.6	6.8	4.9	0.58	3.5	38.9	3.4
45	1.7	6.9	4.9	0.58	3.5	39.2	3.7
45	1.8	6.9	5.0	0.58	3.5	39.5	4.1
55	1.0	7.4	5.4	0.59	3.7	44.3	1.4
55	1.2	7.6	5.6	0.60	3.7	45.7	2.0
55	1.4	7.7	5.7	0.60	3.8	46.9	2.6
55	1.5	7.8	5.7	0.60	3.8	47.4	2.9
55	1.6	7.8	5.7	0.60	3.8	47.8	3.2
55	1.7	7.8	5.8	0.60	3.8	48.2	3.5
55	1.8	7.9	5.8	0.60	3.8	48.5	3.9
68	1.0	8.5	6.4	0.62	4.0	55.2	1.4
68	1.2	8.8	6.6	0.63	4.1	56.9	1.9
68	1.4	8.9	6.7	0.63	4.1	58.4	2.4
68	1.5	8.9	6.8	0.63	4.1	59.0	2.7
68	1.6	8.9	6.8	0.63	4.2	59.5	3.0
68	1.7	9.0	6.8	0.63	4.2	60.0	3.3
68	1.8	9.0	6.9	0.63	4.2	60.4	3.6
75	1.0	9.1	6.9	0.64	4.1	61.2	1.4
75	1.2	9.3	7.2	0.64	4.3	63.0	1.8
75	1.4	9.4	7.3	0.64	4.3	64.6	2.3
75	1.5	9.5	7.3	0.64	4.3	65.3	2.6
75	1.6	9.5	7.3	0.65	4.3	65.9	2.9
75	1.7	9.5	7.3	0.65	4.3	66.4	3.2
75	1.8	9.6	7.3	0.65	4.3	66.8	3.5
86	1.0	9.8	7.5	0.66	4.3	70.9	1.3
86	1.2	10.1	7.8	0.66	4.5	72.9	1.7
86	1.4	10.2	7.9	0.67	4.4	74.7	2.2
86	1.5	10.2	7.9	0.67	4.5	75.4	2.5
86	1.6	10.2	7.9	0.67	4.5	76.1	2.7
86	1.7	10.2	7.9	0.67	4.5	76.6	3.0
86	1.8	10.2	8.0	0.67	4.5	77.1	3.3

Table P4: 006 Fan Correction Factors

Entering CFM	Cooling Capacity	Sensible Capacity	Cooling Input Watts	Heating Capacity	Heating Input Watts
152	0.974	0.892	0.965	0.972	1.032
162	0.981	0.920	0.973	0.979	1.023
171	0.987	0.945	0.981	0.986	1.016
181	0.994	0.973	0.991	0.993	1.008
190	1.000	1.000	1.000	1.000	1.000
209	1.012	1.051	1.020	1.013	0.984
218	1.018	1.077	1.030	1.020	0.977
228	1.025	1.105	1.042	1.027	0.968



Performance Data 009-Cooling

Table P5: GEH/GEV 009 Cooling Performance

Cooling performance data is tabulated at 80.6 F DB/66.2 F WB entering air at ARI/ISO 13256-1 rated CFM. For ARI/ISO 13256-1 certified ratings, see Table P1. See Performance correction tables to correct performance at conditions other than those tabulated. Data shown is for unit performance only. Interpolation is permissible. Extrapolation is not.

Rated GPM: 2.1
Rated CFM: 285

Maximum CFM: 228
Maximum CFM: 342

EWT	GPM	Total Mbtuh	Sen Mbtuh	SHR	Power kW	EER	Reject Mbtuh	LWT	Feet Head
45	1.4	10.6	7.4	0.70	0.56	18.9	12.5	62.9	2.7
45	1.7	10.6	7.4	0.70	0.54	19.6	12.4	59.6	3.8
45	1.9	10.7	7.3	0.68	0.53	20.2	12.5	58.2	4.5
45	2.1	10.7	7.3	0.68	0.52	20.6	12.5	56.9	5.4
45	2.2	10.7	7.3	0.68	0.52	20.6	12.5	56.3	5.8
45	2.3	10.7	7.3	0.68	0.52	20.6	12.5	55.8	6.2
45	2.5	10.7	7.3	0.68	0.52	20.6	12.5	55.0	7.1
55	1.4	10.1	7.1	0.70	0.56	18.0	12.0	72.2	2.6
55	1.7	10.2	7.1	0.70	0.54	18.9	12.0	69.2	3.6
55	1.9	10.2	7.1	0.70	0.53	19.2	12.0	67.6	4.3
55	2.1	10.2	7.1	0.70	0.52	19.6	12.0	66.4	5.0
55	2.2	10.2	7.1	0.70	0.52	19.6	12.0	65.9	5.4
55	2.3	10.2	7.1	0.70	0.52	19.6	12.0	65.4	5.9
55	2.5	10.2	7.1	0.70	0.52	19.6	12.0	64.6	6.7
68	1.4	9.4	6.8	0.72	0.62	15.2	11.5	84.5	2.4
68	1.7	9.5	6.9	0.73	0.60	15.8	11.6	81.6	3.3
68	1.9	9.5	6.9	0.73	0.59	16.1	11.5	80.1	4.0
68	2.1	9.5	6.9	0.73	0.58	16.4	11.5	78.9	4.7
68	2.2	9.5	6.9	0.73	0.57	16.7	11.5	78.4	5.0
68	2.3	9.5	6.9	0.73	0.57	16.7	11.5	78.0	5.4
68	2.5	9.5	6.9	0.73	0.57	16.7	11.5	77.2	6.2
77	1.4	8.9	6.6	0.74	0.68	13.1	11.2	93.1	2.3
77	1.7	9.0	6.7	0.74	0.66	13.6	11.3	90.3	3.1
77	1.9	9.0	6.7	0.74	0.65	13.8	11.2	88.8	3.7
77	2.1	9.0	6.7	0.74	0.64	14.1	11.2	87.7	4.4
77	2.2	9.0	6.7	0.74	0.64	14.1	11.2	87.2	4.8
77	2.3	9.1	6.7	0.74	0.63	14.4	11.3	86.8	5.2
77	2.5	9.0	6.7	0.74	0.63	14.3	11.2	85.9	5.9
86	1.4	8.5	6.4	0.75	0.76	11.2	11.1	101.9	2.2
86	1.7	8.5	6.5	0.76	0.74	11.5	11.0	99.0	3.0
86	1.9	8.5	6.5	0.76	0.73	11.6	11.0	97.6	3.6
86	2.1	8.6	6.5	0.76	0.72	11.9	11.1	96.6	4.2
86	2.2	8.6	6.5	0.76	0.71	12.1	11.0	96.1	4.6
86	2.3	8.6	6.5	0.76	0.71	12.1	11.0	95.6	4.9
86	2.5	8.6	6.5	0.76	0.71	12.1	11.0	94.9	5.7
95	1.4	8.0	6.2	0.78	0.84	9.5	10.9	110.6	2.0
95	1.7	8.1	6.3	0.78	0.82	9.9	10.9	107.9	2.8
95	1.9	8.1	6.3	0.78	0.81	10.0	10.9	106.5	3.4
95	2.1	8.1	6.3	0.78	0.80	10.1	10.8	105.4	4.1
95	2.2	8.1	6.3	0.78	0.80	10.1	10.8	104.9	4.4
95	2.3	8.1	6.3	0.78	0.79	10.3	10.8	104.4	4.7
95	2.5	8.1	6.3	0.78	0.79	10.3	10.8	103.7	5.5
105	1.4	7.5	6.0	0.80	0.93	8.1	10.7	120.4	2.0
105	1.7	7.5	6.0	0.80	0.92	8.2	10.6	117.6	2.7
105	1.9	7.6	6.0	0.79	0.90	8.4	10.7	116.3	3.3
105	2.1	7.6	6.0	0.79	0.89	8.5	10.6	115.2	3.9
105	2.2	7.6	6.0	0.79	0.89	8.5	10.6	114.7	4.2
105	2.3	7.6	6.0	0.79	0.88	8.6	10.6	114.3	4.6
105	2.5	7.6	6.0	0.79	0.88	8.6	10.6	113.5	5.3
115	1.4	6.8	5.7	0.84	1.01	6.7	10.3	129.8	1.9
115	1.7	6.8	5.7	0.84	1.00	6.8	10.2	127.1	2.7
115	1.9	6.9	5.7	0.83	0.98	7.0	10.2	125.9	3.2
115	2.1	6.9	5.7	0.83	0.97	7.1	10.2	124.8	3.8
115	2.2	6.9	5.7	0.83	0.97	7.1	10.2	124.4	4.2
115	2.3	6.9	5.7	0.83	0.97	7.1	10.2	124.0	4.5
115	2.5	6.9	5.7	0.83	0.96	7.2	10.2	123.2	5.2
120	1.4	6.2	5.6	0.90	1.04	6.0	9.8	134.1	1.9
120	1.7	6.3	5.5	0.87	1.03	6.1	9.8	131.7	2.6
120	1.9	6.3	5.5	0.87	1.02	6.2	9.8	130.4	3.2
120	2.1	6.4	5.5	0.86	1.01	6.3	9.9	129.5	3.8
120	2.2	6.4	5.5	0.86	1.00	6.4	9.8	129.0	4.2
120	2.3	6.4	5.5	0.86	1.00	6.4	9.8	128.6	4.5
120	2.5	6.4	5.5	0.86	1.00	6.4	9.8	127.9	5.2



Performance Data 009-Heating

Table P6: GEH/GEV 009 Heating Performance

Heating performance data is tabulated at 68 F DB entering air at ARI/ISO 13256-1 rated CFM. For ARI/ISO 13256-1 certified ratings, see Table P1. See Performance correction tables to correct performance at conditions other than those tabulated. Data shown is for unit performance only. Interpolation is permissible. Extrapolation is not.

Rated GPM: 2.1
Rated CFM: 285

Maximum CFM: 228
Maximum CFM: 342

EWT	GPM	Htg Cap Mbtuh	Absorb Mbtuh	Power kW	COP	LWT	Feet Head
25	1.4	6.7	4.7	0.60	3.3	18.4	3.0
25	1.7	6.7	4.7	0.60	3.3	19.5	4.2
25	1.9	6.7	4.6	0.61	3.2	20.1	5.1
25	2.1	6.7	4.6	0.61	3.2	20.6	6.0
25	2.2	6.8	4.7	0.61	3.3	20.7	6.5
25	2.3	6.8	4.7	0.61	3.3	20.9	7.0
25	2.5	6.8	4.7	0.61	3.3	21.2	8.1
32	1.4	6.9	4.8	0.62	3.3	25.2	2.9
32	1.7	7.0	4.9	0.62	3.3	26.3	4.1
32	1.9	7.0	4.9	0.63	3.3	26.9	4.9
32	2.1	7.1	5.0	0.63	3.3	27.3	5.8
32	2.2	7.1	5.0	0.63	3.3	27.5	6.3
32	2.3	7.2	5.1	0.63	3.3	27.6	6.7
32	2.5	7.2	5.1	0.63	3.3	28.0	7.7
45	1.4	8.1	5.9	0.66	3.6	36.6	2.7
45	1.7	8.3	6.1	0.66	3.7	37.9	3.8
45	1.9	8.4	6.2	0.66	3.7	38.5	4.5
45	2.1	8.5	6.2	0.67	3.7	39.1	5.4
45	2.2	8.5	6.2	0.67	3.7	39.4	5.8
45	2.3	8.5	6.2	0.67	3.7	39.6	6.2
45	2.5	8.6	6.3	0.67	3.8	40.0	7.1
55	1.4	9.2	6.9	0.68	4.0	45.2	2.6
55	1.7	9.4	7.1	0.69	4.0	46.7	3.6
55	1.9	9.5	7.2	0.69	4.0	47.5	4.3
55	2.1	9.6	7.3	0.69	4.1	48.1	5.0
55	2.2	9.7	7.4	0.69	4.1	48.3	5.4
55	2.3	9.7	7.4	0.69	4.1	48.6	5.9
55	2.5	9.8	7.5	0.69	4.2	49.0	6.7
68	1.4	10.6	8.1	0.72	4.3	56.4	2.4
68	1.7	10.9	8.4	0.72	4.4	58.1	3.3
68	1.9	11.0	8.5	0.72	4.5	59.0	4.0
68	2.1	11.1	8.6	0.73	4.5	59.8	4.7
68	2.2	11.1	8.6	0.73	4.5	60.2	5.0
68	2.3	11.2	8.7	0.73	4.5	60.4	5.4
68	2.5	11.2	8.7	0.73	4.5	61.0	6.2
75	1.4	11.4	8.9	0.73	4.6	62.2	2.3
75	1.7	11.6	9.1	0.74	4.6	64.3	3.2
75	1.9	11.7	9.2	0.74	4.6	65.3	3.8
75	2.1	11.8	9.3	0.74	4.7	66.2	4.5
75	2.2	11.8	9.3	0.74	4.7	66.6	4.8
75	2.3	11.9	9.4	0.74	4.7	66.8	5.2
75	2.5	12.0	9.4	0.75	4.7	67.4	6.0
86	1.4	12.4	9.8	0.76	4.8	71.9	2.2
86	1.7	12.6	10.0	0.76	4.9	74.2	3.0
86	1.9	12.7	10.1	0.76	4.9	75.3	3.6
86	2.1	12.8	10.2	0.76	4.9	76.2	4.2
86	2.2	12.9	10.3	0.77	4.9	76.6	4.6
86	2.3	12.9	10.3	0.77	4.9	77.0	4.9
86	2.5	13.0	10.4	0.77	4.9	77.7	5.7

Table P7: 009 Fan Correction Factors

Entering CFM	Cooling Capacity	Sensible Capacity	Cooling Input Watts	Heating Capacity	Heating Input Watts
228	0.974	0.892	0.965	0.972	1.032
242	0.980	0.918	0.972	0.979	1.024
257	0.987	0.946	0.982	0.986	1.016
271	0.993	0.972	0.991	0.993	1.008
285	1.000	1.000	1.000	1.000	1.000
314	1.013	1.052	1.020	1.014	0.984
328	1.019	1.078	1.030	1.020	0.976
342	1.025	1.105	1.042	1.027	0.968



Performance Data 012-Cooling

Table P8: GEH/GEV 012 Cooling Performance

Cooling performance data is tabulated at 80.6 F DB/66.2 F WB entering air at ARI/ISO 13256-1 rated CFM. For ARI/ISO 13256-1 certified ratings, see Table P1. See Performance correction tables to correct performance at conditions other than those tabulated. Data shown is for unit performance only. Interpolation is permissible. Extrapolation is not.

Rated GPM: 2.8
Rated CFM: 380

Maximum CFM: 304
Maximum CFM: 456

EWT	GPM	Total Mbtuh	Sen Mbtuh	SHR	Power kW	EER	Reject Mbtuh	LWT	Feet Head
45	1.8	14.3	10.4	0.73	0.88	16.3	17.3	64.2	4.7
45	2.2	14.4	10.4	0.72	0.85	16.9	17.3	60.7	6.5
45	2.5	14.4	10.5	0.73	0.84	17.1	17.3	58.8	8.0
45	2.8	14.5	10.5	0.72	0.83	17.5	17.3	57.4	9.6
45	2.9	14.5	10.5	0.72	0.82	17.7	17.3	56.9	10.1
45	3.1	14.5	10.5	0.72	0.82	17.7	17.3	56.2	11.2
45	3.4	14.5	10.5	0.72	0.80	18.1	17.2	55.1	13.0
55	1.8	13.9	10.0	0.72	0.80	17.4	16.6	73.5	4.4
55	2.2	13.9	10.0	0.72	0.77	18.1	16.5	70.0	6.1
55	2.5	14.0	10.0	0.71	0.77	18.2	16.6	68.3	7.4
55	2.8	14.1	10.1	0.72	0.75	18.8	16.7	66.9	8.9
55	2.9	14.1	10.1	0.72	0.75	18.8	16.7	66.5	9.4
55	3.1	14.1	10.1	0.72	0.75	18.8	16.7	65.8	10.5
55	3.4	14.1	10.0	0.71	0.72	19.6	16.6	64.7	12.2
68	1.8	13.1	9.6	0.73	0.91	14.4	16.2	86.0	4.1
68	2.2	13.2	9.6	0.73	0.88	15.0	16.2	82.7	5.6
68	2.5	13.2	9.6	0.73	0.88	15.0	16.2	81.0	6.9
68	2.8	13.3	9.7	0.73	0.86	15.5	16.2	79.6	8.3
68	2.9	13.3	9.7	0.73	0.86	15.5	16.2	79.2	8.8
68	3.1	13.3	9.6	0.72	0.86	15.5	16.2	78.5	9.8
68	3.4	13.3	9.6	0.72	0.83	16.0	16.1	77.5	11.3
77	1.8	12.5	9.3	0.74	1.00	12.5	15.9	94.7	3.9
77	2.2	12.6	9.3	0.74	0.97	13.0	15.9	91.5	5.3
77	2.5	12.7	9.4	0.74	0.96	13.2	16.0	89.8	6.6
77	2.8	12.7	9.4	0.74	0.95	13.4	15.9	88.4	7.9
77	2.9	12.8	9.4	0.73	0.95	13.5	16.0	88.1	8.4
77	3.1	12.8	9.4	0.73	0.94	13.6	16.0	87.4	9.4
77	3.4	12.8	9.4	0.73	0.92	13.9	15.9	86.4	10.9
86	1.8	12.0	9.1	0.76	1.08	11.1	15.7	103.5	3.7
86	2.2	12.1	9.1	0.75	1.05	11.5	15.7	100.3	5.1
86	2.5	12.1	9.1	0.75	1.05	11.5	15.7	98.6	6.3
86	2.8	12.2	9.2	0.75	1.03	11.8	15.7	97.3	7.6
86	2.9	12.2	9.2	0.75	1.03	11.8	15.7	96.9	8.1
86	3.1	12.2	9.2	0.75	1.03	11.8	15.7	96.2	9.0
86	3.4	12.2	9.1	0.75	1.00	12.2	15.6	95.2	10.5
95	1.8	11.3	8.8	0.78	1.19	9.5	15.4	112.2	3.5
95	2.2	11.4	8.8	0.77	1.16	9.8	15.4	109.0	4.9
95	2.5	11.5	8.9	0.77	1.15	10.0	15.4	107.4	6.1
95	2.8	11.5	8.9	0.77	1.14	10.1	15.4	106.1	7.4
95	2.9	11.5	8.9	0.77	1.13	10.2	15.4	105.7	7.8
95	3.1	11.6	8.9	0.77	1.13	10.3	15.5	105.0	8.8
95	3.4	11.6	8.9	0.77	1.11	10.5	15.4	104.1	10.2
105	1.8	10.5	8.5	0.81	1.35	7.8	15.1	121.9	3.4
105	2.2	10.6	8.5	0.80	1.31	8.1	15.1	118.8	4.8
105	2.5	10.6	8.6	0.81	1.31	8.1	15.1	117.2	5.9
105	2.8	10.7	8.6	0.80	1.30	8.2	15.1	115.9	7.1
105	2.9	10.7	8.6	0.80	1.29	8.3	15.1	115.5	7.6
105	3.1	10.7	8.6	0.80	1.29	8.3	15.1	114.8	8.5
105	3.4	10.8	8.6	0.80	1.27	8.5	15.1	114.0	9.9
115	1.8	9.6	8.1	0.84	1.49	6.4	14.7	131.5	3.3
115	2.2	9.7	8.1	0.84	1.46	6.6	14.7	128.5	4.6
115	2.5	9.8	8.2	0.84	1.45	6.8	14.8	126.9	5.7
115	2.8	9.9	8.2	0.83	1.44	6.9	14.8	125.7	6.9
115	2.9	9.9	8.2	0.83	1.44	6.9	14.8	125.3	7.4
115	3.1	9.9	8.2	0.83	1.44	6.9	14.8	124.7	8.3
115	3.4	9.9	8.2	0.83	1.41	7.0	14.7	123.7	9.7
120	1.8	9.3	7.9	0.85	1.50	6.2	14.4	136.2	3.2
120	2.2	9.4	7.9	0.84	1.47	6.4	14.4	133.3	4.5
120	2.5	9.5	7.9	0.83	1.46	6.5	14.5	131.7	5.6
120	2.8	9.5	8.0	0.84	1.45	6.6	14.5	130.4	6.8
120	2.9	9.5	8.0	0.84	1.45	6.6	14.5	130.1	7.3
120	3.1	9.6	7.9	0.82	1.44	6.7	14.5	129.5	8.2
120	3.4	9.6	7.9	0.82	1.42	6.8	14.5	128.6	9.6



Performance Data 012-Heating

Table P9: GEH/GEV 012 Heating Performance

Heating performance data is tabulated at 68 F DB entering air at ARI/ISO 13256-1 rated CFM. For ARI/ISO 13256-1 certified ratings, see Table P1. See Performance correction tables to correct performance at conditions other than those tabulated. Data shown is for unit performance only. Interpolation is permissible. Extrapolation is not.

Rated GPM: 2.8
Rated CFM: 380

Maximum CFM: 304
Maximum CFM: 456

EWT	GPM	Htg Cap Mbtuh	Absorb Mbtuh	Power kW	COP	LWT	Feet Head
25	1.8	8.0	5.2	0.83	2.8	19.3	5.6
25	2.2	8.2	5.4	0.83	2.9	20.1	7.7
25	2.5	8.3	5.4	0.84	2.9	20.7	9.4
25	2.8	8.4	5.5	0.84	2.9	21.1	11.2
25	2.9	8.4	5.5	0.84	2.9	21.2	11.8
25	3.1	8.5	5.6	0.84	3.0	21.4	13.1
25	3.4	8.5	5.6	0.84	3.0	21.7	15.0
32	1.8	9.2	6.3	0.85	3.2	25.0	5.3
32	2.2	9.3	6.4	0.86	3.2	26.2	7.3
32	2.5	9.4	6.5	0.86	3.2	26.8	8.9
32	2.8	9.5	6.6	0.86	3.2	27.3	10.6
32	2.9	9.6	6.7	0.86	3.3	27.4	11.2
32	3.1	9.6	6.7	0.86	3.3	27.7	12.4
32	3.4	9.7	6.7	0.87	3.3	28.0	14.3
45	1.8	11.0	7.9	0.90	3.6	36.2	4.7
45	2.2	11.2	8.1	0.91	3.6	37.6	6.5
45	2.5	11.3	8.2	0.92	3.6	38.5	8.0
45	2.8	11.4	8.3	0.92	3.6	39.1	9.6
45	2.9	11.4	8.3	0.92	3.6	39.3	10.1
45	3.1	11.4	8.3	0.92	3.6	39.7	11.2
45	3.4	11.5	8.4	0.92	3.7	40.1	13.0
55	1.8	12.1	8.9	0.93	3.8	45.1	4.4
55	2.2	12.3	9.1	0.93	3.9	46.7	6.1
55	2.5	12.4	9.2	0.94	3.9	47.6	7.4
55	2.8	12.4	9.2	0.94	3.9	48.4	8.9
55	2.9	12.5	9.3	0.94	3.9	48.6	9.4
55	3.1	12.5	9.3	0.94	3.9	49.0	10.5
55	3.4	12.6	9.4	0.94	3.9	49.5	12.2
68	1.8	13.2	10.0	0.95	4.1	56.9	4.1
68	2.2	13.4	10.1	0.96	4.1	58.8	5.6
68	2.5	13.5	10.2	0.96	4.1	59.8	6.9
68	2.8	13.5	10.2	0.96	4.1	60.7	8.3
68	2.9	13.6	10.3	0.96	4.2	60.9	8.8
68	3.1	13.6	10.3	0.96	4.2	61.3	9.8
68	3.4	13.7	10.4	0.97	4.1	61.9	11.3
75	1.8	13.7	10.4	0.97	4.1	63.4	3.9
75	2.2	13.9	10.6	0.97	4.2	65.4	5.4
75	2.5	14.0	10.7	0.98	4.2	66.5	6.6
75	2.8	14.1	10.8	0.98	4.2	67.3	8.0
75	2.9	14.1	10.8	0.98	4.2	67.6	8.5
75	3.1	14.2	10.9	0.98	4.2	68.0	9.5
75	3.4	14.3	10.9	0.99	4.2	68.6	11.0
86	1.8	14.6	11.2	0.99	4.3	73.5	3.7
86	2.2	14.8	11.4	1.00	4.3	75.6	5.1
86	2.5	14.9	11.5	1.01	4.3	76.8	6.3
86	2.8	14.9	11.5	1.01	4.3	77.8	7.6
86	2.9	15.0	11.6	1.01	4.4	78.0	8.1
86	3.1	15.0	11.6	1.00	4.4	78.5	9.0
86	3.4	15.1	11.7	1.01	4.4	79.1	10.5

Table P10: 012 Fan Correction Factors

Entering CFM	Cooling Capacity	Sensible Capacity	Cooling Input Watts	Heating Capacity	Heating Input Watts
304	0.974	0.892	0.965	0.972	1.032
323	0.980	0.919	0.973	0.979	1.024
342	0.987	0.945	0.981	0.986	1.016
361	0.993	0.972	0.990	0.993	1.008
380	1.000	1.000	1.000	1.000	1.000
418	1.012	1.051	1.020	1.013	0.984
437	1.019	1.078	1.030	1.020	0.976
456	1.025	1.105	1.042	1.027	0.968



Performance Data 015-Cooling

Table P11: GEH/GEV 015 Cooling Performance

Cooling performance data is tabulated at 80.6 F DB/66.2 F WB entering air at ARI/ISO 13256-1 rated CFM. For ARI/ISO 13256-1 certified ratings, see Table P1. See Performance correction tables to correct performance at conditions other than those tabulated. Data shown is for unit performance only. Interpolation is permissible. Extrapolation is not.

Rated GPM: 3.5
Rated CFM: 460

Maximum CFM: 368
Maximum CFM: 552

EWT	GPM	Total Mbtuh	Sen Mbtuh	SHR	Power kW	EER	Reject Mbtuh	LWT	Feet Head
45	2.2	17.0	11.9	0.70	0.78	21.8	19.7	62.9	3.9
45	2.8	17.1	12.0	0.70	0.74	23.1	19.6	59.0	5.7
45	3.1	17.1	11.9	0.70	0.73	23.4	19.6	57.6	6.7
45	3.5	17.1	11.9	0.70	0.72	23.8	19.6	56.2	8.2
45	3.6	17.1	11.8	0.69	0.71	24.1	19.5	55.8	8.5
45	3.8	17.1	11.8	0.69	0.71	24.1	19.5	55.3	9.3
45	4.2	17.1	11.8	0.69	0.72	23.8	19.6	54.3	10.9
55	2.2	16.1	11.4	0.71	0.83	19.4	18.9	72.2	3.7
55	2.8	16.2	11.6	0.72	0.79	20.5	18.9	68.5	5.4
55	3.1	16.3	11.6	0.71	0.78	20.9	19.0	67.2	6.3
55	3.5	16.3	11.5	0.71	0.77	21.2	18.9	65.8	7.7
55	3.6	16.3	11.5	0.71	0.77	21.2	18.9	65.5	8.1
55	3.8	16.3	11.5	0.71	0.77	21.2	18.9	65.0	8.8
55	4.2	16.3	11.5	0.71	0.78	20.9	19.0	64.0	10.3
68	2.2	15.2	10.9	0.72	0.93	16.3	18.4	84.7	3.4
68	2.8	15.3	11.1	0.73	0.90	17.0	18.4	81.1	5.0
68	3.1	15.4	11.1	0.72	0.89	17.3	18.4	79.9	5.9
68	3.5	15.4	11.1	0.72	0.88	17.5	18.4	78.5	7.2
68	3.6	15.3	11.1	0.73	0.88	17.4	18.3	78.2	7.5
68	3.8	15.3	11.1	0.73	0.88	17.4	18.3	77.6	8.2
68	4.2	15.4	11.1	0.72	0.88	17.5	18.4	76.8	9.6
77	2.2	14.5	10.6	0.73	1.02	14.2	18.0	93.4	3.2
77	2.8	14.6	10.8	0.74	1.00	14.6	18.0	89.9	4.7
77	3.1	14.6	10.8	0.74	0.99	14.7	18.0	88.6	5.6
77	3.5	14.6	10.8	0.74	0.98	14.9	17.9	87.3	6.8
77	3.6	14.6	10.8	0.74	0.98	14.9	17.9	87.0	7.2
77	3.8	14.6	10.8	0.74	0.98	14.9	17.9	86.5	7.8
77	4.2	14.6	10.9	0.75	0.98	14.9	17.9	85.6	9.2
86	2.2	13.7	10.4	0.76	1.13	12.1	17.6	102.0	3.0
86	2.8	13.8	10.5	0.76	1.11	12.4	17.6	98.6	4.5
86	3.1	13.8	10.5	0.76	1.10	12.5	17.6	97.4	5.3
86	3.5	13.8	10.3	0.75	1.09	12.7	17.5	96.1	6.5
86	3.6	13.8	10.5	0.76	1.09	12.7	17.5	95.8	6.8
86	3.8	13.8	10.5	0.76	1.08	12.8	17.5	95.2	7.5
86	4.2	13.8	10.5	0.76	1.08	12.8	17.5	94.4	8.8
95	2.2	12.8	10.1	0.79	1.25	10.2	17.1	110.6	2.9
95	2.8	12.9	10.2	0.79	1.23	10.5	17.1	107.3	4.2
95	3.1	13.0	10.2	0.78	1.22	10.7	17.2	106.1	5.1
95	3.5	13.0	10.2	0.78	1.20	10.8	17.1	104.8	6.2
95	3.6	13.0	10.2	0.78	1.20	10.8	17.1	104.6	6.5
95	3.8	12.9	10.2	0.79	1.19	10.8	17.0	104.0	7.1
95	4.2	13.0	10.2	0.78	1.18	11.0	17.0	103.2	8.4
105	2.2	11.9	9.9	0.83	1.39	8.6	16.6	120.2	2.7
105	2.8	12.0	9.9	0.83	1.37	8.8	16.7	117.0	4.0
105	3.1	12.1	9.9	0.82	1.35	9.0	16.7	115.9	4.8
105	3.5	12.1	9.8	0.81	1.33	9.1	16.6	114.6	5.9
105	3.6	12.1	9.8	0.81	1.33	9.1	16.6	114.3	6.2
105	3.8	12.1	9.8	0.81	1.32	9.2	16.6	113.8	6.8
105	4.2	12.1	9.8	0.81	1.30	9.3	16.5	112.9	8.0
115	2.2	11.0	9.7	0.88	1.53	7.2	16.2	129.9	2.6
115	2.8	11.1	9.6	0.86	1.50	7.4	16.2	126.7	3.9
115	3.1	11.2	9.5	0.85	1.49	7.5	16.3	125.6	4.6
115	3.5	11.2	9.4	0.84	1.46	7.7	16.2	124.3	5.7
115	3.6	11.1	9.4	0.85	1.46	7.6	16.1	124.0	6.0
115	3.8	11.1	9.3	0.84	1.44	7.7	16.0	123.5	6.5
115	4.2	11.2	9.3	0.83	1.42	7.9	16.1	122.7	7.7
120	2.2	10.5	9.6	0.91	1.60	6.6	16.0	134.7	2.5
120	2.8	10.6	9.5	0.90	1.57	6.8	16.0	131.5	3.8
120	3.1	10.6	9.4	0.89	1.55	6.8	15.9	130.4	4.5
120	3.5	10.6	9.2	0.87	1.53	6.9	15.8	129.1	5.6
120	3.6	10.6	9.2	0.87	1.52	7.0	15.8	128.9	5.9
120	3.8	10.6	9.1	0.86	1.50	7.1	15.7	128.4	6.4
120	4.2	10.6	9.0	0.85	1.47	7.2	15.6	127.5	7.6



Performance Data 015-Heating

Table P12: GEH/GEV 015 Heating Performance

Heating performance data is tabulated at 68 F DB entering air at ARI/ISO 13256-1 rated CFM. For ARI/ISO 13256-1 certified ratings, see Table P1. See Performance correction tables to correct performance at conditions other than those tabulated. Data shown is for unit performance only. Interpolation is permissible. Extrapolation is not.

Rated GPM: 3.5
Rated CFM: 460

Maximum CFM: 368
Maximum CFM: 552

EWT	GPM	Htg Cap Mbtuh	Absorb Mbtuh	Power kW	COP	LWT	Feet Head
25	2.2	9.4	6.5	0.86	3.2	19.1	4.3
25	2.8	9.7	6.7	0.89	3.2	20.2	6.3
25	3.1	9.8	6.8	0.89	3.2	20.6	7.4
25	3.5	9.9	6.9	0.89	3.3	21.1	9.1
25	3.6	10.0	7.0	0.89	3.3	21.1	9.5
25	3.8	10.0	7.0	0.89	3.3	21.3	10.3
25	4.2	10.1	7.0	0.90	3.3	21.7	12.1
32	2.2	10.6	7.5	0.91	3.4	25.2	4.2
32	2.8	10.8	7.6	0.93	3.4	26.6	6.1
32	3.1	11.0	7.8	0.93	3.5	27.0	7.2
32	3.5	11.1	7.9	0.94	3.5	27.5	8.7
32	3.6	11.2	8.0	0.94	3.5	27.6	9.1
32	3.8	11.2	8.0	0.94	3.5	27.8	10.0
32	4.2	11.3	8.1	0.94	3.5	28.1	11.6
45	2.2	12.9	9.6	0.98	3.9	36.3	3.9
45	2.8	13.2	9.8	1.00	3.9	38.0	5.7
45	3.1	13.4	10.0	1.01	3.9	38.6	6.7
45	3.5	13.5	10.1	1.01	3.9	39.3	8.2
45	3.6	13.6	10.2	1.01	3.9	39.4	8.5
45	3.8	13.6	10.2	1.01	3.9	39.7	9.3
45	4.2	13.7	10.2	1.02	3.9	40.1	10.9
55	2.2	14.7	11.2	1.04	4.1	44.9	3.7
55	2.8	15.1	11.5	1.06	4.2	46.8	5.4
55	3.1	15.2	11.6	1.06	4.2	47.5	6.3
55	3.5	15.4	11.8	1.07	4.2	48.3	7.7
55	3.6	15.4	11.8	1.07	4.2	48.5	8.1
55	3.8	15.5	11.9	1.07	4.2	48.8	8.8
55	4.2	15.6	12.0	1.07	4.3	49.3	10.3
68	2.2	16.9	13.2	1.10	4.5	56.0	3.4
68	2.8	17.2	13.4	1.12	4.5	58.4	5.0
68	3.1	17.4	13.5	1.13	4.5	59.3	5.9
68	3.5	17.5	13.6	1.13	4.5	60.2	7.2
68	3.6	17.5	13.6	1.13	4.5	60.4	7.5
68	3.8	17.6	13.7	1.13	4.6	60.8	8.2
68	4.2	17.6	13.7	1.14	4.5	61.5	9.6
75	2.2	17.8	13.9	1.13	4.6	62.3	3.2
75	2.8	18.1	14.2	1.15	4.6	64.8	4.8
75	3.1	18.3	14.4	1.15	4.7	65.7	5.6
75	3.5	18.4	14.4	1.16	4.6	66.7	6.9
75	3.6	18.4	14.4	1.16	4.6	67.0	7.2
75	3.8	18.5	14.5	1.16	4.7	67.3	7.9
75	4.2	18.5	14.5	1.16	4.7	68.1	9.3
86	2.2	18.8	14.9	1.13	4.9	72.4	3.0
86	2.8	19.1	15.2	1.15	4.9	75.1	4.5
86	3.1	19.2	15.2	1.16	4.8	76.1	5.3
86	3.5	19.3	15.3	1.16	4.9	77.2	6.5
86	3.6	19.3	15.3	1.16	4.9	77.4	6.8
86	3.8	19.3	15.3	1.16	4.9	77.9	7.5
86	4.2	19.4	15.4	1.17	4.9	78.6	8.8

Table P13: 015 Fan Correction Factors

Entering CFM	Cooling Capacity	Sensible Capacity	Cooling Input Watts	Heating Capacity	Heating Input Watts
368	0.974	0.892	0.965	0.972	1.032
391	0.980	0.919	0.973	0.979	1.024
414	0.987	0.945	0.981	0.986	1.016
437	0.993	0.972	0.990	0.993	1.008
460	1.000	1.000	1.000	1.000	1.000
506	1.012	1.051	1.020	1.013	0.984
529	1.019	1.078	1.030	1.020	0.976
552	1.025	1.105	1.042	1.027	0.968



Performance Data 018-Cooling

Table P14: GEH/GEV 018 Cooling Performance

Cooling performance data is tabulated at 80.6 F DB/66.2 F WB entering air at ARI/ISO 13256-1 rated CFM. For ARI/ISO 13256-1 certified ratings, see Table P1. See Performance correction tables to correct performance at conditions other than those tabulated. Data shown is for unit performance only. Interpolation is permissible. Extrapolation is not.

Rated GPM: 4.2
Rated CFM: 570

Maximum CFM: 456
Maximum CFM: 684

EWT	GPM	Total Mbtuh	Sen Mbtuh	SHR	Power kW	EER	Reject Mbtuh	LWT	Feet Head
45	2.7	22.4	15.7	0.70	1.11	20.2	26.2	64.4	4.7
45	3.3	22.7	15.9	0.70	1.06	21.4	26.3	60.9	6.4
45	3.7	22.8	15.8	0.69	1.04	21.9	26.4	59.2	7.5
45	4.2	22.8	15.9	0.70	1.03	22.1	26.3	57.5	9.1
45	4.4	22.9	15.9	0.69	1.02	22.5	26.4	57.0	9.8
45	4.6	22.9	16.0	0.70	1.01	22.7	26.4	56.5	10.4
45	5.0	22.9	16.0	0.70	1.01	22.7	26.4	55.5	11.8
55	2.7	21.6	15.6	0.72	1.21	17.9	25.7	74.1	4.3
55	3.3	22.0	15.7	0.71	1.17	18.8	26.0	70.8	5.8
55	3.7	22.0	15.7	0.71	1.14	19.3	25.9	69.0	6.9
55	4.2	22.1	15.8	0.71	1.13	19.6	26.0	67.4	8.3
55	4.4	22.1	15.8	0.71	1.12	19.7	25.9	66.8	8.9
55	4.6	22.1	15.9	0.72	1.12	19.7	25.9	66.3	9.6
55	5.0	22.2	15.9	0.72	1.11	20.0	26.0	65.4	10.9
68	2.7	19.9	15.1	0.76	1.34	14.9	24.5	86.2	3.8
68	3.3	20.3	15.2	0.75	1.30	15.6	24.7	83.0	5.2
68	3.7	20.3	15.2	0.75	1.28	15.9	24.7	81.4	6.2
68	4.2	20.4	15.3	0.75	1.26	16.2	24.7	79.8	7.6
68	4.4	20.4	15.3	0.75	1.26	16.2	24.7	79.2	8.2
68	4.6	20.4	15.3	0.75	1.25	16.3	24.7	78.7	8.8
68	5.0	20.5	15.3	0.75	1.24	16.5	24.7	77.9	10.0
77	2.7	19.0	14.5	0.76	1.47	12.9	24.0	94.8	3.6
77	3.3	19.3	14.7	0.76	1.43	13.5	24.2	91.7	4.9
77	3.7	19.3	14.7	0.76	1.40	13.8	24.1	90.0	5.9
77	4.2	19.4	14.7	0.76	1.39	14.0	24.1	88.5	7.2
77	4.4	19.5	14.7	0.75	1.38	14.1	24.2	88.0	7.8
77	4.6	19.5	14.8	0.76	1.38	14.1	24.2	87.6	8.3
77	5.0	19.5	14.8	0.76	1.37	14.2	24.2	86.7	9.5
86	2.7	18.2	13.9	0.76	1.62	11.2	23.7	103.6	3.3
86	3.3	18.5	14.0	0.76	1.57	11.8	23.9	100.5	4.7
86	3.7	18.5	14.0	0.76	1.55	11.9	23.8	98.9	5.6
86	4.2	18.6	14.1	0.76	1.54	12.1	23.9	97.4	6.9
86	4.4	18.6	14.1	0.76	1.53	12.2	23.8	96.9	7.4
86	4.6	18.7	14.2	0.76	1.52	12.3	23.9	96.4	8.0
86	5.0	18.7	14.2	0.76	1.52	12.3	23.9	95.6	9.1
95	2.7	17.3	13.3	0.77	1.77	9.8	23.3	112.4	3.2
95	3.3	17.6	13.4	0.76	1.73	10.2	23.5	109.3	4.4
95	3.7	17.7	13.4	0.76	1.71	10.4	23.5	107.8	5.4
95	4.2	17.8	13.5	0.76	1.70	10.5	23.6	106.3	6.6
95	4.4	17.8	13.5	0.76	1.69	10.5	23.6	105.8	7.1
95	4.6	17.8	13.5	0.76	1.68	10.6	23.5	105.3	7.7
95	5.0	17.8	13.5	0.76	1.68	10.6	23.5	104.5	8.8
105	2.7	16.1	12.8	0.80	1.96	8.2	22.8	122.0	3.0
105	3.3	16.5	13.0	0.79	1.92	8.6	23.1	119.1	4.2
105	3.7	16.5	12.9	0.78	1.89	8.7	23.0	117.5	5.1
105	4.2	16.6	13.0	0.78	1.88	8.8	23.0	116.0	6.4
105	4.4	16.6	13.0	0.78	1.87	8.9	23.0	115.5	6.9
105	4.6	16.6	13.1	0.79	1.87	8.9	23.0	115.1	7.4
105	5.0	16.7	13.1	0.78	1.86	9.0	23.1	114.3	8.5
115	2.7	15.2	12.8	0.84	2.16	7.0	22.6	131.9	2.8
115	3.3	15.5	12.9	0.83	2.12	7.3	22.7	128.9	4.1
115	3.7	15.5	12.9	0.83	2.09	7.4	22.6	127.4	4.9
115	4.2	15.6	13.0	0.83	2.08	7.5	22.7	125.9	6.1
115	4.4	15.6	13.0	0.83	2.07	7.5	22.7	125.4	6.6
115	4.6	15.6	13.1	0.84	2.07	7.5	22.7	125.0	7.2
115	5.0	15.7	13.1	0.83	2.06	7.6	22.7	124.2	8.3
120	2.7	15.1	13.1	0.87	2.28	6.6	22.9	137.1	2.8
120	3.3	15.4	13.2	0.86	2.24	6.9	23.1	134.1	4.0
120	3.7	15.5	13.2	0.85	2.21	7.0	23.0	132.6	4.9
120	4.2	15.6	13.2	0.85	2.20	7.1	23.1	131.1	6.0
120	4.4	15.6	13.3	0.85	2.19	7.1	23.1	130.6	6.6
120	4.6	15.6	13.3	0.85	2.19	7.1	23.1	130.1	7.1
120	5.0	15.6	13.3	0.85	2.18	7.2	23.0	129.3	8.1



Performance Data 018-Heating

Table P15: GEH/GEV 018 Heating Performance

Heating performance data is tabulated at 68 F DB entering air at ARI/ISO 13256-1 rated CFM. For ARI/ISO 13256-1 certified ratings, see Table P1. See Performance correction tables to correct performance at conditions other than those tabulated. Data shown is for unit performance only. Interpolation is permissible. Extrapolation is not.

Rated GPM: 4.2
Rated CFM: 570

Maximum CFM: 456
Maximum CFM: 684

EWT	GPM	Htg Cap Mbtuh	Absorb Mbtuh	Power kW	COP	LWT	Feet Head
25	2.7	12.5	8.2	1.26	2.9	18.9	5.4
25	3.3	12.7	8.4	1.27	2.9	19.9	7.6
25	3.7	12.9	8.6	1.27	3.0	20.4	9.2
25	4.2	13.0	8.7	1.27	3.0	20.9	11.2
25	4.4	13.0	8.7	1.27	3.0	21.1	12.1
25	4.6	13.1	8.8	1.27	3.0	21.2	12.9
25	5.0	13.1	8.8	1.27	3.0	21.5	14.7
32	2.7	13.6	9.2	1.29	3.1	25.2	5.3
32	3.3	13.9	9.5	1.30	3.1	26.3	7.2
32	3.7	14.1	9.6	1.31	3.2	26.8	8.6
32	4.2	14.2	9.7	1.31	3.2	27.4	10.4
32	4.4	14.3	9.8	1.31	3.2	27.5	11.2
32	4.6	14.3	9.8	1.31	3.2	27.7	11.9
32	5.0	14.3	9.8	1.31	3.2	28.1	13.5
45	2.7	16.2	11.5	1.37	3.5	36.5	4.7
45	3.3	16.5	11.8	1.38	3.5	37.9	6.4
45	3.7	16.7	12.0	1.38	3.5	38.5	7.5
45	4.2	16.9	12.2	1.39	3.6	39.2	9.1
45	4.4	17.0	12.3	1.39	3.6	39.4	9.8
45	4.6	17.0	12.3	1.39	3.6	39.7	10.4
45	5.0	17.1	12.4	1.39	3.6	40.1	11.8
55	2.7	18.3	13.4	1.43	3.7	45.1	4.3
55	3.3	18.7	13.8	1.44	3.8	46.6	5.8
55	3.7	18.9	14.0	1.44	3.8	47.4	6.9
55	4.2	19.2	14.3	1.45	3.9	48.2	8.3
55	4.4	19.2	14.3	1.45	3.9	48.5	8.9
55	4.6	19.3	14.4	1.45	3.9	48.8	9.6
55	5.0	19.3	14.3	1.46	3.9	49.3	10.9
68	2.7	21.2	16.1	1.51	4.1	56.1	3.8
68	3.3	21.6	16.4	1.52	4.2	58.0	5.2
68	3.7	21.9	16.7	1.53	4.2	59.0	6.2
68	4.2	22.1	16.8	1.54	4.2	60.0	7.6
68	4.4	22.2	16.9	1.54	4.2	60.3	8.2
68	4.6	22.2	16.9	1.54	4.2	60.6	8.8
68	5.0	22.3	17.0	1.54	4.2	61.2	10.0
75	2.7	22.7	17.4	1.55	4.3	62.1	3.6
75	3.3	23.1	17.7	1.57	4.3	64.2	5.0
75	3.7	23.3	17.9	1.57	4.3	65.3	6.0
75	4.2	23.6	18.2	1.58	4.4	66.3	7.3
75	4.4	23.7	18.3	1.58	4.4	66.7	7.8
75	4.6	23.7	18.3	1.59	4.4	67.0	8.4
75	5.0	23.8	18.4	1.59	4.4	67.6	9.6
86	2.7	24.6	19.1	1.62	4.4	71.8	3.3
86	3.3	25.1	19.5	1.64	4.5	74.1	4.7
86	3.7	25.4	19.8	1.64	4.5	75.3	5.6
86	4.2	25.6	20.0	1.65	4.5	76.5	6.9
86	4.4	25.7	20.1	1.65	4.6	76.8	7.4
86	4.6	25.7	20.0	1.66	4.5	77.3	8.0
86	5.0	25.8	20.1	1.66	4.6	77.9	9.1

Table P16: 018 Fan Correction Factors

Entering CFM	Cooling Capacity	Sensible Capacity	Cooling Input Watts	Heating Capacity	Heating Input Watts
456	0.974	0.892	0.965	0.972	1.032
485	0.981	0.919	0.973	0.979	1.024
513	0.987	0.945	0.981	0.986	1.016
542	0.993	0.972	0.991	0.993	1.008
570	1.000	1.000	1.000	1.000	1.000
627	1.012	1.051	1.020	1.013	0.984
656	1.019	1.078	1.030	1.020	0.976
684	1.025	1.105	1.042	1.027	0.968



Performance Data 024-Cooling

Table P17: GEH/GEV 024 Cooling Performance

Cooling performance data is tabulated at 80.6 F DB/66.2 F WB entering air at ARI/ISO 13256-1 rated CFM. For ARI/ISO 13256-1 certified ratings, see Table P1. See Performance correction tables to correct performance at conditions other than those tabulated. Data shown is for unit performance only. Interpolation is permissible. Extrapolation is not.

Rated GPM: 5.5
Rated CFM: 760

Maximum CFM: 608
Maximum CFM: 912

EWT	GPM	Total Mbtuh	Sen Mbtuh	SHR	Power kW	EER	Reject Mbtuh	LWT	Feet Head
45	3.6	30.4	21.8	0.72	1.69	18.0	36.2	65.1	4.7
45	4.4	30.7	21.7	0.71	1.65	18.6	36.3	61.5	6.4
45	5.0	30.9	21.8	0.71	1.62	19.1	36.4	59.6	7.9
45	5.5	31.0	21.7	0.70	1.61	19.3	36.5	58.3	9.1
45	5.8	31.0	21.7	0.70	1.60	19.4	36.5	57.6	9.9
45	6.1	31.1	21.7	0.70	1.59	19.6	36.5	57.0	10.7
45	6.6	31.2	21.6	0.69	1.58	19.7	36.6	56.1	12.0
55	3.6	29.6	20.8	0.70	1.79	16.5	35.7	74.8	4.5
55	4.4	29.9	20.8	0.70	1.74	17.2	35.8	71.3	6.1
55	5.0	30.0	20.9	0.70	1.72	17.4	35.9	69.4	7.4
55	5.5	30.1	21.0	0.70	1.70	17.7	35.9	68.1	8.6
55	5.8	30.2	21.0	0.70	1.69	17.9	36.0	67.4	9.3
55	6.1	30.2	21.0	0.70	1.68	18.0	35.9	66.8	10.1
55	6.6	30.3	21.0	0.69	1.67	18.1	36.0	65.9	11.3
68	3.6	27.5	20.0	0.73	1.97	14.0	34.2	87.0	4.1
68	4.4	27.8	20.0	0.72	1.92	14.5	34.4	83.6	5.6
68	5.0	28.0	20.1	0.72	1.89	14.8	34.5	81.8	6.8
68	5.5	28.1	20.2	0.72	1.88	14.9	34.5	80.6	7.9
68	5.8	28.1	20.2	0.72	1.87	15.0	34.5	79.9	8.6
68	6.1	28.2	20.3	0.72	1.86	15.2	34.6	79.3	9.3
68	6.6	28.3	20.3	0.72	1.85	15.3	34.6	78.5	10.5
77	3.6	26.2	19.4	0.74	2.11	12.4	33.4	95.6	3.8
77	4.4	26.5	19.4	0.73	2.07	12.8	33.6	92.3	5.3
77	5.0	26.7	19.5	0.73	2.04	13.1	33.7	90.5	6.4
77	5.5	26.8	19.6	0.73	2.02	13.3	33.7	89.3	7.5
77	5.8	26.8	19.7	0.74	2.02	13.3	33.7	88.6	8.1
77	6.1	26.9	19.7	0.73	2.01	13.4	33.8	88.1	8.8
77	6.6	27.0	19.7	0.73	1.99	13.6	33.8	87.3	10.0
86	3.6	24.6	18.8	0.76	2.26	10.9	32.3	104.0	3.6
86	4.4	24.9	18.8	0.76	2.22	11.2	32.5	100.8	4.9
86	5.0	25.1	18.9	0.75	2.20	11.4	32.6	99.1	6.1
86	5.5	25.2	19.0	0.75	2.18	11.6	32.6	97.9	7.1
86	5.8	25.2	19.0	0.75	2.17	11.6	32.6	97.3	7.7
86	6.1	25.3	19.1	0.75	2.17	11.7	32.7	96.8	8.3
86	6.6	25.3	19.1	0.75	2.15	11.8	32.6	95.9	9.5
95	3.6	22.8	18.2	0.80	2.41	9.5	31.0	112.3	3.3
95	4.4	23.1	18.1	0.78	2.38	9.7	31.2	109.3	4.6
95	5.0	23.2	18.2	0.78	2.36	9.8	31.3	107.6	5.7
95	5.5	23.3	18.3	0.79	2.34	10.0	31.3	106.4	6.7
95	5.8	23.4	18.4	0.79	2.33	10.0	31.4	105.9	7.3
95	6.1	23.4	18.4	0.79	2.32	10.1	31.3	105.3	7.9
95	6.6	23.5	18.4	0.78	2.31	10.2	31.4	104.6	9.0
105	3.6	20.7	17.5	0.85	2.57	8.1	29.5	121.5	3.1
105	4.4	21.0	17.4	0.83	2.54	8.3	29.7	118.6	4.4
105	5.0	21.2	17.5	0.83	2.52	8.4	29.8	117.0	5.4
105	5.5	21.3	17.6	0.83	2.50	8.5	29.8	115.9	6.4
105	5.8	21.3	17.7	0.83	2.50	8.5	29.8	115.4	6.9
105	6.1	21.4	17.7	0.83	2.49	8.6	29.9	114.9	7.6
105	6.6	21.4	17.7	0.83	2.48	8.6	29.9	114.1	8.6
115	3.6	18.8	16.9	0.90	2.70	7.0	28.0	130.7	2.9
115	4.4	19.1	16.7	0.87	2.67	7.2	28.2	128.0	4.2
115	5.0	19.2	16.9	0.88	2.66	7.2	28.3	126.4	5.2
115	5.5	19.3	16.9	0.88	2.64	7.3	28.3	125.4	6.1
115	5.8	19.4	17.0	0.88	2.64	7.3	28.4	124.9	6.7
115	6.1	19.4	17.0	0.88	2.63	7.4	28.4	124.4	7.3
115	6.6	19.5	17.1	0.88	2.62	7.4	28.4	123.7	8.3
120	3.6	17.9	16.5	0.92	2.74	6.5	27.3	135.3	2.9
120	4.4	18.2	16.4	0.90	2.73	6.7	27.5	132.7	4.1
120	5.0	18.4	16.5	0.90	2.71	6.8	27.7	131.2	5.1
120	5.5	18.5	16.6	0.90	2.70	6.9	27.7	130.2	6.0
120	5.8	18.5	16.7	0.90	2.70	6.9	27.7	129.7	6.6
120	6.1	18.6	16.7	0.90	2.69	6.9	27.8	129.2	7.2
120	6.6	18.6	16.7	0.90	2.68	6.9	27.8	128.5	8.2



Performance Data 024-Heating

Table P18: GEH/GEV 024 Heating Performance

Heating performance data is tabulated at 68 F DB entering air at ARI/ISO 13256-1 rated CFM. For ARI/ISO 13256-1 certified ratings, see Table P1. See Performance correction tables to correct performance at conditions other than those tabulated. Data shown is for unit performance only. Interpolation is permissible. Extrapolation is not.

Rated GPM: 5.5
Rated CFM: 760

Maximum CFM: 608
Maximum CFM: 912

EWT	GPM	Htg Cap Mbtuh	Absorb Mbtuh	Power kW	COP	LWT	Feet Head
25	3.6	16.1	10.7	1.59	3.0	19.1	5.0
25	4.4	16.5	11.0	1.61	3.0	20.0	7.0
25	5.0	16.8	11.3	1.62	3.0	20.5	8.7
25	5.5	17.0	11.4	1.63	3.1	20.8	10.1
25	5.8	17.1	11.5	1.63	3.1	21.0	10.9
25	6.1	17.2	11.6	1.64	3.1	21.2	11.8
25	6.6	17.4	11.8	1.64	3.1	21.4	13.3
32	3.6	18.5	12.7	1.70	3.2	24.9	4.9
32	4.4	19.0	13.1	1.72	3.2	26.0	6.9
32	5.0	19.2	13.3	1.73	3.3	26.7	8.4
32	5.5	19.4	13.5	1.74	3.3	27.1	9.7
32	5.8	19.5	13.6	1.74	3.3	27.3	10.6
32	6.1	19.6	13.6	1.75	3.3	27.5	11.4
32	6.6	19.8	13.8	1.75	3.3	27.8	12.9
45	3.6	22.8	16.5	1.85	3.6	35.8	4.7
45	4.4	23.4	17.0	1.87	3.7	37.3	6.4
45	5.0	23.6	17.2	1.88	3.7	38.1	7.9
45	5.5	23.8	17.4	1.89	3.7	38.7	9.1
45	5.8	23.9	17.5	1.89	3.7	39.0	9.9
45	6.1	24.0	17.5	1.90	3.7	39.3	10.7
45	6.6	24.2	17.7	1.90	3.7	39.6	12.0
55	3.6	26.1	19.3	1.98	3.9	44.3	4.5
55	4.4	26.7	19.9	2.00	3.9	46.0	6.1
55	5.0	27.0	20.1	2.01	3.9	46.9	7.4
55	5.5	27.2	20.3	2.02	3.9	47.6	8.6
55	5.8	27.3	20.4	2.03	3.9	48.0	9.3
55	6.1	27.4	20.5	2.03	4.0	48.3	10.1
55	6.6	27.5	20.5	2.04	3.9	48.8	11.3
68	3.6	29.9	22.6	2.14	4.1	55.4	4.1
68	4.4	30.5	23.1	2.16	4.1	57.5	5.6
68	5.0	30.8	23.4	2.17	4.2	58.6	6.8
68	5.5	31.0	23.6	2.18	4.2	59.4	7.9
68	5.8	31.1	23.7	2.18	4.2	59.8	8.6
68	6.1	31.2	23.7	2.19	4.2	60.2	9.3
68	6.6	31.4	23.9	2.19	4.2	60.7	10.5
75	3.6	31.7	24.2	2.19	4.2	61.5	3.9
75	4.4	32.3	24.8	2.21	4.3	63.7	5.3
75	5.0	32.6	25.0	2.22	4.3	65.0	6.5
75	5.5	32.8	25.2	2.23	4.3	65.8	7.6
75	5.8	32.9	25.3	2.24	4.3	66.3	8.2
75	6.1	33.0	25.4	2.24	4.3	66.7	8.9
75	6.6	33.2	25.5	2.25	4.3	67.2	10.1
86	3.6	34.1	26.3	2.29	4.4	71.3	3.6
86	4.4	34.8	26.9	2.31	4.4	73.7	4.9
86	5.0	35.1	27.2	2.32	4.4	75.1	6.1
86	5.5	35.3	27.4	2.33	4.4	76.0	7.1
86	5.8	35.4	27.4	2.34	4.4	76.5	7.7
86	6.1	35.5	27.5	2.34	4.4	76.9	8.3
86	6.6	35.6	27.6	2.35	4.4	77.6	9.5

Table P19: 024 Fan Correction Factors

Entering CFM	Cooling Capacity	Sensible Capacity	Cooling Input Watts	Heating Capacity	Heating Input Watts
608	0.974	0.892	0.965	0.972	1.032
646	0.980	0.919	0.973	0.979	1.024
684	0.987	0.945	0.981	0.986	1.016
722	0.993	0.972	0.990	0.993	1.008
760	1.000	1.000	1.000	1.000	1.000
836	1.012	1.051	1.020	1.013	0.984
874	1.019	1.078	1.030	1.020	0.976
912	1.025	1.105	1.042	1.027	0.968



Performance Data 030-Cooling

Table P20: GEH/GEV 030 Cooling Performance

Cooling performance data is tabulated at 80.6 F DB/66.2 F WB entering air at ARI/ISO 13256-1 rated CFM. For ARI/ISO 13256-1 certified ratings, see Table P1. See Performance correction tables to correct performance at conditions other than those tabulated. Data shown is for unit performance only. Interpolation is permissible. Extrapolation is not.

Rated GPM: 6.9
Rated CFM: 900

Maximum CFM: 720
Maximum CFM: 1080

EWT	GPM	Total Mbtuh	Sen Mbtuh	SHR	Power kW	EER	Reject Mbtuh	LWT	Feet Head
45	4.5	34.3	24.2	0.71	1.78	19.3	40.4	62.9	8.5
45	5.5	34.5	23.9	0.69	1.74	19.8	40.4	59.7	11.5
45	6.2	34.6	23.9	0.69	1.72	20.1	40.5	58.1	13.8
45	6.9	34.7	23.8	0.69	1.71	20.3	40.5	56.7	16.2
45	7.3	34.7	23.8	0.69	1.70	20.4	40.5	56.1	17.7
45	7.6	34.7	23.8	0.69	1.70	20.4	40.5	55.7	18.9
45	8.3	34.8	23.8	0.68	1.69	20.6	40.6	54.8	21.7
55	4.5	32.3	23.2	0.72	1.89	17.1	38.8	72.2	7.8
55	5.5	32.5	23.1	0.71	1.85	17.6	38.8	69.1	10.7
55	6.2	32.6	23.1	0.71	1.83	17.8	38.9	67.5	12.8
55	6.9	32.7	23.2	0.71	1.81	18.1	38.9	66.3	15.1
55	7.3	32.7	23.2	0.71	1.81	18.1	38.9	65.7	16.5
55	7.6	32.7	23.2	0.71	1.80	18.2	38.8	65.2	17.6
55	8.3	32.8	23.2	0.71	1.79	18.3	38.9	64.4	20.3
68	4.5	30.8	22.3	0.72	2.09	14.7	37.9	84.9	7.1
68	5.5	31.0	22.4	0.72	2.05	15.1	38.0	81.8	9.8
68	6.2	31.1	22.5	0.72	2.03	15.3	38.0	80.3	11.8
68	6.9	31.2	22.6	0.72	2.01	15.5	38.1	79.0	14.0
68	7.3	31.2	22.7	0.73	2.01	15.5	38.1	78.4	15.3
68	7.6	31.2	22.7	0.73	2.00	15.6	38.0	78.0	16.4
68	8.3	31.3	22.7	0.73	1.99	15.7	38.1	77.2	18.9
77	4.5	29.4	21.8	0.74	2.25	13.1	37.1	93.5	6.7
77	5.5	29.6	21.9	0.74	2.21	13.4	37.1	90.5	9.3
77	6.2	29.7	22.1	0.74	2.19	13.6	37.2	89.0	11.2
77	6.9	29.8	22.2	0.74	2.17	13.7	37.2	87.8	13.3
77	7.3	29.8	22.2	0.74	2.16	13.8	37.2	87.2	14.6
77	7.6	29.8	22.2	0.74	2.16	13.8	37.2	86.8	15.6
77	8.3	29.9	22.3	0.75	2.14	14.0	37.2	86.0	18.1
86	4.5	27.8	21.3	0.77	2.40	11.6	36.0	102.1	6.4
86	5.5	28.0	21.4	0.76	2.36	11.9	36.1	99.2	8.8
86	6.2	28.1	21.5	0.77	2.34	12.0	36.1	97.7	10.7
86	6.9	28.1	21.6	0.77	2.33	12.1	36.1	96.5	12.8
86	7.3	28.2	21.7	0.77	2.32	12.2	36.1	95.9	14.0
86	7.6	28.2	21.7	0.77	2.31	12.2	36.1	95.5	15.0
86	8.3	28.3	21.7	0.77	2.30	12.3	36.2	94.7	17.5
95	4.5	26.0	20.7	0.80	2.55	10.2	34.7	110.5	6.1
95	5.5	26.1	20.8	0.80	2.51	10.4	34.7	107.7	8.5
95	6.2	26.3	20.9	0.79	2.50	10.5	34.8	106.3	10.3
95	6.9	26.3	21.0	0.80	2.48	10.6	34.8	105.1	12.3
95	7.3	26.3	21.1	0.80	2.48	10.6	34.8	104.6	13.5
95	7.6	26.4	21.1	0.80	2.47	10.7	34.8	104.2	14.5
95	8.3	26.5	21.1	0.80	2.46	10.8	34.9	103.5	16.9
105	4.5	23.9	20.0	0.84	2.71	8.8	33.2	119.8	5.8
105	5.5	24.1	20.1	0.83	2.68	9.0	33.3	117.2	8.1
105	6.2	24.2	20.1	0.83	2.66	9.1	33.3	115.8	9.9
105	6.9	24.3	20.2	0.83	2.65	9.2	33.3	114.7	11.9
105	7.3	24.3	20.2	0.83	2.64	9.2	33.3	114.2	13.1
105	7.6	24.3	20.2	0.83	2.64	9.2	33.3	113.8	14.0
105	8.3	24.4	20.2	0.83	2.62	9.3	33.3	113.1	16.4
115	4.5	22.0	19.1	0.87	2.86	7.7	31.8	129.3	5.5
115	5.5	22.2	19.2	0.86	2.83	7.8	31.9	126.7	7.8
115	6.2	22.3	19.2	0.86	2.82	7.9	31.9	125.4	9.6
115	6.9	22.4	19.3	0.86	2.80	8.0	32.0	124.4	11.5
115	7.3	22.4	19.3	0.86	2.80	8.0	32.0	123.8	12.7
115	7.6	22.4	19.2	0.86	2.79	8.0	31.9	123.5	13.6
115	8.3	22.5	19.2	0.85	2.78	8.1	32.0	122.8	15.9
120	4.5	21.2	18.7	0.88	2.93	7.2	31.2	134.0	5.4
120	5.5	21.4	18.7	0.87	2.90	7.4	31.3	131.5	7.7
120	6.2	21.5	18.8	0.87	2.89	7.4	31.4	130.2	9.4
120	6.9	21.5	18.8	0.87	2.88	7.5	31.3	129.2	11.3
120	7.3	21.6	18.7	0.87	2.87	7.5	31.4	128.7	12.5
120	7.6	21.6	18.7	0.87	2.87	7.5	31.4	128.4	13.4
120	8.3	21.7	18.6	0.86	2.86	7.6	31.5	127.7	15.7



Performance Data 030-Heating

Table P21: GEH/GEV 030 Heating Performance

Heating performance data is tabulated at 68 F DB entering air at ARI/ISO 13256-1 rated CFM. For ARI/ISO 13256-1 certified ratings, see Table P1. See Performance correction tables to correct performance at conditions other than those tabulated. Data shown is for unit performance only. Interpolation is permissible. Extrapolation is not.

Rated GPM: 6.9
Rated CFM: 900

Maximum CFM: 720
Maximum CFM: 1080

EWT	GPM	Htg Cap Mbtuh	Absorb Mbtuh	Power kW	COP	LWT	Feet Head
25	4.5	18.8	12.8	1.77	3.1	19.3	10.2
25	5.5	19.2	13.1	1.78	3.2	20.3	13.8
25	6.2	19.4	13.3	1.78	3.2	20.7	16.3
25	6.9	19.6	13.5	1.79	3.2	21.1	19.1
25	7.3	19.7	13.6	1.79	3.2	21.3	20.5
25	7.6	19.7	13.6	1.79	3.2	21.4	22.0
25	8.3	19.9	13.8	1.79	3.3	21.7	25.0
32	4.5	20.5	14.1	1.87	3.2	25.7	9.5
32	5.5	20.9	14.5	1.88	3.3	26.8	13.0
32	6.2	21.1	14.7	1.89	3.3	27.3	15.5
32	6.9	21.3	14.9	1.89	3.3	27.7	18.1
32	7.3	21.4	15.0	1.89	3.3	27.9	19.5
32	7.6	21.4	14.9	1.90	3.3	28.1	20.9
32	8.3	21.6	15.1	1.90	3.3	28.4	23.9
45	4.5	24.9	18.0	2.03	3.6	37.0	8.5
45	5.5	25.4	18.4	2.05	3.6	38.4	11.7
45	6.2	25.6	18.6	2.06	3.6	39.0	13.9
45	6.9	25.8	18.7	2.07	3.7	39.6	16.3
45	7.3	25.9	18.8	2.07	3.7	39.8	17.6
45	7.6	25.9	18.8	2.07	3.7	40.1	19.0
45	8.3	26.1	19.0	2.08	3.7	40.4	21.8
55	4.5	28.4	21.1	2.15	3.9	45.6	7.9
55	5.5	28.9	21.5	2.17	3.9	47.2	10.8
55	6.2	29.2	21.8	2.18	3.9	48.0	12.9
55	6.9	29.4	21.9	2.19	3.9	48.7	15.2
55	7.3	29.5	22.0	2.19	3.9	48.9	16.5
55	7.6	29.6	22.1	2.20	3.9	49.2	17.7
55	8.3	29.7	22.2	2.20	4.0	49.7	20.4
68	4.5	32.5	24.7	2.30	4.1	57.0	7.1
68	5.5	33.0	25.1	2.32	4.2	58.9	9.9
68	6.2	33.3	25.4	2.33	4.2	59.9	11.9
68	6.9	33.5	25.6	2.33	4.2	60.6	14.1
68	7.3	33.6	25.6	2.34	4.2	61.0	15.2
68	7.6	33.7	25.7	2.34	4.2	61.2	16.4
68	8.3	33.8	25.8	2.35	4.2	61.8	19.0
75	4.5	34.4	26.3	2.37	4.3	63.3	6.8
75	5.5	34.9	26.7	2.39	4.3	65.3	9.5
75	6.2	35.2	27.0	2.40	4.3	66.3	11.4
75	6.9	35.4	27.2	2.41	4.3	67.1	13.6
75	7.3	35.5	27.3	2.41	4.3	67.5	14.7
75	7.6	35.6	27.4	2.41	4.3	67.8	15.9
75	8.3	35.8	27.5	2.42	4.3	68.4	18.4
86	4.5	37.0	28.5	2.48	4.4	73.3	6.4
86	5.5	37.6	29.1	2.50	4.4	75.5	8.9
86	6.2	37.9	29.4	2.50	4.4	76.5	10.8
86	6.9	38.1	29.5	2.51	4.4	77.4	12.9
86	7.3	38.2	29.6	2.51	4.5	77.8	14.0
86	7.6	38.3	29.7	2.52	4.5	78.2	15.1
86	8.3	38.4	29.8	2.52	4.5	78.8	17.5

Table P22: 030 Fan Correction Factors

Entering CFM	Cooling Capacity	Sensible Capacity	Cooling Input Watts	Heating Capacity	Heating Input Watts
720	0.974	0.892	0.965	0.972	1.032
765	0.980	0.919	0.973	0.979	1.024
810	0.987	0.945	0.981	0.986	1.016
855	0.993	0.972	0.990	0.993	1.008
900	1.000	1.000	1.000	1.000	1.000
990	1.012	1.051	1.020	1.013	0.984
1035	1.019	1.078	1.030	1.020	0.976
1080	1.025	1.105	1.042	1.027	0.968



Performance Data 036-Cooling

Table P23: GEH/GEV 036 Cooling Performance

Cooling performance data is tabulated at 80.6 F DB/66.2 F WB entering air at ARI/ISO 13256-1 rated CFM. For ARI/ISO 13256-1 certified ratings, see Table P1. See Performance correction tables to correct performance at conditions other than those tabulated. Data shown is for unit performance only. Interpolation is permissible. Extrapolation is not.

Rated GPM: 8.3
Rated CFM: 1140

Maximum CFM: 912
Maximum CFM: 1368

EWT	GPM	Total Mbtuh	Sen Mbtuh	SHR	Power kW	EER	Reject Mbtuh	LWT	Feet Head
45	5.4	39.3	27.5	0.70	2.22	17.7	46.9	62.4	5.7
45	6.6	39.6	28.0	0.71	2.15	18.4	46.9	59.1	7.8
45	7.5	39.8	28.2	0.71	2.11	18.9	47.0	57.6	9.4
45	8.3	39.9	28.3	0.71	2.09	19.1	47.0	56.3	11.0
45	8.7	39.9	28.4	0.71	2.07	19.3	47.0	55.8	11.9
45	9.1	40.0	28.4	0.71	2.06	19.4	47.0	55.3	12.8
45	10.0	40.2	28.6	0.71	2.04	19.7	47.2	54.5	14.5
55	5.4	37.5	27.0	0.72	2.37	15.8	45.6	71.9	5.4
55	6.6	38.1	27.6	0.72	2.30	16.6	46.0	68.8	7.4
55	7.5	38.4	27.9	0.73	2.27	16.9	46.2	67.4	8.8
55	8.3	38.7	28.1	0.73	2.24	17.3	46.4	66.2	10.4
55	8.7	38.8	28.2	0.73	2.23	17.4	46.4	65.7	11.3
55	9.1	38.9	28.3	0.73	2.22	17.5	46.5	65.2	12.1
55	10.0	39.3	28.5	0.73	2.20	17.9	46.8	64.4	13.8
68	5.4	35.3	26.5	0.75	2.62	13.5	44.2	84.4	5.0
68	6.6	36.2	27.2	0.75	2.56	14.1	44.9	81.6	6.9
68	7.5	36.6	27.6	0.75	2.53	14.5	45.2	80.1	8.2
68	8.3	37.0	27.9	0.75	2.50	14.8	45.5	79.0	9.7
68	8.7	37.2	28.0	0.75	2.49	14.9	45.7	78.5	10.5
68	9.1	37.5	28.2	0.75	2.48	15.1	46.0	78.1	11.3
68	10.0	38.0	28.5	0.75	2.46	15.4	46.4	77.3	12.9
77	5.4	33.9	26.3	0.78	2.81	12.1	43.5	93.2	4.7
77	6.6	34.9	27.1	0.78	2.75	12.7	44.3	90.4	6.5
77	7.5	35.4	27.5	0.78	2.72	13.0	44.7	89.0	7.8
77	8.3	35.9	27.9	0.78	2.70	13.3	45.1	87.9	9.3
77	8.7	36.2	28.0	0.77	2.69	13.5	45.4	87.4	10.0
77	9.1	36.4	28.2	0.77	2.68	13.6	45.6	87.0	10.8
77	10.0	37.0	28.5	0.77	2.66	13.9	46.1	86.3	12.4
86	5.4	32.6	26.1	0.80	3.00	10.9	42.8	101.9	4.5
86	6.6	33.7	27.0	0.80	2.94	11.5	43.7	99.2	6.2
86	7.5	34.3	27.4	0.80	2.92	11.7	44.3	97.9	7.4
86	8.3	34.9	27.9	0.80	2.90	12.0	44.8	96.8	8.8
86	8.7	35.2	28.0	0.80	2.89	12.2	45.1	96.4	9.6
86	9.1	35.4	28.2	0.80	2.88	12.3	45.2	95.9	10.3
86	10.0	36.1	28.6	0.79	2.86	12.6	45.9	95.2	11.9
95	5.4	31.3	25.9	0.83	3.19	9.8	42.2	110.7	4.3
95	6.6	32.5	26.9	0.83	3.14	10.4	43.2	108.1	5.9
95	7.5	33.2	27.4	0.83	3.11	10.7	43.8	106.8	7.1
95	8.3	33.8	27.9	0.83	3.09	10.9	44.4	105.7	8.5
95	8.7	34.1	28.1	0.82	3.09	11.0	44.7	105.3	9.2
95	9.1	34.5	28.3	0.82	3.08	11.2	45.0	104.9	9.9
95	10.0	35.2	28.7	0.82	3.06	11.5	45.6	104.2	11.5
105	5.4	29.9	25.8	0.86	3.39	8.8	41.5	120.5	4.0
105	6.6	31.3	26.8	0.86	3.35	9.3	42.7	118.0	5.6
105	7.5	32.0	27.3	0.85	3.33	9.6	43.4	116.7	6.8
105	8.3	32.7	27.9	0.85	3.31	9.9	44.0	115.7	8.1
105	8.7	33.1	28.1	0.85	3.30	10.0	44.4	115.3	8.9
105	9.1	33.4	28.3	0.85	3.29	10.2	44.6	114.9	9.6
105	10.0	34.2	28.8	0.84	3.28	10.4	45.4	114.2	11.0
115	5.4	28.6	25.6	0.90	3.59	8.0	40.9	130.3	3.9
115	6.6	30.0	26.7	0.89	3.55	8.5	42.1	127.8	5.4
115	7.5	30.9	27.3	0.88	3.53	8.8	43.0	126.6	6.6
115	8.3	31.6	27.8	0.88	3.52	9.0	43.6	125.6	7.9
115	8.7	32.0	28.1	0.88	3.51	9.1	44.0	125.2	8.6
115	9.1	32.4	28.3	0.87	3.50	9.3	44.4	124.8	9.3
115	10.0	33.2	28.9	0.87	3.49	9.5	45.1	124.2	10.7
120	5.4	28.0	25.5	0.91	3.69	7.6	40.6	135.2	3.8
120	6.6	29.5	26.6	0.90	3.65	8.1	42.0	132.8	5.4
120	7.5	30.3	27.2	0.90	3.63	8.3	42.7	131.6	6.5
120	8.3	31.1	27.8	0.89	3.62	8.6	43.5	130.6	7.8
120	8.7	31.5	28.0	0.89	3.61	8.7	43.8	130.2	8.5
120	9.1	31.9	28.3	0.89	3.60	8.9	44.2	129.8	9.2
120	10.0	32.7	28.9	0.88	3.59	9.1	45.0	129.1	10.6



Performance Data 036-Heating

Table P24: GEH/GEV 036 Heating Performance

Heating performance data is tabulated at 68 F DB entering air at ARI/ISO 13256-1 rated CFM. For ARI/ISO 13256-1 certified ratings, see Table P1. See Performance correction tables to correct performance at conditions other than those tabulated. Data shown is for unit performance only. Interpolation is permissible. Extrapolation is not.

Rated GPM: 8.3
Rated CFM: 1140

Maximum CFM: 912
Maximum CFM: 1368

EWT	GPM	Htg Cap Mbtuh	Absorb Mbtuh	Power kW	COP	LWT	Feet Head
25	5.4	20.8	13.7	2.07	2.9	19.9	6.3
25	6.6	21.7	14.5	2.12	3.0	20.6	8.8
25	7.5	22.1	14.8	2.15	3.0	21.0	10.5
25	8.3	22.2	14.8	2.18	3.0	21.4	12.4
25	8.7	22.3	14.8	2.20	3.0	21.6	13.3
25	9.1	22.3	14.8	2.21	3.0	21.8	14.3
25	10.0	22.4	14.8	2.24	2.9	22.0	16.1
32	5.4	23.8	16.3	2.20	3.2	26.0	6.1
32	6.6	24.6	17.0	2.24	3.2	26.9	8.4
32	7.5	25.0	17.3	2.26	3.2	27.4	10.1
32	8.3	25.2	17.4	2.29	3.2	27.8	11.9
32	8.7	25.2	17.4	2.30	3.2	28.0	12.8
32	9.1	25.3	17.4	2.31	3.2	28.2	13.7
32	10.0	25.3	17.3	2.34	3.2	28.5	15.6
45	5.4	30.8	22.2	2.53	3.6	36.8	5.7
45	6.6	31.6	22.9	2.54	3.6	38.1	7.8
45	7.5	32.0	23.3	2.55	3.7	38.8	9.4
45	8.3	32.2	23.5	2.56	3.7	39.3	11.0
45	8.7	32.2	23.4	2.57	3.7	39.6	11.9
45	9.1	32.3	23.5	2.57	3.7	39.8	12.8
45	10.0	32.4	23.6	2.57	3.7	40.3	14.5
55	5.4	35.7	26.6	2.68	3.9	45.2	5.4
55	6.6	36.5	27.3	2.70	4.0	46.8	7.4
55	7.5	36.9	27.7	2.71	4.0	47.6	8.8
55	8.3	37.1	27.8	2.72	4.0	48.3	10.4
55	8.7	37.1	27.8	2.73	4.0	48.6	11.3
55	9.1	37.2	27.9	2.73	4.0	48.9	12.1
55	10.0	37.2	27.9	2.73	4.0	49.4	13.8
68	5.4	41.8	32.0	2.87	4.3	56.1	5.0
68	6.6	42.6	32.7	2.90	4.3	58.1	6.9
68	7.5	43.0	33.0	2.92	4.3	59.1	8.2
68	8.3	43.1	33.1	2.93	4.3	60.0	9.7
68	8.7	43.2	33.2	2.93	4.3	60.4	10.5
68	9.1	43.2	33.2	2.94	4.3	60.7	11.3
68	10.0	43.3	33.3	2.94	4.3	61.3	12.9
75	5.4	45.0	34.9	2.97	4.4	62.0	4.8
75	6.6	45.8	35.6	3.00	4.5	64.3	6.6
75	7.5	46.2	35.9	3.02	4.5	65.4	7.9
75	8.3	46.4	36.1	3.03	4.5	66.3	9.3
75	8.7	46.4	36.0	3.04	4.5	66.7	10.1
75	9.1	46.5	36.1	3.04	4.5	67.1	10.9
75	10.0	46.6	36.2	3.05	4.5	67.7	12.5
86	5.4	48.6	38.0	3.11	4.6	71.9	4.5
86	6.6	49.4	38.7	3.14	4.6	74.3	6.2
86	7.5	49.8	39.0	3.16	4.6	75.5	7.4
86	8.3	50.0	39.2	3.18	4.6	76.5	8.8
86	8.7	50.0	39.1	3.19	4.6	77.0	9.6
86	9.1	50.1	39.2	3.20	4.6	77.4	10.3
86	10.0	50.2	39.2	3.21	4.6	78.1	11.9

Table P25: 036 Fan Correction Factors

Entering CFM	Cooling Capacity	Sensible Capacity	Cooling Input Watts	Heating Capacity	Heating Input Watts
912	0.974	0.892	0.965	0.972	1.032
969	0.980	0.919	0.973	0.979	1.024
1026	0.987	0.945	0.981	0.986	1.016
1083	0.993	0.972	0.990	0.993	1.008
1140	1.000	1.000	1.000	1.000	1.000
1254	1.012	1.051	1.020	1.013	0.984
1311	1.019	1.078	1.030	1.020	0.976
1368	1.025	1.105	1.042	1.027	0.968



Performance Data

040-Cooling

Table P26: GEV 040 Cooling Performance

Cooling performance data is tabulated at 80.6 F DB/66.2 F WB entering air at ARI/ISO 13256-1 rated CFM. For ARI/ISO 13256-1 certified ratings, see Table P1. See Performance correction tables to correct performance at conditions other than those tabulated. Data shown is for unit performance only. Interpolation is permissible. Extrapolation is not.

Rated GPM: 9.2
Rated CFM: 1200

Maximum CFM: 960
Maximum CFM: 1440

EWT	GPM	Total Mbtuh	Sen Mbtuh	SHR	Power kW	EER	Reject Mbtuh	LWT	Feet Head
45	6.0	46.2	31.1	0.67	2.45	18.9	54.6	63.2	7.3
45	7.4	46.1	31.3	0.68	2.40	19.2	54.3	59.7	10.3
45	8.3	46.1	31.3	0.68	2.38	19.4	54.2	58.1	12.4
45	9.2	46.0	31.4	0.68	2.37	19.4	54.1	56.8	14.6
45	9.7	46.0	31.4	0.68	2.36	19.5	54.1	56.2	15.8
45	10.1	45.9	31.4	0.68	2.36	19.4	54.0	55.7	16.9
45	11.0	45.9	31.5	0.69	2.35	19.5	53.9	54.8	19.4
55	6.0	44.2	31.0	0.70	2.60	17.0	53.1	72.7	6.8
55	7.4	44.2	31.3	0.71	2.55	17.3	52.9	69.3	9.6
55	8.3	44.3	31.3	0.71	2.53	17.5	52.9	67.8	11.5
55	9.2	44.3	31.3	0.71	2.51	17.6	52.9	66.5	13.6
55	9.7	44.3	31.4	0.71	2.50	17.7	52.8	65.9	14.8
55	10.1	44.3	31.4	0.71	2.50	17.7	52.8	65.5	15.8
55	11.0	44.3	31.5	0.71	2.49	17.8	52.8	64.6	18.1
68	6.0	41.4	30.3	0.73	2.84	14.6	51.1	85.1	6.3
68	7.4	41.7	30.6	0.73	2.79	14.9	51.2	81.9	8.8
68	8.3	41.8	30.6	0.73	2.77	15.1	51.3	80.4	10.6
68	9.2	41.8	30.6	0.73	2.74	15.3	51.2	79.1	12.5
68	9.7	41.9	30.7	0.73	2.73	15.3	51.2	78.6	13.7
68	10.1	41.9	30.7	0.73	2.73	15.3	51.2	78.2	14.6
68	11.0	42.0	30.8	0.73	2.72	15.4	51.3	77.3	16.9
77	6.0	39.4	29.5	0.75	3.03	13.0	49.7	93.6	5.9
77	7.4	39.7	29.8	0.75	2.98	13.3	49.9	90.5	8.4
77	8.3	39.8	29.8	0.75	2.95	13.5	49.9	89.1	10.1
77	9.2	39.9	29.8	0.75	2.93	13.6	49.9	87.9	12.0
77	9.7	40.0	29.9	0.75	2.92	13.7	50.0	87.3	13.1
77	10.1	40.0	29.9	0.75	2.91	13.7	49.9	86.9	14.0
77	11.0	40.1	30.0	0.75	2.90	13.8	50.0	86.1	16.1
86	6.0	37.3	28.6	0.77	3.22	11.6	48.3	102.2	5.6
86	7.4	37.6	28.9	0.77	3.17	11.9	48.4	99.1	8.0
86	8.3	37.7	28.9	0.77	3.14	12.0	48.4	97.7	9.6
86	9.2	37.9	28.9	0.76	3.12	12.1	48.5	96.6	11.4
86	9.7	37.9	29.0	0.77	3.11	12.2	48.5	96.0	12.5
86	10.1	38.0	29.0	0.76	3.10	12.3	48.6	95.7	13.4
86	11.0	38.0	29.1	0.77	3.09	12.3	48.5	94.9	15.5
95	6.0	35.0	27.6	0.79	3.42	10.2	46.7	110.7	5.4
95	7.4	35.3	27.9	0.79	3.37	10.5	46.8	107.7	7.6
95	8.3	35.5	27.9	0.79	3.34	10.6	46.9	106.4	9.2
95	9.2	35.6	27.9	0.78	3.32	10.7	46.9	105.3	11.0
95	9.7	35.7	28.0	0.78	3.31	10.8	47.0	104.7	12.1
95	10.1	35.7	28.0	0.78	3.30	10.8	47.0	104.4	12.9
95	11.0	35.8	28.1	0.78	3.29	10.9	47.0	103.6	15.0
105	6.0	32.3	26.5	0.82	3.63	8.9	44.7	120.0	5.1
105	7.4	32.7	26.8	0.82	3.58	9.1	44.9	117.2	7.3
105	8.3	32.8	26.8	0.82	3.56	9.2	45.0	115.9	8.9
105	9.2	33.0	26.8	0.81	3.54	9.3	45.1	114.9	10.6
105	9.7	33.0	26.9	0.82	3.53	9.3	45.0	114.4	11.6
105	10.1	33.1	26.9	0.81	3.52	9.4	45.1	114.0	12.5
105	11.0	33.1	27.0	0.82	3.50	9.5	45.0	113.2	14.5
115	6.0	29.4	25.6	0.87	3.83	7.7	42.5	129.3	4.9
115	7.4	29.8	25.8	0.87	3.79	7.9	42.7	126.7	7.0
115	8.3	30.0	25.8	0.86	3.76	8.0	42.8	125.4	8.5
115	9.2	30.2	25.9	0.86	3.74	8.1	43.0	124.4	10.2
115	9.7	30.2	25.9	0.86	3.73	8.1	42.9	123.9	11.2
115	10.1	30.3	25.9	0.85	3.73	8.1	43.0	123.6	12.1
115	11.0	30.3	26.0	0.86	3.71	8.2	43.0	122.9	14.1
120	6.0	28.0	25.2	0.90	3.92	7.1	41.4	134.0	4.8
120	7.4	28.4	25.4	0.89	3.88	7.3	41.6	131.4	6.9
120	8.3	28.6	25.4	0.89	3.86	7.4	41.8	130.2	8.4
120	9.2	28.7	25.5	0.89	3.84	7.5	41.8	129.2	10.1
120	9.7	28.8	25.5	0.89	3.83	7.5	41.9	128.7	11.1
120	10.1	28.8	25.6	0.89	3.82	7.5	41.8	128.4	11.9
120	11.0	28.9	25.6	0.89	3.81	7.6	41.9	127.7	13.9



Performance Data 040-Heating

Table P27: GEV 040 Heating Performance

Heating performance data is tabulated at 68 F DB entering air at ARI/ISO 13256-1 rated CFM. For ARI/ISO 13256-1 certified ratings, see Table P1. See Performance correction tables to correct performance at conditions other than those tabulated. Data shown is for unit performance only. Interpolation is permissible. Extrapolation is not.

Rated GPM: 9.2
Rated CFM: 1200

Maximum CFM: 960
Maximum CFM: 1440

EWT	GPM	Htg Cap Mbtuh	Absorb Mbtuh	Power kW	COP	LWT	Feet Head
25	6.0	21.8	13.5	2.43	2.6	20.5	8.3
25	7.4	22.5	14.1	2.45	2.7	21.2	12.0
25	8.3	22.9	14.5	2.46	2.7	21.5	14.6
25	9.2	23.1	14.7	2.46	2.8	21.8	17.3
25	9.7	23.3	14.9	2.47	2.8	21.9	18.8
25	10.1	23.4	15.0	2.47	2.8	22.0	20.0
25	11.0	23.5	15.1	2.47	2.8	22.3	22.9
32	6.0	26.2	17.5	2.55	3.0	26.2	8.0
32	7.4	26.9	18.1	2.58	3.1	27.1	11.4
32	8.3	27.3	18.5	2.59	3.1	27.5	13.7
32	9.2	27.5	18.7	2.59	3.1	27.9	16.2
32	9.7	27.7	18.9	2.59	3.1	28.1	17.6
32	10.1	27.7	18.8	2.60	3.1	28.3	18.8
32	11.0	27.9	19.0	2.60	3.1	28.5	21.5
45	6.0	32.5	22.9	2.80	3.4	37.4	7.3
45	7.4	33.2	23.5	2.83	3.4	38.7	10.3
45	8.3	33.6	23.9	2.84	3.5	39.2	12.4
45	9.2	33.8	24.1	2.85	3.5	39.8	14.6
45	9.7	34.0	24.2	2.86	3.5	40.0	15.8
45	10.1	34.1	24.3	2.86	3.5	40.2	16.9
45	11.0	34.3	24.5	2.86	3.5	40.5	19.4
55	6.0	37.2	27.0	2.99	3.6	46.0	6.8
55	7.4	37.9	27.6	3.03	3.7	47.5	9.6
55	8.3	38.3	27.9	3.04	3.7	48.3	11.5
55	9.2	38.5	28.1	3.05	3.7	48.9	13.6
55	9.7	38.7	28.3	3.05	3.7	49.2	14.8
55	10.1	38.8	28.4	3.06	3.7	49.4	15.8
55	11.0	38.9	28.5	3.06	3.7	49.8	18.1
68	6.0	43.5	32.5	3.22	4.0	57.2	6.3
68	7.4	44.3	33.2	3.26	4.0	59.0	8.8
68	8.3	44.6	33.4	3.28	4.0	59.9	10.6
68	9.2	44.9	33.7	3.29	4.0	60.7	12.5
68	9.7	45.0	33.8	3.29	4.0	61.0	13.7
68	10.1	45.1	33.9	3.29	4.0	61.3	14.6
68	11.0	45.3	34.0	3.30	4.0	61.8	16.9
75	6.0	46.8	35.4	3.34	4.1	63.2	6.0
75	7.4	47.5	36.0	3.38	4.1	65.2	8.5
75	8.3	47.9	36.3	3.39	4.1	66.2	10.2
75	9.2	48.1	36.5	3.41	4.1	67.0	12.1
75	9.7	48.3	36.7	3.41	4.2	67.4	13.2
75	10.1	48.4	36.7	3.42	4.1	67.7	14.1
75	11.0	48.5	36.8	3.42	4.2	68.3	16.3
86	6.0	50.7	38.7	3.51	4.2	73.0	5.6
86	7.4	51.4	39.3	3.55	4.2	75.3	8.0
86	8.3	51.8	39.6	3.57	4.3	76.4	9.6
86	9.2	52.0	39.8	3.58	4.3	77.3	11.4
86	9.7	52.2	39.9	3.59	4.3	77.7	12.5
86	10.1	52.3	40.0	3.59	4.3	78.0	13.4
86	11.0	52.4	40.1	3.60	4.3	78.7	15.5

Table P28: 040 Fan Correction Factors

Entering CFM	Cooling Capacity	Sensible Capacity	Cooling Input Watts	Heating Capacity	Heating Input Watts
960	0.974	0.892	0.965	0.972	1.032
1020	0.980	0.919	0.973	0.979	1.024
1080	0.987	0.945	0.981	0.986	1.016
1140	0.993	0.972	0.990	0.993	1.008
1200	1.000	1.000	1.000	1.000	1.000
1320	1.012	1.051	1.020	1.013	0.984
1380	1.019	1.078	1.030	1.020	0.976
1440	1.025	1.105	1.042	1.027	0.968



Performance Data 042-Cooling

Table P29: GEH/GEV 042 Cooling Performance

Cooling performance data is tabulated at 80.6 F DB/66.2 F WB entering air at ARI/ISO 13256-1 rated CFM. For ARI/ISO 13256-1 certified ratings, see Table P1. See Performance correction tables to correct performance at conditions other than those tabulated. Data shown is for unit performance only. Interpolation is permissible. Extrapolation is not.

Rated GPM: 9.7
Rated CFM: 1330

Maximum CFM: 1064
Maximum CFM: 1596

EWT	GPM	Total Mbtuh	Sen Mbtuh	SHR	Power kW	EER	Reject Mbtuh	LWT	Feet Head
45	6.3	48.0	33.2	0.69	2.70	17.8	57.2	63.2	8.0
45	7.8	48.0	34.1	0.71	2.65	18.1	57.0	59.6	11.2
45	8.7	47.9	34.3	0.72	2.63	18.2	56.9	58.1	13.3
45	9.7	47.8	34.5	0.72	2.62	18.2	56.7	56.7	15.8
45	10.2	47.8	34.6	0.72	2.61	18.3	56.7	56.1	17.2
45	10.7	47.7	34.7	0.73	2.61	18.3	56.6	55.6	18.5
45	11.6	47.7	34.8	0.73	2.61	18.3	56.6	54.8	21.1
55	6.3	45.9	33.5	0.73	2.89	15.9	55.8	72.7	7.4
55	7.8	46.0	34.2	0.74	2.83	16.3	55.7	69.3	10.4
55	8.7	46.1	34.3	0.74	2.81	16.4	55.7	67.8	12.4
55	9.7	46.1	34.4	0.75	2.78	16.6	55.6	66.5	14.8
55	10.2	46.1	34.5	0.75	2.77	16.6	55.6	65.9	16.0
55	10.7	46.1	34.5	0.75	2.77	16.6	55.6	65.4	17.3
55	11.6	46.1	34.7	0.75	2.76	16.7	55.5	64.6	19.8
68	6.3	43.2	33.1	0.77	3.15	13.7	54.0	85.2	6.8
68	7.8	43.4	33.5	0.77	3.08	14.1	53.9	81.8	9.6
68	8.7	43.5	33.6	0.77	3.06	14.2	53.9	80.4	11.5
68	9.7	43.6	33.6	0.77	3.03	14.4	53.9	79.1	13.7
68	10.2	43.6	33.6	0.77	3.02	14.4	53.9	78.6	14.9
68	10.7	43.6	33.7	0.77	3.01	14.5	53.9	78.1	16.1
68	11.6	43.7	33.7	0.77	3.00	14.6	53.9	77.3	18.4
77	6.3	41.1	32.4	0.79	3.35	12.3	52.5	93.7	6.4
77	7.8	41.4	32.7	0.79	3.29	12.6	52.6	90.5	9.1
77	8.7	41.5	32.7	0.79	3.26	12.7	52.6	89.1	10.9
77	9.7	41.6	32.7	0.79	3.24	12.8	52.7	87.9	13.1
77	10.2	41.7	32.7	0.78	3.23	12.9	52.7	87.4	14.2
77	10.7	41.7	32.8	0.79	3.22	13.0	52.7	86.9	15.4
77	11.6	41.8	32.8	0.78	3.20	13.1	52.7	86.1	17.7
86	6.3	38.9	31.5	0.81	3.57	10.9	51.1	102.3	6.1
86	7.8	39.2	31.7	0.81	3.51	11.2	51.2	99.2	8.7
86	8.7	39.4	31.7	0.80	3.48	11.3	51.3	97.8	10.4
86	9.7	39.5	31.7	0.80	3.46	11.4	51.3	96.6	12.5
86	10.2	39.5	31.7	0.80	3.45	11.4	51.3	96.1	13.6
86	10.7	39.6	31.7	0.80	3.44	11.5	51.3	95.6	14.8
86	11.6	39.7	31.8	0.80	3.42	11.6	51.4	94.9	17.0
95	6.3	36.5	30.4	0.83	3.79	9.6	49.4	110.8	5.8
95	7.8	36.9	30.6	0.83	3.73	9.9	49.6	107.8	8.3
95	8.7	37.0	30.6	0.83	3.71	10.0	49.7	106.5	10.0
95	9.7	37.2	30.6	0.82	3.68	10.1	49.8	105.3	12.1
95	10.2	37.2	30.6	0.82	3.67	10.1	49.7	104.8	13.1
95	10.7	37.3	30.6	0.82	3.66	10.2	49.8	104.4	14.3
95	11.6	37.3	30.7	0.82	3.65	10.2	49.8	103.6	16.5
105	6.3	33.7	29.1	0.86	4.02	8.4	47.4	120.2	5.5
105	7.8	34.1	29.4	0.86	3.97	8.6	47.7	117.3	8.0
105	8.7	34.3	29.4	0.86	3.95	8.7	47.8	116.1	9.6
105	9.7	34.4	29.4	0.85	3.92	8.8	47.8	114.9	11.6
105	10.2	34.5	29.4	0.85	3.91	8.8	47.8	114.5	12.7
105	10.7	34.5	29.4	0.85	3.90	8.8	47.8	114.0	13.8
105	11.6	34.6	29.5	0.85	3.89	8.9	47.9	113.3	16.0
115	6.3	30.7	27.9	0.91	4.24	7.2	45.2	129.5	5.3
115	7.8	31.2	28.3	0.91	4.20	7.4	45.5	126.8	7.7
115	8.7	31.3	28.3	0.90	4.17	7.5	45.5	125.6	9.3
115	9.7	31.5	28.4	0.90	4.15	7.6	45.7	124.5	11.2
115	10.2	31.5	28.4	0.90	4.14	7.6	45.6	124.0	12.3
115	10.7	31.6	28.5	0.90	4.13	7.7	45.7	123.6	13.4
115	11.6	31.7	28.6	0.90	4.12	7.7	45.8	123.0	15.5
120	6.3	29.2	27.4	0.94	4.35	6.7	44.1	134.1	5.2
120	7.8	29.7	27.8	0.94	4.31	6.9	44.4	131.5	7.5
120	8.7	29.8	27.9	0.94	4.28	7.0	44.4	130.3	9.1
120	9.7	30.0	28.0	0.93	4.26	7.0	44.5	129.3	11.1
120	10.2	30.0	28.0	0.93	4.25	7.1	44.5	128.8	12.1
120	10.7	30.1	28.1	0.93	4.24	7.1	44.6	128.4	13.2
120	11.6	30.2	28.2	0.93	4.23	7.1	44.6	127.8	15.3



Performance Data 042-Heating

Table P30: GEH/GEV 042 Heating Performance

Heating performance data is tabulated at 68 F DB entering air at ARI/ISO 13256-1 rated CFM. For ARI/ISO 13256-1 certified ratings, see Table P1. See Performance correction tables to correct performance at conditions other than those tabulated. Data shown is for unit performance only. Interpolation is permissible. Extrapolation is not.

Rated GPM: 9.7
Rated CFM: 1330

Maximum CFM: 1064
Maximum CFM: 1596

EWT	GPM	Htg Cap Mbtuh	Absorb Mbtuh	Power kW	COP	LWT	Feet Head
25	6.3	23.4	14.6	2.57	2.7	20.4	9.0
25	7.8	24.6	15.7	2.61	2.8	21.0	13.2
25	8.7	24.9	15.9	2.63	2.8	21.3	15.8
25	9.7	25.1	16.1	2.64	2.8	21.7	18.8
25	10.2	25.2	16.2	2.64	2.8	21.8	20.4
25	10.7	25.2	16.2	2.64	2.8	22.0	22.0
25	11.6	25.4	16.4	2.65	2.8	22.2	25.0
32	6.3	28.1	18.9	2.71	3.0	26.0	8.7
32	7.8	29.3	19.9	2.75	3.1	26.9	12.4
32	8.7	29.6	20.2	2.76	3.1	27.4	14.8
32	9.7	29.9	20.5	2.77	3.2	27.8	17.6
32	10.2	29.9	20.4	2.78	3.2	28.0	19.1
32	10.7	29.9	20.4	2.78	3.2	28.2	20.6
32	11.6	30.2	20.7	2.79	3.2	28.4	23.4
45	6.3	35.0	24.8	2.99	3.4	37.1	8.0
45	7.8	36.1	25.8	3.03	3.5	38.4	11.2
45	8.7	36.5	26.1	3.05	3.5	39.0	13.3
45	9.7	36.7	26.3	3.06	3.5	39.6	15.8
45	10.2	36.7	26.3	3.06	3.5	39.9	17.2
45	10.7	36.8	26.4	3.06	3.5	40.1	18.5
45	11.6	37.0	26.5	3.07	3.5	40.4	21.1
55	6.3	39.9	28.9	3.22	3.6	45.8	7.4
55	7.8	41.1	30.0	3.26	3.7	47.3	10.4
55	8.7	41.4	30.2	3.28	3.7	48.1	12.4
55	9.7	41.7	30.5	3.29	3.7	48.7	14.8
55	10.2	41.7	30.5	3.29	3.7	49.0	16.0
55	10.7	41.7	30.5	3.29	3.7	49.3	17.3
55	11.6	42.0	30.7	3.30	3.7	49.7	19.8
68	6.3	46.8	34.9	3.48	3.9	56.9	6.8
68	7.8	47.9	35.9	3.52	4.0	58.8	9.6
68	8.7	48.3	36.3	3.53	4.0	59.7	11.5
68	9.7	48.5	36.4	3.55	4.0	60.5	13.7
68	10.2	48.5	36.4	3.55	4.0	60.9	14.9
68	10.7	48.6	36.5	3.55	4.0	61.2	16.1
68	11.6	48.8	36.7	3.56	4.0	61.7	18.4
75	6.3	50.3	38.0	3.60	4.1	62.9	6.5
75	7.8	51.5	39.1	3.64	4.1	65.0	9.2
75	8.7	51.8	39.3	3.66	4.1	65.9	11.0
75	9.7	52.0	39.5	3.67	4.2	66.8	13.2
75	10.2	52.1	39.6	3.67	4.2	67.2	14.3
75	10.7	52.1	39.6	3.67	4.2	67.6	15.5
75	11.6	52.3	39.7	3.68	4.2	68.1	17.8
85	6.3	54.2	41.3	3.78	4.2	71.8	6.1
85	7.8	55.4	42.4	3.82	4.2	74.1	8.7
85	8.7	55.7	42.6	3.84	4.2	75.2	10.5
85	9.7	55.9	42.8	3.85	4.3	76.2	12.6
85	10.2	56.0	42.9	3.85	4.3	76.6	13.7
85	10.7	56.0	42.9	3.85	4.3	77.0	14.9
85	11.6	56.3	43.1	3.86	4.3	77.5	17.1

Table P31: 042 Fan Correction Factors

Entering CFM	Cooling Capacity	Sensible Capacity	Cooling Input Watts	Heating Capacity	Heating Input Watts
1064	0.974	0.892	0.965	0.972	1.032
1131	0.980	0.919	0.973	0.979	1.024
1197	0.987	0.945	0.981	0.986	1.016
1264	0.993	0.972	0.991	0.993	1.008
1330	1.000	1.000	1.000	1.000	1.000
1463	1.012	1.051	1.020	1.013	0.984
1529	1.019	1.078	1.030	1.020	0.976
1596	1.025	1.105	1.042	1.027	0.968



Performance Data 048-Cooling

Table P32: GEH/GEV 048 Cooling Performance

Cooling performance data is tabulated at 80.6 F DB/66.2 F WB entering air at ARI/ISO 13256-1 rated CFM. For ARI/ISO 13256-1 certified ratings, see Table P1. See Performance correction tables to correct performance at conditions other than those tabulated. Data shown is for unit performance only. Interpolation is permissible. Extrapolation is not.

Rated GPM: 11
Rated CFM: 1520

Maximum CFM: 1216
Maximum CFM: 1824

EWT	GPM	Total Mbtuh	Sen Mbtuh	SHR	Power kW	EER	Reject Mbtuh	LWT	Feet Head
45	7.2	56.8	39.9	0.70	3.33	17.1	68.2	63.9	5.6
45	8.8	57.4	40.1	0.70	3.25	17.7	68.5	60.6	7.6
45	9.9	57.7	40.2	0.70	3.21	18.0	68.7	58.9	9.1
45	11.0	57.9	40.4	0.70	3.18	18.2	68.8	57.5	10.8
45	11.6	58.1	40.4	0.70	3.16	18.4	68.9	56.9	11.7
45	12.1	58.2	40.4	0.69	3.15	18.5	69.0	56.4	12.6
45	13.2	58.2	40.5	0.70	3.13	18.6	68.9	55.4	14.4
55	7.2	54.7	39.4	0.72	3.58	15.3	66.9	73.6	5.2
55	8.8	55.4	39.6	0.71	3.50	15.8	67.4	70.3	7.2
55	9.9	55.6	39.7	0.71	3.46	16.1	67.4	68.6	8.6
55	11.0	55.9	39.8	0.71	3.43	16.3	67.6	67.3	10.2
55	11.6	56.0	39.9	0.71	3.42	16.4	67.7	66.7	11.2
55	12.1	56.1	39.9	0.71	3.41	16.5	67.7	66.2	12.0
55	13.2	56.2	40.0	0.71	3.38	16.6	67.7	65.3	13.8
68	7.2	51.2	37.9	0.74	3.90	13.1	64.5	85.9	4.9
68	8.8	51.9	38.1	0.73	3.82	13.6	64.9	82.8	6.7
68	9.9	52.1	38.2	0.73	3.78	13.8	65.0	81.2	8.1
68	11.0	52.3	38.3	0.73	3.75	13.9	65.1	79.9	9.7
68	11.6	52.5	38.4	0.73	3.73	14.1	65.2	79.3	10.6
68	12.1	52.6	38.4	0.73	3.72	14.1	65.3	78.8	11.3
68	13.2	52.6	38.5	0.73	3.70	14.2	65.2	77.9	13.1
77	7.2	48.6	36.8	0.76	4.15	11.7	62.8	94.5	4.7
77	8.8	49.3	37.0	0.75	4.07	12.1	63.2	91.4	6.5
77	9.9	49.5	37.1	0.75	4.03	12.3	63.3	89.8	7.9
77	11.0	49.8	37.2	0.75	4.00	12.5	63.5	88.6	9.4
77	11.6	49.9	37.3	0.75	3.98	12.5	63.5	88.0	10.2
77	12.1	50.0	37.3	0.75	3.97	12.6	63.6	87.5	11.0
77	13.2	50.1	37.4	0.75	3.95	12.7	63.6	86.7	12.8
86	7.2	46.1	35.9	0.78	4.42	10.4	61.2	103.1	4.6
86	8.8	46.8	36.1	0.77	4.34	10.8	61.6	100.1	6.3
86	9.9	47.0	36.3	0.77	4.30	10.9	61.7	98.5	7.7
86	11.0	47.3	36.4	0.77	4.27	11.1	61.9	97.3	9.1
86	11.6	47.4	36.4	0.77	4.25	11.2	61.9	96.7	10.0
86	12.1	47.5	36.5	0.77	4.24	11.2	62.0	96.3	10.7
86	13.2	47.6	36.5	0.77	4.22	11.3	62.0	95.4	12.5
95	7.2	43.6	35.3	0.81	4.69	9.3	59.6	111.7	4.5
95	8.8	44.2	35.5	0.80	4.62	9.6	60.0	108.7	6.2
95	9.9	44.5	35.6	0.80	4.57	9.7	60.1	107.2	7.5
95	11.0	44.7	35.7	0.80	4.54	9.8	60.2	106.0	8.9
95	11.6	44.9	35.8	0.80	4.53	9.9	60.4	105.5	9.8
95	12.1	45.0	35.8	0.80	4.52	10.0	60.4	105.0	10.5
95	13.2	45.0	35.9	0.80	4.49	10.0	60.3	104.2	12.2
105	7.2	40.6	34.8	0.86	4.99	8.1	57.6	121.1	4.4
105	8.8	41.3	35.1	0.85	4.92	8.4	58.1	118.3	6.0
105	9.9	41.5	35.2	0.85	4.88	8.5	58.2	116.8	7.3
105	11.0	41.7	35.3	0.85	4.84	8.6	58.2	115.7	8.7
105	11.6	41.9	35.3	0.84	4.83	8.7	58.4	115.1	9.6
105	12.1	42.0	35.4	0.84	4.82	8.7	58.5	114.7	10.3
105	13.2	42.1	35.4	0.84	4.79	8.8	58.5	113.9	12.0
115	7.2	37.4	34.3	0.92	5.31	7.0	55.5	130.6	4.3
115	8.8	38.1	34.5	0.91	5.23	7.3	56.0	127.8	5.9
115	9.9	38.4	34.6	0.90	5.19	7.4	56.1	126.5	7.2
115	11.0	38.6	34.7	0.90	5.16	7.5	56.2	125.3	8.6
115	11.6	38.7	34.8	0.90	5.15	7.5	56.3	124.8	9.4
115	12.1	38.8	34.8	0.90	5.14	7.5	56.3	124.4	10.1
115	13.2	38.9	34.9	0.90	5.11	7.6	56.3	123.6	11.8
120	7.2	35.8	33.9	0.95	5.50	6.5	54.6	135.3	4.2
120	8.8	36.5	34.1	0.93	5.42	6.7	55.0	132.6	5.8
120	9.9	36.7	34.2	0.93	5.38	6.8	55.1	131.3	7.1
120	11.0	37.0	34.3	0.93	5.35	6.9	55.3	130.2	8.5
120	11.6	37.1	34.4	0.93	5.33	7.0	55.3	129.6	9.3
120	12.1	37.2	34.4	0.92	5.32	7.0	55.4	129.3	10.1
120	13.2	37.3	34.5	0.92	5.30	7.0	55.4	128.5	11.8



Performance Data 048-Heating

Table P33: GEH/GEV 048 Heating Performance

Heating performance data is tabulated at 68 F DB entering air at ARI/ISO 13256-1 rated CFM. For ARI/ISO 13256-1 certified ratings, see Table P1. See Performance correction tables to correct performance at conditions other than those tabulated. Data shown is for unit performance only. Interpolation is permissible. Extrapolation is not.

Rated GPM: 11
Rated CFM: 1520

Maximum CFM: 1216
Maximum CFM: 1824

EWT	GPM	Htg Cap Mbtuh	Absorb Mbtuh	Power kW	COP	LWT	Feet Head
25	7.2	23.2	13.0	3.00	2.3	21.4	6.5
25	8.8	23.9	13.6	3.03	2.3	21.9	8.8
25	9.9	24.4	14.0	3.05	2.3	22.2	10.5
25	11.0	24.7	14.3	3.06	2.4	22.4	12.3
25	11.6	24.8	14.4	3.06	2.4	22.5	13.3
25	12.1	24.9	14.4	3.07	2.4	22.6	14.2
25	13.2	25.1	14.6	3.08	2.4	22.8	16.2
32	7.2	33.6	22.0	3.39	2.9	25.9	6.1
32	8.8	34.4	22.8	3.41	3.0	26.8	8.4
32	9.9	34.8	23.1	3.43	3.0	27.3	10.0
32	11.0	35.1	23.4	3.44	3.0	27.8	11.7
32	11.6	35.3	23.6	3.44	3.0	27.9	12.7
32	12.1	35.4	23.6	3.45	3.0	28.1	13.5
32	13.2	35.5	23.7	3.46	3.0	28.4	15.5
45	7.2	42.3	29.7	3.68	3.4	36.7	5.6
45	8.8	43.1	30.4	3.71	3.4	38.1	7.6
45	9.9	43.5	30.8	3.72	3.4	38.8	9.1
45	11.0	43.8	31.1	3.73	3.4	39.4	10.8
45	11.6	44.0	31.2	3.74	3.4	39.6	11.7
45	12.1	44.1	31.3	3.74	3.5	39.8	12.6
45	13.2	44.2	31.4	3.75	3.5	40.2	14.4
55	7.2	48.1	34.8	3.89	3.6	45.3	5.2
55	8.8	48.8	35.5	3.91	3.7	46.9	7.2
55	9.9	49.2	35.8	3.93	3.7	47.8	8.6
55	11.0	49.6	36.2	3.94	3.7	48.4	10.2
55	11.6	49.7	36.2	3.95	3.7	48.8	11.2
55	12.1	49.8	36.3	3.95	3.7	49.0	12.0
55	13.2	50.0	36.5	3.96	3.7	49.5	13.8
68	7.2	55.5	41.3	4.17	3.9	56.5	4.9
68	8.8	56.2	41.9	4.19	3.9	58.5	6.7
68	9.9	56.7	42.3	4.21	3.9	59.4	8.1
68	11.0	57.0	42.6	4.22	4.0	60.2	9.7
68	11.6	57.1	42.7	4.22	4.0	60.6	10.6
68	12.1	57.3	42.9	4.23	4.0	60.9	11.3
68	13.2	57.4	42.9	4.24	4.0	61.5	13.1
75	7.2	58.3	43.7	4.27	4.0	62.8	4.8
75	8.8	59.0	44.3	4.30	4.0	64.9	6.6
75	9.9	59.5	44.8	4.31	4.0	65.9	7.9
75	11.0	59.8	45.1	4.32	4.1	66.8	9.4
75	11.6	59.9	45.1	4.33	4.1	67.2	10.3
75	12.1	60.0	45.2	4.33	4.1	67.5	11.1
75	13.2	60.2	45.4	4.34	4.1	68.1	12.8
86	7.2	61.3	46.4	4.37	4.1	73.1	4.6
86	8.8	62.0	47.0	4.40	4.1	75.3	6.3
86	9.9	62.5	47.5	4.41	4.2	76.4	7.7
86	11.0	62.8	47.7	4.42	4.2	77.3	9.1
86	11.6	62.9	47.8	4.43	4.2	77.7	10.0
86	12.1	63.0	47.9	4.43	4.2	78.1	10.7
86	13.2	63.2	48.0	4.45	4.2	78.7	12.5

Table P34: 048 Fan Correction Factors

Entering CFM	Cooling Capacity	Sensible Capacity	Cooling Input Watts	Heating Capacity	Heating Input Watts
1216	0.974	0.892	0.965	0.972	1.032
1292	0.980	0.919	0.973	0.979	1.024
1368	0.987	0.945	0.981	0.986	1.016
1444	0.993	0.972	0.991	0.993	1.008
1520	1.000	1.000	1.000	1.000	1.000
1672	1.012	1.051	1.020	1.013	0.984
1748	1.019	1.078	1.030	1.020	0.976
1824	1.025	1.105	1.042	1.027	0.968



Performance Data 060-Cooling

Table P35: GEH/GEV 060 Cooling Performance

Cooling performance data is tabulated at 80.6 F DB/66.2 F WB entering air at ARI/ISO 13256-1 rated CFM. For ARI/ISO 13256-1 certified ratings, see Table P1. See Performance correction tables to correct performance at conditions other than those tabulated. Data shown is for unit performance only. Interpolation is permissible. Extrapolation is not.

Rated GPM: 14.5
Rated CFM: 1900

Maximum CFM: 1520
Maximum CFM: 2280

EWT	GPM	Total Mbtuh	Sen Mbtuh	SHR	Power kW	EER	Reject Mbtuh	LWT	Feet Head
45	9.4	66.5	49.2	0.74	3.71	17.9	79.2	61.8	8.0
45	11.6	65.7	48.6	0.74	3.65	18.0	78.2	58.5	11.0
45	13.1	65.3	48.4	0.74	3.61	18.1	77.6	56.8	13.1
45	14.5	65.1	48.3	0.74	3.59	18.1	77.4	55.7	15.3
45	15.2	64.9	48.2	0.74	3.58	18.1	77.1	55.1	16.5
45	16.0	64.8	48.1	0.74	3.57	18.2	77.0	54.6	17.9
45	17.4	64.7	47.9	0.74	3.56	18.2	76.9	53.8	20.6
55	9.4	64.6	47.8	0.74	3.97	16.3	78.2	71.6	7.5
55	11.6	64.3	47.7	0.74	3.89	16.5	77.6	68.4	10.3
55	13.1	64.2	47.8	0.74	3.85	16.7	77.3	66.8	12.3
55	14.5	64.2	47.8	0.74	3.82	16.8	77.2	65.7	14.4
55	15.2	64.2	47.8	0.74	3.81	16.9	77.2	65.2	15.6
55	16.0	64.2	47.8	0.74	3.80	16.9	77.2	64.6	16.9
55	17.4	64.3	47.7	0.74	3.78	17.0	77.2	63.9	19.5
68	9.4	61.7	46.4	0.75	4.39	14.1	76.7	84.3	6.9
68	11.6	61.8	46.8	0.76	4.29	14.4	76.4	81.2	9.6
68	13.1	61.9	47.1	0.76	4.24	14.6	76.4	79.7	11.5
68	14.5	62.0	47.2	0.76	4.21	14.7	76.4	78.5	13.5
68	15.2	62.1	47.3	0.76	4.19	14.8	76.4	78.1	14.6
68	16.0	62.2	47.3	0.76	4.18	14.9	76.5	77.6	15.9
68	17.4	62.4	47.3	0.76	4.16	15.0	76.6	76.8	18.3
77	9.4	59.5	45.6	0.77	4.74	12.6	75.7	93.1	6.5
77	11.6	59.7	46.2	0.77	4.63	12.9	75.5	90.1	9.1
77	13.1	59.9	46.5	0.78	4.58	13.1	75.5	88.6	11.0
77	14.5	60.1	46.8	0.78	4.53	13.3	75.6	87.4	13.0
77	15.2	60.2	46.8	0.78	4.52	13.3	75.6	87.0	14.0
77	16.0	60.3	46.9	0.78	4.50	13.4	75.7	86.5	15.3
77	17.4	60.5	46.9	0.78	4.47	13.5	75.8	85.7	17.7
86	9.4	57.1	44.8	0.78	5.14	11.1	74.6	101.9	6.2
86	11.6	57.4	45.5	0.79	5.02	11.4	74.5	98.9	8.8
86	13.1	57.7	45.9	0.80	4.96	11.6	74.6	97.4	10.6
86	14.5	57.9	46.1	0.80	4.91	11.8	74.7	96.3	12.5
86	15.2	58.0	46.2	0.80	4.89	11.9	74.7	95.9	13.6
86	16.0	58.1	46.3	0.80	4.87	11.9	74.7	95.4	14.8
86	17.4	58.3	46.3	0.79	4.84	12.0	74.8	94.6	17.1
95	9.4	54.6	44.0	0.81	5.60	9.8	73.7	110.8	5.9
95	11.6	55.0	44.7	0.81	5.47	10.1	73.7	107.8	8.5
95	13.1	55.2	45.0	0.82	5.40	10.2	73.6	106.3	10.3
95	14.5	55.5	45.2	0.81	5.34	10.4	73.7	105.2	12.1
95	15.2	55.6	45.3	0.81	5.32	10.5	73.8	104.8	13.2
95	16.0	55.7	45.3	0.81	5.30	10.5	73.8	104.3	14.4
95	17.4	55.8	45.3	0.81	5.27	10.6	73.8	103.5	16.7
105	9.4	51.8	42.9	0.83	6.19	8.4	72.9	120.6	5.6
105	11.6	52.2	43.5	0.83	6.04	8.6	72.8	117.7	8.1
105	13.1	52.4	43.7	0.83	5.96	8.8	72.7	116.2	9.9
105	14.5	52.6	43.8	0.83	5.89	8.9	72.7	115.1	11.8
105	15.2	52.7	43.8	0.83	5.87	9.0	72.7	114.6	12.8
105	16.0	52.8	43.8	0.83	5.84	9.0	72.7	114.2	14.0
105	17.4	52.9	43.7	0.83	5.80	9.1	72.7	113.4	16.2
115	9.4	48.9	41.6	0.85	6.85	7.1	72.3	130.5	5.4
115	11.6	49.3	41.8	0.85	6.68	7.4	72.1	127.6	7.9
115	13.1	49.5	41.8	0.84	6.59	7.5	72.0	126.1	9.6
115	14.5	49.7	41.8	0.84	6.52	7.6	72.0	125.0	11.5
115	15.2	49.7	41.7	0.84	6.49	7.7	71.9	124.6	12.4
115	16.0	49.8	41.7	0.84	6.47	7.7	71.9	124.1	13.6
115	17.4	49.9	41.5	0.83	6.42	7.8	71.8	123.3	15.8
120	9.4	47.4	40.7	0.86	7.21	6.6	72.0	135.5	5.3
120	11.6	47.8	40.7	0.85	7.04	6.8	71.8	132.5	7.8
120	13.1	48.0	40.6	0.85	6.94	6.9	71.7	131.1	9.5
120	14.5	48.2	40.5	0.84	6.87	7.0	71.7	130.0	11.3
120	15.2	48.2	40.4	0.84	6.84	7.0	71.5	129.5	12.3
120	16.0	48.3	40.3	0.83	6.81	7.1	71.5	129.0	13.4
120	17.4	48.3	40.1	0.83	6.76	7.1	71.4	128.3	15.6



Performance Data 060-Heating

Table P36: GEH/GEV 060 Heating Performance

Heating performance data is tabulated at 68 F DB entering air at ARI/ISO 13256-1 rated CFM. For ARI/ISO 13256-1 certified ratings, see Table P1. See Performance correction tables to correct performance at conditions other than those tabulated. Data shown is for unit performance only. Interpolation is permissible. Extrapolation is not.

Rated GPM: 14.5
Rated CFM: 1900

Maximum CFM: 1520
Maximum CFM: 2280

EWT	GPM	Htg Cap Mbtuh	Absorb Mbtuh	Power kW	COP	LWT	Feet Head
25	9.4	40.7	26.1	4.28	2.8	19.5	9.6
25	11.6	41.9	27.2	4.30	2.9	20.3	12.6
25	13.1	42.2	27.5	4.31	2.9	20.8	15.0
25	14.5	42.3	27.6	4.31	2.9	21.2	17.6
25	15.2	42.3	27.6	4.31	2.9	21.4	19.0
25	16.0	42.3	27.6	4.31	2.9	21.5	20.5
25	17.4	42.3	27.6	4.32	2.9	21.8	23.7
32	9.4	45.2	30.3	4.36	3.0	25.6	8.9
32	11.6	46.6	31.7	4.38	3.1	26.5	12.0
32	13.1	47.0	32.0	4.39	3.1	27.1	14.2
32	14.5	47.2	32.2	4.40	3.1	27.6	16.7
32	15.2	47.2	32.2	4.41	3.1	27.8	18.0
32	16.0	47.3	32.3	4.41	3.1	28.0	19.4
32	17.4	47.4	32.4	4.41	3.1	28.3	22.4
45	9.4	54.7	39.1	4.58	3.5	36.7	8.1
45	11.6	56.1	40.4	4.61	3.6	38.0	11.0
45	13.1	56.6	40.8	4.62	3.6	38.7	13.0
45	14.5	56.9	41.1	4.63	3.6	39.3	15.3
45	15.2	57.1	41.3	4.64	3.6	39.6	16.6
45	16.0	57.2	41.4	4.64	3.6	39.8	17.8
45	17.4	57.5	41.6	4.65	3.6	40.2	20.6
55	9.4	62.2	45.9	4.78	3.8	45.3	7.5
55	11.6	63.6	47.2	4.81	3.9	46.9	10.3
55	13.1	64.1	47.7	4.82	3.9	47.7	12.3
55	14.5	64.6	48.1	4.84	3.9	48.4	14.4
55	15.2	64.7	48.2	4.84	3.9	48.7	15.6
55	16.0	64.9	48.4	4.85	3.9	48.9	16.9
55	17.4	65.3	48.7	4.86	3.9	49.4	19.5
68	9.4	71.6	54.4	5.04	4.2	56.4	6.9
68	11.6	72.9	55.6	5.08	4.2	58.4	9.6
68	13.1	73.4	56.0	5.10	4.2	59.4	11.4
68	14.5	73.8	56.4	5.11	4.2	60.2	13.5
68	15.2	74.1	56.6	5.12	4.2	60.6	14.6
68	16.0	74.3	56.8	5.12	4.3	60.9	15.8
68	17.4	74.7	57.2	5.13	4.3	61.4	18.3
75	9.4	76.2	58.5	5.18	4.3	62.6	6.6
75	11.6	77.3	59.5	5.21	4.3	64.7	9.2
75	13.1	77.8	60.0	5.23	4.4	65.8	11.1
75	14.5	78.2	60.3	5.25	4.4	66.7	13.1
75	15.2	78.5	60.6	5.25	4.4	67.0	14.2
75	16.0	78.7	60.8	5.26	4.4	67.4	15.3
75	17.4	79.2	61.2	5.27	4.4	67.9	17.8
86	9.4	82.1	63.8	5.36	4.5	72.4	6.2
86	11.6	83.0	64.6	5.39	4.5	74.8	8.8
86	13.1	83.4	64.9	5.41	4.5	76.0	10.6
86	14.5	83.8	65.3	5.43	4.5	77.0	12.5
86	15.2	84.0	65.5	5.43	4.5	77.4	13.6
86	16.0	84.3	65.7	5.44	4.5	77.7	14.7
86	17.4	84.8	66.2	5.45	4.6	78.4	17.1

Table P37: 060 Fan Correction Factors

Entering CFM	Cooling Capacity	Sensible Capacity	Cooling Input Watts	Heating Capacity	Heating Input Watts
1520	0.974	0.892	0.965	0.972	1.032
1615	0.980	0.919	0.973	0.979	1.024
1710	0.987	0.945	0.981	0.986	1.016
1805	0.993	0.972	0.990	0.993	1.008
1900	1.000	1.000	1.000	1.000	1.000
2090	1.012	1.051	1.020	1.013	0.984
2185	1.019	1.078	1.030	1.020	0.976
2280	1.025	1.105	1.042	1.027	0.968



Performance Data Correction Factors

Table P38: 006-060 Correction Factors for Variation in Entering Air Temperature

Cooling Entering Air WB F	Cooling Capacity	Cooling Input Watts	Sensible vs Entering Dry Bulb Multipliers				
			65.6	70.6	75.6	80.6	85.6
49.4	0.722	0.893	*	*	*	*	*
56.3	0.836	0.937	0.799	0.964	*	*	*
60.3	0.903	0.963	0.641	0.841	1.016	1.097	*
63.2	0.951	0.981	0.504	0.728	0.924	1.097	*
66.2	1.000	1.000		0.593	0.809	1.000	1.169
72.1	1.098	1.038			0.538	0.761	0.960
77.1	1.181	1.069				0.519	0.741

Heating Entering Air DB F	Heating Capacity	Heating Input Watts
53.0	1.030	0.878
58.0	1.020	0.919
63.0	1.010	0.959
68.0	1.000	1.000
73.0	0.990	1.041
78.0	0.980	1.081
83.0	0.970	1.122

* = Sensible equals total capacity



Performance Data Electrical

E1-Electrical performance

Model No.	Volts	Total FLA	Comp RLA (ea)	Comp LRA (ea)	No. of Compres.	Cmp MCC	Blower Motor FLA	Blower Motor HP	Fan Motor Num	Minimum Circuit Ampacity	Maximum Overcurrent Protective Device	Electric Heat kW	Electric Heat Amps
006	115/60/1	6.8	5.70	36.2	1	9.1	1.20	1/12	1	8.3	15	0	0
	208/60/1	3.4	2.80	17.7	1	4.6	0.60	1/12	1	4.1	15	0	0
	208/60/1	4.48	2.8	17.7	1	4.6	0.60	1/12	1	5.6	15	0.82	3.9
	230/60/1	3.4	2.80	17.7	1	4.6	0.60	1/12	1	4.1	15	0	0
	230/60/1	4.88	2.8	17.7	1	4.6	0.60	1/12	1	6.1	15	1.00	4.3
	220-240/50/1	3.6	3.10	18.8	1	5.2	0.52	1/12	1	4.4	15	0	0
	220-240/50/1	7.3	3.1	18.8	1	5.2	0.52	1/12	1	9.2	15	1.64	6.8
	265/60/1	3.0	2.45	15.0	1	3.9	0.52	1/12	1	3.6	15	0	0
009	265/60/1	5.5	2.5	15.0	1	3.9	0.52	1/12	1	6.9	15	1.33	5.0
	115/60/1	8.3	7.20	45.6	1	10.9	1.20	1/12	1	10.2	15	0	0
	208/60/1	4.0	3.40	22.2	1	6.4	0.60	1/12	1	4.9	15	0	0
	208/60/1	6.48	3.4	22.2	1	6.4	0.60	1/12	1	8.1	15	1.23	5.9
	230/60/1	4.0	3.40	22.2	1	6.4	0.60	1/12	1	4.9	15	0	0
	230/60/1	7.08	3.4	22.2	1	6.4	0.60	1/12	1	8.9	15	1.50	6.5
	220-240/50/1	5.0	4.30	22.2	1	6.6	0.72	1/8	1	6.1	15	0	0
	220-240/50/1	9.72	4.3	22.2	1	6.6	0.72	1/8	1	12.2	15	2.17	9.0
	265/60/1	3.6	3.10	18.8	1	5.2	0.52	1/12	1	4.4	15	0	0
	265/60/1	8.0	3.1	18.8	1	5.2	0.52	1/12	1	10.0	15	2.00	7.5
012	115/60/1	12.2	10.60	56.7	1	16.0	1.57	1/8	1	14.8	25	0	0
	208/60/1	5.7	5.00	27.9	1	8.3	0.70	1/8	1	7.0	15	0	0
	208/60/1	8.5	5.0	27.9	1	8.3	0.70	1/8	1	10.6	15	1.63	7.8
	230/60/1	5.7	5.00	27.9	1	8.3	0.70	1/8	1	7.0	15	0	0
	230/60/1	9.4	5.0	27.9	1	8.3	0.70	1/8	1	11.8	15	2.00	8.7
	220-240/50/1	5.5	4.80	27.0	1	8.5	0.72	1/8	1	6.7	15	0	0
	220-240/50/1	12.02	4.8	27.0	1	8.5	0.72	1/8	1	15.0	15	2.70	11.3
	265/60/1	5.0	4.30	22.2	1	6.6	0.72	1/8	1	6.1	15	0	0
	265/60/1	10.72	4.3	22.2	1	6.6	0.72	1/8	1	13.4	15	2.65	10.0
015 - Std Static	220-240/50/1	7.1	6.3	32.0	1	10.0	0.80	1/8	1	8.7	15	0	0
	220-240/50/1	14.5	6.3	32.0	1	10.0	0.80	1/8	1	18.1	20	3.28	13.7
015 - Hi Static	208/60/1	6.1	5.40	29.0	1	9.2	0.70	1/8	1	7.5	15	0	0
	208/60/1	10.3	5.4	29.0	1	9.2	0.70	1/8	1	12.9	15	2.00	9.6
	230/60/1	6.1	5.40	29.0	1	9.2	0.70	1/8	1	7.5	15	0	0
	230/60/1	11.6	5.4	29.0	1	9.2	0.70	1/8	1	14.5	15	2.50	10.9
	220-240/50/1	7.8	6.30	32.0	1	10.0	1.53	1/3	1	9.4	15	0	0
	220-240/50/1	15.23	6.3	32.0	1	10.0	1.53	1/3	1	19.0	20	3.28	13.7
	265/60/1	5.5	4.80	27.0	1	8.5	0.72	1/8	1	6.7	15	0	0
018 - Std Static	265/60/1	13.22	4.8	27.0	1	8.5	0.72	1/8	1	16.5	20	3.30	12.5
	208/60/1	8.5	7.6	45.0	1	13.0	0.9	1/8	1	10.4	15	0	0
	208/60/1	12.7	7.6	45.0	1	13.0	0.90	1/8	1	15.9	20	2.46	11.8
	230/60/1	8.5	7.6	45.0	1	13.0	0.90	1/8	1	10.4	15	0	0
	230/60/1	13.9	7.6	45.0	1	13.0	0.90	1/8	1	17.4	20	3.0	13.0
	265/60/1	7.1	6.3	32.0	1	10.0	0.80	1/8	1	8.7	15	0	0
018 - Hi Static	265/60/1	15.9	6.3	32.0	1	10.0	0.80	1/8	1	19.9	20	4.00	15.1
	208/60/1	9.4	7.60	45.0	1	13.0	2.10	1/3	1	11.6	15	0	0
	208/60/1	13.6	7.6	45.0	1	13.0	2.10	1/3	1	17.4	20	2.46	11.8
	230/60/1	9.4	7.60	45.0	1	13.0	2.10	1/3	1	11.6	15	0	0
	230/60/1	14.8	7.6	45.0	1	13.0	2.10	1/3	1	18.9	20	3.00	13.0
	220-240/50/1	11.4	9.90	55.0	1	13.8	1.53	1/3	1	13.9	20	0	0
	220-240/50/1	19.63	9.9	55.0	1	13.8	1.53	1/3	1	24.5	25	4.35	18.1
	265/60/1	7.8	6.30	32.0	1	10.0	1.53	1/3	1	9.4	15	0	0
	265/60/1	16.63	6.3	32.0	1	10.0	1.53	1/3	1	20.8	25	4.00	15.1
	380-415/50/3	4.9	3.90	25.0	1	5.4	0.95	1/3	1	5.8	15	0	0
	380-415/50/3	11.45	3.9	25.0	1	5.4	0.95	1/3	1	14.3	15	4.35	10.5



Performance Data Electrical

E2-Electrical performance (continued)

Model No.	Volts	Total FLA	Comp RLA (ea)	Comp LRA (ea)	No. of Compress.	Cmp MCC	Blower Motor FLA	Blower Motor HP	Fan Motor Num	Minimum Circuit Ampacity	Maximum Overcurrent Protective Device	Electric Heat kW	Electric Heat Amps
024	208/60/1	12.7	10.90	56.0	1	15.3	2.10	1/3	1	15.7	25	0	0
	208/60/1	17.5	10.9	56.0	1	15.3	2.10	1/3	1	22.3	25	3.26	15.7
	230/60/1	12.7	10.90	56.0	1	15.3	2.10	1/3	1	15.7	25	0	0
	230/60/1	19.2	10.9	56.0	1	15.3	2.10	1/3	1	24.0	25	4.00	17.4
	220-240/50/1	12.4	10.90	58.0	1	15.3	1.53	1/3	1	15.2	25	0	0
	220-240/50/1	24.03	10.9	58.0	1	15.3	1.53	1/3	1	30.0	35	5.40	22.5
	265/60/1	11.4	9.90	55.0	1	13.8	1.53	1/3	1	13.9	20	0	0
	265/60/1	21.53	9.9	55.0	1	13.8	1.53	1/3	1	26.9	30	5.30	20.0
	208/60/3	9.3	7.50	51.0	1	10.5	1.80	1/3	1	11.2	15	0	0
	208/60/3	10.8	7.5	51.0	1	10.5	1.80	1/3	1	13.5	15	3.26	9.0
	230/60/3	9.3	7.50	51.0	1	10.5	1.80	1/3	1	11.2	15	0	0
	230/60/3	11.8	7.5	51.0	1	10.5	1.80	1/3	1	14.8	15	4.00	10.0
	380-415/50/3	5.0	4.00	28.0	1	5.6	0.95	1/3	1	6.0	15	0	0
	380-415/50/3	8.45	4.0	28.0	1	5.6	0.95	1/3	1	10.6	15	5.40	7.5
	460/60/3	4.9	3.90	25.0	1	5.4	0.95	1/3	1	5.8	15	0	0
	460/60/3	7.65	3.9	25.0	1	5.4	0.95	1/3	1	9.6	15	5.30	6.7
030	208/60/1	14.2	12.40	61.0	1	17.4	2.10	1/3	1	17.6	30	0	0
	208/60/1	21.5	12.4	61.0	1	17.4	2.10	1/3	1	27.3	30	4.10	19.7
	230/60/1	14.2	12.40	61.0	1	17.4	2.10	1/3	1	17.6	30	0	0
	230/60/1	23.5	12.4	61.0	1	17.4	2.10	1/3	1	29.8	30	5.00	21.7
	220-240/50/1	16.4	13.60	64.0	1	19.1	2.77	1/2	1	19.8	30	0	0
	220-240/50/1	29.97	13.6	64.0	1	19.1	2.77	1/2	1	37.5	40	6.52	27.2
	265/60/1	12.4	10.90	58.0	1	15.3	1.53	1/3	1	15.2	25	0	0
	265/60/1	26.43	10.9	58.0	1	15.3	1.53	1/3	1	33.0	35	6.60	24.9
	208/60/3	9.5	7.70	55.0	1	10.8	1.80	1/3	1	11.4	15	0	0
	208/60/3	13.2	7.7	55.0	1	10.8	1.80	1/3	1	16.5	20	4.10	11.4
	230/60/3	9.5	7.70	55.0	1	10.8	1.80	1/3	1	11.4	15	0	0
	230/60/3	14.4	7.7	55.0	1	10.8	1.80	1/3	1	18.0	20	5.00	12.6
	380-415/50/3	6.6	4.90	33.0	1	6.9	1.70	1/2	1	7.8	15	0	0
	380-415/50/3	10.8	4.9	33.0	1	6.9	1.70	1/2	1	13.5	15	6.52	9.1
	460/60/3	5.0	4.00	28.0	1	5.6	0.95	1/3	1	6.0	15	0	0
	460/60/3	9.25	4.0	28.0	1	5.6	0.95	1/3	1	11.6	15	6.60	8.3
036	208/60/1	19.3	16.00	82.0	1	22.4	3.60	1/2	1	23.6	35	0	0
	208/60/1	26.87	16.0	82.0	1	22.4	3.60	1/2	1	34.0	35	4.90	23.6
	230/60/1	19.3	16.00	82.0	1	22.4	3.60	1/2	1	23.6	35	0	0
	230/60/1	29.37	16.0	82.0	1	22.4	3.60	1/2	1	37.1	40	6.00	26.1
	265/60/1	16.4	13.60	64.0	1	19.1	2.77	1/2	1	19.8	30	0	0
	265/60/1	32.77	13.6	64.0	1	19.1	2.77	1/2	1	41.0	45	7.95	30.0
	208/60/3	13.7	10.40	65.5	1	14.6	3.60	1/2	1	16.6	25	0	0
	208/60/3	16.87	10.4	65.5	1	14.6	3.60	1/2	1	21.5	25	4.90	13.6
	230/60/3	13.7	10.40	65.5	1	14.6	3.60	1/2	1	16.6	25	0	0
	230/60/3	18.37	10.4	65.5	1	14.6	3.60	1/2	1	23.4	25	6.00	15.1
	380-415/50/3	6.5	4.80	40.0	1	6.7	1.70	1/2	1	7.7	15	0	0
	380-415/50/3	11.6	4.8	40.0	1	6.7	1.70	1/2	1	14.5	15	7.15	9.9
	460/60/3	6.6	4.90	33.0	1	6.9	1.70	1/2	1	7.8	15	0	0
	460/60/3	11.7	4.9	33.0	1	6.9	1.70	1/2	1	14.6	15	7.95	10.0
	208/60/1	19.4	16.1	82.0	1	22.5	3.60	1/2	1	23.7	35	0	0
	208/60/1	29.27	16.1	82.0	1	22.5	3.60	1/2	1	37.0	40	5.40	26.0
230/60/1	19.4	16.1	82.0	1	22.5	3.60	1/2	1	23.7	35	0	0	
230/60/1	31.97	16.1	82.0	1	22.5	3.60	1/2	1	40.4	45	6.60	28.7	
265/60/1	17.8	15.0	83.0	1	21.0	2.77	1/2	1	21.5	35	0	0	
265/60/1	35.97	15.0	83.0	1	0.0	2.77	1/2	1	45.0	45	8.80	33.2	
208/60/3	13.3	10.0	70.0	1	14.0	3.60	1/2	1	16.1	25	0	0	
208/60/3	18.27	10.0	70.0	1	14.0	3.60	1/2	1	23.3	25	5.40	15.0	
230/60/3	13.3	10.0	70.0	1	14.0	3.60	1/2	1	16.1	25	0	0	
230/60/3	19.87	10.0	70.0	1	14.0	3.60	1/2	1	25.3	30	6.60	16.6	
460/60/3	6.8	5.1	33.0	1	7.1	1.70	1/2	1	8.1	15	0	0	
460/60/3	12.7	5.1	33.0	1	7.1	1.70	1/2	1	15.9	20	8.80	11.0	



Performance Data Electrical

E3-Electrical performance (continued)

Model No.	Volts	Total FLA	Comp RLA (ea)	Comp LRA (ea)	No. of Compres.	Cmp MCC	Blower Motor FLA	Blower Motor HP	Fan Motor Num	Minimum Circuit Ampacity	Maximum Overcurrent Protective Device	Electric Heat kW	Electric Heat Amps
042 - Hi Static	208/60/1	21.3	18.00	96.0	1	25.2	3.60	1/2	1	26.1	40	0	0
	208/60/1	30.67	18.0	96.0	1	25.2	3.60	1/2	1	38.8	40	5.70	27.4
	230/60/1	21.3	18.00	96.0	1	25.2	3.60	1/2	1	26.1	40	0	0
	230/60/1	33.67	18.0	96.0	1	25.2	3.60	1/2	1	42.5	45	7.00	30.4
	208/60/3	14.7	11.40	75.0	1	16.0	3.60	1/2	1	17.9	25	0	0
	208/60/3	19.07	11.4	75.0	1	16.0	3.60	1/2	1	24.3	25	5.70	15.8
	230/60/3	14.7	11.40	75.0	1	16.0	3.60	1/2	1	17.9	25	0	0
	230/60/3	20.87	11.4	75.0	1	16.0	3.60	1/2	1	26.5	30	7.00	17.6
	380-415/50/3	9.1	6.40	42.0	1	8.9	2.70	1	1	10.7	15	0	0
	380-415/50/3	14.7	6.4	42.0	1	8.9	2.70	1	1	18.4	20	8.60	12.0
	460/60/3	6.5	4.80	40.0	1	6.7	1.70	1/2	1	7.7	15	0	0
	460/60/3	13.4	4.8	40.0	1	6.7	1.70	1/2	1	16.8	20	9.30	11.7
	575/60/3	5.4	4.10	31.0	1	5.7	1.31	1/2	1	6.4	15	0	0
	042 - Std Static	380-415/50/3	7.8	6.4	42.0	1	8.9	1.40	1/2	1	9.4	15	0
042 - Std Static	380-415/50/3	13.4	6.4	42.0	1	8.9	1.40	1/2	1	16.8	20	8.60	12.0
048 - Hi Static	208/60/1	25.8	20.40	102.0	1	28.5	5.40	1	1	30.9	50	0	0
	208/60/1	36.7	20.4	102.0	1	28.5	5.40	1	1	45.9	50	6.50	31.3
	230/60/1	25.8	20.40	102.0	1	28.5	5.40	1	1	30.9	50	0	0
	230/60/1	40.2	20.4	102.0	1	28.5	5.40	1	1	50.3	60	8.00	34.8
	208/60/3	19.4	14.00	91.0	1	19.7	5.40	1	1	22.9	35	0	0
	208/60/3	23.4	14.0	91.0	1	19.7	5.40	1	1	29.3	35	6.50	18.0
	230/60/3	19.4	14.00	91.0	1	19.7	5.40	1	1	22.9	35	0	0
	230/60/3	25.5	14.0	91.0	1	19.7	5.40	1	1	31.9	35	8.00	20.1
	380-415/50/3	10.2	7.50	49.5	1	10.5	2.70	1	1	12.1	15	0	0
	380-415/50/3	14.7	7.5	49.5	1	10.5	2.70	1	1	18.4	20	8.60	12.0
	460/60/3	9.1	6.40	42.0	1	8.9	2.70	1	1	10.7	15	0	0
	460/60/3	16.0	6.4	42.0	1	8.9	2.70	1	1	20.0	25	10.60	13.3
	575/60/3	7.4	5.20	39.0	1	7.3	2.20	1	1	8.7	15	0	0
	048 - Std Static	208/60/1	23.2	20.4	102.0	1	28.5	2.80	1/2	1	28.3	50	0
048 - Std Static	208/60/1	34.1	20.4	102.0	1	28.5	2.80	1/2	1	42.6	50	6.50	31.3
048 - Std Static	230/60/1	23.2	20.4	102.0	1	28.5	2.80	1/2	1	28.3	50	0	0
048 - Std Static	230/60/1	37.6	20.4	102.0	1	28.5	2.80	1/2	1	47.0	50	8.00	34.8
048 - Std Static	208/60/3	16.8	14.0	91.0	1	19.7	2.80	1/2	1	20.3	35	0	0
048 - Std Static	208/60/3	20.8	14.0	91.0	1	19.7	2.80	1/2	1	26.0	35	6.50	18.0
048 - Std Static	230/60/3	16.8	14.0	91.0	1	19.7	2.80	1/2	1	20.3	35	0	0
048 - Std Static	230/60/3	22.9	14.0	91.0	1	19.7	2.80	1/2	1	28.6	35	8.00	20.1
048 - Std Static	460/60/3	7.8	6.4	42.0	1	8.9	1.40	1/2	1	9.4	15	0	0
048 - Std Static	460/60/3	14.7	6.4	42.0	1	8.9	1.40	1/2	1	18.4	25	10.60	13.3
048 - Std Static	575/60/3	6.3	5.2	39.0	1	7.3	1.10	1/2	1	7.6	15	0	0
060	208/60/1	33.4	28.00	169.0	1	39.0	5.40	1	1	40.4	60	0	0
	208/60/1	36.7	28.0	169.0	1	39.0	5.4	1	1	45.9	60	6.50	31.3
	230/60/1	33.4	28.00	169.0	1	35.0	5.40	1	1	40.4	60	0	0
	230/60/1	40.2	28.0	169.0	1	39.0	5.4	1	1	50.3	60	8.00	34.8
	208/60/3	25.4	20.00	123.0	1	28.0	5.40	1	1	30.4	50	0	0
	208/60/3	25.4	20.0	123.0	1	27.0	5.4	1	1	30.4	50	6.50	18.0
	230/60/3	25.4	20.00	123.0	1	28.0	5.40	1	1	30.4	50	0	0
	230/60/3	25.5	20.0	123.0	1	27.0	5.4	1	1	31.9	50	8.00	20.1
	380-415/50/3	12.8	10.00	62.0	1	14.0	2.70	1	1	15.2	25	0	0
	380-415/50/3	14.7	10.0	62.0	1	14.0	2.7	1	1	18.4	25	8.60	12.0
	460/60/3	10.2	7.50	49.5	1	10.5	2.70	1	1	12.1	15	0	0
	460/60/3	16.0	7.5	49.5	1	10.5	2.7	1	1	20.0	25	10.60	13.3
	575/60/3	8.6	6.40	40.0	1	9.0	2.20	1	1	10.2	15	0	0

E4-Electrical minimum and maximum

Digit 8	Rated Voltage	HZ	Ph	Minimum Utilization Voltage	Maximum Utilization Voltage
0	115	60	1	104	126
1	208	60	1	197	229
2	230	60	1	207	253
3	208	60	3	187	229
4	460	60	3	414	506

E4-Electrical minimum and maximum (continued)

Digit 8	Rated Voltage	HZ	Ph	Minimum Utilization Voltage	Maximum Utilization Voltage
5	575	60	3	518	633
6	220-240	50	1	198	264
7	265	60	1	239	292
8	230	60	3	207	253
9	380-415	60	3	342	456



Performance Data

Fan Performance

Table F1: Fan performance for standard static motor includes wet coil and 1" filter

Model Number	Max CFM	Min CFM	External Static Pressure (in. of wg)																							
			0	.05	.1	.15	.2	.25	.3	.35	.4	.45	.5	.55	.6	.65	.7	.75	.8	.85	.9	.95	1	1.05		
006	High	342	228	-	-	-	-	-	-	-	-	-	-	236	205	161	100	-	-	-	-	-	-	-	-	
	Med			-	-	-	-	-	-	-	-	-	-	239	222	200	169	125	-	-	-	-	-	-	-	-
	Low			-	-	-	-	-	-	-	-	235	222	208	191	169	138	-	-	-	-	-	-	-	-	-
009	High	342	228	-	-	-	-	345	330	316	302	289	275	258	236	205	-	-	-	-	-	-	-	-	-	
	Med			-	-	341	325	309	294	280	266	253	239	222	-	-	-	-	-	-	-	-	-	-	-	-
	Low			342	325	310	294	278	263	249	235	222	-	-	-	-	-	-	-	-	-	-	-	-	-	-
012	High	456	304	-	-	-	-	-	-	-	-	-	-	-	462	424	347	211	-	-	-	-	-	-	-	
	Med			-	-	-	-	459	451	447	46	446	443	428	390	313	177	-	-	-	-	-	-	-	-	-
	Low			-	-	464	453	441	431	423	419	418	418	415	400	362	285	-	-	-	-	-	-	-	-	-
015	High	550	368	550	537	526	515	503	493	485	481	480	480	477	462	424	347	-	-	-	-	-	-	-	-	
	Med			516	503	492	481	469	459	451	447	46	446	443	428	390	313	-	-	-	-	-	-	-	-	-
	Low			488	475	464	453	441	431	423	419	418	418	415	400	362	-	-	-	-	-	-	-	-	-	-
018	High	684	456	-	-	688	675	664	649	633	612	587	560	522	457	427	-	-	-	-	-	-	-	-	-	
	Med			657	652	644	633	621	605	587	568	543	512	475	429	-	-	-	-	-	-	-	-	-	-	-
	Low			632	624	615	604	592	578	561	540	513	481	431	-	-	-	-	-	-	-	-	-	-	-	-
024	High	912	608	-	-	-	-	922	903	883	860	833	802	766	723	675	623	572	-	-	-	-	-	-	-	
	Med			915	901	891	879	866	851	835	819	801	779	751	715	670	621	577	-	-	-	-	-	-	-	-
	Low			827	819	806	793	780	769	756	741	723	701	674	642	605	-	-	-	-	-	-	-	-	-	-
030	High	1009	720	1009	988	971	955	939	922	903	883	860	833	802	766	723	675	-	-	-	-	-	-	-	-	
	Med			915	901	891	879	866	851	835	819	801	779	751	715	-	-	-	-	-	-	-	-	-	-	-
	Low			827	819	806	793	780	769	756	741	723	701	-	-	-	-	-	-	-	-	-	-	-	-	-
036	High	1368	912	-	-	-	-	1381	1366	1351	1334	1315	1295	1272	1247	1219	1187	1152	1112	1068	1018	963	901	-		
	Med			1221	1218	1216	1211	1206	1199	1190	1181	1170	1159	1146	1132	1116	1096	1073	1044	1010	969	922	867	-	-	
	Low			1099	1094	1090	1087	1083	1079	1075	1069	1062	1052	1040	1025	1007	985	958	927	890	-	-	-	-	-	-
GEVA 040	High	1440	960	1480	1460	1429	1391	1349	1304	1258	1213	1168	1124	1082	1039	997	953	-	-	-	-	-	-	-		
	Med			1311	1294	1268	1237	1203	1168	1134	1101	1068	1035	1002	968	931	-	-	-	-	-	-	-	-	-	
	Low			1199	1191	1174	1151	1125	1098	1070	1042	1013	985	955	-	-	-	-	-	-	-	-	-	-	-	
042	High	1436	1064	1436	1427	1417	1406	1394	1381	1366	1351	1334	1315	1295	1272	1247	1219	1187	1152	1112	1068	1018	-	-		
	Med			1221	1218	1216	1211	1206	1199	1190	1181	1170	1159	1146	1132	1116	1096	1073	1044	-	-	-	-	-	-	
	Low			1099	1094	1090	1087	1083	1079	1075	1069	1062	-	-	-	-	-	-	-	-	-	-	-	-	-	
048	High	1824	1216	1850	1786	1732	1686	1646	1608	1572	1536	1499	1459	1417	1371	1323	1272	1216	-	-	-	-	-	-		
	Med			1783	1724	1675	1632	1595	1560	1525	1491	1455	1417	1376	1332	1285	1216	-	-	-	-	-	-	-	-	
	Low			1687	1639	1598	1562	1530	1499	1467	1434	1399	1362	1321	1278	1216	-	-	-	-	-	-	-	-	-	
060	High	2266	1520	2266	2246	2221	2194	2165	2133	2099	2063	2024	1984	1943	1899	1854	1808	1761	1712	1664	1615	1566	1517	-		
	Med			2056	2036	2011	1984	1955	1923	1889	1853	1814	1774	1733	1689	1644	1598	1551	1502	-	-	-	-	-	-	
	Low			1883	1863	1838	1811	1782	1750	1716	1680	1641	1601	1560	1516	-	-	-	-	-	-	-	-	-	-	



Performance Data

Fan Performance

Table F-2: Fan performance (high static option) includes wet coil and 1" filter

Model Number	Max CFM	Min CFM	External Static Pressure (in. of wg)																								
			0	.05	.1	.15	.2	.25	.3	.35	.4	.45	.5	.55	.6	.65	.7	.75	.8	.85	.9	.95	1	1.05			
006	High	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	248	204	143	-	-	-	-	-	-		
	Med			-	-	-	-	-	-	-	-	-	-	-	-	-	-	236	205	161	100	-	-	-	-	-	-
	Low			-	-	-	-	-	-	-	-	-	-	239	222	200	169	125	-	-	-	-	-	-	-	-	-
009	High	342	228	-	-	-	-	-	-	-	345	332	318	301	279	248	204	-	-	-	-	-	-	-	-	-	
	Med			-	-	-	-	345	330	316	302	289	275	258	236	205	-	-	-	-	-	-	-	-	-	-	-
	Low			-	-	341	325	309	294	280	266	253	239	222	-	-	-	-	-	-	-	-	-	-	-	-	-
012	High	456	304	-	-	-	-	-	-	-	-	-	-	-	-	488	450	373	237	-	-	-	-	-	-	-	
	Med			-	-	-	-	-	-	-	-	-	-	-	-	-	462	424	347	211	-	-	-	-	-	-	-
	Low			-	-	-	-	-	-	459	451	447	446	446	443	428	390	313	177	-	-	-	-	-	-	-	-
015	High	550	368	-	-	552	541	529	519	511	507	506	506	503	488	450	373	237	-	-	-	-	-	-	-	-	
	Med			550	537	526	515	503	493	485	481	480	480	477	462	424	347	-	-	-	-	-	-	-	-	-	-
	Low			516	503	492	481	469	459	451	447	461	446	443	428	390	313	-	-	-	-	-	-	-	-	-	-
018	High	684	456	-	-	-	-	-	-	-	-	-	-	-	725	676	623	566	503	431	-	-	-	-	-	-	
	Med			-	-	-	-	-	-	-	-	-	-	705	657	608	556	504	450	-	-	-	-	-	-	-	-
	Low			-	-	-	-	-	-	-	-	-	-	708	668	626	580	533	483	431	-	-	-	-	-	-	-
024	High	912	608	-	-	-	-	-	-	-	-	935	906	875	841	802	755	695	615	504	-	-	-	-	-	-	
	Med			-	-	-	-	922	903	883	860	833	802	766	723	675	623	572	-	-	-	-	-	-	-	-	-
	Low			915	901	891	879	866	851	835	819	801	779	751	715	670	621	577	-	-	-	-	-	-	-	-	-
030	High	1009	720	-	1097	1074	1053	1033	1011	988	962	935	906	875	841	802	755	695	-	-	-	-	-	-	-	-	
	Med			1009	988	971	955	939	922	903	883	860	833	802	766	723	675	-	-	-	-	-	-	-	-	-	-
	Low			915	901	891	879	866	851	835	819	801	779	751	715	-	-	-	-	-	-	-	-	-	-	-	-
036	High	1368	912	-	-	-	-	-	-	-	-	-	-	-	1396	1364	1329	1291	1249	1203	1154	1100	1042	979	910		
	Med			-	-	-	-	-	-	1381	1366	1351	1334	1315	1295	1272	1247	1219	1187	1152	1112	1068	1018	963	901	-	
	Low			1221	1218	1216	1211	1206	1199	1190	1181	1170	1159	1146	1132	1116	1096	1073	1044	1010	969	922	867	-	-	-	-
GEVA 040	High	1440	960	-	-	-	1480	1436	1389	1340	1291	1242	1194	1146	1098	1051	1004	956	-	-	-	-	-	-	-	-	
	Med			-	1460	1429	1391	1349	1304	1258	1213	1168	1124	1082	1039	997	953	-	-	-	-	-	-	-	-	-	-
	Low			1311	1294	1268	1237	1203	1168	1134	1101	1068	1035	1002	968	931	-	-	-	-	-	-	-	-	-	-	-
042	High	1596	1064	-	1605	1585	1566	1548	1531	1512	1493	1472	1449	1424	1396	1364	1329	1291	1249	1203	1154	1100	1042	-	-		
	Med			1436	1427	1417	1406	1394	1381	1366	1351	1334	1315	1295	1272	1247	1219	1187	1152	1112	1068	1018	-	-	-	-	
	Low			1221	1218	1216	1211	1206	1199	1190	1181	1170	1159	1146	1132	1116	1096	1073	1044	-	-	-	-	-	-	-	-
048	High	1824	1216	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1831	1782	1734	1684	1636	1587	1540	1493		
	Med			-	-	-	-	-	-	-	-	-	-	-	-	-	-	1854	1808	1761	1712	1664	1615	1566	1517	1470	1423
	Low			-	-	-	-	-	-	-	1853	1814	1774	1733	1689	1644	1598	1551	1502	1454	1405	1356	1307	1260	1213	-	-
060	High	2266	1520	-	-	2291	2264	2235	2203	2169	2133	2094	2054	2013	1969	1924	1878	1831	1782	1734	1684	1636	1587	1540	1493		
	Med			2266	2246	2221	2194	2165	2133	2099	2063	2024	1984	1943	1899	1854	1808	1761	1712	1664	1615	1566	1517	-	-	-	
	Low			2056	2036	2011	1984	1955	1923	1889	1853	1814	1774	1733	1689	1644	1598	1551	1502	-	-	-	-	-	-	-	-

Table F-3: Fan performance (high static option)

includes wet coil and 1" filter

Model Number	Max CFM	Min CFM	External Static Pressure (in. of wg)							
			1.1	1.15	1.2	1.25	1.3	1.35	1.4	
GEHA 048	High	1824	1216	1448	1404	1362	1321	1281	1242	1201
	Med			1378	1334	1292	1251	1211	-	-
	High			-	-	-	-	-	-	-



Performance Data Waterside Economizer

Performance data is tabulated for cooling at 80 F DB/67 F WB entering air and 45 F entering fluid at ARI 410 rated SCFM.

Table W1: Waterside Economizer Performance Data (1/2 through 5 Tons)

Tonnage of Heat Pump	Input Data			Output Data						
	Model GEH	SCFM	GPM	Total Capacity (MBH)	Sensible Capacity (MBH)	LVG. Air DB (Deg F)	LVG. Air WB (Deg F)	Standard APD (IN WG)	LVG.Fluid Temp. Degree F	Fluid PD (FT H ₂ O)
0.50	006	190	1.2	5.83	4.28	59.4	57.3	0.03	54.7	0.23
			1.5	6.3	4.6	58.5	56.5	0.03	53.4	0.34
			1.7	6.65	4.61	57.8	55.8	0.03	52.8	0.42
0.75	009	285	1.7	7.86	5.91	61.1	58.4	0.07	54.2	0.42
			2.1	8.49	6.14	60.3	57.7	0.07	53.1	0.60
			2.3	8.76	6.25	60.0	57.3	0.07	52.6	0.71
1.00	012	380	2.2	9.75	7.41	62.2	59.1	0.11	53.8	0.65
			2.8	10.6	7.72	61.4	58.3	0.11	52.6	0.99
			3.1	11.03	7.91	61.0	57.9	0.11	52.1	1.18
1.25	015	460	2.8	11.44	8.68	62.7	59.3	0.15	53.1	0.99
			3.5	12.33	9.03	62.1	58.7	0.15	52.0	1.46
			3.8	12.69	9.19	61.7	58.4	0.15	51.7	1.69
1.50	018	570	3.3	16.27	11.71	61.2	58.1	0.12	54.8	1.36
			4.2	17.61	12.25	60.4	57.3	0.12	53.4	2.08
			4.6	18.05	12.42	60.1	57.0	0.12	52.8	2.45
2.00	024	760	4.4	20.25	14.65	62.4	58.7	0.19	54.2	2.26
			5.5	21.58	15.21	61.7	0.2	0.19	52.8	3.4
			6.1	22.19	15.43	61.4	57.9	0.19	52.3	4.03
2.50	030	900	5.5	23.27	16.81	62.9	59.0	0.25	53.4	3.4
			6.9	24.71	17.38	62.3	58.5	0.25	52.1	5.01
			7.6	25.28	17.64	62.1	58.3	0.25	51.6	5.95
3.00	036	1140	6.6	29.28	21.57	62.7	59.1	0.19	53.8	2.39
			8.3	31.47	22.41	62.0	58.4	0.19	52.6	5.25
			9.1	32.2	22.2	61.8	58.2	0.19	52.1	6.19
3.50	042	1330	7.8	32.88	24.88	63.4	59.4	0.25	53.4	4.70
			9.7	34.81	25.05	62.8	58.9	0.25	52.2	6.92
			10.7	35.67	25.37	62.6	58.7	0.25	51.6	8.24
4.00	048	1520	8.8	39.77	29.11	62.5	58.9	0.17	54.0	1.24
			11	42.44	30.25	61.8	58.3	0.17	52.7	1.86
			12.1	43.65	30.69	61.5	58.0	0.17	52.2	2.21
5.00	060	1900	11.6	47.59	34.73	63.3	59.3	0.24	53.2	2.04
			14.5	50.66	35.94	62.7	58.7	0.24	52.0	3.05
			16	51.87	36.39	62.5	58.5	0.24	51.5	3.65

Performance Data

Antifreeze Correction Factors

Table A1: Correction Factors for Antifreeze Solutions

Methanol					
Item	Concentration by Volume				
	10%	20%	30%	40%	50%
Cool Capacity	.9980	.9965	.9949	.9932	.9915
Heat Capacity	.9950	.9898	.9846	.9794	.9742
Pressure Drop	1.023	1.057	1.091	1.122	1.160
Ethylene Glycol					
Cool Capacity	.9955	.9912	.9870	.9830	.9790
Heat Capacity	.9925	.9848	.9770	.9690	.9610
Pressure Drop	1.024	1.068	1.124	1.188	1.263
Propylene Glycol					
Cool Capacity	.9934	.9869	.9804	.9739	.9681
Heat Capacity	.9863	.9732	.9603	.9477	.9350
Pressure Drop	1.040	1.098	1.174	1.273	1.405

Example 1 (Ethylene Glycol):

The antifreeze solution is 20% by volume of Ethylene Glycol. Determine the corrected cooling capacity and water-side pressure drop for a GEHB 018 when the EWT is 86 F and the GPM is 4.2.

From the catalog data, the cooling capacity at these conditions with 100% water is 18.6 MBTUH, and the waterside pressure drop is 6.0 feet of head. At 20% Ethylene Glycol, the correction factor for cool capacity is 0.9912 and the pressure drop is 1.068.

The corrected cooling capacity (MBTUH) = $18.6 * 0.9912 = 18.4$. The corrected water side pressure drop (Ft. head) = $6.9 * 1.068 = 7.4$.

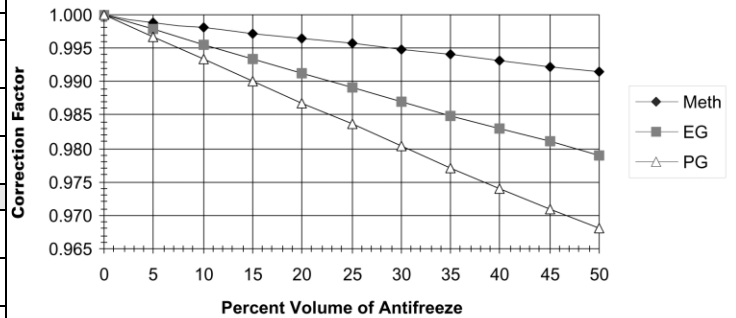
Example 2 (Propylene Glycol):

The antifreeze solution is 30% by volume of Propylene Glycol. Determine the corrected heating capacity and waterside pressure drop for a GEHB 042 when the EWT is 45 F and the GPM is 9.7.

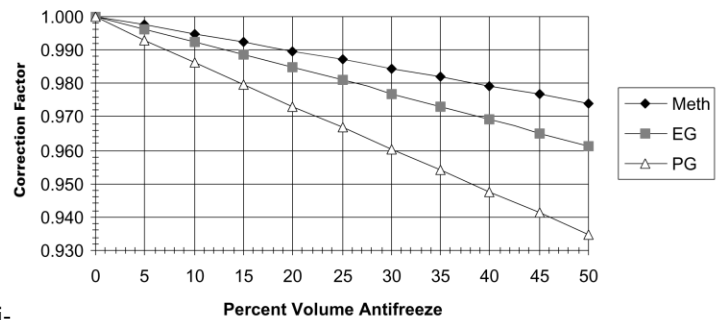
From the catalog data, the heating capacity at these conditions with 100% water is 36.7 MBTUH, and the waterside pressure drop is 16.1 feet of head. At 30% Propylene Glycol, the correction factor for heat capacity is 0.9603 and the pressure drop is 1.174.

The corrected cooling capacity (MBTUH) = $36.7 * 0.9603 = 35.2$. The corrected water side pressure drop (Ft. head) = $16.1 * 1.174 = 18.9$.

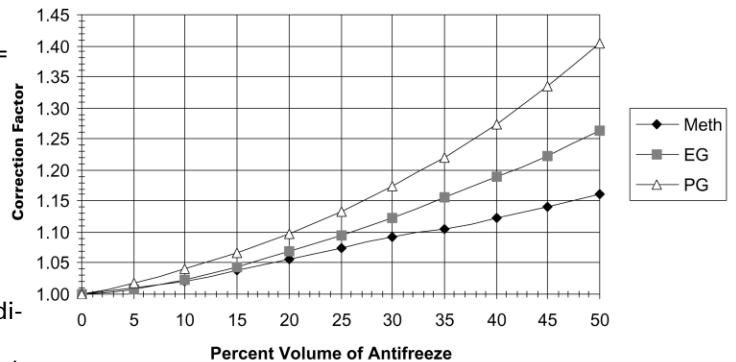
Cooling Capacity Correction Factor



Heating Capacity Correction Factor



Water Pressure Drop Correction Factor

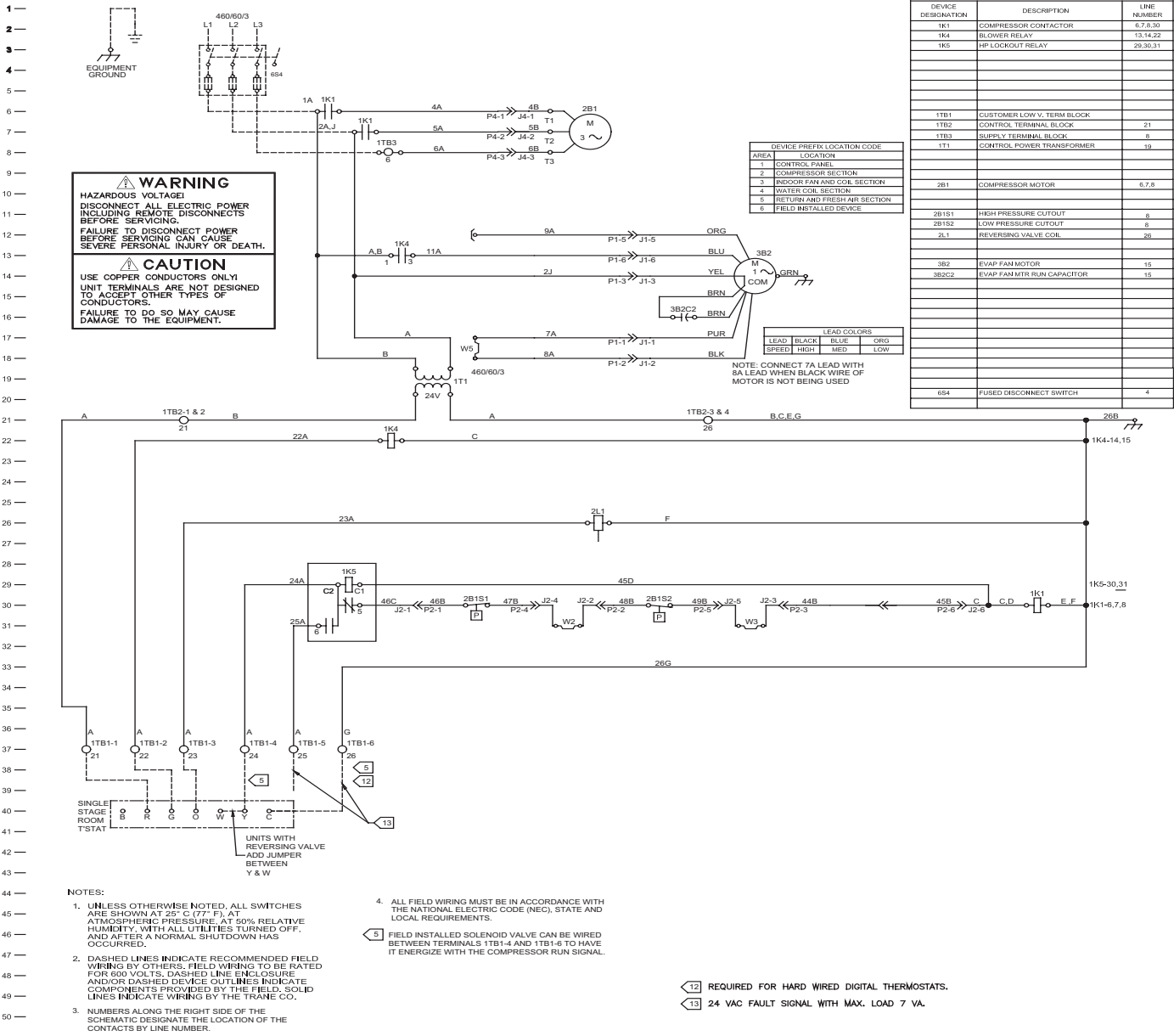




Control Wiring

Basic 24V - 1 PH

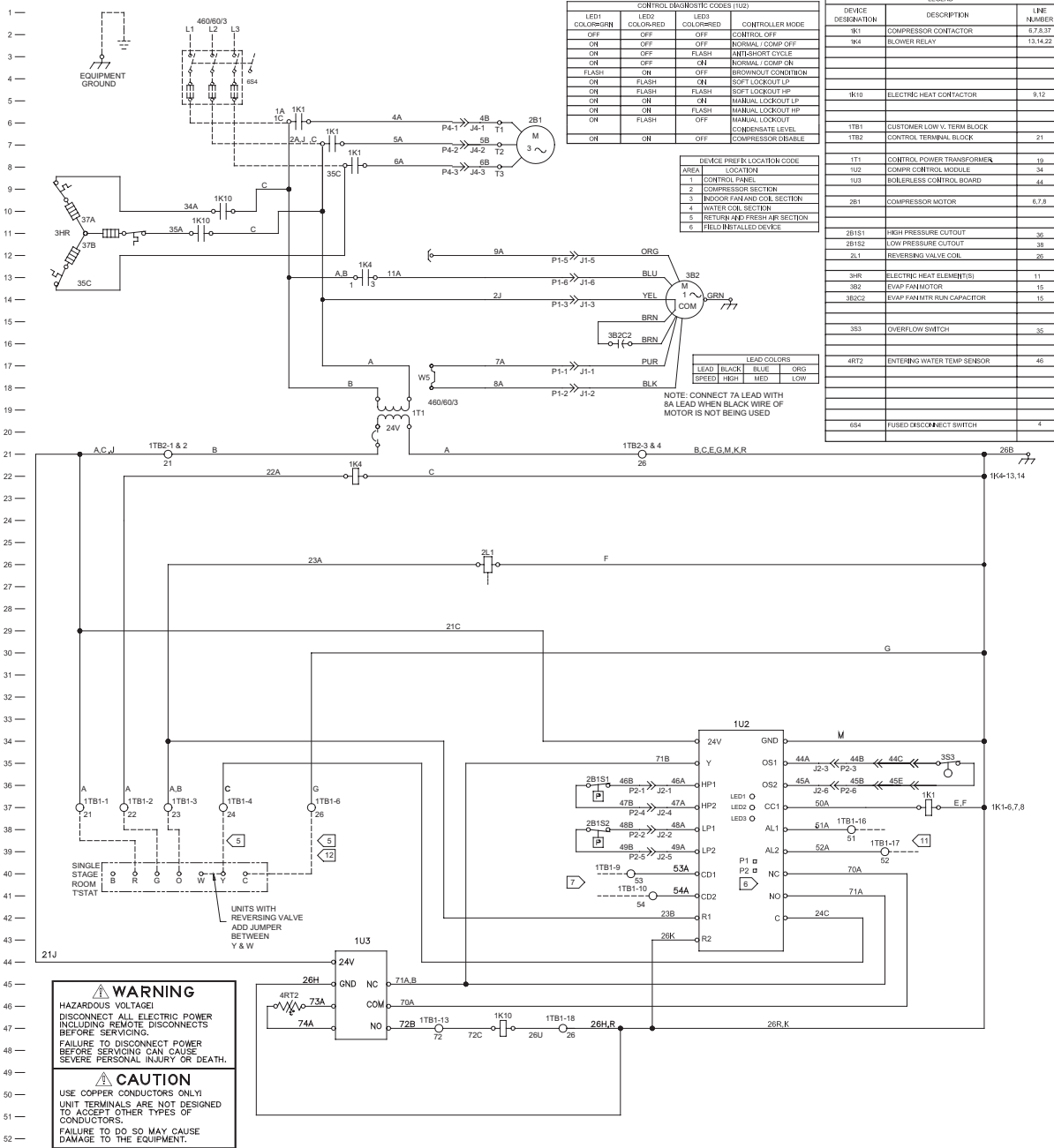
208V-60HZ-1PH



Control Wiring

Deluxe 24V - 3 PH

208V-60HZ-3PH



WARNING
HAZARDOUS VOLTAGE!
DISCONNECT ALL ELECTRIC POWER INCLUDING REMOTE DISCONNECTS BEFORE SERVICING.
FAILURE TO DISCONNECT POWER BEFORE SERVICING CAN CAUSE SEVERE PERSONAL INJURY OR DEATH.

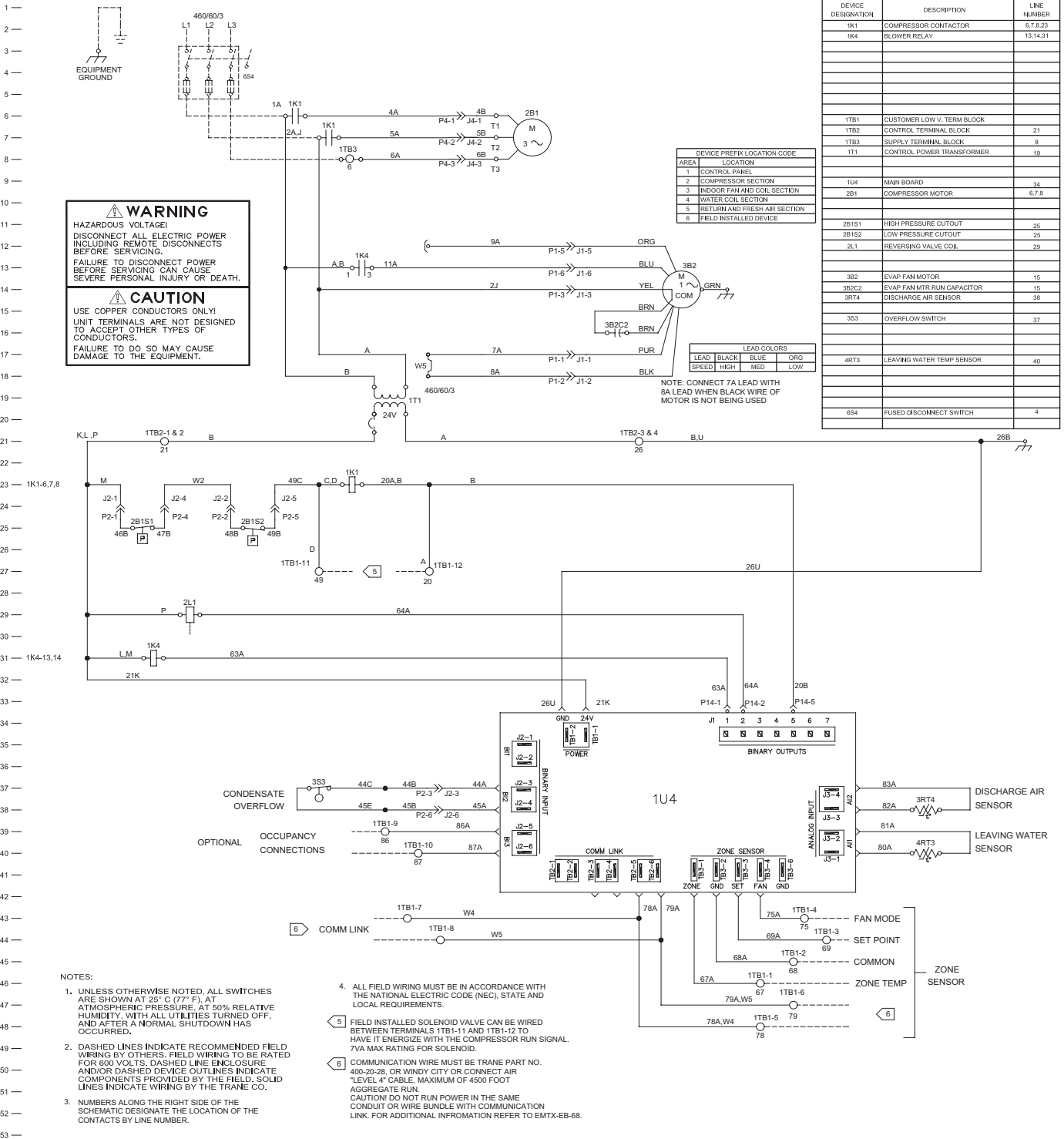
CAUTION
USE COPPER CONDUCTORS ONLY!
UNIT TERMINALS ARE NOT DESIGNED TO ACCEPT OTHER TYPES OF CONDUCTORS.
FAILURE TO DO SO MAY CAUSE DAMAGE TO THE EQUIPMENT.

- NOTES:
- 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.
 - DASHED LINES INDICATE RECOMMENDED FIELD WIRING BY OTHERS. FIELD WIRING TO BE RATED FOR 600 VOLTS. DASHED LINE ENCLOSURE AND/OR DASHED DEVICE OUTLINES INDICATE COMPONENTS PROVIDED BY THE FIELD. SOLID LINES INDICATE WIRING BY THE TRANE CO.
 - NUMBERS ALONG THE RIGHT SIDE OF THE SCHEMATIC DESIGNATE THE LOCATION OF THE CONTACTS BY LINE NUMBER.
 - ALL FIELD WIRING MUST BE IN ACCORDANCE WITH THE NATIONAL ELECTRIC CODE (NEC), STATE AND LOCAL REQUIREMENTS.
 - FIELD INSTALLED SOLENOID VALVE CAN BE WIRED BETWEEN TERMINALS 1TB1-4 AND 1TB1-6 TO HAVE IT ENERGIZE WITH THE COMPRESSOR RUN SIGNAL.
 - VERIFY TEST JUMPER HAS BEEN REMOVED TO PREVENT CONTROL TIMING ERRORS.
 - CONNECTION FOR 24VAC CLASS 2 COMPRESSOR DISABLE INPUT. FOR CLO APPLICATIONS PUMP RESTART RELAY REQUIRED FOR OVERRIDE. USE TERM 1TB1-4, 6 TO ENERGIZE PUMP RESTART RELAY COIL. MAX LOAD (5 VA).
 - ISOLATED GENERAL ALARM CONTACTS. CONTACTS CLOSE WHEN CONTROL 1U2 GOES INTO MANUAL LOCKOUT MODE. CONTACTS RATED FOR CLASS 2 24V. TERMINAL 1TB1-16 AND 17.
 - REQUIRED FOR HARD WIRED DIGITAL THERMOSTATS.

Control Wiring

Tracer ZN510-1PH

208V-60HZ-1PH



WARNING
HAZARDOUS VOLTAGE!
DISCONNECT ALL ELECTRIC POWER INCLUDING REMOTE DISCONNECTS BEFORE SERVICING.
FAILURE TO DISCONNECT POWER BEFORE SERVICING CAN CAUSE SEVERE PERSONAL INJURY OR DEATH.

CAUTION
USE COPPER CONDUCTORS ONLY!
UNIT TERMINALS ARE NOT DESIGNED TO ACCEPT OTHER TYPES OF CONDUCTORS.
FAILURE TO DO SO MAY CAUSE DAMAGE TO THE EQUIPMENT.

DEVICE PREFIX LOCATION CODE	
AREA	LOCATION
1	CONTROL PANEL
2	COMPRESSOR SECTION
3	INDOOR FAN AND COIL SECTION
4	WATER COIL SECTION
5	RETURN AND FRESH AIR SECTION
6	FIELD INSTALLED DEVICE

LEAD COLORS			
LEAD	BLACK	BLUE	ORG
SPEED	HIGH	MED	LOW

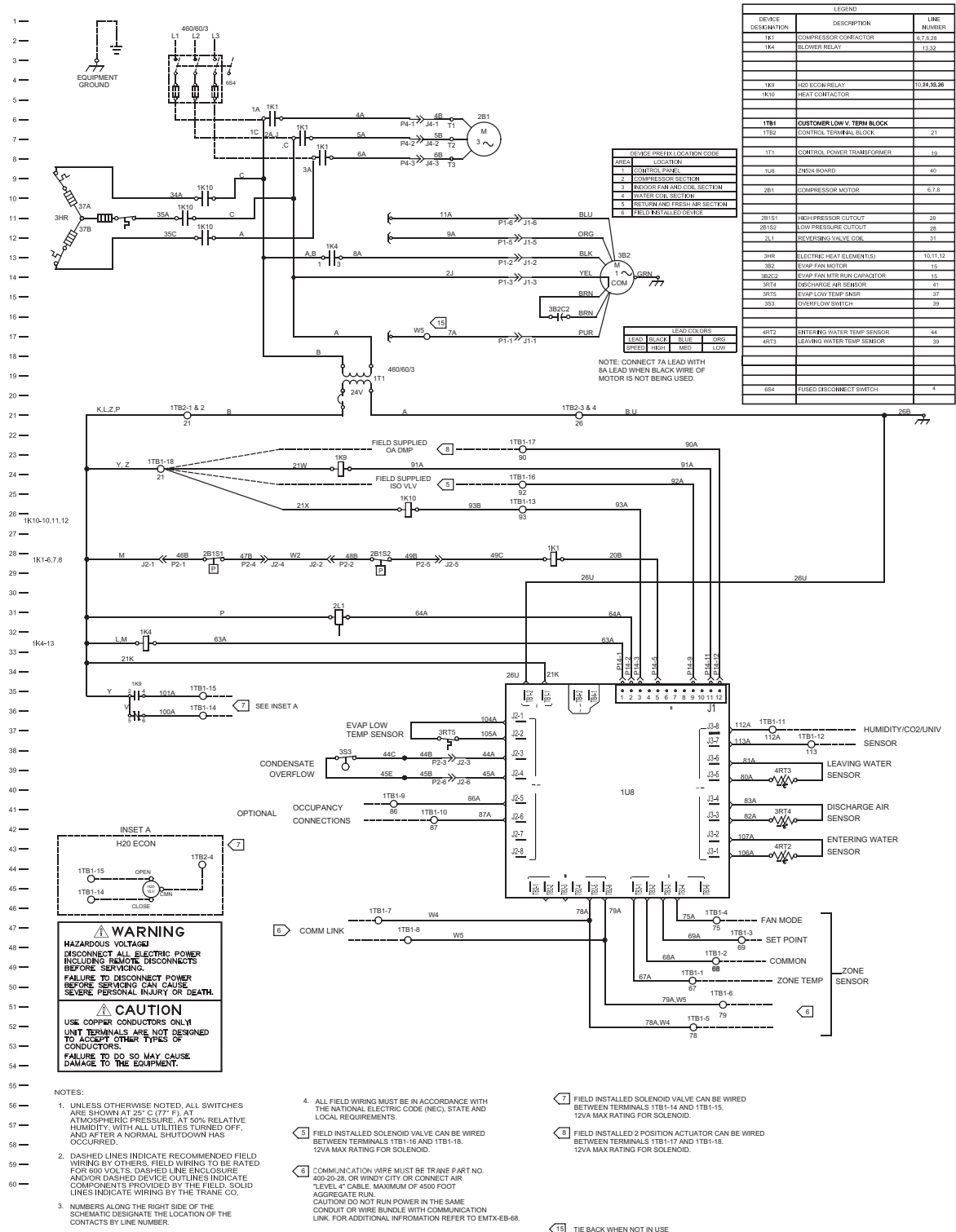
NOTE: CONNECT 7A LEAD WITH 8A LEAD WHEN BLACK WIRE OF MOTOR IS NOT BEING USED

- NOTES:
- 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.
 - DASHED LINES INDICATE RECOMMENDED FIELD WIRING BY OTHERS. FIELD WIRING TO BE RATED FOR 600 VOLTS. DASHED LINE ENCLOSURE AND/OR DASHED DEVICE OUTLINES INDICATE COMPONENTS PROVIDED BY THE FIELD. SOLID LINES INDICATE WIRING BY THE TRANE CO.
 - NUMBERS ALONG THE RIGHT SIDE OF THE SCHEMATIC DESIGNATE THE LOCATION OF THE CONTACTS BY LINE NUMBER.
 - ALL FIELD WIRING MUST BE IN ACCORDANCE WITH THE NATIONAL ELECTRIC CODE (NEC), STATE AND LOCAL REQUIREMENTS.
 - FIELD INSTALLED SOLENOID VALVE CAN BE WIRED BETWEEN TERMINALS 1TB1-11 AND 1TB1-12 TO HAVE IT ENERGIZE WITH THE COMPRESSOR RUN SIGNAL. 7VA MAX RATING FOR SOLENOID.
 - 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.

Dimensional Data

Tracer ZN524-3PH

460V-60HZ-3PH



Dimensional Data

Weight Distribution

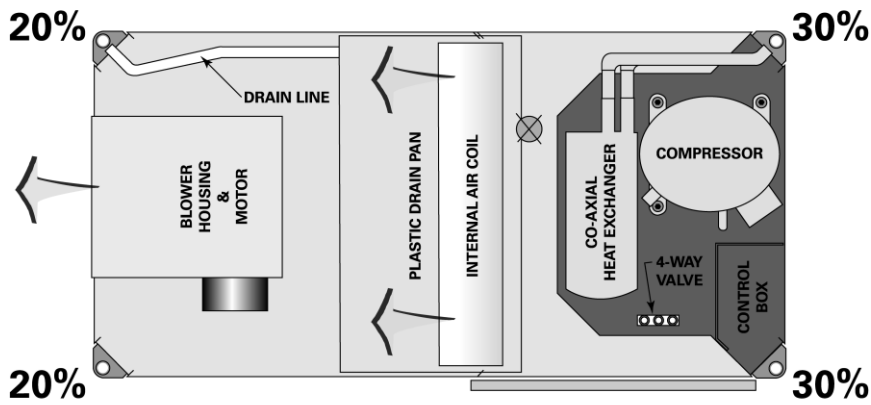


Figure 39: Approximate weight distribution

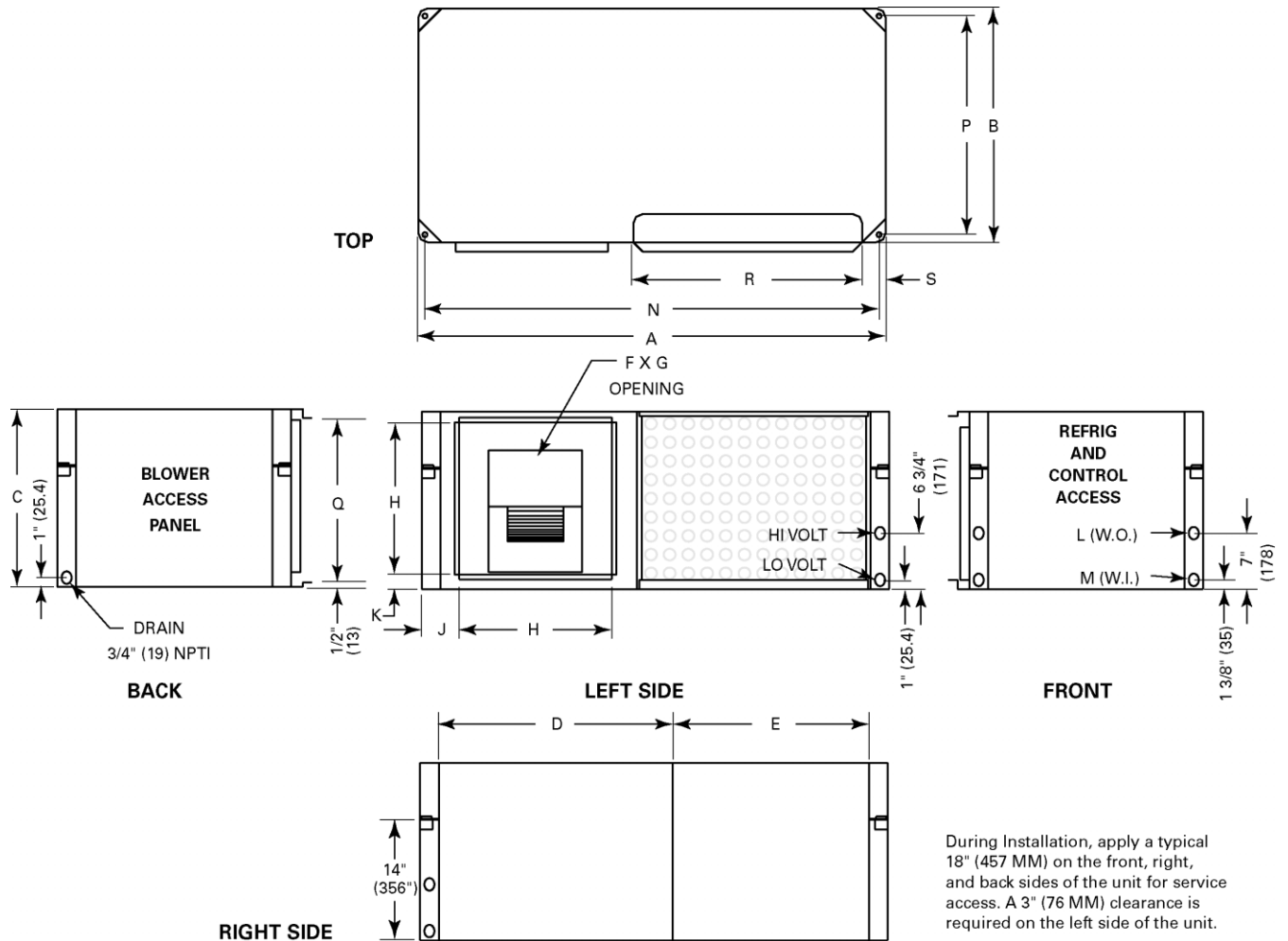
Weight Distribution

- 1 Approximate weight distribution for the GEH model is indicated in Figure 39.
- 2 Tolerance on the weights determined are $\pm 15\%$.
- 3 Total weights for each unit are listed below.

GEH Unit	Shipping Weight (lbs)	Running Weight (lbs)
006-015	188	158
018-030	278	248
036-042	318	288
048, 060	428	398

Dimensional Data

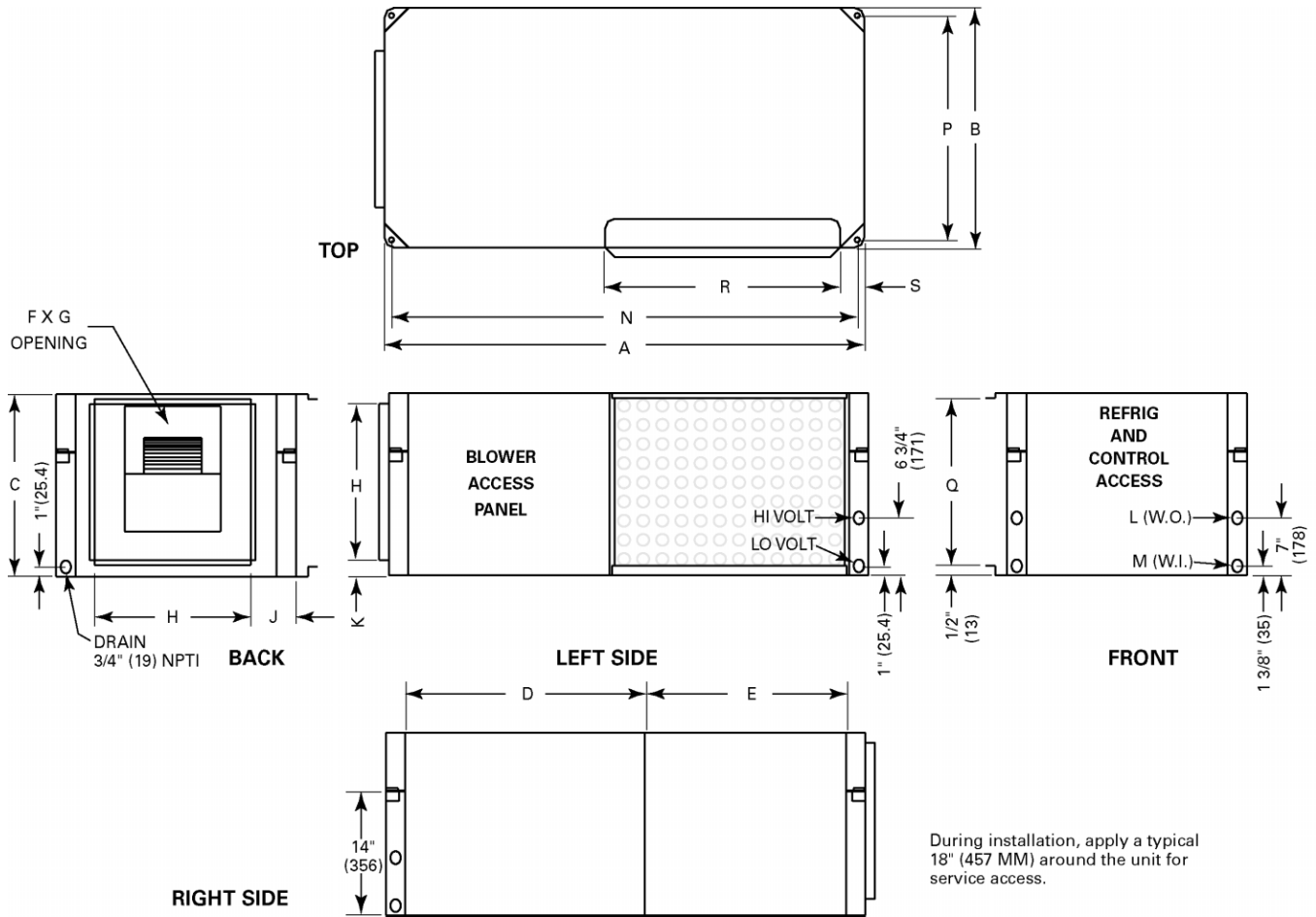
Left Return/Left Supply



Unit	A	B	C	D	E	F	G	H	J	K	L NPTI	M NPTI	N	P	Q	R	S
006, 009	40" (1016)	20" (508)	15" (381)	20" (508)	15" (381)	6 7/8" (175)	8" (203)	11 1/2" (292)	4 1/4" (108)	1 3/4" (45)	1/2" (12.7)	1/2" (12.7)	38 3/4" (984)	18 3/4" (476)	13 5/8" (346)	18 1/2" (470)	3 1/4" (83)
012, 015	40" (1016)	20" (508)	15" (381)	20" (508)	15" (381)	6 7/8" (175)	9 7/8" (251)	11 1/2" (292)	4 1/4" (108)	2 3/4" (70)	1/2" (12.7)	1/2" (12.7)	38 3/4" (984)	18 3/4" (476)	13 5/8" (346)	18 1/2" (470)	3 1/4" (83)
018	46" (1168)	23" (584)	17" (432)	23" (584)	18" (457)	8 1/4" (210)	9 3/4" (248)	13 1/2" (343)	4 3/4" (121)	2 1/4" (57)	3/4" (19)	3/4" (19)	44 3/4" (1137)	21 3/4" (552)	15 5/8" (397)	18 1/2" (470)	4 1/4" (108)
024, 030	46" (1168)	23" (584)	17" (432)	23" (584)	18" (457)	8 1/4" (210)	11 3/8" (289)	13 1/2" (343)	4 3/4" (121)	2 1/4" (57)	3/4" (19)	3/4" (19)	44 3/4" (1137)	21 3/4" (552)	15 5/8" (397)	18 1/2" (470)	4 1/4" (108)
036, 042	50" (1270)	25" (635)	19" (483)	25" (635)	20" (508)	10 1/2" (267)	13 1/2" (343)	16 3/8" (416)	4" (102)	1" (25.4)	3/4" (19)	3/4" (19)	48 3/4" (1238)	23 3/4" (603)	17 5/8" (448)	23 1/2" (597)	3 1/4" (83)
Std-048	58" (1473)	33" (838)	21" (533)	23 1/2" (597)	29 1/2" (749)	13 1/8" (333)	11 3/8" (289)	18" (457)	6 5/8" (168)	1 1/2" (38)	1" (25.4)	1" (25.4)	56 3/4" (1441)	31 3/4" (806)	19 5/8" (498)	23 1/2" (597)	5 1/2" (140)
Hi-048, 060	58" (1473)	33" (838)	21" (533)	23 1/2" (597)	29 1/2" (749)	13 7/8" (352)	13 7/8" (352)	18" (457)	6 5/8" (168)	1 1/2" (38)	1" (25.4)	1" (25.4)	56 3/4" (1441)	31 3/4" (806)	19 5/8" (498)	23 1/2" (597)	5 1/2" (140)

Dimensional Data

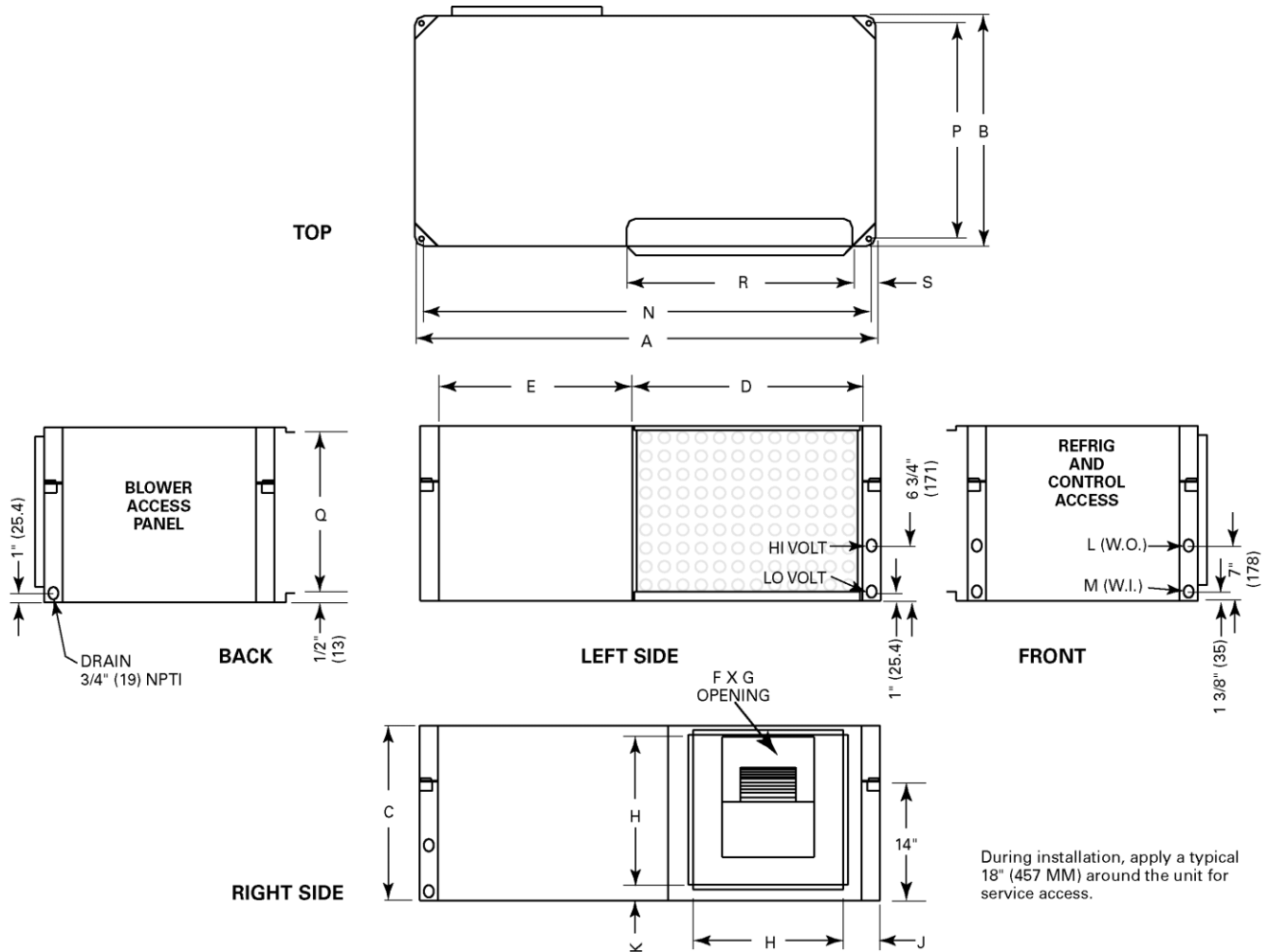
Left Return/Back Supply



Unit	A	B	C	D	E	F	G	H	J	K	L NPTI	M NPTI	N	P	Q	R	S
006,009	40" (1016)	20" (508)	15" (381)	20" (508)	15" (381)	6 7/8" (175)	8" (203)	11 1/2" (292)	4 1/4" (108)	1 3/4" (45)	1/2" (12.7)	1/2" (12.7)	38 3/4" (984)	18 3/4" (476)	13 5/8" (346)	18 1/2" (470)	3 1/4" (83)
012, 015	40" (1016)	20" (508)	15" (381)	20" (508)	15" (381)	6 7/8" (175)	9 7/8" (251)	11 1/2" (292)	4 1/4" (108)	2 3/4" (70)	1/2" (12.7)	1/2" (12.7)	38 3/4" (984)	18 3/4" (476)	13 5/8" (346)	18 1/2" (470)	3 1/4" (83)
018	46" (1168)	23" (584)	17" (432)	23" (584)	18" (457)	8 1/4" (210)	9 3/4" (248)	13 1/2" (343)	4 3/4" (121)	2 1/4" (57)	3/4" (19)	3/4" (19)	44 3/4" (1137)	21 3/4" (552)	15 5/8" (397)	18 1/2" (470)	4 1/4" (108)
024, 030	46" (1168)	23" (584)	17" (432)	23" (584)	18" (457)	8 1/4" (210)	11 3/8" (289)	13 1/2" (343)	4 3/4" (121)	2 1/4" (57)	3/4" (19)	3/4" (19)	44 3/4" (1137)	21 3/4" (552)	15 5/8" (397)	18 1/2" (470)	4 1/4" (108)
036, 042	50" (1270)	25" (635)	19" (483)	25" (635)	20" (508)	10 1/2" (267)	13 1/2" (343)	16 3/8" (416)	4" (102)	1" (25.4)	3/4" (19)	3/4" (19)	48 3/4" (1238)	23 3/4" (603)	17 5/8" (448)	23 1/2" (597)	3 1/4" (83)
Std-048	58" (1473)	33" (838)	21" (533)	23 1/2" (597)	29 1/2" (749)	13 1/8" (333)	11 3/8" (289)	18" (457)	6 5/8" (168)	1 1/2" (38)	1" (25.4)	1" (25.4)	56 3/4" (1441)	31 3/4" (806)	19 5/8" (498)	23 1/2" (597)	5 1/2" (140)
Hi-048, 060	58" (1473)	33" (838)	21" (533)	23 1/2" (597)	29 1/2" (749)	13 7/8" (352)	13 7/8" (352)	18" (457)	6 5/8" (168)	1 1/2" (38)	1" (25.4)	1" (25.4)	56 3/4" (1441)	31 3/4" (806)	19 5/8" (498)	23 1/2" (597)	5 1/2" (140)

Dimensional Data

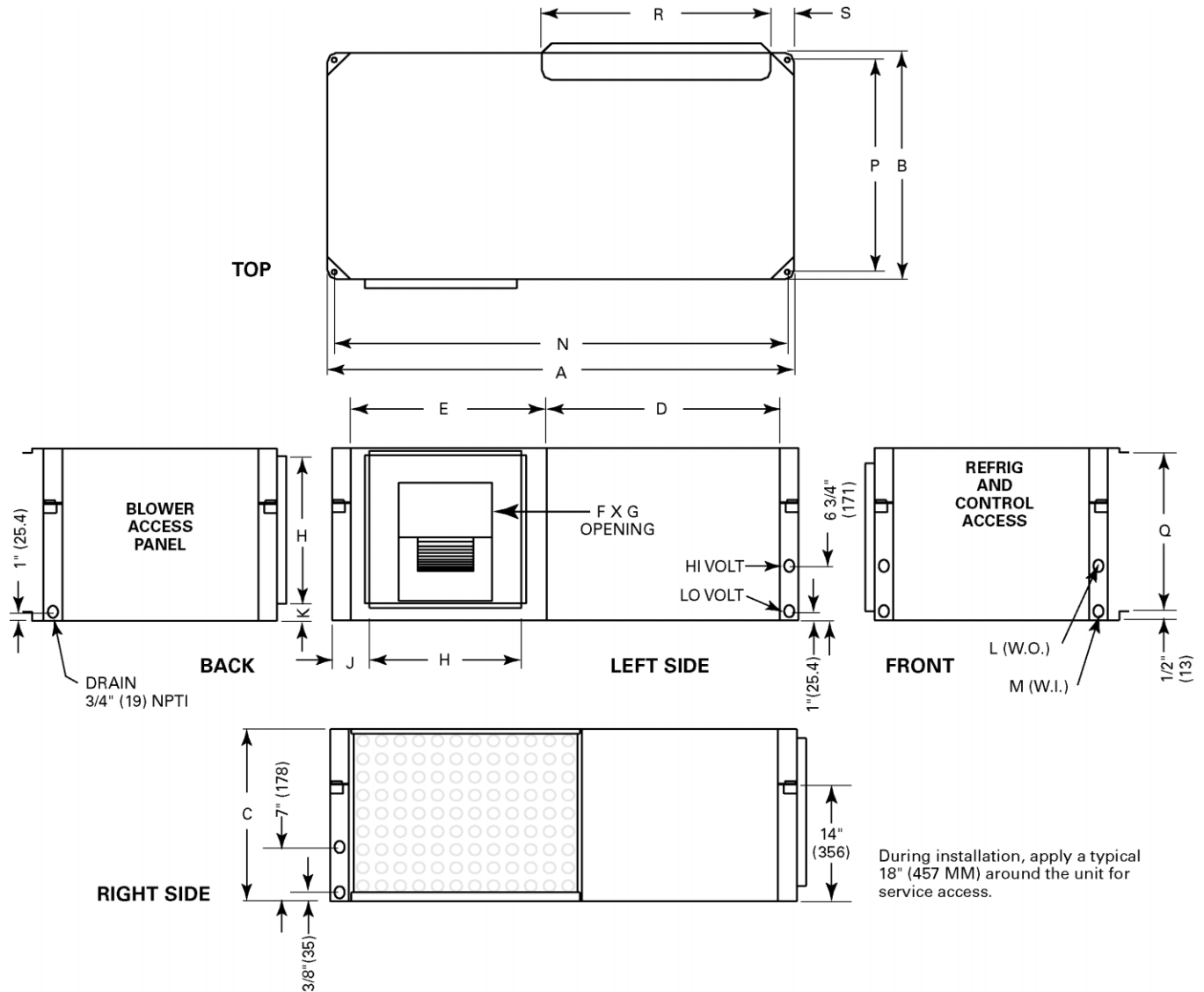
Left Return/Right Supply



Unit	A	B	C	D	E	F	G	H	J	K	L NPTI	M NPTI	N	P	Q	R	S
006,009	40" (1016)	20" (508)	15" (381)	20" (508)	15" (381)	6 7/8" (175)	8" (203)	11 1/2" (292)	4 1/4" (108)	1 3/4" (45)	1/2" (12.7)	1/2" (12.7)	38 3/4" (984)	18 3/4" (476)	13 5/8" (346)	18 1/2" (470)	3 1/4" (83)
012, 015	40" (1016)	20" (508)	15" (381)	20" (508)	15" (381)	6 7/8" (175)	9 7/8" (251)	11 1/2" (292)	4 1/4" (108)	2 3/4" (70)	1/2" (12.7)	1/2" (12.7)	38 3/4" (984)	18 3/4" (476)	13 5/8" (346)	18 1/2" (470)	3 1/4" (83)
018	46" (1168)	23" (584)	17" (432)	23" (584)	18" (457)	8 1/4" (210)	9 3/4" (248)	13 1/2" (343)	4 3/4" (121)	2 1/4" (57)	3/4" (19)	3/4" (19)	44 3/4" (1137)	21 3/4" (552)	15 5/8" (397)	18 1/2" (470)	4 1/4" (108)
024, 030	46" (1168)	23" (584)	17" (432)	23" (584)	18" (457)	8 1/4" (210)	11 3/8" (289)	13 1/2" (343)	4 3/4" (121)	2 1/4" (57)	3/4" (19)	3/4" (19)	44 3/4" (1137)	21 3/4" (552)	15 5/8" (397)	18 1/2" (470)	4 1/4" (108)
036, 042	50" (1270)	25" (635)	19" (483)	25" (635)	20" (508)	10 1/2" (267)	13 1/2" (343)	16 3/8" (416)	4" (102)	1" (25.4)	3/4" (19)	3/4" (19)	48 3/4" (1238)	23 3/4" (603)	17 5/8" (448)	23 1/2" (597)	3 1/4" (83)
Std-048	58" (1473)	33" (838)	21" (533)	23 1/2" (597)	29 1/2" (749)	13 1/8" (333)	11 3/8" (289)	18" (457)	6 5/8" (168)	1 1/2" (38)	1" (25.4)	1" (25.4)	56 3/4" (1441)	31 3/4" (806)	19 5/8" (498)	23 1/2" (597)	5 1/2" (140)
Hi-048, 060	58" (1473)	33" (838)	21" (533)	23 1/2" (597)	29 1/2" (749)	13 7/8" (352)	13 7/8" (352)	18" (457)	6 5/8" (168)	1 1/2" (38)	1" (25.4)	1" (25.4)	56 3/4" (1441)	31 3/4" (806)	19 5/8" (498)	23 1/2" (597)	5 1/2" (140)

Dimensional Data

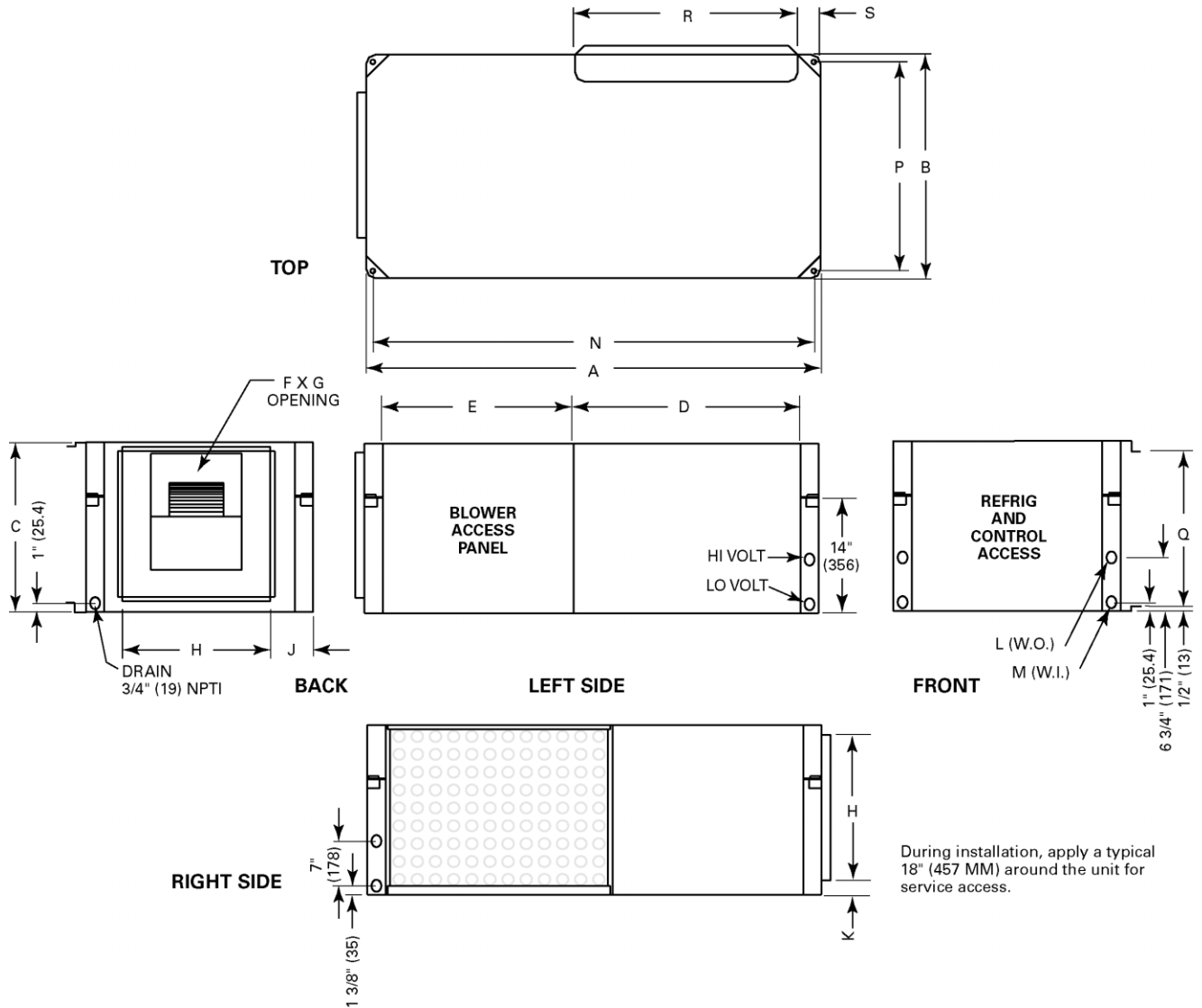
Right Return/Left Supply



During installation, apply a typical 18" (457 MM) around the unit for service access.

Unit	A	B	C	D	E	F	G	H	J	K	L NPTI	M NPTI	N	P	Q	R	S
006, 009	40" (1016)	20" (508)	15" (381)	20" (508)	15" (381)	6 7/8" (175)	8" (203)	11 1/2" (292)	4 1/4" (108)	1 3/4" (45)	1/2" (12.7)	1/2" (12.7)	38 3/4" (984)	18 3/4" (476)	13 5/8" (346)	18 1/2" (470)	3 1/4" (83)
012, 015	40" (1016)	20" (508)	15" (381)	20" (508)	15" (381)	6 7/8" (175)	9 7/8" (251)	11 1/2" (292)	4 1/4" (108)	2 3/4" (70)	1/2" (12.7)	1/2" (12.7)	38 3/4" (984)	18 3/4" (476)	13 5/8" (346)	18 1/2" (470)	3 1/4" (83)
018	46" (1168)	23" (584)	17" (432)	23" (584)	18" (457)	8 1/4" (210)	9 3/4" (248)	13 1/2" (343)	4 3/4" (121)	2 1/4" (57)	3/4" (19)	3/4" (19)	44 3/4" (1137)	21 3/4" (552)	15 5/8" (397)	18 1/2" (470)	4 1/4" (108)
024, 030	46" (1168)	23" (584)	17" (432)	23" (584)	18" (457)	8 1/4" (210)	11 3/8" (289)	13 1/2" (343)	4 3/4" (121)	2 1/4" (57)	3/4" (19)	3/4" (19)	44 3/4" (1137)	21 3/4" (552)	15 5/8" (397)	18 1/2" (470)	4 1/4" (108)
036, 042	50" (1270)	25" (635)	19" (483)	25" (635)	20" (508)	10 1/2" (267)	13 1/2" (343)	16 3/8" (416)	4" (102)	1" (25.4)	3/4" (19)	3/4" (19)	48 3/4" (1238)	23 3/4" (603)	17 5/8" (448)	23 1/2" (597)	3 1/4" (83)
Std-048	58" (1473)	33" (838)	21" (533)	23 1/2" (597)	29 1/2" (749)	13 1/8" (333)	11 3/8" (289)	18" (457)	6 5/8" (168)	1 1/2" (38)	1" (25.4)	1" (25.4)	56 3/4" (1441)	31 3/4" (806)	19 5/8" (498)	23 1/2" (597)	5 1/2" (140)
Hi-048, 060	58" (1473)	33" (838)	21" (533)	23 1/2" (597)	29 1/2" (749)	13 7/8" (352)	13 7/8" (352)	18" (457)	6 5/8" (168)	1 1/2" (38)	1" (25.4)	1" (25.4)	56 3/4" (1441)	31 3/4" (806)	19 5/8" (498)	23 1/2" (597)	5 1/2" (140)

Dimensional Data Right Return/Back Supply

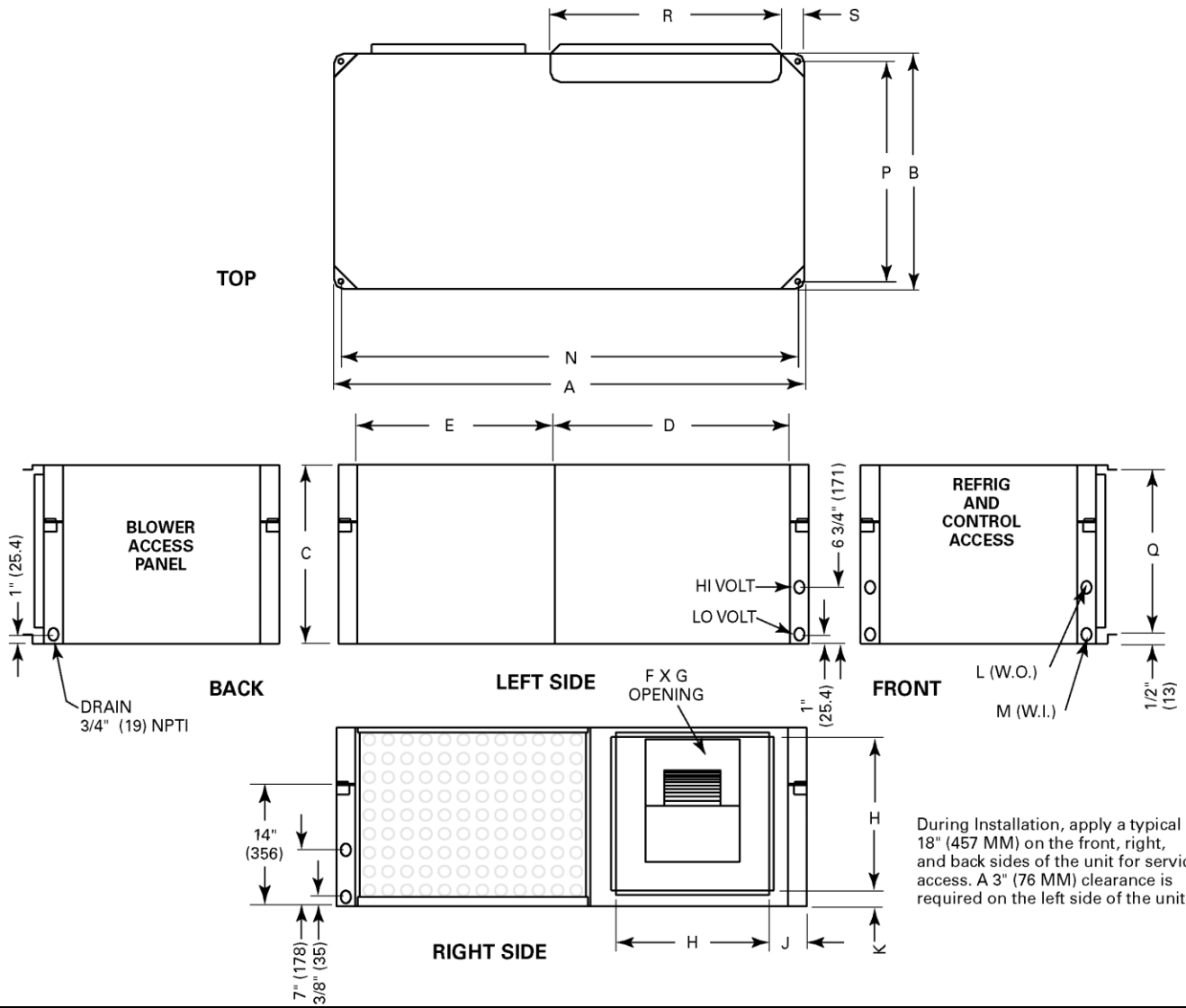


During installation, apply a typical 18" (457 MM) around the unit for service access.

Unit	A	B	C	D	E	F	G	H	J	K	L NPTI	M NPTI	N	P	Q	R	S
006, 009	40" (1016)	20" (508)	15" (381)	20" (508)	15" (381)	6 7/8" (175)	8" (203)	11 1/2" (292)	4 1/4" (108)	1 3/4" (45)	1/2" (12.7)	1/2" (12.7)	38 3/4" (984)	18 3/4" (476)	13 5/8" (346)	18 1/2" (470)	3 1/4" (83)
012, 015	40" (1016)	20" (508)	15" (381)	20" (508)	15" (381)	6 7/8" (175)	9 7/8" (251)	11 1/2" (292)	4 1/4" (108)	2 3/4" (70)	1/2" (12.7)	1/2" (12.7)	38 3/4" (984)	18 3/4" (476)	13 5/8" (346)	18 1/2" (470)	3 1/4" (83)
018	46" (1168)	23" (584)	17" (432)	23" (584)	18" (457)	8 1/4" (210)	9 3/4" (248)	13 1/2" (343)	4 3/4" (121)	2 1/4" (57)	3/4" (19)	3/4" (19)	44 3/4" (1137)	21 3/4" (552)	15 5/8" (397)	18 1/2" (470)	4 1/4" (108)
024, 030	46" (1168)	23" (584)	17" (432)	23" (584)	18" (457)	8 1/4" (210)	11 3/8" (289)	13 1/2" (343)	4 3/4" (121)	2 1/4" (57)	3/4" (19)	3/4" (19)	44 3/4" (1137)	21 3/4" (552)	15 5/8" (397)	18 1/2" (470)	4 1/4" (108)
036, 042	50" (1270)	25" (635)	19" (483)	25" (635)	20" (508)	10 1/2" (267)	13 1/2" (343)	16 3/8" (416)	4" (102)	1" (25.4)	3/4" (19)	3/4" (19)	48 3/4" (1238)	23 3/4" (603)	17 5/8" (448)	23 1/2" (597)	3 1/4" (83)
Std-048	58" (1473)	33" (838)	21" (533)	23 1/2" (597)	29 1/2" (749)	13 1/8" (333)	11 3/8" (289)	18" (457)	6 5/8" (168)	1 1/2" (38)	1" (25.4)	1" (25.4)	56 3/4" (1441)	31 3/4" (806)	19 5/8" (498)	23 1/2" (597)	5 1/2" (140)
Hi-048, 060	58" (1473)	33" (838)	21" (533)	23 1/2" (597)	29 1/2" (749)	13 7/8" (352)	13 7/8" (352)	18" (457)	6 5/8" (168)	1 1/2" (38)	1" (25.4)	1" (25.4)	56 3/4" (1441)	31 3/4" (806)	19 5/8" (498)	23 1/2" (597)	5 1/2" (140)

Dimensional Data

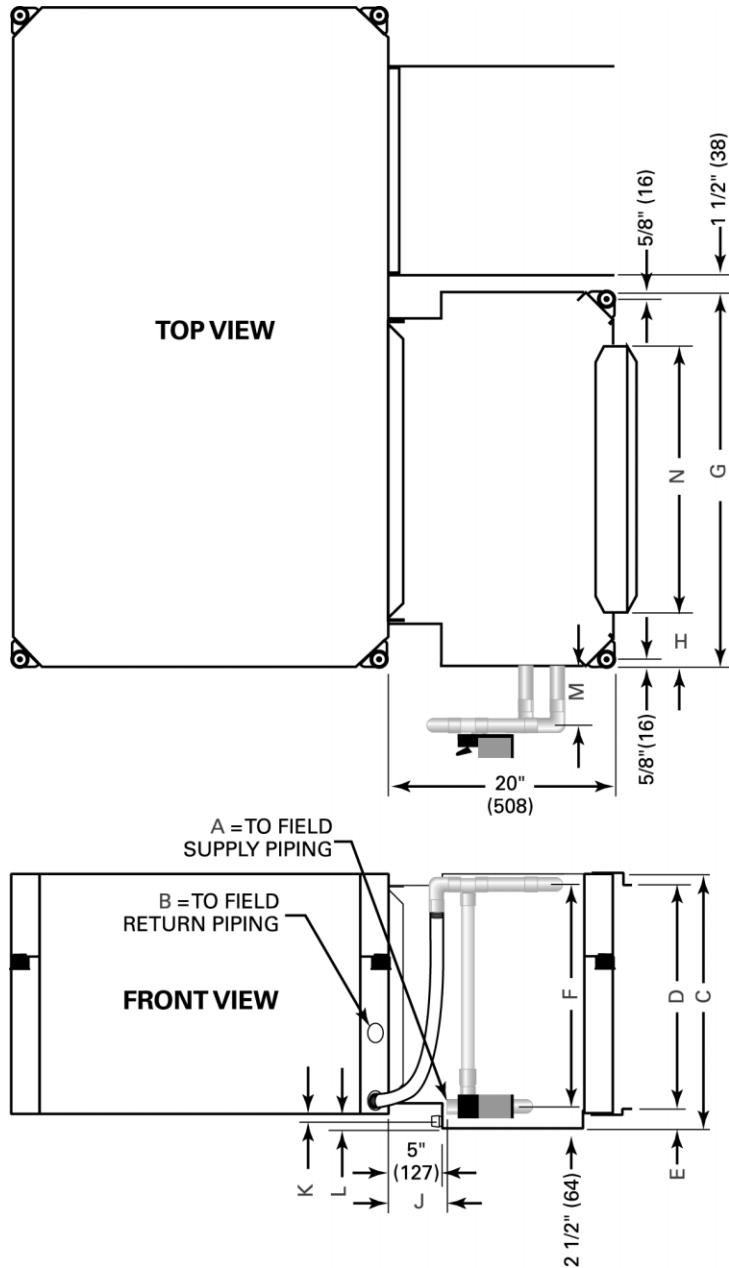
Right Return/Right Supply



During Installation, apply a typical 18" (457 MM) on the front, right, and back sides of the unit for service access. A 3" (76 MM) clearance is required on the left side of the unit.

Unit	A	B	C	D	E	F	G	H	J	K	L NPTI	M NPTI	N	P	Q	R	S
006,009	40" (1016)	20" (508)	15" (381)	20" (508)	15" (381)	6 7/8" (175)	8" (203)	11 1/2" (292)	4 1/4" (108)	1 3/4" (45)	1/2" (12.7)	1/2" (12.7)	38 3/4" (984)	18 3/4" (476)	13 5/8" (346)	18 1/2" (470)	3 1/4" (83)
012, 015	40" (1016)	20" (508)	15" (381)	20" (508)	15" (381)	6 7/8" (175)	9 7/8" (251)	11 1/2" (292)	4 1/4" (108)	2 3/4" (70)	1/2" (12.7)	1/2" (12.7)	38 3/4" (984)	18 3/4" (476)	13 5/8" (346)	18 1/2" (470)	3 1/4" (83)
018	46" (1168)	23" (584)	17" (432)	23" (584)	18" (457)	8 1/4" (210)	9 3/4" (248)	13 1/2" (343)	4 3/4" (121)	2 1/4" (57)	3/4" (19)	3/4" (19)	44 3/4" (1137)	21 3/4" (552)	15 5/8" (397)	18 1/2" (470)	4 1/4" (108)
024, 030	46" (1168)	23" (584)	17" (432)	23" (584)	18" (457)	8 1/4" (210)	11 3/8" (289)	13 1/2" (343)	4 3/4" (121)	2 1/4" (57)	3/4" (19)	3/4" (19)	44 3/4" (1137)	21 3/4" (552)	15 5/8" (397)	18 1/2" (470)	4 1/4" (108)
036, 042	50" (1270)	25" (635)	19" (483)	25" (635)	20" (508)	10 1/2" (267)	13 1/2" (343)	16 3/8" (416)	4" (102)	1" (25.4)	3/4" (19)	3/4" (19)	48 3/4" (1238)	23 3/4" (603)	17 5/8" (448)	23 1/2" (597)	3 1/4" (83)
Std-048	58" (1473)	33" (838)	21" (533)	23 1/2" (597)	29 1/2" (749)	13 1/8" (333)	11 3/8" (289)	18" (457)	6 5/8" (168)	1 1/2" (38)	1" (25.4)	1" (25.4)	56 3/4" (1441)	31 3/4" (806)	19 5/8" (498)	23 1/2" (597)	5 1/2" (140)
Hi-048, 060	58" (1473)	33" (838)	21" (533)	23 1/2" (597)	29 1/2" (749)	13 7/8" (352)	13 7/8" (352)	18" (457)	6 5/8" (168)	1 1/2" (38)	1" (25.4)	1" (25.4)	56 3/4" (1441)	31 3/4" (806)	19 5/8" (498)	23 1/2" (597)	5 1/2" (140)

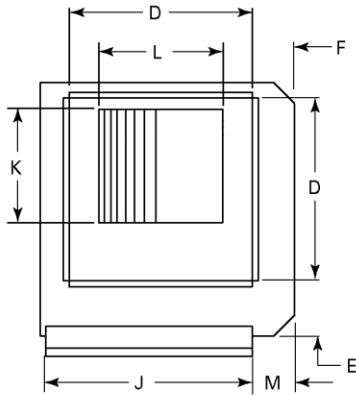
Dimensional Data Waterside Economizer



Unit	A NPTI	B NPTI	C	D	E	F	G	H	J	K	L	M	N	Filter Size (nominal)
006-015	1/2" (12.7)	1/2" (12.7)	16 1/8" (410)	13 5/8" (346)	1 1/2" (38)	10 3/4" (273)	23" (584)	2 1/4" (57)	7 1/2" (191)	1 1/2" (12.7)	1" (25.4)	4" (102)	18 1/2" (470)	14 3/4" x 23 3/4" 375 mm x 518 mm
018-030	3/4" (19)	3/4" (19)	18 1/2" (470)	15 5/8" (397)	1 1/2" (38)	13 3/4" (349)	26" (660)	3 1/4" (83)	6 7/8" (175)	1 1/2" (12.7)	1" (25.4)	4" (102)	18 1/2" (470)	16 3/4" x 23 3/4" 426 mm x 603 mm
036-042	3/4" (19)	3/4" (19)	21" (533)	17 5/8" (448)	2 1/4" (57)	16 1/2" (419)	30" (762)	3 3/4" (95)	6 1/4" (159)	1 1/4" (32)	2" (50.8)	4 1/2" (114)	23 1/2" (597)	18 3/4" x 25 1/2" 476 mm x 648 mm
048, 060	1" (25.4)	1" (25.4)	23 1/8" (587)	19 5/8" (498)	2 1/2" (64)	19 1/2" (495)	34" (864)	5 1/4" (133)	5 7/8" (149)	1 1/4" (32)	2" (50.8)	4 1/2" (114)	23 1/2" (597)	20 3/4" x 29 7/8" 528 mm x 759 mm

Dimensional Data

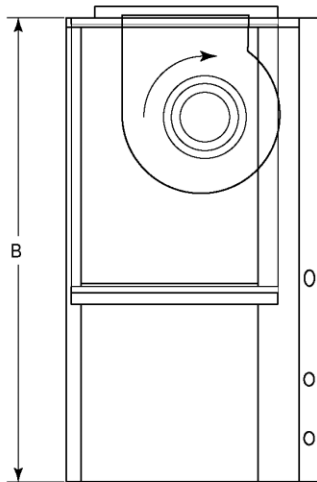
Left Return/Top Supply



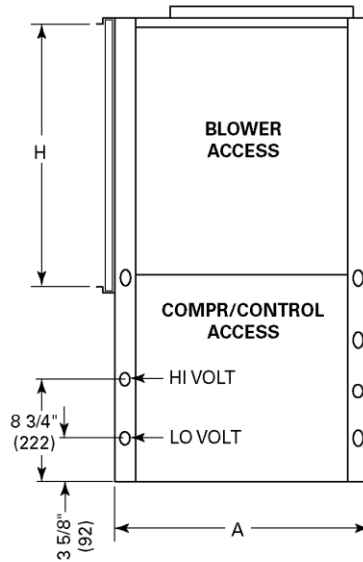
TOP

N During installation, apply a typical 24-inch access at the front service access panel

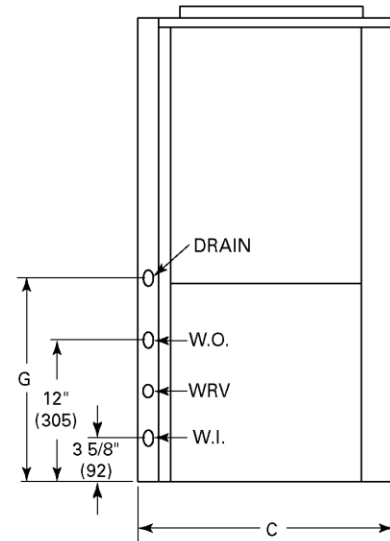
N



LEFT SIDE



FRONT



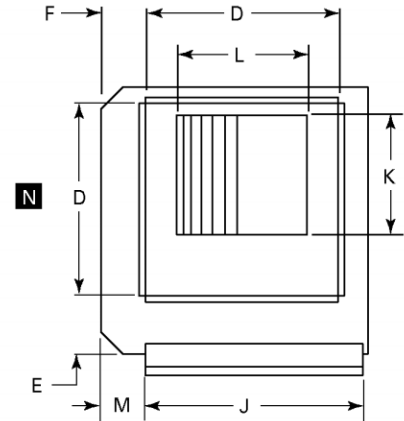
RIGHT SIDE

Unit GEV	A	B	C	D	E	F	G	H	J	K	L	M	W.I. NPTI	W.O. NPTI	Drain FPT
006-015	19 1/2" (495)	31 1/4" (794)	21 1/2" (546)	11 1/2" (292)	4" (102)	5 3/4" (146)	16 1/2" (419)	14 7/8" (378)	17" (432)	6 7/8" (175)	8" (203)	3 3/4" (95)	1/2" (12.7)	1/2" (12.7)	3/4" (19)
018, 024, 030, 040	21 1/2" (546)	39 1/4" (997)	21 1/2" (546)	13 1/2" (343)	4" (102)	4" (1021)	17 1/2" (445)	24" (610)	18" (457)	8 1/4" (368)	9 3/4" (248) 11 1/2" (292)	1 7/8" (48)	3/4" (19)	3/4" (19)	3/4" (19)
036, 042	24 1/2" (622)	41 7/8" (1064)	26 1/2" (673)	18" (457)	3 1/4" (83)	4" (1021)	19 1/2" (495)	19" (483)	23" (584)	10 1/2" (267)	13 3/4" (349)	3 1/4" (83)	3/4" (19)	3/4" (19)	3/4" (19)
Std-048	26 1/2" (673)	46 7/8" (1191)	30 1/2" (775)	18" (457)	4 1/4" (108)	9 3/4" (248)	21 1/2" (546)	28 7/8" (733)	27" (686)	13 7/8" (352)	13 7/8" (352)	3 1/4" (83)	1" (25.4)	1" (25.4)	3/4" (19)
Hi-048, 060	26 1/2" (673)	46 7/8" (1191)	30 1/2" (775)	18" (457)	4 1/4" (108)	9 3/4" (248)	21 1/2" (546)	28 7/8" (733)	27" (686)	13 1/8" (333)	11 3/8" (289)	3 1/4" (83)	1" (25.4)	1" (25.4)	3/4" (19)

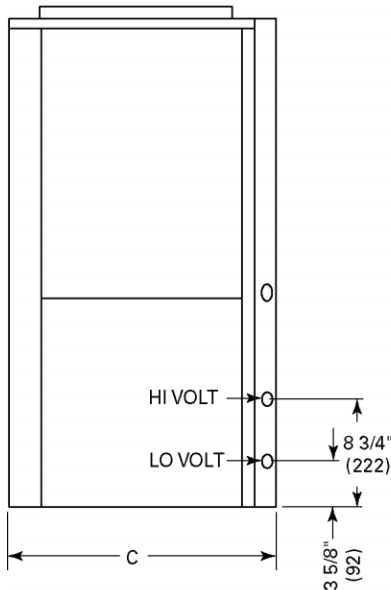
Dimensional Data

Right Return/Top Supply

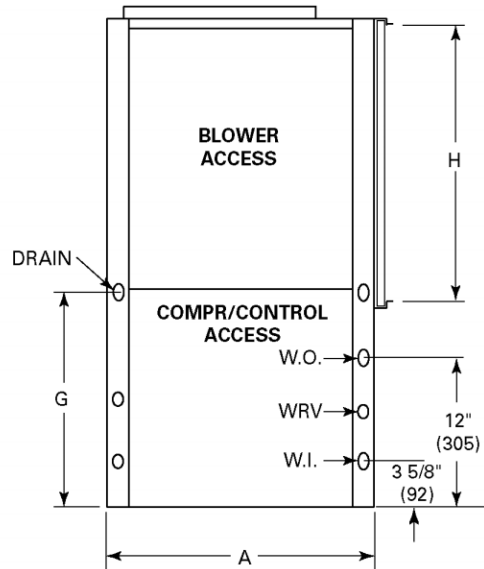
N During installation, apply a typical 24-inch access at the front service access panel



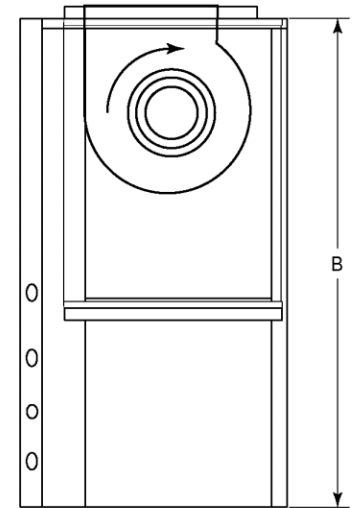
TOP



LEFT SIDE



FRONT

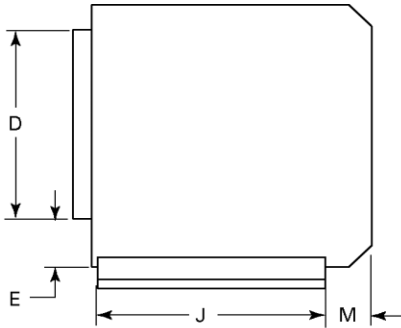


RIGHT SIDE

Unit GEV	A	B	C	D	E	F	G	H	J	K	L	M	W.I. NPTI	W.O. NPTI	Drain FPT
006-015	19 1/2" (495)	31 1/4" (794)	21 1/2" (546)	11 1/2" (292)	4" (102)	5 3/4" (146)	16 1/2" (419)	14 7/8" (378)	17" (432)	6 7/8" (175)	8" (203)	3 3/4" (95)	1/2" (12.7)	1/2" (12.7)	3/4" (19)
018, 024, 030, 040	21 1/2" (546)	39 1/4" (997)	21 1/2" (546)	13 1/2" (343)	4" (102)	4" (102)	17 1/2" (445)	24" (610)	18" (457)	8 1/4" (368)	9 3/4" (248) 11 1/2" (292)	1 7/8" (48)	3/4" (19)	3/4" (19)	3/4" (19)
036, 042	24 1/2" (622)	41 7/8" (1064)	26 1/2" (673)	18" (457)	3 1/4" (83)	4" (102)	19 1/2" (495)	19" (483)	23" (584)	10 1/2" (267)	13 3/4" (349)	3 1/4" (83)	3/4" (19)	3/4" (19)	3/4" (19)
Std-048	26 1/2" (673)	46 7/8" (1191)	30 1/2" (775)	18" (457)	4 1/4" (108)	9 3/4" (248)	21 1/2" (546)	28 7/8" (733)	27" (686)	13 7/8" (352)	13 7/8" (352)	3 1/4" (83)	1" (25.4)	1" (25.4)	3/4" (19)
Hi-048, 060	26 1/2" (673)	46 7/8" (1191)	30 1/2" (775)	18" (457)	4 1/4" (108)	9 3/4" (248)	21 1/2" (546)	28 7/8" (733)	27" (686)	13 1/8" (333)	11 3/8" (289)	3 1/4" (83)	1" (25.4)	1" (25.4)	3/4" (19)

Dimensional Data

Left Return/Back Supply

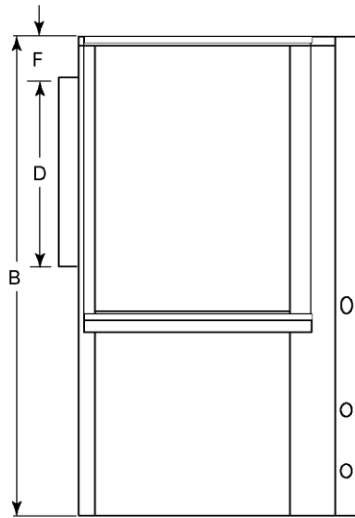


TOP

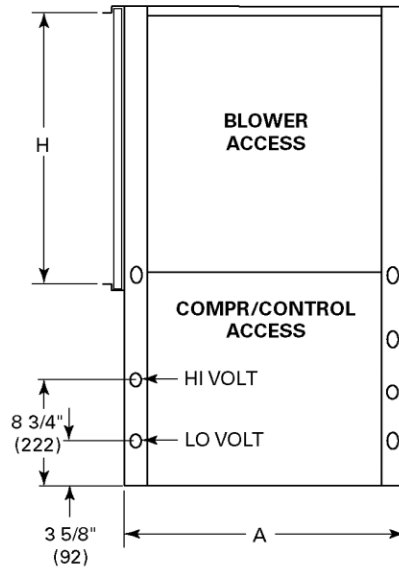
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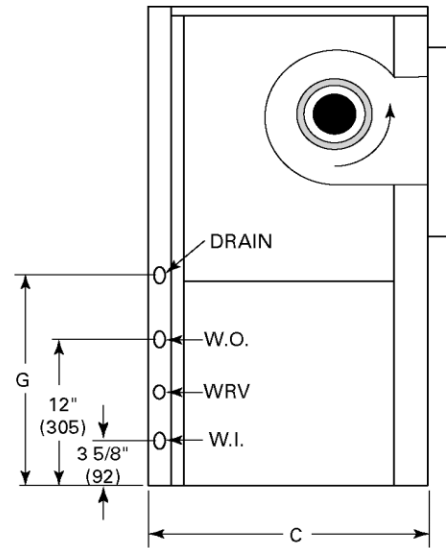
During installation, apply a typical 24-inch access at the front service access panel



LEFT SIDE



FRONT

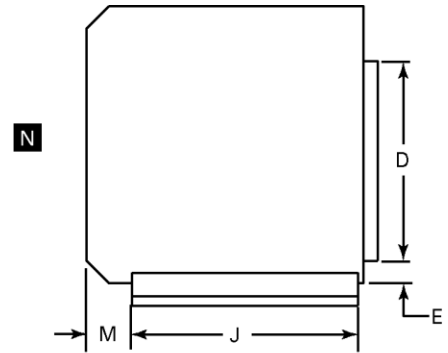


RIGHT SIDE

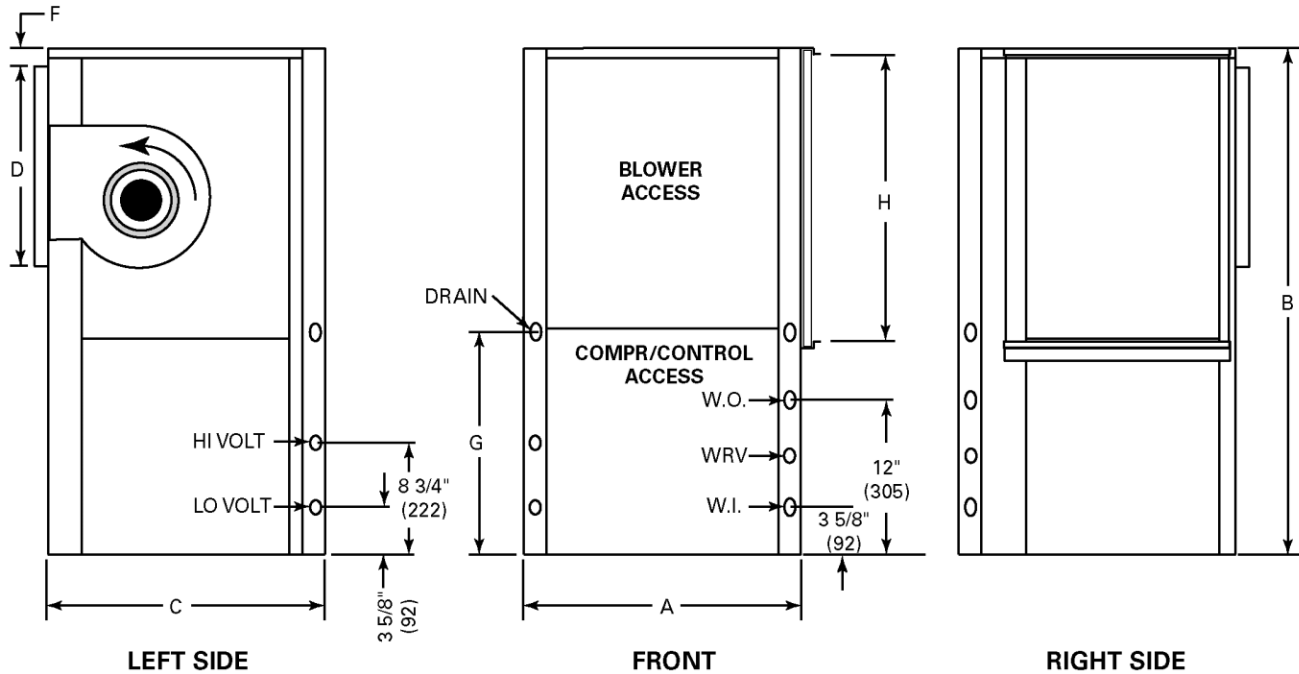
Unit GEV	A	B	C	D	E	F	G	H	J	K	L	M	W.I. NPTI	W.O. NPTI	Drain FPT
006-015	19 1/2" (495)	31 1/4" (794)	21 1/2" (546)	11 1/2" (292)	4" (102)	5 3/4" (146)	16 1/2" (419)	14 7/8" (378)	17" (432)	6 7/8" (175)	8" (203)	3 3/4" (95)	1/2" (12.7)	1/2" (12.7)	3/4" (19)
018, 024, 030, 040	21 1/2" (546)	39 1/4" (997)	21 1/2" (546)	13 1/2" (343)	4" (102)	4 3/8" (111)	17 1/2" (445)	24" (610)	18" (457)	8 1/4" (368)	9 3/4" (248) 11 1/2" (292)	1 7/8" (48)	3/4" (19)	3/4" (19)	3/4" (19)
036, 042	24 1/2" (622)	41 7/8" (1064)	26 1/2" (673)	18" (457)	5 3/4" (146)	4" (102)	19 1/2" (495)	19" (483)	23" (584)	10 1/2" (267)	13 3/4" (349)	3 1/4" (83)	3/4" (19)	3/4" (19)	3/4" (19)
Std-048	26 1/2" (673)	46 7/8" (1191)	30 1/2" (775)	18" (457)	4 1/4" (108)	9 3/4" (248)	21 1/2" (546)	28 7/8" (733)	27" (686)	13 7/8" (352)	13 7/8" (352)	3 1/4" (83)	1" (25.4)	1" (25.4)	3/4" (19)
Hi-048, 060	26 1/2" (673)	46 7/8" (1191)	30 1/2" (775)	18" (457)	4 1/4" (108)	9 3/4" (248)	21 1/2" (546)	28 7/8" (733)	27" (686)	13 1/8" (333)	11 3/8" (289)	3 1/4" (83)	1" (25.4)	1" (25.4)	3/4" (19)

Dimensional Data Right Return/Back Supply

N During installation, apply a typical 24-inch access at the front service access panel



TOP








Unit GEV	A	B	C	D	E	F	G	H	J	K	L	M	W.I. NPTI	W.O. NPTI	Drain FPT
006-015	19 1/2" (495)	31 1/4" (794)	21 1/2" (546)	11 1/2" (292)	4" (102)	5 3/4" (146)	16 1/2" (419)	14 7/8" (378)	17" (432)	6 7/8" (175)	8" (203)	3 3/4" (95)	1/2" (12.7)	1/2" (12.7)	3/4" (19)
018, 024, 030, 040	21 1/2" (546)	39 1/4" (997)	21 1/2" (546)	13 1/2" (343)	4" (102)	4 3/8" (111)	17 1/2" (445)	24" (610)	18" (457)	8 1/4" (368)	9 3/4" (248) 11 1/2" (292)	1 7/8" (48)	3/4" (19)	3/4" (19)	3/4" (19)
036, 042	24 1/2" (622)	41 7/8" (1064)	26 1/2" (673)	18" (457)	5 3/4" (146)	4" (102)	19 1/2" (495)	19" (483)	23" (584)	10 1/2" (267)	13 3/4" (349)	3 1/4" (83)	3/4" (19)	3/4" (19)	3/4" (19)
Std-048	26 1/2" (673)	46 7/8" (1191)	30 1/2" (775)	18" (457)	4 1/4" (108)	9 3/4" (248)	21 1/2" (546)	28 7/8" (733)	27" (686)	13 7/8" (352)	13 7/8" (352)	3 1/4" (83)	1" (25.4)	1" (25.4)	3/4" (19)
Hi-048, 060	26 1/2" (673)	46 7/8" (1191)	30 1/2" (775)	18" (457)	4 1/4" (108)	9 3/4" (248)	21 1/2" (546)	28 7/8" (733)	27" (686)	13 1/8" (333)	11 3/8" (289)	3 1/4" (83)	1" (25.4)	1" (25.4)	3/4" (19)

Accessories





Remote Thermostats

Thermostat/Sensor Selections

Thermostat/Sensor	Part Number	Description
	X13510309010 - thermostat X13530069010 - subbase	Mercury Thermostat <ul style="list-style-type: none"> • 0-stage heat/1-stage cool manual changeover with COOL-OFF • Non Programmable • Fan switching includes FAN ON-AUTO
	X13511039010	Manual Changeover Digital Stat <ul style="list-style-type: none"> • 2-stage heat/1-stage cool • System switching includes HEAT-OFF-COOL • Fan switching includes AUTO-ON • Non programmable
	X13511041010	Auto/Manual Changeover Digital Stat <ul style="list-style-type: none"> • 1-stage heat/1-stage cool • System switching includes HEAT-OFF-COOL-AUTO • Fan switching includes ON-AUTO • Non programmable
	X13511042010	Auto/Manual Changeover Digital Stat <ul style="list-style-type: none"> • 3-stage heat/2-stage cool • System switching includes HEAT-OFF-COOL-AUTO • Fan switching includes ON-AUTO • 7-day programmable • Adjustable 1 to 15-degree night setback
	X13511043010	Manual Changeover Digital Stat <ul style="list-style-type: none"> • 2-stage heat/1-stage cool • System switching includes HEAT-OFF-COOL • Fan switching includes ON-AUTO • 5-day programmable • Adjustable 1 to 15-degree night setback

Accessories

Remote T'stats/Zone Sensors

Thermostat/Sensor	Part Number	Description
	X13510628010	Zone Sensor <ul style="list-style-type: none"> • Tracer ZN510 and ZN524 compatible • Internal setpoint adjustment wheel • Communication Jack
	X13510606010	Zone Sensor <ul style="list-style-type: none"> • Tracer ZN510 and ZN524 compatible • External setpoint adjustment wheel • Communication Jack
	X13510606020	Zone Sensor <ul style="list-style-type: none"> • Tracer ZN510 and ZN524 compatible • External setpoint adjustment wheel • Communication Jack • ON and CANCEL buttons
	X13510635010	Zone Sensor <ul style="list-style-type: none"> • Tracer ZN510 and ZN524 compatible • External setpoint adjustment wheel • Communication Jack • ON and CANCEL buttons • Fan switch AUTO-OFF

Accessories

Pump Module

The pump module and hose kit make a complete self-contained pumping package for distributed pumping systems. These kits contain all the necessary components for the installation, operation and maintenance of the water circuit of a closed loop geothermal application. Standard pump module features include insulated Grundfos pumps, insulated cabinet, bronze or cast iron pump, and 3-way brass valves. The module is factory piped, wired and mounted. See *Figure 40* for pump module assembly. Literature number WSHPC-IN-5 (72-9006-03) will provide electrical and dimensional requirements for the PMCA and PMBA products.



Figure 40: Pump module

Pump Module Hose Kit

The pump module hose kit consists of two brass, 3/4 or 1-inch male pipe thread (MPT) -by-barb fittings; two brass 90 degree 1-inch, MPT-by-barb elbows with pressure/temperature ports; and 10 feet of rubber hose with 4 hose clamps. The pump module hose kit is available separately from the pump module. See *Figure 41* for pump module hose kit.



Figure 41: Pump module hose kit

Water Regulating Valve Assembly

The water regulating valve assembly consists of a direct acting valve and a reverse acting valve installed on the water-out side of the unit. The valve connection sizes shall range from 1/2" to 1 1/2" FPT. The direct acting valve opens in response to an increase in discharge pressure during the cooling cycle. The reverse acting valve opens in response to a decrease in suction pressure during the heating cycle. Water regulating valves should be used where low flow and low or high fluid temperature conditions could occur. See page 29 of this manual for application information. This option is beneficial with open loop systems, but not necessary. See *Figure 42* for water regulating valve assembly.

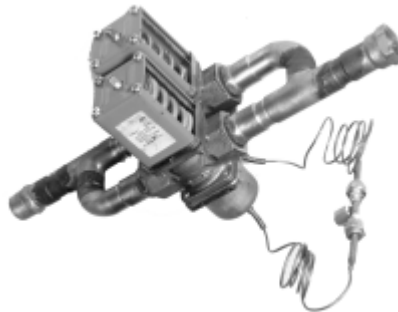


Figure 42: Water regulating valve

Motorized Water Valve

The motorized water valve is installed on the return line of the water loop system between the loop and the loop's pump module. This isolation device is less expensive and a very effective alternative to the water regulating valve.

When the compressor begins running, the valve will open, allowing water to flow through the unit. As the compressor shuts down, the valve slowly closes off. The main purpose of the motorized valve is to shut-off the flow of water through the unit when the unit is off, thus reducing water consumption. The motorized valve is fast opening to prevent compressor trip-out, and slow closing to prevent water hammer. See *Figure 43* for motorized water valve.



Figure 43: Motorized water valve

Accessories

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 1/2" duct flange facilitates ease of field connection to the mechanical 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. See *Figure 44* for return-air duct panel.

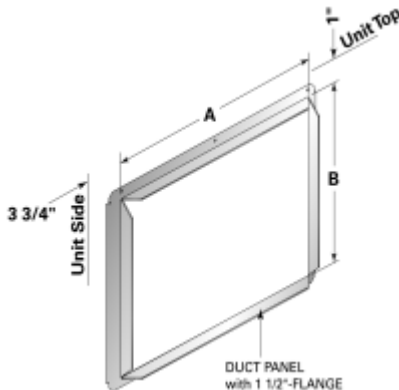


Figure 44: Return-air duct panel

Unit Size	A	B	Part Number
006-015	17 1/2"	13"	4474 1133 0100
018-030	20 1/2"	15"	4474 1134 0100
036-042	22 1/2"	17"	4474 1135 0100
048-060	26 1/2"	19"	4474 1136 0100

Hose Kits

Trane provides three hose kit selections for equipment balancing.

- Ball valve flow control (manual)
- Circuit setter flow control (manual)
- Automatic flow control (automatic)

Each selection provides some accuracy in equipment balancing. Range of accuracy consist of $\pm 25\%$ for the ball valve method, $\pm 20\%$ for the circuit setter method, and $\pm 10\%$ for the automatic flow control method.

Utilizing the ball valve method, the pressure/temperature measurement on the leaving and entering side of the heat pump is measured within the water piping. The ball valve is then throttled to change the amount of flow to the unit to reach the desired temperature or pressure differential.

The circuit setter method combines both the readout and the adjustment feature in one device. In order to determine flow rate, the user must record both handle position, and differential pressure drop. Then, the user must consult a chart containing both pieces of information to make the necessary adjustments to the circuit setter.

For automatic system balancing of a water-source heat pump, the Mesurflo® self balancing kit provides a constant flow rate over the pressure differential rage of 2 to 80 psid. As system pressure changes (through further addition of heat pumps, for example) each individual flow control valve will automatically adjust to the new system conditions. In variable water volume applications, a self balancing hose kit can provide continuous balancing because of its ability to automatically adjust to the varying system conditions. For more information pertaining to the automatic balancing hose kits, see literature documentation WSHP-SLB005-EN. See *Figure 45* for system balancing hose kits.

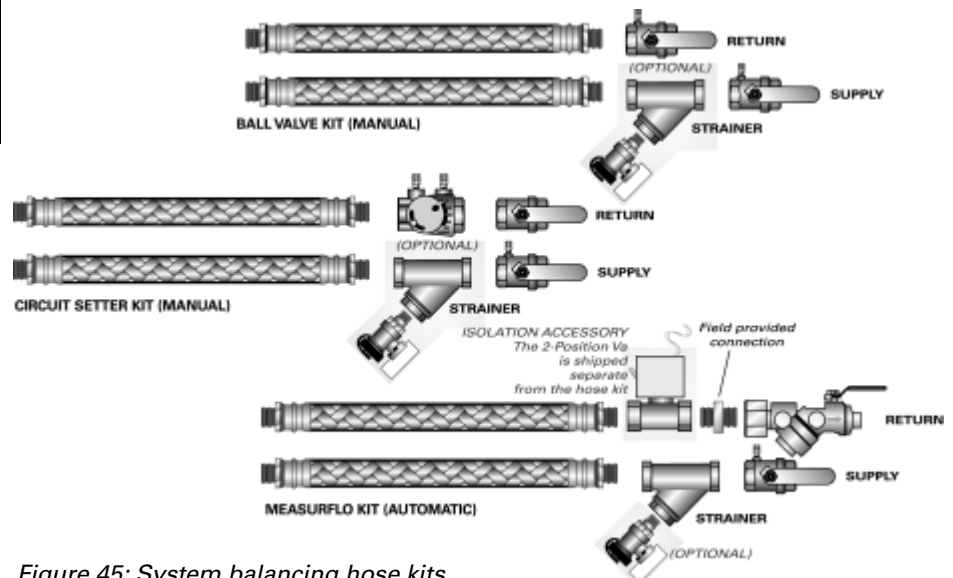


Figure 45: System balancing hose kits



Mechanical Specifications

General

Equipment shall be completely assembled, piped, internally wired, fully charged with HCFC-22 and test operated at the factory. Filters, thermostat field interface terminal strip, and all safety controls are furnished and factory installed.

The system water inlet and outlet connections shall be female NPT composed of either a copper or a bronze option.

The 5-ton and below equipment shall contain ETL, CETL and ISO-ARI 13256-1 listings and labels prior to leaving the factory. Larger units shall be rated in accordance with ISO-ARI 13256-1. Service and caution area labels shall also be placed on the unit in their appropriate locations.

Cabinet

Unit casing shall be constructed of zinc coated, heavy gauge, galvanized steel. Service to the refrigerant and controls shall be provided through a single access panel at the front of the equipment. Access to the refrigerant and controls for the larger units shall be provided through the front and side access panels.

All panels shall be insulated with 1/2-inch thick dual density bonded glass fiber. The exposed side is a high density erosion proof material suitable for use in air streams up to 3600 feet per minute (FPM). The insulation meets the erosion requirements of UL 181. It has a flame spread of less than 25 and a smoke developed classification of less than 50 per ASTM E-84 and UL 723.

Access for inspection and cleaning of the unit drain pan, coils and fan section shall be provided. The unit shall be installed for proper access.

Filters

One inch or two inch, throwaway filters shall be standard and factory installed. The filters shall have an average resistance of 76-percent and dust holding capacity of 26-grams per square foot.

Sound Attenuation

Sound attenuation shall be applied as a standard feature in the product design. The sound reduction package shall include a compressor discharge muffler, vibration isolation to the compressor and water-to-refrigerant coil, unit base stiffeners, insulated metal compressor enclosure, and a second stage of vibration isolation to the compressor and water-to-refrigerant base pan.

All units shall be tested and rated in accordance with ARI 260.

Compressors

The unit shall contain a high efficiency rotary, reciprocating, or scroll compressor. External vibration isolation shall be provided by rubber mounting devices located underneath the mounting base of the compressor. A second isolation of the refrigeration assembly shall be supported under the compressor mounting base.

Internal thermal overload protection shall be provided. Protection against excessive discharge pressure shall be provided by means of a high pressure switch. A loss of charge shall be provided by a low pressure safety.

Refrigerant Tubing

The refrigerant tubing shall be of 99% pure copper. This system shall be free from contaminants and conditions such as drilling fragments, dirt and oil. All refrigerant and water lines shall be insulated with an elastomeric insulation that has a 3/8-inch thick wall in the air-side section of the unit.

Refrigerant Circuits

The refrigerant circuit shall contain a thermal expansion device. Service pressure ports shall be factory supplied on the high and low pressure

sides for easy refrigerant pressure or temperature testing.

Air-to-Refrigerant Coil

Internally finned, 3/8-inch copper tubes mechanically bonded to a configured aluminum plate fin shall be standard. Coils shall be leak tested at the factory to ensure the pressure integrity. The coil shall be leak tested to 200 psig and pressure tested to 450 psig. The tubes are to be completely evacuated of air and correctly charged with proper volume of refrigerant prior to shipment.

The refrigerant coil distributor assembly shall be of orifice style with round copper distributor tubes. The tubes shall be sized consistently with the capacity of the coil. Suction header shall be fabricated from rounded copper pipe.

A thermostatic expansion valve shall be factory selected and installed for a wide range of control.

Drain Pan

The condensate pan shall be constructed of corrosion resistant material and insulated to prevent sweating. The bottom of the drain pan shall be sloped on two planes which pitches the condensate to the drain connection. The drain pan shall be flame rated per UL945V-B. When the unit is installed and trapped per the manufacturer's installation manual, and local city specifications, the drain pan shall be designed to leave puddles no more than 2-inch in diameter, no more than 1/8-inch deep, no longer than 3-minutes following the step 3 of the following test.

- 1 Temporarily plug the drain pan.
- 2 Fill the drain pan with 1/2-inch of water or the maximum allowed by the drain pan depth, whichever is smaller.
- 3 Remove the temporary plug.

Mechanical Specifications

Water-to-Refrigerant Heat Exchanger

The water-to-refrigerant heat exchanger shall be of a high quality co-axial coil for maximum heat transfer. The copper or optional cupro-nickel coil shall be deeply fluted to enhance heat transfer and minimize fouling and scaling. The coil shall have a working pressure of 400 psig on both the refrigerant and water sides. The factory shall provide rubber isolation to the heat exchanging device to enhance sound attenuation.

Indoor Fan

The blower shall be a forward-curved style wheel with four speed combinations, or nine blower motor/sheave combinations available.

All direct drive motors shall have sealed bearings that do not require field lubrication.

Options of the blower motor/fan packages shall be selected and wired from the factory to match performance criteria suggested in the performance section. The motor shall contain a quick disconnect plug for service, convertibility and safety precautions.

The fan(s) shall be placed in a draw-through configuration. They shall be constructed of corrosion resistant galvanized material.

Electrical

The unit control box shall contain all necessary devices to allow heating and cooling operation to occur from a remote wall thermostat. These devices shall be as follows:

- 24 VAC energy limiting class II 50 VA (minimum) transformer
- 24 VAC blower motor relay
- 24 VAC compressor contactor for compressor control
- Field thermostat connections shall be provided for ease of hook-up to

a terminal strip located in the unit's control box

- Lockout relay which controls cycling of the compressor shall be provided to protect the compressor during adverse operating conditions. The device may be reset by interrupting power to the 24 VAC control circuit. Reset may be done either at a remote thermostat or through a momentary main power interruption
- A high pressure switch shall protect the compressor against operation at refrigerant system pressures exceeding 395 psig.
- The low-water temperature switch or sensor shall prevent the compressor operation with leaving water temperatures below 20 F.
- Factory installed wire harness shall be available for the Basic, Deluxe, ZN510 and ZN524 control packages.

Nameplate information shall be provided for the application of either time-delay fuses or HACR circuit breakers for branch circuit protection from the primary source of power.

Basic Controls (option)

The basic control package shall contain a low and high pressure switch along with a compressor lockout relay for control assistance. High voltage power connections shall be made at the equipments contactor. An optional condensate overflow detection device shall be made available with this control package. Each device shall be factory mounted, wired, and tested in the equipment.

Deluxe Controls (option)

The deluxe control package shall provide a 75 VA transformer with circuit breaker. The controller shall include a lockout relay, anti-short cycle compressor protection, random start delay, brown-out protection, low pressure time delay, compressor delay on start and an open relay for night setback or pump request. Optional wiring from the factory for night setback, condensate overflow, hot gas reheat, electric heat, and compressor enable shall also be provided. Three LEDs (light emitting diodes) shall also be included for diagnostics of the equipment.

Tracer ZN510 or ZN524 Controller (option)

This system shall utilize factory furnished and mounted DDC controls for operation of up to 120 units on a Comm 5 (LonMark) link. The Tracer ZN510 control package shall include a 75 VA transformer. The controller shall provide random start delay, heating/cooling status, occupied/unoccupied mode, fan status and filter maintenance options. Optional wiring from the factory for condensate overflow shall be available. Three LEDs (light emitting diodes) shall be included for diagnostics of the equipment.

The ZN510 shall be capable of a standalone application, or as applied to a full building automation installation.



Mechanical Specifications

Tracer ZN524 Controller *(option)*

The ZN524 controller shall utilize factory furnished and mounted DDC controls for operation of up to 120 units on a Comm 5 (LonMark) link. The Tracer ZN524 control package shall include a 75 VA (minimum) transformer. The controller shall provide random start delay, heating/cooling status, occupied/unoccupied mode, fan status and filter maintenance options. Optional wiring from the factory for condensate overflow shall be available. Three LEDs (light emitting diodes) shall be included for diagnostics of the equipment.

The ZN524 shall be capable of a standalone application, or as applied to a full building automation installation.

With this controller, the unit shall be capable of a hot gas reheat (for dehumidification), boilerless control for electric heat, waterside economizing, and support of variable speed pump control applications.

Orifice Ring

Removal of the motor and fan wheel for the 1/2 through 5-ton units shall be made with the assistance of a factory provided orifice ring device. This device shall attach the wheel and motor to the fan housing in one assembly providing single side service access.

Water Regulating Valve Assembly *(option)*

The water regulating valve assembly shall consist of a direct acting valve and a reverse acting valve. The direct acting valve shall open in response to an increase in discharge pressure during the cooling cycle. The reverse acting valve shall open in response to a decrease in suction pressure during the heating cycle. Water regulating valves shall be used where low flow, or low or high fluid temperature conditions exist. This accessory shall be used with open-loop systems.

Economizing Coil *(GEH option)*

The waterside economizing package shall be an external unit accessory pre-piped and pre-wired ready for turn-key installation to the unit. The economizing coil shall be designed to perform with the WSHP at unit measured flow rate of 80.6 F DB/66.2 F WB with 45 F EWT.

All hydronic coils shall be of 5/8" copper and aluminum plate fin combination. All coils shall be proof and leak tested from the manufacturer. The proof test shall be performed at 1.5 times the maximum operating pressure and the leak test at the maximum operating pressure.

A dual sloped non corrosive drain pan shall be easily accessible and cleanable for the hydronic economizing coil.

An electronic two-position, 3-way valve shall meter water flow to the economizing coil during the economizing mode. It shall be factory set to energize the economizing mode at 55 F, while simultaneously halting mechanical operation of the compressor.

Hanging brackets with rubber isolation shall be provided for the horizontal version of the economizing coil option. The bracket design shall be the same throughout the equipment.

Electric Heat *(option)*

Boilerless control electric heat shall be factory wired and tested. It shall be composed of a nichrome open wire coil designed for 2-kW per unit ton. The design consist of a single stage of electric heat used as a primary heating source when compressor lockout has occurred due to the entering water temperature falling below 55 F with an adjustable range between 25 F to 60 F. All power connections to the electric heat shall be made in the equipment's control box.

Hot Gas Reheat *(option)*

Dehumidification shall be provided through a hot gas reheat option. The coil shall consist of 3/8"/1/2" copper tubes mechanically expanded into evenly spaced aluminum fins. All coils shall be proof and leak tested. The proof test must be performed at 1.5 time the maximum operating pressure and the leak test performed at the maximum operating pressure.

Ball Valves *(option)*

Ball valves shall be field installed between the unit and the supply and return lines of the loop to stop water flow to the unit in a maintenance or service situation.

Motorized Water Valve *(option)*

When extreme fluid temperature conditions do not exist with an open loop system, a motorized water valve shall be applied to each water-source heat pump. The motorized valve shall stop flow to the unit, causing pressures to rise. This rise in pressure will halt pump operation to provide greater energy savings of the entire system.

Mechanical Specifications

Pump Module *(option)*

The pump module shall be a complete self contained pumping package for an earth-coupled heat pump system.

The module shall consist of a single, 1/6-HP bronze pump, and a brass 3-way shut-off valve. These kits shall contain the necessary components for the installation, operation, and maintenance of the water circuit of a closed-loop distributed pumping application.

Hoses *(option)*

Hoses shall consist of a stainless steel outer braid with an inner core of tube made of a nontoxic synthetic polymer material. The hoses shall be suitable for water temperatures ranging between 33 F and 211 F without the use of glycol.

Automatic Flow Devices *(option)*

The automatic flow kit shall contain a Hays Mesurflo[®] automatic flow control valve, two ball valves, two flexible hoses, a high flow Y-strainer, and may include a strainer blow-down and various other accessories.

The automatic flow control valve shall be factory set to a rated flow, and shall automatically control the flow to within 10% of the rated value over a 40 to 1 differential pressure, operating range (2 to 80 PSID). Operational temperature shall be rated from fluid freezing, to 225-degrees F. The valve body shall be constructed from hot forged brass UNS C37700 per ASTM B-283 latest revision. For more information pertaining to the automatic balancing hose kits, see literature documentation WSHP-SLB005-EN.



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Literature Order Number	WSHP-PRC001-EN
File Number	PL-UN-000-WSHP-PRC001-EN-0305
Supersedes	PL-UN-000-WSHP-PRC001-EN-0104
Stocking Location	Inland

Trane has a policy of continuous product and data improvement and reserves the right to change design and specifications without notice.