



Heating and Air Conditioning

TECHNICAL GUIDE

PREDATOR[®]

R-410A ZH/ZR/XP SERIES 6-1/2 - 12-1/2 TON 60 Hertz



6-1/2 THROUGH 10 TON



12-1/2 TON

Description

ASHRAE 90.1 COMPLIANT

YORK[®] Predator[®] units are convertible single packages with a common footprint cabinet and common roof curb for all 6-1/2 through 12-1/2 ton models. All units have two compressors with independent refrigeration circuits to provide 2 stages of cooling. The units were designed for light commercial applications and can be easily installed on a roof curb, slab, or frame.

All Predator[®] units are self-contained and assembled on rigid full perimeter base rails allowing for 3-way forklift access and overhead rigging. Every unit is completely charged, wired, piped, and tested at the factory to provide a quick and easy field installation.

All units are convertible between side and down airflow. Independent economizer designs are used on side and down discharge applications, as well as all tonnage sizes.

Predator[®] units are available in the following configurations: cooling only, cooling with electric heat, cooling with gas heat, heat pump, and heat pump with electric heat. Electric heaters are available as factory-installed options or field-installed accessories.

Tested in accordance with:



ARI Standard 340/360
Commercial and Industrial Unitary
Air Conditioning Equipment

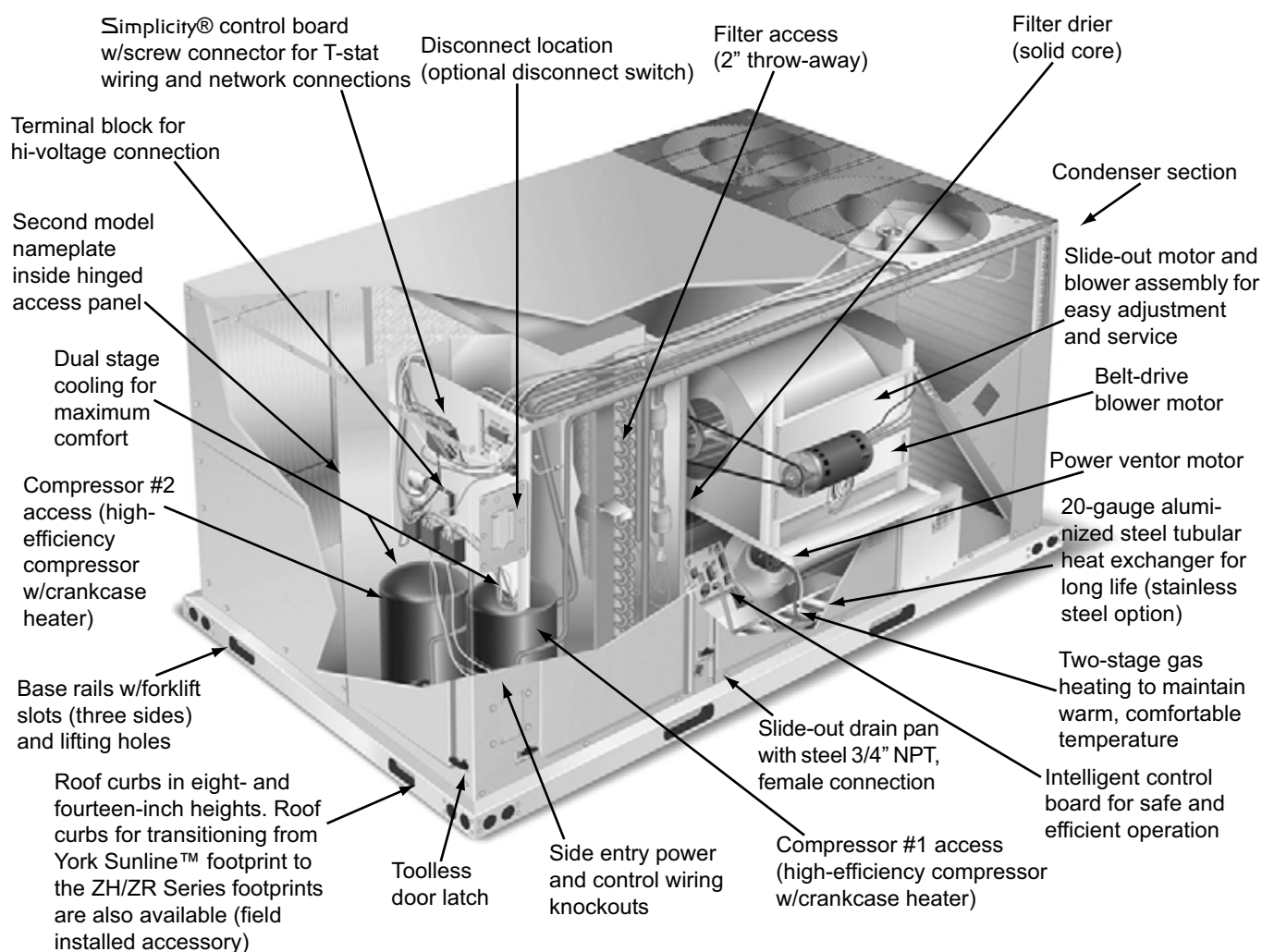


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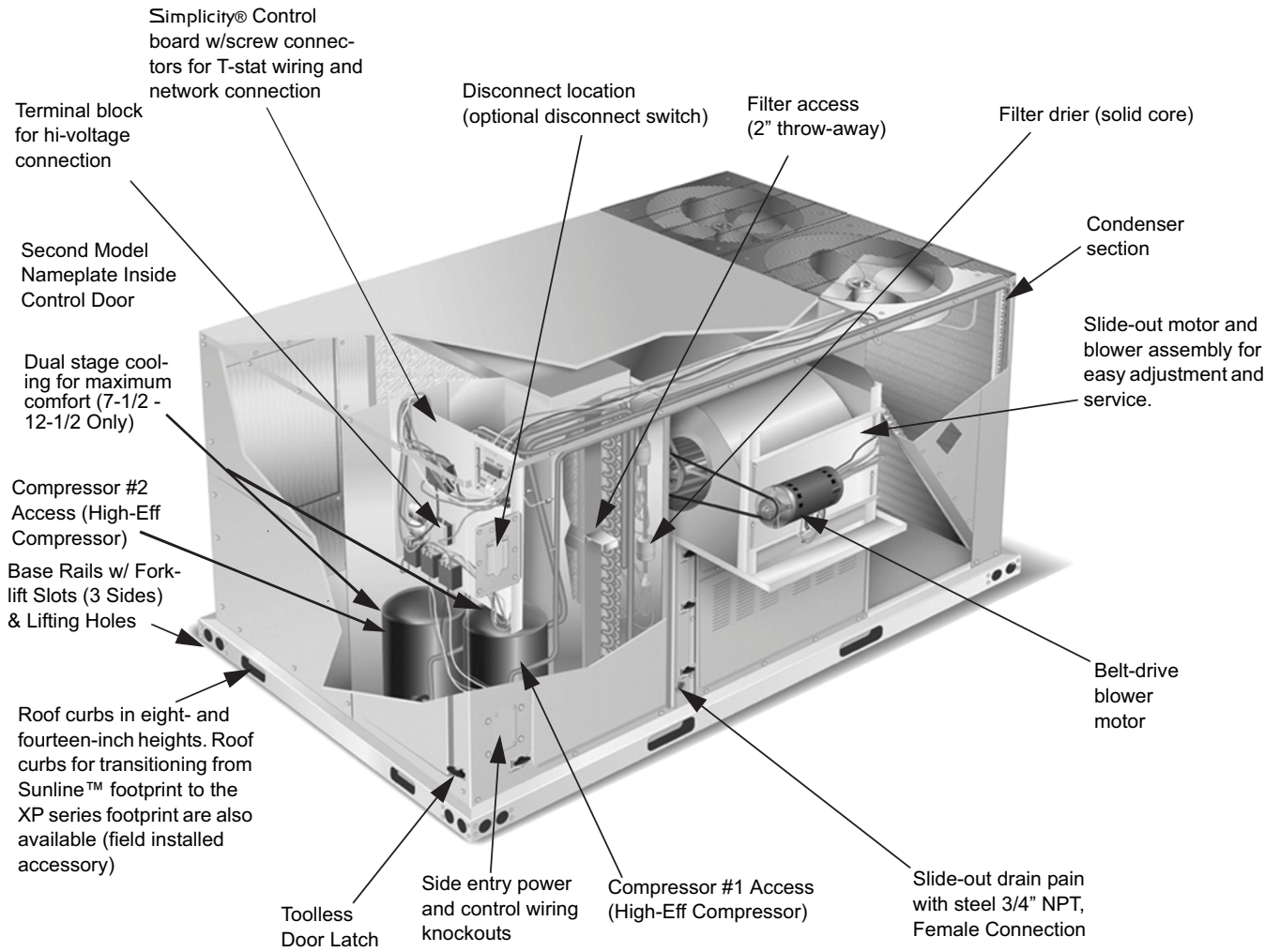
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Component Location

Cooling With Gas Heat

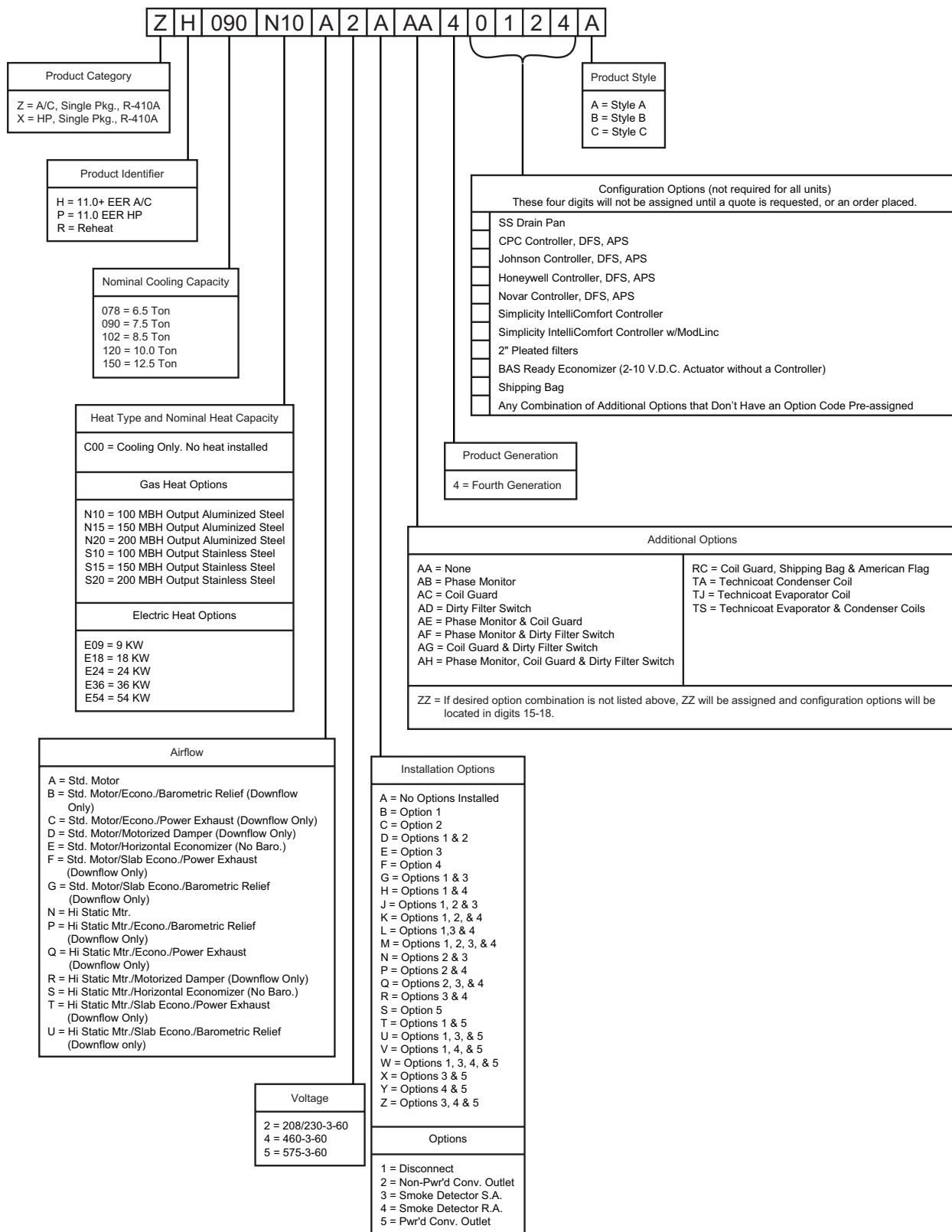


Heat Pump



Nomenclature

6.5-12.5 Ton York® Model Number Nomenclature



Features and Benefits

Standard Features

- **High Efficiency** – High efficiency units reach as high as 11.5 EER. Gas/electric units have electronic spark ignition and power vented combustion with steady state efficiencies of 80%. These efficiencies exceed all legislated minimum levels and provide low operating costs.
- **Service Friendly** – The Predator® incorporates a number of enhancements which improve serviceability.

The motor and blower slide out of the unit as a common assembly. This facilitates greater access to all the indoor airflow components, thus simplifying maintenance and adjustment.

Service time is reduced through the use of hinged, toolless panels. Such panels provide access to frequently inspected components and areas, including the control box, compressors, filters, indoor motor & blower, and the heating section. The panels are screwed in place at the factory to prevent access by children or other unauthorized persons. It is recommended that the panels be secured with screws once service is complete.

Service windows have been placed in both condenser section walls. Rotation of the cover allows easy access to the condenser coils for cleaning or inspection.

Both the unit control board and ignition control board utilize flash codes to aid in diagnosis of unit malfunctions. Unique alarm codes quickly identify the source of the unit alarm.

All units use the same standard filter size. This standardization removes any confusion on which filter sizes are needed for replacement.

The non-corrosive drain pan slides out of the unit to permit easy cleaning. The drain pan is accessed by removing the drain pan cover plate on the rear of the unit. Once the plate is removed, the drain pan slides out through the rear of the unit.

All Predator® units have a second model nameplate located inside the control access door. This is to prevent deterioration of the nameplate through weathering.
- **Environmentally Aware** – For improved Indoor Air Quality, foil faced insulation is used exclusively throughout the units.
- **Balanced Heating** – The Predator® offers "Ultimate Heating Comfort" with a balance between 1st and 2nd stage gas heating. The first stage of a gas heat Predator® unit provides 60% of the heating capacity. Balanced heating allows the unit to better maintain desired temperatures.
- **Convertible Airflow Design** – The side duct openings are covered when they leave the factory. If a side supply/return is desired, the installer simply removes the two side duct covers from the outside of the unit and installs them over the down shot openings. No panel cutting is required. Convertible airflow design allows maximum field flexibility and minimum inventory.
- **System Protection** - Suction line freezestats are supplied on all units to protect against loss of charge and coil frosting when the economizer operates at low outdoor air temperatures while the compressors are running. Every unit has solid-core liquid line filter-driers and high and low-

pressure switches. Internal compressor protection is standard on all compressors. Crankcase heaters are standard on reciprocating compressors. Scroll compressors do not require crankcase heaters. Phase Monitors are standard on units with scroll compressors. This accessory monitors the incoming power to the unit and protects the unit from phase loss and reversed phase rotation.

- **Advanced Controls** - Simplicity® ZH/ZR/XP control boards have standardized a number of features previously available only as options or by utilizing additional controls.
- **Low Ambient** - An integrated low-ambient control allows all units to operate in the cooling mode down to 0°F outdoor ambient without additional assistance. Optionally, the control board can be programmed to lockout the compressors when the outdoor air temperature is low or when free cooling is available.
- **Anti-Short Cycle Protection** - To aid compressor life, an anti-short cycle delay is incorporated into the standard controls. Compressor reliability is further ensured by programmable minimum run times. For testing, the anti-short cycle delay can be temporarily overridden with the push of a button.
- **Lead-Lag** - An integrated Lead-Lag option allows equal run time hours on all compressors, thereby extending the life of all compressors. This option is selectable on the unit control board.
- **Fan Delays** - Fan on and fan off delays are fully programmable. Furthermore, the heating and cooling fan delay times are independent of one another. All units are programmed with default values based upon their configuration of cooling and heat.
- **Safety Monitoring** - The control board monitors the high and low-pressure switches, the freezestats, the gas valve, if applicable, and the temperature limit switch on gas and electric heat units. The unit control board will alarm on ignition failures, compressor lockouts and repeated limit switch trips.
- **Nuisance Trip Protection and Strikes** - To prevent nuisance trouble calls, the control board uses a "three times, you're out" philosophy. The high and low-pressure switches and the freezestats must trip three times within two hours before the unit control board will lock out the associated compressor.
- **On Board Diagnostics** - Each alarm will energize a trouble light on the thermostat, if so equipped, and flash an alarm code on the control board LED. Each high and low-pressure switch alarm as well as each freezestat alarm has its own flash code. The control board saves the five most recent alarms in memory, and these alarms can be reviewed at any time. Alarms and programmed values are retained through the loss of power.
- **Reliable** – From the beginning – All units undergo computer automated testing before they leave the factory. Units are tested for refrigerant charge and pressure, unit amperage, and 100% functionality. For the long term – All Predator® units are painted with a long lasting, powder paint that stands up over the life of the unit. The paint used has been proven by a 1000 hour salt spray test.

- **Flexible Placement** – All models and configurations share the same cabinet/footprint and thus the same roof curb. You have the flexibility to set one curb and choose the correct tonnage size and heating option after the internal loads have been determined.

To further simplify planning and installation, Predator® ZH/ZR/XP cabinets are designed to fit your roof. With the optional roof curb, the unit ductwork is designed to fit around 24" on-center joists or between 48" on-center joists.

The drain pan can be rotated to drain to either the front or the rear of the unit. Additionally, the drain pan can be fitted to drain through the roof curb. As it is sometimes difficult to have a level installation, the drain pan features a generous slope to ensure proper drainage.

- **Full Perimeter Base Rails** – The permanently attached base rails provide a solid foundation for the entire unit and protect the unit during shipment. The rails offer forklift access from 3 sides, and rigging holes are available so that an overhead crane can be used to place the units on a roof.
- **Easy Installation** – Gas and electric utility knockouts are supplied in the unit underside as well as the side of the unit. A clearly identified location is provided to mount a field supplied electrical disconnect switch. Utility connections can be made quickly and with a minimum amount of field labor. All units are shipped with 2" throw-away filters installed.
- **Wide Range of Indoor Airflows** – All indoor fan motors are belt-drive type providing maximum flexibility to handle most airflow requirements. For high static applications, factory installed alternate indoor fan motors are available. With the optional indoor fan motor, all units can supply nominal airflow at a minimum of 1.5" ESP.
- **Warranty** - All models include a 1-year limited warranty on the complete unit. Compressors and electric heater elements each carry a 5-year warranty. Aluminized steel and stainless steel tubular heat exchangers carry a 10-year warranty.

Factory Installed Options

YORK® offers several equipment options factory installed, for the Predator® line.

- **Optional Factory Installed Economizers** - Predator units offer a variety of optional factory installed economizers with low leak dampers. The outdoor air enthalpy sensor enables economizer operation if the outdoor enthalpy is less than the setpoint of the economizer logic module. See economizer options section to determine the correct economizer for your application.
- **Downflow Economizer - (With barometric relief)** - The economizer is provided with a single enthalpy input. The economizer is 2% low leakage type, and is shipped installed and wired. The installer needs only to assemble and mount the outdoor air hood (Provided). The economizer has spring return, fully modulating damper actuators and is capable of introducing up to 100% outdoor air. As the outdoor air intake dampers open, the return air dampers close. The changeover from mechanical refrigeration to economizer operation is regulated by the standard single enthalpy input. There is

an optional input dual dry bulb available. To meet regulated air standards, the economizer control accepts an optional CO₂ input for demand ventilation. With single enthalpy input, the economizer control monitors outdoor air. The dual enthalpy kit provides a second input used to monitor the return air. With a dual input kit installed, the economizer control compares the values of the two enthalpy or temperature inputs and positions the dampers to provide the maximum efficiency possible.

- **Horizontal Economizer - (Without barometric relief)** - All features of the downflow economizer exist except you must order the duct mount barometric relief separately. **You must order a 1EH0408 if you are installing a power exhaust. You can order a 1RD0411 Barometric Relief for horizontal flow economizers only.**
- **BAS Ready Economizer -(With barometric relief)** - The economizer is provided with an actuator that requires a 0-10V DC input from an external source (i.e., field installed building automation system controller). Power exhaust options are available. The economizer is 2% low leakage type with spring return and fully modulating dampers capable of introducing up to 100% outside air. Also include 2" pleated filters.
- **Slab Economizer for Energy Recovery Ventilators-(With barometric relief and Fresh Air Hood)** - The economizer is provided with a single enthalpy input. The economizer is 2% low leakage type, and is shipped installed and wired. The economizer has spring return, fully modulating damper actuators and is capable of introducing up to 100% outdoor air. As the outdoor air intake dampers open, the return air dampers close. The changeover from mechanical refrigeration to economizer operation is regulated by the standard single enthalpy input. There is an optional input dual dry bulb available. To meet regulated air standards, the economizer control accepts an optional CO₂ input for demand ventilation. With single enthalpy input, the economizer control monitors outdoor air. The dual enthalpy kit provides a second input used to monitor the return air. With a dual input kit installed, the economizer control compares the values of the two enthalpy or temperature inputs and positions the dampers to provide the maximum efficiency possible.
- **Power Exhaust (Downflow only)** - This accessory installs in the unit with a down flow economizer.
- **Motorized Outdoor Air Damper** - The motorized outdoor air damper includes a slide-in/plug-in damper assembly with an outdoor air hood and filters. The outdoor air dampers open to the preset position when the indoor fan motor is energized. The damper has a range of 0% to 100% outdoor air entry. Factory installed option or field installed accessory.
- **Alternate Indoor Blower Motor** - For applications with high static restrictions, units are offered with optional indoor motors that provide higher static output and/or higher airflow, depending upon the installer's needs.
- **Aluminized Steel Gas Heat Exchanger** - For applications in non-corrosive environments.

- **Stainless Steel Gas Heat Exchanger** - For applications in corrosive environments, this option provides a full stainless steel heat exchanger assembly.
- **Stainless Steel Drain Pan** - An optional rust-proof stainless steel drain pan is available to provide years of trouble-free operation in corrosive environments.
- **Electric Heaters** - The electric heaters range from 9kW to 54kW and are available in all the voltage options of the base units. All heaters are dual staged. All heaters are intended for single point power supply.
- **Disconnect Switch** - For gas heat units and cooling units with electric heat, a HACR breaker sized to the unit is provided. For cooling only units, a switch sized to the largest electric heat available for the particular unit is provided. Factory installed option only.
- **Convenience Outlet - (Non-Powered/Powered)** - This option locates a 120V single-phase GFCI outlet with cover, on the corner of the unit housing adjacent to the compressors. The "Non-powered" option requires the installer to provide the 120V single-phase power source and wiring. The "Powered" option is powered by a stepdown transformer in the unit. Factory installed option only.
- **Smoke Detectors** - The smoke detectors stop operation of the unit by interrupting power to the control board if smoke is detected within the air compartment. Available for both the supply and/or return air.

WARNING

Factory installed smoke detectors in the return air, may be subjected to freezing temperatures during "off" times due to outside air infiltration. These smoke detectors have an operational limit of 32 °F to 131°F. Smoke detectors installed in areas that could be outside those limitations will have to be moved to prevent having false alarms.

- **Phase Monitors** - Designed to prevent unit damage. The phase monitor will shut the unit down in an out-of phase condition. **(Standard on units with Scroll Compressors.)**
- **Coil Guard** - Customers can purchase a coil guard kit to protect the condenser coil from damage. Additionally, this kit stops animals and foreign objects from entering the space between the inner condenser coil and the main cabinet. This is not a hail guard kit.
- **Dirty Filter Switch** - This kit includes a differential pressure switch that energizes the fault light on the unit thermostat, indicating that there is an abnormally high pressure drop across the filters. Factory installed option or field installed accessory.
- **Technicoat Condenser Coils** - The condenser coils are coated with a phenolic coating for protection against corrosion due to harsh environments.
- **Technicoat Evaporator Coil** - The evaporator coils are coated with a phenolic coating for protection against corrosion due to harsh environments.
- **Hot Gas Bypass** - Allows operation during low load conditions while avoiding coil frosting and damage to compressor. When suction pressure falls below valve

setpoint, the valve modulates hot gas to the inlet of the evaporator.

Control Options

- **BAS - Building Automation System Controls Simplicity® INTELLI-Comfort™ Control** - The York® Simplicity® INTELLI-Comfort™ control is factory installed. It includes a supply air sensor, a return air sensor, and an outside air sensor. There are provisions for a field installed dirty filter indicator switch, an air-proving switch, an Outside Air Humidity sensor, a Return Air Humidity sensor, an Inside IAQ sensor, and an Outside Air IAQ sensor. Construction mode operation, 365-day real time clock with 7 day programming plus holiday scheduling is built-in. Two different modes of demand ventilation are achieved through the INTELLI-Comfort™ using CO₂ sensors. It uses an inside CO₂ sensor to perform Demand Ventilation. It can also use an Outside CO₂ sensor to perform Differential Demand Ventilation. It uses a Patented Comfort Ventilation algorithm to provide comfortable ventilation air temperature. The patented economizer-loading algorithm will protect the equipment when harsh operating conditions exist. Humidity in the occupied space or return duct can be monitored and controlled via humidity sensors and the on-board connection for hot gas re-heat system. It uses the INTELLI-Start™ algorithm to maximize energy savings by recovering the building from the Unoccupied Setpoints to the Occupied Setpoints just in time for the Occupied Time Period to begin. The Simplicity® INTELLI-Comfort™ balances space temperature, ventilation air temperature, CO₂ and humidity for ultimate comfort.
- **Simplicity® INTELLI-Comfort™ with ModLINC Control** - The York® Simplicity® INTELLI-Comfort™ with ModLINC control is factory installed. It includes all the features of the INTELLI-Comfort™ control with an additional control to translate communications from MODBUS to the BACnet MSTP protocol.
- **Novar® BAS Control** - The Novar® ETC-3 building automation system controller is factory installed. Includes supply air sensor, return air sensor, dirty filter indicator switch, and air proving switch.
- **Johnson Controls BAS Control** - The Johnson Control YK-UNT-1126 building automation system controller is factory installed. Includes supply air sensor, return air sensor, dirty filter indicator switch, and air proving switch.
- **CPC BAS Control** - The Computer Process Controls Model 810-3060 ARTC Advanced Rooftop building automation system controller is factory installed. Includes supply air sensor, return air sensor, dirty filter indicator switch and air proving switch.
- **Honeywell BAS Control** - The Honeywell W7750C building automation system controller is factory installed. Includes air supply sensor, return air sensor, dirty filter indicator switch, and air proving switch.

Field Installed Accessories

YORK® offers several equipment accessories for field installation, for the Predator® line.

- **Downflow Economizer - (With barometric relief)** - The economizer is provided with a single enthalpy input. The

economizer is 2% low leakage type. The economizer has spring return, fully modulating damper actuators and is capable of introducing up to 100% outdoor air. As the outdoor air intake dampers open, the return air dampers close. The changeover from mechanical refrigeration to economizer operation is regulated by the standard single enthalpy input. There is an optional input dual dry bulb available. To meet regulated air standards, the economizer control accepts an optional CO₂ input for demand ventilation. With single enthalpy input, the economizer control monitors outdoor air. The dual enthalpy kit provides a second input used to monitor the return air. With a dual input kit installed, the economizer control compares the values of the two enthalpy or temperature inputs and positions the dampers to provide the maximum efficiency possible.

- **Horizontal Economizer - (Without barometric relief) -** All features of the downflow economizer exist except you must order the duct mount barometric relief separately. **You must order a 1EH0408 if you are installing a power exhaust. You can order a 1RD0411 Barometric Relief for horizontal flow economizer.**
- **Slab Economizer for Energy Recovery Ventilator-(Without barometric relief or Fresh Air Hood) -** The economizer is provided with a single enthalpy input. The economizer is 2% low leakage type. The economizer has spring return, fully modulating damper actuators and is capable of introducing up to 100% outdoor air. As the outdoor air intake dampers open, the return air dampers close. The changeover from mechanical refrigeration to economizer operation is regulated by the standard single enthalpy input. There is an optional input dual dry bulb available. To meet regulated air standards, the economizer control accepts an optional CO₂ input for demand ventilation. With single enthalpy input, the economizer control monitors outdoor air. The dual enthalpy kit provides a second input used to monitor the return air. With a dual input kit installed, the economizer control compares the values of the two enthalpy or temperature inputs and positions the dampers to provide the maximum efficiency possible. **You can order 1EH0409 Barometric Relief/FA Hood for field installations without an ERV.**
- **Dual Enthalpy Control, Accessory -** This kit contains the required components to convert a single enthalpy economizer to dual enthalpy.
- **Barometric Relief Damper -** Zero to 100% capacity barometric relief dampers for use with horizontal flow, or field installed slab economizers.
- **Power Exhaust -** This accessory installs in the unit with a down flow economizer. Power exhaust plugs into the connector in the unit bulkhead. **You must purchase 1EH0408 barometric relief when applying to a horizontal flow application.**
- **Manual Outdoor Air Damper -** Like the motorized outdoor air damper, each manual outdoor air damper includes a slide-in damper assembly with an outdoor air hood and filters. Customers have a choice of dampers with ranges of 0% to 100% or 0% to 35% outdoor air entry.
- **Motorized Outdoor Air Damper -** The motorized outdoor air damper includes a slide-in/plug-in damper assembly with

an outdoor air hood and filters. The outdoor air dampers open to the preset position when the indoor fan motor is energized. The damper has a range of 0% to 100% outdoor air entry. Factory installed option or field installed accessory.

- **Smoke Detectors -** The smoke detectors stop operation of the unit by interrupting power to the control board if smoke is detected within the air compartment.
- **CO₂ Sensor -** Senses CO₂ levels and automatically overrides the economizer when levels rise above the preset limits.
- **Dirty Filter Switch -** This kit includes a differential pressure switch that energizes the fault light on the unit thermostat, indicating that there is an abnormally high pressure drop across the filters.
- **Coil Guard -** Field installed decorative wire coil guard.
- **Hail Guard -** This kit includes a sloped hood which installs over the outside condenser coil and prevents damage to the coil fins from hail strikes. Field installed accessory only.
- **Flue Exhaust Extension Kit -** In locations with wind or weather conditions which may interfere with proper exhausting of furnace combustion products, this kit can be installed to prevent the flue exhaust from entering nearby fresh air intakes.
- **-60°F Gas Heat Kit -** For installations which require gas heat units to perform in low ambient temperatures, a gas section heating kit is available. This kit provides electric heat in the gas heat controls section to ensure the gas valve and controls will continue to function properly at extremely low temperatures.
- **Gas Heat High Altitude Kit -** This kit converts a gas heat unit to operate at high altitudes, 2,000 to 6,000 feet. Conversion kits are available for natural gas and propane.
- **Gas Heat Propane Conversion Kit -** This kit converts a gas-fired heater from natural gas to propane. It contains the main burner orifices and gas valve replacement springs.
- **Gas Piping Kit -** Contains pipe nipples, fittings and gas cock required for gas supply connection with external shut off.
- **Electric Heaters -** The electric heaters range from 9 kW to 54kW and are available in all the voltage options of the base units. All heaters are dual staged. Cooling units include an adapter panel for easy installation of the electric heaters. Necessary hardware and connectors are included with the heaters. All heaters are intended for single point power supply.
- **Low Limit / Compressor Lockout Kit**
 - **Compressor Lockout (CLO):** To prevent mechanical (compressorized) operation of the unit during cold outdoor conditions where there is a risk of returning liquid refrigerant back to the compressors.
 - **Low Limit Control (LLC):** To prevent the supply air from dropping below a specified setpoint by utilizing the units first stage heating means when there is a demand for cooling during cold outside conditions.
- **Metal Frame Filter Kit -** Metal frame with polyester filter medium.
- **Permanent Filters -** Permanent filters are available.

- **Roof Curbs** - The roof curbs have insulated decks and are shipped disassembled. The roof curbs are available in 8" and 14" heights. For applications with security concerns, burglar bars are available for the duct openings of the roof curbs.
- **Roof Curb Transition** - Single Piece Adapter (10" High) - Roof curbs for transitioning from Sunline™ units to Predator® units. Fits 7.5 to 12.5 Sunline™ roof curbs only.
- **Burglar Bars** - Mount in the supply and return openings to prevent entry into the duct work.
- **Thermostat** - The units are designed to operate with 24-volt electronic and electro-mechanical thermostats. All units (with or without an economizer) operate with two-stage heat/two-stage cool or two-stage cooling only thermostats, depending upon unit configuration.

Accessories

Part Number	Description
1RC0470	Roof Curb, 8" Height
1RC0471	Roof Curb, 14" Height
1RC0472	Roof Curb, Transition (7.5 T through 12.5 T)
1BD0408	Burglar Bars, Downflow
2TP04520925	Electric Heat 9kW 230V
2TP04521825	Electric Heat 18kW 230V
2TP04522425	Electric Heat 24kW 230V
2TP04523625	Electric Heat 36kW 230V
2TP04525425	Electric Heat 54kW 230V
2TP04520946	Electric Heat 9kW 460V
2TP04521846	Electric Heat 18kW 460V
2TP04522446	Electric Heat 24kW 460V
2TP04523646	Electric Heat 36kW 460V
2TP04525446	Electric Heat 54kW 460V
2TP04520958	Electric Heat 9kW 575V
2TP04521858	Electric Heat 18kW 575V
2TP04522458	Electric Heat 24kW 575V
2TP04523658	Electric Heat 36kW 575V
2TP04525458	Electric Heat 54kW 575V
2TP04540925	Electric Heat 9kW 230V, 42" Tall Cabinet
2TP04541825	Electric Heat 18kW 230V, 42" Tall Cabinet
2TP04542425	Electric Heat 24kW 230V, 42" Tall Cabinet
2TP04543625	Electric Heat 36kW 230V, 42" Tall Cabinet
2TP04540946	Electric Heat 9kW 460V, 42" Tall Cabinet
2TP04541846	Electric Heat 18kW 460V, 42" Tall Cabinet
2TP04542446	Electric Heat 24kW 460V, 42" Tall Cabinet
2TP04543646	Electric Heat 36kW 460V, 42" Tall Cabinet
2TP04540958	Electric Heat 9kW 575V, 42" Tall Cabinet
2TP04541858	Electric Heat 18kW 575V, 42" Tall Cabinet
2TP04542458	Electric Heat 24kW 575V, 42" Tall Cabinet
2TP04543658	Electric Heat 36kW 575V, 42" Tall Cabinet
1FA0413	Manual Outside Air Damper 0-35%, Downflow (Incl. Hood, Damper & Filters, No Barometric Relief)
1FA0414	Manual Outside Air Damper 0-100%, Downflow (Incl. Hood, Damper & Filters, No Barometric Relief)
2MD04702724	Motorized Damper, Downflow (Incl. Hood, Damper & Filter, no Barometric Relief)
2MD04703324	Motorized Damper, Horizontal (Incl. Hood, Damper & Filter, no Barometric Relief)
2EE04705424	Economizer, Downflow (Incl. Barometric Relief & All Hoods)
2EE04705524	Economizer, Horizontal (Incl. Dampers & Hoods, no Barometric Relief)
2EE04705224	Economizer, Slab, Downflow (Incl. Dampers only no Hoods or Barometric Relief)
2EE04705624	"Downflow Economizer, Slab type for ERV (no Barometric Relief or FA hood)", 42" Tall Cabinet
2PE04703225	Power Exhaust, Downflow, 230V (For Units with Economizer only)
2PE04703246	Power Exhaust, Downflow, 460V (For Units with Economizer only)
2PE04703258	Power Exhaust, Downflow, 580V (For Units with Economizer only)
2EC04700924	Dual Enthalpy Control (Use with Single Enthalpy Economizer)
1EH0407	Hood Kit, Downflow Economizer (Included with all Downflow Economizers)
1RD0411	Barometric Relief Kit, Ductmount for Horizontal Application (Incl. Damper & Hood)
1EH0408	Barometric Relief Kit, Ductmount for Horizontal Application w/Power Exhaust (Incl. Damper & Hood)
1EH0409	Barometric Relief / Hood Kit, for Field Installed Slab Econ. w/o ERV (Incl. Barometric Relief & FA Hood)
2AQ04700424	CO2 Detector Unit Mount
2AQ04700324	CO2 Detector Space Mount

Accessories (Continued)

Part Number	Description
2SD04700424	Smoke Detector, Supply or Return (Return Not Available with Horizontal Economizer)
2MK04700624	Low Limit / Compressor Lockout Kit
1CG0419	Coil Guard (Electric / Electric & HP models), 8-1/2 and 10 Ton
1CG0420	Coil Guard (Gas / Electric models), 8-1/2 and 10 Ton
1CG0424	Coil Guard (Electric / Electric and HP models), 12-1/2 Ton
1CG0425	Coil Guard (Gas / Electric models), 12-1/2 Ton
1CG0427	Coil Guard (Electric / Electric & HP Models), 6-1/2 and 7-1/2 Ton
1CG0428	Coil Guard (Gas / Electric Models), 6-1/2 and 7-1/2 Ton
1HG0411	Hail Guard Kit
1HG0415	Hail Guard Kit, 42" Tall Cabinet
1GP0405	Gas Piping Kit
1NP0442	Propane Conversion Kit
1HA0442	High Altitude Kit for Natural Gas
1HA0443	High Altitude Kit for Propane
1FE0412	Flue Exhaust Extension Kit
2BC04700106	Gas Heat Kit, -60 deg F, 230V
2BC04700151	Gas Heat Kit, -60 deg F, 460V
2BC04700154	Gas Heat Kit, -60 deg F, 575V
1FL0402	Permanent Filter Kit
1FL0423	Permanent Filter Kit, 42" Tall Cabinet
2DF0401	Dirty Filter Switch
1FF0410	Filter Frame Kit, Metal
1FF0411	Metal Filter Frame Kit, 42" Tall Cabinet

Guide Specifications

GENERAL

Units shall be manufactured by York International Unitary Products Group in an ISO 9001 certified facility. YORK® Predator® units are convertible single packages with a common footprint cabinet and common roof curb for all 6-1/2 through 12-1/2 ton models. All units have two compressors with independent R-410a refrigeration circuits to provide 2 stages of cooling. The units were designed for light commercial applications and can be easily installed on a roof curb, slab, or frame. All Predator® units are self-contained and assembled on rigid full perimeter base rails allowing for 3-way forklift access and overhead rigging. Every unit is completely charged with R-410a, wired, piped, and tested at the factory to provide a quick and easy field installation. All units are convertible between side and down airflow. Independent economizer designs are used on side and down discharge applications, as well as all tonnage sizes. Predator® units are available in the following configurations: cooling only, cooling with electric heat, cooling with gas heat, heat pump, and heat pump with electric heat. Electric heaters are available as factory-installed options or field-installed accessories.

DESCRIPTION

Units shall be factory assembled, single package, (Elec/Elec, Gas/Elec), designed for outdoor installation. They shall have built in field convertible duct connections for down discharge supply/return or horizontal discharge supply/return and be available with factory installed options or field installed accessories. The units shall be factory wired, piped and charged with R-410a refrigerant and factory tested prior to shipment. All unit wiring shall be both

numbered and color coded. The cooling performance shall be rated in accordance with DOE and ARI test procedures. Units shall be CSA certified to ANSI Z21.47 and UL 1995/CAN/CSA No. 236-M90 standards.

UNIT CABINET

Unit cabinet shall be constructed of G90 galvanized steel with exterior surfaces coated with a non-chalking, powder paint finish, certified at 1000 hour salt spray test per ASTM-B117 standards. Indoor blower sections shall be insulated with up to 1" thick insulation coated on the airside. Aluminum foil faced insulation shall be used in the unit's compartments and be fastened to prevent insulation from entering the air stream. Cabinet doors shall be hinged with toolless access for easy servicing and maintenance. Full perimeter base rails shall be provided to assure reliable transit of equipment, overhead rigging, fork truck access and proper sealing on roof curb applications. Disposable 2" filters shall be furnished and be accessible through hinged access door. Fan performance measuring ports shall be provided on the outside of the cabinet to allow accurate air measurements of evaporator fan performance without removing panels or creating bypass of the coils. Condensate pan shall be slide out design, constructed of a non corrosive material, internally sloped and conforming to ASHRAE 62-B9 standards. Condensate connection shall be a minimum of ¾" I.D. female and be rigid mount connection.

INDOOR (EVAPORATOR) FAN ASSEMBLY

Fan shall be a belt drive assembly and include an adjustable pitch motor pulley. Job site selected brake horsepower shall not exceed the motors nameplate horsepower rating plus the service factor. Units shall be designed to operate within the service

factor. Fan wheel shall be double inlet type with forward curve blades, dynamically balanced to operate smoothly throughout the entire range of operation. Airflow design shall be constant volume. Bearings shall be sealed and permanently lubricated for longer life and no maintenance. Entire blower assembly and motor shall be slide out design.

OUTDOOR (CONDENSER) FAN ASSEMBLY

The outdoor fans shall be of the direct drive type, discharge air vertically, have aluminum blades riveted to corrosion resistant steel spider brackets and shall be dynamically balanced for smooth operation. The outdoor fan motors shall have permanently lubricated bearings internally protected against overload conditions and staged independently. A cleaning window shall be provided on two sides of the units for coil cleaning.

REFRIGERANT COMPONENTS

Compressors:

- a. Shall be fully hermetic type, direct drive, internally protected with internal high-pressure relief and over temperature protection. The hermetic motor shall be suction gas cooled and have a voltage range of + or – 10% of the unit nameplate voltage.
- b. Shall have internal spring isolation and sound muffling to minimize vibration and noise, and be externally isolated on a dedicated, independent mounting.

Coils:

- a. Evaporator and condenser coils shall have aluminum plate fins mechanically bonded to seamless internally enhanced copper tubes with all joints brazed. Special Phenolic coating shall be available as a factory option.
- b. Evaporator and condenser coils shall be of the direct expansion, draw-thru design.

Refrigerant Circuit and Refrigerant Safety Components shall include:

- a. Independent fixed-orifice or thermally operated expansion devices.
- b. Solid core filter drier/strainer to eliminate any moisture or foreign matter.
- c. Accessible service gage connections on both suction and discharge lines to charge, evacuate, and measure refrigerant pressure during any necessary servicing or troubleshooting, without losing charge.
- d. The unit shall have two independent refrigerant circuits, equally split in 50% capacity increments.

Unit Controls:

- a. Unit shall be complete with self-contained low-voltage control circuit protected by a resettable circuit breaker on the 24-volt transformer side.
- b. Unit shall incorporate a lockout circuit which provides reset capability at the space thermostat or base unit

should any of the following standard safety devices trip and shut off compressor:

- c. Loss-of-charge/Low-pressure switch.
 - High-pressure switch.
 - Freeze-protection thermostat, evaporator coil. If any of the above safety devices trip, an LED (light-emitting diode) indicator shall flash a diagnostic code that indicates which safety switch has tripped.
- d. Unit shall incorporate "AUTO RESET" compressor over temperature, over current protection.
- e. Unit shall operate with conventional thermostat designs and have a low voltage terminal strip for easy hook-up.
- f. Unit control board shall have on-board diagnostics and fault code display.
- g. Standard controls shall include anti-short cycle and low voltage protection, and permit cooling operation down to 0 °F.
- h. Control board shall monitor each refrigerant safety switch independently.
- i. Control board shall retain last 5 fault codes in non-volatile memory, which will not be lost in the event of a power loss.

GAS HEATING SECTION (IF EQUIPPED)

Heat exchanger and exhaust system shall be constructed of aluminized steel and shall be designed with induced draft combustion with post purge logic, energy saving direct spark ignition, and redundant main gas valve. The heat exchanger shall be of the tubular type, constructed of T1-40 aluminized steel for corrosion resistance and allowing minimum mixed air entering temperature of 40 °F. Burners shall be of the in-shot type, constructed of aluminum-coated steel. All gas piping shall enter the unit cabinet at a single location, through either the side or bottom, without any field modifications. An integrated control board shall provide timed control of evaporator fan functioning and burner ignition. Heating section shall be provided with the following minimum protection:

- a. Primary and auxiliary high-temperature limit switches.
- b. Induced draft pressure sensor.
- c. Flame roll out switch (manual reset).
- d. Flame proving controls. Unit shall have two independent stages of capacity (60% 1st stage, 100% 2nd stage).

ELECTRIC HEATING SECTION (IF EQUIPPED)

An electric heating section, with nickel chromium elements, shall be provided in a range of 9 thru 54 KW, offering two states of capacity all sizes. The heating section shall have a primary limit control(s) (automatic reset) to prevent the heating element system from operating at an excessive temperature. The Heating Section assembly shall slide out of the unit for easy maintenance and service. Units with Electric Heating Sections shall be wired for a single point power supply with branch circuit fusing (where required).

UNIT OPERATING CHARACTERISTICS

Unit shall be capable of starting and running at 125 °F outdoor temperature, exceeding maximum load criteria of ARI Standard 340/360. The compressor, with standard controls, shall be capable of operation down to 0 °F outdoor temperature. Unit shall be provided with fan time delay to prevent cold air delivery before heat exchanger warms up. (Gas heat only)

ELECTRICAL REQUIREMENTS - All unit power wiring shall enter unit cabinet at a single factory provided location and be capable of side or bottom entry to minimize roof penetrations and avoid unit field modifications. Separate side and bottom openings shall be provided for the control wiring.

STANDARD LIMITED WARRANTIES - Compressor – 5 Years, Heat Exchanger – 10 Years, Elect. Heat Elem. – 5 Years, Parts – 1 Year

FACTORY INSTALLED OPTIONAL OUTDOOR AIR (Shall be made available by either/or):

- **ELECTRONIC ENTHALPY AUTOMATIC ECONOMIZER** – Outdoor and return air dampers that are interlocked and positioned by a fully-modulating, spring-return damper actuator. The maximum leakage rate for the outdoor air intake dampers shall not exceed 2% when dampers are fully closed and operating against a pressure differential of 0.5 IWG. A unit-mounted potentiometer shall be provided to adjust the outdoor and return air damper assembly to take in outdoor air to meet the minimum ventilation requirement of the conditioned space during normal operation. During economizer operation, a mixed-air temperature control shall modulate the outdoor and return air damper assembly to prevent the supply air temperature from dropping below 55 °F. Changeover from compressor to economizer operation shall be provided by an integral electronic enthalpy control that feeds input into the basic module. The outdoor intake opening shall be covered with a rain hood that matches the exterior of the unit. Water eliminator/filters shall be provided. Simultaneous economizer/compressor operation is also possible. Dampers shall fully close on power loss. Available with barometric relief or power exhaust.
- **MOTORIZED OUTDOOR AIR DAMPERS** – Outdoor and return air dampers that are interlocked and positioned by a 2-position, spring-return damper actuator. The maximum leakage rate for the outdoor air intake dampers shall not exceed 2% when dampers are fully closed and operating against a pressure differential of 0.5 IWG. A unit-mounted potentiometer shall be provided to adjust the outdoor and return air damper assembly to take in the design CFM of outdoor air to meet the ventilation requirements of the conditioned space during normal operation. Whenever the indoor fan motor is energized, the dampers open up to one of two pre-selected positions – regardless of the outdoor air enthalpy. Dampers return to the fully closed position when the indoor fan motor is de-energized. Dampers shall fully close on power loss.

ADDITIONAL FACTORY INSTALLED OPTIONS

- **ALTERNATE INDOOR BLOWER MOTOR** – For applications with high restrictions, units are available with optional indoor blower motors that provide higher static output and/or higher airflow.
- **CONVENIENCE OUTLET (POWERED/NON-POWERED)**– Unit can be provided with an optional 120VAC GFCI outlet with cover on the corner of the unit housing the compressors.
- **ELECTRIC HEAT** - Electric Heaters range from 9 kW to 54 kW and are available in all the voltage options of the base unit.
- **PHASE MONITOR** - Designed to prevent damage in out-of-phase condition.
- **COIL GUARD** - Designed to prevent condenser coil damage.
- **BAS CONTROLS** - Include supply air sensor, return air sensor, dirty filter indicator and air proving switch.
- **DIRTY FILTER SWITCH** – This kit includes a differential pressure switch that energizes the fault light on the unit thermostat, indicating that there is an abnormally high-pressure drop across the filters.
- **BREAKER** – An HACR breaker can be factory installed on gas heat units or cooling units with electric heat.
- **DISCONNECT SWITCH** - A disconnect can be factory installed on a cooling only units sized for the largest electric heat available.
- **STAINLESS STEEL HEAT EXCHANGER** – For applications in a corrosive environment, this option provides a full stainless steel heat exchanger assembly.
- **SMOKE DETECTOR** – A smoke detector can be factory mounted and wired in the supply and/or return air compartments.

OTHER PRE-ENGINEERED ACCESSORIES AVAILABLE

- **ROOF CURB** - 14" and 8" high, full perimeter knockdown curb, with hinged design for quick assembly.
- **BAROMETRIC RELIEF DAMPER** – (Unit mounted – Downflow, Duct Mounted – Horizontal) – Contains a rain hood, air inlet screen, exhaust damper and mounting hardware. Used to relieve internal air pressure through the unit during economizer operation.
- **PROPANE CONVERSION KIT** – Contains new orifices and gas valve springs to convert from natural to L.P. gas.
- **60°F GAS HEAT KIT** – Provides an electric heat kit for the gas compartment for use in extreme low ambient conditions.
- **ECONOMIZER** (Downflow and Horizontal flow)
- **POWER EXHAUST** – (Unit mount – Downflow, Duct mount – Horizontal flow)
- **DUAL ENTHALPY KIT** - Provides a second input to economizer to monitor return air.

REHEAT MODE SEQUENCE OF OPERATION

The reheat control board allows the user to select two different modes of operation via a jumper connection on the board. (See Figure 3.) Each mode is described below.

"NORMAL" MODE

When the reheat control board (RCB) detects a need for dehumidification (24VAC) at "HUM" via the field supplied dehumidistat connected to RHTB-1 and RHTB-2 and there is not a call for cooling, it energizes the hot gas relay (HGR), which energizes the 3-way valve (SOL 3), the condenser coil valve (SOL 2), and de-energizes the reheat coil bleed valve (SOL 1). (In the ZR150, SOL 2 is only energized when the discharge pressure in circuit #1 rises above 400 psig and de-energizes SOL 2 after the discharge pressure falls below 320 psig. Both outdoor fans of circuit #1 in the ZR150 also disengage to conserve energy.) The Y1 signal is passed to the unit control board (UCB), which engages circuit # 1, resulting in circuit #1 reheat mode operation.

When the room thermostat calls for first stage cooling, with or without a call for dehumidification, the RCB senses a signal through "Y1", de-energizing the HGR, which de-energizes SOL 3 and SOL 2 and energizes SOL 1, engaging circuit #1, resulting in circuit #1 cooling mode operation.

When the room thermostat calls for second stage cooling, the RCB senses a signal through "Y1" & "Y2" and engages circuit #1 and circuit #2 in cooling mode.

Indoor blower operation is initiated upon a call for first stage cooling, second stage cooling or dehumidification.

Anytime there is a call for 2 stages of cooling, the unit will not operate in the reheat mode, even if there is a call for dehumidification at "HUM".

The unit will not operate in the reheat mode if there is any call for heating.

On units with economizers, the unit will not operate in the reheat mode if there is a call for cooling and the economizer is operating as first stage of cooling.

All safety devices function as previously described.

"ALTERNATE" MODE

When the RCB detects a need for dehumidification (24VAC) at "HUM" via the field supplied dehumidistat connected to RHTB-1 and RHTB-2, and there is not a call for cooling, it energizes the HGR, which energizes the SOL 3, SOL 2, and de-energizes SOL 1. (In the ZR150, SOL 2 is only energized when the discharge pressure in circuit #1 rises above 400 psig and de-energizes SOL 2 after the discharge pressure falls below 320 psig. Both outdoor fans of circuit #1 in the ZR150 also disengage to conserve energy.) The unit then operates with circuit #1 in reheat mode and circuit #2 in cooling mode.

When the room thermostat calls for first stage cooling while there is still a call for dehumidification, no operational change is made. The call for cooling is ignored and the unit continues to operate with circuit #1 in reheat mode and circuit #2 in cooling mode.

When the room thermostat calls for second stage cooling, the RCB senses a signal through "Y1" and "Y2" and de-energizes the HGR, which de-energizes SOL 3 and SOL 2, and energizes SOL 1. Both circuits operate in the cooling mode.

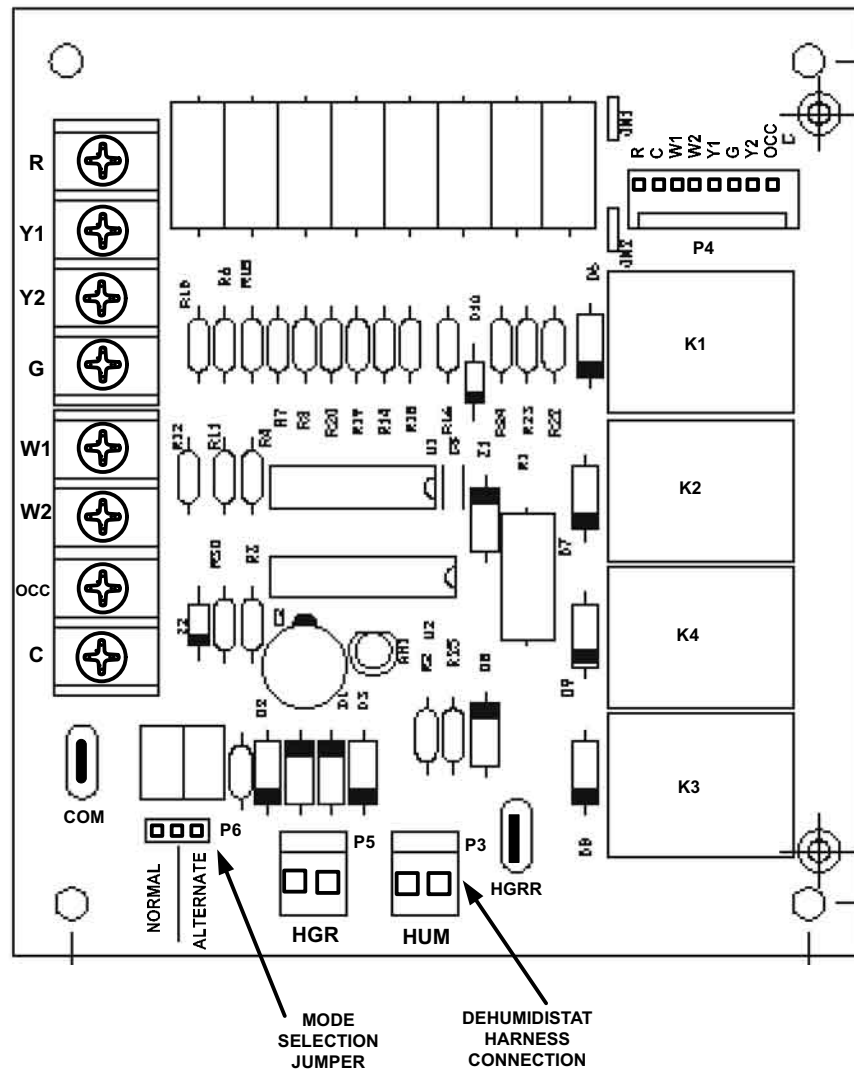
Indoor blower operation is initiated upon a call for first stage cooling, second stage cooling or dehumidification.

Anytime there is a call for 2 stages of cooling, the unit will not operate in the reheat mode, even if there is still a call for dehumidification at "HUM".

The unit will not operate in the reheat mode if there is any call for heating.

All safety devices function as previously described.

Reheat Control Board



Physical Data

ZH078-150 Physical Data

Component	Models									
	ZH078		ZH090		ZH102		ZH120		ZH150	
Nominal Tonnage	6.5		7.5		8.5		10		12.5	
ARI COOLING PERFORMANCE										
Gross Capacity @ ARI A point (Btu)	79000		93000		106000		126000		156000	
ARI net capacity (Btu)	76000		90000		102000		122000		150000	
EER	11.4		11.4		11.5		11.5		11.2	
SEER	-		-		-		-		-	
IPLV	12.7		12.4		12.4		12.1		12.7	
Nominal CFM	2600		3000		3400		4000		5000	
System power (KW)	6.67		7.90		8.87		10.61		13.40	
Refrigerant type	R-410a		R-410a		R-410a		R-410a		R-410a	
Refrigerant charge (lb-oz)										
System 1	9-4		8-8		11-8		11-8		19-8	
System 2	6-0		8-4		11-0		11-8		19-8	
ARI HEATING PERFORMANCE										
Heating model	10	15	10	15	10	15	15	20	15	20
Heat input (K Btu)	120	180	120	180	120	180	180	240	180	240
Heat output (K Btu)	96	144	96	144	96	144	144	192	144	192
AFUE %	-	-	-	-	-	-	-	-	-	-
Steady state efficiency (%)	80	80	80	80	80	80	80	80	80	80
No. burners	4	6	4	6	4	6	6	8	6	8
No. stages	2	2	2	2	2	2	2	2	2	2
Temperature Rise Range (°F)	20-50	35-65	15-45	30-60	10-40	25-55	20-50	35-65	10-40	25-55
Gas Limit Setting (°F)	165	165	165	165	215	195	195	160	195	160
Gas piping connection (in.)	3/4	3/4	3/4	3/4	3/4	3/4	3/4	3/4	3/4	3/4
DIMENSIONS (inches)										
Length	89		89		89		89		119-7/16	
Width	59		59		59		59		59	
Height	42		42		50-3/4		50-3/4		50-3/4	
OPERATING WT. (lbs.)	900		920		1135		1135		1400	
COMPRESSORS										
Type	Scroll		Scroll		Scroll		Scroll		Scroll	
Quantity	2		2		2		2		2	
Unit Capacity Steps (%)	50 / 100		50 / 100		50 / 100		50 / 100		50 / 100	
CONDENSER COIL DATA										
Face area (Sq. Ft.)	23.8		23.8		29.0		29.0		47.5	
Rows	2 / 1		2		2		2		2	
Fins per inch	20		20		20		20		15	
Tube diameter (in.)	3/8		3/8		3/8		3/8		3/8	
Circuitry Type	Split-face		Split-face		Split-face		Split-face		Split-face	
EVAPORATOR COIL DATA										
Face area (Sq. Ft.)	10.6		10.6		13.2		13.2		13.2	
Rows	3		3		4		4		4	
Fins per inch	15		15		15		15		15	
Tube diameter	0.375		0.375		0.375		0.375		0.375	
Circuitry Type	Split-face		Split-face		Split-face		Split-face		Split-face	
Refrigerant control	TXV		TXV		TXV		TXV		TXV	

ZH078-150 Physical Data (Continued)

Component	Models									
	ZH078		ZH090		ZH102		ZH120		ZH150	
Nominal Tonnage	6.5		7.5		8.5		10		12.5	
CONDENSER FAN DATA										
Quantity	2		2		2		2		4	
Fan diameter (Inch)	24		24		24		24		24	
Type	Prop		Prop		Prop		Prop		Prop	
Drive type	Direct		Direct		Direct		Direct		Direct	
No. speeds	1		1		1		1		1	
Number of motors	2		2		2		2		4	
Motor HP each	1/3		1/3		3/4		3/4		1/3	
RPM	850		850		1110		1110		850	
Nominal total CFM	6800		6800		8800		8800		14000	
BELT DRIVE EVAP FAN DATA										
Quantity	1		1		1		1		1	
Fan Size (Inch)	12 x 12		12 x 12		15 x 15		15 x 15		15 x 15	
Type	Centrifugal		Centrifugal		Centrifugal		Centrifugal		Centrifugal	
Motor Sheave	1VM50	1VM50	1VM50	1VM50	1VM50	1VM50	1VM50	1VM50	1VM50	1VP56
Blower Sheave	AK74	AK64	AK74	AK61	AK89	AK74	AK84	AK74	AK74	BK77
Belt	A49	A49	A49	A49	A56	A54	A56	A54	A54	BX55
Motor HP each	1-1/2	2	1-1/2	3	2	3	2	3	3	5
RPM	1725	1725	1725	1725	1725	1725	1725	1725	1725	1725
Frame size	56	56	56	56	56	56	56	56	56	184T
FILTERS										
Quantity - Size	4 - 25 x 16 x 2		4 - 25 x 16 x 2		4 - 25 x 20 x 2		4 - 25 x 20 x 2		4 - 25 x 20 x 2	

Capacity Performance

ZH078-150 Cooling Capacities

ZH078 (6.5 Ton)

Air on Evaporator Coil		Temperature of Air on Condenser Coil															
CFM	WB (°F)	Total Capacity ¹ (MBh)	Total Input (kW) ²	Sensible Capacity (MBh)						Total Capacity ¹ (MBh)	Total Input (kW) ²	Sensible Capacity (MBh)					
				Return Dry Bulb (°F)								Return Dry Bulb (°F)					
				90	85	80	75	70	65			90	85	80	75	70	65
		75°F								85°F							
1625	77	100.5	4.5	42.8	33.7	25.9	-	-	-	94.8	5.2	39.6	32.0	24.3	-	-	-
	72	91.5	4.5	53.4	45.6	37.8	30.0	-	-	86.2	5.2	51.3	43.7	36.0	28.4	-	-
	67	82.5	4.4	63.9	57.4	49.6	41.8	34.0	-	77.5	5.1	63.0	55.4	47.7	40.0	32.4	-
	62	78.1	4.4	78.1	72.3	61.3	53.5	45.7	37.9	73.0	5.1	73.0	70.1	58.7	51.0	43.4	35.7
1950	77	104.3	4.6	46.3	37.5	28.7	-	-	-	98.0	5.2	44.3	35.6	26.9	-	-	-
	72	95.0	4.5	59.4	50.6	41.8	33.0	-	-	89.0	5.2	57.2	48.5	39.7	31.0	-	-
	67	85.6	4.5	72.5	63.7	54.9	46.1	37.3	-	80.1	5.2	70.1	61.4	52.6	43.9	35.2	-
	62	81.0	4.5	81.0	77.1	67.8	59.0	50.2	41.4	75.4	5.1	75.4	73.5	64.8	56.0	47.3	38.6
	57	78.6	4.5	78.6	78.3	69.5	60.7	51.9	43.1	75.4	5.1	75.4	74.4	65.7	57.0	48.3	39.5
2275	77	108.0	4.6	49.7	41.2	31.4	-	-	-	101.1	5.3	49.0	39.2	29.4	-	-	-
	72	98.4	4.6	65.4	55.6	45.8	36.0	-	-	91.9	5.2	63.1	53.3	43.5	33.7	-	-
	67	88.7	4.5	81.1	70.0	60.2	50.4	40.6	-	82.7	5.2	77.2	67.4	57.6	47.8	38.0	-
	62	83.9	4.5	83.9	81.9	74.3	64.5	54.7	44.9	77.9	5.2	77.9	76.9	70.8	61.0	51.2	41.4
	57	81.4	4.5	81.4	81.3	76.2	66.4	56.5	46.7	77.8	5.2	77.8	77.4	71.9	62.1	52.3	42.5
2600	77	111.8	4.6	53.2	45.0	34.2	-	-	-	104.3	5.3	53.6	42.8	31.9	-	-	-
	72	101.8	4.6	71.5	60.6	49.8	39.0	-	-	94.8	5.2	68.9	58.1	47.2	36.3	-	-
	67	91.8	4.6	89.7	76.3	65.5	54.6	43.8	-	85.3	5.2	84.2	73.4	62.5	51.6	40.8	-
	62	86.8	4.5	86.8	86.8	80.8	70.0	59.2	48.4	80.3	5.2	80.3	80.3	76.9	66.0	55.2	44.3
	57	84.3	4.6	84.3	84.3	82.8	72.0	61.2	50.4	80.3	5.2	80.3	80.3	78.0	67.2	56.3	45.4
2925	72	104.1	4.6	76.6	64.8	53.0	41.3	-	-	96.8	5.2	74.3	62.4	50.4	38.5	-	-
	67	93.8	4.6	92.8	81.5	69.7	57.9	46.1	-	87.1	5.2	86.6	78.7	66.8	54.9	42.9	-
	62	88.7	4.5	88.7	88.7	85.7	74.0	62.2	50.4	82.0	5.2	82.0	82.0	80.3	68.4	56.4	44.5
	57	86.2	4.6	86.2	86.2	85.4	73.7	61.9	50.1	82.0	5.2	82.0	82.0	80.8	68.9	57.0	45.1
	3250	72	106.3	4.6	81.7	69.0	56.2	43.5	-	-	98.8	5.2	79.7	66.7	53.7	40.7	-
67		95.9	4.6	95.9	86.6	73.9	61.2	48.4	-	88.9	5.2	88.9	84.1	71.1	58.1	45.1	-
62		90.6	4.6	90.6	90.6	90.6	77.9	65.2	52.4	83.7	5.2	83.7	83.7	83.7	70.7	57.7	44.7
57		88.1	4.6	88.1	88.1	88.1	75.3	62.6	49.8	83.7	5.2	83.7	83.7	83.7	70.7	57.7	44.7
		95°F								105°F							
1625	77	89.1	5.9	36.5	30.3	22.8	-	-	-	82.2	6.9	31.8	27.9	20.7	-	-	-
	72	80.8	5.9	49.3	41.8	34.3	26.7	-	-	74.4	6.7	46.5	39.2	31.9	24.6	-	-
	67	72.5	5.8	62.1	53.3	45.8	38.2	30.7	-	66.5	6.5	61.2	50.4	43.2	35.9	28.6	-
	62	67.9	5.8	67.9	67.9	56.1	48.6	41.0	33.5	62.2	6.5	62.2	62.2	51.0	43.7	36.4	29.1
1950	77	91.7	5.9	42.3	33.7	25.1	-	-	-	84.5	6.9	39.9	31.4	22.8	-	-	-
	72	83.1	5.9	55.0	46.4	37.7	29.1	-	-	76.4	6.7	52.4	43.8	35.2	26.7	-	-
	67	74.6	5.8	67.7	59.0	50.4	41.7	33.1	-	68.4	6.5	64.8	56.2	47.7	39.1	30.6	-
	62	69.9	5.8	69.9	69.9	61.7	53.1	44.4	35.8	63.9	6.5	63.9	63.9	56.3	47.7	39.2	30.6
	57	72.2	5.8	72.2	70.6	61.9	53.3	44.6	36.0	66.6	6.5	66.6	64.8	56.2	47.7	39.1	30.6
2275	77	94.2	5.9	48.2	37.1	27.3	-	-	-	86.8	6.9	48.1	34.8	25.0	-	-	-
	72	85.5	5.9	60.7	50.9	41.2	31.4	-	-	78.5	6.7	58.2	48.4	38.6	28.7	-	-
	67	76.7	5.8	73.2	64.7	55.0	45.2	35.4	-	70.2	6.6	68.4	62.0	52.2	42.3	32.5	-
	62	71.8	5.8	71.8	71.8	67.3	57.6	47.8	38.0	65.6	6.5	65.6	65.6	61.6	51.7	41.9	32.1
	57	74.2	5.8	74.2	73.4	67.6	57.8	48.0	38.2	68.4	6.5	68.4	67.5	61.5	51.7	41.9	32.0
2600	77	96.8	5.9	54.1	40.5	29.6	-	-	-	89.0	6.9	56.2	38.2	27.1	-	-	-
	72	87.8	5.9	66.4	55.5	44.6	33.7	-	-	80.5	6.8	64.1	53.0	41.9	30.8	-	-
	67	78.8	5.8	78.8	70.5	59.6	48.6	37.7	-	72.0	6.6	72.0	67.8	56.7	45.6	34.5	-
	62	73.8	5.8	73.8	73.8	73.0	62.1	51.1	40.2	67.3	6.5	67.3	67.3	66.9	55.8	44.7	33.6
	57	76.3	5.8	76.3	76.3	73.2	62.3	51.4	40.5	70.2	6.5	70.2	70.2	66.8	55.7	44.6	33.5
2925	72	89.5	5.9	72.0	60.0	47.9	35.8	-	-	81.9	6.8	69.4	57.1	44.9	32.7	-	-
	67	80.3	5.8	80.3	76.0	63.9	51.9	39.8	-	73.2	6.6	73.2	71.0	60.8	48.6	36.4	-
	62	75.2	5.8	75.2	75.2	74.8	62.8	50.7	38.6	68.4	6.5	68.4	68.4	68.2	56.0	43.8	31.6
	57	77.8	5.8	77.8	77.8	76.3	64.2	52.1	40.0	71.4	6.5	71.4	71.4	69.7	57.5	45.3	33.1
3250	72	91.3	5.9	77.6	64.4	51.1	37.9	-	-	83.2	6.8	74.6	61.3	48.0	34.7	-	-
	67	81.9	5.8	81.9	81.6	68.3	55.1	41.8	-	74.4	6.6	74.4	74.2	64.9	51.6	38.3	-
	62	76.7	5.8	76.7	76.7	76.7	63.5	50.2	37.0	69.5	6.5	69.5	69.5	69.5	56.2	42.9	29.6
	57	79.3	5.8	79.3	79.3	79.3	66.0	52.8	39.5	72.5	6.5	72.5	72.5	72.5	59.2	45.9	32.6

ZH078 (6.5 Ton) (Continued)

Air on Evaporator Coil		Temperature of Air on Condenser Coil															
CFM	WB (°F)	Total Capacity ¹ (MBh)	Total Input (kW) ²	Sensible Capacity (MBh)						Total Capacity ¹ (MBh)	Total Input (kW) ²	Sensible Capacity (MBh)					
				Return Dry Bulb (°F)								Return Dry Bulb (°F)					
				90	85	80	75	70	65			90	85	80	75	70	65
		115°F								125°F							
1625	77	75.4	7.9	27.1	25.6	18.6	-	-	-	68.5	8.9	27.1	21.3	16.5	-	-	-
	72	68.0	7.6	43.7	36.6	29.6	22.5	-	-	61.5	8.4	40.8	34.0	27.2	20.4	-	-
	67	60.5	7.3	60.2	47.6	40.6	33.5	26.5	-	54.6	8.0	54.6	44.8	38.0	31.2	24.4	-
	62	56.4	7.2	56.4	56.4	45.8	38.8	31.8	24.7	50.6	8.0	50.6	50.6	40.7	33.9	27.1	20.3
1950	77	77.4	7.9	37.5	29.1	20.6	-	-	-	70.2	8.9	38.3	26.7	18.4	-	-	-
	72	69.7	7.6	49.7	41.2	32.8	24.3	-	-	63.0	8.5	47.1	38.7	30.3	21.9	-	-
	67	62.1	7.3	61.9	53.4	45.0	36.5	28.0	-	55.9	8.0	55.9	50.7	42.3	33.9	25.5	-
	62	57.8	7.3	57.8	57.8	50.8	42.4	33.9	25.4	51.8	8.0	51.8	51.8	45.4	37.0	28.6	20.3
	57	61.0	7.2	61.0	59.0	50.6	42.1	33.6	25.2	55.4	7.9	55.4	53.3	44.9	36.5	28.2	19.8
2275	77	79.3	7.9	47.9	32.5	22.6	-	-	-	71.9	9.0	49.4	32.1	20.2	-	-	-
	72	71.5	7.6	55.8	45.9	36.0	26.1	-	-	64.5	8.5	53.3	43.4	33.4	23.5	-	-
	67	63.7	7.3	63.6	59.3	49.4	39.5	29.6	-	57.2	8.0	57.2	56.5	46.6	36.7	26.7	-
	62	59.3	7.3	59.3	59.3	55.8	45.9	36.0	26.2	53.1	8.0	53.1	53.1	50.0	40.1	30.2	20.2
	57	62.6	7.2	62.6	61.6	55.5	45.6	35.8	25.9	56.7	8.0	56.7	55.7	49.5	39.6	29.6	19.7
2600	77	81.3	8.0	58.4	35.9	24.6	-	-	-	73.5	9.0	60.5	37.5	22.1	-	-	-
	72	73.3	7.6	61.8	50.5	39.2	27.9	-	-	66.0	8.5	59.5	48.0	36.5	25.0	-	-
	67	65.3	7.3	65.3	65.1	53.8	42.5	31.2	-	58.5	8.0	58.5	58.5	50.9	39.4	27.9	-
	62	60.8	7.3	60.8	60.8	60.8	49.5	38.2	26.9	54.3	8.0	54.3	54.3	54.3	43.2	31.7	20.2
	57	64.1	7.3	64.1	64.1	60.5	49.2	37.9	26.6	58.1	8.0	58.1	58.1	54.1	42.6	31.1	19.6
2925	72	74.2	7.6	66.7	54.3	42.0	29.7	-	-	66.5	8.5	64.0	51.5	39.1	26.6	-	-
	67	66.1	7.3	66.1	66.0	57.6	45.3	33.0	-	59.0	8.0	59.0	59.0	54.5	42.0	29.6	-
	62	61.5	7.3	61.5	61.5	61.5	49.2	36.9	24.6	54.7	8.0	54.7	54.7	54.7	42.4	30.0	17.5
	57	64.9	7.3	64.9	64.9	63.1	50.8	38.4	26.1	58.5	8.0	58.5	58.5	56.5	44.1	31.6	19.2
3250	72	75.1	7.6	71.5	58.2	44.8	31.5	-	-	67.0	8.5	67.0	55.1	41.6	28.2	-	-
	67	66.9	7.3	66.9	66.9	61.5	48.1	34.8	-	59.4	8.0	59.4	59.4	58.1	44.7	31.2	-
	62	62.3	7.3	62.3	62.3	62.3	48.9	35.6	22.2	55.1	8.0	55.1	55.1	55.1	41.7	28.3	14.9
	57	65.7	7.3	65.7	65.7	65.7	52.4	39.0	25.7	58.9	8.0	58.9	58.9	58.9	45.5	32.1	18.7

1. These capacities are gross ratings. For net capacity, deduct air blower motor, MBh = 3.415 x kW. Refer to the appropriate Blower Performance Table for the kW of the supply air blower motor.
2. These ratings include the condenser fan motors (total 1 kW) and the compressor motors but not the supply air blower motor.

ZH090 (7.5 Ton)

Air on Evaporator Coil		Temperature of Air on Condenser Coil															
CFM	WB (°F)	Total Capacity ¹ (MBh)	Total Input (kW) ²	Sensible Capacity (MBh)						Total Capacity ¹ (MBh)	Total Input (kW) ²	Sensible Capacity (MBh)					
				Return Dry Bulb (°F)								Return Dry Bulb (°F)					
				90	85	80	75	70	65			90	85	80	75	70	65
		75°F								85°F							
1875	77	119.1	5.6	50.2	42.2	34.1	-	-	-	108.4	6.2	46.6	38.5	30.3	-	-	-
	72	107.7	5.5	63.0	54.9	46.8	38.7	-	-	99.3	6.1	59.4	51.3	43.2	35.1	-	-
	67	96.3	5.3	75.8	67.7	59.6	51.5	43.4	-	90.2	6.1	72.3	64.1	56.0	47.9	39.8	-
	62	91.3	5.3	91.3	88.6	75.9	67.8	59.7	51.6	83.9	6.0	83.9	82.5	70.3	62.1	54.0	45.9
2250	77	123.0	5.6	55.4	46.1	36.7	-	-	-	112.2	6.2	51.7	42.4	33.1	-	-	-
	72	111.2	5.5	69.1	59.8	50.5	41.2	-	-	102.7	6.1	65.7	56.4	47.1	37.7	-	-
	67	99.4	5.3	82.8	73.5	64.2	54.9	45.6	-	93.3	6.1	79.7	70.4	61.0	51.7	42.4	-
	62	94.2	5.3	94.2	92.4	81.8	72.5	63.2	53.9	86.8	6.0	86.8	85.9	76.6	67.2	57.9	48.6
	57	87.2	5.3	87.2	87.2	81.7	72.3	63.0	53.7	84.0	6.0	84.0	84.0	77.0	67.6	58.3	49.0
2625	77	126.8	5.6	60.5	50.0	39.4	-	-	-	115.9	6.2	56.9	46.3	35.8	-	-	-
	72	114.7	5.5	75.2	64.6	54.1	43.6	-	-	106.2	6.1	72.0	61.5	50.9	40.4	-	-
	67	102.5	5.3	89.9	79.3	68.8	58.3	47.7	-	96.5	6.1	87.2	76.6	66.1	55.5	45.0	-
	62	97.2	5.3	97.2	96.3	87.7	77.2	66.6	56.1	89.7	6.0	89.7	89.3	82.9	72.3	61.8	51.2
	57	89.9	5.3	89.9	89.9	87.5	77.0	66.5	55.9	86.8	6.0	86.8	86.8	83.3	72.7	62.2	51.7
3000	77	130.7	5.6	65.6	53.9	42.1	-	-	-	119.7	6.2	62.0	50.3	38.5	-	-	-
	72	118.1	5.5	81.3	69.5	57.8	46.0	-	-	109.6	6.2	78.3	66.6	54.8	43.1	-	-
	67	105.6	5.3	96.9	85.2	73.4	61.7	49.9	-	99.6	6.1	94.6	82.9	71.1	59.4	47.6	-
	62	100.1	5.3	100.1	100.1	93.6	81.8	70.1	58.3	92.6	6.0	92.6	92.6	89.2	77.4	65.7	53.9
	57	92.6	5.3	92.6	92.6	93.4	81.6	69.9	58.1	89.6	6.0	89.6	89.6	89.6	77.9	66.1	54.4
3375	72	120.9	5.8	86.4	74.0	61.6	49.2	-	-	111.3	6.3	83.7	71.0	58.4	45.8	-	-
	67	108.1	5.6	103.7	90.7	78.3	65.9	53.5	-	101.1	6.2	98.6	88.4	75.8	63.1	50.5	-
	62	102.4	5.6	102.4	102.4	99.2	86.8	74.4	62.0	94.0	6.2	94.0	94.0	92.3	79.7	67.0	54.4
	57	94.9	5.6	94.9	94.9	95.2	82.9	70.5	58.1	91.0	6.2	91.0	91.0	91.0	78.3	65.7	53.1
3750	72	123.6	6.1	91.5	78.4	65.4	52.4	-	-	112.9	6.5	89.0	75.5	62.0	48.5	-	-
	67	110.6	6.0	110.6	96.2	83.2	70.2	57.1	-	102.6	6.4	102.6	93.9	80.4	66.9	53.4	-
	62	104.8	5.9	104.8	104.8	104.8	91.7	78.7	65.7	95.4	6.3	95.4	95.4	95.4	81.9	68.3	54.8
	57	97.1	5.9	97.1	97.1	97.1	84.1	71.0	58.0	92.3	6.3	92.3	92.3	92.3	78.8	65.3	51.8
		95°F								105°F							
1875	77	97.7	6.9	42.9	34.8	26.6	-	-	-	92.8	7.7	37.6	32.1	24.0	-	-	-
	72	90.9	6.8	55.8	47.7	39.5	31.4	-	-	85.2	7.7	52.9	44.8	36.7	28.7	-	-
	67	84.2	6.8	68.7	60.6	52.4	44.3	36.1	-	77.7	7.6	68.1	57.5	49.5	41.4	33.4	-
	62	76.5	6.7	76.5	76.5	64.6	56.4	48.3	40.1	72.0	7.6	72.0	72.0	59.4	51.4	43.3	35.3
2250	77	101.3	6.9	48.1	38.8	29.4	-	-	-	95.7	7.7	45.3	35.9	26.6	-	-	-
	72	94.3	6.8	62.3	53.0	43.6	34.3	-	-	87.9	7.7	59.4	50.0	40.7	31.3	-	-
	67	87.3	6.8	76.6	67.2	57.9	48.5	39.2	-	80.1	7.6	73.5	64.1	54.8	45.4	36.0	-
	62	79.4	6.7	79.4	79.4	71.3	62.0	52.6	43.3	74.2	7.6	74.2	74.2	65.8	56.4	47.0	37.7
	57	80.8	6.7	80.8	80.8	72.2	62.9	53.5	44.2	75.6	7.6	75.6	75.3	66.3	57.0	47.6	38.2
2625	77	105.0	6.9	53.3	42.7	32.2	-	-	-	98.5	7.7	53.0	39.8	29.1	-	-	-
	72	97.7	6.8	68.9	58.3	47.8	37.2	-	-	90.5	7.7	65.9	55.2	44.6	33.9	-	-
	67	90.4	6.8	84.4	73.9	63.3	52.8	42.2	-	82.5	7.6	78.8	70.7	60.0	49.4	38.7	-
	62	82.2	6.7	82.2	82.2	78.0	67.5	57.0	46.4	76.4	7.6	76.4	76.4	72.1	61.4	50.8	40.1
	57	83.7	6.7	83.7	83.7	79.1	68.5	58.0	47.4	77.9	7.6	77.9	77.7	72.7	62.0	51.4	40.7
3000	77	108.6	6.9	58.4	46.7	35.0	-	-	-	101.4	7.7	60.7	43.7	31.7	-	-	-
	72	101.1	6.9	75.4	63.6	51.9	40.1	-	-	93.1	7.7	72.4	60.5	48.5	36.5	-	-
	67	93.6	6.8	92.3	80.5	68.8	57.1	45.3	-	84.9	7.7	84.2	77.3	65.3	53.3	41.3	-
	62	85.1	6.8	85.1	85.1	84.8	73.0	61.3	49.5	78.6	7.6	78.6	78.6	78.4	66.5	54.5	42.5
	57	86.6	6.8	86.6	86.6	85.9	74.1	62.4	50.6	80.1	7.6	80.1	80.1	79.1	67.1	55.1	43.2
3375	72	101.6	6.9	81.0	68.1	55.2	42.3	-	-	93.6	7.7	77.8	64.7	51.7	38.6	-	-
	67	94.1	6.8	93.4	86.1	73.2	60.3	47.5	-	85.3	7.7	85.0	80.8	69.6	56.5	43.5	-
	62	85.6	6.8	85.6	85.6	85.4	72.5	59.6	46.7	79.0	7.6	79.0	79.0	79.0	65.9	52.9	39.8
	57	87.1	6.8	87.1	87.1	86.7	73.8	60.9	48.1	80.6	7.6	80.6	80.6	80.1	67.0	54.0	40.9
3750	72	102.2	6.9	86.6	72.6	58.5	44.5	-	-	94.2	7.7	83.1	69.0	54.9	40.7	-	-
	67	94.6	6.8	94.6	91.7	77.6	63.6	49.6	-	85.8	7.7	85.8	84.4	73.9	59.8	45.6	-
	62	86.0	6.8	86.0	86.0	86.0	72.0	58.0	44.0	79.5	7.6	79.5	79.5	79.5	65.4	51.2	37.1
	57	87.5	6.8	87.5	87.5	87.5	73.5	59.5	45.5	81.0	7.6	81.0	81.0	81.0	66.9	52.8	38.6

ZH090 (7.5 Ton) (Continued)

Air on Evaporator Coil		Temperature of Air on Condenser Coil															
CFM	WB (°F)	Total Capacity ¹ (MBh)	Total Input (kW) ²	Sensible Capacity (MBh)						Total Capacity ¹ (MBh)	Total Input (kW) ²	Sensible Capacity (MBh)					
				Return Dry Bulb (°F)								Return Dry Bulb (°F)					
				90	85	80	75	70	65			90	85	80	75	70	65
		115°F								125°F							
1875	77	88.0	8.6	32.3	29.4	21.4	-	-	-	83.1	9.4	29.2	25.0	18.8	-	-	-
	72	79.6	8.5	49.9	41.9	34.0	26.0	-	-	73.9	9.4	46.9	39.1	31.2	23.3	-	-
	67	71.1	8.5	67.5	54.5	46.5	38.6	30.6	-	64.6	9.3	64.6	51.5	43.6	35.7	27.8	-
	62	67.4	8.5	67.4	67.4	54.3	46.3	38.3	30.4	62.8	9.3	62.8	62.8	49.1	41.2	33.3	25.5
2250	77	90.0	8.6	42.5	33.1	23.7	-	-	-	84.4	9.4	41.4	30.3	20.9	-	-	-
	72	81.4	8.5	56.4	47.1	37.7	28.3	-	-	75.0	9.4	53.5	44.1	34.7	25.3	-	-
	67	72.8	8.5	70.4	61.0	51.6	42.2	32.9	-	65.6	9.3	65.6	57.9	48.5	39.1	29.7	-
	62	69.0	8.5	69.0	69.0	60.2	50.8	41.4	32.1	63.8	9.3	63.8	63.8	54.7	45.3	35.9	26.5
	57	70.4	8.5	70.4	69.8	60.4	51.0	41.6	32.3	65.2	9.3	65.2	64.3	54.5	45.1	35.7	26.3
2625	77	92.1	8.6	52.7	36.9	26.1	-	-	-	85.6	9.4	53.6	35.6	23.0	-	-	-
	72	83.3	8.5	63.0	52.2	41.4	30.6	-	-	76.1	9.4	60.1	49.1	38.2	27.3	-	-
	67	74.5	8.5	73.3	67.5	56.7	45.9	35.1	-	66.5	9.3	66.5	64.3	53.4	42.5	31.6	-
	62	70.5	8.5	70.5	70.5	66.2	55.4	44.6	33.8	64.7	9.3	64.7	64.7	60.2	49.3	38.4	27.4
	57	72.0	8.5	72.0	71.7	66.4	55.6	44.8	34.0	66.1	9.3	66.1	65.7	60.0	49.1	38.2	27.3
3000	77	94.1	8.6	63.0	40.6	28.4	-	-	-	86.9	9.4	65.9	41.0	25.2	-	-	-
	72	85.1	8.5	69.5	57.3	45.1	32.9	-	-	77.1	9.4	66.6	54.2	41.7	29.3	-	-
	67	76.1	8.5	76.1	74.0	61.8	49.6	37.4	-	67.4	9.3	67.4	67.4	58.3	45.9	33.4	-
	62	72.1	8.5	72.1	72.1	72.1	59.9	47.7	35.5	65.6	9.3	65.6	65.6	65.6	53.3	40.9	28.4
	57	73.6	8.5	73.6	73.6	72.3	60.1	47.9	35.7	67.1	9.3	67.1	67.1	65.6	53.1	40.7	28.2
3375	72	85.6	8.5	74.6	61.4	48.1	34.9	-	-	77.7	9.4	71.4	58.0	44.6	31.2	-	-
	67	76.6	8.5	76.6	75.5	66.0	52.7	39.5	-	67.8	9.3	67.8	67.8	62.3	48.9	35.6	-
	62	72.5	8.5	72.5	72.5	72.5	59.3	46.1	32.9	66.0	9.4	66.0	66.0	66.0	52.7	39.3	25.9
	57	74.0	8.5	74.0	74.0	73.4	60.2	47.0	33.7	67.5	9.4	67.5	67.5	66.8	53.4	40.0	26.6
3750	72	86.2	8.6	79.6	65.4	51.2	36.9	-	-	78.2	9.4	76.2	61.8	47.5	33.2	-	-
	67	77.1	8.5	77.1	77.1	70.1	55.9	41.7	-	68.3	9.4	68.3	68.3	66.4	52.0	37.7	-
	62	73.0	8.5	73.0	73.0	73.0	58.8	44.5	30.3	66.5	9.4	66.5	66.5	66.5	52.1	37.8	23.5
	57	74.5	8.5	74.5	74.5	74.5	60.3	46.0	31.8	68.0	9.4	68.0	68.0	68.0	53.6	39.3	24.9

1. These capacities are gross ratings. For net capacity, deduct air blower motor, MBh = 3.415 x kW. Refer to the appropriate Blower Performance Table for the kW of the supply air blower motor.
2. These ratings include the condenser fan motors (total 1 kW) and the compressor motors but not the supply air blower motor.

ZH102 (8.5 Ton)

Air on Evaporator Coil		Temperature of Air on Condenser Coil															
CFM	WB (°F)	Total Capacity ¹ (MBh)	Total Input (kW) ²	Sensible Capacity (MBh)						Total Capacity ¹ (MBh)	Total Input (kW) ²	Sensible Capacity (MBh)					
				Return Dry Bulb (°F)								Return Dry Bulb (°F)					
				90	85	80	75	70	65			90	85	80	75	70	65
		75°F								85°F							
2125	77	125.2	6.6	57.1	45.0	35.0	-	-	-	122.5	7.0	54.2	44.2	34.2	-	-	-
	72	116.5	6.6	70.4	60.4	50.3	40.3	-	-	112.6	7.0	69.1	59.1	49.1	39.1	-	-
	67	107.7	6.6	83.6	75.7	65.6	55.6	45.6	-	102.7	7.0	84.1	74.0	64.0	54.0	44.0	-
	62	98.3	6.6	98.3	97.6	78.5	68.4	58.4	48.4	93.7	6.9	93.7	93.4	77.0	67.0	57.0	47.0
2550	77	130.8	6.5	62.2	50.6	39.0	-	-	-	127.0	7.0	61.1	49.5	37.9	-	-	-
	72	121.6	6.5	79.3	67.7	56.1	44.5	-	-	116.7	7.0	77.6	66.0	54.4	42.8	-	-
	67	112.5	6.5	96.4	84.8	73.2	61.6	50.0	-	106.4	7.0	94.1	82.5	70.9	59.3	47.7	-
	62	102.6	6.5	102.6	102.2	87.5	75.9	64.3	52.7	97.1	6.9	97.1	96.9	85.3	73.7	62.1	50.5
	57	100.7	6.5	100.7	100.7	89.3	77.7	66.1	54.5	97.1	6.9	97.1	97.1	85.7	74.1	62.5	50.9
2975	77	136.3	6.3	67.3	56.2	43.0	-	-	-	131.4	7.0	68.0	54.7	41.6	-	-	-
	72	126.8	6.3	88.2	75.0	61.9	48.7	-	-	120.8	7.0	86.0	72.8	59.7	46.5	-	-
	67	117.2	6.3	109.2	93.9	80.7	67.5	54.4	-	110.2	7.0	104.0	90.9	77.8	64.6	51.4	-
	62	106.9	6.3	106.9	106.7	96.5	83.3	70.2	57.0	100.5	6.9	100.5	100.4	93.6	80.4	67.3	54.1
	57	105.0	6.3	105.0	105.0	98.5	85.4	72.2	59.0	100.5	7.0	100.5	100.5	94.0	80.8	67.6	54.5
3400	77	141.9	6.2	72.4	61.8	47.0	-	-	-	135.9	7.0	74.9	60.0	45.3	-	-	-
	72	131.9	6.2	97.1	82.4	67.6	52.9	-	-	124.9	7.0	94.4	79.7	65.0	50.2	-	-
	67	121.9	6.2	121.9	103.0	88.3	73.5	58.8	-	113.9	7.0	113.9	99.4	84.6	69.9	55.2	-
	62	111.2	6.2	111.2	111.2	105.5	90.8	76.0	61.3	103.9	6.9	103.9	103.9	101.9	87.1	72.4	57.7
	57	109.3	6.2	109.3	109.3	107.7	93.0	78.2	63.5	103.9	7.0	103.9	103.9	102.3	87.5	72.8	58.1
3825	72	135.0	6.2	123.1	97.7	72.3	46.9	-	-	127.6	7.0	111.3	90.5	69.7	48.9	-	-
	67	124.8	6.2	124.8	115.3	94.3	68.9	43.5	-	116.4	7.0	116.4	109.1	90.8	70.0	49.2	-
	62	113.8	6.2	113.8	113.8	111.0	85.6	60.2	34.8	106.2	7.0	106.2	106.2	105.2	84.4	63.6	42.8
	57	111.8	6.2	111.8	111.8	111.0	85.6	60.3	34.9	106.2	7.0	106.2	106.2	105.4	84.6	63.8	43.0
4250	72	138.1	6.2	149.0	113.0	76.9	40.9	-	-	130.3	7.0	128.1	101.3	74.4	47.6	-	-
	67	127.6	6.2	127.6	127.6	100.4	64.3	28.3	-	118.9	7.0	118.9	118.9	97.0	70.2	43.3	-
	62	116.4	6.3	116.4	116.4	116.4	80.4	44.3	8.3	108.5	7.0	108.5	108.5	108.5	81.6	54.8	27.9
	57	114.4	6.2	114.4	114.4	114.4	78.3	42.3	6.2	108.5	7.0	108.5	108.5	108.5	81.6	54.8	27.9
		95°F								105°F							
2125	77	119.8	7.3	51.2	43.5	33.5	-	-	-	112.1	8.4	45.1	39.9	29.9	-	-	-
	72	108.7	7.3	67.9	57.9	47.9	37.9	-	-	101.7	8.4	64.7	54.8	44.8	34.9	-	-
	67	97.7	7.3	84.6	72.4	62.4	52.4	42.4	-	91.2	8.4	84.3	69.6	59.7	49.8	39.8	-
	62	89.1	7.2	89.1	89.1	75.6	65.6	55.6	45.6	83.4	8.3	83.4	83.4	72.8	62.9	53.0	43.0
2550	77	123.2	7.5	60.0	48.4	36.8	-	-	-	114.7	8.5	55.9	44.4	33.0	-	-	-
	72	111.8	7.5	75.8	64.3	52.7	41.1	-	-	104.0	8.5	72.3	60.8	49.3	37.9	-	-
	67	100.4	7.5	91.7	80.2	68.6	57.0	45.5	-	93.3	8.5	88.7	77.2	65.7	54.2	42.8	-
	62	91.6	7.4	91.6	91.6	83.1	71.6	60.0	48.4	85.3	8.4	85.3	85.3	80.2	68.7	57.2	45.7
	57	93.5	7.4	93.5	93.5	82.0	70.4	58.8	47.3	87.0	8.5	87.0	87.0	76.8	65.3	53.8	42.3
2975	77	126.5	7.6	68.7	53.3	40.2	-	-	-	117.3	8.6	66.7	49.0	36.0	-	-	-
	72	114.9	7.6	83.8	70.6	57.5	44.3	-	-	106.4	8.6	79.9	66.9	53.9	40.8	-	-
	67	103.2	7.6	98.8	88.0	74.8	61.7	48.5	-	95.4	8.6	93.1	84.8	71.7	58.7	45.7	-
	62	94.1	7.5	94.1	94.1	90.7	77.5	64.4	51.2	87.2	8.6	87.2	87.2	87.5	74.5	61.4	48.4
	57	96.0	7.6	96.0	96.0	89.4	76.3	63.1	50.0	89.0	8.6	89.0	89.0	83.8	70.8	57.7	44.7
3400	77	129.9	7.8	77.5	58.2	43.5	-	-	-	119.9	8.7	77.6	53.6	39.0	-	-	-
	72	117.9	7.8	91.7	77.0	62.3	47.5	-	-	108.8	8.7	87.6	73.0	58.4	43.8	-	-
	67	105.9	7.8	105.9	95.7	81.0	66.3	51.6	-	97.6	8.7	97.6	92.3	77.8	63.2	48.6	-
	62	96.6	7.7	96.6	96.6	98.2	83.5	68.7	54.0	89.2	8.7	89.2	89.2	94.8	80.2	65.6	51.0
	57	98.6	7.7	98.6	98.6	96.8	82.1	67.4	52.7	91.0	8.7	91.0	91.0	90.8	76.2	61.6	47.0
3825	72	120.3	7.8	99.5	83.3	67.1	50.9	-	-	110.9	8.7	95.1	79.0	63.0	46.9	-	-
	67	108.0	7.8	108.0	102.9	87.3	71.1	55.0	-	99.5	8.7	99.5	96.9	83.9	67.8	51.8	-
	62	98.6	7.7	98.6	98.6	99.3	83.2	67.0	50.8	91.0	8.6	91.0	91.0	93.8	77.8	61.7	45.7
	57	100.6	7.7	100.6	100.6	99.7	83.5	67.3	51.1	92.8	8.7	92.8	92.8	92.7	76.7	60.6	44.6
4250	72	122.6	7.8	107.2	89.6	71.9	54.3	-	-	113.1	8.7	102.6	85.1	67.6	50.1	-	-
	67	110.1	7.8	110.1	110.1	93.6	76.0	58.3	-	101.5	8.7	101.5	101.5	90.0	72.5	55.0	-
	62	100.5	7.7	100.5	100.5	100.5	82.9	65.2	47.6	92.8	8.6	92.8	92.8	92.8	75.3	57.8	40.3
	57	102.5	7.7	102.5	102.5	102.5	84.9	67.3	49.6	94.6	8.7	94.6	94.6	94.6	77.1	59.6	42.2

ZH102 (8.5 Ton) (Continued)

Air on Evaporator Coil		Temperature of Air on Condenser Coil															
CFM	WB (°F)	Total Capacity ¹ (MBh)	Total Input (kW) ²	Sensible Capacity (MBh)						Total Capacity ¹ (MBh)	Total Input (kW) ²	Sensible Capacity (MBh)					
				Return Dry Bulb (°F)								Return Dry Bulb (°F)					
				90	85	80	75	70	65			90	85	80	75	70	65
		115°F								125°F							
2125	77	104.5	9.5	39.0	36.3	26.4	-	-	-	96.8	10.6	38.2	30.3	22.9	-	-	-
	72	94.6	9.5	61.5	51.6	41.7	31.8	-	-	87.5	10.6	58.2	48.4	38.6	28.8	-	-
	67	84.7	9.5	83.9	66.9	57.0	47.2	37.3	-	78.2	10.6	78.2	64.2	54.4	44.6	34.8	-
	62	77.6	9.5	77.6	77.6	70.0	60.2	50.3	40.4	71.8	10.6	71.8	71.8	71.8	57.5	47.7	37.9
2550	77	106.3	9.5	51.9	40.5	29.1	-	-	-	97.9	10.5	51.4	36.5	25.2	-	-	-
	72	96.3	9.5	68.8	57.4	46.0	34.6	-	-	88.5	10.6	65.2	53.9	42.6	31.3	-	-
	67	86.2	9.6	85.7	74.3	62.9	51.4	40.0	-	79.1	10.6	79.1	71.3	60.0	48.7	37.3	-
	62	78.9	9.5	78.9	78.9	77.2	65.8	54.4	43.0	72.6	10.6	72.6	72.6	72.6	62.9	51.6	40.3
	57	80.5	9.5	80.5	80.5	71.6	60.2	48.8	37.4	74.0	10.6	74.0	74.0	66.4	55.0	43.7	32.4
2975	77	108.2	9.6	64.8	44.7	31.8	-	-	-	99.0	10.5	64.5	42.8	27.6	-	-	-
	72	97.9	9.6	76.1	63.2	50.2	37.3	-	-	89.5	10.6	72.3	59.4	46.6	33.8	-	-
	67	87.7	9.6	87.4	81.6	68.7	55.7	42.8	-	80.0	10.6	80.0	78.4	65.6	52.8	39.9	-
	62	80.3	9.6	80.3	80.3	84.3	71.4	58.5	45.5	73.4	10.6	73.4	73.4	73.4	68.3	55.5	42.7
	57	81.9	9.6	81.9	81.9	78.2	65.3	52.3	39.4	74.9	10.6	74.9	74.9	72.6	59.8	46.9	34.1
3400	77	110.0	9.6	77.6	48.9	34.5	-	-	-	100.0	10.5	77.7	49.0	30.0	-	-	-
	72	99.6	9.6	83.4	68.9	54.5	40.0	-	-	90.4	10.5	79.3	64.9	50.6	36.3	-	-
	67	89.2	9.7	89.2	89.0	74.5	60.0	45.5	-	80.8	10.6	80.8	80.8	71.2	56.9	42.5	-
	62	81.7	9.6	81.7	81.7	91.5	77.0	62.5	48.1	74.2	10.6	74.2	74.2	74.2	73.8	59.4	45.1
	57	83.3	9.6	83.3	83.3	84.8	70.3	55.9	41.4	75.7	10.5	75.7	75.7	75.7	64.5	50.1	35.8
3825	72	101.6	9.6	90.7	74.8	58.9	43.0	-	-	92.3	10.5	86.3	70.5	54.7	39.0	-	-
	67	91.0	9.6	91.0	90.9	80.5	64.6	48.7	-	82.5	10.6	82.5	82.5	77.0	61.3	45.5	-
	62	83.3	9.6	83.3	83.3	88.2	72.3	56.4	40.5	75.7	10.5	75.7	75.7	75.7	66.9	51.2	35.4
	57	85.0	9.6	85.0	85.0	85.8	69.9	54.0	38.1	77.2	10.5	77.2	77.2	77.2	63.0	47.3	31.5
4250	72	103.7	9.6	97.9	80.6	63.2	45.9	-	-	94.2	10.5	93.3	76.1	58.9	41.7	-	-
	67	92.9	9.6	92.9	92.9	86.4	69.1	51.8	-	84.2	10.6	84.2	84.2	82.9	65.7	48.5	-
	62	85.0	9.6	85.0	85.0	85.0	67.7	50.3	33.0	77.3	10.5	77.3	77.3	77.3	60.1	42.9	25.7
	57	86.7	9.6	86.7	86.7	86.7	69.4	52.0	34.7	78.8	10.5	78.8	78.8	78.8	61.6	44.4	27.2

1. These capacities are gross ratings. For net capacity, deduct air blower motor, MBh = 3.415 x kW. Refer to the appropriate Blower Performance Table for the kW of the supply air blower motor.
2. These ratings include the condenser fan motors (total 1 kW) and the compressor motors but not the supply air blower motor.

ZH120 (10 Ton)

Air on Evaporator Coil		Temperature of Air on Condenser Coil																			
CFM	WB (°F)	Total Capacity ¹ (MBh)	Total Input (kW) ²	Sensible Capacity (MBh)						Total Capacity ¹ (MBh)	Total Input (kW) ²	Sensible Capacity (MBh)									
				Return Dry Bulb (°F)								Return Dry Bulb (°F)									
				90	85	80	75	70	65			90	85	80	75	70	65				
		75°F										85°F									
2500	77	156.1	7.6	68.9	57.2	46.2	-	-	-	147.4	8.5	64.0	52.8	41.6	-	-	-				
	72	144.0	7.5	85.7	74.7	63.7	52.6	-	-	136.1	8.3	82.0	70.8	59.6	48.4	-	-				
	67	131.9	7.4	102.5	92.2	81.1	70.1	59.1	-	124.7	8.2	100.0	88.8	77.6	66.4	55.2	-				
	62	117.8	7.4	117.8	118.1	100.3	89.2	78.2	67.2	113.3	8.2	113.3	112.8	94.7	83.5	72.2	61.0				
3000	77	160.9	7.6	75.6	62.9	50.2	-	-	-	151.8	8.5	71.2	58.3	45.5	-	-	-				
	72	148.4	7.5	94.6	81.9	69.2	56.5	-	-	140.1	8.4	90.9	78.0	65.1	52.2	-	-				
	67	136.0	7.4	113.6	100.9	88.2	75.5	62.8	-	128.5	8.3	110.6	97.7	84.8	71.9	59.0	-				
	62	121.5	7.4	121.5	121.7	109.0	96.3	83.6	70.9	116.7	8.3	116.7	116.4	103.5	90.6	77.7	64.8				
	57	117.2	7.3	117.2	117.2	114.2	101.5	88.8	76.1	113.2	8.3	113.2	113.2	107.1	94.3	81.4	68.5				
3500	77	165.7	7.6	82.3	68.6	54.3	-	-	-	156.2	8.6	78.5	63.9	49.3	-	-	-				
	72	152.9	7.5	103.4	89.1	74.7	60.4	-	-	144.2	8.4	99.8	85.2	70.7	56.1	-	-				
	67	140.0	7.4	124.6	109.6	95.2	80.9	66.5	-	132.2	8.3	121.1	106.6	92.0	77.5	62.9	-				
	62	125.1	7.5	125.1	125.2	117.7	103.3	89.0	74.6	120.1	8.3	120.1	119.9	112.3	97.7	83.2	68.6				
	57	120.7	7.3	120.7	120.7	123.4	109.0	94.7	80.3	116.5	8.3	116.5	116.5	116.3	101.7	87.1	72.6				
4000	77	170.5	7.6	88.9	74.3	58.3	-	-	-	160.6	8.6	85.7	69.4	53.2	-	-	-				
	72	157.3	7.5	112.3	96.3	80.3	64.3	-	-	148.3	8.5	108.7	92.5	76.2	60.0	-	-				
	67	144.1	7.4	135.7	118.3	102.3	86.2	70.2	-	135.9	8.3	131.7	115.5	99.2	83.0	66.8	-				
	62	128.7	7.5	128.7	128.7	126.4	110.4	94.4	78.4	123.4	8.3	123.4	123.4	121.1	104.9	88.6	72.4				
	57	124.3	7.3	124.3	124.3	132.5	116.5	100.5	84.5	119.8	8.3	119.8	119.8	125.4	109.1	92.9	76.7				
4500	72	161.7	7.5	120.9	103.3	85.7	68.1	-	-	152.1	8.5	117.1	99.3	81.5	63.7	-	-				
	67	148.1	7.4	143.9	126.8	109.2	91.6	74.0	-	139.4	8.3	137.3	123.9	106.1	88.4	70.6	-				
	62	132.3	7.5	132.3	132.3	131.2	113.6	96.0	78.4	126.6	8.4	126.6	126.6	125.4	107.6	89.9	72.1				
	57	127.8	7.3	127.8	127.8	131.9	114.3	96.7	79.1	122.8	8.4	122.8	122.8	125.6	107.9	90.1	72.3				
5000	72	166.1	7.5	129.6	110.4	91.2	72.0	-	-	155.9	8.5	125.4	106.1	86.8	67.5	-	-				
	67	152.2	7.4	152.2	135.3	116.1	96.9	77.7	-	142.9	8.4	142.9	132.3	113.0	93.7	74.4	-				
	62	136.0	7.5	136.0	136.0	136.0	116.8	97.6	78.4	129.8	8.4	129.8	129.8	129.8	110.4	91.1	71.8				
	57	131.3	7.3	131.3	131.3	131.3	112.1	92.9	73.7	125.9	8.4	125.9	125.9	125.9	106.6	87.3	68.0				
		95°F										105°F									
2500	77	138.8	9.4	59.1	48.4	37.0	-	-	-	133.4	10.5	53.7	46.1	34.9	-	-	-				
	72	128.2	9.2	78.3	66.9	55.5	44.1	-	-	122.8	10.4	76.1	64.9	53.6	42.4	-	-				
	67	117.6	9.1	97.5	85.4	74.0	62.6	51.2	-	112.2	10.3	98.5	83.6	72.4	61.1	49.9	-				
	62	108.7	9.0	108.7	107.5	89.1	77.7	66.3	54.9	104.1	10.3	104.1	103.5	86.7	75.4	64.2	53.0				
3000	77	142.8	9.4	66.9	53.8	40.7	-	-	-	135.8	10.6	64.1	51.1	38.1	-	-	-				
	72	131.9	9.3	87.2	74.1	61.1	48.0	-	-	125.0	10.5	84.6	71.6	58.6	45.6	-	-				
	67	121.0	9.1	107.6	94.5	81.4	68.3	55.3	-	114.1	10.3	105.0	92.0	79.0	66.0	53.0	-				
	62	111.9	9.1	111.9	111.1	98.0	84.9	71.8	58.7	106.0	10.3	106.0	105.6	94.6	81.7	68.7	55.7				
	57	109.1	9.2	109.1	109.1	100.1	87.0	73.9	60.8	103.9	10.4	103.9	103.9	94.2	81.2	68.2	55.2				
3500	77	146.8	9.5	74.6	59.2	44.4	-	-	-	138.1	10.6	74.5	56.1	41.3	-	-	-				
	72	135.6	9.3	96.2	81.4	66.6	51.8	-	-	127.1	10.5	93.0	78.3	63.5	48.7	-	-				
	67	124.4	9.2	117.7	103.6	88.8	74.0	59.3	-	116.1	10.4	111.6	100.4	85.7	70.9	56.2	-				
	62	115.0	9.1	115.0	114.6	106.9	92.1	77.3	62.5	107.8	10.4	107.8	107.6	102.6	87.9	73.1	58.4				
	57	112.2	9.3	112.2	112.2	109.2	94.4	79.6	64.8	105.7	10.4	105.7	105.7	102.1	87.4	72.6	57.8				
4000	77	150.8	9.6	82.4	64.6	48.1	-	-	-	140.4	10.7	84.9	61.1	44.6	-	-	-				
	72	139.3	9.4	105.1	88.6	72.1	55.7	-	-	129.3	10.5	101.5	85.0	68.5	51.9	-	-				
	67	127.8	9.2	127.8	112.7	96.2	79.7	63.3	-	118.1	10.4	118.1	108.9	92.3	75.8	59.3	-				
	62	118.2	9.2	118.2	118.2	115.8	99.3	82.8	66.4	109.6	10.4	109.6	109.6	110.6	94.1	77.6	61.0				
	57	115.3	9.3	115.3	115.3	118.3	101.8	85.3	68.8	107.5	10.5	107.5	107.5	110.1	93.5	77.0	60.5				
4500	72	142.5	9.4	113.2	95.2	77.3	59.3	-	-	132.1	10.6	109.5	91.5	73.5	55.5	-	-				
	67	130.7	9.3	130.7	121.0	103.1	85.1	67.2	-	120.7	10.4	120.7	115.1	99.1	81.1	63.1	-				
	62	120.8	9.2	120.8	120.8	119.7	101.7	83.8	65.8	112.1	10.4	112.1	112.1	112.6	94.6	76.5	58.5				
	57	117.9	9.4	117.9	117.9	119.4	101.4	83.5	65.5	109.9	10.5	109.9	109.9	111.2	93.2	75.2	57.2				
5000	72	145.6	9.5	121.3	101.9	82.4	63.0	-	-	135.0	10.6	117.5	98.0	78.5	59.0	-	-				
	67	133.6	9.3	133.6	129.4	109.9	90.5	71.1	-	123.4	10.4	123.4	121.3	105.9	86.4	66.9	-				
	62	123.5	9.3	123.5	123.5	123.5	104.1	84.7	65.3	114.5	10.4	114.5	114.5	114.5	95.0	75.5	56.0				
	57	120.5	9.4	120.5	120.5	120.5	101.1	81.7	62.3	112.3	10.5	112.3	112.3	112.3	92.8	73.3	53.8				

ZH120 (10 Ton) (Continued)

Air on Evaporator Coil		Temperature of Air on Condenser Coil															
CFM	WB (°F)	Total Capacity ¹ (MBh)	Total Input (kW) ²	Sensible Capacity (MBh)						Total Capacity ¹ (MBh)	Total Input (kW) ²	Sensible Capacity (MBh)					
				Return Dry Bulb (°F)								Return Dry Bulb (°F)					
				90	85	80	75	70	65			90	85	80	75	70	65
		115°F								125°F							
2500	77	128.1	11.7	48.4	43.9	32.8	-	-	-	122.7	12.9	43.0	40.4	30.7	-	-	-
	72	117.4	11.6	73.9	62.8	51.7	40.7	-	-	112.1	12.8	71.7	60.8	49.9	38.9	-	-
	67	106.8	11.5	99.5	81.8	70.7	59.6	48.5	-	101.4	12.7	100.5	80.0	69.1	58.1	47.2	-
	62	99.5	11.6	99.5	99.5	84.3	73.2	62.1	51.0	94.9	12.8	94.9	94.9	82.6	70.9	60.0	49.0
3000	77	128.7	11.7	61.4	48.4	35.5	-	-	-	121.7	12.9	58.6	45.8	33.0	-	-	-
	72	118.0	11.6	81.9	69.0	56.1	43.2	-	-	111.1	12.8	79.2	66.4	53.6	40.8	-	-
	67	107.3	11.5	102.5	89.5	76.6	63.7	50.8	-	100.5	12.7	99.9	87.1	74.2	61.4	48.6	-
	62	100.1	11.6	100.1	100.1	91.3	78.4	65.5	52.6	94.1	12.8	94.1	94.1	88.0	75.2	62.3	49.5
	57	98.8	11.6	98.8	98.8	88.2	75.3	62.4	49.5	93.6	12.8	93.6	93.6	82.3	69.5	56.7	43.8
3500	77	129.4	11.7	74.3	53.0	38.3	-	-	-	120.7	12.9	74.2	51.2	35.2	-	-	-
	72	118.6	11.6	89.9	75.2	60.4	45.7	-	-	110.2	12.8	86.8	72.0	57.3	42.6	-	-
	67	107.9	11.5	105.4	97.3	82.6	67.8	53.1	-	99.6	12.7	99.3	94.1	79.4	64.7	50.0	-
	62	100.6	11.6	100.6	100.6	98.4	83.6	68.9	54.2	93.3	12.8	93.3	93.3	93.3	79.4	64.7	50.0
	57	99.3	11.6	99.3	99.3	95.0	80.3	65.6	50.8	92.8	12.8	92.8	92.8	88.0	73.3	58.5	43.8
4000	77	130.1	11.8	87.3	57.6	41.0	-	-	-	119.7	12.9	89.8	56.6	37.5	-	-	-
	72	119.3	11.7	97.9	81.3	64.8	48.2	-	-	109.2	12.8	94.3	77.7	61.1	44.4	-	-
	67	108.4	11.6	108.4	105.0	88.5	71.9	55.3	-	98.8	12.7	98.8	98.8	84.6	68.0	51.4	-
	62	101.1	11.6	101.1	101.1	105.4	88.9	72.3	55.7	92.6	12.8	92.6	92.6	92.6	83.6	67.0	50.4
	57	99.8	11.6	99.8	99.8	101.9	85.3	68.7	52.2	92.0	12.8	92.0	92.0	92.0	77.1	60.4	43.8
4500	72	121.8	11.7	105.8	87.7	69.6	51.6	-	-	111.5	12.8	102.0	83.9	65.8	47.7	-	-
	67	110.8	11.6	110.8	109.1	95.2	77.1	59.0	-	100.8	12.7	100.8	100.8	91.2	73.1	55.0	-
	62	103.3	11.6	103.3	103.3	105.5	87.4	69.3	51.3	94.5	12.8	94.5	94.5	94.5	80.2	62.1	44.0
	57	101.9	11.6	101.9	101.9	103.0	84.9	66.9	48.8	94.0	12.8	94.0	94.0	94.0	76.7	58.6	40.4
5000	72	124.4	11.7	113.6	94.1	74.5	55.0	-	-	113.8	12.8	109.8	90.2	70.6	50.9	-	-
	67	113.1	11.6	113.1	113.1	101.8	82.3	62.7	-	102.9	12.7	102.9	102.9	97.8	78.1	58.5	-
	62	105.5	11.6	105.5	105.5	105.5	85.9	66.4	46.8	96.4	12.8	96.4	96.4	96.4	76.8	57.2	37.6
	57	104.1	11.6	104.1	104.1	104.1	84.6	65.0	45.4	95.9	12.8	95.9	95.9	95.9	76.3	56.7	37.0

1. These capacities are gross ratings. For net capacity, deduct air blower motor, MBh = 3.415 x kW. Refer to the appropriate Blower Performance Table for the kW of the supply air blower motor.
2. These ratings include the condenser fan motors (total 1 kW) and the compressor motors but not the supply air blower motor.

ZH150 (12.5 Ton)

Air on Evaporator Coil		Temperature of Air on Condenser Coil															
CFM	WB (°F)	Total Capacity ¹ (MBh)	Total Input (kW) ²	Sensible Capacity (MBh)						Total Capacity ¹ (MBh)	Total Input (kW) ²	Sensible Capacity (MBh)					
				Return Dry Bulb (°F)								Return Dry Bulb (°F)					
				90	85	80	75	70	65			90	85	80	75	70	65
		75°F										85°F					
3125	77	187.0	9.5	73.2	60.2	47.2	-	-	-	182.7	10.6	74.6	61.2	47.8	-	-	-
	72	176.3	9.5	98.5	85.5	72.4	59.4	-	-	169.9	10.5	98.6	85.2	71.9	58.5	-	-
	67	165.5	9.4	123.7	110.7	97.7	84.7	71.7	-	157.2	10.4	122.7	109.3	95.9	82.5	69.1	-
	62	149.3	9.2	149.3	143.1	119.8	106.8	93.8	80.8	142.6	10.2	142.6	139.6	118.5	105.1	91.7	78.3
3750	77	193.7	9.6	82.5	67.3	52.2	-	-	-	188.6	10.7	83.1	67.8	52.4	-	-	-
	72	182.5	9.6	110.4	95.2	80.1	64.9	-	-	175.5	10.6	109.5	94.1	78.8	63.5	-	-
	67	171.4	9.5	138.3	123.1	108.0	92.8	77.7	-	162.3	10.5	135.8	120.5	105.2	89.9	74.5	-
	62	154.5	9.3	154.5	150.5	132.4	117.3	102.1	87.0	147.3	10.3	147.3	145.3	129.9	114.6	99.3	84.0
	57	155.4	9.2	155.4	155.4	138.2	123.1	107.9	92.8	148.3	10.3	148.3	148.3	133.2	117.9	102.5	87.2
4375	77	200.3	9.7	91.7	74.4	57.2	-	-	-	194.6	10.8	91.6	74.3	57.1	-	-	-
	72	188.8	9.7	122.3	105.0	87.7	70.4	-	-	181.0	10.7	120.3	103.0	85.8	68.5	-	-
	67	177.2	9.6	152.8	135.5	118.2	101.0	83.7	-	167.5	10.6	149.0	131.7	114.5	97.2	80.0	-
	62	159.8	9.3	159.8	157.8	145.0	127.7	110.5	93.2	152.0	10.4	152.0	151.0	141.4	124.2	106.9	89.6
	57	160.7	9.3	160.7	160.7	151.3	134.0	116.8	99.5	152.9	10.4	152.9	152.9	144.9	127.7	110.4	93.2
5000	77	207.0	9.8	101.0	81.6	62.2	-	-	-	200.6	10.9	100.1	80.9	61.7	-	-	-
	72	195.1	9.8	134.2	114.7	95.3	75.9	-	-	186.6	10.8	131.1	111.9	92.7	73.5	-	-
	67	183.1	9.7	167.3	147.9	128.5	109.1	89.7	-	172.6	10.7	162.2	143.0	123.8	104.6	85.4	-
	62	165.1	9.4	165.1	165.1	157.6	138.2	118.8	99.4	156.6	10.5	156.6	156.6	152.9	133.7	114.5	95.3
	57	166.0	9.4	166.0	166.0	164.4	145.0	125.6	106.2	157.6	10.5	157.6	157.6	156.7	137.5	118.3	99.1
5625	72	203.6	9.7	143.3	122.5	101.8	81.1	-	-	193.3	10.8	140.6	120.0	99.4	78.7	-	-
	67	191.1	9.6	183.2	158.0	137.2	116.5	95.8	-	178.9	10.7	173.6	153.2	132.6	112.0	91.3	-
	62	172.4	9.4	172.4	172.4	168.6	147.9	127.1	106.4	162.3	10.5	162.3	162.3	160.4	139.8	119.2	98.5
	57	173.3	9.3	173.3	173.3	172.5	151.8	131.0	110.3	163.3	10.4	163.3	163.3	162.9	142.2	121.6	101.0
6250	72	212.2	9.7	152.4	130.3	108.2	86.2	-	-	200.1	10.8	150.1	128.0	106.0	83.9	-	-
	67	199.1	9.6	199.1	168.0	145.9	123.9	101.8	-	185.1	10.7	185.1	163.5	141.4	119.3	97.3	-
	62	179.6	9.4	179.6	179.6	179.6	157.5	135.5	113.4	168.0	10.4	168.0	168.0	168.0	145.9	123.8	101.8
	57	180.6	9.3	180.6	180.6	180.6	158.5	136.5	114.4	169.0	10.4	169.0	169.0	169.0	147.0	124.9	102.8
		95°F										105°F					
3125	77	178.3	11.7	76.0	62.2	48.4	-	-	-	167.8	13.1	69.9	58.4	44.7	-	-	-
	72	163.6	11.6	98.8	85.0	71.3	57.5	-	-	153.7	13.0	94.5	80.9	67.2	53.6	-	-
	67	148.9	11.5	121.6	107.9	94.1	80.3	66.6	-	139.7	12.8	119.1	103.4	89.7	76.1	62.4	-
	62	136.0	11.2	136.0	136.0	117.1	103.4	89.6	75.8	128.6	12.6	128.6	128.6	108.9	95.2	81.5	67.9
3750	77	183.6	11.8	83.7	68.2	52.7	-	-	-	172.5	13.2	79.8	64.4	48.9	-	-	-
	72	168.4	11.7	108.6	93.1	77.6	62.1	-	-	158.0	13.0	104.4	89.0	73.5	58.1	-	-
	67	153.3	11.6	133.4	117.9	102.4	86.9	71.4	-	143.6	12.9	129.0	113.6	98.1	82.7	67.2	-
	62	140.1	11.3	140.1	140.1	127.5	112.0	96.5	81.0	132.2	12.7	132.2	132.2	119.0	103.6	88.1	72.7
	57	141.1	11.3	141.1	141.1	128.2	112.7	97.2	81.6	132.5	12.7	132.5	132.5	119.2	103.7	88.3	72.8
4375	77	188.9	12.0	91.5	74.2	57.0	-	-	-	177.2	13.3	89.7	70.4	53.1	-	-	-
	72	173.3	11.8	118.3	101.1	83.9	66.6	-	-	162.3	13.1	114.3	97.1	79.8	62.5	-	-
	67	157.7	11.7	145.2	128.0	110.7	93.5	76.2	-	147.5	13.0	138.9	123.8	106.5	89.3	72.0	-
	62	144.1	11.4	144.1	144.1	137.8	120.6	103.3	86.1	135.8	12.8	135.8	135.8	129.2	112.0	94.7	77.4
	57	145.2	11.4	145.2	145.2	138.6	121.3	104.1	86.8	136.1	12.8	136.1	136.1	129.4	112.1	94.8	77.6
5000	77	194.1	12.1	99.2	80.3	61.3	-	-	-	181.9	13.3	99.7	76.3	57.3	-	-	-
	72	178.1	11.9	128.1	109.1	90.1	71.2	-	-	166.6	13.2	124.2	105.2	86.1	67.0	-	-
	67	162.1	11.8	157.0	138.0	119.0	100.0	81.0	-	151.4	13.1	148.8	134.0	114.9	95.9	76.8	-
	62	148.1	11.5	148.1	148.1	129.2	110.2	91.2	72.0	139.4	12.9	139.4	139.4	139.4	120.3	101.3	82.2
	57	149.2	11.5	149.2	149.2	148.9	130.0	111.0	92.0	139.7	12.9	139.7	139.7	139.6	120.5	101.4	82.4
5625	72	183.1	11.9	138.0	117.4	96.9	76.4	-	-	170.9	13.2	133.8	113.2	92.7	72.1	-	-
	67	166.6	11.8	164.0	148.5	128.0	107.4	86.9	-	155.3	13.1	154.0	143.5	123.7	103.1	82.5	-
	62	152.2	11.5	152.2	152.2	152.2	131.7	111.2	90.7	143.0	12.9	143.0	143.0	143.0	122.4	101.8	81.2
	57	153.4	11.5	153.4	153.4	153.2	132.7	112.2	91.6	143.3	12.9	143.3	143.3	143.2	122.6	102.0	81.5
6250	72	188.0	11.9	147.8	125.7	103.7	81.6	-	-	175.1	13.2	143.4	121.3	99.2	77.1	-	-
	67	171.1	11.8	171.1	159.0	136.9	114.8	92.8	-	159.1	13.1	159.1	153.1	132.5	110.4	88.3	-
	62	156.3	11.5	156.3	156.3	156.3	134.3	112.2	90.1	146.5	12.9	146.5	146.5	146.5	124.4	102.3	80.3
	57	157.5	11.5	157.5	157.5	157.5	135.4	113.4	91.3	146.8	12.9	146.8	146.8	146.8	124.7	102.7	80.6

ZH150 (12.5 Ton) (Continued)

Air on Evaporator Coil		Temperature of Air on Condenser Coil																	
CFM	WB (°F)	Total Capacity ¹ (MBh)	Total Input (kW) ²	Sensible Capacity (MBh)						Total Capacity ¹ (MBh)	Total Input (kW) ²	Sensible Capacity (MBh)							
				Return Dry Bulb (°F)								Return Dry Bulb (°F)							
				90	85	80	75	70	65			90	85	80	75	70	65		
		115°F										125°F							
3125	77	157.3	14.5	63.8	54.6	41.0	-	-	-	146.7	15.8	56.5	50.7	37.3	-	-	-		
	72	143.8	14.3	90.2	76.7	63.2	49.6	-	-	134.0	15.7	85.9	72.5	59.1	45.7	-	-		
	67	130.4	14.1	116.6	98.8	85.3	71.8	58.2	-	121.2	15.5	114.1	94.3	80.9	67.5	54.1	-		
	62	121.2	14.0	121.2	121.2	100.6	87.0	73.5	60.0	113.7	15.4	113.7	113.7	92.3	78.9	65.4	52.0		
3750	77	161.4	14.5	75.9	60.5	45.1	-	-	-	150.3	15.9	72.0	56.7	41.3	-	-	-		
	72	147.6	14.4	100.3	84.9	69.5	54.1	-	-	137.2	15.7	96.1	80.8	65.4	50.0	-	-		
	67	133.8	14.2	124.6	109.2	93.8	78.4	63.0	-	124.1	15.5	120.2	104.9	89.5	74.2	58.8	-		
	62	124.3	14.1	124.3	124.3	110.6	95.2	79.8	64.4	116.5	15.4	116.5	116.5	102.2	86.8	71.4	56.1		
	57	123.8	14.1	123.8	123.8	110.2	94.8	79.4	63.9	115.2	15.5	115.2	115.2	101.2	85.8	70.5	55.1		
4375	77	165.5	14.6	88.0	66.5	49.2	-	-	-	153.8	15.9	87.5	62.6	45.3	-	-	-		
	72	151.4	14.4	110.3	93.0	75.8	58.5	-	-	140.4	15.7	106.3	89.0	71.7	54.4	-	-		
	67	137.2	14.3	132.6	119.6	102.3	85.0	67.8	-	127.0	15.5	126.4	115.4	98.1	80.8	63.5	-		
	62	127.5	14.1	127.5	127.5	120.6	103.4	86.1	68.8	119.2	15.5	119.2	119.2	112.1	94.8	77.5	60.2		
	57	127.0	14.2	127.0	127.0	120.2	102.9	85.6	68.3	117.9	15.5	117.9	117.9	111.0	93.7	76.4	59.1		
5000	77	169.6	14.6	100.1	72.4	53.3	-	-	-	157.3	15.9	103.1	68.5	49.3	-	-	-		
	72	155.1	14.5	120.4	101.2	82.1	62.9	-	-	143.6	15.7	116.5	97.3	78.0	58.8	-	-		
	67	140.7	14.3	140.7	130.0	110.8	91.7	72.5	-	129.9	15.6	129.9	126.0	106.7	87.5	68.3	-		
	62	130.7	14.2	130.7	130.7	130.7	111.5	92.4	73.2	121.9	15.5	121.9	121.9	121.9	102.7	83.5	64.2		
	57	130.2	14.2	130.2	130.2	130.2	111.0	91.9	72.7	120.6	15.6	120.6	120.6	120.6	101.5	82.3	63.1		
5625	72	158.7	14.5	129.7	109.1	88.4	67.8	-	-	146.5	15.8	125.5	104.9	84.2	63.5	-	-		
	67	143.9	14.3	143.9	138.6	119.4	98.8	78.2	-	132.5	15.6	132.5	132.5	115.2	94.5	73.8	-		
	62	133.7	14.2	133.7	133.7	133.7	113.1	92.4	71.8	124.4	15.6	124.4	124.4	124.4	103.7	83.1	62.4		
	57	133.2	14.3	133.2	133.2	133.2	112.5	91.9	71.3	123.1	15.6	123.1	123.1	123.1	102.5	81.8	61.1		
6250	72	162.3	14.5	139.0	116.9	94.8	72.7	-	-	149.4	15.8	134.6	112.5	90.3	68.2	-	-		
	67	147.2	14.4	147.2	147.2	128.0	105.9	83.8	-	135.2	15.7	135.2	135.2	123.6	101.5	79.3	-		
	62	136.7	14.2	136.7	136.7	136.7	114.6	92.5	70.4	126.9	15.6	126.9	126.9	126.9	104.8	82.6	60.5		
	57	136.2	14.3	136.2	136.2	136.2	114.1	92.0	69.8	125.5	15.7	125.5	125.5	125.5	103.4	81.2	59.1		

1. These capacities are gross ratings. For net capacity, deduct air blower motor, MBh = 3.415 x kW. Refer to the appropriate Blower Performance Table for the kW of the supply air blower motor.
2. These ratings include the condenser fan motors (total 1 kW) and the compressor motors but not the supply air blower motor.

Airflow Performance

ZH078-150 Side Duct Application

ZH078 (6.5 Ton) Side Duct

Air Flow (CFM)	Available External Static Pressure - IWG ¹																			
	0.2		0.4		0.6		0.8		1.0		1.2		1.4		1.6		1.8		2.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
	1.5 HP & Field Supplied Drive						Standard 1.5 HP & Drive								Hi Static 2 HP & Drive					
1800	751	0.22	813	0.43	872	0.62	929	0.78	985	0.93	1040	1.07	1095	1.20	1150	1.33	1206	1.46	1265	1.59
2000	776	0.35	838	0.56	897	0.75	954	0.92	1010	1.07	1064	1.20	1119	1.33	1175	1.46	1231	1.59	1289	1.72
2200	804	0.50	866	0.71	925	0.90	982	1.06	1038	1.21	1092	1.35	1147	1.48	1203	1.61	1259	1.73	1317	1.87
2400	835	0.66	897	0.87	956	1.06	1013	1.22	1069	1.37	1124	1.51	1178	1.64	1234	1.77	1290	1.90	1348	2.03
2600	869	0.84	931	1.05	990	1.24	1047	1.40	1103	1.55	1158	1.69	1212	1.82	1268	1.95	1324	2.07	1382	2.21
2800	906	1.03	968	1.25	1027	1.43	1084	1.60	1139	1.75	1194	1.89	1249	2.02	1304	2.14	1361	2.27	-	-
3000	945	1.25	1007	1.46	1066	1.65	1123	1.81	1179	1.96	1234	2.10	1288	2.23	-	-	-	-	-	-
3200	987	1.48	1048	1.69	1107	1.88	1165	2.04	1220	2.19	-	-	-	-	-	-	-	-	-	-
3400	1030	1.73	1092	1.94	1151	2.12	1208	2.29	-	-	-	-	-	-	-	-	-	-	-	-
	2 HP & Field Supplied Drive																			

1. Blower performance includes gas heat exchangers and 2" filters. See STATIC RESISTANCE table for additional applications.
2. See RPM SELECTION table to determine desired motor sheave setting and to determine the maximum continuous BHP.
3. kW = BHP x 0.932.

ZH090 (7.5 Ton) Side Duct

Air Flow (CFM)	Available External Static Pressure - IWG ¹																			
	0.2		0.4		0.6		0.8		1.0		1.2		1.4		1.6		1.8		2.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
	1.5 HP & Field Supplied Drive				Standard 1.5 HP & Drive								Hi Static 3 HP & Drive							
2000	776	0.35	838	0.56	897	0.75	954	0.92	1010	1.07	1064	1.20	1119	1.33	1175	1.46	1231	1.59	1289	1.72
2200	804	0.50	866	0.71	925	0.90	982	1.06	1038	1.21	1092	1.35	1147	1.48	1203	1.61	1259	1.73	1317	1.87
2400	835	0.66	897	0.87	956	1.06	1013	1.22	1069	1.37	1124	1.51	1178	1.64	1234	1.77	1290	1.90	1348	2.03
2600	869	0.84	931	1.05	990	1.24	1047	1.40	1103	1.55	1158	1.69	1212	1.82	1268	1.95	1324	2.07	1382	2.21
2800	906	1.03	968	1.25	1027	1.43	1084	1.60	1139	1.75	1194	1.89	1249	2.02	1304	2.14	1361	2.27	1419	2.40
3000	945	1.25	1007	1.46	1066	1.65	1123	1.81	1179	1.96	1234	2.10	1288	2.23	1344	2.36	1400	2.48	1458	2.62
3200	987	1.48	1048	1.69	1107	1.88	1165	2.04	1220	2.19	1275	2.33	1330	2.46	1385	2.59	1442	2.71	1500	2.85
3400	1030	1.73	1092	1.94	1151	2.12	1208	2.29	1264	2.44	1319	2.58	1374	2.71	1429	2.84	1485	2.96	1544	3.10
3600	1076	1.99	1138	2.20	1197	2.39	1254	2.56	1310	2.71	1364	2.84	1419	2.97	1475	3.10	1531	3.23	1589	3.36
3800	1124	2.27	1185	2.48	1245	2.67	1302	2.84	1357	2.99	1412	3.12	1467	3.25	1522	3.38	-	-	-	-
	3 HP & Field Supplied Drive																			

1. Blower performance includes gas heat exchangers and 2" filters. See STATIC RESISTANCE table for additional applications.
2. See RPM SELECTION table to determine desired motor sheave setting and to determine the maximum continuous BHP.
3. kW = BHP x 0.932.

ZH102 (8.5 Ton) Side Duct

Air Flow (CFM)	Available External Static Pressure - IWG ¹																			
	0.2		0.4		0.6		0.8		1.0		1.2		1.4		1.6		1.8		2.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
	2 HP & Field Supplied Drive				Standard 2 HP & Drive								Hi Static 3 HP & Drive							
2200	654	0.32	706	0.53	755	0.73	803	0.92	849	1.10	893	1.27	937	1.44	979	1.62	1020	1.79	1061	1.96
2400	664	0.43	716	0.64	765	0.83	813	1.02	859	1.20	904	1.38	947	1.55	989	1.72	1030	1.89	1071	2.07
2600	675	0.53	726	0.74	776	0.94	824	1.12	870	1.30	914	1.48	957	1.65	1000	1.82	1041	1.99	1082	2.17
2800	686	0.63	738	0.84	787	1.04	835	1.23	881	1.41	925	1.58	969	1.76	1011	1.93	1052	2.10	1093	2.27
3000	699	0.75	750	0.96	800	1.16	847	1.34	893	1.52	938	1.70	981	1.87	1024	2.04	1065	2.21	1106	2.39
3200	713	0.88	764	1.09	814	1.28	861	1.47	907	1.65	952	1.83	995	2.00	1037	2.17	1079	2.34	1119	2.52
3400	728	1.02	779	1.23	829	1.43	877	1.61	923	1.79	967	1.97	1010	2.14	1053	2.31	1094	2.48	1135	2.66
3600	745	1.18	796	1.39	846	1.59	893	1.77	939	1.95	984	2.13	1027	2.30	1069	2.47	1111	2.64	1152	2.82
3800	763	1.36	815	1.57	864	1.76	912	1.95	958	2.13	1002	2.31	1046	2.48	1088	2.65	1129	2.82	1170	3.00
4000	783	1.55	835	1.76	884	1.96	932	2.15	978	2.33	1022	2.50	1066	2.67	1108	2.84	1149	3.02	1190	3.19
4200	805	1.77	856	1.98	906	2.17	953	2.36	999	2.54	1044	2.72	1087	2.89	1129	3.06	1171	3.23	1211	3.41
	3 HP & Field Supplied Drive																			

1. Blower performance includes gas heat exchangers and 2" filters. See STATIC RESISTANCE table for additional applications.
2. See RPM SELECTION table to determine desired motor sheave setting and to determine the maximum continuous BHP.
3. kW = BHP x 0.932.

ZH120 (10 Ton) Side Duct

Air Flow (CFM)	Available External Static Pressure - IWG ¹											
	0.2		0.4		0.6		0.8		1.0		1.2	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
	2 HP & Field Supplied Drive				Standard 2 HP & Drive				Hi Static 3 HP & Drive			
2600	675	0.53	726	0.74	776	0.94	824	1.12	870	1.30	914	1.48
2800	686	0.63	738	0.84	787	1.04	835	1.23	881	1.41	925	1.58
3000	699	0.75	750	0.96	800	1.16	847	1.34	893	1.52	938	1.70
3200	713	0.88	764	1.09	814	1.28	861	1.47	907	1.65	952	1.83
3400	728	1.02	779	1.23	829	1.43	877	1.61	923	1.79	967	1.97
3600	745	1.18	796	1.39	846	1.59	893	1.77	939	1.95	984	2.13
3800	763	1.36	815	1.57	864	1.76	912	1.95	958	2.13	1002	2.31
4000	783	1.55	835	1.76	884	1.96	932	2.15	978	2.33	1022	2.50
4200	805	1.77	856	1.98	906	2.17	953	2.36	999	2.54	1044	2.72
4400	828	2.00	879	2.21	929	2.41	976	2.59	1022	2.77	1067	2.95
4600	852	2.25	904	2.46	953	2.66	1001	2.85	1047	3.03	1092	3.20
4800	879	2.52	930	2.73	980	2.93	1027	3.12	1073	3.30	-	-
5000	906	2.81	958	3.02	1007	3.22	1055	3.41	-	-	-	-

3 HP & Field Supplied Drive

1. Blower performance includes gas heat exchangers and 2" filters. See STATIC RESISTANCE table for additional applications.
2. See RPM SELECTION table to determine desired motor sheave setting and to determine the maximum continuous BHP.
3. KW = BHP x 0.932.

ZH150 (12.5 Ton) Side Duct

Air Flow (CFM)	Available External Static Pressure - IWG ¹											
	0.2		0.4		0.6		0.8		1.0		1.2	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
	3 HP & Field Supplied Drive				Standard 3 HP & Drive				Hi Static 5 HP & Drive			
3200	713	0.88	764	1.09	814	1.28	861	1.47	907	1.65	952	1.83
3400	728	1.02	779	1.23	829	1.43	877	1.61	923	1.79	967	1.97
3600	745	1.18	796	1.39	846	1.59	893	1.77	939	1.95	984	2.13
3800	763	1.36	815	1.57	864	1.76	912	1.95	958	2.13	1002	2.31
4000	783	1.55	835	1.76	884	1.96	932	2.15	978	2.33	1022	2.50
4200	805	1.77	856	1.98	906	2.17	953	2.36	999	2.54	1044	2.72
4400	828	2.00	879	2.21	929	2.41	976	2.59	1022	2.77	1067	2.95
4600	852	2.25	904	2.46	953	2.66	1001	2.85	1047	3.03	1092	3.20
4800	879	2.52	930	2.73	980	2.93	1027	3.12	1073	3.30	1118	3.47
5000	906	2.81	958	3.02	1007	3.22	1055	3.41	1101	3.59	1146	3.76
5200	936	3.12	987	3.33	1037	3.53	1084	3.72	1130	3.90	1175	4.07
5400	966	3.45	1018	3.66	1067	3.86	1115	4.05	1161	4.23	1206	4.40
5600	999	3.80	1050	4.01	1100	4.20	1147	4.39	1193	4.57	1238	4.75
5800	1032	4.16	1084	4.37	1133	4.57	1181	4.75	1227	4.93	1271	5.11
6000	1067	4.54	1119	4.75	1168	4.95	1216	5.13	1262	5.31	1306	5.49
6200	1103	4.94	1155	5.15	1204	5.34	1252	5.53	1298	5.71	-	-

5 HP & Field Supplied Drive

1. Blower performance includes gas heat exchangers and 2" filters. See STATIC RESISTANCE table for additional applications.
2. See RPM SELECTION table to determine desired motor sheave setting and to determine the maximum continuous BHP.
3. KW = BHP x 0.932.

ZH078-150 Bottom Duct Application**ZH078 (6.5 Ton) Bottom Duct**

Air Flow (CFM)	Available External Static Pressure - IWG ¹															
	0.2		0.4		0.6		0.8		1.0		1.2		1.4		1.6	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
	1.5 HP & Field Supplied Drive				Standard 1.5 HP & Drive				Hi Static 2 HP & Drive							
1800	775	0.31	850	0.53	924	0.72	998	0.89	1072	1.05	1147	1.20	1224	1.35	1303	1.51
2000	803	0.45	878	0.67	952	0.86	1026	1.03	1100	1.19	1175	1.34	1252	1.49	1331	1.65
2200	838	0.60	913	0.82	986	1.01	1060	1.19	1134	1.34	1210	1.49	1286	1.65	1365	1.81
2400	878	0.78	953	1.00	1027	1.19	1100	1.36	1174	1.52	1250	1.67	1327	1.82	1405	1.98
2600	923	0.98	997	1.20	1071	1.39	1145	1.56	1219	1.72	1294	1.87	1371	2.02	1450	2.18
2800	971	1.20	1046	1.42	1119	1.61	1193	1.78	1267	1.94	1343	2.09	1419	2.24	-	-
3000	1023	1.44	1097	1.66	1171	1.85	1245	2.03	1319	2.18	-	-	-	-	-	-
3200	1077	1.71	1151	1.93	1225	2.12	1299	2.29	-	-	-	-	-	-	-	-
3400	1133	1.99	1208	2.21	-	-	-	-	-	-	-	-	-	-	-	-

2 HP & Field Supplied Drive

1. Blower performance includes gas heat exchangers and 2" filters. See STATIC RESISTANCE table for additional applications.
2. See RPM SELECTION table to determine desired motor sheave setting and to determine the maximum continuous BHP.
3. kW = BHP x 0.932.

ZH090 (7.5 Ton) Bottom Duct

Air Flow (CFM)	Available External Static Pressure - IWG ¹															
	0.2		0.4		0.6		0.8		1.0		1.2		1.4		1.6	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
	1.5 HP & Field Supplied Drive				Standard 1.5 HP & Drive				Hi Static 3 HP & Drive							
2000	803	0.45	878	0.67	952	0.86	1026	1.03	1100	1.19	1175	1.34	1252	1.49	1331	1.65
2200	838	0.60	913	0.82	986	1.01	1060	1.19	1134	1.34	1210	1.49	1286	1.65	1365	1.81
2400	878	0.78	953	1.00	1027	1.19	1100	1.36	1174	1.52	1250	1.67	1327	1.82	1405	1.98
2600	923	0.98	997	1.20	1071	1.39	1145	1.56	1219	1.72	1294	1.87	1371	2.02	1450	2.18
2800	971	1.20	1046	1.42	1119	1.61	1193	1.78	1267	1.94	1343	2.09	1419	2.24	1498	2.40
3000	1023	1.44	1097	1.66	1171	1.85	1245	2.03	1319	2.18	1394	2.33	1471	2.49	1550	2.65
3200	1077	1.71	1151	1.93	1225	2.12	1299	2.29	1373	2.45	1448	2.60	1525	2.75	1604	2.91
3400	1133	1.99	1208	2.21	1282	2.41	1356	2.58	1430	2.73	1505	2.88	1582	3.04	1661	3.20
3600	1192	2.30	1267	2.52	1341	2.71	1414	2.88	1489	3.04	1564	3.19	1641	3.34	-	-
3800	1253	2.63	1327	2.85	1401	3.04	1475	3.21	1549	3.37	-	-	-	-	-	-

3 HP & Field Supplied Drive

1. Blower performance includes gas heat exchangers and 2" filters. See STATIC RESISTANCE table for additional applications.
2. See RPM SELECTION table to determine desired motor sheave setting and to determine the maximum continuous BHP.
3. kW = BHP x 0.932.

ZH102 (8.5 Ton) Bottom Duct

Air Flow (CFM)	Available External Static Pressure - IWG ¹															
	0.2		0.4		0.6		0.8		1.0		1.2		1.4		1.6	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
	2 HP & Field Supplied Drive				Standard 2 HP & Drive				Hi Static 3 HP & Drive							
2200	685	0.59	739	0.74	791	0.88	841	1.01	889	1.14	936	1.27	981	1.39	1025	1.51
2400	702	0.70	756	0.85	808	0.99	858	1.12	906	1.25	953	1.37	999	1.49	1043	1.62
2600	722	0.83	776	0.97	828	1.11	878	1.25	926	1.37	973	1.50	1018	1.62	1063	1.74
2800	744	0.97	798	1.12	850	1.26	900	1.39	949	1.52	995	1.64	1041	1.76	1085	1.88
3000	769	1.13	823	1.28	875	1.42	925	1.55	974	1.68	1020	1.80	1066	1.92	1110	2.05
3200	797	1.32	851	1.46	903	1.60	953	1.74	1001	1.86	1048	1.99	1093	2.11	1138	2.23
3400	828	1.52	882	1.67	934	1.81	983	1.94	1032	2.07	1078	2.19	1124	2.32	1168	2.44
3600	861	1.75	915	1.90	967	2.04	1017	2.17	1065	2.30	1112	2.42	1157	2.54	1201	2.67
3800	897	2.00	951	2.15	1002	2.29	1052	2.42	1101	2.55	1147	2.67	1193	2.80	1237	2.92
4000	935	2.27	989	2.42	1041	2.56	1091	2.69	1139	2.82	1186	2.95	1231	3.07	1275	3.19
4200	976	2.57	1030	2.72	1082	2.86	1132	2.99	1180	3.12	1227	3.24	1272	3.36	-	-

3 HP & Field Supplied Drive

1. Blower performance includes gas heat exchangers and 2" filters. See STATIC RESISTANCE table for additional applications.
2. See RPM SELECTION table to determine desired motor sheave setting and to determine the maximum continuous BHP.
3. kW = BHP x 0.932.

ZH120 (10 Ton) Bottom Duct

Air Flow (CFM)	Available External Static Pressure - IWG ¹											
	0.2		0.4		0.6		0.8		1.0		1.2	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
	2 HP & Field Supplied Drive				Standard 2 HP & Drive				Hi Static 3 HP & Drive			
2600	722	0.83	776	0.97	828	1.11	878	1.25	926	1.37	973	1.50
2800	744	0.97	798	1.12	850	1.26	900	1.39	949	1.52	995	1.64
3000	769	1.13	823	1.28	875	1.42	925	1.55	974	1.68	1020	1.80
3200	797	1.32	851	1.46	903	1.60	953	1.74	1001	1.86	1048	1.99
3400	828	1.52	882	1.67	934	1.81	983	1.94	1032	2.07	1078	2.19
3600	861	1.75	915	1.90	967	2.04	1017	2.17	1065	2.30	1112	2.42
3800	897	2.00	951	2.15	1002	2.29	1052	2.42	1101	2.55	1147	2.67
4000	935	2.27	989	2.42	1041	2.56	1091	2.69	1139	2.82	1186	2.95
4200	976	2.57	1030	2.72	1082	2.86	1132	2.99	1180	3.12	1227	3.24
4400	1019	2.88	1073	3.03	1125	3.17	1175	3.30	1223	3.43	-	-
4600	1065	3.22	1119	3.36	-	-	-	-	-	-	-	-

3 HP & Field Supplied Drive

1. Blower performance includes gas heat exchangers and 2" filters. See STATIC RESISTANCE table for additional applications.
2. See RPM SELECTION table to determine desired motor sheave setting and to determine the maximum continuous BHP.
3. kW = BHP x 0.932.

ZH150 (12.5 Ton) Bottom Duct

Air Flow (CFM)	Available External Static Pressure - IWG ¹											
	0.2		0.4		0.6		0.8		1.0		1.2	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
	3 HP & Field Supplied Drive				Standard 3 HP & Drive				Hi Static 5 HP & Drive			
3200	797	1.32	851	1.46	903	1.60	953	1.74	1001	1.86	1048	1.99
3400	828	1.52	882	1.67	934	1.81	983	1.94	1032	2.07	1078	2.19
3600	861	1.75	915	1.90	967	2.04	1017	2.17	1065	2.30	1112	2.42
3800	897	2.00	951	2.15	1002	2.29	1052	2.42	1101	2.55	1147	2.67
4000	935	2.27	989	2.42	1041	2.56	1091	2.69	1139	2.82	1186	2.95
4200	976	2.57	1030	2.72	1082	2.86	1132	2.99	1180	3.12	1227	3.24
4400	1019	2.88	1073	3.03	1125	3.17	1175	3.30	1223	3.43	1270	3.55
4600	1065	3.22	1119	3.36	1171	3.50	1221	3.64	1269	3.76	1316	3.89
4800	1113	3.57	1167	3.72	1219	3.86	1269	3.99	1317	4.12	1364	4.24
5000	1163	3.94	1217	4.09	1269	4.23	1319	4.36	1367	4.49	1414	4.62
5200	1216	4.34	1270	4.48	1321	4.62	1371	4.76	1420	4.88	1466	5.01
5400	1270	4.75	1324	4.89	1376	5.03	1426	5.17	1474	5.29	1521	5.42
5600	1327	5.17	1381	5.32	1433	5.46	1483	5.59	1531	5.72	-	-
5800	1385	5.62	-	-	-	-	-	-	-	-	-	-

5 HP & Field Supplied Drive

1. Blower performance includes gas heat exchangers and 2" filters. See STATIC RESISTANCE table for additional applications.
2. See RPM SELECTION table to determine desired motor sheave setting and to determine the maximum continuous BHP.
3. kW = BHP x 0.932.

RPM Selection

Size (Tons)	Model	HP	Max BHP	Motor Sheave	Blower Sheave	6 Turns Open	5 Turns Open	4 Turns Open	3 Turns Open	2 Turns Open	1 Turn Open	Fully Closed
078 (6.5)	ZH	1.5	1.73	1VM50	AK74	N/A	897	945	991	1035	1079	1126
		2	2.30	1VM50	AK64	N/A	1039	1094	1150	1207	1256	1308
090 (7.5)	ZH	1.5	1.73	1VM50	AK74	N/A	897	945	991	1035	1079	1126
		3	3.45	1VM50	AK61	N/A	1088	1147	1205	1265	1312	1365
102 (8.5)	ZH	2	2.30	1VM50	AK89	N/A	735	775	815	851	889	930
		3	3.45	1VM50	AK74	N/A	880	928	972	1016	1067	1110
120 (10)	ZH	2	2.30	1VM50	AK84	N/A	785	821	858	901	940	980
		3	3.45	1VM50	AK74	N/A	880	928	972	1016	1067	1110
150 (12.5)	ZH	3	3.45	1VM50	AK74	N/A	880	928	972	1016	1067	1110
		5	5.75	1VP56	BK77	1052	1095	1136	1175	1216	1272	N/A
078 (6.5)	ZR	1.5	1.73	1VM50	AK74	N/A	897	945	991	1035	1079	1126
		2	2.30	1VM50	AK64	N/A	1039	1094	1150	1207	1256	1308
090 (7.5)	ZR	1.5	1.73	1VM50	AK74	N/A	897	945	991	1035	1079	1126
		3	3.45	1VM50	AK61	N/A	1088	1147	1205	1265	1312	1365
102 (8.5)	ZR	2	2.30	1VM50	AK89	N/A	735	775	815	851	889	930
		3	3.45	1VM50	AK74	N/A	880	928	972	1016	1067	1110
120 (10)	ZR	2	2.30	1VM50	AK84	N/A	785	821	858	901	940	980
		3	3.45	1VM50	AK74	N/A	880	928	972	1016	1067	1110
150 (12.5)	ZR	3	3.45	1VM50	AK74	N/A	880	928	972	1016	1067	1110
		5	5.75	1VP56	BK77	1052	1095	1136	1175	1216	1272	N/A
078 (6.5)	XP	1.5	1.73	1VM50	AK74	N/A	897	945	991	1035	1079	1126
		2	2.30	1VM50	AK64	N/A	1039	1094	1150	1207	1256	1308
090 (7.5)	XP	1.5	1.73	1VM50	AK74	N/A	897	945	991	1035	1079	1126
		3	3.45	1VM50	AK61	N/A	1088	1147	1205	1265	1312	1365
102 (8.5)	XP	2	2.30	1VM50	AK89	N/A	735	775	815	851	889	930
		3	3.45	1VM50	AK74	N/A	880	928	972	1016	1067	1110
120 (10)	XP	2	2.30	1VM50	AK84	N/A	785	821	858	901	940	980
		3	3.45	1VM50	AK74	N/A	880	928	972	1016	1067	1110
150 (12.5)	XP	3	3.45	1VM50	AK74	N/A	880	928	972	1016	1067	1110
		5	5.75	1VP56	BK77	1052	1095	1136	1175	1216	1272	N/A

Additional Static Resistance

Size (Tons)	Model	CFM	Cooling Only ¹	Economizer ^{2 3}	Electric Heat kW ²				
					95	18	24	36	54
078 (6.5) 090 (7.5)	ZH/ZR/XP	1900	0.00	0.07	0.05	0.06	0.07	0.08	0.10
		2100	-0.01	0.09	0.06	0.07	0.08	0.09	0.11
		2300	-0.01	0.11	0.07	0.08	0.09	0.10	0.13
		2500	-0.02	0.13	0.08	0.09	0.10	0.11	0.14
		2700	-0.03	0.16	0.09	0.10	0.12	0.13	0.16
		2900	-0.04	0.18	0.10	0.11	0.13	0.14	0.18
		3100	-0.05	0.20	0.12	0.13	0.15	0.16	0.20
		3300	-0.06	0.22	0.13	0.14	0.17	0.18	0.22
		3500	-0.07	0.24	0.15	0.16	0.19	0.20	0.24
		3700	-0.08	0.27	0.17	0.18	0.21	0.22	0.26
		3900	-0.09	0.29	0.19	0.20	0.23	0.24	0.28
		4100	-0.09	0.31	0.21	0.22	0.25	0.26	0.31
		4300	-0.10	0.30	0.23	0.24	0.28	0.29	0.34
		4500	-0.11	0.35	0.25	0.26	0.30	0.31	0.37
102 (8.5) 120 (10) 150 (12.5)	ZH/ZR/XP	1900	0.06	0.02	0.05	0.06	0.07	0.08	0.10
		2100	0.07	0.02	0.06	0.07	0.08	0.09	0.11
		2300	0.08	0.02	0.07	0.08	0.09	0.10	0.13
		2500	0.09	0.02	0.08	0.09	0.10	0.11	0.14
		2700	0.11	0.03	0.09	0.10	0.12	0.13	0.16
		2900	0.12	0.03	0.10	0.11	0.13	0.14	0.18
		3100	0.14	0.03	0.12	0.13	0.15	0.16	0.20
		3300	0.16	0.03	0.13	0.14	0.17	0.18	0.22
		3500	0.18	0.04	0.15	0.16	0.19	0.20	0.24
		3700	0.20	0.04	0.17	0.18	0.21	0.22	0.26
		3900	0.23	0.04	0.19	0.20	0.23	0.24	0.28
		4100	0.25	0.04	0.21	0.22	0.25	0.26	0.31
		4300	0.28	0.05	0.23	0.24	0.28	0.29	0.34
		4500	0.30	0.05	0.25	0.26	0.30	0.31	0.37
		4700	0.33	0.05	0.28	0.29	0.33	0.34	0.40
		4900	0.36	0.05	0.30	0.31	0.35	0.37	0.43
		5100	0.39	0.06	0.33	0.34	0.38	0.40	0.46
		5300	0.42	0.06	0.35	0.37	0.41	0.43	0.49
		5500	0.45	0.06	0.38	0.40	0.44	0.46	0.53
		5700	0.48	0.06	0.41	0.43	0.47	0.49	0.56
		5900	0.52	0.07	0.44	0.46	0.50	0.53	0.59
		6100	0.56	0.07	0.47	0.49	0.53	0.56	0.62
		6300	0.60	0.07	0.50	0.53	0.56	0.59	0.65

1. Add these values to the available static resistance in the respective Blower Performance Tables.
2. Deduct these values from the available external static pressure shown in the respective Blower Performance Tables.
3. The pressure drop through the economizer is greater for 100% outdoor air than for 100% return air. If the resistance of the return air duct is less than 0.25 IWG, the unit will deliver less CFM during full economizer operation.

Drive Selection

1. Determine desired airflow.
2. Calculate or measure the amount of external static pressure.
3. Using the operating point determined from steps 1 & 2, locate this point on the appropriate supply air blower performance table. (Linear interpolation may be necessary.)
4. Noting the RPM and BHP from step 3, locate the appropriate model and drive on the RPM selection table.
5. Review the BHP compared to the motor options available. Select the appropriate motor.
6. Review the RPM range for the motor options available. Select the appropriate drive if multiple drives are available for the chosen motor.
7. Determine turns open to obtain the desired operation point.

Example

1. 19000 CFM
2. 5.4 iwg
3. Using the supply air blower performance table below, the following data point was located: 1150 RPM & 36 BHP.
4. Using the RPM selection table below, Size X and Model Y is found.
5. 36 BHP exceeds the maximum continuous BHP rating of the 30 HP motor. The 40 HP motor is required.
6. 1150 RPM is within the range of the 30 & 40 HP drives, but step 5 requires the 40 HP motor.
7. Using the 40 HP motor and drive, 5.5 turns open will achieve 1150 RPM.

Example Supply Air Blower Performance

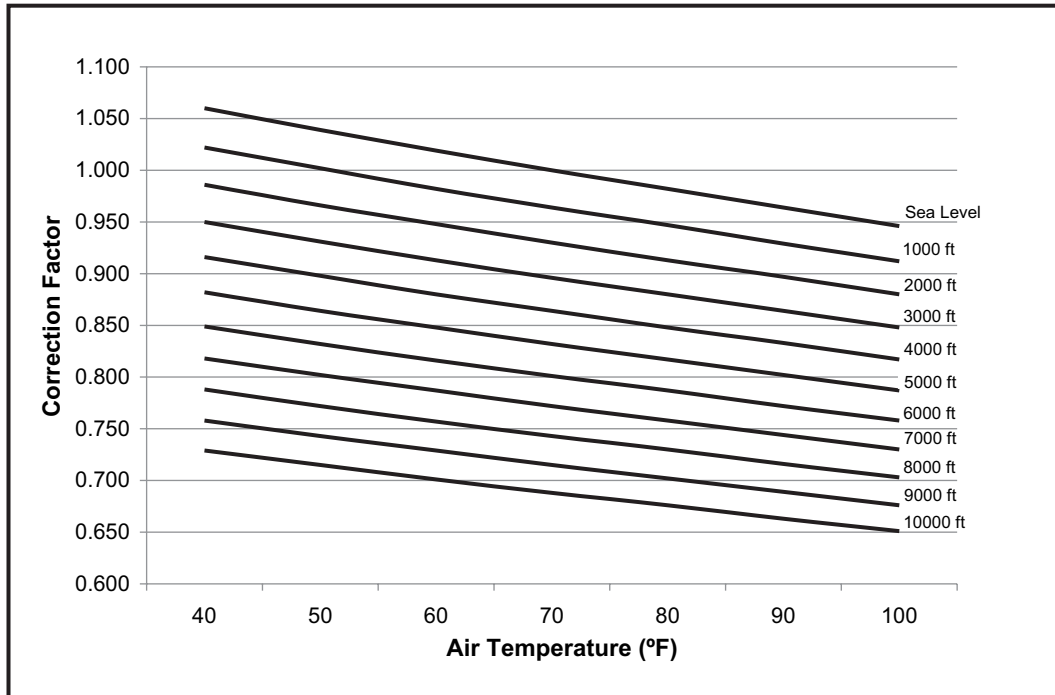
Air Flow (CFM)	Available External Static Pressure - IWG																			
	3.0		3.4		3.8		4.2		4.6		5.0		5.4		5.8		6.2		6.6	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
	30 HP & Field Supplied Drive						Standard 30 HP & Drive						Alternate 40 HP & Drive							
18000	800	10.00	850	14.00	900	18.00	950	22.00	1000	26.00	1050	30.00	1100	34.00	1150	38.00	1200	42.00	1250	46.00
19000	850	12.00	900	16.00	950	20.00	1000	24.00	1050	28.00	1100	32.00	1150	36.00	1200	40.00	1250	44.00	1300	48.00
20000	900	14.00	950	18.00	1000	22.00	1050	26.00	1100	30.00	1150	34.00	1200	38.00	1250	42.00	1300	46.00	1350	50.00
21000	950	16.00	1000	20.00	1050	24.00	1100	28.00	1150	32.00	1200	36.00	1250	40.00	1300	44.00	1350	48.00	1400	52.00

Table X: RPM Selection

Size (Tons)	Model	HP	Max BHP	Motor Sheave	Blower Sheave	6 Turns Open	5 Turns Open	4 Turns Open	3 Turns Open	2 Turns Open	1 Turn Open	Fully Closed
X	Y	30	34.50	1VL51	BK99	1000	1025	1045	1060	1110	1150	N/A
		40	46.00	1VL63	BK67	1125	1175	1250	1325	1400	1475	N/A

Altitude/Temperature Correction Factors

Air Temp.	Altitude (Ft.)										
	0	1000	2000	3000	4000	5000	6000	7000	8000	9000	10000
40	1.060	1.022	0.986	0.950	0.916	0.882	0.849	0.818	0.788	0.758	0.729
50	1.039	1.002	0.966	0.931	0.898	0.864	0.832	0.802	0.772	0.743	0.715
60	1.019	0.982	0.948	0.913	0.880	0.848	0.816	0.787	0.757	0.729	0.701
70	1.000	0.964	0.930	0.896	0.864	0.832	0.801	0.772	0.743	0.715	0.688
80	0.982	0.947	0.913	0.880	0.848	0.817	0.787	0.758	0.730	0.702	0.676
90	0.964	0.929	0.897	0.864	0.833	0.802	0.772	0.744	0.716	0.689	0.663
100	0.946	0.912	0.880	0.848	0.817	0.787	0.758	0.730	0.703	0.676	0.651



Gas Heat Minimum Supply Air

Size (Tons)	Model	Heat Size	Supply Air (CFM)			
			Cooling		Heating	
			Min	Max	Min	Max
078 (6.5)	ZH/ZR	10	1950	3250	1950	3250
		15	1950	3250	1950	3250
090 (7.5)	ZH/ZR	10	2250	3750	2250	3750
		15	2250	3750	2250	3750
102 (8.5)	ZH/ZR	10	2550	4250	2550	4250
		15	2550	4250	2550	4250
120 (10)	ZH/ZR	15	3000	5000	3000	5000
		20	3000	5000	3000	5000
150 (12.5)	ZH/ZR	15	3750	6250	3750	6250
		20	3750	6250	3750	6250

Electric Heat Minimum Supply Air

Size (Tons)	Model	Voltage	Minimum Supply Air (CFM)				
			Heater kW				
			9	18	24	36	54
078 (6.5)	ZH/ZR/XP	208/230-3-60	1950	1950	1950	1950	-
		460-3-60	1950	1950	1950	1950	-
		600-3-60	1950	1950	1950	1950	-
090 (7.5)	ZH/ZR/XP	208/230-3-60	2250	2250	2250	2250	-
		460-3-60	2250	2250	2250	2250	-
		600-3-60	2250	2250	2250	2250	-
102 (8.5)	ZH/ZR/XP	208/230-3-60	2550	2550	2550	2550	-
		460-3-60	2550	2550	2550	2550	-
		600-3-60	2550	2550	2550	2550	-
120 (10)	ZH/ZR/XP	208/230-3-60	-	3000	3000	3000	3500
		460-3-60	-	3000	3000	3000	3000
		600-3-60	-	3000	3000	3000	3500
150 (12.5)	ZH/ZR/XP	208/230-3-60	-	3750	3750	3750	4000
		460-3-60	-	3750	3750	3750	3750
		600-3-60	-	3750	3750	3750	3750

Indoor Blower Specifications

Size (Tons)	Model	Motor					Motor Sheave			Blower Sheave			Belt
		HP	RPM	Eff.	SF	Frame	Datum Dia. (in.)	Bore (in.)	Model	Datum Dia. (in.)	Bore (in.)	Model	
078 (6.5)	ZH/ZR/XP	1-1/2	1725	0.8	1.15	56	3.4 - 4.4	7/8	1VM50	7.0	1	AK74	A49
		2	1725	0.8	1.15	56	3.4 - 4.4	7/8	1VM50	6.0	1	AK64	A49
090 (7.5)	ZH/ZR/XP	1-1/2	1725	0.8	1.15	56	3.4 - 4.4	7/8	1VM50	7.0	1	AK74	A49
		3	1725	0.8	1.15	56	3.4 - 4.4	7/8	1VM50	5.7	1	AK61	A49
102 (8.5)	ZH/ZR/XP	2	1725	0.8	1.15	56	3.4 - 4.4	7/8	1VM50	8.5	1	AK89	A56
		3	1725	0.8	1.15	56	3.4 - 4.4	7/8	1VM50	7.0	1	AK74	A54
120 (10)	ZH/ZR/XP	2	1725	0.8	1.15	56	3.4 - 4.4	7/8	1VM50	8.0	1	AK84	A56
		3	1725	0.8	1.15	56	3.4 - 4.4	7/8	1VM50	7.0	1	AK74	A54
150 (12.5)	ZH/ZR/XP	3	1725	0.8	1.15	56	3.4 - 4.4	7/8	1VM50	7.0	1	AK74	A54
		5	1725	0.87	1.15	184T	4.3 - 5.3	1-1/8	1VP56	6.7	1	BK77	BX55

Power Exhaust Specifications

Model	Voltage	Motor			Motor			Fuse Size	CFM @ 0.1 ESP
		HP	RPM ¹	QTY	LRA	FLA	MCA		
2PE04703225	208/230-1-60	3/4	1075	1	7.8	5	6.3	10	3800
2PE04703246	460-1-60	3/4	1075	1	3.4	2.2	2.8	5	3800
2PE04703258	575-1-60	3/4	1050	1	2.9	1.5	1.9	4	3800

1. Motors are multi-tapped and factory wired for high speed.

Electric Heat Multipliers

Voltage		kW Capacity Multipliers ¹
Nominal	Applied	
240	208	0.75
	230	0.92
480	460	0.92
600	575	0.92

1. Electric heaters are rated at nominal voltage. Use this table to determine the electric heat capacity for heaters applied at lower voltages.

Sound Performance

Indoor Sound Power Levels

Size (Tons)	Model	CFM	ESP (IWG)	Blower		Sound Power, dB (10 ⁻¹²) Watts								
				RPM	BHP	Sound Rating ¹ dB (A)	Octave Band Centerline Frequency (Hz)							
							63	125	250	500	1000	2000	4000	8000
078 (6.5)	ZH/ZR/XP	2600	0.6	812	1.14	74	71	73	73	71	69	65	65	60
090 (7.5)	ZH/ZR/XP	3000	0.6	854	1.47	77	74	76	76	74	72	68	68	63
102 (8.5)	ZH/ZR/XP	3400	0.6	872	1.65	80	77	79	79	77	75	71	71	66
120 (10)	ZH/ZR/XP	4000	0.6	959	2.29	83	80	82	82	80	78	74	74	69
150 (12.5)	ZH/ZR/XP	5000	0.6	1132	3.74	87	84	86	86	84	82	78	78	73

1. These values have been accessed using a model of sound propagation from a point source into the hemispheric/free field. The dBA values provided are to be used for reference only. Calculation of dBA values cover matters of system design and the fan manufacture has no way of knowing the details of each system. This constitutes an exception to any specification or guarantee requiring a dBA value of sound data in any other form than sound power level ratings.

Outdoor Sound Power Levels

ZH/ZR/XP078-150

Size (Tons)	Model	Sound Rating ¹ dB (A)	Octave Band Centerline Frequency (Hz)						
			125	250	500	1000	2000	4000	8000
078 (6.5)	ZH	83	88.0	82.5	81.5	78.0	73.0	69.0	62.0
090 (7.5)	ZH	83	89.5	83.5	82.0	78.0	72.5	68.0	60.5
102 (8.5)	ZH	90	93.5	92.5	88.0	84.5	79.0	74.5	68.0
120 (10)	ZH	90	94.0	92.0	88.5	84.5	80.0	75.5	68.5
150 (12.5)	ZH	84	90.0	84.5	81.5	77.5	72.0	68.5	61.5
078 (6.5)	ZR/XP	83	88.0	82.5	81.5	78.0	73.0	69.0	62.0
090 (7.5)	ZR/XP	83	89.5	83.5	82.0	78.0	72.5	68.0	60.5
102 (8.5)	ZR/XP	83	89.0	84.5	81.5	78.0	72.5	68.5	70.5
120 (10)	ZR/XP	83	89.5	83.5	81.0	78.0	72.0	68.5	70.5
150 (12.5)	ZR/XP	84	90.0	84.5	81.5	77.5	72.0	68.5	61.5

1. Rated in accordance with ARI 270 standard.

Electrical Data

ZH078-150 Standard Motor - Without Powered Convenience Outlet

Size (Tons)	Volt	Compressors (each)			OD Fan Motors (each)	Supply Blower Motor	Pwr Exh Motor	Pwr Conv Outlet	Electric Heat Option				MCA ¹ (Amps)	MCA ¹ w/Pwr Exh (Amps)	Max Fuse ² / Breaker ³ Size (Amps)	Max Fuse ² / Breaker ³ Size w/ Pwr Exh (Amps)
		RLA	LRA	MCC					Model	kW	Stages	Amps				
078 (6.5)	208	12.8	95.0	20.0	1.5	6.2	5.5	0.0	None	-	-	-	38.0	43.5	50	50
									E09	6.8	1	18.9	38.0	43.5	50	50
									E18	13.5	2	37.5	54.6	61.5	60	70
									E24	18.0	2	50.0	70.2	77.1	80	80
									E36	25.5	2	70.8	96.2	103.1	100	110
	230	12.8	95.0	20.0	1.5	6.2	5.5	0.0	None	-	-	-	38.0	43.5	50	50
									E09	9.0	1	22.6	38.0	43.5	50	50
									E18	18.0	2	45.2	61.9	68.8	70	70
									E24	24.0	2	60.2	79.9	86.8	80	90
									E36	34.0	2	85.3	110.0	116.9	110	125
	460	6.4	45.0	10.0	0.8	3.1	2.2	0.0	None	-	-	-	19.1	21.3	25	25
									E09	9.0	1	11.3	19.1	21.3	25	25
									E18	18.0	2	22.6	30.9	33.7	35	35
									E24	24.0	2	30.1	40.0	42.7	40	45
									E36	34.0	2	42.7	55.0	57.7	60	60
	575	5.4	38.0	8.5	0.6	2.4	1.8	0.0	None	-	-	-	15.8	17.6	20	20
									E09	9.0	1	9.0	15.8	17.6	20	20
									E18	18.0	2	18.1	24.7	26.9	25	30
									E24	24.0	2	24.1	31.9	34.1	35	35
									E36	34.0	2	34.1	43.9	46.1	45	50
090 (7.5)	208	14.7	115.0	23.0	1.5	6.2	5.5	0.0	None	-	-	-	42.3	47.8	50	60
									E09	6.8	1	18.9	42.3	47.8	50	60
									E18	13.5	1	37.5	54.6	61.5	60	70
									E24	18.0	1	50.0	70.2	77.1	80	80
									E36	25.5	1	70.8	96.2	103.1	100	110
	230	14.7	115.0	23.0	1.5	6.2	5.5	0.0	None	-	-	-	42.3	47.8	50	60
									E09	9.0	1	22.6	42.3	47.8	50	60
									E18	18.0	1	45.2	61.9	68.8	70	70
									E24	24.0	1	60.2	79.9	86.8	80	90
									E36	34.0	1	85.3	110.0	116.9	110	125
	460	7.7	50.0	12.0	0.8	3.1	2.2	0.0	None	-	-	-	22.0	24.2	25	30
									E09	9.0	1	11.3	22.0	24.2	25	30
									E18	18.0	1	22.6	30.9	33.7	35	35
									E24	24.0	1	30.1	40.0	42.7	40	45
									E36	34.0	1	42.7	55.0	57.7	60	60
	575	6.4	40.0	10.0	0.6	2.4	1.8	0.0	None	-	-	-	18.0	19.8	20	25
									E09	9.0	1	9.0	18.0	19.8	20	25
									E18	18.0	1	18.1	24.7	26.9	25	30
									E24	24.0	1	24.1	31.9	34.1	35	35
									E36	34.0	1	34.1	43.9	46.1	45	50
102 (8.5)	208	16.0	120.0	25.0	3.5	8.2	5.5	0.0	None	-	-	-	51.2	56.7	60	70
									E09	6.8	1	18.9	51.2	56.7	60	70
									E18	13.5	2	37.5	57.1	64.0	60	70
									E24	18.0	2	50.0	72.7	79.6	80	80
									E36	25.5	2	70.8	98.7	105.6	100	110
	230	16.0	120.0	25.0	3.5	8.2	5.5	0.0	None	-	-	-	51.2	56.7	60	70
									E09	9.0	1	22.6	51.2	56.7	60	70
									E18	18.0	2	45.2	64.4	71.3	70	80
									E24	24.0	2	60.2	82.4	89.3	90	90
									E36	34.0	2	85.3	112.5	119.4	125	125
	460	8.3	60.0	13.0	1.6	4.1	2.2	0.0	None	-	-	-	26.0	28.2	30	35
									E09	9.0	1	11.3	26.0	28.2	30	35
									E18	18.0	2	22.6	32.2	34.9	35	35
									E24	24.0	2	30.1	41.2	44.0	45	45
									E36	34.0	2	42.7	56.2	59.0	60	60
	575	6.7	40.0	10.5	1.3	3.6	1.8	0.0	None	-	-	-	21.3	23.1	25	25
									E09	9.0	1	9.0	21.3	23.1	25	25
									E18	18.0	2	18.1	26.2	28.4	30	30
									E24	24.0	2	24.1	33.4	35.6	35	40
									E36	34.0	2	34.1	45.4	47.6	50	50

ZH078-150 Standard Motor - Without Powered Convenience Outlet (Continued)

Size (Tons)	Volt	Compressors (each)			OD Fan Motors (each)	Supply Blower Motor	Pwr Exh Motor	Pwr Conv Outlet	Electric Heat Option				MCA ¹ (Amps)	MCA ¹ w/Pwr Exh (Amps)	Max Fuse ² / Breaker ³ Size (Amps)	Max Fuse ² / Breaker ³ Size w/ Pwr Exh (Amps)
		RLA	LRA	MCC	FLA	FLA	FLA	FLA	Model	kW	Stages	Amps				
120 (10)	208	17.9	120.0	28.0	3.5	8.2	5.5	0.0	None	-	-	-	55.5	61.0	70	70
									E18	13.5	2	37.5	57.1	64.0	70	70
									E24	18.0	2	50.0	72.7	79.6	80	80
									E36	25.5	2	70.8	98.7	105.6	100	110
									E54	40.6	2	112.7	151.1	158.0	175	175
	230	17.9	120.0	28.0	3.5	8.2	5.5	0.0	None	-	-	-	55.5	61.0	70	70
									E18	18.0	2	45.2	64.4	71.3	70	80
									E24	24.0	2	60.2	82.4	89.3	90	90
									E36	34.0	2	85.3	112.5	119.4	125	125
									E54	54.0	2	135.6	140.2	147.0	150	175
	460	9.6	70.0	15.0	1.6	4.1	2.2	0.0	None	-	-	-	28.9	31.1	35	40
									E18	18.0	2	22.6	32.2	34.9	35	40
									E24	24.0	2	30.1	41.2	44.0	45	45
									E36	34.0	2	42.7	56.2	59.0	60	60
									E54	54.0	2	67.8	70.1	72.8	80	80
	575	7.4	53.0	11.5	1.3	3.6	1.8	0.0	None	-	-	-	22.9	24.7	30	30
									E18	18.0	2	18.1	26.2	28.4	30	30
									E24	24.0	2	24.1	33.4	35.6	35	40
									E36	34.0	2	34.1	45.4	47.6	50	50
									E54	54.0	2	54.2	56.5	58.7	70	70
150 (12.5)	208	25.0	149.0	35.0	1.5	10.9	5.5	0.0	None	-	-	-	73.2	78.7	90	100
									E18	13.5	2	37.5	73.2	78.7	90	100
									E24	18.0	2	50.0	76.1	83.0	90	100
									E36	25.5	2	70.8	102.1	109.0	110	110
									E54	40.6	2	112.7	154.5	161.4	175	175
	230	25.0	149.0	35.0	1.5	10.9	5.5	0.0	None	-	-	-	73.2	78.7	90	100
									E18	18.0	2	45.2	73.2	78.7	90	100
									E24	24.0	2	60.2	85.8	92.7	90	100
									E36	34.0	2	85.3	115.9	122.7	125	125
									E54	54.0	2	135.6	143.5	150.4	175	175
	460	11.8	75.0	16.5	0.8	5.3	2.2	0.0	None	-	-	-	35.1	37.3	45	45
									E18	18.0	2	22.6	35.1	37.3	45	45
									E24	24.0	2	30.1	42.7	45.5	45	50
									E36	34.0	2	42.7	57.7	60.5	60	70
									E54	54.0	2	67.8	71.6	74.3	80	80
	575	8.6	54.0	12.0	0.6	4.1	1.8	0.0	None	-	-	-	25.9	27.7	30	35
									E18	18.0	2	18.1	26.8	29.0	30	35
									E24	24.0	2	24.1	34.0	36.2	35	40
									E36	34.0	2	34.1	46.0	48.3	50	50
									E54	54.0	2	54.2	57.1	59.3	70	70

1. Minimum Circuit Ampacity.
2. Dual Element, Time Delay Type.
3. HACR type per NEC.

ZH078-150 Hi Static Motor - Without Powered Convenience Outlet

Size (Tons)	Volt	Compressors (each)			OD Fan Motors (each)	Supply Blower Motor	Pwr Exh Motor	Pwr Conv Outlet	Electric Heat Option				MCA ¹ (Amps)	MCA ¹ w/Pwr Exh (Amps)	Max Fuse ^{2/} Breaker ³ Size (Amps)	Max Fuse ^{2/} Breaker ³ Size w/ Pwr Exh (Amps)
		RLA	LRA	MCC					Model	kW	Stages	Amps				
078 (6.5)	208	12.8	95.0	20.0	1.5	8.2	5.5	0.0	None	-	-	-	40.0	45.5	50	50
									E09	6.8	1	18.9	40.0	45.5	50	50
									E18	13.5	2	37.5	57.1	64.0	60	70
									E24	18.0	2	50.0	72.7	79.6	80	80
									E36	25.5	2	70.8	98.7	105.6	100	110
	230	12.8	95.0	20.0	1.5	8.2	5.5	0.0	None	-	-	-	40.0	45.5	50	50
									E09	9.0	1	22.6	40.0	45.5	50	50
									E18	18.0	2	45.2	64.4	71.3	70	80
									E24	24.0	2	60.2	82.4	89.3	90	90
									E36	34.0	2	85.3	112.5	119.4	125	125
	460	6.4	45.0	10.0	0.8	4.1	2.2	0.0	None	-	-	-	20.1	22.3	25	25
									E09	9.0	1	11.3	20.1	22.3	25	25
									E18	18.0	2	22.6	32.2	34.9	35	35
									E24	24.0	2	30.1	41.2	44.0	45	45
									E36	34.0	2	42.7	56.2	59.0	60	60
	575	5.4	38.0	8.5	0.6	3.6	1.8	0.0	None	-	-	-	17.0	18.8	20	20
									E09	9.0	1	9.0	17.0	18.8	20	20
									E18	18.0	2	18.1	26.2	28.4	30	30
									E24	24.0	2	24.1	33.4	35.6	35	40
									E36	34.0	2	34.1	45.4	47.6	50	50
090 (7.5)	208	14.7	115.0	23.0	1.5	10.9	5.5	0.0	None	-	-	-	47.0	52.5	60	60
									E09	6.8	1	18.9	47.0	52.5	60	60
									E18	13.5	2	37.5	60.5	67.3	70	70
									E24	18.0	2	50.0	76.1	83.0	80	90
									E36	25.5	2	70.8	102.1	109.0	110	110
	230	14.7	115.0	23.0	1.5	10.9	5.5	0.0	None	-	-	-	47.0	52.5	60	60
									E09	9.0	1	22.6	47.0	52.5	60	60
									E18	18.0	2	45.2	67.8	74.6	70	80
									E24	24.0	2	60.2	85.8	92.7	90	100
									E36	34.0	2	85.3	115.9	122.7	125	125
	460	7.7	50.0	12.0	0.8	5.3	2.2	0.0	None	-	-	-	24.2	26.4	30	30
									E09	9.0	1	11.3	24.2	26.4	30	30
									E18	18.0	2	22.6	33.7	36.4	35	40
									E24	24.0	2	30.1	42.7	45.5	45	50
									E36	34.0	2	42.7	57.7	60.5	60	70
	575	6.4	40.0	10.0	0.6	4.1	1.8	0.0	None	-	-	-	19.7	21.5	25	25
									E09	9.0	1	9.0	19.7	21.5	25	25
									E18	18.0	2	18.1	26.8	29.0	30	30
									E24	24.0	2	24.1	34.0	36.2	35	40
									E36	34.0	2	34.1	46.0	48.3	50	50
102 (8.5)	208	16.0	120.0	25.0	3.5	10.9	5.5	0.0	None	-	-	-	53.9	59.4	60	70
									E09	6.8	1	18.9	53.9	59.4	60	70
									E18	13.5	2	37.5	60.5	67.3	70	70
									E24	18.0	2	50.0	76.1	83.0	80	90
									E36	25.5	2	70.8	102.1	109.0	110	110
	230	16.0	120.0	25.0	3.5	10.9	5.5	0.0	None	-	-	-	53.9	59.4	60	70
									E09	9.0	1	22.6	53.9	59.4	60	70
									E18	18.0	2	45.2	67.8	74.6	70	80
									E24	24.0	2	60.2	85.8	92.7	90	100
									E36	34.0	2	85.3	115.9	122.7	125	125
	460	8.3	60.0	13.0	1.6	5.3	2.2	0.0	None	-	-	-	27.2	29.4	35	35
									E09	9.0	1	11.3	27.2	29.4	35	35
									E18	18.0	2	22.6	33.7	36.4	35	40
									E24	24.0	2	30.1	42.7	45.5	45	50
									E36	34.0	2	42.7	57.7	60.5	60	70
	575	6.7	40.0	10.5	1.3	4.1	1.8	0.0	None	-	-	-	21.8	23.6	25	30
									E09	9.0	1	9.0	21.8	23.6	25	30
									E18	18.0	2	18.1	26.8	29.0	30	30
									E24	24.0	2	24.1	34.0	36.2	35	40
									E36	34.0	2	34.1	46.0	48.3	50	50

ZH078-150 Hi Static Motor - Without Powered Convenience Outlet (Continued)

Size (Tons)	Volt	Compressors (each)			OD Fan Motors (each)	Supply Blower Motor	Pwr Exh Motor	Pwr Conv Outlet	Electric Heat Option				MCA ¹ (Amps)	MCA ¹ w/Pwr Exh (Amps)	Max Fuse ² / Breaker ³ Size (Amps)	Max Fuse ² / Breaker ³ Size w/ Pwr Exh (Amps)
		RLA	LRA	MCC	FLA	FLA	FLA	FLA	Model	kW	Stages	Amps				
120 (10)	208	17.9	120.0	28.0	3.5	10.9	5.5	0.0	None	-	-	-	58.2	63.7	70	80
									E18	13.5	2	37.5	60.5	67.3	70	80
									E24	18.0	2	50.0	76.1	83.0	80	90
									E36	25.5	2	70.8	102.1	109.0	110	110
									E54	40.6	2	112.7	154.5	161.4	175	175
	230	17.9	120.0	28.0	3.5	10.9	5.5	0.0	None	-	-	-	58.2	63.7	70	80
									E18	18.0	2	45.2	67.8	74.6	70	80
									E24	24.0	2	60.2	85.8	92.7	90	100
									E36	34.0	2	85.3	115.9	122.7	125	125
									E54	54.0	2	135.6	143.5	150.4	175	175
	460	9.6	70.0	15.0	1.6	5.3	2.2	0.0	None	-	-	-	30.1	32.3	35	40
									E18	18.0	2	22.6	33.7	36.4	35	40
									E24	24.0	2	30.1	42.7	45.5	45	50
									E36	34.0	2	42.7	57.7	60.5	60	70
									E54	54.0	2	67.8	71.6	74.3	80	80
	575	7.4	53.0	11.5	1.3	4.1	1.8	0.0	None	-	-	-	23.4	25.2	30	30
									E18	18.0	2	18.1	26.8	29.0	30	30
									E24	24.0	2	24.1	34.0	36.2	35	40
									E36	34.0	2	34.1	46.0	48.3	50	50
									E54	54.0	2	54.2	57.1	59.3	70	70
150 (12.5)	208	25.0	149.0	35.0	1.5	16.1	5.5	0.0	None	-	-	-	78.4	83.9	100	100
									E18	13.5	2	37.5	78.4	83.9	100	100
									E24	18.0	2	50.0	82.6	89.5	100	100
									E36	25.5	2	70.8	108.6	115.5	110	125
									E54	40.6	2	112.7	161.0	167.9	175	175
	230	25.0	149.0	35.0	1.5	16.1	5.5	0.0	None	-	-	-	78.4	83.9	100	100
									E18	18.0	2	45.2	78.4	83.9	100	100
									E24	24.0	2	60.2	92.3	99.2	100	100
									E36	34.0	2	85.3	122.4	129.2	125	150
									E54	54.0	2	135.6	150.0	156.9	175	175
	460	11.8	75.0	16.5	0.8	8.1	2.2	0.0	None	-	-	-	37.9	40.1	45	50
									E18	18.0	2	22.6	37.9	40.1	45	50
									E24	24.0	2	30.1	46.2	49.0	50	50
									E36	34.0	2	42.7	61.2	64.0	70	70
									E54	54.0	2	67.8	75.1	77.8	90	90
	575	8.6	54.0	12.0	0.6	6.0	1.8	0.0	None	-	-	-	27.8	29.6	35	35
									E18	18.0	2	18.1	29.2	31.4	35	35
									E24	24.0	2	24.1	36.4	38.6	40	40
									E36	34.0	2	34.1	48.4	50.6	50	60
									E54	54.0	2	54.2	59.5	61.7	70	70

1. Minimum Circuit Ampacity.
2. Dual Element, Time Delay Type.
3. HACR type per NEC.

ZH078-150 Standard Motor - With Powered Convenience Outlet

Size (Tons)	Volt	Compressors (each)			OD Fan Motors (each)	Supply Blower Motor	Pwr Exh Motor	Pwr Conv Outlet	Electric Heat Option				MCA ¹ (Amps)	MCA ¹ w/Pwr Exh (Amps)	Max Fuse ² / Breaker ³ Size (Amps)	Max Fuse ² / Breaker ³ Size w/ Pwr Exh (Amps)
		RLA	LRA	MCC					Model	kW	Stages	Amps				
078 (6.5)	208	12.8	95.0	20.0	1.5	6.2	5.5	10.0	None	—	—	—	48.0	53.5	60	60
									E09	6.8	1	18.9	48.0	53.5	60	60
									E18	13.5	2	37.5	67.1	74.0	70	80
									E24	18.0	2	50.0	82.7	89.6	90	90
									E36	25.5	2	70.8	108.7	115.6	110	125
	230	12.8	95.0	20.0	1.5	6.2	5.5	10.0	None	—	—	—	48.0	53.5	60	60
									E09	9.0	1	22.6	48.0	54.2	60	60
									E18	18.0	2	45.2	74.4	81.3	80	90
									E24	24.0	2	60.2	92.4	99.3	100	100
									E36	34.0	2	85.3	122.5	129.4	125	150
	460	6.4	45.0	10.0	0.8	3.1	2.2	5.0	None	—	—	—	24.1	26.3	30	30
									E09	9.0	1	11.3	24.1	26.4	30	30
									E18	18.0	2	22.6	37.2	39.9	40	40
									E24	24.0	2	30.1	46.2	49.0	50	50
									E36	34.0	2	42.7	61.2	64.0	70	70
	575	5.4	38.0	8.5	0.6	2.4	1.8	4.0	None	—	—	—	19.8	21.6	25	25
									E09	9.0	1	9.0	19.8	21.6	25	25
									E18	18.0	2	18.1	29.7	31.9	30	35
									E24	24.0	2	24.1	36.9	39.1	40	40
									E36	34.0	2	34.1	48.9	51.1	50	60
090 (7.5)	208	14.7	115.0	23.0	1.5	6.2	5.5	10.0	None	—	—	—	52.3	57.8	60	70
									E09	6.8	1	18.9	52.3	57.8	60	70
									E18	13.5	1	37.5	67.1	74.0	70	80
									E24	18.0	1	50.0	82.7	89.6	90	90
									E36	25.5	1	70.8	108.7	115.6	110	125
	230	14.7	115.0	23.0	1.5	6.2	5.5	10.0	None	—	—	—	52.3	57.8	60	70
									E09	9.0	1	22.6	52.3	57.8	60	70
									E18	18.0	1	45.2	74.4	81.3	80	90
									E24	24.0	1	60.2	92.4	99.3	100	100
									E36	34.0	1	85.3	122.5	129.4	125	150
	460	7.7	50.0	12.0	0.8	3.1	2.2	5.0	None	—	—	—	27.0	29.2	30	35
									E09	9.0	1	11.3	27.0	29.2	30	35
									E18	18.0	1	22.6	37.2	39.9	40	40
									E24	24.0	1	30.1	46.2	49.0	50	50
									E36	34.0	1	42.7	61.2	64.0	70	70
	575	6.4	40.0	10.0	0.6	2.4	1.8	4.0	None	—	—	—	22.0	23.8	25	30
									E09	9.0	1	9.0	22.0	23.8	25	30
									E18	18.0	1	18.1	29.7	31.9	30	35
									E24	24.0	1	24.1	36.9	39.1	40	40
									E36	34.0	1	34.1	48.9	51.1	50	60
102 (8.5)	208	16.0	120.0	25.0	3.5	8.2	5.5	10.0	None	—	—	—	61.2	66.7	70	80
									E09	6.8	1	18.9	61.2	66.7	70	80
									E18	13.5	2	37.5	69.6	76.5	70	80
									E24	18.0	2	50.0	85.2	92.1	90	100
									E36	25.5	2	70.8	111.2	118.1	125	125
	230	16.0	120.0	25.0	3.5	8.2	5.5	10.0	None	—	—	—	61.2	66.7	70	80
									E09	9.0	1	22.6	61.2	66.7	70	80
									E18	18.0	2	45.2	76.9	83.8	80	90
									E24	24.0	2	60.2	94.9	101.8	100	110
									E36	34.0	2	85.3	125.0	131.9	125	150
	460	8.3	60.0	13.0	1.6	4.1	2.2	5.0	None	—	—	—	31.0	33.2	35	40
									E09	9.0	1	11.3	31.0	33.2	35	40
									E18	18.0	2	22.6	38.4	41.2	40	45
									E24	24.0	2	30.1	47.5	50.2	50	60
									E36	34.0	2	42.7	62.5	65.2	70	70
	575	6.7	40.0	10.5	1.3	3.6	1.8	4.0	None	—	—	—	25.3	27.1	30	30
									E09	9.0	1	9.0	25.3	27.1	30	30
									E18	18.0	2	18.1	31.2	33.4	35	35
									E24	24.0	2	24.1	38.4	40.6	40	45
									E36	34.0	2	34.1	50.4	52.6	60	60

ZH078-150 Standard Motor - With Powered Convenience Outlet (Continued)

Size (Tons)	Volt	Compressors (each)			OD Fan Motors (each)	Supply Blower Motor	Pwr Exh Motor	Pwr Conv Outlet	Electric Heat Option				MCA ¹ (Amps)	MCA ¹ w/Pwr Exh (Amps)	Max Fuse ² / Breaker ³ Size (Amps)	Max Fuse ² / Breaker ³ Size w/ Pwr Exh (Amps)
		RLA	LRA	MCC					FLA	FLA	FLA	FLA				
120 (10)	208	17.9	120.0	28.0	3.5	8.2	5.5	10.0	None	—	—	—	65.5	71.0	80	80
									E18	13.5	2	37.5	69.6	76.5	80	80
									E24	18.0	2	50.0	85.2	92.1	90	100
									E36	25.5	2	70.8	111.2	118.1	125	125
									E54	40.6	2	112.7	163.6	170.5	175	175
	230	17.9	120.0	28.0	3.5	8.2	5.5	10.0	None	—	—	—	65.5	71.0	80	80
									E18	18.0	2	45.2	76.9	83.8	80	90
									E24	24.0	2	60.2	94.9	101.8	100	110
									E36	34.0	2	85.3	125.0	131.9	125	150
									E54	54.0	2	135.6	152.7	159.5	175	175
	460	9.6	70.0	15.0	1.6	4.1	2.2	5.0	None	—	—	—	33.9	36.1	40	45
									E18	18.0	2	22.6	38.4	41.2	40	45
									E24	24.0	2	30.1	47.5	50.2	50	60
									E36	34.0	2	42.7	62.5	65.2	70	70
									E54	54.0	2	67.8	76.3	79.1	90	90
	575	7.4	53.0	11.5	1.3	3.6	1.8	4.0	None	—	—	—	26.9	28.7	30	35
									E18	18.0	2	18.1	31.2	33.4	35	35
									E24	24.0	2	24.1	38.4	40.6	40	45
									E36	34.0	2	34.1	50.4	52.6	60	60
									E54	54.0	2	54.2	61.5	63.7	70	70
150 (12.5)	208	25.0	149.0	35.0	1.5	10.9	5.5	10.0	None	—	—	—	83.2	88.7	100	110
									E18	13.5	2	37.5	83.2	88.7	100	110
									E24	18.0	2	50.0	88.6	95.5	100	110
									E36	25.5	2	70.8	114.6	121.5	125	125
									E54	40.6	2	112.7	167.0	173.9	175	175
	230	25.0	149.0	35.0	1.5	10.9	5.5	10.0	None	—	—	—	83.2	88.7	100	110
									E18	18.0	2	45.2	83.2	88.7	100	110
									E24	24.0	2	60.2	98.3	105.2	100	110
									E36	34.0	2	85.3	128.4	135.2	150	150
									E54	54.0	2	135.6	156.0	162.9	175	175
	460	11.8	75.0	16.5	0.8	5.3	2.2	5.0	None	—	—	—	40.1	42.3	50	50
									E18	18.0	2	22.6	40.1	42.7	50	50
									E24	24.0	2	30.1	49.0	51.7	50	60
									E36	34.0	2	42.7	64.0	66.7	70	70
									E54	54.0	2	67.8	77.8	80.6	90	90
	575	8.6	54.0	12.0	0.6	4.1	1.8	4.0	None	—	—	—	29.9	31.7	35	40
									E18	18.0	2	18.1	31.8	34.0	35	40
									E24	24.0	2	24.1	39.0	41.2	40	45
									E36	34.0	2	34.1	51.0	53.3	60	60
									E54	54.0	2	54.2	62.1	64.3	70	70

1. Minimum Circuit Ampacity.
2. Dual Element, Time Delay Type.
3. HACR type per NEC.

ZH078-150 Hi Static Motor - With Powered Convenience Outlet

Size (Tons)	Volt	Compressors (each)			OD Fan Motors (each)	Supply Blower Motor	Pwr Exh Motor	Pwr Conv Outlet	Electric Heat Option				MCA ¹ (Amps)	MCA ¹ w/Pwr Exh (Amps)	Max Fuse ² / Breaker ³ Size (Amps)	Max Fuse ² / Breaker ³ Size w/ Pwr Exh (Amps)
		RLA	LRA	MCC	FLA	FLA	FLA	FLA	Model	kW	Stages	Amps				
078 (6.5)	208	12.8	95.0	20.0	1.5	8.2	5.5	10.0	None	—	—	—	50.0	55.5	60	60
									E09	6.8	1	18.9	50.0	55.5	60	60
									E18	13.5	2	37.5	69.6	76.5	70	80
									E24	18.0	2	50.0	85.2	92.1	90	100
									E36	25.5	2	70.8	111.2	118.1	125	125
	230	12.8	95.0	20.0	1.5	8.2	5.5	10.0	None	—	—	—	50.0	55.5	60	60
									E09	9.0	1	22.6	50.0	56.7	60	60
									E18	18.0	2	45.2	76.9	83.8	80	90
									E24	24.0	2	60.2	94.9	101.8	100	110
									E36	34.0	2	85.3	125.0	131.9	125	150
	460	6.4	45.0	10.0	0.8	4.1	2.2	5.0	None	—	—	—	25.1	27.3	30	30
									E09	9.0	1	11.3	25.1	27.7	30	30
									E18	18.0	2	22.6	38.4	41.2	40	45
									E24	24.0	2	30.1	47.5	50.2	50	60
									E36	34.0	2	42.7	62.5	65.2	70	70
	575	5.4	38.0	8.5	0.6	3.6	1.8	4.0	None	—	—	—	21.0	22.8	25	25
									E09	9.0	1	9.0	21.0	22.8	25	25
									E18	18.0	2	18.1	31.2	33.4	35	35
									E24	24.0	2	24.1	38.4	40.6	40	45
									E36	34.0	2	34.1	50.4	52.6	60	60
090 (7.5)	208	14.7	115.0	23.0	1.5	10.9	5.5	10.0	None	—	—	—	57.0	62.5	70	70
									E09	6.8	1	18.9	57.0	62.5	70	70
									E18	13.5	2	37.5	73.0	79.8	80	80
									E24	18.0	2	50.0	88.6	95.5	90	100
									E36	25.5	2	70.8	114.6	121.5	125	125
	230	14.7	115.0	23.0	1.5	10.9	5.5	10.0	None	—	—	—	57.0	62.5	70	70
									E09	9.0	1	22.6	57.0	62.5	70	70
									E18	18.0	2	45.2	80.3	87.1	90	90
									E24	24.0	2	60.2	98.3	105.2	100	110
									E36	34.0	2	85.3	128.4	135.2	150	150
	460	7.7	50.0	12.0	0.8	5.3	2.2	5.0	None	—	—	—	29.2	31.4	35	35
									E09	9.0	1	11.3	29.2	31.4	35	35
									E18	18.0	2	22.6	39.9	42.7	40	45
									E24	24.0	2	30.1	49.0	51.7	50	60
									E36	34.0	2	42.7	64.0	66.7	70	70
	575	6.4	40.0	10.0	0.6	4.1	1.8	4.0	None	—	—	—	23.7	25.5	30	30
									E09	9.0	1	9.0	23.7	25.5	30	30
									E18	18.0	2	18.1	31.8	34.0	35	35
									E24	24.0	2	24.1	39.0	41.2	40	45
									E36	34.0	2	34.1	51.0	53.3	60	60
102 (8.5)	208	16.0	120.0	25.0	3.5	10.9	5.5	10.0	None	—	—	—	63.9	69.4	70	80
									E09	6.8	1	18.9	63.9	69.4	70	80
									E18	13.5	2	37.5	73.0	79.8	80	80
									E24	18.0	2	50.0	88.6	95.5	90	100
									E36	25.5	2	70.8	114.6	121.5	125	125
	230	16.0	120.0	25.0	3.5	10.9	5.5	10.0	None	—	—	—	63.9	69.4	70	80
									E09	9.0	1	22.6	63.9	69.4	70	80
									E18	18.0	2	45.2	80.3	87.1	90	90
									E24	24.0	2	60.2	98.3	105.2	100	110
									E36	34.0	2	85.3	128.4	135.2	150	150
	460	8.3	60.0	13.0	1.6	5.3	2.2	5.0	None	—	—	—	32.2	34.4	40	40
									E09	9.0	1	11.3	32.2	34.4	40	40
									E18	18.0	2	22.6	39.9	42.7	40	45
									E24	24.0	2	30.1	49.0	51.7	50	60
									E36	34.0	2	42.7	64.0	66.7	70	70
	575	6.7	40.0	10.5	1.3	4.1	1.8	4.0	None	—	—	—	25.8	27.6	30	30
									E09	9.0	1	9.0	25.8	27.6	30	30
									E18	18.0	2	18.1	31.8	34.0	35	35
									E24	24.0	2	24.1	39.0	41.2	40	45
									E36	34.0	2	34.1	51.0	53.3	60	60

ZH078-150 Hi Static Motor - With Powered Convenience Outlet (Continued)

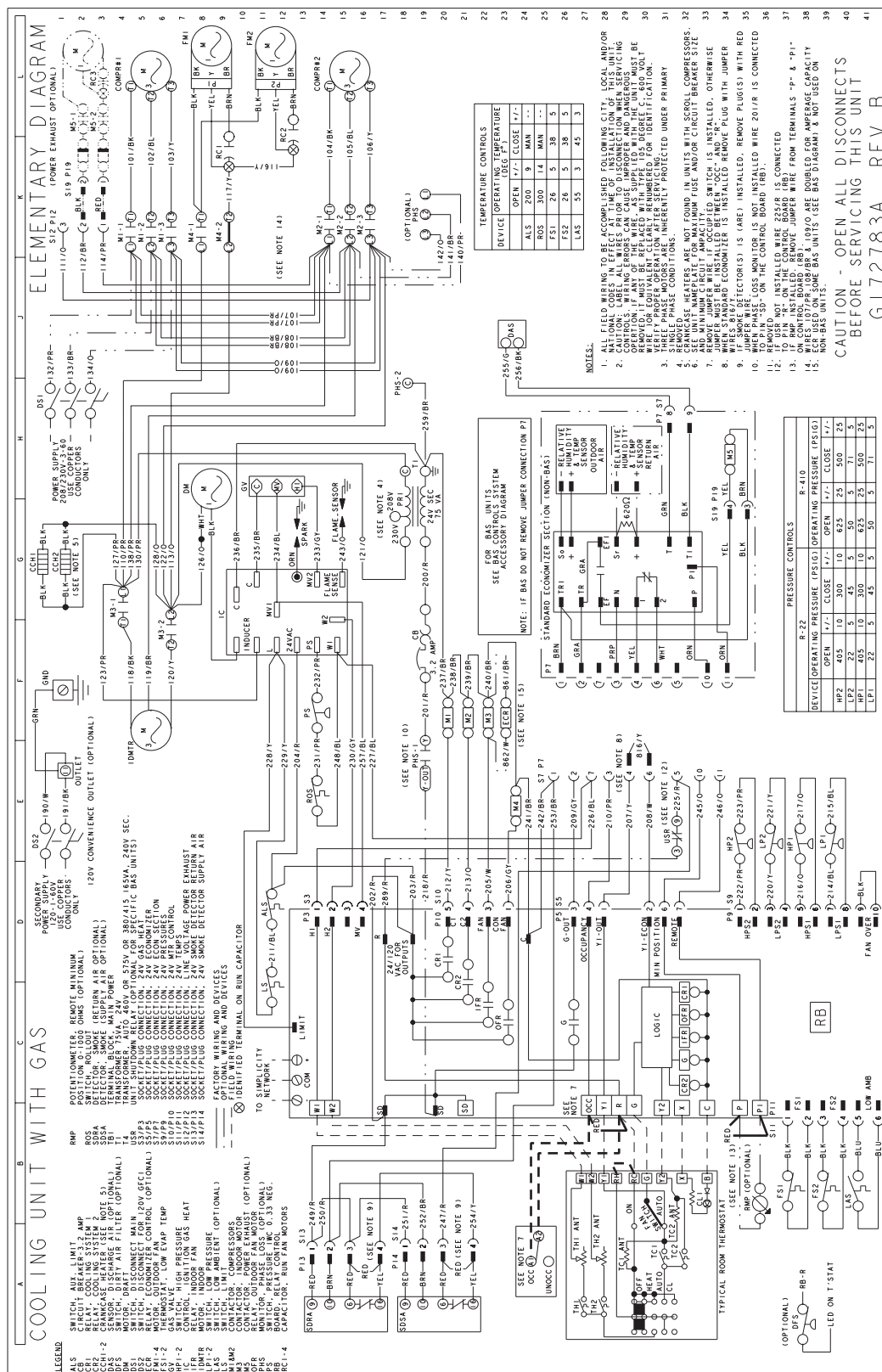
Size (Tons)	Volt	Compressors (each)			OD Fan Motors (each)	Supply Blower Motor	Pwr Exh Motor	Pwr Conv Outlet	Electric Heat Option				MCA ¹ (Amps)	MCA ¹ w/Pwr Exh (Amps)	Max Fuse ² / Breaker ³ Size (Amps)	Max Fuse ² / Breaker ³ Size w/ Pwr Exh (Amps)
		RLA	LRA	MCC					FLA	FLA	FLA	FLA				
120 (10)	208	17.9	120.0	28.0	3.5	10.9	5.5	10.0	None	—	—	—	68.2	73.7	80	90
									E18	13.5	2	37.5	73.0	79.8	80	90
									E24	18.0	2	50.0	88.6	95.5	90	100
									E36	25.5	2	70.8	114.6	121.5	125	125
									E54	40.6	2	112.7	167.0	173.9	175	175
	230	17.9	120.0	28.0	3.5	10.9	5.5	10.0	None	—	—	—	68.2	73.7	80	90
									E18	18.0	2	45.2	80.3	87.1	90	90
									E24	24.0	2	60.2	98.3	105.2	100	110
									E36	34.0	2	85.3	128.4	135.2	150	150
									E54	54.0	2	135.6	156.0	162.9	175	175
	460	9.6	70.0	15.0	1.6	5.3	2.2	5.0	None	—	—	—	35.1	37.3	40	45
									E18	18.0	2	22.6	39.9	42.7	40	45
									E24	24.0	2	30.1	49.0	51.7	50	60
									E36	34.0	2	42.7	64.0	66.7	70	70
									E54	54.0	2	67.8	77.8	80.6	90	90
	575	7.4	53.0	11.5	1.3	4.1	1.8	4.0	None	—	—	—	27.4	29.2	30	35
									E18	18.0	2	18.1	31.8	34.0	35	35
									E24	24.0	2	24.1	39.0	41.2	40	45
									E36	34.0	2	34.1	51.0	53.3	60	60
									E54	54.0	2	54.2	62.1	64.3	70	70
150 (12.5)	208	25.0	149.0	35.0	1.5	16.1	5.5	10.0	None	—	—	—	88.4	93.9	110	110
									E18	13.5	2	37.5	88.4	93.9	110	110
									E24	18.0	2	50.0	95.1	102.0	110	110
									E36	25.5	2	70.8	121.1	128.0	125	150
									E54	40.6	2	112.7	173.5	180.4	175	200
	230	25.0	149.0	35.0	1.5	16.1	5.5	10.0	None	—	—	—	88.4	93.9	110	110
									E18	18.0	2	45.2	88.4	93.9	110	110
									E24	24.0	2	60.2	104.8	111.7	110	125
									E36	34.0	2	85.3	134.9	141.7	150	150
									E54	54.0	2	135.6	162.5	169.4	175	175
	460	11.8	75.0	16.5	0.8	8.1	2.2	5.0	None	—	—	—	42.9	45.1	50	50
									E18	18.0	2	22.6	43.4	46.2	50	50
									E24	24.0	2	30.1	52.5	55.2	60	60
									E36	34.0	2	42.7	67.5	70.2	70	80
									E54	54.0	2	67.8	81.3	84.1	90	90
	575	8.6	54.0	12.0	0.6	6.0	1.8	4.0	None	—	—	—	31.8	33.6	40	40
									E18	18.0	2	18.1	34.2	36.4	40	40
									E24	24.0	2	24.1	41.4	43.6	45	45
									E36	34.0	2	34.1	53.4	55.6	60	60
									E54	54.0	2	54.2	64.5	66.7	70	70

1. Minimum Circuit Ampacity.
2. Dual Element, Time Delay Type.
3. HACR type per NEC.

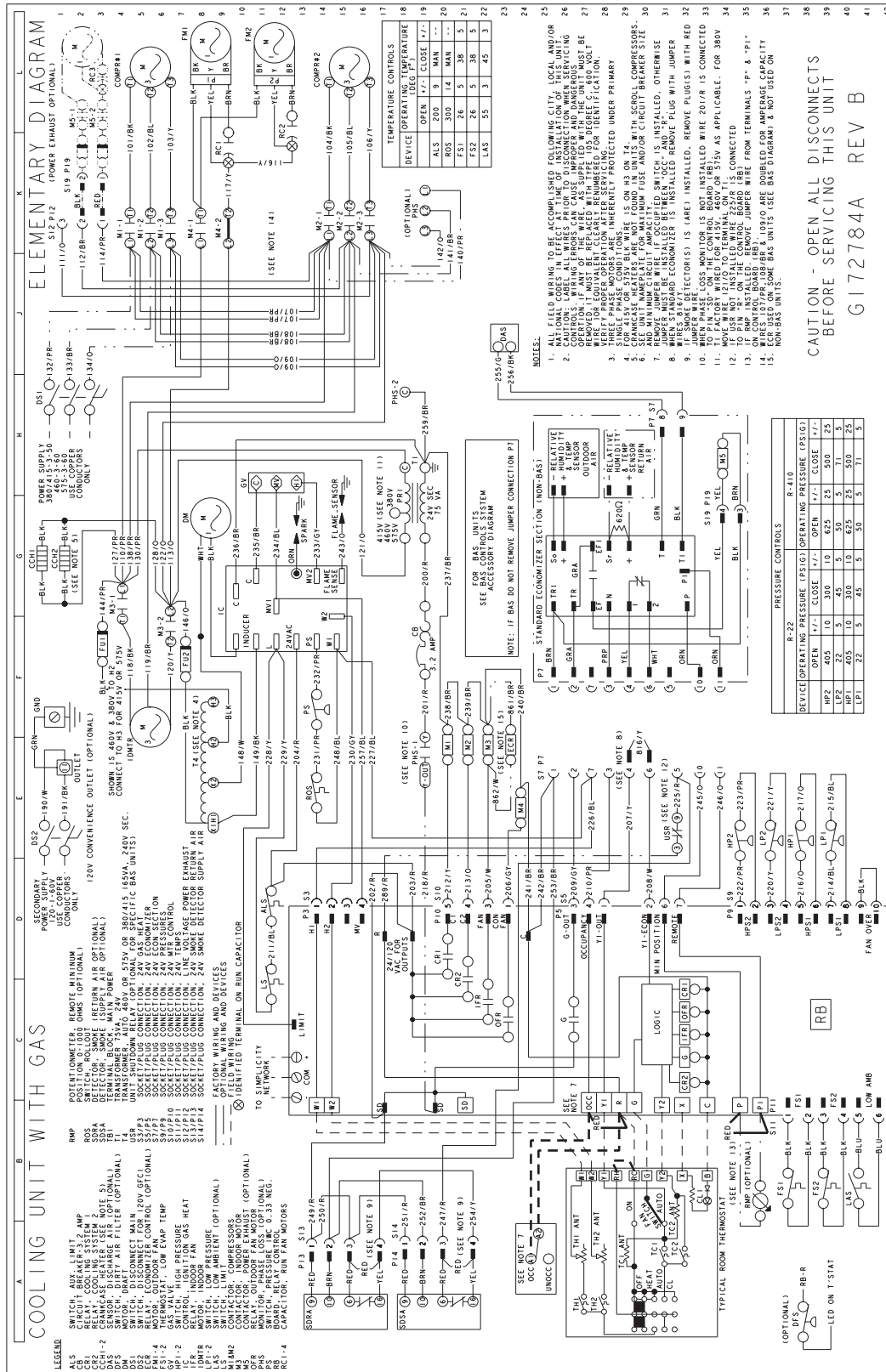
Typical Wiring Diagrams

ZH/ZR078-150 Typical Wiring Diagrams

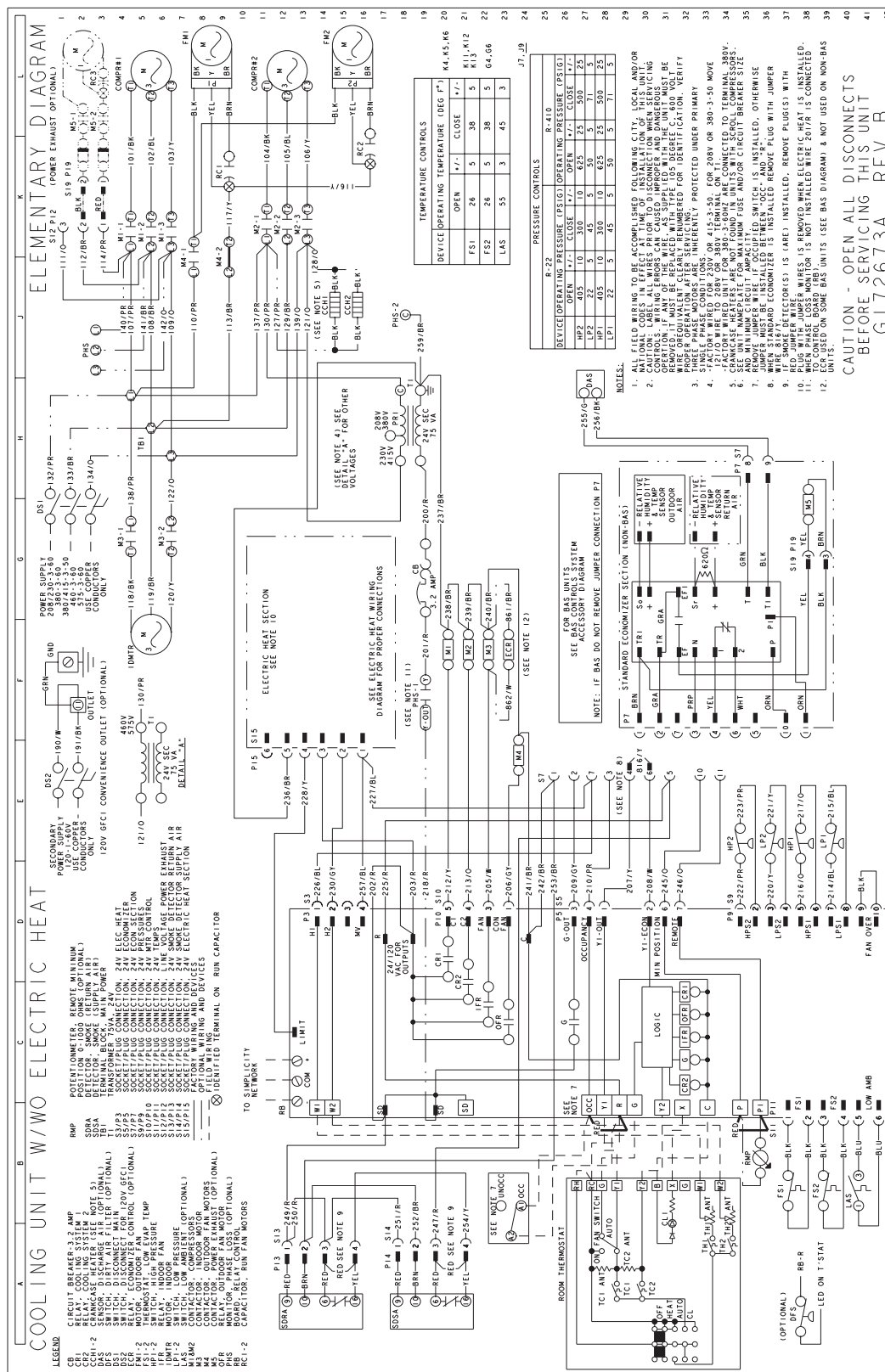
Typical ZH/ZR078-120 Cooling Unit with Gas Heat 230 Volt Wiring Diagram



Typical ZH/ZR078-120 Cooling Unit with Gas Heat 460/575 Volt Wiring Diagram

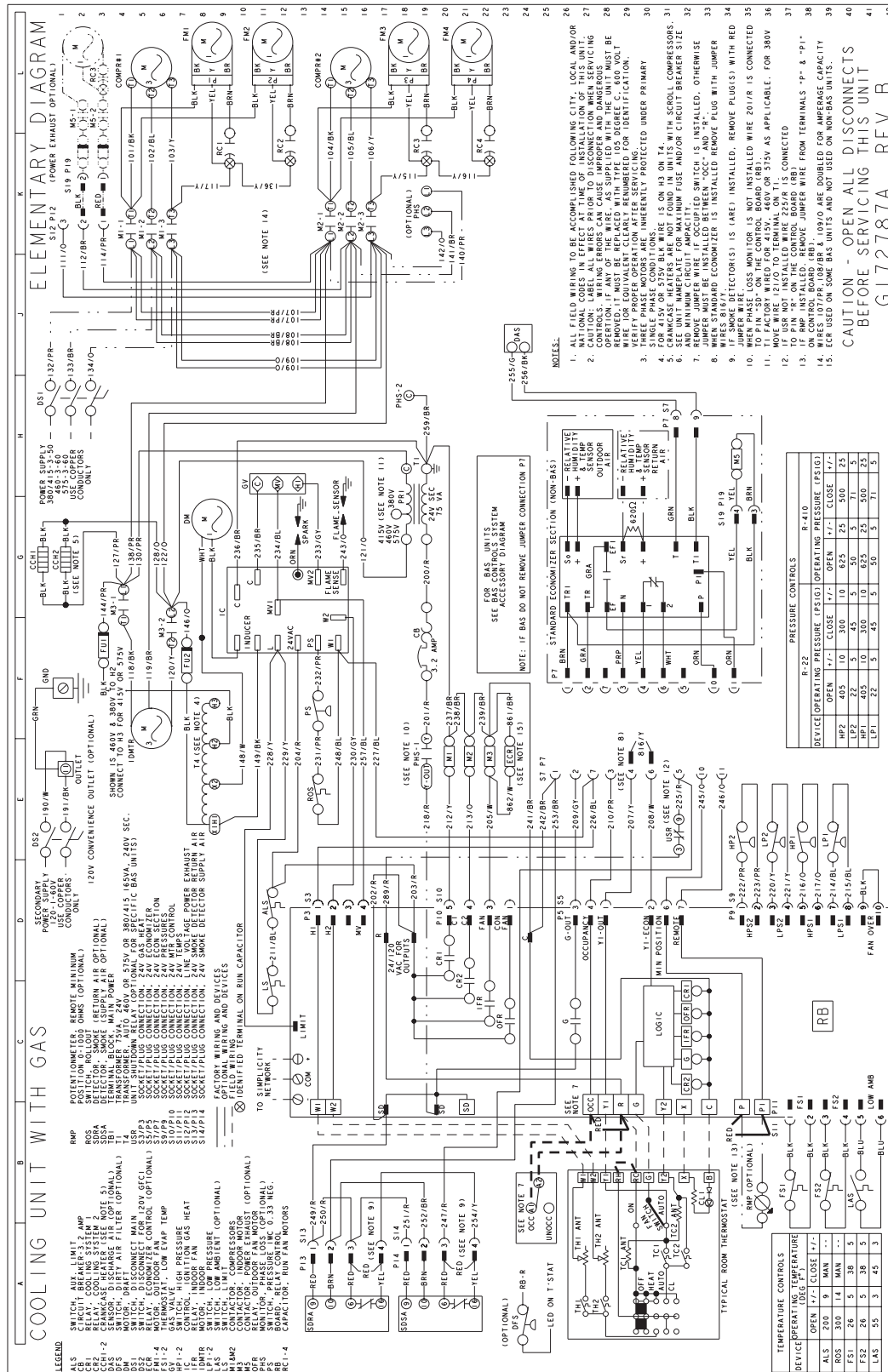


Typical ZH/ZR078-120 Cooling Unit with/without Electric Heat Wiring Diagram





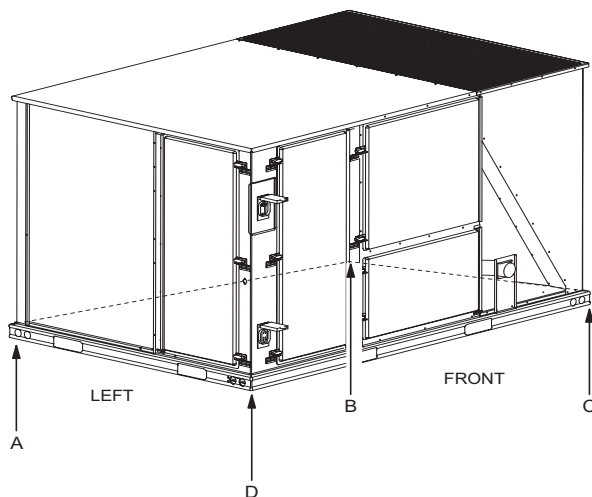
Typical ZH/ZR150 Cooling Unit with/without Electric Heat Wiring Diagram



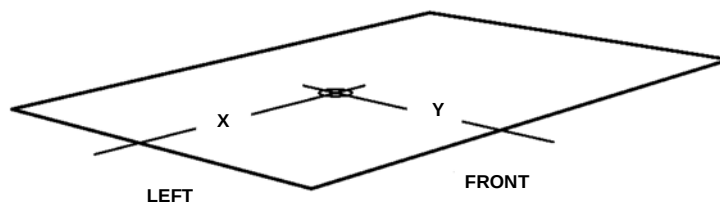
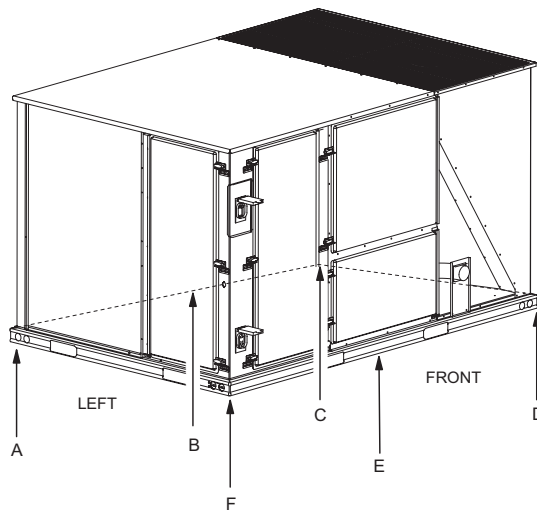
Weights and Dimensions

ZH/ZR/XP078-150 Unit Weights

Unit 4 Point Load Weight



Unit 6 Point Load Weight

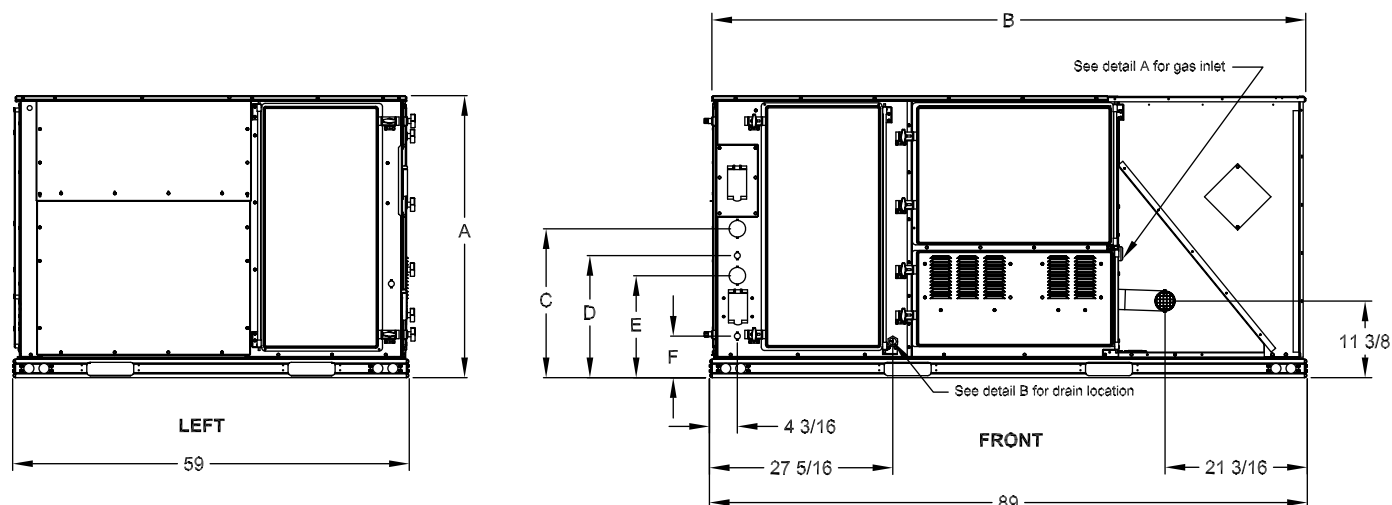
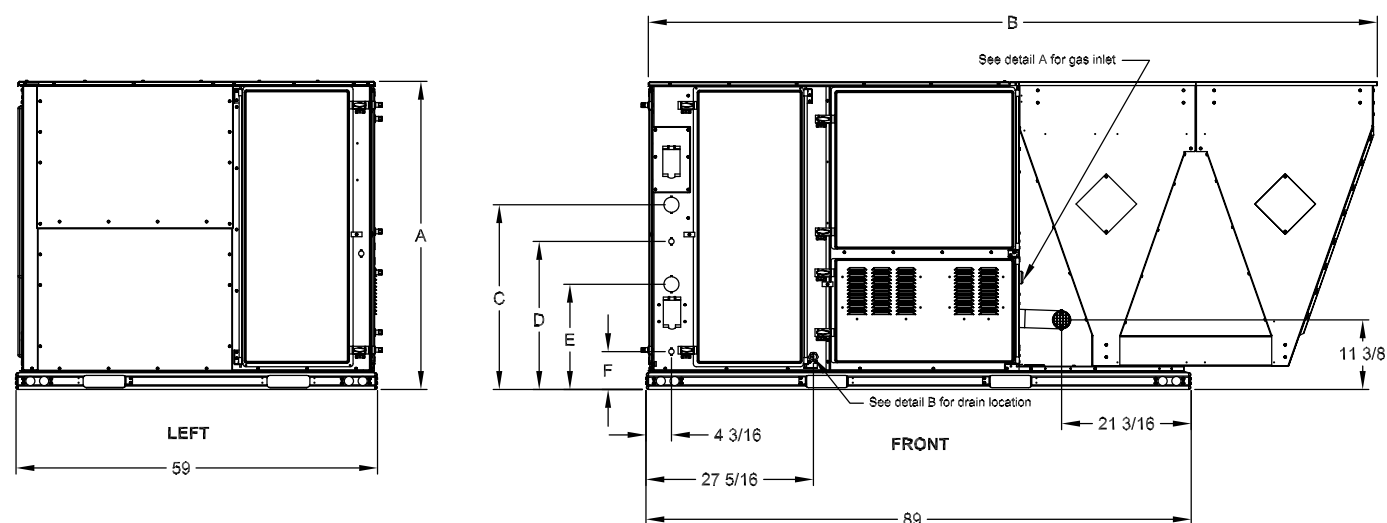


Size (Tons)	Model	Weight (lbs.)		Center of Gravity		4 Point Load Location (lbs.)				6 Point Load Location (lbs.)					
		Shipping	Operating	X	Y	A	B	C	D	A	B	C	D	E	F
078 (6.5)	ZH	905	900	38	23	201	150	234	315	141	115	95	149	180	221
090 (7.5)	ZH	925	920	38	23	206	153	240	322	144	117	97	152	184	225
102 (8.5)	ZH	1140	1135	38	25.5	281	209	275	369	197	160	133	175	211	259
120 (10)	ZH	1140	1135	38	25.5	281	209	275	369	197	160	133	175	211	259
150 (12.5)	ZH	1405	1400	51	25.5	258	347	456	339	164	198	243	319	260	216
078 (6.5)	ZR	970	965	38	23	216	161	251	337	151	123	102	160	193	236
090 (7.5)	ZR	970	965	38	23	216	161	251	337	151	123	102	160	193	236
102 (8.5)	ZR	1205	1200	38	25.5	297	221	291	390	208	170	141	185	223	274
120 (10)	ZR	1205	1200	38	25.5	297	221	291	390	208	170	141	185	223	274
150 (12.5)	ZR	1470	1465	51	25.5	270	363	477	355	172	207	254	334	272	226
078 (6.5)	XP	925	920	38	23	206	153	240	322	144	117	97	152	184	225
090 (7.5)	XP	925	920	38	23	206	153	240	322	144	117	97	152	184	225
102 (8.5)	XP	1140	1135	38	25.5	281	209	275	369	197	160	133	175	211	259
120 (10)	XP	1140	1135	38	25.5	281	209	275	369	197	160	133	175	211	259
150 (12.5)	XP	1405	1400	51	25.5	258	347	456	339	164	198	243	319	260	216

ZH/ZR/XP078-150 Unit Accessory Weights

Unit Accessory	Weight (lbs.)	
	Shipping	Operating
Economizer	90	85
Power Exhaust	155	150
Electric Heat ¹	80	80
Gas Heat ²	110	110

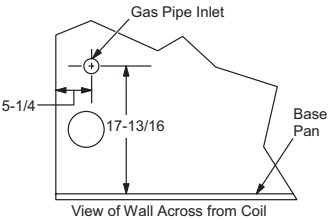
1. Weight given is for the maximum heater size available (54KW).
2. Weight given is for the maximum number of tube heat exchangers available (8 tube).

ZH/ZR/XP078-150 Unit Dimensions**ZH/ZR/XP078-120****ZH/ZR/XP150**

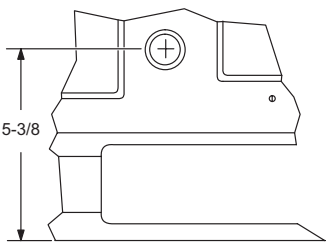
ZH/ZR/XP078-150 Unit Physical Dimensions

Unit Model Number	Dimension (in.)					
	A	B	C	D	E	F
078	42	89	22 1/8	18 3/16	15 3/16	6 3/16
090	42	89	22 1/8	18 3/16	15 3/16	6 3/16
102	50 3/4	89	30 3/16	24 3/16	17 3/16	6 3/16
120	50 3/4	89	30 3/16	24 3/16	17 3/16	6 3/16
150	50 3/4	119 1/2	30 3/16	24 3/16	17 3/16	6 3/16

Detail A



Detail B

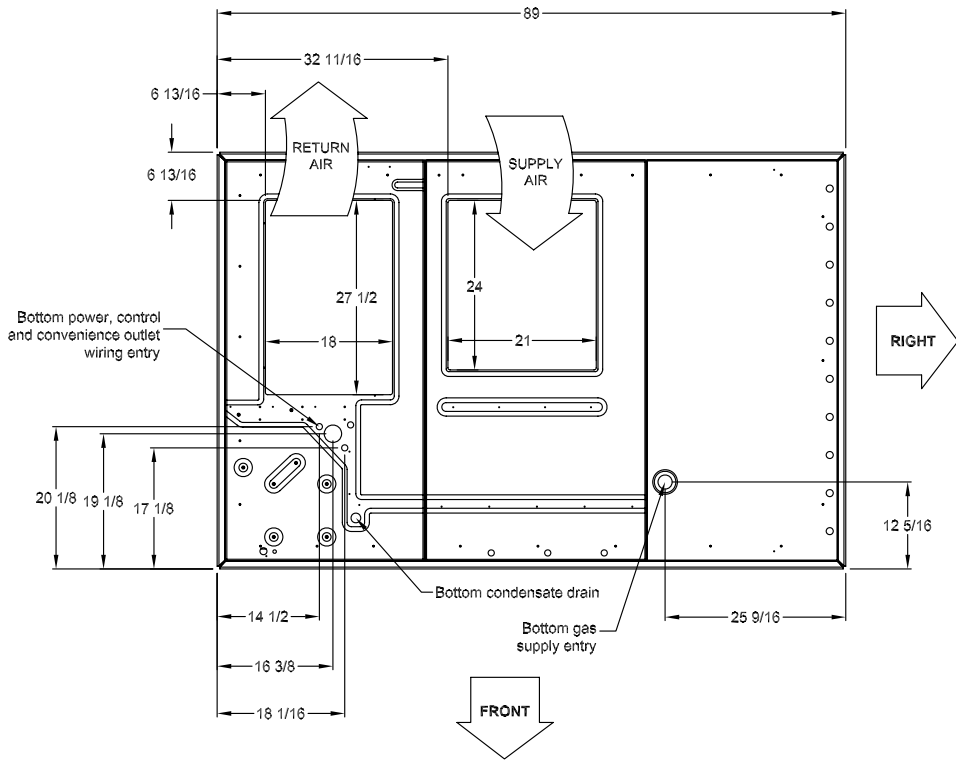


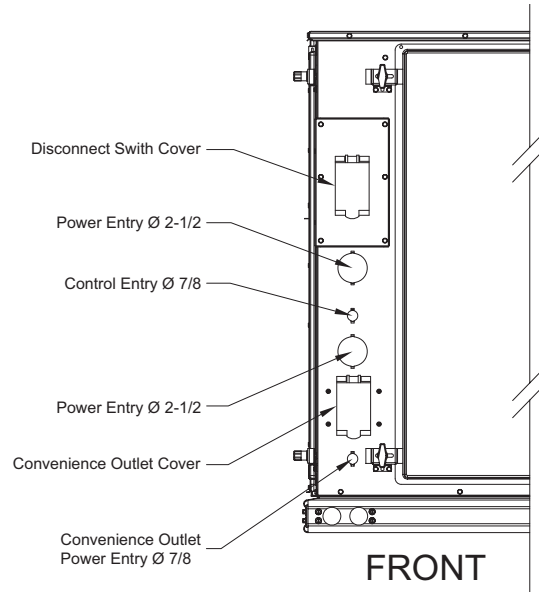
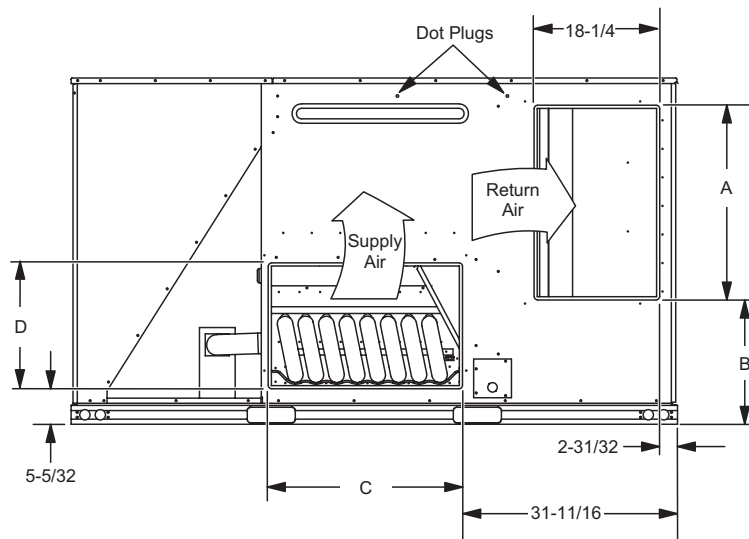
ZH/ZR/XP078-150 Unit Clearances

Direction	Distance (in.)	Direction	Distance (in.)
Top ¹	72	Right	12
Front	36	Left	36
Rear	36	Bottom ²	0

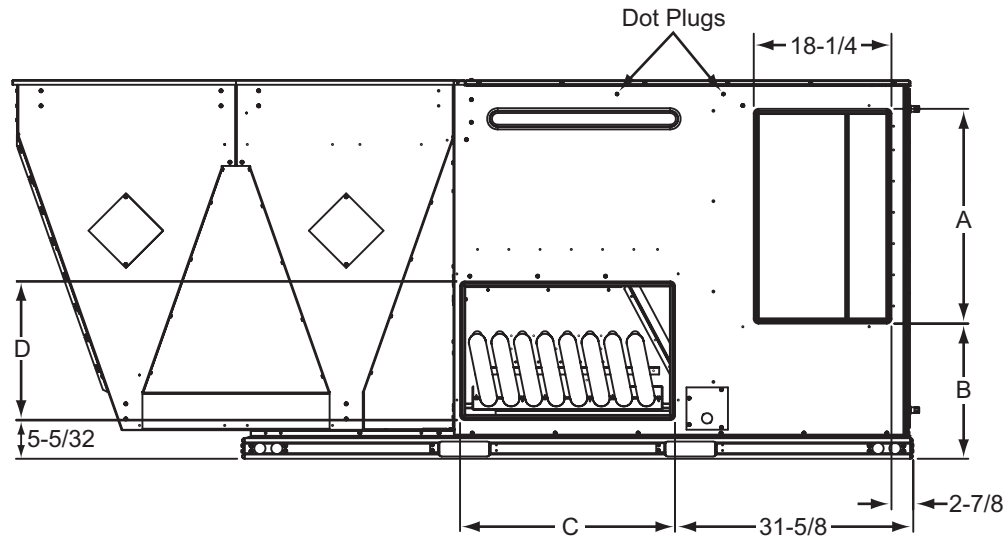
- 1. Units must be installed outdoors. Over hanging structure or shrubs should not obscure condenser air discharge outlet.
- 2. Units may be installed on combustable floors made from wood or class A, B or C roof covering materials.

ZH/ZR/XP078-150 Unit Bottom Duct Openings



ZH/ZR/XP078-150 Unit Electrical Entry**ZH/ZR/XP078-120 Unit Side Duct Openings**

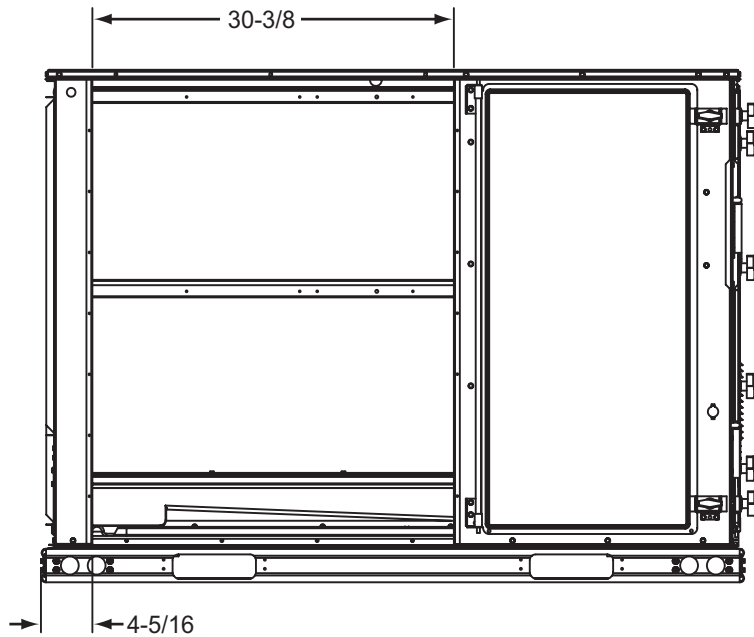
ZH/ZR/XP150 Unit Side Duct Openings



Side Duct Dimensions

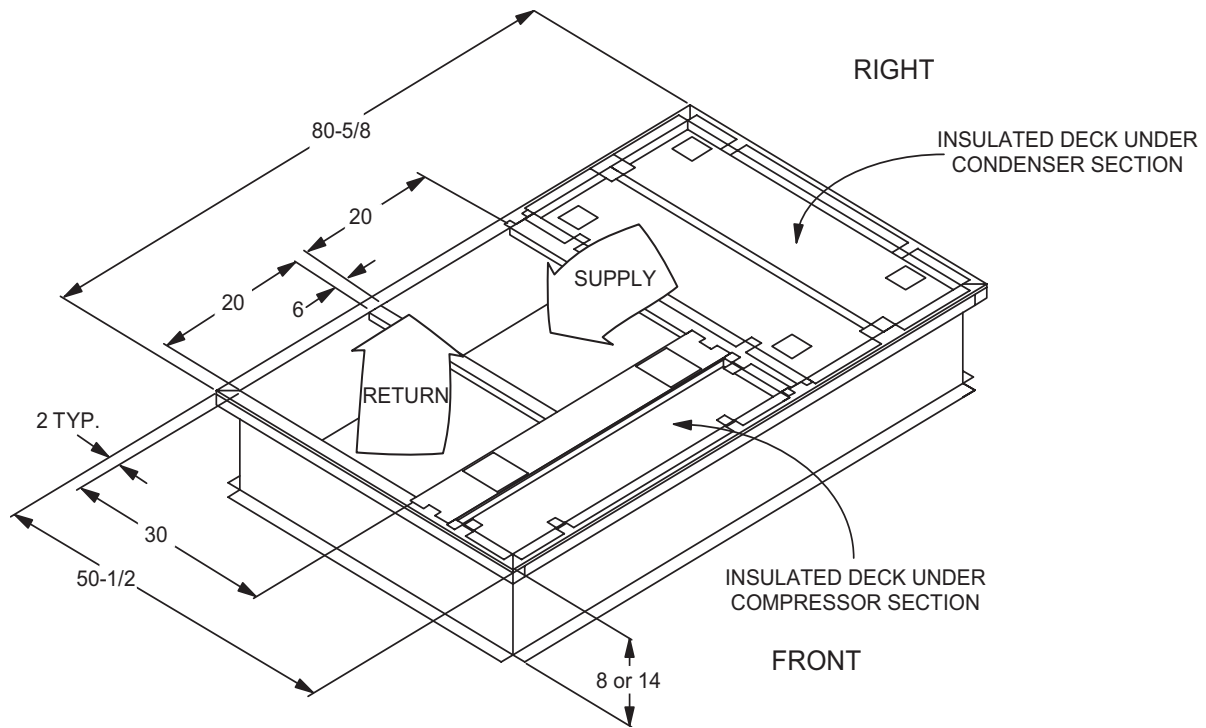
Unit Model Number	Dimension (in.)			
	A	B	C	D
078	27 3/4	12 1/16	27 1/2	16
090	27 3/4	12 1/16	27 1/2	16
102	28 1/4	18 1/16	28 1/4	18 1/4
120	28 1/4	18 1/16	28 1/4	18 1/4
150	28 1/4	18 1/16	28 1/4	18 1/4

ZH/ZR/XP078-150 Unit Left Duct Opening

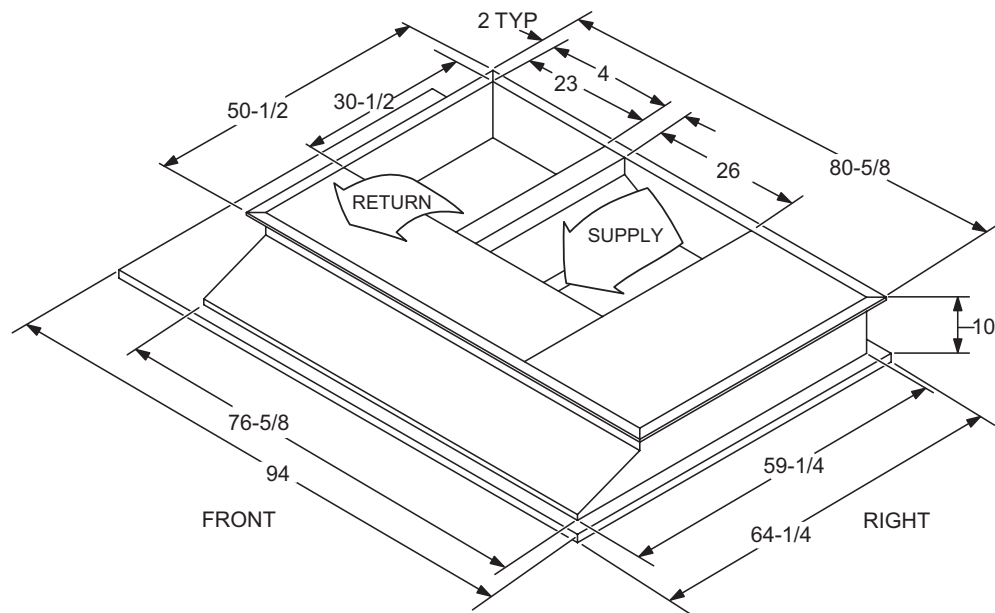


ZH/ZR/XP078-150 Unit Accessory Dimensions

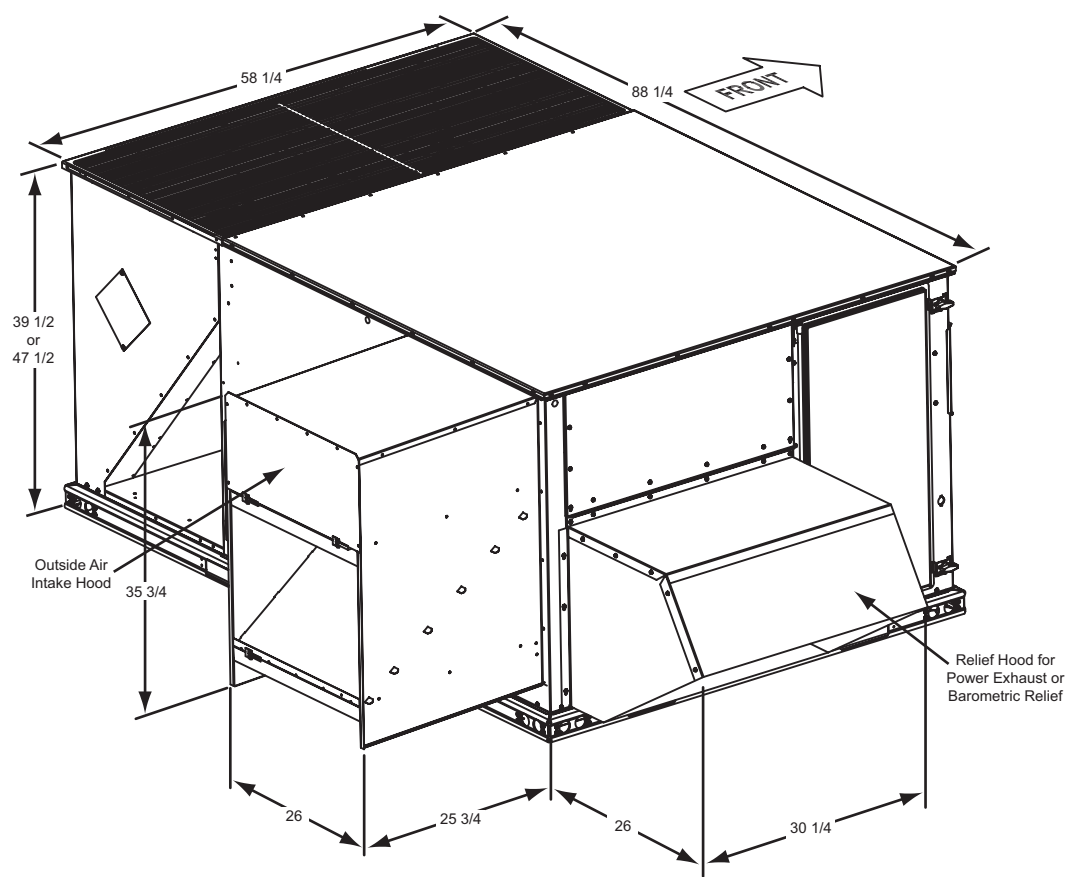
ZH/ZR/XP078-150 Roof Curb



ZH/ZR/XP078-150 Transition Roof Curb



ZH/ZR/XP078-150 Economizer Assembly



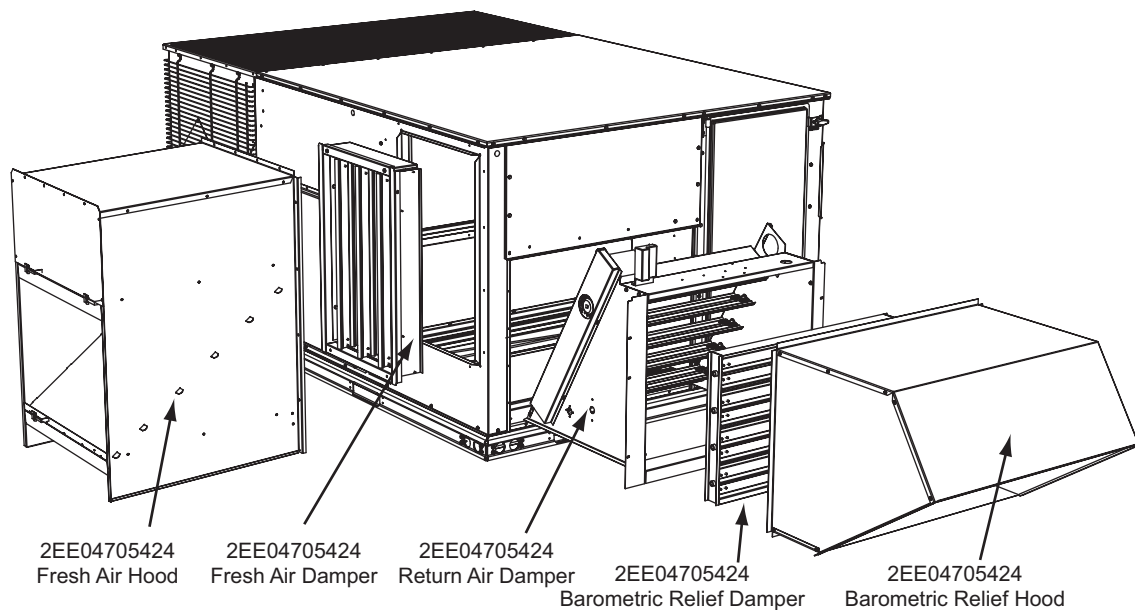
Economizer Options

Economizer Usage

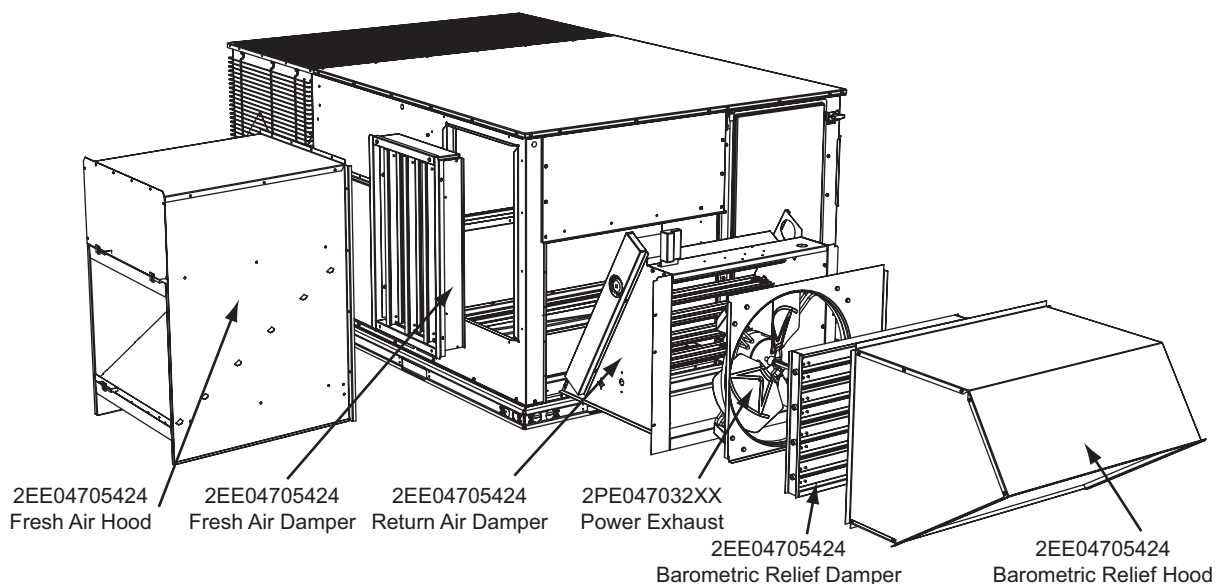
Application	Cabinet Height	Description	Model
Bottom Return	All	Downflow economizer with barometric relief	2EE04705424
Side Return	All	Horizontal economizer without barometric relief	2EE04705524 ¹
ERV or End Return	42"	Slab Economizer, 42" tall cabinet	2EE04705624 ²
	50"	Slab Economizer, 50" tall cabinet	2EE04705224 ²

1. Barometric relief must be ordered separately and installed in duct work.
2. Barometric relief or fresh air hood not included. Must be ordered separately.

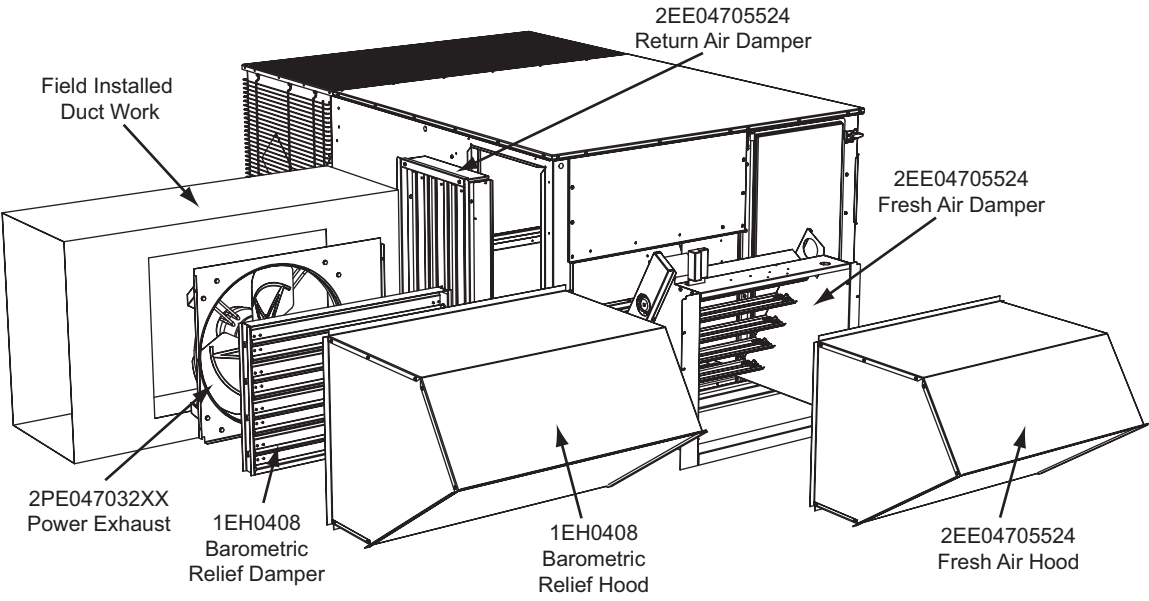
Factory Installed Downflow Economizer



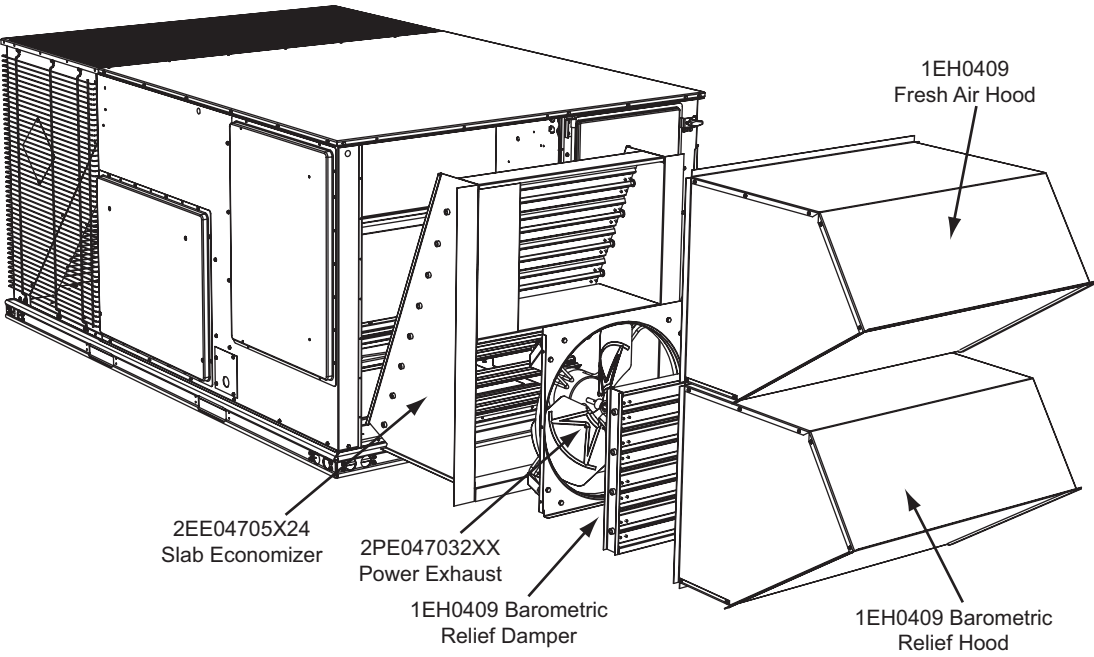
Field Installed Downflow Economizer W/Power Exhaust



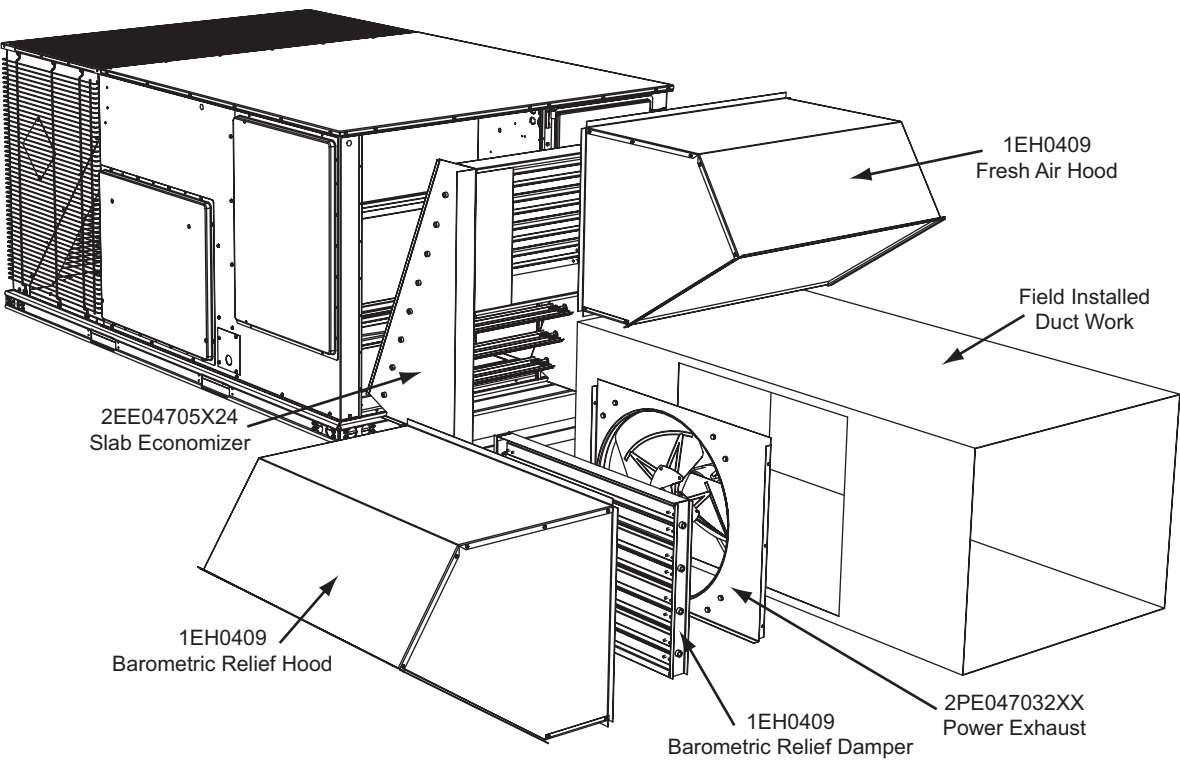
Field Installed Horizontal Economizer W/Power Exhaust



Slab Economizer Downflow W/Power Exhaust



Slab Economizer End Return W/Power Exhaust



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246824-YTG-E-0507
Supersedes: 246824-YTG-D-0806