# TECHNICAL GUIDE
# R-410A
# ZH/ZJ/ZR SERIES
# 3 - 12.5 TON
# 60 Hertz




ZH/ZJ/ZR 3 THROUGH 10 TON




ZH/ZJ/ZR 12.5 TON

SMART EQUIPMENT

## Description

**ASHRAE 90.1 COMPLIANT**

YORK® Sun™ Pro units are convertible single packages with a common footprint cabinet and common roof curb for all 3 through 12.5 ton models. All 6.5 through 12.5 ton 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 Sun™ Pro 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.

Sun™ Pro units in all tonnage sizes are convertible between side airflow and down airflow, with corresponding economizer if economizer option is desired.

Sun™ Pro units are available in the following configurations: cooling only, cooling with electric heat, cooling with gas heat, reheat only, reheat with electric heat and reheat with gas heat. Electric heaters are available as factory-installed options or field-installed accessories.

All units provide constant supply air volume. A variable air volume (VAV) option, which features a variable frequency drive (VFD), is available on 6.5 through 12.5 ton ZH/ZJ models only.

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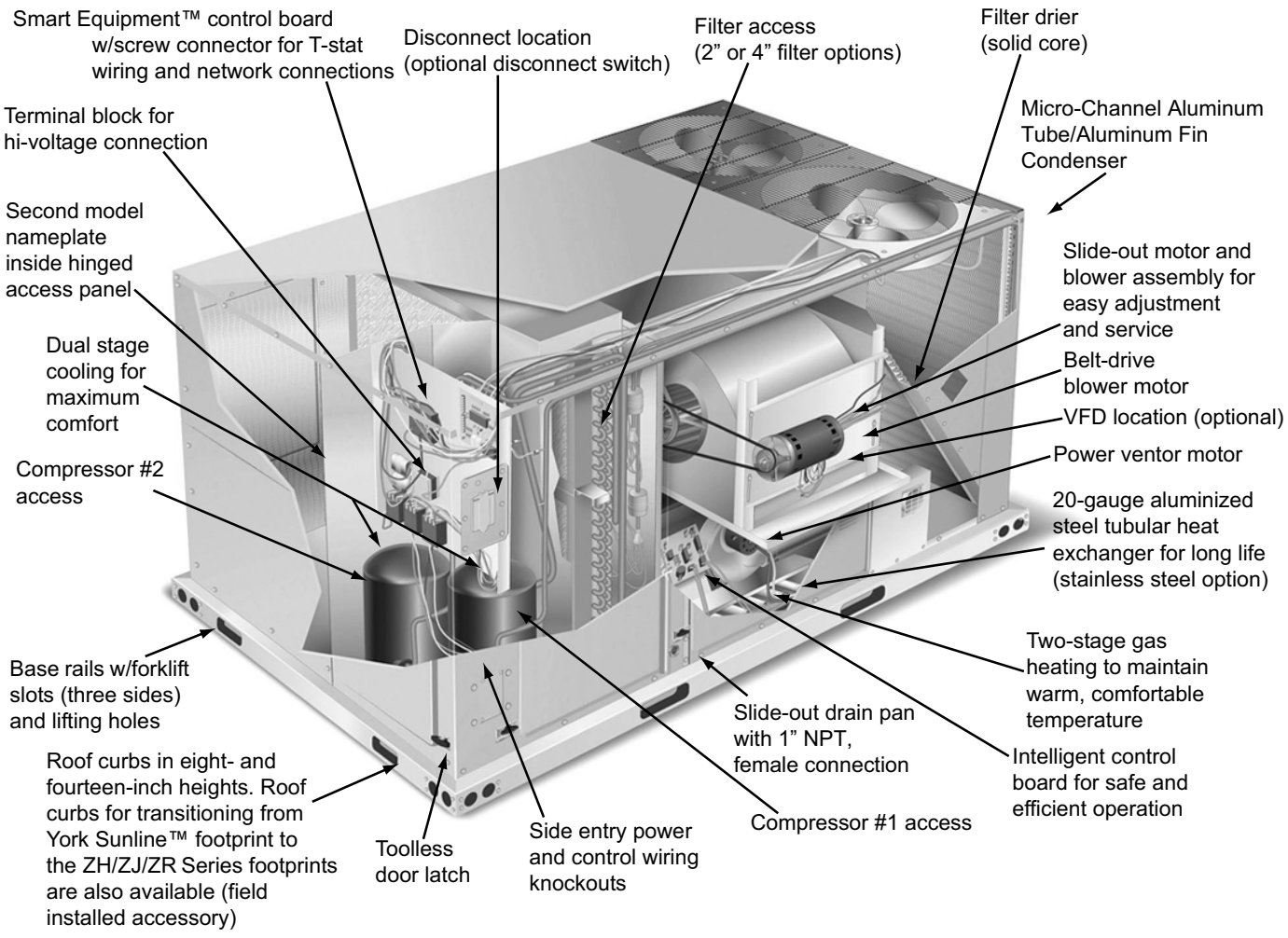
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## Table of Contents

**Description** . . . . . 1
**Table of Contents** . . . . . 2
**Component Location** . . . . . 2
**Nomenclature** . . . . . 3
**Features and Benefits** . . . . . 4
**Guide Specifications** . . . . . 11
**Physical Data** . . . . . 15
**Capacity Performance** . . . . . 34
**Airflow Performance** . . . . . 106
**Sound Performance** . . . . . 124
**Electrical Data** . . . . . 138
**Typical Wiring Diagrams** . . . . . 174
**Weights and Dimensions** . . . . . 196
**Economizer Options** . . . . . 207

## Component Location

**Cooling With Gas Heat (6 Through 10 Ton)**



## Nomenclature

### 3-12.5 Ton York® Model Number Nomenclature

| Z | H | 090 | C | 00 | A | 2 | A | 1 | A | A | A | 1 | A | 2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

**Product Category**
Z = A/C, Single Pkg., R-410A

**Product Identifier**
H = Standard(3-5)/High(6-12) Eff
J = Pkg AC High Eff
R = Standard Eff Reheat

**Nominal Cooling Capacity**
037 = 3 Ton
049 = 4 Ton
061 = 5 Ton
078 = 6.5 Ton
090 = 7.5 Ton
102 = 8.5 Ton
120 = 10.0 Ton
150 = 12.5 Ton

**Heat Type**
C = Cooling Only
E = Electric Heat

**Single Stage Natural Gas Heat Options**
H = 1 Stage Gas Aluminized Steel
J = 1 Stage Gas Stainless Steel
K = 1 Stage Low Nox Gas Aluminized Steel
L = 1 Stage Low Nox Gas Stainless Steel

**Two Stage Natural Gas Heat Options**
N = 2 Stage Gas Aluminized Steel
S = 2 Stage Gas Stainless Steel
P = 2 Stage Low Nox Gas Aluminized Steel
Q = 2 Stage Low Nox Gas Stainless Steel

**Heat Capacity**
00 = Cooling Only

**Gas MBH Input (Unit Size Allowed)**
06 = 60 MBH Input (037, 049)
08 = 80 MBH Input (037, 049, 061)
12 = 120 MBH Input (037, 049, 061, 078, 090, 102)
16 = 160 MBH Input (061)
18 = 180 MBH Input (078,090,102,120,150)
24 = 240 MBH Input (120,150)

**Electric Heat (Unit Size Allowed)**
03 = 3 KW (037)
06 = 6 KW (037,049,061)
09 = 9 KW (037,049,061,078,090,102)
15 = 15KW (037,049,061)
18 = 18 KW (078,090,102,120,150)
20 = 20 KW (049,061)
24 = 24 KW (061, 078,090,102,120,150)
36 = 36 KW (078,090,102,120,150)
54 = 54 KW (120,150)

**Blower Option**
B = Standard Static
D = High Static
E = VFD/VAV Std Static
G = VFD/VAV High Static
H = VFD/VAV w/Bypass Std Static
K = VFD/VAV w/Bypass High Static
L = VFD/VAV Customer Std Static
N = VFD/VAV Customer High Static
P = VFD IntelliSpeed Std Static
R = VFD IntelliSpeed High Static
S = VFD w/Byp IntelliSp Std Static
U = VFD w/Byp IntelliSp Hi Static
V = VFD Cust IntelliSp Std Static
X = VFD Cust IntelliSp Hi Static

**Voltage**
2 = 208/230-3-60
4 = 460-3-60
5 = 575-3-60

**Outdoor Air Option**
A = No Economizer
B = Economizer w/Barometric RLF
D = Economizer w/Power EXH
H = Motorized Damper

**Service Options**
1 = No Service Options
2 = DSC (Disconnect Switch)
3 = NCO (Non-PWR Conv. Outlet)
4 = PCO (Powered Conv. Outlet)
5 = DSC,NCO
6 = DSC,PCO

**Sensors**
A = No Sensors
B = PHM (Phase Monitor)
C = DFS (Dirty Filter Switch)
D = SSD (Supply Air Smoke DET)
E = RSD (Return Air Smoke DET)
F = PHM,DFS
G = PHM,SSD
H = PHM,RSD
J = DFS,SSD
K = DFS,RSD
L = SSD,RSD
M = PHM,DFS,SSD
N = PHM,DFS,RSD
P = PHM,SSD,RSD
Q = DFS,SSD,RSD
R = PHM,DFS,SSD,RSD

**Controls Option**
A = Stand Alone Smart Equipment™
C = BACnet MSTP,Mdbs,N2 COM Card
D = CPC Control, DFS, APS
G = Novar UCM Ctrl, DFS, APS
H = Hnywll Excel 10 CTRL,DFS,APS
M = Verasys Single Zone
N = Verasys Change Over Bypass
P = Verasys VAV

**Refrigeration**
A = Standard Refrigeration
B = ECC (E-Coat Cond Coil)
C = EEC (E-Coat Evap Coil)
D = HGBP (Hot Gas Bypass)
F = ECC,EEC
G = ECC,EEC,HGBP
J = ECC,HGBP
M = EEC,HGBP

**Additional Options**
1 = STD Throwaway Filter
2 = 2" Pleated Filters (Merv 8)
3 = 4" Pleated Filters (Merv 13)
4 = Coil Guard (CG), STD Filter
5 = 2" Pleated Filter,CG
6 = 4" Pleated Filter,CG

**Cabinet Options**
A = Std Cabinet
E = SSD (SST Drain Pan)
R = Reverse Drain Pan

**Product Generation**
1 = First Generation
2 = Second Generation

# Features and Benefits

## Standard Features

- **Service Friendly** - The Sun™ Pro incorporates a number of key features for ease of 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.

  The Smart Equipment™ control board provides alarm messages to help quickly identify any faults.

  All units use four filters of the same standard size. This standardization simplifies selections for filter 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 Sun™ Pro units have a second model nameplate located inside the control access door. This is to prevent deterioration of the nameplate through weathering.
- **Coil Technology** – All ZH/ZJ condensers utilize Micro-Channel “all-aluminum” condensers which provide improved heat transfer capabilities and reduced charge volumes. All evaporators utilize a conventional copper tube/aluminum fin design for proven reliability and performance. ZR037 thru 061 models utilize Micro-Channel condenser coils, ZR078 thru 150 models utilize copper tube/aluminum fin or Micro-Channel condenser coils. For specific unit model information see Physical Data Tables.
- **Environmentally Aware** - For improved Indoor Air Quality, a combination of aluminum foil faced and elastometric rubber insulations are used exclusively throughout the units.
- **Balanced Heating** - The Sun™ Pro two stage gas heating offers "Ultimate Heating Comfort" with a balance between 1st and 2nd stage gas heating to provide a well maintained desired temperature.

| Unit Tonnage | 1st. Stage | 2nd. Stage |
|---|---|---|
| 3-5 Ton | 70 to 75% of Heating Capacity | 100% of Heating Capacity |
| 6.5 - 12.5 Ton | 60% of Heating Capacity | 100% of Heating Capacity |

- **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. 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** - Smart Equipment™ control boards have standardized a number of features previously available only as options or by utilizing additional controls.

**⚠ CAUTION**

The Smart Equipment™ control board used in this product will effectively operate the cooling system down to 0°F when this product is applied in a comfort cooling application for people. An economizer is typically included in this type of application. When applying this product for process cooling applications (computer rooms, switchgear, etc.), please call the applications department for Ducted Systems @ 1-877-874-SERV for guidance. Additional accessories may be needed for stable operation at temperatures below 30°F.



- **Units will come with the new state of the art Smart Equipment™ control system.** The new unit control incorporates the best of the already proven controls and creates a more robust, intelligent control. The goal of this control is to utilize cutting edge technology making the equipment easier to install, operate, and service. All units are Factory commissioned, configured, and run tested.
- **Versatile -** The Smart Equipment™ control can be configured to use with a standard thermostat (easy to connect screw terminals), A zone sensor, or can be setup to communicate with multiple BAS communication protocols to integrate with building automation systems.
- **Reduce field installed complexity -** Each unit will comes equipped with factory installed supply air, return air, and outdoor air temperature sensors providing key temperature readings thus reduce field installed complexity.
- **On-board USB Port -** The new control comes with a long list of features including data logging, current and previous system faults and software update capabilities using the on board USB port and common flash drive. Energy use monitoring capabilities allow custom tailoring to allow a system to work more efficiently at all times and occupancy levels. Self test and start-up reports also available from the board VIA the USB port.
- **Embedded LCD Display -** The board has a easy to read, built-in LCD display and easy to use navigation joystick and buttons allowing the user to quickly navigate the menus displaying unit status, options, current function, supply, return and outdoor temperatures, fault codes and other information.
- **Safety Monitoring -** The control monitors the outdoor, supply, and return air temperatures and the high and low pressure switch status on the independent refrigerant circuits. On units with heating the gas valve and high temperature limit switches are monitored on gas and electric heating units. The control also monitors the voltage supplied to the unit and will protect the unit if low voltage due to a brown out, or other electrical issue occurs.
- **Low Ambient -** An integrated low-ambient control allows units to operate in the cooling mode down to 0°F outdoor ambient without additional components or intervention. 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 control. 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.
- **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/or heating capacity.
- **Nuisance Trip Protection and Three Strikes -** To prevent nuisance calls, the control board uses a three times, you're out philosophy. The high, low-pressure switch, anti-freeze protection, low voltage or heating high limit must trip three times within two hours before the unit control board will lock out the associated compressor.An alarm message will be displayed on the LCD screen.
- **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.
- **Low Limit Control (LLC)** - To prevent the supply air from dropping below a specified set point, when there is a demand for cooling during cold outside conditions. (Programmable Set point)
- **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 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 750-hour salt spray test.
- **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 rigging holes 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. 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 supply air blowers are equipped with a belt drive that can be adjusted to meet the exact requirements of the job. A high static drive option is available for applications with a higher CFM and/ or static pressure requirement.

- **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 (10 yr.) and stainless steel tubular heat exchangers carry a 15- year warranty.

## Factory Installed Options

YORK® offers several equipment options factory installed, for the Sun™ Pro line.

- **Optional Factory Installed Economizers** - Sun™ Pro units offer a variety of optional factory installed economizers with low leak dampers. The outdoor air dry bulb sensor enables economizer operation if the outdoor air temperature is less than the set point of the economizer logic module. See economizer options section to determine the correct economizer for your application.
  - **Down flow / End Return Economizers (with barometric relief and fresh air hood)** - All units offer a variety of optional factory installed down flow economizers that are shipped, installed and wired with low leak dampers designed to meet ASHRAE 90.1, AMCA 511 Class 1A damper, and the International Energy Conservation Code (IECC) certification requirements by achieving leakage rates of 3 CFM/sq. ft. at 1" of static pressure. Each economizer goes through a rigorous 60,000 cycle test. Dry bulb, single enthalpy, and dual enthalpy (with field installed kit) can be selected. 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 outdoor air dry bulb temperature or the outdoor air enthalpy input. The optional (field installed) single or dual enthalpy kits provide additional inputs to monitor outdoor air/ or return air humidity and temperature for true enthalpy control. The installer needs only to assemble the outdoor air hood, attach the enthalpy control the hood and mount the hood to the unit (Hood and control are provided).
- **Power Exhaust** - This factory option allows down flow or horizontal end return economizer operation. **The power exhaust must be removed from the unit and mounted in the horizontal end return duct work when applying the product in the horizontal, end return configuration.**
- **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.
- **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.
- **Variable Air Volume (VAV; 6.5 through 12.5 ton, only)** - A factory-installed variable frequency drive (VFD), mounted in the Blower Access compartment, is used to control the speed of the indoor blower motor in order to maintain a constant static pressure in the supply duct. A duct pressure transducer is provided with the unit. The drive comes completely wired and pre-programmed from the factory.

  An optional, factory-installed manual bypass switch available with factory-installed VFD can be found in the Blower Motor Access compartment. The switch can be used to either route power to the VFD for modulating control of the blower motor, to bypass the drive and operate the motor at full speed, or to power the drive (and not the motor) for diagnostic purposes.

  VAV is not available with the factory-installed 3rd. party BAS controllers. VAV is only factory installed with the Smart Equipment™ Controller.

  A 'VFD-ready' option provides the provisions for a customer-installed drive. The unit comes with a mounting bracket installed in the Blower Access compartment which may accommodate other vendor's drives depending on their size. In order to utilize the unit's mounting bracket, the maximum recommended drive dimensions are limited to approximately 9" H x 5" W x 7.5" D.

  If the drive will not fit in the allotted space, then it will have to be mounted elsewhere; either within the building on a perpendicular wall which is not subjected to excessive temperature, vibration, humidity, dust, corrosive gas, explosive gas, etc., or within an appropriate enclosure rated for outside installation to safeguard against moisture, dust and excessive heat. A terminal block located in the control box is provided for field connection of the VFD controls.
- ***IntelliSpeed*™ Supply Fan Control Option (ASHRAE 90.1 compliant) -** Units configured with the ***IntelliSpeed*™** Supply Fan Option will contain a VFD for multi-speed supply fan operation. This option allows the supply fan RPM to vary based on the number of compressors or heating stages energized. The economizer's minimum position will also be configurable to vary based on the supply fan VFD frequency output.
- **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.
- **Low NOx Option** - For units with gas furnaces in locations where codes require that the Oxides of Nitrogen emissions from the furnace be below 40 Nano grams per joule.
- **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 3kW to 54kW and are available in all the voltage options of the base units. 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 and provide a fault message to the control board. Smoke detectors are available for both the supply and/or return air configurations.
- **Filters -** 2” Pleated MERV 8 or 4” Pleated MERV 13 are available to meet LEED requirements. A 2” Throwaway is shipped as standard.

**⚠WARNING**

Factory-installed smoke detectors may be subjected to extreme temperatures during "off" times due to outside air infiltration. These smoke detectors have an operational limit of -4°F to 158°F. Smoke detectors installed in areas that could be outside this range will have to be relocated to prevent 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.
- **E-Coat Condenser Coils** - The condenser coils are coated with an epoxy polymer coating to protect against corrosion.
- **E-Coat Evaporator Coils** - The evaporator coils are coated with an epoxy polymer coating to protect against corrosion.
- **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. HGBP is standard on all units with VAV and optional with constant-volume units.

## Control Options

- **Smart Equipment™ with Communication Option Control** - The York® Smart Equipment™ with Communication Option Control is factory installed. It includes all the features of the Smart Equipment™ control with an additional gateway to BACnet MS/TP (programmable to Modbus or N2 protocols).
- **FDD (Fault Detection and Diagnostics) - Refrigerant side (Modification Center Option Only)**A factory installed control system option on the commercial equipment that constantly monitors refrigerant circuit pressures, refrigerant circuit temperatures, as well as the environmental temperatures and humidity via multiple sensor inputs.
  - Provides a building owner, technician or contractor with the operational characteristics of the RTUs entire refrigerant circuit to ensure the unit is functioning at its specified performance level.
  - Provides alarms if the unit is not functioning optimally.
  - Remotely accessible via the Mobile Access Portal (MAP) gateway as well as scrolled on the UCB LCD screen.
- **Novar® BAS Control -** The Novar® 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, with optional 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, with optional dirty filter indicator switch, and air proving switch.
- **Verasys** - Verasys provides a simple user experience with configurable self-recognizing controllers without the need for any additional tools. Verasys creates enhanced integration of HVACR equipment, zoning, and controls. Contractors are able to offer a complete bundled solution of equipment and controls to serve the light commercial market.

## Field Installed Accessories

YORK® offers several equipment accessories for field installation, for the Sun™ Pro line.

- **Down flow and End Return Economizers (with fresh air hood and barometric relief) -** All units offer a variety of optional factory installed down flow economizers that are shipped, installed and wired with low leak dampers designed to meet ASHRAE 90.1, AMCA 511 Class 1A damper, and the International Energy Conservation Code (IECC) certification requirements by achieving leakage rates of 3 CFM/sq. ft. at 1" of static pressure. Each economizer goes through a rigorous 60,000 cycle test. Dry bulb, single enthalpy, and dual enthalpy (with field installed kit) can be selected. 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 outdoor air dry bulb temperature or the outdoor air enthalpy input. The dual enthalpy kit provides a second input used to

monitor the return air (field installed). The installer needs only to assemble the outdoor air hood, attach the enthalpy control the hood and mount the hood to the unit (Hood and control are provided).

- **Single or Dual Enthalpy Control, Accessories** - These kits contain the required components to convert a dry bulb economizer to a single enthalpy and/or dual enthalpy economizer.
- **Barometric Relief Damper** - Zero to 100% capacity barometric relief dampers for use with horizontal flow, or field installed economizers.
- **Power Exhaust** - This accessory installs in the unit with a down flow or horizontal end return economizer. Power exhaust plugs into the connector in the unit bulkhead. **User must purchase the 1EH0408 barometric relief and hood kit when applying the product in a horizontal flow application. The power exhaust must be mounted in the horizontal end return ductwork.**
- **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.
- **$CO_2$ Sensor** - Senses $CO_2$ 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.
- **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.
- **Low NOx Kit** - For units with gas furnaces in locations where codes require that the Oxides of Nitrogen emissions from the furnace be below 40 Nano grams per joule.
- **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 3kW to 54kW and are available in all the voltage options of the base units. The 54kW/208-240 volt, field-installed heater kit is not available with VAV units due to a lack of space to accommodate the heater's fuse block accessory.

  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.
- **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 Sun™ Pro 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 6.5 thru 12.5 ton ZH,ZJ units and all 3 thru 12.5 ton ZR 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

### Field Installed Accessories - Non-Electrical

| MODEL | VOLTAGE | DESCRIPTION | WHERE USED |
|---|---|---|---|
| 1BD0408 | All | Burglar Bars, Downflow | All Cabinets |
| 1CG0419 | All | Coil Guard | (Electric / Electric Models), 50” Tall Standard Cabinets |
| 1CG0420 | All | Coil Guard | (Gas / Electric Models), 50" Tall Standard Cabinets |
| 1CG0427 | All | Coil Guard | (Electric / Electric Models), 42” Tall Cabinets |
| 1CG0428 | All | Coil Guard | (Gas / Electric Models), 42" Tall Cabinets |
| 1HG0411 | All | Hail Guard Kit | All Tall (50") Standard Cabinets, (Excludes 12.5T "V" cabinets) |
| 1HG0415 | All | Hail Guard Kit | All Short (42") Standard Cabinets |
| 1HG0425 | All | Hail Guard Kit | Diamond Pattern "W" Style Cabinet: ZH/ZR/ZJ/XP 150 |
| 1HG0431 | All | Hail Guard Kit | Provent Style 42" Std Short Cabinets |
| 1HG0432 | All | Hail Guard Kit | Provent Style 50" Std Tall Cabinets (Excludes 12.5T "V" cabinets) |
| 1FE0412 | All | Flue Exhaust Extension Kit | All Cabinets |
| 1FF0414 | All | 2" only Metal Filter Frame Kit | All Tall 50" Cabinets |
| 1FF0415 | All | 2" only Metal Filter Frame Kit | All Tall 42" Cabinets |
| 1FL0402 | All | Permanent 2" only Filter Kit Includes (4) Four Filters) | All Tall 50" Cabinets |
| 1FL0423 | All | Permanent 2" only Filter Kit (Includes (4) four Filters) | All Tall 42" Cabinets |
| 1GP0405 | All | Gas Piping Kit | All Cabinets |
| 1HA0442 | All | High Altitude Kit for Natural Gas | All 6 - 12T Cabinets |
| 1HA0450 | All | High Altitude Kit for Natural Gas | 3 - 5T (80, 120 & 160 MBH Input) |
| 1HA0451 | All | High Altitude Kit for Natural Gas | 3 - 4T (60 MBH Input) |
| 1HA0443 | All | High Altitude Kit for Propane | All 6 - 12T Cabinets |
| 1HA0452 | All | High Altitude Kit for Propane | 3 - 5T (80, 120 & 160 MBH Input) |
| 1HA0453 | All | High Altitude Kit for Propane | 3 - 4T (60 MBH Input) |
| 1NP0442 | All | Propane Conversion Kit | All 6 - 12T Cabinets |
| 1NP0454 | All | Propane Conversion Kit | 3 - 5T (80, 120 & 160 MBH Input) |
| 1NP0455 | All | Propane Conversion Kit | 3 - 4T (60 MBH Input) |
| 1RC0470 | All | Roof Curb, 8" Height | All Cabinets |
| 1RC0471 | All | Roof Curb, 14" Height | All Cabinets |
| 1RC0472 | All | Roof Curb, Transition (7.5 T thru 12.5T Sunline to Sun™ Pro 3-12T) | All Cabinets |
| 1WC0412 | All | Wooden Crate for extra protection during shipping and handling | Standard Cabinets Only (not applicable to units 119" in length) |
| 1LN0407 | All | Low NOx Kit | 3 - 5T (80, 120 & 160 MBH Input) |
| 1LN0408 | All | Low NOx Kit | 3 - 5T (60 MBH Input) |

## Accessories (Continued)

### Field Installed Accessories - Electric Heat

| MODEL | VOLTAGE | DESCRIPTION | WHERE USED |
|---|---|---|---|
| 2TP04520925 | 230 | 9kW Electric Heat | All 50" Cabinet 6.5 and 8.5 Ton Models |
| 2TP04520946 | 460 | | |
| 2TP04520958 | 575 | | |
| 2TP04531825 | 230 | 18kW Electric Heat | All 50" Cabinet 6.5, 8.5, 10 and 12.5 Ton Models |
| 2TP04531846 | 460 | | |
| 2TP04521858 | 575 | | |
| 2TP04532425 | 230 | 24kW Electric Heat | All 50" Cabinet 6.5, 8.5, 10 and 12.5 Ton Models |
| 2TP04532446 | 460 | | |
| 2TP04522458 | 575 | | |
| 2TP04533625 | 230 | 36kW Electric Heat | All 50" Cabinet 6.5, 8.5, 10 and 12.5 Ton Models |
| 2TP04533646 | 460 | | |
| 2TP04523658 | 575 | | |
| 2TP04525425 | 230 | 54kW Electric Heat | All 50" 10 and 12.5 Ton Models |
| 2TP04525446 | 460 | | |
| 2TP04525458 | 575 | | |
| 2TP04540925 | 230 | 9kW Electric Heat | All 42" Cabinet 6.5, 7.5 and 8.5 Ton Models |
| 2TP04540946 | 460 | | |
| 2TP04540958 | 575 | | |
| 2TP04541825 | 230 | 18kW Electric Heat | All 42" 6.5, 7.5 and 8.5 Ton Models |
| 2TP04541846 | 460 | | |
| 2TP04541858 | 575 | | |
| 2TP04542425 | 230 | 24kW Electric Heat | All 42" Cabinet 6.5, 7.5 and 8.5 Ton Models |
| 2TP04542446 | 460 | | |
| 2TP04542458 | 575 | | |
| 2TP04543625 | 230 | 36kW Electric Heat | All 42" Cabinet 6.5, 7.5 and 8.5 Ton Models |
| 2TP04543646 | 460 | | |
| 2TP04543658 | 575 | | |
| 2TP04510325 | 230 | 3kW Electric Heat | All 42" Cabinet 3 Ton Models |
| 2TP04510346 | 460 | | |
| 2TP04510625 | 230 | 6kW Electric Heat | All 42" Cabinet 3, 4 and 5 Ton Models |
| 2TP04510646 | 460 | | |
| 2TP04510825 | 230 | 9kW Electric Heat | All 42" Cabinet 3, 4 and 5 Ton Models |
| 2TP04510846 | 460 | | |
| 2TP04510858 | 575 | | |
| 2TP04511525 | 230 | 15kW Electric Heat | All 42" Cabinet 3, 4 and 5 Ton Models |
| 2TP04511546 | 460 | | |
| 2TP04511558 | 575 | | |
| 2TP04512025 | 230 | 20kW Electric Heat | All 42" 4 and 5 Ton Models |
| 2TP04512046 | 460 | | |
| 2TP04512058 | 575 | | |
| 2TP04512325 | 230 | 24kW Electric Heat | All 42" Cabinet 5 Ton Models |
| 2TP04512346 | 460 | | |
| 2TP04512358 | 575 | | |

## Accessories (Continued)

**Field Installed Accessories - Fresh Air**

| MODEL | VOLTAGE | DESCRIPTION | WHERE USED |
|---|---|---|---|
| 1FA0413 | All | Manual Outside Air Damper 0-35%, Downflow | All Cabinets |
| 1FA0414 | All | Manual Outside Air Damper 0-100%, Downflow | All Cabinets |
| 1EH0408 | All | Barometric Relief Kit for Power Exhaust, Horizontal Application | All Cabinets |
| 2EC0401 | All | Single Enthalpy Control | All Cabinets |
| 2EC0402 | All | Dual Enthalpy Control (Includes 2 Sensors) | All Cabinets |
| 2EE04717424 | All | Economizer for Downflow, End Return Horizontal, or ERV Applications. Includes FA Hood, Exhaust Hood w/Baro Relief | All 50" Cabinets |
| 2EE04717624 | All | Economizer for Downflow, End Return Horizontal, or ERV Applications. Includes FA Hood, Exhaust Hood w/Baro Relief | All 42" Cabinets |
| 2EE04706924 | All | Horizontal Economizer without Barometric Relief | All Cabinets |
| 2MD04703824 | All | Motorized Damper, Downflow without Barometric Relief | All Cabinets |
| 2MD04703924 | All | Motorized Damper, Horizontal without Barometric Relief | All Cabinets |
| 2PE04704706 | 230 | Power Exhaust 230V Downflow or Horizontal | All Cabinets |
| 2PE04704746 | 460 | Power Exhaust 460V Downflow or Horizontal | All Cabinets |
| 2PE04704758 | 575 | Power Exhaust 575V Downflow or Horizontal | All Cabinets |

**Field Installed Accessories - Controls**

| MODEL | VOLTAGE | DESCRIPTION | WHERE USED |
|---|---|---|---|
| 2AP0401 | All | Air Proving Switch | All Units |
| 2AQ04700524 | All | $CO^2$ Space Accessory | All Units |
| 2AQ04700624 | All | $CO^2$ Unit Accessory | All Units |
| 2DF0402 | All | Dirty Air Switch | All Units |
| 2SD04700824 | All | Smoke Detector for Supply | All Gen 5 units and greater with 2" & 4" Filters |
| 2SD04700924 | All | Smoke Detector for Return | All Gen 5 units and greater with 2" & 4" Filters |
| 2SD04701024 | All | Smoke Detector for Supply and Return | All Gen 5 units and greater with 2" & 4" Filters |
| S1-YK-MAP1810-0P | All | MAP (Mobile Access Portal) Gateway- For use with Smart Equipment™ Control. | All Units |
| S1-MP-PRTKIT-0P | All | MAP (Mobile Access Portal) Gateway Kit- Replacement MAP gateway protective case, lanyard and communication cable. Use only to replace worn or damaged components. | All Units |

**Field Installed Accessories - Electrical**

| MODEL | VOLTAGE | DESCRIPTION | WHERE USED |
|---|---|---|---|
| 2LA04702412 | All | Low Ambient Kit | All 3 - 10T units (excludes ZT and 3-5T ZR units) |
| 2LA04702424 | All | Low Ambient Kit | All 12.5T cabinets |

# Guide Specifications

### GENERAL

YORK® Sun™ Pro units are convertible single packages with a common footprint cabinet and common roof curb for all 3 through 12.5 ton models. All 6.5 through 12.5 ton 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 Sun™ Pro 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. Sun™ Pro units are available in the following configurations: cooling only, cooling with electric heat, cooling with gas heat, reheat only, reheat with electric heat and reheat with gas 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 AHRI 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 galvanized steel with exterior surfaces coated with a non-chalking, powder paint finish, certified at a 750-hour salt spray test per ASTM-B117

standards. Indoor blower sections shall be insulated with up to 1" thick insulation coated on the airside. Either aluminum foil faced or elastometric rubber 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 as standard 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 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 coils shall be of the direct expansion, draw-thru design.

c. Condenser coils shall have aluminum plate fins mechanically bonded to seamless internally enhanced copper tubes with all joints brazed or Micro-Channel aluminum tube, aluminum fins.

d. Condenser coils shall be of the 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 6.5 through 12.5 ton 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.

1. Loss-of-charge/Low-pressure switch.
2. High-pressure switch.
3. Freeze condition sensor on evaporator coil. If any of these safety devices trip, the LCD screen will display the alarm message.

c. Unit shall incorporate "AUTO RESET" compressor over temperature, over current protection.

d. Unit shall operate with conventional thermostat designs and have a low voltage terminal strip for easy hook-up.

e. Unit control board shall have on-board diagnostics and fault message display.

f. Standard controls shall include anti-short cycle and low voltage protection, and permit cooling operation down to a selectable value as low as 0 °F.

g. Control board shall monitor each refrigerant safety switch independently.

**GAS HEATING SECTION (IF EQUIPPED)**

Heat exchanger and exhaust system shall be constructed of aluminized steel, and 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 ºF. 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.

e. All two stage gas units shall have two independent stages of capacity as shown on Page 5.

**ELECTRIC HEATING SECTION (IF EQUIPPED)**

An electric heating section, with nickel chromium elements, shall be provided in a range of 3 thru 54KW. 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 ºF outdoor temperature, exceeding maximum load criteria of AHRI Standard 340/360. The compressor, with standard controls, shall be capable of operation down to 0 ºF 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

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

- **DRY BULB 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 be designed to meet ASHRAE 90.1, AMCA 511 Class 1A damper, and the International Energy Conservation Code (IECC) certification requirements by achieving leakage rates of 3 CFM/sq. ft. at 1" of static pressure. 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 and power exhaust.
- **MOTORIZED OUTDOOR AIR DAMPERS -** Outdoor and return air dampers that are interlocked and positioned by a 2- position, spring-return damper actuator. 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.
- **VARIABLE AIR VOLUME (VAV)** - The VAV option using a variable frequency drive (VFD) shall be available on 6.5 through 12.5 ton models for applications requiring a constant supply-duct static pressure. Units equipped for VAV shall be controlled by a duct pressure transducer with a 0 - 5" WC pressure range. The pressure transducer shall provide a 0 - 5 VDC output signal to a VAV control board which, in turn shall provide a 2 - 10 VDC speed reference signal to the VFD. The control board shall operate using factory-installed Supply Air, Return Air and Outside Air Temperature Sensors with a nominal resistance of 10,000 Ohms. Units equipped with VFD's shall have factory-installed manual bypass as an option.
- **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 3kW to 54kW 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 HARDWARE** - 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.
- **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.

# Physical Data

### ZH037-061 Single Stage Gas Physical Data

| Component | Models | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | ZH037 | | | ZH049 | | | ZH061 | | |
| **Nominal Tonnage** | **3.0** | | | **4.0** | | | **5.0** | | |
| **AHRI COOLING PERFORMANCE** | | | | | | | | | |
| Gross Capacity @ AHRI A point (MBh) | 36700 | | | 48500 | | | 60000 | | |
| AHRI net capacity (MBh) | 35600 | | | 47000 | | | 58000 | | |
| EER | 12.0 | | | 12.0 | | | 12.0 | | |
| SEER | 14 | | | 14 | | | 14 | | |
| CFM | 1200 | | | 1600 | | | 2000 | | |
| System power (KW) | 2.97 | | | 3.92 | | | 4.83 | | |
| Refrigerant type | R-410A | | | R-410A | | | R-410A | | |
| Refrigerant charge (lb-oz) | | | | | | | | | |
| System 1 | 6-2 | | | 6-10 | | | 8-2 | | |
| System 2 | - | | | - | | | - | | |
| **AHRI HEATING PERFORMANCE** | | | | | | | | | |
| Heating model | H06 | H08 | H12 | H06 | H08 | H12 | H08 | H12 | H16 |
| Heat input (K Btu) | 60 | 80 | 120 | 60 | 80 | 120 | 80 | 120 | 160 |
| Heat output (K Btu) | 49 | 65 | 97 | 49 | 65 | 97 | 65 | 97 | 129 |
| AFUE % | - | | - | - | | - | - | | - |
| Steady state efficiency (%) | 81.5 | 81 | 81 | 81.5 | 81 | 81 | 81 | 81 | 80.5 |
| No. burners | 4 | 4 | 6 | 4 | 4 | 6 | 4 | 6 | 8 |
| No. stages | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Temperature Rise Range (ºF) | 20-50°F | 25-65°F | 50-80°F | 20-50°F | 25-65°F | 40-70°F | 25-65°F | 35-65°F | 45-75°F |
| Gas Limit Setting (ºF) | 235°F | 200°F | 255°F | 235°F | 200°F | 255°F | 200°F | 245°F | 240°F |
| Gas piping connection (in.) | 3/4 | 3/4 | 3/4 | 3/4 | 3/4 | 3/4 | 3/4 | 3/4 | 3/4 |
| **DIMENSIONS (inches)** | | | | | | | | | |
| Length | 89 | | | 89 | | | 89 | | |
| Width | 59 | | | 59 | | | 59 | | |
| Height | 42 | | | 42 | | | 42 | | |
| **OPERATING WT. (lbs.)** | 701 | | | 748 | | | 855 | | |
| **COMPRESSORS**[1] | | | | | | | | | |
| Type | Scroll | | | Scroll | | | Scroll | | |
| Quantity | 1 | | | 1 | | | 1 | | |
| Unit Capacity Steps (%) | 100 | | | 100 | | | 100 | | |
| **CONDENSER COIL DATA** | | | | | | | | | |
| Face area (Sq. Ft.) | 11.9 | | | 18.5 | | | 21.1 | | |
| Rows | 1 | | | 1 | | | 1 | | |
| Fins per inch | 23 | | | 23 | | | 23 | | |
| Tube diameter (in./MM) | 1/25 | | | .71/18 | | | .71/18 | | |
| Circuitry Type | 2-pass Microchannel | | | 2-pass Microchannel | | | 2-pass Microchannel | | |
| **EVAPORATOR COIL DATA** | | | | | | | | | |
| Face area (Sq. Ft.) | 8 | | | 8 | | | 10.6 | | |
| Rows | 3 | | | 3 | | | 3 | | |
| Fins per inch | 15 | | | 15 | | | 15 | | |
| Tube diameter | 0.375 | | | 0.375 | | | 0.375 | | |
| Refrigerant control | TXV | | | TXV | | | TXV | | |

**ZH037-061 Single Stage Gas Physical Data (Continued)**

| Component | Models | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | ZH037 | | | ZH049 | | | ZH061 | | |
| **Nominal Tonnage** | **3.0** | | | **4.0** | | | **5.0** | | |
| **CONDENSER FAN DATA** | | | | | | | | | |
| Quantity of fans | 1 | | | 1 | | | 2 | | |
| Fan diameter (Inch) | 24 | | | 24 | | | 24 | | |
| Type | Prop | | | Prop | | | Prop | | |
| Drive type | Direct | | | Direct | | | Direct | | |
| Quantity of motors | 1 | | | 1 | | | 2 | | |
| Motor HP each | 1/3 | | | 1/3 | | | 1/3 | | |
| No. speeds | 1 | | | 1 | | | 1 | | |
| RPM | 850 | | | 850 | | | 850 | | |
| Total CFM | 3300 | | | 3700 | | | 6700 | | |
| **BELT DRIVE EVAP FAN DATA** | | | | | | | | | |
| Quantity | 1 | | | 1 | | | 1 | | |
| Fan Size (Inch) | 12 x 9 | | | 12 x 9 | | | 12 x 9 | | |
| Type | Centrifugal | | | Centrifugal | | | Centrifugal | | |
| Motor Sheave | 1VM34 | | 1VL44 | 1VM34 | | 1VL44 | 1VL40 | | 1VP56 |
| Blower Sheave | AK69 | | AK69 | AK56 | | AK56 | AK61 | | AK74 |
| Belt | A47 | | A47 | A47 | | A47 | A47 | | A51 |
| Motor HP each | 1-1/2 | | 1-1/2 | 1-1/2 | | 1-1/2 | 1-1/2 | | 2 |
| RPM | 1725 | | 1725 | 1725 | | 1725 | 1725 | | 1725 |
| Frame size | 56 | | 56 | 56 | | 56 | 56 | | 56 |
| **FILTERS** | | | | | | | | | |
| Quantity - Size | 4 - (24 x 16 x 2)[2,3] | | | 4 - (24 x 16 x 2)[2,3] | | | 4 - (24 x 16 x 2)[2,3] | | |
| | 4 - (24 x 16 x 4)[4] | | | 4 - (24 x 16 x 4)[4] | | | 4 - (24 x 16 x 4)[4] | | |

1. ZH037, ZH049, ZH061 have crankcase heaters standard.
2. 2 In. Throwaway, Standard, MERV (Minimum Efficiency Reporting Value).
3. 2 In. Pleated, Optional, MERV 8.
4. 4 In. Pleated, Optional, MERV 13.

**ZH037-061 Two Stage Gas Physical Data**

| Component | Models | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | ZH037 | | | ZH049 | | | ZH061 | | |
| **Nominal Tonnage** | **3.0** | | | **4.0** | | | **5.0** | | |
| **AHRI COOLING PERFORMANCE** | | | | | | | | | |
| Gross Capacity @ AHRI A point (MBh) | 36700 | | | 48500 | | | 60000 | | |
| AHRI net capacity (MBh) | 35600 | | | 47000 | | | 58000 | | |
| EER | 12.0 | | | 12.0 | | | 12.0 | | |
| SEER | 14 | | | 14 | | | 14 | | |
| CFM | 1200 | | | 1600 | | | 2000 | | |
| System power (KW) | 2.97 | | | 3.92 | | | 4.83 | | |
| Refrigerant type | R-410A | | | R-410A | | | R-410A | | |
| Refrigerant charge (lb-oz) | | | | | | | | | |
| System 1 | 6-2 | | | 6-10 | | | 8-2 | | |
| System 2 | - | | | - | | | - | | |
| **AHRI HEATING PERFORMANCE** | | | | | | | | | |
| Heating model | N06 | N08 | N12 | N06 | N08 | N12 | N08 | N12 | N16 |
| Heat input (K Btu) | 60 | 80 | 120 | 60 | 80 | 120 | 80 | 120 | 160 |
| Heat output (K Btu) | 49 | 65 | 97 | 49 | 65 | 97 | 65 | 97 | 129 |
| AFUE % | - | | - | - | | - | - | | - |
| Steady state efficiency (%) | 81.5 | 81 | 81 | 81.5 | 81 | 81 | 81 | 81 | 80.5 |
| No. burners | 4 | 4 | 6 | 4 | 4 | 6 | 4 | 6 | 8 |
| No. stages | 2[1] | 2[2] | 2[2] | 2[1] | 2[2] | 2[2] | 2[2] | 2[2] | 2[2] |
| Temperature Rise Range (ºF) | 20-50°F | 25-65°F | 50-80°F | 20-50°F | 25-65°F | 40-70°F | 25-65°F | 35-65°F | 45-75°F |
| Gas Limit Setting (ºF) | 235°F | 200°F | 255°F | 235°F | 200°F | 255°F | 200°F | 245°F | 240°F |
| Gas piping connection (in.) | 3/4 | 3/4 | 3/4 | 3/4 | 3/4 | 3/4 | 3/4 | 3/4 | 3/4 |
| **DIMENSIONS (inches)** | | | | | | | | | |
| Length | 89 | | | 89 | | | 89 | | |
| Width | 59 | | | 59 | | | 59 | | |
| Height | 42 | | | 42 | | | 42 | | |
| **OPERATING WT. (lbs.)** | 701 | | | 748 | | | 855 | | |
| **COMPRESSORS[3]** | | | | | | | | | |
| Type | Scroll | | | Scroll | | | Scroll | | |
| Quantity | 1 | | | 1 | | | 1 | | |
| Unit Capacity Steps (%) | 100 | | | 100 | | | 100 | | |
| **CONDENSER COIL DATA** | | | | | | | | | |
| Face area (Sq. Ft.) | 11.9 | | | 18.5 | | | 21.1 | | |
| Rows | 1 | | | 1 | | | 1 | | |
| Fins per inch | 23 | | | 23 | | | 23 | | |
| Tube diameter (in./MM) | 1/25 | | | .71/18 | | | .71/18 | | |
| Circuitry Type | 2-pass Microchannel | | | 2-pass Microchannel | | | 2-pass Microchannel | | |
| **EVAPORATOR COIL DATA** | | | | | | | | | |
| Face area (Sq. Ft.) | 8 | | | 8 | | | 10.6 | | |
| Rows | 3 | | | 3 | | | 3 | | |
| Fins per inch | 15 | | | 15 | | | 15 | | |
| Tube diameter | 0.375 | | | 0.375 | | | 0.375 | | |
| Refrigerant control | TXV | | | TXV | | | TXV | | |

**ZH037-061 Two Stage Gas Physical Data (Continued)**

| Component | Models | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | ZH037 | | | ZH049 | | | ZH061 | | |
| **Nominal Tonnage** | **3.0** | | | **4.0** | | | **5.0** | | |
| **CONDENSER FAN DATA** | | | | | | | | | |
| Quantity of fans | 1 | | | 1 | | | 2 | | |
| Fan diameter (Inch) | 24 | | | 24 | | | 24 | | |
| Type | Prop | | | Prop | | | Prop | | |
| Drive type | Direct | | | Direct | | | Direct | | |
| Quantity of motors | 1 | | | 1 | | | 2 | | |
| Motor HP each | 1/3 | | | 1/3 | | | 1/3 | | |
| No. speeds | 1 | | | 1 | | | 1 | | |
| RPM | 850 | | | 850 | | | 850 | | |
| Total CFM | 3300 | | | 3700 | | | 6700 | | |
| **BELT DRIVE EVAP FAN DATA** | | | | | | | | | |
| Quantity | 1 | | | 1 | | | 1 | | |
| Fan Size (Inch) | 12 x 9 | | | 12 x 9 | | | 12 x 9 | | |
| Type | Centrifugal | | | Centrifugal | | | Centrifugal | | |
| Motor Sheave | 1VM34 | | 1VL44 | 1VM34 | | 1VL44 | 1VL40 | | 1VP56 |
| Blower Sheave | AK69 | | AK69 | AK56 | | AK56 | AK61 | | AK74 |
| Belt | A47 | | A47 | A47 | | A47 | A47 | | A51 |
| Motor HP each | 1-1/2 | | 1-1/2 | 1-1/2 | | 1-1/2 | 1-1/2 | | 2 |
| RPM | 1725 | | 1725 | 1725 | | 1725 | 1725 | | 1725 |
| Frame size | 56 | | 56 | 56 | | 56 | 56 | | 56 |
| **FILTERS** | | | | | | | | | |
| Quantity - Size | 4 - (24 x 16 x 2)[4,5]<br>4 - (24 x 16 x 4)[6] | | | 4 - (24 x 16 x 2)[4,5]<br>4 - (24 x 16 x 4)[6] | | | 4 - (24 x 16 x 2)[4,5]<br>4 - (24 x 16 x 4)[6] | | |

1. 1st Stage Capacity is 75% of Full Capacity.
2. 1st Stage Capacity is 70% of Full Capacity.
3. ZH037, ZH049, ZH061 have crankcase heaters standard.
4. 2 In. Throwaway, Standard, MERV (Minimum Efficiency Reporting Value)
5. 2 In. Pleated, Optional, MERV 8.
6. 4 In. Pleated, Optional, MERV 13.

### ZH078-150 Physical Data

| Component | Models | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | ZH078 | | ZH090 | | ZH102 | | ZH120 | | ZH150 | |
| **Nominal Tonnage** | **6.5** | | **7.5** | | **8.5** | | **10** | | **12.5** | |
| **AHRI COOLING PERFORMANCE** | | | | | | | | | | |
| Gross Capacity @ AHRI A point (Btu) | 80500 | | 87500 | | 102800 | | 125000 | | 156000 | |
| AHRI net capacity (Btu) | 77000 | | 85000 | | 99000 | | 118000 | | 150000 | |
| EER | 11.7[1]/11.5[2] | | 11.5 | | 11.7[1]/11.5[2] | | 11.7[1]/11.5[2] | | 11.7[1]/11.5[2] | |
| IEER with Constant Volume | 12.0[3] | | 12.2[3] | | 12.0[3] | | 12.0[3] | | 12.8[1]/12.6[2] | |
| IEER with Intellispeed | 14.8[1]/14.6[2] | | 13.5 | | 14.0[1]/13.8[2] | | 14.8[1]/14.6[2] | | 14.4[1]/14.2[2] | |
| IEER with VAV | 13.9[1]/13.7[2] | | 13.2[1]/13.0[2] | | 13.0[1]/12.8[2] | | 13.5[1]/13.3[2] | | 13.4[1]/13.2[2] | |
| CFM | 2700 | | 2500 | | 3400 | | 4000 | | 3750 | |
| System power (KW) | 6.70 | | 7.40 | | 9.0 | | 10.40 | | 12.80 | |
| Refrigerant type | R-410A | | R-410A | | R-410A | | R-410A | | R-410A | |
| Refrigerant charge (lb-oz) | | | | | | | | | | |
| System 1 | 5-6 | | 6-0 | | 7-2 | | 8-6 | | 8-2 | |
| System 2 | 5-14 | | 5-10 | | 6-14 | | 7-7 | | 8-2 | |
| **AHRI HEATING PERFORMANCE** | | | | | | | | | | |
| Heating model | N12 | N18 | N12 | N18 | N12 | N18 | N18 | N24 | N18 | N24 |
| 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[4] | 2[4] | 2[4] | 2[4] | 2[4] | 2[4] | 2[4] | 2[4] | 2[4] | 2[4] |
| Temperature Rise Range (ºF) | 20-50 | 35-65 | 15-45 | 30-60 | 10-40 | 25-55 | 20-50 | 35-65 | 10-40 | 25-55 |
| Gas Limit Setting (ºF) | 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 | | 119-1/2 | |
| Width | 59 | | 59 | | 59 | | 59 | | 59 | |
| Height | 42 | | 42 | | 50-3/4 | | 50-3/4 | | 50-3/4 | |
| **OPERATING WT. (lbs.)** | 911 | | 895 | | 1032 | | 1090 | | 1280 | |
| **COMPRESSORS[5]** | | | | | | | | | | |
| 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 | 1 | | 1 | | 1 | | 1 | | 1 | |
| Fins per inch | 23 | | 23 | | 23 | | 23 | | 23 | |
| Tube diameter (in./MM) | 1/25 | | 1/25 | | 1/25 | | 1/25 | | .71/18 | |
| Circuitry Type | 2-pass Microchannel | | 2-pass Microchannel | | 2-pass Microchannel | | 2-pass Microchannel | | 2-pass Microchannel | |
| **EVAPORATOR COIL DATA** | | | | | | | | | | |
| Face area (Sq. Ft.) | 10.6 | | 10.6 | | 13.2 | | 13.2 | | 13.2 | |
| Rows | 3 | | 3 | | 3 | | 4 | | 4 | |
| Fins per inch | 15 | | 15 | | 15 | | 15 | | 15 | |
| Tube diameter | 0.375 | | 0.375 | | 0.375 | | 0.375 | | 0.375 | |
| Circuitry Type | Intertwined | | Intertwined | | Intertwined | | Intertwined | | Intertwined | |
| 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 of fans | 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 | |
| Quantity of motors | 2 | | 2 | | 2 | | 2 | | 4 | |
| Motor HP each | 1/3 | | 3/4 | | 3/4 | | 3/4 | | 1/3 | |
| No. speeds | 1 | | 1 | | 1 | | 1 | | 1 | |
| RPM | 850 | | 1110 | | 1110 | | 1110 | | 850 | |
| Total CFM | 6700 | | 8600 | | 9400 | | 9400 | | 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 | AK94 | 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 - (24 x 16 x 2)[6,7] | | 4 - (24 x 16 x 2)[6,7] | | 4 - (24 x 20 x 2)[6,7] | | 4 - (24 x 20 x 2)[6,7] | | 4 - (24 x 20 x 2)[6,7] | |
| | 4 - (24 x 16 x 4)[8] | | 4 - (24 x 16 x 4)[8] | | 4 - (24 x 20 x 4)[8] | | 4 - (24 x 20 x 4)[8] | | 4 - (24 x 20 x 4)[8] | |

1. Cooling Only Unit or Cooling Unit with Electric Heat
2. Cooling Unit with Gas Heat
3. Does not meet DOE 2018 minimum efficiency requirements.
4. 1st Stage 60% of Full Capacity.
5. All ZH units have crankcase heaters standard.
6. 2 In. Throwaway, Standard, MERV (Minimum Efficiency Reporting Value) 3.
7. 2 In. Pleated, Optional, MERV 8.
8. 4 In. Pleated, Optional, MERV 13.

**ZJ037-061 Single Stage Gas Heat Physical Data**

| Component | Models | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | ZJ037 | | | ZJ049 | | | ZJ061 | | |
| **Nominal Tonnage** | **3.0** | | | **4.0** | | | **5.0** | | |
| **AHRI COOLING PERFORMANCE** | | | | | | | | | |
| Gross Capacity @ AHRI A point (MBh) | 36000 | | | 48500 | | | 59000 | | |
| AHRI net capacity (MBh) | 35000 | | | 47000 | | | 57000 | | |
| EER | 12.2 | | | 12.2 | | | 12.2 | | |
| SEER | 14.5 | | | 15 | | | 14.5 | | |
| CFM | 1200 | | | 1600 | | | 2000 | | |
| System power (KW) | 2.87 | | | 3.85 | | | 4.67 | | |
| Refrigerant type | R-410A | | | R-410A | | | R-410A | | |
| Refrigerant charge (lb-oz) | | | | | | | | | |
| System 1 | 6-12 | | | 8-6 | | | 7-8 | | |
| System 2 | - | | | - | | | - | | |
| **AHRI HEATING PERFORMANCE** | | | | | | | | | |
| Heating model | H06 | H08 | H12 | H06 | H08 | H12 | H08 | H12 | H16 |
| Heat input (K Btu) | 60 | 80 | 120 | 60 | 80 | 120 | 80 | 120 | 160 |
| Heat output (K Btu) | 49 | 65 | 97 | 49 | 65 | 97 | 65 | 97 | 129 |
| AFUE % | - | | - | - | | - | - | | - |
| Steady state efficiency (%) | 81.5 | 81 | 81 | 81.5 | 81 | 81 | 81 | 81 | 80.5 |
| No. burners | 4 | 4 | 6 | 4 | 4 | 6 | 4 | 6 | 8 |
| No. stages | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Temperature Rise Range (ºF) | 20-50°F | 25-65°F | 50-80°F | 20-50°F | 25-65°F | 40-70°F | 25-65°F | 35-65°F | 45-75°F |
| Gas Limit Setting (ºF) | 235°F | 200°F | 255°F | 235°F | 200°F | 255°F | 200°F | 245°F | 240°F |
| Gas piping connection (in.) | 3/4 | 3/4 | 3/4 | 3/4 | 3/4 | 3/4 | 3/4 | 3/4 | 3/4 |
| **DIMENSIONS (inches)** | | | | | | | | | |
| Length | 89 | | | 89 | | | 89 | | |
| Width | 59 | | | 59 | | | 59 | | |
| Height | 42 | | | 42 | | | 42 | | |
| **OPERATING WT. (lbs.)** | 719 | | | 748 | | | 765 | | |
| **COMPRESSORS**[1] | | | | | | | | | |
| Type | Scroll | | | Scroll | | | Scroll | | |
| Quantity | 1 | | | 1 | | | 1 | | |
| Unit Capacity Steps (%) | 100 | | | 100 | | | 100 | | |
| **CONDENSER COIL DATA** | | | | | | | | | |
| Face area (Sq. Ft.) | 18.5 | | | 23.8 | | | 23.8 | | |
| Rows | 1 | | | 1 | | | 1 | | |
| Fins per inch | 23 | | | 23 | | | 23 | | |
| Tube diameter (in./MM) | .71/18 | | | .71/18 | | | .71/18 | | |
| Circuitry Type | 2-pass Microchannel | | | 2-pass Microchannel | | | 2-pass Microchannel | | |
| **EVAPORATOR COIL DATA** | | | | | | | | | |
| Face area (Sq. Ft.) | 7.9 | | | 10.5 | | | 10.5 | | |
| Rows | 3 | | | 3 | | | 3 | | |
| Fins per inch | 15 | | | 15 | | | 15 | | |
| Tube diameter | 0.375 | | | 0.375 | | | 0.375 | | |
| Refrigerant control | TXV | | | TXV | | | TXV | | |

**ZJ037-061 Single Stage Gas Heat Physical Data (Continued)**

| Component | Models | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | ZJ037 | | | ZJ049 | | | ZJ061 | | |
| **Nominal Tonnage** | **3.0** | | | **4.0** | | | **5.0** | | |
| **CONDENSER FAN DATA** | | | | | | | | | |
| Quantity of fans | 1 | | | 1 | | | 2 | | |
| Fan diameter (Inch) | 24 | | | 24 | | | 24 | | |
| Type | Prop | | | Prop | | | Prop | | |
| Drive type | Direct | | | Direct | | | Direct | | |
| Quantity of motors | 1 | | | 1 | | | 2 | | |
| Motor HP each | 1/3 | | | 1/3 | | | 1/3 | | |
| No. speeds | 1 | | | 1 | | | 1 | | |
| RPM | 850 | | | 850 | | | 850 | | |
| Total CFM | 3300 | | | 3700 | | | 6300 | | |
| **BELT DRIVE EVAP FAN DATA** | | | | | | | | | |
| Quantity | 1 | | | 1 | | | 1 | | |
| Fan Size (Inch) | 12 x 9 | | | 12 x 9 | | | 12 x 9 | | |
| Type | Centrifugal | | | Centrifugal | | | Centrifugal | | |
| Motor Sheave | 1VM34 | | 1VL44 | 1VM34 | | 1VL44 | 1VL40 | | 1VP56 |
| Blower Sheave | AK69 | | AK69 | AK56 | | AK56 | AK61 | | AK74 |
| Belt | A47 | | A47 | A47 | | A47 | A47 | | A51 |
| Motor HP each | 1-1/2 | | 1-1/2 | 1-1/2 | | 1-1/2 | 1-1/2 | | 2 |
| RPM | 1725 | | 1725 | 1725 | | 1725 | 1725 | | 1725 |
| Frame size | 56 | | 56 | 56 | | 56 | 56 | | 56 |
| **FILTERS** | | | | | | | | | |
| Quantity - Size | 4 - (24 x 16 x 2)[2,3]<br>4 - (24 x 16 x 4)[4] | | | 4 - (24 x 16 x 2)[2,3]<br>4 - (24 x 16 x 4)[4] | | | 4 - (24 x 16 x 2)[2,3]<br>4 - (24 x 16 x 4)[4] | | |

1. ZJ037, ZJ049 and ZJ061 have crankcase heaters standard.
2. 2 In. Throwaway, Standard, MERV (Minimum Efficiency Reporting Value)
3. 2 In. Pleated, Optional, MERV 8.
4. 4 In. Pleated, Optional, MERV 13.

**ZJ037-061 Two Stage Gas Heat Physical Data**

| Component | Models | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | ZJ037 | | | ZJ049 | | | ZJ061 | | |
| **Nominal Tonnage** | **3.0** | | | **4.0** | | | **5.0** | | |
| **AHRI COOLING PERFORMANCE** | | | | | | | | | |
| Gross Capacity @ AHRI A point (MBh) | 36000 | | | 48500 | | | 59000 | | |
| AHRI net capacity (MBh) | 35000 | | | 47000 | | | 57000 | | |
| EER | 12.2 | | | 12.2 | | | 12.2 | | |
| SEER | 14.5 | | | 15 | | | 14.5 | | |
| CFM | 1200 | | | 1600 | | | 2000 | | |
| System power (KW) | 2.87 | | | 3.85 | | | 4.67 | | |
| Refrigerant type | R-410A | | | R-410A | | | R-410A | | |
| Refrigerant charge (lb-oz) | | | | | | | | | |
| System 1 | 6-12 | | | 8-6 | | | 7-8 | | |
| System 2 | - | | | - | | | - | | |
| **AHRI HEATING PERFORMANCE** | | | | | | | | | |
| Heating model | N06 | N08 | N12 | N06 | N08 | N12 | N08 | N12 | N16 |
| Heat input (K Btu) | 60 | 80 | 120 | 60 | 80 | 120 | 80 | 120 | 160 |
| Heat output (K Btu) | 49 | 65 | 97 | 49 | 65 | 97 | 65 | 97 | 129 |
| AFUE % | - | | - | - | | - | - | | - |
| Steady state efficiency (%) | 81.5 | 81 | 81 | 81.5 | 81 | 81 | 81 | 81 | 80.5 |
| No. burners | 4 | 4 | 6 | 4 | 4 | 6 | 4 | 6 | 8 |
| No. stages | 2[1] | 2[2] | 2[2] | 2[1] | 2[2] | 2[2] | 2[2] | 2[2] | 2[2] |
| Temperature Rise Range (ºF) | 20-50°F | 25-65°F | 50-80°F | 20-50°F | 25-65°F | 40-70°F | 25-65°F | 35-65°F | 45-75°F |
| Gas Limit Setting (ºF) | 235°F | 200°F | 255°F | 235°F | 200°F | 255°F | 200°F | 245°F | 240°F |
| Gas piping connection (in.) | 3/4 | 3/4 | 3/4 | 3/4 | 3/4 | 3/4 | 3/4 | 3/4 | 3/4 |
| **DIMENSIONS (inches)** | | | | | | | | | |
| Length | 89 | | | 89 | | | 89 | | |
| Width | 59 | | | 59 | | | 59 | | |
| Height | 42 | | | 42 | | | 42 | | |
| **OPERATING WT. (lbs.)** | 719 | | | 748 | | | 765 | | |
| **COMPRESSORS[3]** | | | | | | | | | |
| Type | Scroll | | | Scroll | | | Scroll | | |
| Quantity | 1 | | | 1 | | | 1 | | |
| Unit Capacity Steps (%) | 100 | | | 100 | | | 100 | | |
| **CONDENSER COIL DATA** | | | | | | | | | |
| Face area (Sq. Ft.) | 18.5 | | | 23.8 | | | 23.8 | | |
| Rows | 1 | | | 1 | | | 1 | | |
| Fins per inch | 23 | | | 23 | | | 23 | | |
| Tube diameter (in./MM) | .71/18 | | | .71/18 | | | .71/18 | | |
| Circuitry Type | 2-pass Microchannel | | | 2-pass Microchannel | | | 2-pass Microchannel | | |
| **EVAPORATOR COIL DATA** | | | | | | | | | |
| Face area (Sq. Ft.) | 7.9 | | | 23.8 | | | 10.5 | | |
| Rows | 3 | | | 3 | | | 3 | | |
| Fins per inch | 15 | | | 15 | | | 15 | | |
| Tube diameter | 0.375 | | | 0.375 | | | 0.375 | | |
| Refrigerant control | TXV | | | TXV | | | TXV | | |

**ZJ037-061 Two Stage Gas Heat Physical Data (Continued)**

| Component | Models | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | ZJ037 | | | ZJ049 | | | ZJ061 | | |
| **Nominal Tonnage** | **3.0** | | | **4.0** | | | **5.0** | | |
| **CONDENSER FAN DATA** | | | | | | | | | |
| Quantity of fans | 1 | | | 1 | | | 2 | | |
| Fan diameter (Inch) | 24 | | | 24 | | | 24 | | |
| Type | Prop | | | Prop | | | Prop | | |
| Drive type | Direct | | | Direct | | | Direct | | |
| Quantity of motors | 1 | | | 1 | | | 2 | | |
| Motor HP each | 1/3 | | | 1/3 | | | 1/3 | | |
| No. speeds | 1 | | | 1 | | | 1 | | |
| RPM | 850 | | | 850 | | | 850 | | |
| Total CFM | 3300 | | | 3700 | | | 6300 | | |
| **BELT DRIVE EVAP FAN DATA** | | | | | | | | | |
| Quantity | 1 | | | 1 | | | 1 | | |
| Fan Size (Inch) | 12 x 9 | | | 12 x 9 | | | 12 x 9 | | |
| Type | Centrifugal | | | Centrifugal | | | Centrifugal | | |
| Motor Sheave | 1VM34 | | 1VL44 | 1VM34 | | 1VL44 | 1VL40 | | 1VP56 |
| Blower Sheave | AK69 | | AK69 | AK56 | | AK56 | AK61 | | AK74 |
| Belt | A47 | | A47 | A47 | | A47 | A47 | | A51 |
| Motor HP each | 1-1/2 | | 1-1/2 | 1-1/2 | | 1-1/2 | 1-1/2 | | 2 |
| RPM | 1725 | | 1725 | 1725 | | 1725 | 1725 | | 1725 |
| Frame size | 56 | | 56 | 56 | | 56 | 56 | | 56 |
| **FILTERS** | | | | | | | | | |
| Quantity - Size | 4 - (24 x 16 x 2)[4,5]<br>4 - (24 x 16 x 4)[6] | | | 4 - (24 x 16 x 2)[4,5]<br>4 - (24 x 16 x 4)[6] | | | 4 - (24 x 16 x 2)[4,5]<br>4 - (24 x 16 x 4)[6] | | |

1. 1st Stage Capacity is 75% of Full Capacity.
2. 1st Stage Capacity is 70% of Full Capacity.
3. ZJ037, ZJ049 and ZJ061 have crankcase heaters standard.
4. 2 In. Throwaway, Standard, MERV (Minimum Efficiency Reporting Value)
5. 2 In. Pleated, Optional, MERV 8.
6. 4 In. Pleated, Optional, MERV 13.

**ZJ078-150 Physical Data**

| Component | Models | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | ZJ078 | | ZJ090 | | ZJ102 | | ZJ120 | | ZJ150 | |
| **Nominal Tonnage** | **6.5** | | **7.5** | | **8.5** | | **10** | | **12.5** | |
| **AHRI COOLING PERFORMANCE** | | | | | | | | | | |
| Gross Capacity @ AHRI A point (Btu) | 76000 | | 88000 | | 99700 | | 124000 | | 154000 | |
| AHRI net capacity (Btu) | 74000 | | 86000 | | 96000 | | 120000 | | 150000 | |
| EER | 11.8 | | 12.2[1]/12.0[2] | | 12.2[1]/12.0[2] | | 12.0 | | 12.1[1]/12[2] | |
| IEER with Constant Volume | 13.20 | | 13.2[1]/13.0[2] | | 13.0 | | 12.9[1]/12.8[2] | | 13.7[1]/13.5[2] | |
| IEER with Intellispeed | 14.8[1]/14.6[2] | | 14.8[1]/14.6[2] | | 14.0[1]/13.8[2] | | 14.8[1]/14.6[2] | | 15.2[1]/15.0[2] | |
| IEER with VAV | 14.1[1]/13.9[2] | | 13.2[1]/13.0[2] | | 13.45[1]/13.25[2] | | 13.85[1]/13.65[2] | | 13.8[1]/13.6[2] | |
| CFM | 2500 | | 2500 | | 3300 | | 3400 | | 3500 | |
| System power (KW) | 6.40 | | 7.17 | | 8.00 | | 9.80 | | 12.50 | |
| Refrigerant type | R-410A | | R-410A | | R-410A | | R-410A | | R-410A | |
| Refrigerant charge (lb-oz) | | | | | | | | | | |
| System 1 | 5-12 | | 7-12 | | 8-2 | | 7-14 | | 10-8 | |
| System 2 | 5-12 | | 7-5 | | 7-14 | | 7-14 | | 9-12 | |
| **AHRI HEATING PERFORMANCE** | | | | | | | | | | |
| Heating model | N12 | N18 | N12 | N18 | N12 | N18 | N18 | N24 | N18 | N24 |
| 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[3] | 2[3] | 2[3] | 2[3] | 2[3] | 2[3] | 2[3] | 2[3] | 2[3] | 2[3] |
| Temperature Rise Range (ºF) | 20-50 | 35-65 | 15-45 | 30-60 | 10-40 | 25-55 | 20-50 | 35-65 | 10-40 | 25-55 |
| Gas Limit Setting (ºF) | 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 | | 119-1/2 | |
| Width | 59 | | 59 | | 59 | | 59 | | 59 | |
| Height | 50-3/4 | | 50-3/4 | | 50-3/4 | | 50-3/4 | | 50-3/4 | |
| **OPERATING WT. (lbs.)** | 1033 | | 1035 | | 1044 | | 1070 | | 1280 | |
| **COMPRESSORS[4]** | | | | | | | | | | |
| 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.) | 29.0 | | 23.8 | | 29.0 | | 29.0 | | 47.5 | |
| Rows | 1 | | 1 | | 1 | | 1 | | 1 | |
| Fins per inch | 23 | | 23 | | 23 | | 23 | | 23 | |
| Tube diameter (in./MM) | .71/18 | | 1/25 | | 1/25 | | 1/25 | | .71/18 | |
| Circuitry Type | 2-pass Microchannel | | 2-pass Microchannel | | 2-pass Microchannel | | 2-pass Microchannel | | 2-pass Microchannel | |
| **EVAPORATOR COIL DATA** | | | | | | | | | | |
| Face area (Sq. Ft.) | 13.2 | | 13.2 | | 13.2 | | 13.2 | | 13.2 | |
| Rows | 3 | | 4 | | 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 | Intertwined | | Intertwined | | Intertwined | | Intertwined | | Intertwined | |
| Refrigerant control | TXV | | TXV | | TXV | | TXV | | TXV | |