



# Product Catalog

## **Packaged Rooftop Air Conditioners Precedent™ 17 Plus – Cooling and Gas/Electric 3 to 5Tons – 60 Hz**





# Introduction

## Packaged Rooftop Air Conditioners

Trane customers demand products that provide exceptional reliability, meet stringent performance requirements, and are competitively priced. Trane delivers with Precedent™.

Precedent features cutting edge technologies: reliable compressors, Trane engineered ReliaTel controls, computer-aided run testing, and Integrated Comfort™ Systems. So, whether you're the contractor, the engineer, or the owner you can be certain Precedent products are built to meet your needs.

Through the years, Trane has designed and developed the most complete line of Packaged Rooftop products available in the market today. Trane was the first to introduce the Micro—microelectronic unit controls—and has continued to improve and revolutionize this design concept.

All units utilize ReliaTel™ controls. These are standard for variable staged cooling Precedent™ products.

The ReliaTel control platform offers the same great features and functionality as the original Micro, with additional benefits for greater application flexibility.

With its sleek, compact cabinet, Precedent continues to provide the highest standards in quality and reliability, comfort, ease of service, and the performance of Trane light commercial products.

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## Revision History

RT-PRC048J-EN (11 July 2014)

- Updated Low Leak Economizer Factory and Field Installed Option

RT-PRC048H-EN (11 April 2014)

- Reheat updates - Features & Benefits, General Data, Fan Performance, Weights, Mechanical Specifications

RT-PRC048G-EN (01 February 2014)

- Added Low Leak Economizer Field Installed Option
- TXV/Reheat updates
- Multiple Zone VAV Control Verbiage Refresh
- Removed TCI
- Human Interface - 5 inch Color Touchscreen



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# Features and Benefits<sup>1</sup>

## Standard Features

- 5-year Limited Compressor Warranty
- 5-year Limited Heat Exchanger Warranty
- 1-year Limited Parts Warranty
- Anti-Short Cycle Timer (Standard with ReliaTel™)
- Colored and Numbered Wiring
- Convertible Airflow
- Crankcase Heaters
- Easy Access Low Voltage Terminal Board (LTB)
- Enhanced Dehumidification Functionality
- Filters are Standard on all Units
- Foil-Faced and Edge Captured Insulation
- High Pressure Control
- IAQ Dual Sloped, Plastic, Removable, Reversible Drain Pan
- Liquid Line Refrigerant Drier
- Low Ambient Cooling to 0°F
- Low Pressure Control
- Operating Charge of R-410A
- Patent-Pending Hybrid Condenser Coil for easy cleaning
- Phase Balance Protection
- Phase Loss Protection
- Phase Monitor
- Phase Reversal Protection
- Progressive Tubular Aluminized Steel Heat Exchanger
- Provisions for Through-the-Base Gas and Condensate Drain Connections
- Quick Access Panels
- ReliaTel Microprocessor Controls
- Single Point Power
- Single Side Service
- Standardized Components
- Scroll Compressors
- Thermal Expansion Valve
- Variable Speed Direct Drive Motors

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<sup>1</sup> VariTrac™ or Comm 3/4 will not be supported, nor is compatible with 17 Plus units.

## Options<sup>1</sup>

### ***Factory Installed Options***

- 2" MERV 8 Filters or 2" MERV 13 Filters with Filter Removal Tool
- Black Epoxy Pre-Coated Coils
- CO<sub>2</sub> Sensor (wiring only)
- CompleteCoat™ Condenser Coil
- Condensate Overflow Switch
- Dehumidification Option
- Fault Detection & Diagnostics (FDD); Meets CA Title 24 Requirements
- Hinged Access Doors
- Human Interface - 5 inch Color Touchscreen
- Multiple Zone VAV (Variable Air Volume)
- NoVar Return Air Sensor
- NoVar Unit Controls
- Powered<sup>2</sup> or Unpowered Convenience Outlet
- Single Zone Variable Air Volume (SZVAV)
- Stainless Steel Drain Pan
- Stainless Steel Heat Exchanger with 10-year warranty
- Supply, Return or Plenum Air Smoke Detector
- Through-the-Base Electrical Access
- Through-the-Base Electrical with Circuit Breaker
- Through-the-Base Electrical with Disconnect Switch

### ***Factory or Field Installed Options***

- Barometric Relief
- Clogged Filter/Fan Failure Switch
- Discharge Air Temperature Sensing Kit
- Economizer: Standard and Low Leak
- Electric Heaters
- Froststat™
- LonTalk® Communications Interface (LCI)
- BACnet® Communications Interface (BCI)
- Reference or Comparative Enthalpy
- Tool-less Hail Guards

### ***Field Installed Options***

- CO<sub>2</sub> Sensor<sup>3</sup>
- Dual Thermistor Remote Zone Sensor

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<sup>1</sup> Refer to Model Number Description for option availability

<sup>2</sup> Powered Convenience Outlet not available on 460V and 575V units

<sup>3</sup> CO<sub>2</sub> sensor always field installed; associated with demand control ventilation



## Features and Benefits

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- Economizer: Low Leak
- High Altitude Kit
- High Static Drive
- Humidity Sensor/Humidistat
- LP Conversion Kit
- Manual Outside Air Damper
- Motorized Outside Air Dampers
- Powered Exhaust
- Quick Adapt Curbs
- Quick Start Kit
- Remote Potentiometer
- Roof Curb
- Thermostat
- Ventilation Override Accessory
- Wireless Zone Sensor
- Zone Sensor

## Other Benefits

- Cabinet design ensures water integrity
- Ease of Service, Installation and Maintenance
- Mixed model build enables “fastest in the industry” ship cycle times
- Outstanding Airflow Distribution
- ReliaTel™ Controls
- Unmatched Product Support is one of our finest assets. Trane Sales Representatives are a Support Group that can assist you with:
  - Product
  - Application
  - Service
  - Training
  - Special Applications
  - Specifications
  - Computer Programs and much more

## Standard Features

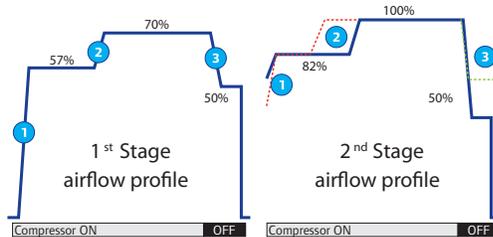
### **Anti-Short Cycle Timer (Standard with ReliaTel)™**

Provides a 3 minute minimum “ON” time and 3 minute “OFF” time for compressors to enhance compressor reliability by assuring proper oil return.

### **Colored And Numbered Wiring**

Save time and money tracing wires and diagnosing the unit.

### Direct Drive Variable Speed Motors



Direct Drive motor shall be variable speed type with constant airflow setting. Motor will be ECM (Electronically Commutated Motor) as standard pre-programmed with enhanced airflow capabilities.

### Compressors



Precedent contains the best compressor technology available to achieve the highest possible performance. Variable stage compressors are outstanding for humidity control, light load cooling conditions and system back-up applications.

### Condenser Coil



Precedent boasts a patent-pending 1+1+1 condenser coil, permanently gapped for easy cleaning.

### Controls – ReliaTel

ReliaTel microprocessor controls provide unit control for heating, cooling and ventilating utilizing input from sensors that measure indoor and outdoor temperature and other zone sensors. ReliaTel also provides outputs for building automation systems and expanded diagnostics. For a complete list of ReliaTel offerings, refer to the “Other Benefits” section within the Features and Benefits section of this catalog.

### Convertible Units



The units ship in a downflow configuration. They can be easily converted to horizontal by simply moving two panels.

Units come complete with horizontal duct flanges so the contractor doesn’t have to field fabricate them. These duct flanges are a time and cost saver.

### Cooling

High Efficiency variable stage cooling available.

### Crankcase Heaters

These band heaters provide improved compressor reliability by warming the oil to prevent migration during off-cycles or low ambient conditions.

## Features and Benefits

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### Easy Access Low Voltage Terminal Board



Precedent's Low Voltage Terminal Board is external to the electrical control cabinet. It is extremely easy to locate and attach the thermostat wire and test operation of all unit functions. This is another cost and time saving installation feature.

### Foil Faced Insulation



All panels in the evaporator section of the unit have cleanable foil-faced insulation. All edges are either captured or sealed to ensure no insulation fibers get into the airstream.

### Enhanced Dehumidification

Enhanced Dehumidification will be available on all units equipped with a Space Humidity sensor, regardless of whether the unit is configured with traditional Hot Gas Reheat (see page 10). Humidity levels are decreased while increasing the comfort level in an air space through advanced controls of compressor and indoor fan operation.

### Heat Exchanger

The compact cabinet features a progressive tubular heat exchanger in low, medium and high heat capacities.

The heat exchanger is fabricated using stainless steel burners and corrosion-resistant aluminized steel tubes as standard on all models. It has an induced draft blower to pull the gas mixture through the burner tubes. The heater has a direct spark ignition system which doubles as a safety device to prove the flame.

Gas/Electric Precedent models exceed all California seasonal efficiency requirements. They also perform better than required to meet the California NOx emission requirements.

### High Pressure Control

All units include High Pressure Control as standard.

### IAQ Dual Sloped, Plastic, Removable, Reversible Drain Pans

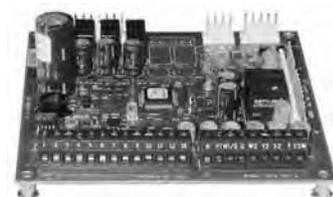


Every Precedent unit has a plastic, removable, dual-sloped drain pan that's easy to clean and reversible to allow installation of drain trap on either side of the unit.

### Low Ambient Cooling

All Precedent microprocessor units have cooling capabilities down to 0°F as standard.

### Low Voltage Connections



The wiring of the low voltage connections to the unit and the zone sensors is as simple as 1-1, 2-2, and 3-3. This simplified system makes it easy for the installer to wire.

### **Phase Monitoring Protection**

Precedent™ units with 3-phase power are equipped with phase monitoring protection as standard. The phase monitor protects motors by preventing unit operation when there is a phase loss, phase imbalance or phase reversal condition. An illuminated green LED indicates proper phase operation, and an illuminated red LED indicates there is a fault.

### **Constant CFM Fan<sup>1</sup>**

All variable stage units shall include constant CFM direct drive variable speed indoor motor with advanced airflow profile.

### **Quick-Access Panels**

Remove two screws for access to the standardized internal components and wiring.

### **Single Point Power**

A single electrical connection powers the unit.

### **Single Side Service**

Single side service is standard on all units.

### **Standardized Components**

Components are placed in the same location on all Precedent units.

Due to standardized components throughout the Precedent line, contractors/owners can stock fewer parts.

### **Thermal Expansion Valve**

This feature is standard on all units.

### **Through-the-Base Condensate**

Every unit includes provisions for through the base condensate drain connections. This allows the drain to be connected through the roof curb instead of a roof penetration.

## **Variety of Options**

### **Factory Installed Options<sup>2</sup>**

#### **Black Epoxy Pre-Coated Coils**

The pre-coated coils are an economical option for protection in mildly corrosive environments.

#### **CO<sub>2</sub> Sensor Wiring**

This unit wiring for field installed CO<sub>2</sub> sensors. Factory-installed CO<sub>2</sub> sensor wiring saves time and ensures proper unit connections for the field installed CO<sub>2</sub> sensor kits.

#### **CompleteCoat™ Condenser Coil**

These coils provide excellent corrosion resistance as well as uniformity of coverage and coating thickness.

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<sup>1</sup> (T,Y)HC(037, 047, 067)E

<sup>2</sup> Refer to Model Number Description for option availability.

## Features and Benefits

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### Condensate Overflow Switch

A condensate overflow switch is available to shut the unit down in the event that the condensate drain line becomes clogged. This option protects the unit from water overflowing from the drain pan and entering the base of the units.

### Dehumidification (Hot Gas Reheat Option)



When a unit is configured with the dehumidification option, the unit will attempt to satisfy space humidity requirements utilizing the enhanced dehumidification control sequence (see page 8).

This option allows for increased outdoor air ventilation. It reduces humidity levels while increasing comfort level in the air space. Cooling can operate without a demand for dehumidification. The hot gas reheat coil is designed to deliver maximum reheat temperatures.

### Fault Detection & Diagnostics (FDD)

This offering meets the mandatory requirement of CA Title 24 of fully configurable diagnostics allowing fault history and reading fault codes at the unit. This option provides detection of the following faults: Air temperature sensor failure/fault and notification of acceptable economizer mode. The FDD system shall be certified by the Energy Commission as meeting the requirements.

### High Efficiency Filtration

Precedent units offer a variety of high efficiency filtration options. MERV 8 and MERV 13 filters provide additional filtration beyond the capabilities of typical 2" throwaway filters. Also, when MERV 8 or MERV 13 filters are ordered, units come equipped with a filter removal tool.

### Human Interface - 5 Inch Color Touchscreen

The 5 inch Color Touchscreen Human Interface provides an intuitive user interface to the rooftop unit that speeds up unit commissioning, shortens unit troubleshooting times, and enhances preventative maintenance measures. The human interface includes several features.



- Data trending capabilities by means of time series graphs
- Historical alarm messages
- Real-time sensor measurements
- On board system setpoints
- USB port that enables the downloading of component runtime information as well as trended historical sensor data
- Customized reports

**Note:** Refer to RT-SVX49\*-EN for additional information.

### Disconnect Switch (Available on units equipped with Through-the-Base Electrical)

Factory installed 3-pole, molded case, disconnect switch for through-the-base electrical connections.

Codes require a method of assured unit shutdown for servicing. Field-installed disconnects sometimes interfere with service access. Factory installation of unit disconnects reduces costs, assures proper mounting and provides the opportunity to upgrade to unit circuit breaker protection.

### Circuit Breaker (Available on units equipped with Through-the-Base Electrical)



This option is a factory installed thermal magnetic, molded case, HACR Circuit Breaker with provisions for through the base electrical connections.

### Hinged Access Doors



These doors permit easy access to the filter, fan/heat and compressor/control sections. They reduce the potential roof damage from screws or sharp access door corners.

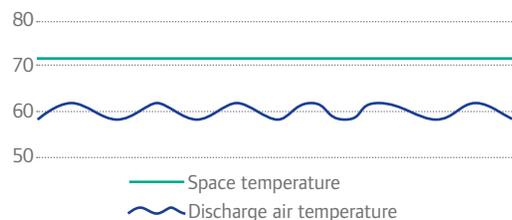
### Multiple-Zone VAV Control

A multiple-zone VAV (MZVAV) system consists of a packaged rooftop unit that serves several individually controlled zones. Each zone is equipped with a VAV terminal unit that varies the quantity of air delivered to maintain the desired temperature in that zone. The rooftop unit controller varies the speed of the indoor fan to maintain the static pressure in the supply ductwork at a setpoint, ensuring that all zones receive the necessary quantity of air. In addition, cooling capacity is cycled to maintain the supply air temperature at the desired setpoint. For decades, Trane has been an industry leader in rooftop VAV systems. Now, multiple-zone VAV control is available in Trane's light commercial rooftop platform (3-25 tons).

### Novar Unit Controls

Novar 3051 and 2024 are available for Precedent Gas and Electric Heat models.

### Single Zone Variable Air Volume



Single Zone VAV control offers full supply fan modulation across the available airflow range. In addition to full supply fan modulation, the unit controls the discharge air temperature to a varying discharge air temperature setpoint in order to maintain Space Temperature.

### Stainless Steel Heat Exchanger

The optional stainless steel heat exchanger is constructed of 409 stainless steel. It is resistant to corrosion and oxidation and easy to clean. The high strength to weight ratio allows for high ventilation rates with gas units. It is an excellent option to compliment the dehumidification option as a high outside air ventilation unit. With this option, a 10-year stainless steel heat exchanger warranty is standard.

## Features and Benefits

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### Stainless Steel Drain Pan

For excellent corrosion and oxidation resistance, the optional stainless steel drain pan provides a cleanable surface that complement other IAQ solutions such as high efficiency filtration (MERV 8 or 13), demand control ventilation (CO<sub>2</sub>), and hot gas reheat.

### Powered or Unpowered Convenience Outlet



This option is a GFCI, 120V/15amp, 2 plug, convenience outlet, either powered or unpowered. This option can only be ordered when Through the Base Electrical with either the Disconnect Switch or Circuit Breaker option is ordered.

**Note:** Not available on 460V/575V units.

### Supply, Return, and Plenum Air Smoke Detector



With this option installed, if smoke is detected, all unit operation will be shut down. Reset will be manual at the unit. In order for the supply air smoke detector or return air smoke detector to properly sense smoke in the supply air stream or the return air stream, the air velocity entering the smoke detector unit must be between 500 - 4000 feet per minute. Equipment covered in this manual will develop an airflow velocity that falls within these limits over the entire airflow range specified in the evaporator fan performance table. Supply and/or Return Smoke Detectors may not be used with the Plenum Smoke Detector.

### Through-the-Base Electrical Utility Access



An electrical service entrance shall be provided allowing electrical access for both control and main power connections inside the curb and through the base of the unit. Option will allow for field installation of liquid-tight conduit and an external field installed disconnect switch.



Factory provided through the base openings simplify wiring and piping. Because these utility openings frequently minimize the number of roof penetrations, the integrity of roofing materials is enhanced.

## Factory or Field Installed Options<sup>1</sup>

### **BACnet® Communications Interface**

The BACnet communications interface allows the unit to communicate directly with a generic open protocol BACnet MS/TP Network Building Automation System Controls.

### **Barometric Relief**

Designed to be used on downflow units, barometric relief is an unpowered means of relieving excess building pressure.

### **Clogged Filter/Fan Failure Switch**

A dedicated differential pressure switch is available to achieve active fan failure indication and/or clogged filter indication.

These sensors allow a zone sensor service light or Integrated Comfort System to indicate a dirty filter or a fan that's not working. The field installation charges for these valuable feedback devices often eliminate them from consideration. Factory installation can make such features a good investment.

### **Discharge Air Temperature Sensing Kit**

Provides true discharge air temperature sensing in heating models. The kit is functional only with the ReliaTel Options Module.

### **Economizer (Standard)**

This accessory shall be available with or without barometric relief. The assembly includes fully modulating 0-100 percent motor and dampers, minimum position setting, preset linkage, wiring harness with plug, spring return actuator and fixed dry bulb control. The barometric relief shall provide a pressure operated damper that shall be gravity closing and shall prohibit entrance of outside air during the equipment "off" cycle. Optional solid state or differential enthalpy control shall be available for either factory or field installation. The economizer arrives in the shipping position and shall be moved to the operating position by the installing contractor.

### **Electric Heaters**

Electric heat modules are available within the basic unit. If ordering the Through-the-Base Electrical option with an Electrical Heater, the heater must be factory installed.

### **Fresh Air Options – Dampers and Economizer**

0 - 25% manual or 0 - 50% motorized outside air hoods are available.

Economizers are equipped with either dry bulb or reference or comparative enthalpy sensing. These economizers provide free cooling as the outdoor temperature and/or humidity decreases. Correctly installed, they offer a valuable energy savings. Factory-installed economizers save time and ensure proper installation.

The economizers come with three control options — dry bulb is standard, enthalpy and differential enthalpy are optional.

### **Frostat™**

This capillary bulb embedded in the face of the evaporator coil monitors coil temperature to prevent evaporator icing and protect the compressor. Recommended for applications with low leaving air temperatures, low airflow and or high latent load applications.

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<sup>1</sup> Refer to Model Number Description for option availability.

## Features and Benefits

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### **LonTalk® Communications Interface**

The LonTalk communications interface allows the unit to communicate as a Tracer™ LCI-V device or directly with the generic LonTalk Network Building Automation System Controls.

### **Low Leak Economizer**

This accessory meets low leak requirements for ASHRAE 90.1, IECC, and CA Title 24 standards (3 cfm/ft<sup>2</sup>@1" wg exterior air, 4 cfm/ft<sup>2</sup>@1" wg return air). This option allows 100% outdoor air supply from 0-100% modulating dampers and is standard with barometric relief. It can be paired with powered exhaust for additional building pressure relief. This option can be paired with or without Fault Detection & Diagnostics (FDD) to meet current mandatory CA Title 24 requirements. Available on downflow units only.

The economizers come with three control options, dry bulb and reference or comparative enthalpy (optional).

### **Reference or Comparative Enthalpy**

Measures and communicates humidity while maximizing comfort control.

### **Tool-less Hail Guards**



Tool-less, hail protection quality coil guards shall be either factory or field-installed for condenser coil protection. This option protects the condenser coil from vandalism and/or hail damage.

## Field Installed Options<sup>1</sup>

### **CO<sub>2</sub> Sensor - Demand Control Ventilation (DCV)**

Demand-controlled ventilation (DCV) is a control strategy that responds to the actual demand (need) for ventilation by regulating the rate at which the HVAC system brings outdoor air into the building. A CO<sub>2</sub> sensor measures the concentration (parts per million, ppm) of CO<sub>2</sub> (Carbon Dioxide) in the air. As the CO<sub>2</sub> concentration changes, the outside air damper modulates to meet the current ventilation needs of the zone. The CO<sub>2</sub> sensor kit is available as a field installed accessory. Two field installed kits are offered; CO<sub>2</sub> sensor and wiring or CO<sub>2</sub> sensor only. The CO<sub>2</sub> Sensor only kit should be ordered with factory installed CO<sub>2</sub> sensor wiring. Factory installed CO<sub>2</sub> sensor wiring saves set-up time and ensures proper unit connections for the CO<sub>2</sub> sensor.

### **High Altitude Kit**

Previously a Canadian Agency requirement for units applied above 2000 feet, it is not required by the U.S. Domestic contractors should consult with local authority on best practice. Derates gas orifices by 10%.

### **Humidity Sensor/Humidistat**

The humidity sensor/humidistat, when used in conjunction with our Dehumidification (Hot Gas Reheat) units will provide outstanding humidity control and comfort. Humidity sensors can be wall or duct mounted. The humidity deadband can be set between 40% and 60% relative humidity.

### **Low Leak Economizer**

This accessory meets low leak requirements for ASHRAE 90.1, IECC, and CA Title 24 standards (3 cfm/ft<sup>2</sup>@1" wg exterior air, 4 cfm/ft<sup>2</sup>@1" wg return air). This option allows 100% outdoor air

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<sup>1</sup> Refer to Model Number Description for option availability.

supply from 0-100% modulating dampers and is standard with barometric relief. It can be paired with powered exhaust for additional building pressure relief. Available on downflow units only.

### **LP Conversion Kit**

Provided for field conversion of gas/electric units from Natural gas to Propane.

### **Quick Adapt Curbs**

Enables easy conversion of existing Voyager 3-10 ton units to Precedent units on replacement jobs.

### **Quick Start Kits**

Single phase equipment to enable startup and prevent building lighting dimming during low voltage.

### **Roof Curbs**

Available for downflow units. Only two roof curbs for the entire line simplifies curb selection.

### **Remote Potentiometer**

When properly installed in the economizer control circuitry, this accessory provides a remote variable resistance to enable the operator to adjust the minimum damper position.

### **Ventilation Override Accessory**

With the Ventilation Override Accessory installed, the unit can be set to transition to up to 3 different pre-programmed sequences for Smoke Purge, Pressurization, and Exhaust. The transition occurs when a binary input on the RTOM is closed (shorted). This would typically be a hard wired relay output from a smoke detector or fire control panel. The ventilation override kit is available as a field installed accessory.

### **Zone Sensors/Thermostats**

Available in programmable, automatic and manual styles.

## **Other Benefits**

### **Easy to Install, Service and Maintain**

Because today's owners are very cost-conscious when it comes to service and maintenance, the Precedent was designed with direct input from service contractors. This valuable information helped to design a product that would get the service person off the job quicker and save the owner money. Precedent offers outstanding standard features enhanced by a variety of factory and field installed options, multiple control options, rigorously tested proven designs and superior product and technical support.

### **Airflow Distribution**

Airflow is outstanding. Precedent can replace an older machine with old ductwork and, in many cases, improve the comfort through better air distribution.

### **Cabinet Integrity**



For added water integrity, Precedent has a raised 1 1/8" lip around the supply and return of the downflow units to prevent water from blowing into the ductwork.

## Features and Benefits

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### Flexibility

Precedent offers ultimate flexibility. Units are built to order in our standard “shortest in the industry” ship cycle time.

### Unit Cabinet

The compact cabinet with rounded corners takes up less room and is less costly to ship. The beveled and ribbed top is not only aesthetically pleasing, it is designed to prevent water from pooling.

### Rigorous Testing

All of Precedent’s designs were rigorously rain tested at the factory to ensure water integrity.

Actual shipping tests were performed to determine packaging requirements. Units were test shipped around the country to determine the best packaging. Factory shake and drop tests were used as part of the package design process to help assure that the unit arrives at the job site in top condition.

Rigging tests include lifting a unit into the air and letting it drop one foot, assuring that the lifting lugs and rails hold up under stress.

We perform a 100% coil leak test at the factory. The evaporator and condenser coils are leak tested at 600 psig. The assembled unit is leak tested to 465 psig.

All parts are inspected at the point of final assembly. Sub-standard parts are identified and rejected immediately.

Every unit receives a 100% unit run test before leaving the production line to make sure it lives up to rigorous Trane requirements.

### ReliaTel™ Controls

ReliaTel controls provide unit control for heating, cooling and ventilating utilizing input from sensors that measure outdoor and indoor temperature.

ReliaTel Control Logic Enhances Quality and Reliability

- prevents the unit from short cycling, considerably improving compressor life.
- ensures that the compressor will run for a specific amount of time which allows oil to return for better lubrication, enhancing the reliability of the compressor.

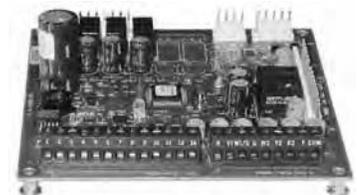
Precedent units with ReliaTel reduces the number of components required to operate the unit, thereby reducing possibilities for component failure.

ReliaTel Makes Installing and Servicing Easy

ReliaTel eliminates the need for field installed anti-shortcycle timer and time delay relays.

ReliaTel eliminates the need for field installed anti-shortcycle timer and time delay relays. ReliaTel controls provide these functions as an integral part of the unit. The contractor no longer has to purchase these controls as options and pay to install them.

The wiring of the low voltage connections to the unit and the zone sensors is as easy as 1-1, 2-2, and 3-3. This simplified system makes wiring easier for the installer.



***ReliaTel Makes Testing Easy***

ReliaTel requires no special tools to run the Precedent unit through its paces. Simply place a jumper between Test 1 and Test 2 terminals on the Low Voltage Terminal Board and the unit will walk through its operational steps automatically.

The unit automatically returns control to the zone sensor after stepping through the test mode a single time, even if the jumper is left on the unit.

As long as the unit has power and the "system on" LED is lit, ReliaTel is operational. The light indicates that the controls are functioning properly.

ReliaTel features expanded diagnostic capabilities when utilized with Trane Integrated Comfort™ Systems.

Some zone sensor options have central control panel lights which indicate the mode the unit is in and possible diagnostic information (dirty filters for example).

***Other ReliaTel Benefits***

The ReliaTel built-in anti-shortcycle timer, time delay relay and minimum "on" time control functions are factory tested to assure proper operation.

ReliaTel softens electrical "spikes" by staging on fans, compressors and heaters.

Intelligent Fallback is a benefit to the building occupant. If a component fails, the unit will continue to operate at predetermined temperature setpoint.

Intelligent Anticipation is a standard ReliaTel feature. It functions continuously as ReliaTel and zone sensor(s) work together in harmony to provide much tighter comfort control than conventional electro-mechanical thermostats.

The same ReliaTel Board fits all Packaged Gas/Electric and Cooling with Electric Heat models. This provides standardization of parts for contractors. Less money is tied up in inventory with ReliaTel.



# Application Considerations

Application of this product should be within the cataloged airflow and cooling considerations.

## Barometric Relief

This product line offers an optional barometric relief damper for use in conjunction with economizer option. This accessory consists of gravity dampers which open with increased pressure. As the building air pressure increases, the pressure in the unit return air section also increases, opening the dampers and relieving the conditioned space.

**Note:** *The effectiveness of barometric relief damper during economizing operation is limited, depending on the pressure drop of the return-air path. For some applications, powered exhaust may be better suited for preventing over-pressurization when economizing.*

## Black Epoxy Coil

The coils are manufactured with a thermoset, vinyl coating that is bonded to the aluminum fin stock prior to the fin stamping process. These coils are an economical option for protection in mildly corrosive environments.

**Note:** *Not to be used where seacoast applications exist.*

## Clearance Requirements

The recommended clearances identified with unit dimensions should be maintained to assure adequate service maximum capacity and peak operating efficiency. Actual clearances which appear inadequate should be reviewed with the local Trane sales personnel.

Model Number	Clearance required from duct to combustible surfaces (inches)
THC037E	0
THC047E	0
THC067E	0

## CompleteCoat™ Condenser Coil

The coils provide protection from corrosive environments and are ideal for seacoast applications.

## Condensate Trap

The evaporator is a draw-thru configuration. A trap must be field provided prior to start-up on the cooling cycle.

## Heating Operation

The heat exchanger is manufactured with aluminized steel. To prevent condensation within the heat exchanger, do not exceed 50% outside air or a minimum mixed air temperature of 40°F.

## Low Airflow/VAV Operation

Units equipped electric heat or staged gas heat may not be selected for supply airflow less than 320 cfm/ton. Cooling-only units can be used in applications designed for supply airflow below 320 cfm/ton. The units must be high-efficiency models with dehumidification (hot gas reheat) or be equipped with a TXV, Froststat™, and crankcase heaters.

Units selected with Single-Zone VAV Control, or Multiple-Zone VAV Control are capable of operating at supply airflows below 320 cavum/ton at part-load conditions, but design (or "full") airflow must be set to 320 cavum/ton or higher.

## Low Ambient Cooling

The Precedent™ line features, with ReliaTel™ microprocessor controls, low ambient cooling down to 0°F. The following features or options need to be included/considered when low ambient

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## Application Considerations

applications are required: continuous fan operation, crankcase heaters, thermal expansion valves, Froststat.

Contact a local Trane Representative for more assistance with low ambient cooling applications.

### **Optional Stainless Steel Heat Exchanger**

The optional stainless steel heat exchanger is manufactured with 409 stainless steel. To prevent corrosion and prolong heat exchanger reliability, the minimum mixed air temperature allowed across the heat exchanger is 20°F.

The stainless steel heat exchanger option is an excellent option that compliments the dehumidification package. Whenever high outside air or outside applications exist, these options should be utilized.

### **Unit Pitch**

These units have reversible sloped condensate drain pans. Units must be installed level. Any unit slope must be toward the side of unit where condensate drain is connected.



# Selection Procedure

## Cooling Capacity

**Note:** Cooling Capacity Procedure is the same for electric heat (T\*C) and gas heat (Y\*C).

### Step 1.

Calculate the building's total and sensible cooling loads at design conditions. Use the Trane calculation methods or any other standard accepted method.

Factors used in unit selection:

- Packaged Cooling with Optional Electric Heat
- Total Cooling Load: 58 MBh
- Sensible Cooling Load: 40 MBh
- Airflow: 2000 cfm
- Electrical Characteristics: 460/60/3
- Summer Design Conditions: Entering Evaporator Coil: 80 DB
- 67WB Outdoor Ambient: 95
- External Static Pressure: 0.36 in. wg
- Downflow Configuration
- Efficiency: 17 SEER
- Economizer

### Step 2.

As a starting point, a rough determination must be made of the size of the unit. The final selection will be made after examining the performance at the given conditions. Divide the total cooling load by nominal Btuh per ton (12 MBh per ton); then round up to the nearest unit size.

$$59 \text{ MBh} / 12 \text{ MBh} = \text{approx. } 5 \text{ tons}$$

### Step 3.

Table 6, p. 34 shows that a THC067E4 has a **gross** cooling capacity of 60.0 MBh and 45.29 MBh sensible capacity at 2000 cfm and 95 DB outdoor ambient with 80 DB, 67 WB air entering the evaporator.

### To Find Capacity at Intermediate Conditions not in the table.

When the design conditions are between two numbers that are in the capacity table, interpolation is required to approximate the capacity.

**Note:** Extrapolation outside of the table conditions is not recommended.

### Step 4.

In order to select the correct unit which meets the building's requirements, the fan motor heat must be deducted from the gross cooling capacity. The amount of heat that the fan motor generates is dependent on the effort by the motor - cfm and static pressure. To determine the total unit static pressure:

External Static Duct System	0.36 wg
Standard Filter 2 in. from Table 16, p. 43	0.05 wg
Economizer from Table 16, p. 43 (100% Outside Air) *worst case	0.11 wg
Electric Heater Size 6 kW from Table 16, p. 43 (reference "Heating Capacity" section on this page for determination of heater size)	0.02 wg
Total Static Pressure	0.54 wg

**Note:** The Evaporator Fan Performance Table 12, p. 41 has deducted the pressure drop for a filter already in the unit (see note below Table 12, p. 41). Therefore, the actual total static pressure is 0.54 - 0.05 (from Table 16, p. 43) = 0.49 wg.

With 2000 cfm and 0.5 wg.  
*Table 12, p. 41* shows 0.55 bhp for this unit.

**Note:** Below the table is the formula to calculate Fan Motor Heat

$$2.9245 \times \text{bhp} + 0.055 = \text{MBh.}$$
$$2.9245 \times 0.55 + 0.055 = 1.7 \text{ MBh.}$$

Now subtract the fan motor heat from the gross cooling capacity of the unit:

**Net** Total Cooling Capacity  
= 60.0 MBh - 1.7 = 58.3 MBh

**Net** Sensible Cooling Capacity  
= 45.3 MBh - 1.7 = 43.6 MBh

Subtracting Sensible from Total Capacity to find Latent Capacity

**Net** Latent Capacity  
= 58.3 - 43.6 = 14.7 MBh

#### **Step 5.**

Compare your resulting capacities to the building load. If the performance will not meet the required load of the building's total or sensible cooling load, try a selection at the next higher size unit.

## **Heating Capacity**

**Note:** Heating capacity procedure DIFFERS for electric heat (THC) and gas heat (YHC) units

#### **Step 1.**

Calculate the building heating load using the Trane calculation form or other standard accepted method.

#### **Step 2.**

Size the system heating capacity to match the calculated building heating load. The following are building heating requirements:

Total heating load of 15 MBh  
2000 cfm

THC units with optional electric heat: 460V/3 phase Power Supply

The electric heat accessory capacities are listed in *Table 18, p. 44*. From the table, a 6 kW heater will deliver 20.48 MBh at 480 volts. In order to determine capacity at 460 volts, the heater voltage correction factor from *Table 19, p. 44* must be used. Therefore, 20.48 MBh x 0.918 (voltage correction factor) = 18.8 MBh

YHC units with gas heat: Fuel- natural gas.

60 MBh, 80 MBh and 130 MBh input models shown in *Table 16, p. 43*. The output capacities of these furnaces are 48 MBh, 64 MBh and 104 MBh respectively. The low heat model with 48 MBh best matches the building requirements.

## **Air Delivery Selection**

**Note:** Air Delivery procedure is the same for electric heat and gas heat units.)

External static pressure drop through the air distribution system has been calculated to be 0.5 inches of water. Enter *Table 11, p. 40* for a THC067E4 at 2000 cfm and 0.5 static pressure. The standard direct drive motor will give the desired airflow at a rated bhp of 0.55 and 835 rpm.



## Selection Procedure

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### Dehumidification Selection

**Note:** Dehumidification selection procedure is the same for both electric heat (THC) and gas heat (YHC) models).

Typical 5 ton THC067E

2000 cfm Total Supply airflow

400 cfm Outside Air (40%)

600 cfm Return Air

0.34" External Static Pressure

OA Conditions

Part load day and raining

68°F db

67°F wb

95% RH

RA conditions

75°F db

63°F wb

#### Step 1:

Determine the mixed/entering air condition (MA)

MA = (% outside air\*outside air dry-bulb temperature) + (% return air\*return air dry-bulb temperature)

$$MA = (0.40*68°F) + (0.60*75°F)$$

$$MA = 72.20°F \text{ db}$$

Repeat for wet-bulb temperature (wb).

MA

72.2°F db

64.6°F wb

#### Step 2:

Determine the additional static pressure drop for a reheat unit

Table 16, p. 43 shows a static pressure drop of 0.13" for the reheat coil and an additional 0.08 for the mandatory 2" pleated filters required when ordering the dehumidification option. Total static pressure =

$$.34 + 0.08 + 0.13 = 0.55$$

Do not forget to also add any additional static from other accessories. This selection does not include additional accessories.

#### Step 3a:

Determine leaving evaporator temperature (SA')

Leaving Evaporator Temperature = SA'

Utilizing the manual **Cooling Capacity** selection method as previously described, find the leaving evaporator temperatures with the formula:

$$\Delta \text{ Temp} = \frac{\text{gross sensible or gross latent cooling capacity in Btuh}}{(\text{cfm}) (1.085)}$$

Subtract your sensible  $\Delta$  temp from the entering db and latent  $\Delta$  temp from the entering wb to determine the leaving evaporator db & wb (temperatures without the addition of fan heat).

52.7°F db  
52.7°F wb  
52.7°F dp

### Step 3b:

Determine leaving unit temperature in standard cooling mode

Repeat Step 3a substituting **net** sensible or latent capacity for **gross** sensible or latent capacity to find the leaving unit temperature including fan heat.

53.7°F db  
53.1°F wb

### Step 4:

Determine reheat temperature rise

Using the leaving evaporator temp (SA'), go to [Table 21, p. 45](#) and determine the reheat temperature rise for that particular cfm:  $\cong 17.0^\circ\text{F db}$

**Note:** Reheat temperature rise is based on **supply airflow** and leaving **evaporator coil** temperature.

### Step 5:

Determine leaving unit sensible temperature with reheat active (SA)

Reheat temperature (obtained in step 4) + (SA' + fan heat) = SA

(SA' + fan heat) = leaving unit temperature in standard cooling mode from step 3b.

$19.0^\circ\text{F db} + 53.7^\circ\text{F} = 72.7^\circ\text{F db}$

SA=72.7°F

Since reheat adds only sensible heat, the dewpoint temperature will remain constant so follow the dewpoint temperature line across the psychrometric chart to find the new wb temperature.

$\cong 60.5^\circ\text{F wb}$   
52.7 dp  
49.9% RH

If the space relative humidity is equal to or above the space relative humidity setpoint, the Dehumidification option will:

- Energize compressor
- Hot gas reheat valve is energized and hot gas is diverted to the reheat coil
- Dehumidification/reheat is terminated when space humidity is reduced to 5% below relative humidity setpoint

At MA air enters the RTU. The RTU filters, cools, and dehumidifies the air as it moves through the evaporator coil. Air leaves the evaporator coil saturated at the preset dew point condition (SA') and is reheated by the hot gas reheat coil to deliver 72.7°F (SA) supply air to the space.



# Model Number Description - 3-5 Ton

Y	H	C	O	3	7	E	3	R	Z	B	*	*
1	2	3	4	5	6	7	8	9	10	11	12	13

## Digit 1 - Unit Type

- T DX Cooling
- Y DX Cooling, Gas Heat

## Digit 2 - Efficiency

- S Standard Efficiency
- H High Efficiency

## Digit 3 - Airflow

- C Convertible

## Digit 4,5,6 - Nominal Gross Cooling Capacity (MBh)

- 037 3Ton
- 047 4Ton
- 067 5Ton

## Digit 7 - Major Design Sequence

- E R-410A Refrigerant

## Digit 8 - Voltage Selection

- 3 208-230/60/3
- 4 460/60/3
- W 575/60/3

## Digit 9 - Unit Controls

- R ReliaTel™ Microprocessor

## Digit 10 - Heating Capacity

- 0=No Electric Heat      G=18 kW (1&3 phase)
- B=6 kW (3 phase)      J=23 kW (3 phase)
- E=12 kW (3 phase)
- L Low Heat
- M Medium Heat
- H High Heat
- X Low Heat, Stainless Steel Heat Exchanger
- Y Medium Heat, Stainless Steel Heat Exchanger
- Z High Heat, Stainless Steel Heat Exchanger

## Digit 11 - Minor Design Sequence

- A First Sequence<sup>16</sup>

## Digit 12,13 - Service Sequence

- \*\* Factory Assigned

## Digit 14 - Fresh Air Selection

- 0 No Fresh Air
- A Manual Outside Air Damper 0-50%<sup>2</sup>
- B Motorized Outside Air Damper 0-50%
- C Economizer, Dry Bulb 0-100% without Barometric Relief<sup>5</sup>
- D Economizer, Dry Bulb 0-100% with Barometric Relief<sup>5</sup>
- E Economizer, Reference Enthalpy 0-100% without Barometric Relief<sup>5</sup>
- F Economizer, Reference Enthalpy 0-100% with Barometric Relief<sup>5</sup>
- G Economizer, Comparative Enthalpy 0-100% without Barometric Relief<sup>5</sup>
- H Economizer, Comparative Enthalpy 0-100% with Barometric Relief<sup>5</sup>
- K Low Leak Economizer with Barometric Relief
- M Low Leak Economizer with Reference Enthalpy with Barometric Relief
- P Low Leak Economizer with Comparative Enthalpy with Barometric Relief

## Digit 15 - Supply Fan/Drive Type/Motor

- 0 Standard Drive<sup>4</sup>
- 6 Single Zone VAV<sup>21</sup>
- E VAV Supply Air Temperature Control Standard Motor<sup>21</sup>

## Digit 16 - Hinged Service Access/ Filters

- 0 Standard Panels/Standard Filters
- A Hinged Access Panels/Standard Filters
- B Standard Panels/2" MERV 8 Filters
- C Hinged Access Panels/2" MERV 8 Filters
- D Standard Panels/2" MERV 13 Filters
- E Hinged Access Panels/2" MERV 13 Filters

## Digit 17 - Condenser Coil Protection

- 0 Standard Coil
- 1 Standard Coil with Hail Guard
- 2 Black Epoxy Pre-Coated Condenser Coil
- 3 Black Epoxy Pre-Coated Condenser Coil with Hail Guard
- 4 CompleteCoat™ Condenser Coil
- 5 CompleteCoat™ Condenser Coil with Hail Guard

## Digit 18 - Through the Base Provisions

- 0 No Through-the-Base Provisions
- A Through-the-Base Electric<sup>6</sup>
- B Through-the-Base Gas Piping<sup>13</sup>
- C Through-the-Base Electric and Gas Piping<sup>13</sup>

## Digit 19 - Disconnect/Circuit Breaker (three-phase only)

- 0 No Disconnect/No Circuit Breaker
- 1 Unit Mounted Non-Fused Disconnect<sup>6</sup>
- 2 Unit Mounted Circuit Breaker<sup>6</sup>

## Digit 20 - Convenience Outlet

- 0 No Convenience Outlet
- A Unpowered Convenience Outlet
- B Powered Convenience Outlet (three-phase only)<sup>7</sup>

## Digit 21 - Communications Options

- 0 No Communications Interface
- 2 LonTalk® Communications Interface
- 3 Novar 2024 Controls
- 4 Novar 3051 Controls without Zone Sensor
- 5 Novar 3051 Controls Interface with DCV
- 6 BACnet® Communications Interface

## Digit 22 - Refrigeration System Option

- 0 Standard Refrigeration System<sup>8</sup>
- B Dehumidification Option<sup>17</sup>

## Digit 23 - Refrigeration Controls

**Note:** Applicable to Digit 7 = E

- 0 No Refrigeration Control<sup>3</sup>
- 1 Frostat™
- 2 Crankcase Heater<sup>1</sup>
- 3 Frostat and Crankcase Heater<sup>1</sup>

## Digit 24 - Smoke Detector<sup>14</sup>

- 0 No Smoke Detector
- A Return Air Smoke Detector<sup>9,10</sup>
- B Supply Air Smoke Detector
- C Supply and Return Air Smoke Detectors<sup>9,10</sup>
- D Plenum Smoke Detector

## Digit 25 - System Monitoring Controls

- 0 No Monitoring Control<sup>11</sup>
- 1 Clogged Filter Switch<sup>11</sup>
- 2 Fan Failure Switch<sup>11</sup>
- 3 Discharge Air Sensing Tube<sup>11</sup>
- 4 Clogged Filter Switch and Fan Failure Switch<sup>11</sup>
- 5 Clogged Filter Switch and Discharge Air Sensing Tube<sup>11</sup>

## Model Number Description - 3-5 Ton

- 6 Fan Failure Switch and Discharge Air Sensing Tube<sup>11</sup>
- 7 Clogged Filter Switch, Fan Failure Switch and Discharge Air Sensing Tube<sup>11</sup>
- 8 Novar Return Air Sensor (NOVAR 2024)<sup>12,20</sup>
- 9 Novar Zone Temp Sensor (NOVAR 3051)<sup>15,20</sup>
- A Condensate Drain Pan Overflow Switch
- B Clogged Filter Switch<sup>11</sup> and Condensate Drain Pan Overflow Switch
- C Fan Failure Switch<sup>11</sup> and Condensate Drain Pan Overflow Switch
- D Discharge Air Sensing<sup>11</sup> and Condensate Drain Pan Overflow Switch
- E Clogged Filter Switch<sup>11</sup>, Fan Failure Switch<sup>11</sup> and Condensate Drain Pan Overflow Switch
- F Clogged Filter Switch<sup>11</sup>, Discharge Air Sensing Tube<sup>11</sup> and Condensate Drain Pan Overflow Switch
- G Fan Failure Switch<sup>11</sup>, Discharge Air Sensing Tube<sup>11</sup> and Condensate Drain Pan Overflow Switch
- H Clogged Filter Switch<sup>11</sup>, Fan Failure Switch<sup>11</sup>, Discharge Air Sensing<sup>11</sup> and Condensate Drain Pan Overflow Switch

### Digit 26 - System Monitoring Controls

- 0 No Monitoring Controls
- A Demand Control Ventilation (CO<sub>2</sub>)<sup>18,19</sup>
- B Low Leak Economizer with FDD (Fault Detection & Diagnostics)
- C FDD (Fault Detection & Diagnostics) with DCV (Demand Control Ventilation)

### Digit 27 - Unit Hardware Enhancements

- 0 No Enhancements
- 1 Stainless Steel Drain Pan

### Digit 31 - Advanced Unit Controls

- 0 Standard Unit Controls
- 1 Human Interface

## Model Number Notes

1. Standard on all variable stage units.
2. Manual outside air damper will ship factory supplied within the unit, but must be field installed.
3. High pressure control is standard on all units.
4. Constant CFM direct drive is standard for 3-5Ton variable stage units.

### Digit 15 = 0, 6

3 Phase (3-5 ton) - High Efficiency Constant CFM

5. Economizer with Barometric Relief is for downflow configured units only. Order Economizer without Barometric Relief for horizontal configuration. Barometric Relief for horizontal configured units must be ordered as field installed accessory.
6. Through the base electric required when ordering disconnect/circuit breaker options.
7. Requires use of Disconnect or Circuit Breaker.

### Not Available

High Efficiency  
3-5 ton w/Standard Indoor Motor w/460V or 575V

8. Standard metering devices are TXVs.
9. The return air smoke detector may not fit up or work properly on the Precedent units when used in conjunction with 3rd party accessories such as bolt on heat wheels, economizers and power exhaust. Do not order the return air smoke detectors when using this type of accessory.
10. Return Air Smoke Detector cannot be ordered with Novar Controls.
11. These options are standard when ordering Novar Controls.
12. This option is used when ordering Novar Controls.

13. Includes gas piping and shutoff (field assembly required).
14. Not available with high temperature duct sensor accessory.
15. Novar Sensor utilized with Digit 21 = (4) Novar 3051 Controls without Zone Sensor.
16. Available for T/Y 3,4,5 ton high efficiency models.
17. Requires selection of 2" Pleated Filters (option B or C) for Digit 16.
18. Demand Control Ventilation not available with electromechanical controls.
19. Demand Control Ventilation Option includes wiring only. The CO<sub>2</sub> sensor is a field-installed only option.
20. Novar is not available with SZVAV products.
21. Discharge Air Sensing is also standard equipment on units with Single Zone and Supply Air Temperature Control VAV.



# General Data

**Table 1. General data - 3-5 ton - 2 stage high efficiency - 17 Plus**

	3 Tons	4 Tons	5 Tons
	T/YHC037E3,4,W <sup>(a)</sup>	T/YHC047E3,4,W <sup>(a)</sup>	T/YHC067E3,4,W <sup>(a)</sup>
<b>Cooling Performance<sup>(b)</sup></b>			
Gross Cooling Capacity - High Stage	36,500	50,500	60,000
EER/SEER <sup>(c)</sup>	13.0/17.5	13.0/17.5	13.0/17.2
Nominal CFM-High Stage/AHRI Rated CFM	1,200/1,200	1,600/1,600	2,000/2,000
Nominal CFM-Low Stage	840	1,120	1,400
AHRI Net Cooling Capacity-High Stage	36,000	49,000	58,500
System Power-High Stage (KW)	2.78	3.67	4.57
<b>Compressor</b>			
No./Type	1/Scroll (2 Stage)	1/Scroll (2 Stage)	1/Scroll (2 Stage)
<b>Outdoor Sound Rating (dB)<sup>(d)</sup></b>			
	81	87	87
<b>Outdoor Coil - Type</b>			
Tube Size (in.) OD	Lanced	Lanced	Lanced
Face Area (sq. ft)	0.3125	0.3125	0.3125
Rows/FPI	17.00	17.00	17.00
	3/17	3/16	3/16
<b>Indoor Coil - Type</b>			
Tube Size (in.) OD	Lanced	Lanced	Lanced
Face Area (sq. ft)	0.3125	0.3125	0.3125
Rows/FPI	7.71	9.27	9.89
	3/16	3/16	4/16
Refrigerant Control	Thermal Expansion Valve	Thermal Expansion Valve	Thermal Expansion Valve
Drain Connection No./Size (in.)	1 3/4 NPT	1 3/4 NPT	1 3/4 NPT
<b>Outdoor Fan - Type</b>			
No. Used / Diameter (in.)	Propeller	Propeller	Propeller
Drive Type / No. Speeds	1/22	1/26	1/26
CFM	Direct/1	Direct/1	Direct/1
Motor HP	3064	3982	3953
Motor RPM	0.2/0.4	0.4	0.4
	1075	1075	1075
<b>Indoor Fan - Type (Optional)</b>			
No. Used / Diameter (in.)	FC Centrifugal	FC Centrifugal	FC Centrifugal
Drive Type / Number. Speeds	1/11 x 11	1/11 x 11	1/11 x 11
Number Motors	Direct/Variable	Direct/Variable	Direct/Variable
Motor HP (Standard/Oversized)	1	1	1
Motor Frame Size (Standard/Oversized)	0.75	1.0	1.0
	48	48	48
<b>Filters - Type Furnished<sup>(e)</sup></b>			
(No.) Size Recommended	Throwaway	Throwaway	Throwaway
	(2) 20 x 30 x 2	(4) 16 x 25 x 2	(4) 16 x 25 x 2
<b>Optional Hot Gas Reheat Coil -Type</b>			
Tube Size (in.)OD	0.3125	0.3125	0.3125
Face Area (sq. ft.)	5.23	6.28	6.28
Rows/FPI	1/16	1/16	1/16
<b>Refrigerant Charge (Lbs of R-410A)<sup>(f)</sup></b>			
Standard	7.8	10.8	12.5
Optional Hot Gas Reheat Coil	10.5	15.2	15.3

continued on next page

## General Data

**Table 1. General data - 3-5 ton - 2 stage high efficiency - 17 Plus (continued)**

	3 Tons			4 Tons			5 Tons		
	T/YHC037E3,4,W <sup>(a)</sup>			T/YHC047E3,4,W <sup>(a)</sup>			T/YHC067E3,4,W <sup>(a)</sup>		
<b>Gas/Electric Only</b>									
<b>Heating Performance<sup>(g)</sup></b>									
Heating Models	<b>Low</b>	<b>Med</b>	<b>High</b>	<b>Low</b>	<b>Med</b>	<b>High</b>	<b>Low</b>	<b>Med</b>	<b>High</b>
Heating Input (Btu)	60,000	80,000	100,000	60,000	80,000	120,000	60,000	80,000	130,000
Heating Output (Btu)	48,000	64,000	80,000	49,000	64,000	96,000	49,000	64,000	104,000
AFUE% <sup>(h)</sup>	78%	78%	78%	80%	79%	79%	80%	79%	80%
Steady State Efficiency (%)	80%	80%	81%	81%	80%	81%	81%	80%	80%
No. Burners	2	2	3	2	2	3	2	2	3
No. Stages	1	1	1	1	1	1	1	1	1
<b>Gas Supply Line Pressure</b>									
Natural (minimum / maximum)	4.5/14.0			4.5/14.0			4.5/14.0		
LP (minimum / maximum)	11/14.0			11/14.0			11/14.0		
<b>Gas Connection Pipe Size (in.)</b>									
	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2

(a) 575 (W voltage) is only available as YHC. No THC models available with 575V (W voltage).

(b) High Stage Cooling Performance is rated at 95°F ambient, 80°F entering dry bulb, 67°F entering wet bulb. Gross capacity does not include the effect of fan motor heat. AHRI capacity is net and includes the effect of fan motor heat. Units are suitable for operation to ±20% of nominal cfm. Units are certified in accordance with the Unitary Air-Conditioner Equipment certification program, which is based on AHRI standard 210/240.

(c) EER and/or SEER are rated at AHRI conditions and in accordance with DOE test procedures.

(d) Outdoor Sound Rating shown is tested in accordance with AHRI Standard 270. For additional information refer to [Table 15, p. 43](#).

(e) Optional 2" MERV 8 and MERV 13 pleated filters also available.

(f) Refrigerant charge is an approximate value. For a more precise value, see unit nameplate and service instructions.

(g) Heating performance limit settings and rating data were established and approved under laboratory test conditions using American National Standards Institute standards. Ratings shown are for elevations up to 2000 feet. For elevations above 2000 feet, ratings should be reduced at the rate of 4% for each 1000 feet above sea level. Applicable to Gas/Electric units only.

(h) AFUE is rated in accordance with DOE test procedures.



# Performance Data

**Table 2. Gross cooling capacities 3 tons 17 Plus - high stage - three phase T/YHC037E3,4,W**

Air Flow cfm		Ent DB (F)		Ambient Temperature																	
				85						95						105					
				Entering Wet Bulb																	
		61		67		73		61		67		73		61		67		73			
		MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC		
600	75	28.6	22.0	32.2	16.8	37.0	9.1	26.7	20.9	30.1	15.9	34.7	8.5	24.7	19.7	27.9	15.0	32.3	7.7		
600	80	29.1	25.3	32.1	21.5	36.3	15.2	27.2	24.1	30.0	20.5	34.0	14.4	25.3	22.8	27.9	19.4	31.7	13.5		
600	85	29.9	27.9	32.3	25.5	36.0	20.5	28.1	26.6	30.3	24.3	33.7	19.5	26.1	25.2	28.2	23.1	31.4	18.5		
600	90	31.0	29.8	32.9	28.7	36.0	25.0	29.2	28.3	30.9	27.4	33.8	24.0	27.3	26.8	28.8	26.0	31.4	22.8		
720	75	30.2	23.7	33.7	18.2	38.3	10.3	28.3	22.5	31.5	17.3	36.0	9.5	26.2	21.2	29.2	16.2	33.5	8.7		
720	80	30.9	27.3	33.8	23.2	37.8	16.6	29.0	26.0	31.6	22.1	35.5	15.7	26.9	24.6	29.4	20.9	33.0	14.7		
720	85	31.8	30.1	34.2	27.3	37.7	22.1	29.9	28.7	32.0	26.1	35.3	21.1	27.9	27.1	29.8	24.8	32.9	19.9		
720	90	33.1	32.2	34.9	30.8	37.8	26.8	31.3	30.6	32.8	29.4	35.5	25.7	29.3	28.9	30.6	28.0	33.1	24.4		
840	75	31.7	25.2	35.0	19.5	39.5	11.3	29.7	24.0	32.8	18.5	37.1	10.5	27.5	22.6	30.4	17.3	34.5	9.5		
840	80	32.5	29.0	35.3	24.7	39.2	17.8	30.5	27.6	33.0	23.5	36.8	16.8	28.4	26.2	30.7	22.2	34.2	15.8		
840	85	33.6	32.1	35.8	29.1	39.2	23.5	31.6	30.6	33.6	27.8	36.8	22.4	29.5	28.9	31.3	26.4	34.2	21.2		
840	90	35.1	34.4	36.7	32.7	39.5	28.5	33.1	32.7	34.5	31.3	37.1	27.3	31.0	31.0	32.2	29.7	34.6	25.9		
960	75	33.0	26.6	36.2	20.7	40.6	12.2	30.9	25.3	33.9	19.5	38.0	11.3	28.7	23.9	31.4	18.3	35.4	10.2		
960	80	34.0	30.7	36.6	26.0	40.4	18.9	31.9	29.2	34.3	24.8	37.9	17.8	29.7	27.6	31.8	23.4	35.2	16.7		
960	85	35.2	33.9	37.3	30.6	40.5	24.9	33.2	32.3	35.0	29.2	38.0	23.7	31.0	30.6	32.6	27.7	35.4	22.4		
960	90	36.8	36.4	38.3	34.5	40.9	30.0	34.8	34.7	36.0	33.0	38.5	28.7	32.6	32.6	33.6	31.3	35.9	27.3		
1080	75	34.2	27.9	37.2	21.7	41.4	12.9	32.0	26.5	34.8	20.4	38.8	11.9	29.6	24.9	32.2	19.1	36.0	10.8		
1080	80	35.3	32.1	37.7	27.3	41.4	19.9	33.1	30.6	35.3	25.9	38.8	18.7	30.8	28.9	32.8	24.4	36.0	17.4		
1080	85	36.7	35.6	38.6	32.1	41.7	26.0	34.5	33.9	36.2	30.6	39.1	24.7	32.2	32.1	33.7	29.0	36.4	23.3		
1080	90	38.4	38.3	39.7	36.1	42.3	31.4	36.3	36.3	37.4	34.5	39.7	30.0	34.0	34.0	34.9	32.8	37.0	28.5		
1200	75	35.1	29.0	38.0	22.5	42.1	13.5	32.9	27.5	35.5	21.2	39.4	12.4	30.4	25.9	32.9	19.8	36.5	11.2		
1200	80	36.4	33.4	38.7	28.3	42.2	20.6	34.1	31.8	36.2	26.9	39.5	19.4	31.7	30.0	33.6	25.3	36.7	18.1		
1200	85	37.9	37.1	39.7	33.3	42.6	27.0	35.7	35.4	37.2	31.8	40.0	25.6	33.3	33.3	34.6	30.1	37.2	24.2		
1200	90	39.8	39.8	41.0	37.6	43.4	32.6	37.6	37.6	38.6	35.9	40.7	31.1	35.7	35.7	36.0	34.1	38.0	29.5		
1320	75	35.9	30.0	38.7	23.2	42.6	13.9	33.5	28.3	36.1	21.8	39.8	12.7	31.0	26.6	33.4	20.3	36.9	11.4		
1320	80	37.3	34.6	39.5	29.2	42.9	21.3	35.0	32.9	36.9	27.7	40.1	20.0	32.5	31.0	34.2	26.0	37.2	18.5		
1320	85	39.0	38.5	40.6	34.5	43.4	27.9	36.7	36.7	38.1	32.8	40.7	26.4	34.2	34.2	35.4	31.0	37.8	24.9		
1320	90	41.1	41.1	42.1	39.0	44.3	33.7	38.8	38.8	39.6	37.2	41.6	32.1	36.6	36.6	36.9	35.3	38.7	30.4		
1440	75	36.5	30.8	39.1	23.8	42.9	14.2	34.1	29.1	36.5	22.3	40.0	12.9	31.5	27.3	33.7	20.7	37.0	11.5		
1440	80	38.1	35.6	40.1	30.0	43.3	21.8	35.6	33.8	37.5	28.4	40.5	20.4	33.1	31.9	34.7	26.6	37.5	18.8		
1440	85	39.9	39.8	41.4	35.4	44.1	28.6	37.5	37.5	38.8	33.7	41.2	27.0	35.0	35.0	36.0	31.8	38.3	25.4		
1440	90	42.1	42.1	43.0	40.1	45.1	34.6	39.7	39.7	40.4	38.3	42.3	33.0	37.3	37.3	37.7	36.3	39.4	31.2		

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**Table 2. Gross cooling capacities 3 tons 17 Plus - high stage - three phase T/YHC037E3,4,W (continued)**

Air Flow cfm		Ent DB (F)		Ambient Temperature											
				115						125					
				Entering Wet Bulb											
		61		67		73		61		67		73			
		MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC		
600	75	22.6	18.4	25.6	13.9	29.7	6.8	20.4	17.1	23.1	12.7	27.1	5.8		
600	80	23.2	21.4	25.6	18.2	29.1	12.5	21.0	19.9	23.1	16.9	26.5	11.4		
600	85	24.1	23.6	25.9	21.8	28.9	17.4	21.9	21.9	23.5	20.3	26.3	16.1		
600	90	26.3	26.3	26.5	24.6	29.0	21.5	23.9	23.9	24.2	23.0	26.4	20.2		
720	75	24.0	19.9	26.8	15.1	30.8	7.7	21.7	18.4	24.3	13.8	28.1	6.6		
720	80	24.7	23.1	27.0	19.6	30.4	13.6	22.4	21.5	24.5	18.2	27.7	12.4		
720	85	25.8	25.5	27.4	23.4	30.3	18.7	23.5	23.5	25.0	21.8	27.6	17.4		
720	90	28.0	28.0	28.2	26.4	30.5	23.1	25.5	25.5	25.8	24.7	27.9	21.6		
840	75	25.3	21.2	27.9	16.1	31.8	8.5	22.9	19.6	25.3	14.7	29.0	7.3		
840	80	26.1	24.6	28.2	20.8	31.5	14.6	23.7	22.9	25.6	19.3	28.7	13.3		
840	85	27.3	27.2	28.8	24.8	31.6	19.9	24.9	24.9	26.3	23.2	28.8	18.5		
840	90	29.5	29.5	29.8	28.1	31.9	24.5	27.0	27.0	27.2	26.3	29.2	22.9		
960	75	26.3	22.3	28.8	17.0	32.6	9.1	23.8	20.7	26.1	15.5	29.6	7.8		
960	80	27.3	25.9	29.3	21.9	32.4	15.4	24.9	24.2	26.6	20.4	29.5	14.0		
960	85	28.7	28.7	30.0	26.1	32.6	21.0	26.2	26.2	27.4	24.4	29.8	19.4		
960	90	30.8	30.8	31.1	29.6	33.2	25.7	28.2	28.2	28.5	27.7	30.3	24.1		
1080	75	27.2	23.3	29.6	17.7	33.2	9.5	24.6	21.6	26.8	16.1	30.1	8.2		
1080	80	28.3	27.1	30.2	22.9	33.2	16.1	25.8	25.3	27.4	21.2	30.2	14.6		
1080	85	29.8	29.8	31.1	27.3	33.5	21.8	27.3	27.3	28.3	25.5	30.6	20.2		
1080	90	32.0	32.0	32.3	31.0	34.2	26.9	29.3	29.3	29.6	29.0	31.3	25.1		
1200	75	27.9	24.1	30.1	18.3	33.6	9.9	25.2	22.3	27.2	16.6	30.5	8.4		
1200	80	29.2	28.2	30.9	23.7	33.7	16.6	26.6	26.2	28.0	21.9	30.7	15.0		
1200	85	30.8	30.8	31.9	28.3	34.2	22.6	28.2	28.2	29.1	26.4	31.2	20.9		
1200	90	33.0	33.0	33.3	32.2	35.1	27.8	30.2	30.2	30.5	30.2	32.1	26.0		
2200	75	28.4	24.8	30.5	18.7	33.8	10.0	25.7	22.9	27.5	17.0	30.6	8.5		
2200	80	29.9	29.1	31.4	24.3	34.1	17.0	27.1	27.1	28.5	22.5	31.0	15.3		
2200	85	31.7	31.7	32.6	29.2	34.8	23.2	29.0	29.0	29.7	27.2	31.7	21.4		
2200	90	33.8	33.8	34.2	33.3	35.8	28.6	31.0	31.0	31.3	31.1	32.7	26.7		
2400	75	28.8	25.4	30.7	19.0	33.9	10.0	25.9	23.4	27.7	17.2	30.6	8.4		
2400	80	30.4	29.9	31.8	24.8	34.4	17.2	27.6	27.6	28.7	22.9	31.1	15.5		
2400	85	32.3	32.3	33.1	29.9	35.2	23.6	29.5	29.5	30.1	27.8	31.9	21.8		
2400	90	34.5	34.5	34.8	34.2	36.3	29.3	31.9	31.9	31.9	31.9	33.1	27.3		

**Notes:**

1. All capacities shown are gross and have not considered indoor fan heat. To obtain **NET** cooling capacity subtract indoor fan heat. For indoor fan heat formula, refer to appropriate airflow table notes.
  2. MBh = Total Gross Capacity
  3. SHC = Sensible Heat Capacity
- \* Unit applications below 320 CFM/Ton are only applicable on THC models without electric heat. Electric and Gas heat applications are restricted to applications 320 CFM/Ton and above.



## Performance Data

**Table 3. Gross cooling capacities 3 tons 17 Plus - low stage - three phase T/YHC037E3,4,W**

Air Flow cfm		Ent DB (F)		Ambient Temperature									
				85					95				
				61		67		73		61		67	
		MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC
600	75	21.9	17.8	24.6	13.7	28.3	7.7	20.2	16.7	22.7	12.8	26.3	7.0
600	80	22.5	20.6	24.7	17.6	27.9	12.7	20.9	19.4	22.9	16.6	25.9	11.8
600	85	23.5	22.9	25.1	20.9	27.8	17.0	21.8	21.6	23.3	19.8	25.9	16.0
600	90	24.6	24.6	25.8	23.6	28.0	20.8	23.8	23.8	24.0	22.4	26.1	19.7
720	75	23.2	19.2	25.7	14.9	29.3	8.6	21.5	18.0	23.8	13.9	27.2	7.8
720	80	24.0	22.3	26.0	19.0	29.1	13.8	22.3	21.0	24.1	17.9	27.0	12.9
720	85	25.1	24.8	26.6	22.5	29.1	18.3	23.4	23.4	24.7	21.3	27.1	17.3
720	90	27.1	27.1	27.4	25.5	29.5	22.3	25.3	25.3	25.6	24.2	27.5	21.2
840	75	24.3	20.4	26.6	15.9	30.0	9.3	22.4	19.2	24.6	14.8	27.9	8.4
840	80	25.2	23.7	27.1	20.2	30.0	14.7	23.4	22.4	25.1	19.0	27.9	13.7
840	85	26.5	26.4	27.8	23.9	30.2	19.5	24.7	24.7	25.9	22.7	28.1	18.4
840	90	28.5	28.5	28.8	27.1	30.7	23.7	26.7	26.7	26.9	25.7	28.7	22.5
960	75	25.1	21.5	27.3	16.6	30.6	9.9	23.2	20.2	25.2	15.5	28.3	8.9
960	80	26.2	25.0	27.9	21.2	30.7	15.5	24.4	23.6	25.9	19.9	28.5	14.4
960	85	27.7	27.7	28.8	25.1	31.1	20.4	25.8	25.8	26.8	23.8	28.9	19.3
960	90	29.7	29.7	30.0	28.5	31.8	24.9	27.8	27.8	28.1	27.1	29.6	23.6

**Notes:**

1. All capacities shown are gross and have not considered indoor fan heat. To obtain **NET** cooling capacity subtract indoor fan heat. For indoor fan heat formula, refer to appropriate airflow table notes.
2. MBh = Total Gross Capacity
3. SHC = Sensible Heat Capacity

**Table 4. Gross cooling capacities 4 tons 17 Plus - high stage - three phase T/YHC047E3,4,W**

Air Flow cfm		Ent DB (F)		Ambient Temperature																			
				85						95						105							
				Entering Wet Bulb						61						67						73	
		61		67		73		61		67		73		61		67		73					
		MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC				
800	75	39.2	30.0	44.0	22.7	50.4	12.0	36.9	28.6	41.4	21.7	47.5	11.2	34.3	27.1	38.6	20.4	44.4	10.3				
800	80	39.9	34.6	43.9	29.2	49.6	20.4	37.6	33.1	41.3	28.0	46.7	19.4	35.1	31.4	38.5	26.6	43.7	18.3				
800	85	41.0	38.3	44.3	34.7	49.2	27.7	38.7	36.6	41.7	33.3	46.4	26.6	36.2	34.7	39.0	31.7	43.4	25.3				
800	90	42.6	40.9	45.2	39.2	49.3	34.0	40.3	39.0	42.6	37.6	46.5	32.7	37.9	37.0	39.9	35.8	43.5	31.2				
960	75	41.5	32.3	46.1	24.7	52.3	13.7	39.0	30.9	43.4	23.6	49.3	12.8	36.4	29.3	40.5	22.2	46.1	11.7				
960	80	42.4	37.3	46.2	31.5	51.7	22.3	40.0	35.7	43.5	30.2	48.7	21.2	37.3	33.9	40.6	28.7	45.6	20.0				
960	85	43.7	41.2	46.8	37.3	51.6	29.9	41.3	39.4	44.2	35.8	48.6	28.7	38.7	37.5	41.3	34.1	45.5	27.3				
960	90	45.5	44.1	47.9	42.0	51.9	36.5	43.1	42.1	45.2	40.3	49.0	35.1	40.6	40.0	42.4	38.5	45.9	33.5				
1120	75	43.6	34.5	48.0	26.5	54.0	15.1	41.0	32.9	45.1	25.2	50.9	14.1	38.2	31.2	42.1	23.8	47.6	13.0				
1120	80	44.7	39.7	48.3	33.6	53.6	24.0	42.1	38.0	45.5	32.2	50.5	22.9	39.4	36.1	42.5	30.6	47.3	21.6				
1120	85	46.2	43.9	49.1	39.7	53.7	32.0	43.7	42.0	46.3	38.0	50.6	30.6	41.0	40.0	43.4	36.3	47.4	29.1				
1120	90	48.2	47.1	50.4	44.7	54.2	38.8	45.7	45.0	47.6	42.9	51.2	37.3	43.0	42.8	44.7	41.0	48.0	35.7				
1280	75	45.4	36.4	49.6	28.1	55.5	16.4	42.7	34.7	46.6	26.7	52.2	15.2	39.8	32.9	43.5	25.2	48.8	14.0				
1280	80	46.7	41.9	50.2	35.5	55.3	25.6	44.0	40.1	47.2	33.9	52.1	24.3	41.2	38.1	44.1	32.2	48.7	22.9				
1280	85	48.5	46.5	51.2	41.8	55.6	33.8	45.8	44.4	48.3	40.1	52.4	32.3	43.0	42.3	45.2	38.2	49.1	30.7				
1280	90	50.7	49.9	52.7	47.2	56.3	40.9	48.1	47.8	49.8	45.3	53.2	39.3	45.3	45.3	46.7	43.2	49.9	37.6				
1440	75	46.9	38.1	51.0	29.5	56.7	17.4	44.1	36.4	47.9	28.0	53.3	16.2	41.2	34.5	44.7	26.4	49.8	14.8				
1440	80	48.5	44.0	51.8	37.2	56.7	26.9	45.7	42.0	48.7	35.5	53.4	25.5	42.7	39.9	45.5	33.7	49.9	24.0				
1440	85	50.5	48.8	53.0	43.8	57.2	35.4	47.7	46.6	50.0	42.0	53.9	33.8	44.8	44.4	46.8	40.0	50.5	32.1				
1440	90	52.9	52.5	54.7	49.4	58.2	42.8	50.2	50.2	51.7	47.4	54.9	41.1	47.2	47.2	48.6	45.3	51.5	39.2				
1600	75	48.3	39.7	52.2	30.7	57.7	18.2	45.4	37.8	49.0	29.1	54.2	16.9	42.3	35.8	45.6	27.3	50.6	15.4				
1600	80	50.0	45.8	53.2	38.6	57.9	28.0	47.1	43.7	50.0	36.8	54.5	26.5	44.0	41.5	46.7	34.9	50.9	24.9				
1600	85	52.2	50.9	54.6	45.5	58.6	36.8	49.3	48.6	51.5	43.6	55.2	35.1	46.3	46.3	48.2	41.5	51.7	33.3				
1600	90	54.9	54.9	56.5	51.4	59.8	44.5	52.0	52.0	53.4	49.3	56.4	42.7	49.0	49.0	50.1	47.1	52.9	40.7				
1760	75	49.4	41.0	53.1	31.6	58.4	18.8	46.3	39.0	49.8	29.9	54.8	17.4	43.1	36.9	46.3	28.1	51.1	15.8				
1760	80	51.3	47.4	54.3	39.9	58.9	28.9	48.3	45.2	51.0	38.0	55.3	27.3	45.1	42.9	47.6	36.0	51.6	25.6				
1760	85	53.7	52.7	56.0	47.1	59.8	38.0	50.7	50.4	52.7	45.0	56.3	36.2	47.6	47.6	49.3	42.9	52.6	34.3				
1760	90	56.6	56.6	58.1	53.3	61.2	46.0	53.6	53.6	54.9	51.1	57.7	44.1	50.5	50.5	51.5	48.7	54.0	42.0				
1920	75	50.2	42.1	53.8	32.4	58.9	19.2	47.1	40.0	50.4	30.6	55.2	17.7	43.8	37.8	46.8	28.6	51.4	16.0				
1920	80	52.4	48.8	55.2	40.9	59.6	29.6	49.3	46.5	51.8	38.9	55.9	27.9	46.0	44.1	48.2	36.8	52.1	26.1				
1920	85	55.0	54.4	57.1	48.4	60.7	38.9	51.9	51.9	53.7	46.3	57.1	37.1	48.6	48.6	50.2	44.0	53.3	35.1				
1920	90	58.1	58.1	59.4	54.9	62.4	47.3	55.0	55.0	56.1	52.6	58.7	45.2	51.8	51.8	52.6	50.1	55.0	43.1				

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## Performance Data

**Table 4. Gross cooling capacities 4 tons 17 Plus - high stage - three phase T/YHC047E3,4,W (continued)**

Air Flow cfm		Ent DB (F)		Ambient Temperature											
				115						125					
				Entering Wet Bulb											
		61		67		73		61		67		73			
		MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC		
800	75	31.6	25.5	35.6	19.1	41.2	9.2	29.0	23.9	32.8	17.7	38.1	8.1		
800	80	32.4	29.6	35.6	25.1	40.4	17.0	29.8	28.0	32.8	23.6	37.4	15.8		
800	85	33.6	32.8	36.1	30.0	40.2	23.9	31.0	30.9	33.3	28.5	37.2	22.5		
800	90	35.2	34.9	37.0	34.0	40.3	29.6	33.9	33.9	34.2	32.3	37.4	28.2		
960	75	33.6	27.5	37.4	20.8	42.8	10.5	30.9	25.9	34.4	19.4	39.6	9.3		
960	80	34.5	32.0	37.6	27.0	42.2	18.7	31.9	30.2	34.7	25.5	39.1	17.4		
960	85	35.9	35.4	38.3	32.3	42.2	25.8	33.3	33.3	35.4	30.7	39.1	24.4		
960	90	37.8	37.8	39.4	36.5	42.6	31.9	36.2	36.2	36.6	34.8	39.5	30.3		
1120	75	35.3	29.4	38.9	22.3	44.1	11.7	32.5	27.6	35.9	20.7	40.9	10.4		
1120	80	36.5	34.1	39.3	28.8	43.8	20.1	33.7	32.3	36.3	27.2	40.6	18.7		
1120	85	38.1	37.8	40.2	34.4	44.0	27.5	35.4	35.4	37.3	32.6	40.8	26.0		
1120	90	40.2	40.2	41.6	38.9	44.6	33.9	38.3	38.3	38.6	37.0	41.4	32.2		
1280	75	36.8	31.0	40.2	23.5	45.3	12.6	33.9	29.2	37.1	21.9	41.9	11.2		
1280	80	38.1	36.0	40.8	30.4	45.2	21.3	35.3	34.1	37.8	28.7	41.8	19.8		
1280	85	40.0	40.0	41.9	36.2	45.5	29.0	37.2	37.2	38.9	34.4	42.2	27.4		
1280	90	42.3	42.3	43.5	41.0	46.3	35.7	40.1	40.1	40.5	39.1	43.1	33.9		
1440	75	38.0	32.4	41.3	24.6	46.1	13.3	35.0	30.5	38.0	22.9	42.7	11.8		
1440	80	39.6	37.7	42.1	31.7	46.3	22.3	36.6	35.7	38.9	30.0	42.8	20.7		
1440	85	41.6	41.6	43.4	37.9	46.8	30.3	38.7	38.7	40.3	36.0	43.4	28.6		
1440	90	44.1	44.1	45.2	43.0	47.9	37.2	41.7	41.7	42.1	41.0	44.5	35.4		
1600	75	39.0	33.6	42.1	25.4	46.8	13.8	35.9	31.6	38.8	23.7	43.2	12.2		
1600	80	40.8	39.2	43.1	32.9	47.1	23.1	37.7	37.1	39.9	31.0	43.6	21.4		
1600	85	43.1	43.1	44.7	39.3	47.9	31.4	40.1	40.1	41.4	37.3	44.4	29.6		
1600	90	46.2	46.2	46.7	44.7	49.2	38.6	43.0	43.0	43.4	42.6	45.7	36.7		
1760	75	39.8	34.6	42.7	26.1	47.2	14.1	36.6	32.5	39.2	24.2	43.5	12.4		
1760	80	41.8	40.5	43.9	33.8	47.7	23.7	38.6	38.3	40.5	31.9	44.1	21.9		
1760	85	44.2	44.2	45.7	40.5	48.7	32.3	41.1	41.1	42.3	38.5	45.1	30.4		
1760	90	47.4	47.4	47.9	46.2	50.2	39.8	44.1	44.1	44.6	44.0	46.6	37.8		
1920	75	40.3	35.4	43.0	26.5	47.4	14.2	37.0	33.2	39.5	24.6	43.6	12.4		
1920	80	42.5	41.6	44.5	34.6	48.1	24.1	39.2	39.2	41.0	32.5	44.4	22.2		
1920	85	45.2	45.2	46.5	41.6	49.3	32.9	42.0	42.0	43.0	39.4	45.6	30.9		
1920	90	48.4	48.4	48.9	47.5	51.0	40.7	45.0	45.0	45.4	45.2	47.3	38.7		

**Notes:**

1. All capacities shown are gross and have not considered indoor fan heat. To obtain **NET** cooling capacity subtract indoor fan heat. For indoor fan heat formula, refer to appropriate airflow table notes.
2. MBh = Total Gross Capacity
3. SHC = Sensible Heat Capacity

**Table 5. Gross cooling capacities 4 tons 17 Plus - low stage - three phase T/YHC047E3,4,W**

Air Flow cfm		Ent DB (F)		Ambient Temperature									
				85					95				
				61		67		73		61		67	
		MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC
800	75	30.9	26.7	34.4	20.7	39.4	12.0	28.8	26.1	32.1	20.3	36.9	11.8
800	80	31.7	30.5	34.6	25.9	38.9	18.7	29.7	29.7	32.3	25.4	36.4	18.3
800	85	32.9	32.9	35.1	30.3	38.8	24.5	30.9	30.9	32.9	29.6	36.4	24.0
800	90	34.5	34.5	36.0	33.9	39.0	29.5	33.5	33.5	33.8	33.1	36.7	28.9
960	75	32.7	28.7	36.0	22.4	40.7	13.3	30.5	27.9	33.6	21.8	38.2	13.0
960	80	33.7	32.7	36.4	27.9	40.5	20.3	31.6	31.6	34.0	27.2	37.9	19.8
960	85	35.1	35.1	37.1	32.6	40.6	26.4	33.0	33.0	34.8	31.8	38.1	25.8
960	90	37.9	37.9	38.3	36.4	41.1	31.8	35.6	35.6	36.0	35.5	38.6	31.0
1120	75	34.1	30.3	37.2	23.7	41.8	14.3	31.9	29.4	34.8	23.0	39.1	13.9
1120	80	35.4	34.7	37.9	29.5	41.8	21.6	33.2	33.2	35.4	28.7	39.1	21.0
1120	85	37.1	37.1	38.9	34.5	42.1	28.1	34.8	34.8	36.5	33.6	39.5	27.4
1120	90	39.8	39.8	40.2	38.7	42.8	33.7	37.5	37.5	37.9	37.6	40.3	32.9
1280	75	35.3	31.7	38.2	24.8	42.6	15.1	32.9	30.7	35.6	24.0	39.8	14.5
1280	80	36.8	36.4	39.1	30.9	42.8	22.7	34.5	34.5	36.5	30.0	40.0	22.0
1280	85	38.7	38.7	40.3	36.2	43.3	29.4	36.4	36.4	37.8	35.1	40.6	28.6
1280	90	41.5	41.5	41.9	40.6	44.3	35.3	39.4	39.4	39.4	39.4	41.6	34.4

**Notes:**

1. All capacities shown are gross and have not considered indoor fan heat. To obtain **NET** cooling capacity subtract indoor fan heat. For indoor fan heat formula, refer to appropriate airflow table notes.
2. MBh = Total Gross Capacity
3. SHC = Sensible Heat Capacity



## Performance Data

**Table 6. Gross cooling capacities 5 tons 17 Plus - high stage - three phase T/YHC067E3,4,W**

Air Flow cfm		Ent DB (F)		Ambient Temperature																	
				85						95						105					
				Entering Wet Bulb																	
		61		67		73		61		67		73		61		67		73			
		MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC		
1000	75	47.6	36.8	53.6	28.2	61.6	15.4	44.5	35.0	50.2	26.7	57.9	14.3	41.3	33.0	46.6	25.1	54.0	13.1		
1000	80	48.4	42.5	53.4	36.1	60.5	25.5	45.4	40.5	50.0	34.4	56.8	24.2	42.2	38.3	46.5	32.6	52.9	22.7		
1000	85	49.9	46.9	53.8	42.7	59.9	34.4	46.8	44.7	50.5	40.9	56.3	32.9	43.7	42.3	47.0	38.8	52.5	31.2		
1000	90	51.9	50.1	54.9	48.1	60.0	42.0	48.9	47.7	51.6	46.0	56.4	40.3	45.8	45.1	48.1	43.8	52.6	38.4		
1200	75	50.3	39.7	56.0	30.7	63.8	17.5	47.1	37.7	52.5	29.1	60.0	16.3	43.7	35.6	48.8	27.3	55.9	14.9		
1200	80	51.4	45.7	56.1	38.9	62.9	28.0	48.2	43.5	52.6	37.1	59.1	26.5	44.8	41.2	48.9	35.1	55.1	24.9		
1200	85	53.0	50.5	56.8	45.9	62.6	37.2	49.9	48.1	53.3	43.9	58.9	35.5	46.6	45.6	49.7	41.7	54.9	33.7		
1200	90	55.3	54.0	58.1	51.6	62.9	45.1	52.2	51.4	54.7	49.4	59.2	43.2	49.0	48.7	51.1	47.0	55.3	41.2		
1400	75	52.7	42.3	58.2	32.9	65.7	19.4	49.3	40.2	54.5	31.2	61.7	18.0	45.8	38.0	50.7	29.3	57.6	16.5		
1400	80	54.0	48.7	58.5	41.5	65.1	30.2	50.7	46.4	54.9	39.5	61.1	28.6	47.2	43.9	51.1	37.4	57.0	26.8		
1400	85	55.9	53.7	59.5	48.8	65.0	39.7	52.7	51.2	55.9	46.6	61.2	37.9	49.3	48.6	52.1	44.3	57.1	35.9		
1400	90	58.5	57.6	61.0	54.8	65.6	47.9	55.3	54.9	57.5	52.5	61.8	45.9	51.9	51.9	53.8	50.0	57.8	43.8		
1600	75	54.8	44.7	60.0	34.9	67.3	21.0	51.3	42.5	56.2	33.0	63.2	19.5	47.7	40.1	52.3	31.0	59.0	17.8		
1600	80	56.4	51.3	60.6	43.8	67.0	32.1	52.9	48.9	56.9	41.7	62.9	30.4	49.3	46.3	53.0	39.5	58.7	28.5		
1600	85	58.5	56.7	61.8	51.4	67.2	41.9	55.2	54.1	58.1	49.1	63.2	40.0	51.6	51.3	54.3	46.7	59.0	37.9		
1600	90	61.3	60.9	63.6	57.8	68.0	50.5	58.0	58.0	60.0	55.3	64.0	48.4	54.5	54.5	56.2	52.7	59.9	46.1		
1800	75	56.6	46.8	61.6	36.6	68.7	22.3	53.0	44.4	57.7	34.6	64.4	20.7	49.2	41.9	53.6	32.5	60.0	18.9		
1800	80	58.4	53.8	62.4	45.8	68.5	33.8	54.9	51.2	58.6	43.6	64.4	31.9	51.2	48.5	54.6	41.3	60.0	29.9		
1800	85	60.9	59.5	63.9	53.8	69.0	43.9	57.4	56.7	60.1	51.4	64.9	41.9	53.7	53.7	56.1	48.8	60.6	39.7		
1800	90	63.9	63.9	66.0	60.5	70.1	52.9	60.5	60.5	62.2	57.9	66.0	50.6	56.8	56.8	58.3	55.1	61.8	48.2		
2000	75	58.1	48.6	62.9	38.1	69.7	23.4	54.4	46.1	58.8	36.0	65.4	21.6	50.5	43.5	54.6	33.7	60.8	19.7		
2000	80	60.2	55.9	64.0	47.6	69.8	35.2	56.5	53.2	60.0	45.3	65.5	33.2	52.7	50.4	55.8	42.8	61.1	31.1		
2000	85	62.9	62.0	65.7	55.9	70.6	45.7	59.3	59.1	61.8	53.4	66.3	43.5	55.5	55.5	57.7	50.7	61.9	41.2		
2000	90	66.2	66.2	68.0	63.0	71.9	54.9	62.6	62.6	64.1	60.2	67.7	52.5	58.9	58.9	60.1	57.3	63.3	50.0		
2200	75	59.3	50.2	63.9	39.3	70.5	24.3	55.5	47.6	59.7	37.0	66.0	22.3	51.5	44.8	55.4	34.6	61.4	20.3		
2200	80	61.7	57.9	65.2	49.2	70.9	36.3	57.9	55.0	61.1	46.7	66.4	34.2	54.0	52.1	56.9	44.1	61.8	32.0		
2200	85	64.7	64.3	67.2	57.8	71.9	47.2	60.9	60.9	63.2	55.1	67.5	44.8	57.0	57.0	58.9	52.3	62.9	42.4		
2200	90	68.2	68.2	69.8	65.1	73.5	56.7	64.5	64.5	65.8	62.3	69.1	54.2	60.7	60.7	61.6	59.2	64.6	51.6		
2400	75	60.3	51.6	64.6	40.3	70.9	24.8	56.3	48.8	60.3	37.9	66.3	22.8	52.2	45.9	55.9	35.3	61.6	20.6		
2400	80	62.9	59.5	66.2	50.5	71.6	37.2	59.0	56.6	62.0	47.9	67.0	35.0	54.9	53.5	57.6	45.1	62.3	32.6		
2400	85	66.1	66.1	68.4	59.4	72.8	48.4	62.3	62.3	64.3	56.6	68.3	45.9	58.2	58.2	59.9	53.6	63.7	43.4		
2400	90	69.9	69.9	71.3	67.1	74.7	58.3	66.1	66.1	67.1	64.1	70.2	55.7	62.2	62.2	62.8	60.9	65.6	52.9		

continued on next page

**Table 6. Gross cooling capacities 5 tons 17 Plus - high stage - three phase T/YHC067E3,4,W (continued)**

Air Flow cfm		Ent DB (F)		Ambient Temperature											
				115						125					
				Entering Wet Bulb											
		61		67		73		61		67		73			
		MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC		
1000	75	37.8	30.9	42.8	23.4	49.9	11.7	34.2	28.7	38.9	21.5	45.7	10.1		
1000	80	38.8	36.0	42.8	30.6	48.9	21.1	35.2	33.5	38.9	28.5	44.7	19.4		
1000	85	40.3	39.8	43.4	36.6	48.5	29.4	36.8	36.8	39.5	34.3	44.3	27.4		
1000	90	42.5	42.3	44.5	41.4	48.7	36.4	40.3	40.3	40.8	38.9	44.6	34.2		
1200	75	40.1	33.4	44.9	25.5	51.7	13.4	36.4	31.0	40.8	23.4	47.4	11.7		
1200	80	41.3	38.8	45.1	33.1	51.0	23.2	37.7	36.2	41.1	30.8	46.7	21.3		
1200	85	43.1	42.9	45.9	39.4	50.8	31.7	39.5	39.5	42.0	37.0	46.6	29.7		
1200	90	45.5	45.5	47.4	44.5	51.3	39.1	43.0	43.0	43.5	41.8	47.0	36.8		
1400	75	42.1	35.6	46.7	27.3	53.3	14.8	38.3	33.1	42.5	25.1	48.8	13.0		
1400	80	43.6	41.3	47.1	35.2	52.8	25.0	39.8	38.6	43.0	32.8	48.3	23.0		
1400	85	45.7	45.7	48.2	41.9	52.9	33.9	41.9	41.9	44.2	39.3	48.5	31.6		
1400	90	48.3	48.3	49.9	47.3	53.6	41.5	45.4	45.4	45.9	44.5	49.2	39.1		
1600	75	43.9	37.6	48.2	28.9	54.5	16.0	39.9	34.9	43.9	26.6	49.9	14.1		
1600	80	45.6	43.6	48.9	37.1	54.3	26.5	41.7	40.8	44.7	34.6	49.7	24.4		
1600	85	47.9	47.9	50.2	44.1	54.6	35.7	44.0	44.0	46.0	41.4	50.1	33.4		
1600	90	50.8	50.8	52.2	49.9	55.6	43.7	47.6	47.6	48.0	47.0	51.1	41.1		
1800	75	45.3	39.3	49.4	30.2	55.5	17.0	41.2	36.5	44.9	27.8	50.8	14.9		
1800	80	47.3	45.7	50.4	38.8	55.5	27.8	43.3	42.7	46.0	36.2	50.8	25.5		
1800	85	49.9	49.9	52.0	46.1	56.1	37.3	45.9	45.9	47.6	43.3	51.5	34.9		
1800	90	53.6	53.6	54.2	52.2	57.3	45.6	49.4	49.4	49.9	49.2	52.8	42.9		
2000	75	46.5	40.7	50.3	31.3	56.2	17.7	42.3	37.8	45.7	28.7	51.3	15.5		
2000	80	48.7	47.4	51.5	40.2	56.4	28.8	44.5	44.3	47.0	37.4	51.6	26.4		
2000	85	51.5	51.5	53.4	47.9	57.3	38.7	47.4	47.4	49.0	44.9	52.6	36.1		
2000	90	55.3	55.3	55.8	54.3	58.8	47.3	50.9	50.9	51.5	51.1	54.1	44.5		
2200	75	47.3	41.9	50.9	32.1	56.6	18.1	43.0	38.9	46.3	29.4	51.6	15.8		
2200	80	49.8	49.0	52.4	41.3	57.1	29.6	45.5	45.5	47.8	38.4	52.2	27.0		
2200	85	52.9	52.9	54.5	49.3	58.2	39.8	48.7	48.7	50.0	46.2	53.3	37.0		
2200	90	56.7	56.7	57.2	56.1	60.0	48.7	52.7	52.7	52.7	52.7	55.1	45.8		
2400	75	47.9	42.9	51.2	32.7	56.7	18.3	43.5	39.7	46.5	29.8	51.6	15.8		
2400	80	50.7	50.2	53.0	42.2	57.5	30.1	46.3	46.3	48.3	39.2	52.4	27.4		
2400	85	54.0	54.0	55.4	50.5	58.8	40.6	49.7	49.7	50.7	47.3	53.8	37.7		
2400	90	57.8	57.8	58.4	57.6	60.8	49.9	53.7	53.7	53.7	53.7	55.9	46.8		

**Notes:**

1. All capacities shown are gross and have not considered indoor fan heat. To obtain **NET** cooling capacity subtract indoor fan heat. For indoor fan heat formula, refer to appropriate airflow table notes.
2. MBh = Total Gross Capacity
3. SHC = Sensible Heat Capacity



## Performance Data

**Table 7. Gross cooling capacities 5 tons 17 Plus - low stage - three phase T/YHC067E3,4,W**

Air Flow cfm	Ent DB (F)	Ambient Temperature											
		85						95					
		Entering Wet Bulb											
		61		67		73		61		67		73	
MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC	MBh	SHC
1000	75	36.8	30.0	41.2	23.3	47.4	13.4	34.1	28.4	38.2	22.0	44.2	12.3
1000	80	37.8	34.7	41.3	29.7	46.7	21.5	35.1	32.9	38.4	28.2	43.5	20.2
1000	85	39.2	38.4	41.9	35.2	46.4	28.7	36.7	36.5	39.1	33.5	43.3	27.2
1000	90	41.1	41.1	43.0	39.6	46.6	34.8	38.7	38.7	40.2	37.7	43.6	33.2
1200	75	38.9	32.4	43.0	25.4	49.0	15.0	36.1	30.6	40.0	23.8	45.7	13.8
1200	80	40.1	37.4	43.4	32.1	48.5	23.5	37.4	35.5	40.4	30.4	45.3	22.1
1200	85	41.9	41.5	44.3	37.8	48.5	31.0	39.2	39.2	41.4	36.0	45.4	29.4
1200	90	44.1	44.1	45.6	42.6	49.0	37.5	41.5	41.5	42.8	40.6	45.9	35.7
1400	75	40.6	34.5	44.5	27.1	50.2	16.4	37.7	32.6	41.3	25.4	46.8	15.0
1400	80	42.1	39.9	45.2	34.1	50.0	25.2	39.3	37.8	42.1	32.3	46.7	23.6
1400	85	44.2	44.2	46.3	40.2	50.3	33.0	41.4	41.4	43.3	38.2	47.0	31.2
1400	90	46.6	46.6	47.9	45.3	51.0	39.8	44.5	44.5	45.0	43.2	47.8	37.9
1600	75	42.0	36.3	45.6	28.5	51.0	17.4	39.0	34.2	42.3	26.7	47.5	15.9
1600	80	43.8	42.0	46.5	35.9	51.1	26.5	40.9	39.7	43.3	33.9	47.7	24.8
1600	85	46.1	46.1	48.0	42.3	51.7	34.7	43.2	43.2	44.8	40.1	48.3	32.8
1600	90	48.8	48.8	49.9	47.8	52.7	41.8	46.3	46.3	46.8	45.4	49.4	39.8

**Notes:**

1. All capacities shown are gross and have not considered indoor fan heat. To obtain **NET** cooling capacity subtract indoor fan heat. For indoor fan heat formula, refer to appropriate airflow table notes.
2. MBh = Total Gross Capacity
3. SHC = Sensible Heat Capacity



# Evaporator Fan Performance

**Table 8. Direct drive evaporator fan performance - 3 ton high efficiency - T/YHC037E3,E4,EW downflow airflow**

External Static Pressure (Inches of Water)																						
		.10		.20		.30		.40		.50		.60		.70		.80		.90		1.00		
cfm	rpm	bhp	rpm	bhp	rpm	bhp																
960	—	—	615	0.15	655	0.18	695	0.22	735	0.26	775	0.29	815	0.33	855	0.37	896	0.41	936	0.44		
1080	599	0.16	639	0.20	680	0.24	720	0.27	760	0.31	800	0.35	840	0.38	880	0.42	920	0.46	960	0.49		
1200	624	0.21	664	0.25	704	0.29	744	0.32	784	0.36	824	0.40	865	0.43	905	0.47	945	0.51	985	0.54		
1320	649	0.26	689	0.30	729	0.34	769	0.37	809	0.41	849	0.45	889	0.49	929	0.52	969	0.56	1009	0.60		
1440	673	0.31	713	0.35	753	0.39	793	0.43	834	0.46	874	0.50	914	0.54	954	0.57	994	0.61	1034	0.65		

Continued

External Static Pressure (Inches of Water)												
		1.10		1.20		1.30		1.40		1.50		
cfm	rpm	bhp	rpm	bhp								
960	976	0.48	1016	0.52	1056	0.55	1096	0.59	1136	0.63		
1080	1000	0.53	1040	0.57	1081	0.60	1121	0.64	—	—		
1200	1025	0.58	1065	0.62	1105	0.66	—	—	—	—		
1320	1050	0.63	1090	0.67	—	—	—	—	—	—		
1440	1074	0.68	—	—	—	—	—	—	—	—		

**Notes:**

1. For Constant CFM Direct Drive Fan, reference [Table 14, p. 43](#) for Voltage vs. CFM setting.
2. Data includes pressure drop due to standard filters and wet coils.
3. Refer to [Table 16, p. 43](#) to determine additional static pressure drop due to other options/accessories.
4. Direct Drive Fan Motor Heat (MBH) = 2.9245xFan BHP + 0.055
5. Factory supplied motors, in equipment, are definite purpose motors, specifically designed and tested to operate at all cataloged conditions. Using the full horsepower range of our fan motors as shown in our tabular data will not result in nuisance tripping or premature motor failure. Our product's warranty will not be affected.



## Evaporator Fan Performance

**Table 9. Direct drive evaporator fan performance - 3 ton high efficiency - T/YHC037E3,E4,EW horizontal airflow**

	External Static Pressure (Inches of Water)																			
	.10		.20		.30		.40		.50		.60		.70		.80		.90		1.00	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
960	596	0.11	634	0.15	673	0.18	711	0.22	750	0.26	788	0.29	827	0.33	865	0.36	904	0.40	942	0.44
1080	618	0.16	656	0.20	695	0.23	733	0.27	772	0.31	810	0.34	849	0.38	887	0.42	926	0.45	964	0.49
1200	640	0.21	678	0.25	717	0.29	755	0.32	794	0.36	832	0.40	871	0.43	909	0.47	948	0.51	986	0.54
1320	662	0.27	700	0.30	739	0.34	777	0.38	816	0.41	854	0.45	893	0.49	931	0.52	970	0.56	1008	0.59
1440	684	0.32	722	0.36	761	0.39	799	0.43	838	0.46	876	0.50	915	0.54	953	0.57	992	0.61	1030	0.65

Continued

	External Static Pressure (Inches of Water)									
	1.10		1.20		1.30		1.40		1.50	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
960	981	0.47	—	—	—	—	—	—	—	—
1080	—	—	—	—	—	—	—	—	—	—
1200	—	—	—	—	—	—	—	—	—	—
1320	—	—	—	—	—	—	—	—	—	—
1440	—	—	—	—	—	—	—	—	—	—

**Notes:**

1. For Constant CFM Direct Drive Fan, reference [Table 14, p. 43](#) for Voltage vs. CFM setting.
2. Data includes pressure drop due to standard filters and wet coils.
3. Refer to [Table 16, p. 43](#) to determine additional static pressure drop due to other options/accessories.
4. Direct Drive Fan Motor Heat (MBH) = 2.9245xFan BHP + 0.055
5. Factory supplied motors, in equipment, are definite purpose motors, specifically designed and tested to operate at all cataloged conditions. Using the full horsepower range of our fan motors as shown in our tabular data will not result in nuisance tripping or premature motor failure. Our product's warranty will not be affected.

## Evaporator Fan Performance

**Table 10. Direct drive evaporator fan performance - 4 ton high efficiency - T/YHC047E3,E4,EW downflow airflow**

	External Static Pressure (Inches of Water)																			
	.10		.20		.30		.40		.50		.60		.70		.80		.90		1.00	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
1280	541	0.07	585	0.12	628	0.18	672	0.23	715	0.28	759	0.33	802	0.39	846	0.44	889	0.49	933	0.55
1440	564	0.15	608	0.20	651	0.25	695	0.30	738	0.36	782	0.41	825	0.46	869	0.51	912	0.57	956	0.62
1600	587	0.22	631	0.27	674	0.33	718	0.38	761	0.43	805	0.48	848	0.54	892	0.59	935	0.64	979	0.70
1760	610	0.30	654	0.35	697	0.40	741	0.45	784	0.51	828	0.56	871	0.61	915	0.66	958	0.72	1002	0.77
1920	634	0.37	677	0.42	721	0.48	764	0.53	808	0.58	851	0.63	895	0.69	938	0.74	982	0.79	1025	0.85

Continued

	External Static Pressure (Inches of Water)									
	1.10		1.20		1.30		1.40		1.50	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
1280	976	0.60	1020	0.65	1063	0.70	1107	0.76	1150	0.81
1440	999	0.67	1043	0.73	1086	0.78	1130	0.83	1173	0.88
1600	1022	0.75	1066	0.80	1109	0.85	1153	0.91	1196	0.96
1760	1045	0.82	1089	0.88	1132	0.93	1176	0.98	1219	1.03
1920	1069	0.90	1112	0.95	1156	1.00	1199	1.06	1243	1.11

**Notes:**

1. For Constant CFM Direct Drive Fan, reference [Table 14, p. 43](#) for Voltage vs. CFM setting.
2. Data includes pressure drop due to standard filters and wet coils.
3. Refer to [Table 16, p. 43](#) to determine additional static pressure drop due to other options/accessories.
4. Direct Drive Fan Motor Heat (MBH) = 2.9245xFan BHP + 0.055
5. Factory supplied motors, in equipment, are definite purpose motors, specifically designed and tested to operate at all cataloged conditions. Using the full horsepower range of our fan motors as shown in our tabular data will not result in nuisance tripping or premature motor failure. Our product's warranty will not be affected.



## Evaporator Fan Performance

**Table 11. Direct drive evaporator fan performance - 4 ton high efficiency - T/YHC047E3,E4,EW horizontal airflow**

	External Static Pressure (Inches of Water)																			
	.10		.20		.30		.40		.50		.60		.70		.80		.90		1.00	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
1280	591	0.10	632	0.15	674	0.20	715	0.26	756	0.31	798	0.36	839	0.41	880	0.47	922	0.52	963	0.57
1440	621	0.19	663	0.24	704	0.30	745	0.35	787	0.40	828	0.45	869	0.51	911	0.56	952	0.61	993	0.66
1600	652	0.28	693	0.33	734	0.39	776	0.44	817	0.49	858	0.55	900	0.60	941	0.65	982	0.70	1023	0.76
1760	682	0.37	723	0.43	765	0.48	806	0.53	847	0.58	889	0.64	930	0.69	971	0.74	1012	0.80	1054	0.85
1920	712	0.47	754	0.52	795	0.57	836	0.62	878	0.68	919	0.73	960	0.78	1001	0.83	1043	0.89	1084	0.94

Continued

	External Static Pressure (Inches of Water)									
	1.10		1.20		1.30		1.40		1.50	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
1280	1004	0.62	1045	0.68	1087	0.73	1128	0.78	1169	0.83
1440	1034	0.72	1076	0.77	1117	0.82	1158	0.87	1200	0.93
1600	1065	0.81	1106	0.86	1147	0.91	1189	0.97	1230	1.02
1760	1095	0.90	1136	0.95	1178	1.01	1219	1.06	1260	1.11
1920	1125	0.99	1167	1.05	1208	1.10	1249	1.15	1291	1.20

**Notes:**

1. For Constant CFM Direct Drive Fan, reference [Table 14, p. 43](#) for Voltage vs. CFM setting.
2. Data includes pressure drop due to standard filters and wet coils.
3. Refer to [Table 16, p. 43](#) to determine additional static pressure drop due to other options/accessories.
4. Direct Drive Fan Motor Heat (MBH) = 2.9245xFan BHP + 0.055
5. Factory supplied motors, in equipment, are definite purpose motors, specifically designed and tested to operate at all cataloged conditions. Using the full horsepower range of our fan motors as shown in our tabular data will not result in nuisance tripping or premature motor failure. Our product's warranty will not be affected.

## Evaporator Fan Performance

**Table 12. Direct drive evaporator fan performance - 5 ton high efficiency - T/YHC067E3,E4,EW downflow airflow**

	External Static Pressure (Inches of Water)																			
	.10		.20		.30		.40		.50		.60		.70		.80		.90		1.00	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
1600	618	0.13	656	0.18	693	0.23	731	0.28	769	0.33	806	0.38	844	0.43	881	0.48	919	0.53	957	0.58
1800	651	0.24	689	0.29	727	0.34	764	0.39	802	0.44	839	0.49	877	0.54	915	0.59	952	0.64	990	0.69
2000	685	0.35	722	0.40	760	0.45	798	0.50	835	0.55	873	0.60	910	0.65	948	0.70	986	0.75	1023	0.80
2200	718	0.46	756	0.51	793	0.56	831	0.61	869	0.66	906	0.71	944	0.76	981	0.81	1019	0.86	1057	0.91
2400	752	0.57	789	0.62	827	0.67	864	0.72	902	0.77	940	0.82	977	0.87	1015	0.92	1052	0.97	1090	1.02

Continued

	External Static Pressure (Inches of Water)									
	1.10		1.20		1.30		1.40		1.50	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
1600	994	0.63	1032	0.68	1069	0.73	1107	0.79	1145	0.84
1800	1027	0.74	1065	0.79	1103	0.84	1140	0.89	—	—
2000	1061	0.85	1098	0.90	1136	0.95	—	—	—	—
2200	1094	0.96	1132	1.01	—	—	—	—	—	—
2400	—	—	—	—	—	—	—	—	—	—

**Notes:**

1. For Constant CFM Direct Drive Fan, reference [Table 14, p. 43](#) for Voltage vs. CFM setting.
2. Data includes pressure drop due to standard filters and wet coils.
3. Refer to [Table 16, p. 43](#) to determine additional static pressure drop due to other options/accessories.
4. Direct Drive Fan Motor Heat (MBH) = 2.9245xFan BHP + 0.055
5. Factory supplied motors, in equipment, are definite purpose motors, specifically designed and tested to operate at all cataloged conditions. Using the full horsepower range of our fan motors as shown in our tabular data will not result in nuisance tripping or premature motor failure. Our product's warranty will not be affected.



## Evaporator Fan Performance

**Table 13. Direct drive evaporator fan performance - 5 ton high efficiency - T/YHC067E3,E4,EW horizontal airflow**

	External Static Pressure (Inches of Water)																			
	.10		.20		.30		.40		.50		.60		.70		.80		.90		1.00	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
1600	680	0.14	717	0.19	753	0.25	790	0.31	827	0.36	864	0.42	901	0.47	937	0.53	974	0.59	1011	0.64
1800	716	0.27	753	0.32	789	0.38	826	0.44	863	0.49	900	0.55	937	0.61	973	0.66	1010	0.72	1047	0.78
2000	752	0.40	789	0.46	825	0.51	862	0.57	899	0.63	936	0.68	973	0.74	1009	0.80	1046	0.85	1083	0.91
2200	788	0.53	825	0.59	861	0.65	898	0.70	935	0.76	972	0.82	1009	0.87	1045	0.93	1082	0.99	1119	1.04
2400	824	0.67	861	0.72	897	0.78	934	0.84	971	0.89	1008	0.95	1045	1.01	1081	1.06	1118	1.12	1155	1.18

Continued

	External Static Pressure (Inches of Water)									
	1.10		1.20		1.30		1.40		1.50	
cfm	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
1600	—	—	—	—	—	—	—	—	—	—
1800	—	—	—	—	—	—	—	—	—	—
2000	—	—	—	—	—	—	—	—	—	—
2200	—	—	—	—	—	—	—	—	—	—
2400	—	—	—	—	—	—	—	—	—	—

**Notes:**

1. For Constant CFM Direct Drive Fan, reference [Table 14, p. 43](#) for Voltage vs. CFM setting.
2. Data includes pressure drop due to standard filters and wet coils.
3. Refer to [Table 16, p. 43](#) to determine additional static pressure drop due to other options/accessories.
4. Direct Drive Fan Motor Heat (MBH) = 2.9245xFan BHP + 0.055
5. Factory supplied motors, in equipment, are definite purpose motors, specifically designed and tested to operate at all cataloged conditions. Using the full horsepower range of our fan motors as shown in our tabular data will not result in nuisance tripping or premature motor failure. Our product's warranty will not be affected.



# Fan Performance

**Table 14. Voltage vs. CFM table**

T/YHC037E, T/YHC047E, T/YHC067E		
PWM% Value	Potentiometer Voltage (Vdc)	CFM/Ton
70	<0.1	320
75	0.7	347
80	1.25	373
85	1.65	400
90	1.95	427
95	2.17	453
100	>2.4	480

**Table 15. Outdoor sound power level - dB (ref. 10 - 12 W)**

Tons	Unit Model Number	Octave Center Frequency								Overall dBA
		63	125	250	500	1000	2000	4000	8000	
3	T/YHC037E	79	85	79	79	77	71	67	58	81
4	T/YHC047E	80	86	84	85	83	79	73	67	87
5	T/YHC067E	80	86	84	85	83	79	73	67	87

Note: Tests follow ARI270-95.

**Table 16. Static pressure drop through accessories (inches water column) - 3-5 tons**

Tons	Unit Model Number	cfm	Economizer with OA/RA Dampers <sup>(a)</sup>										Electric Heater Accessory (kW) <sup>(b),(c)</sup>					
			Standard Filters <sup>(d)</sup>	2" MERV 8 Filter	2" MERV 13 Filter	Reheat Coil	100% OA		100% RA		100% OA		100% RA		5-6	9-18	23-36	54
							Downflow	Low Leak <sup>(e)</sup>	Downflow	Low Leak <sup>(e)</sup>	Horizontal	Horizontal						
3	T/YHC037E3,4,W	600	0.01	0.02	0.03	0.04	0.03	0.01	0.04	0.01	0.03	0.01	—	—	—	—		
3	T/YHC037E3,4,W	960	0.01	0.03	0.04	0.08	0.04	0.01	0.11	0.04	0.04	0.01	0.01	0.01	0.01	—		
3	T/YHC037E3,4,W	1200	0.02	0.04	0.05	0.10	0.06	0.01	0.17	0.07	0.06	0.01	0.02	0.02	0.02	—		
3	T/YHC037E3,4,W	1440	0.03	0.05	0.06	0.14	0.08	0.02	0.23	0.09	0.08	0.01	0.02	0.03	0.03	—		
4	T/YHC047E3,4,W	800	0.01	0.03	0.04	0.03	0.06	0.00	0.02	0.03	0.03	0.01	—	—	—	—		
4	T/YHC047E3,4,W	1280	0.02	0.04	0.03	0.07	0.08	0.00	0.08	0.04	0.04	0.01	0.01	0.00	0.01	—		
4	T/YHC047E3,4,W	1600	0.03	0.06	0.05	0.09	0.09	0.01	0.13	0.08	0.05	0.02	0.02	0.01	0.02	—		
4	T/YHC047E3,4,W	1920	0.05	0.08	0.07	0.12	0.10	0.01	0.20	0.09	0.07	0.02	0.02	0.01	0.03	—		
5	T/YHC067E3,4,W	1000	0.01	0.04	0.03	0.05	0.06	0.01	0.04	0.03	0.06	0.01	—	—	—	—		
5	T/YHC067E3,4,W	1600	0.03	0.06	0.08	0.09	0.09	0.01	0.14	0.08	0.05	0.01	0.02	0.01	0.02	—		
5	T/YHC067E3,4,W	2000	0.05	0.08	0.11	0.13	0.11	0.01	0.22	0.10	0.07	0.02	0.02	0.02	0.03	—		
5	T/YHC067E3,4,W	2400	0.07	0.10	0.13	0.17	0.12	0.03	0.31	0.11	0.09	0.04	0.03	0.02	0.04	—		

(a) OA = Outside Air and RA = Return Air.

(b) Nominal kW ratings at 240, 480, 600 volts. Heaters only available on T units.

(c) Electric heaters restricted on applications below 320 cfm/Ton.

(d) Tested with standard filters. Difference in pressure drop should be considered when utilizing optional 2" MERV 8 and MERV 13 filters.

(e) Low Leak - Downflow only.



## Fan Performance

**Table 17. Gas fired heating capacities - high efficiency**

Tons	Unit Model Number	Heating Input MBh	Heating Output MBh	Air Temp. Rise, F
3	YHC037E(3,4,W)*(L,X)	60	48	25-55
3	YHC037E(3,4,W)*(M,Y)	80	64	35-65
3	YHC037E(3,4,W)*(H,Z)	100	80	55-85
4	YHC047E(3,4,W)*(L,X)	60	48	10-40
4	YHC047E(3,4,W)*(M,Y)	80	64	20-50
4	YHC047E(3,4,W)*(H,Z)	120	96	40-70
5	YHC067E(3,4,W)*(L,X)	60	48	10-40
5	YHC067E(3,4,W)*(M,Y)	80	64	15-45
5	YHC067E(3,4,W)*(H,Z)	130	104	35-65

**Note:** Ratings shown are for elevations up to 2,000 ft. For higher elevations, reduce ratings at a rate of 4% per 1,000 ft. elevation.

**Table 18. Auxiliary electric heat capacity**

Tons	Unit Model Number	Total <sup>(a)</sup>			Stage 1		Stage 2	
		kW Input <sup>(b)</sup>	MBh Output	No. of Stages	kW Input	MBh Output	kW Input	MBh Output
3	THC037E3, E4	6.00	20.48	1	6.00	20.48	—	—
3	THC037E3, E4	12.00	40.97	2	6.00	20.48	6.00	20.48
3	THC037E3, E4	17.40	59.40	2	8.70	29.70	8.70	29.70
4	THC047E3, E4	6.00	20.48	1	6.00	20.48	—	—
4	THC047E3, E4	12.00	40.97	2	6.00	20.48	6.00	20.48
4	THC047E3, E4	17.40	59.40	2	8.70	29.70	8.70	29.70
5	THC067E3, E4	6.00	20.48	1	6.00	20.48	—	—
5	THC067E3, E4	12.00	40.97	2	6.00	20.48	6.00	20.48
5	THC067E3, E4	17.40	59.40	2	8.70	29.70	8.70	29.70
5	THC067E3, E4	23.00	78.52	2	8.70	29.70	14.30	48.82

(a) Heaters are rated at 240V, 380V, 480V and 600V. For other than rated voltage, CAP= (voltage/rated voltage)<sup>2</sup> x rated cap.  
 (b) All input/output does not include indoor fan power or heat.

**Table 19. Electric heater voltage correction factors (applicable to auxiliary heat capacity)**

Nominal Voltage	Distribution Voltage	Capacity Multiplier
240	208	0.751
240	230	0.918
240	240	1.000
480	440	0.840
480	460	0.918
480	480	1.000
600	540	0.810
600	575	0.918
600	600	1.000

**Table 20. Air temperature rise across electric heaters (°F)**

kW	Stages	3 Tons <sup>(a)</sup> 1200 cfm	4 Tons 1600 cfm	5 Tons <sup>(b)</sup> 2000 cfm
		Three Phase THC037E3,E4	Three Phase THC047E3, E4	Three Phase THC067E3, E4
6.00	1	18.5	10.5	11.4
12.00	2	36.2	22.3	21.5
17.40	2	48.2	33.0	30.0
23.0	2	—	—	38.8

**Notes:**

1. For minimum design airflow, see airflow performance table for each unit.
2. To calculate temp rise at different airflow, use the following formula: Temp. rise across Electric Heater = kWx3414/1.08xCFM.

(a) The minimum allowable airflow for a 3 ton with a 17.4 kW heater is 1080 cfm.

(b) The minimum allowable airflow for a 5 ton unit with a 23.0 kW heater is 1900 cfm.

**Table 21. Reheat temperature rise table**

Leaving Evaporator Dry Bulb									
Tons	Unit Model No.	SCFM	35	40	45	50	55	60	65
3	T/YHC	960	20.6	19.6	18.5	17.3	16.1	14.8	13.5
3	T/YHC	1080	18.8	18.1	17.2	16.2	15.1	13.9	12.8
3	T/YHC	1200	17.4	16.9	16.1	15.2	14.2	13.1	11.9
3	T/YHC	1320	16.1	15.7	15.1	14.3	13.3	12.3	11.3
3	T/YHC	1440	14.9	14.6	14.0	13.3	12.5	11.5	10.6
4	T/YHC	1280	20.7	19.6	18.4	17.1	15.8	14.5	13.2
4	T/YHC	1440	19.4	18.4	17.4	16.2	14.9	13.6	12.4
4	T/YHC	1600	18.1	17.3	16.3	15.2	14.1	13.0	11.8
4	T/YHC	1760	16.8	16.2	15.4	14.5	13.5	12.4	11.3
4	T/YHC	1920	15.7	15.1	14.5	13.7	12.9	12.0	11.1
5	T/YHC	1600	19.4	17.8	16.3	14.9	13.5	12.1	10.8
5	T/YHC	1800	18.2	16.8	15.4	14.0	12.7	11.4	10.2
5	T/YHC	2000	17.2	15.9	14.6	13.3	12.1	10.8	9.7
5	T/YHC	2200	16.3	15.1	13.9	12.6	11.5	10.3	9.2
5	T/YHC	2400	15.6	14.4	13.2	12.1	10.9	9.8	8.8

# Controls

## ReliaTel™ Controlled Units

Zone Sensors are the building occupant's comfort control devices. The following zone sensor options are available for Precedent units with ReliaTel control:

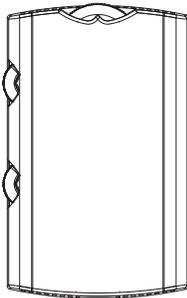
### Differential Enthalpy

Differential Enthalpy replaces the standard dry bulb control with two enthalpy sensors that compare total heat content of the indoor air and outdoor air to determine the most efficient air source. This control option offers the highest level of comfort control, plus energy efficiency, available.

### Differential Pressure Switches

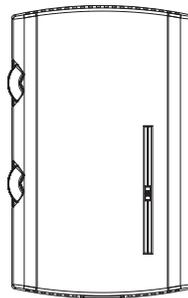
This factory or field-installed option allows individual fan failure and dirty filter indication. The fan failure switch will disable all unit functions and "flash" the Service LED on the zone sensor. The dirty filter switch will light the Service LED on the zone sensor and will allow continued unit operation.

#### Manual Changeover



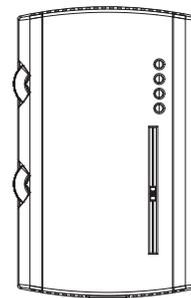
Heat, Cool or Off System Switch. Fan Auto or Off Switch. One temperature setpoint lever.

#### Manual/Automatic Changeover



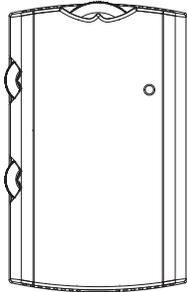
Auto, Heat, Cool or Off System Switch. Fan Auto or Off Switch. Two temperature setpoint levers.

#### Manual/Automatic Changeover



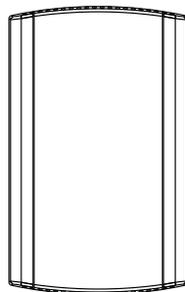
Auto, Heat, Cool or Off System Switch. Fan Auto or Off Switch. Two temperature setpoint levers. Status Indication LED lights, System On, Heat, Cool, or Service.

#### Manual/Automatic Changeover



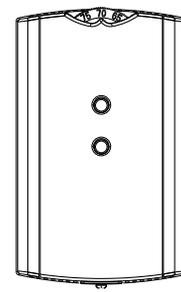
Auto, Heat, Cool or Off System Switch. Fan Auto or Off Switch. Two temperature setpoint levers.

#### Remote Sensor



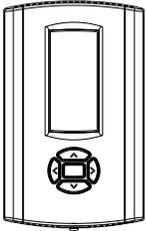
Sensor(s) available for all zone sensors to provide remote sensing capabilities.

#### Integrated Comfort™ System



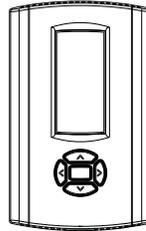
Sensor(s) available with optional temperature adjustment and override buttons to provide central control through a Trane Integrated Comfort™ system.

**Digital Display Programmable Thermostat (1H/1C)**



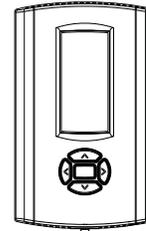
One heat/One Cool Auto changeover digital display thermostat.

**Digital Display Thermostat (3H/2C)**



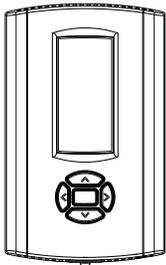
Three Heat, Two Cool Auto changeover digital display thermostat.

**Digital Display Programmable Thermostat (3H/2C)**



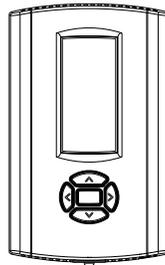
Three Heat/Two Cool Auto changeover digital display thermostat. 7-day programmable stat with night setback is available.

**Programmable Night Setback**



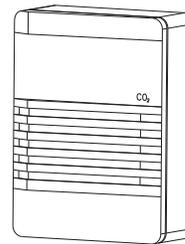
Auto or manual changeover with seven-day programming. Keyboard selection of Heat, Cool, Fan, Auto, or On. All programmable sensors have System On, Heat, Cool, Service LED/indicators as standard. Night Setback Sensors have one (1) Occupied, one (1) Un-occupied, and one (1) Override program per day.

**Wireless Zone Sensor**



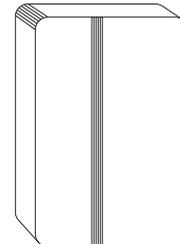
LCD display that provides heat, cool, auto or off. Includes two temperature setpoints and a lockable setting with °F or °C indicators.

**CO<sub>2</sub> Sensing**

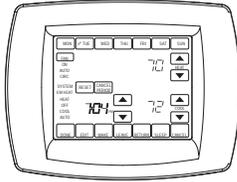


The CO<sub>2</sub> sensor shall have the ability to monitor the concentration (parts per million, ppm) of CO<sub>2</sub> (Carbon Dioxide) in the air. As the CO<sub>2</sub> concentration changes, the outside air damper modulates to meet the current ventilation needs of the zone.

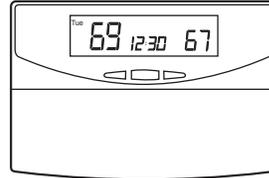
**Humidity Sensor**



Field installed, wall-mounted or duct-mounted humidity sensor is used to control activation of the hot gas reheat dehumidification option. The humidity sensor can be set for humidity levels between 40% and 60% relative humidity by adjusting the ReliaTel™ Options Module.

**Touchscreen Programmable Thermostat (2H/2C)**

Two Heat/Two Cool programmable thermostat with touch screen digital display. Menu-driven programming. Effortless set-up. Program each day separately with no need to copy multiple days. All programming can be done on one screen. Easy to read and use. Large, clear backlit digital display.

**Digital Display Programmable Thermostat with Built-In Relative Humidity Sensing (3H/2C)**

Three Heat, Two Cool digital display thermostat with built-in humidity control and display. This thermostat combines both humidity and dry bulb into one. Fully programmable with night setback.

**Economizer Controls**

The standard equipment offering is a fixed dry bulb changeover control. In addition, there are two optional controls, Enthalpy and Differential Enthalpy Control.

**Enthalpy Control**

Replaces the dry bulb control with a wet bulb changeover controller which has a fully adjustable setpoint. Enthalpy control offers a higher level of comfort control, along with energy savings potential, than the standard dry bulb control. This is due to the additional wet bulb sensing capability.

**RA Remote Sensor**

Return Air Remote Sensor which can be mounted in the return air duct to report return air temperature.

**Room Remote Sensor**

Space Remote Sensor which can be mounted on the wall to report/control from a remote location in the space.

**Remote Potentiometer**

Minimum position setting of economizer can be remotely adjusted with this accessory.

**BACnet® Communication Interface**

This option shall be provided to allow the unit to communicate directly with a generic open protocol BACnet MS/TP Network Building Automation System Controls.



# Electrical Data

**Table 22. Unit wiring with cooling (no electric heat) - high efficiency - 3-5 tons**

Tons	Unit Model Number	Unit Operating Voltage Range	Standard Indoor Motor	
			MCA	Max Fuse Size or Max Circuit Breaker
3	THC037E3	208 - 230	23.3	30
3	THC037E4	460	11.4	15
4	THC047E3	208 - 230	29.4	40
4	THC047E4	460	13.7	20
5	THC067E3	208 - 230	32.2	45
5	THC067E4	460	15.2	20

**Table 23. Unit wiring with gas heat - high efficiency - 3-5 tons**

Tons	Unit Model Number	Unit Operating Voltage Range	Standard Indoor Motor	
			MCA	Max Fuse Size or Max Circuit Breaker
3	YHC037E3	230	23.3	30
3	YHC037E4	460	11.4	15
3	YHC037EW	517-633	8.7	15
4	YHC047E3	230	29.4	40
4	YHC047E4	460	13.7	20
4	YHC047EW	517-633	10.4	15
5	YHC067E3	230	32.2	45
5	YHC067E4	460	15.2	20
5	YHC067EW	517-633	11.2	15

**Table 24. Unit wiring with electric heat (single point connection) - high efficiency - 3-5 tons**

Tons	Unit Model Number	Heater Model Number	Heater kW Rating <sup>(a)</sup>	Control Stages	Heater Amps	Standard Indoor Motor	
						MCA	Max Fuse Size or Max Circuit Breaker
<b>208/230 Volts Three Phase</b>							
3	THC037E3	BAYHTRE306*	4.5/6.0	1	12.5/14.4	24.8/27.1	30.0/30.0
3	THC037E3	BAYHTRE312*	9.0/12.0	2	25.0/28.9	40.4/45.3	45.0/50.0
3	THC037E3	BAYHTRE318*	13.1/17.4	2	36.3/41.9	54.5/61.5	60.0/70.0
4	THC047E3	BAYHTRX306*	4.5/6.0	1	12.5/14.4	29.4/29.8	40.0/40.0
4	THC047E3	BAYHTRX312*	9.0/12.0	2	25.0/28.9	43.0/47.9	45.0/50.0
4	THC047E3	BAYHTRX318*	13.1/17.4	2	36.3/41.9	57.1/64.1	60.0/70.0
5	THC067E3	BAYHTRX306*	4.5/6.0	1	12.5/14.4	32.2/32.2	45.0/45.0
5	THC067E3	BAYHTRX312*	9.0/12.0	2	25.0/28.9	43.0/47.9	45.0/50.0
5	THC067E3	BAYHTRX318*	13.1/17.4	2	36.3/41.9	57.1/64.1	60.0/70.0
5	THC067E3	BAYHTRX323*	17.3/23.0	2	48.0/55.3	71.8/80.9	80.0/90.0
<b>460 Volts Three Phase</b>							
3	THC037E4	BAYHTRE406*	6.0	1	7.2	13.6	15.0
3	THC037E4	BAYHTRE412*	12.0	2	14.4	22.6	25.0
3	THC037E4	BAYHTRE418*	17.4	2	20.9	30.8	35.0



## Electrical Data

**Table 24. Unit wiring with electric heat (single point connection) - high efficiency - 3-5 tons (continued)**

Tons	Unit Model Number	Heater Model Number	Heater kW Rating <sup>(a)</sup>	Control Stages	Heater Amps	Standard Indoor Motor	
						MCA	Max Fuse Size or Max Circuit Breaker
4	THC047E4	BAYHTRX406*	6.0	1	7.2	14.9	20.0
4	THC047E4	BAYHTRX412*	12.0	2	14.4	23.9	25.0
4	THC047E4	BAYHTRX418*	17.4	2	20.9	32.0	35.0
<b>460 Volts Three Phase</b>							
5	THC067E4	BAYHTRX406*	6.0	1	7.2	15.2	20.0
5	THC067E4	BAYHTRX412*	12.0	2	14.4	23.9	25.0
5	THC067E4	BAYHTRX418*	17.4	2	20.9	32.0	35.0
5	THC067E4	BAYHTRX423*	23.0	2	27.7	40.5	45.0

(a) Heater kW ratings are at 208/240V for 208/230V units, 480V for 460V units.

**Table 25. Electrical characteristics - compressor motor and condenser fan motor - 60 cycle - high efficiency**

Unit Model		Compressor Motors								Condenser Fan Motors					
Ton	Number	No.	Volts	Phase	hp	rpm	RLA	LRA	MCC	No.	Volts	Phase	hp	FLA	LRA
3	T/YHC037E3	1	208-230	3	2.8	3500	11.6	73.0	18.1	1	208-230	1	0.20	1.5	2.4
3	T/YHC037E4	1	460	3	2.7	3500	5.7	38.0	8.9	1	460	1	0.20	0.6	1.3
3	T/YHC037EW	1	575	3	4.0	3500	4.0	25.6	6.2	1	575	1	0.40	0.8	2.0
4	T/YHC047E3	1	208-230	3	3.6	3500	14.0	83.1	21.9	1	208-230	1	0.40	2.5	4.3
4	T/YHC047E4	1	460	3	3.6	3500	6.4	41.0	10.0	1	460	1	0.40	1.0	2.2
4	T/YHC047EW	1	575	3	5.3	3500	4.6	33.0	7.1	1	575	1	0.40	0.8	2.0
5	T/YHC067E3	1	208-230	3	4.3	3500	16.2	110.0	25.3	1	208-230	1	0.40	2.5	4.3
5	T/YHC067E4	1	460	3	4.3	3500	7.6	52.0	11.9	1	460	1	0.40	1.0	2.2
5	T/YHC067EW	1	575	3	6.1	3500	5.3	38.9	8.3	1	575	1	0.40	0.8	2.0

**Table 26. Electrical characteristics - evaporator fan motor - 60 cycle - direct drive - high efficiency**

Unit Model		Volts	Hz	Motor Phase	No.	FLA	LRA	bhp
Ton	Number							
3	T/YHC037E3	208-230	60	1	1	7.3	—	0.75
3	T/YHC037E4	208-230 <sup>(a)</sup>	60	1	1	7.3	—	0.75
3	T/YHC037EW	575 <sup>(b)</sup>	60	1	1	2.9	—	0.75
4	T/YHC047E3	208-230	60	1	1	9.4	—	1.00
4	T/YHC047E4	208-230 <sup>(a)</sup>	60	1	1	9.4	—	1.00
4	T/YHC047EW	575 <sup>(b)</sup>	60	1	1	3.8	—	1.00
5	T/YHC067E3	208-230	60	1	1	9.4	—	1.00
5	T/YHC067E4	208-230 <sup>(a)</sup>	60	1	1	9.4	—	1.00
5	T/YHC067EW	575 <sup>(b)</sup>	60	1	1	3.8	—	1.00

(a) Precedent models with 460 volt supply power will utilize a high efficiency (208-230)volt powered evaporator fan motor.

(b) 575V rated units utilize a high efficiency 230V evaporator fan motor powered through a 575/230V transformer. Motor voltage/FLA rated at transformer input.

**Table 27. Electrical characteristics - inducer motor**

Unit Model Number	Stage	hp	rpm	Volts	Motor Phase	LRA
YHC037-067E	1	1/35	3000	208-230	1	0.6

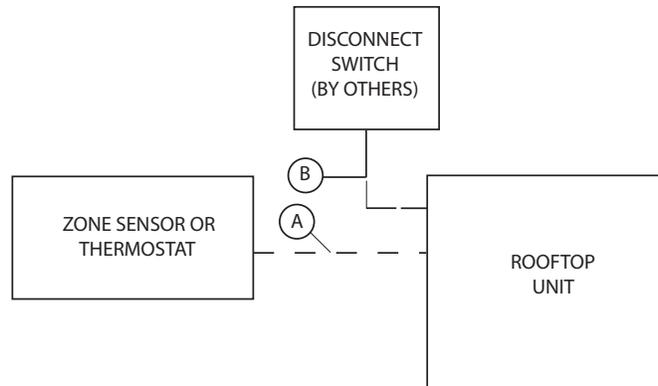
**Table 28. Electrical characteristics – power exhaust (cooling and gas/electric)**

Tons	Volts	Motor Phase	hp	rpm	FLA	LRA
3-5	208-230	1	0.33	1075	2.2	3.9
3-5	460	1	0.33	1075	1.1	2.0
3-5	575	1	0.33	1075	1.0	1.8

# Jobsite Connections

**Table 29. Typical Number of Wires**

Zone Sensors		
A	Manual Changeover.....	4
	Manual/Auto Changeover.....	5
	Manual/Auto Changeover with Status Indication LED's.....	10
	Programmable Night Setback with Status Indication LED's.....	7
Thermostats		
A	3 Wires, 24V, Cooling only	
	4 Wires, 24V, with Electric Heat	
B	3 Power Wires + 1 Ground Wire (3-phase)	
	2 Power Wires + 1 Ground Wire (1-phase)	



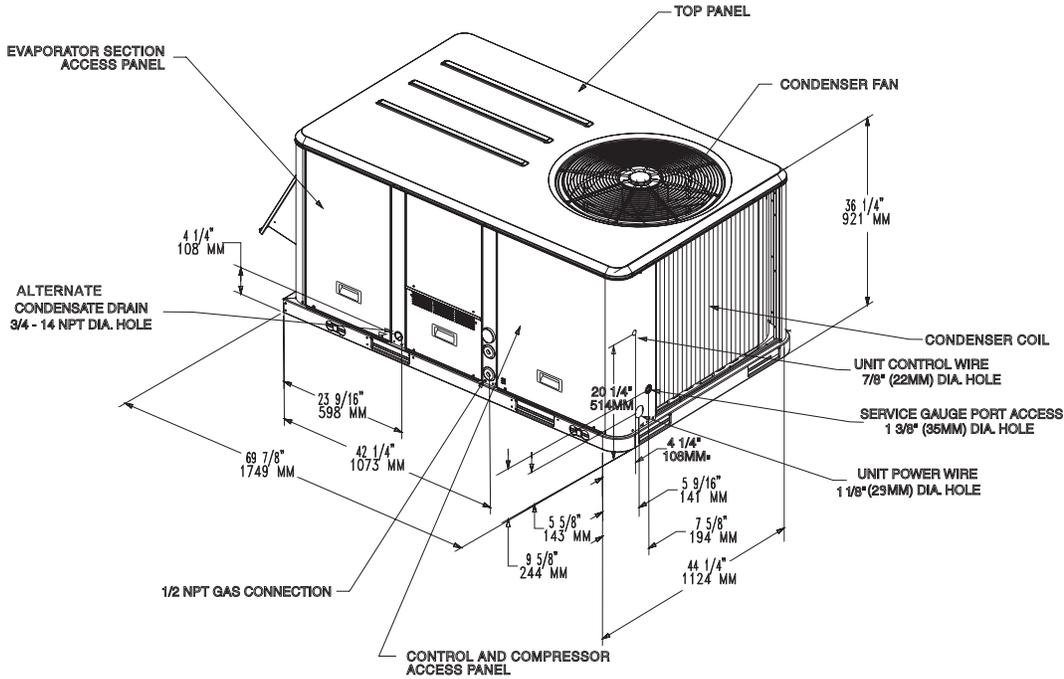
For specific wiring information, see the installation instructions.  
 All wiring except power wire is low voltage.  
 All customer supplied wiring to be copper and must conform to applicable electrical codes (such as NEC or CEC) and local electric codes. Wiring shown dotted is to be furnished and installed by the customer.

# Dimensional Data

**Figure 1. Cooling and gas/electric - 3 tons high efficiency**

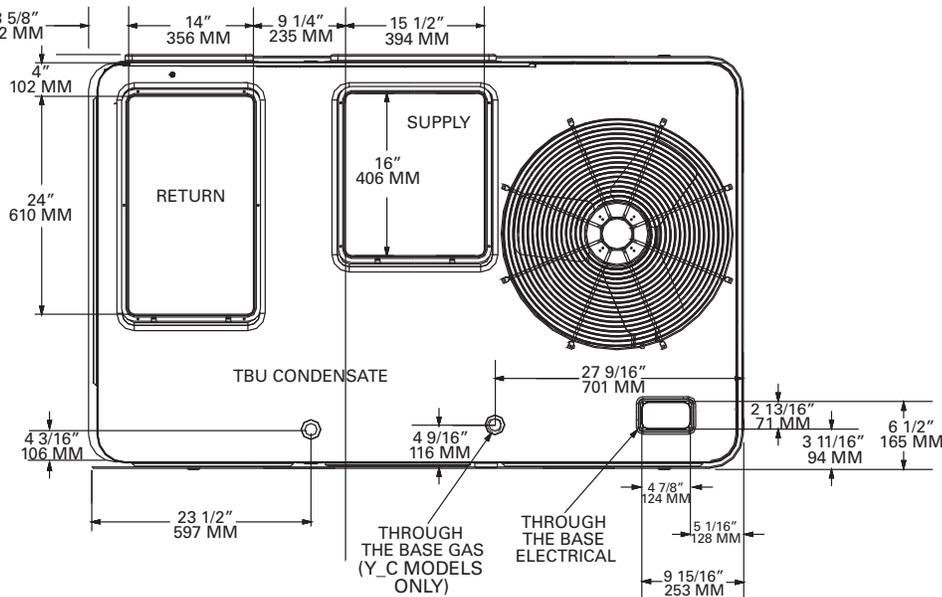
**Notes:**

1. All dimensions are in inches/millimeters.
2. 1/2 NPT Gas Connection = (Y\_C Models only); 2" Electrical Connection: Single Point Power When Heat Installed (T\_C Models only.)



**Figure 2. Cooling and gas/electric - 3 tons high efficiency, downflow airflow supply/return - through the base utilities**

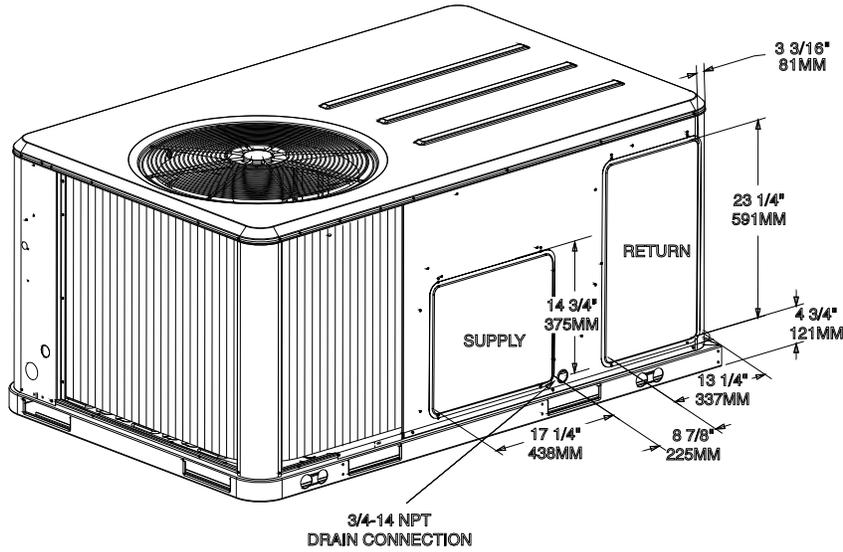
**Note:** All dimensions are in inches/millimeters.



## Dimensional Data

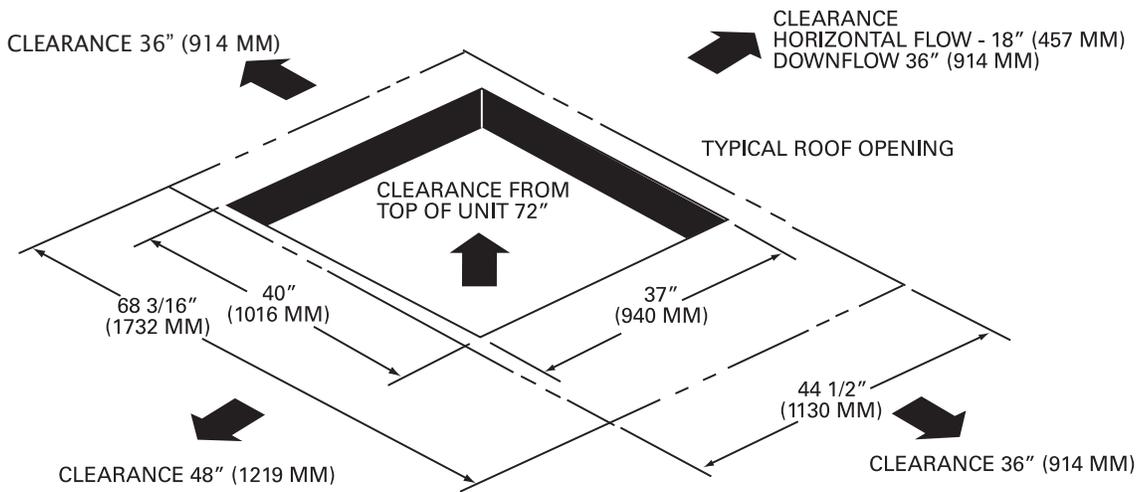
**Figure 3. Cooling and gas/electric - 3 tons high efficiency - horizontal airflow supply/return**

Note: All dimensions are in inches/millimeters.



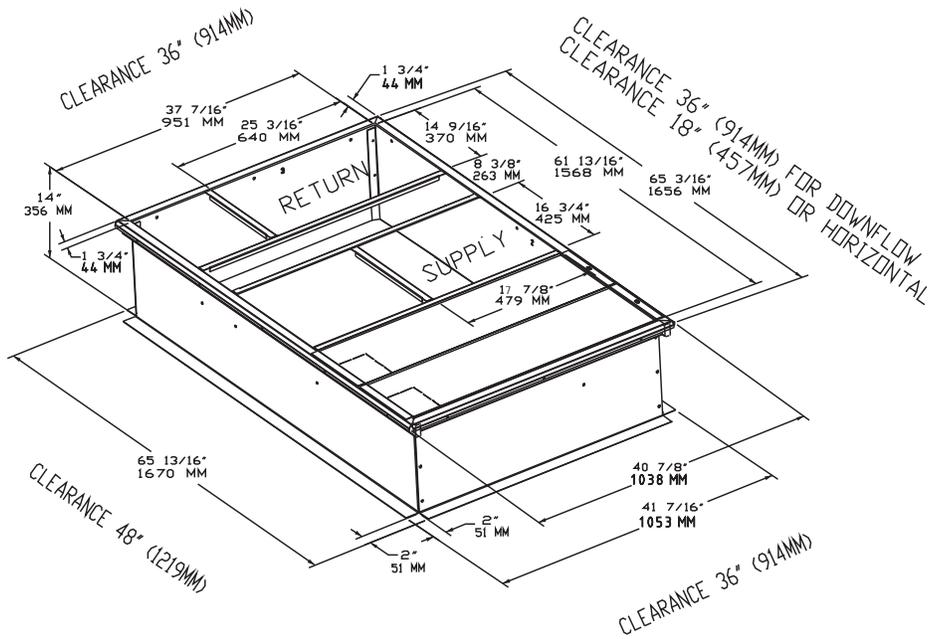
**Figure 4. Cooling and gas/electric - 3 tons high efficiency, unit clearance and roof opening**

Note: All dimensions are in inches/millimeters.



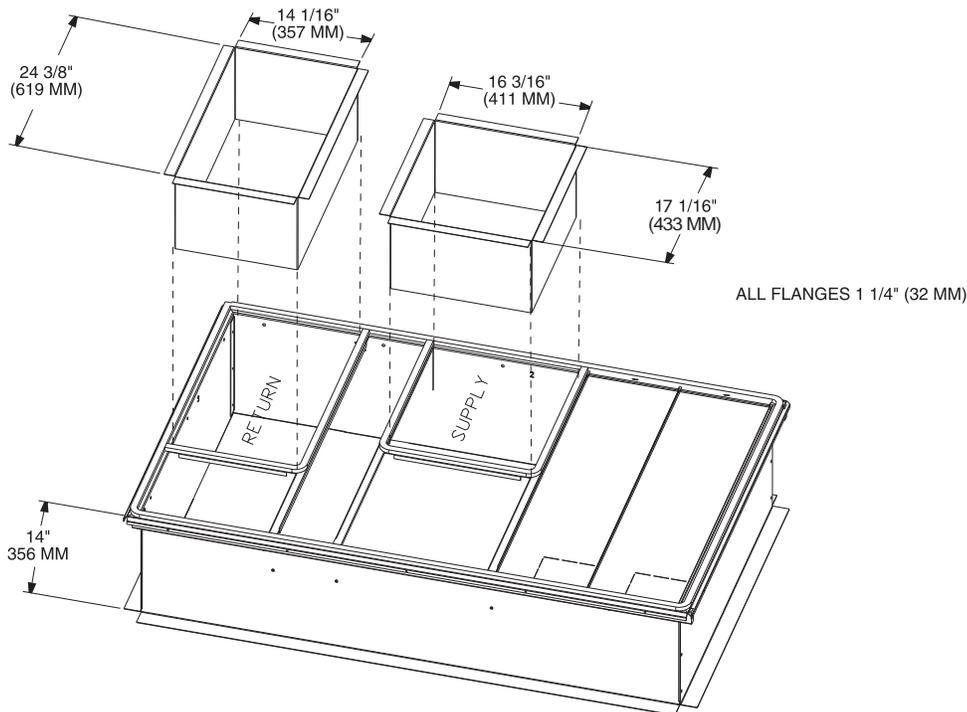
**Figure 5. Cooling and gas/electric - 3 tons high efficiency - roof curb**

Note: All dimensions are in inches/millimeters.



**Figure 6. Cooling and gas/electric - 3 tons high efficiency - downflow duct connections - field fabricated**

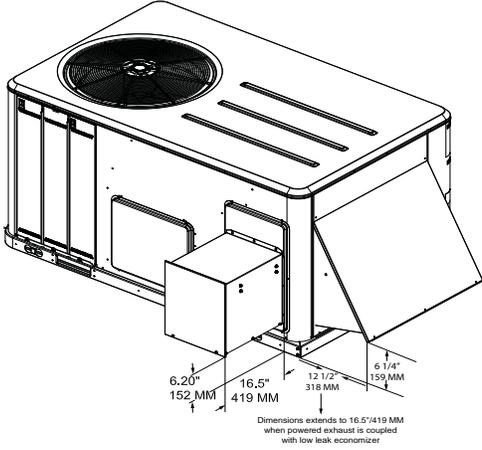
Note: All dimensions are in inches/millimeters.



## Dimensional Data

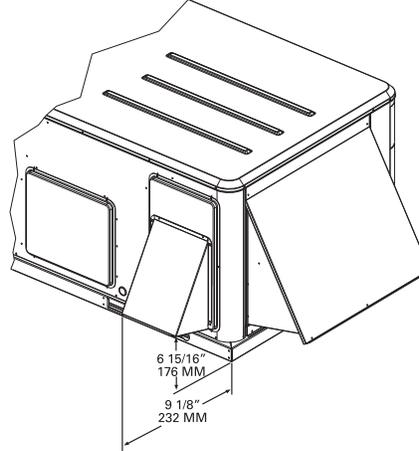
**Figure 7. Cooling and gas/electric - 3 tons high efficiency - economizer, manual or motorized fresh air damper; power exhaust**

**Note:** All dimensions are in inches/millimeters.



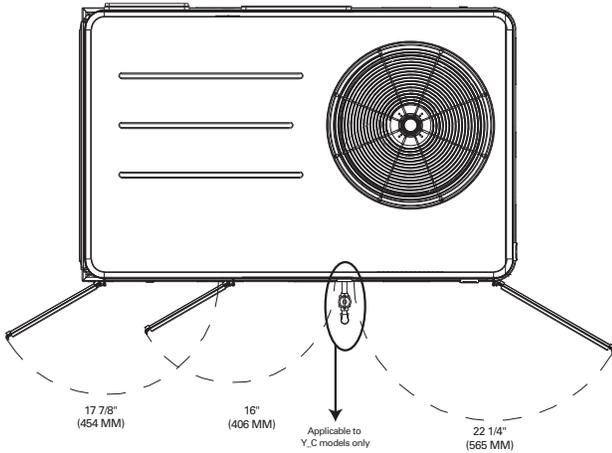
**Figure 8. Cooling and gas/electric - 3 tons high efficiency economizer & barometric relief damper hood**

**Note:** All dimensions are in inches/millimeters.



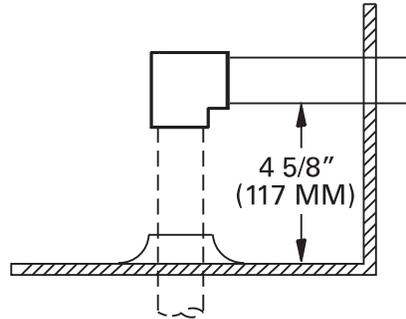
**Figure 9. Cooling and gas/electric models - 3 tons high efficiency - swing diameter for hinged door(s) option**

**Note:** All dimensions are in inches/millimeters.



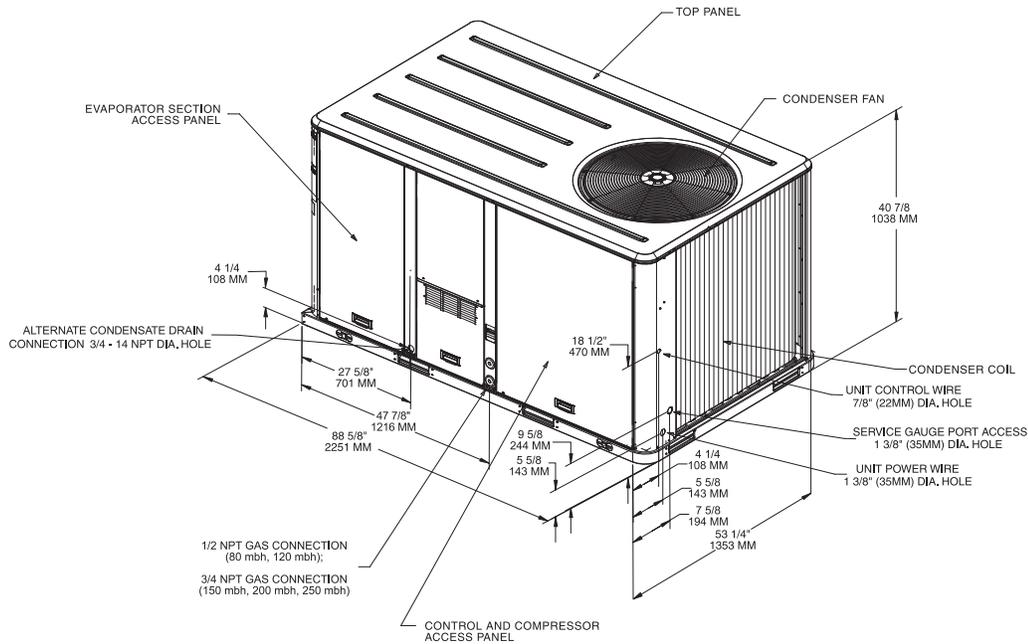
**Figure 10. Gas/electric models - 3 tons high efficiency height of gas pipe required from inside base of unit to gas shut off assembly (factory provided) - Y\_C models only**

**Note:** All dimensions are in inches/millimeters.



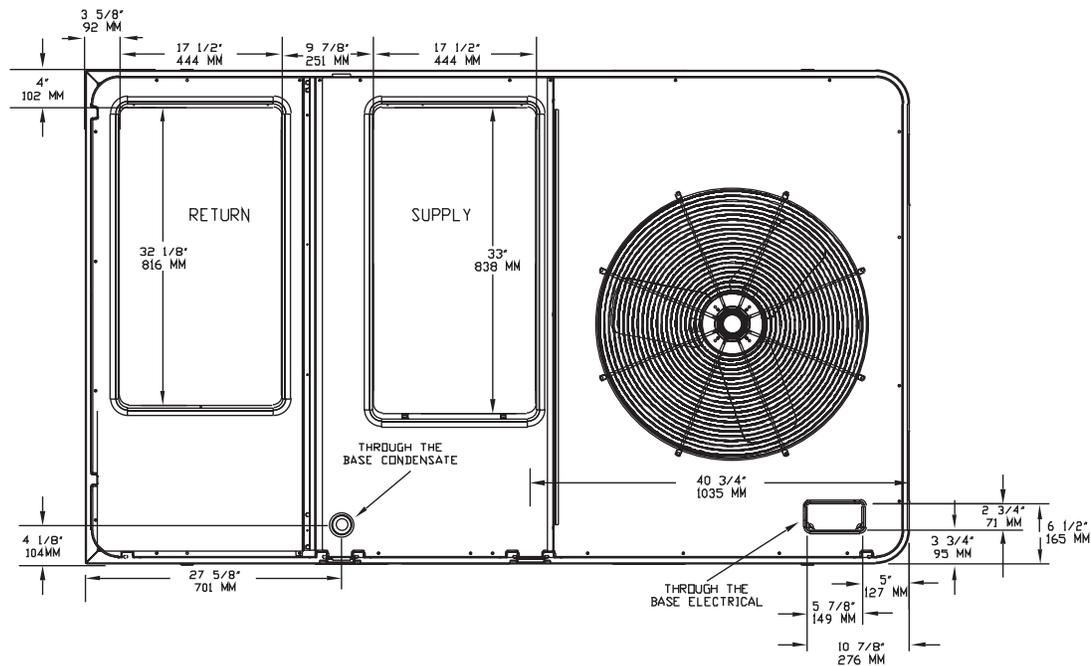
**Figure 11. Cooling and gas/electric - 4-5 tons high efficiency**

**Note:** All dimensions are in inches/millimeters.



**Figure 12. Cooling and gas/electric - 4-5 tons high efficiency - downflow airflow supply/return - through the base utilities**

**Note:** All dimensions are in inches/millimeters.

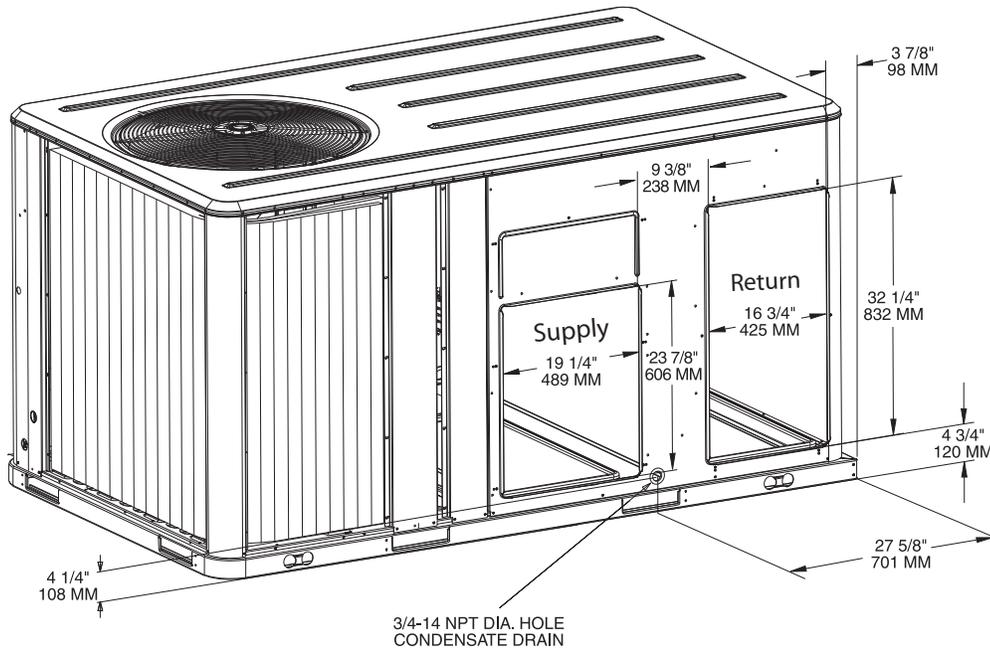




## Dimensional Data

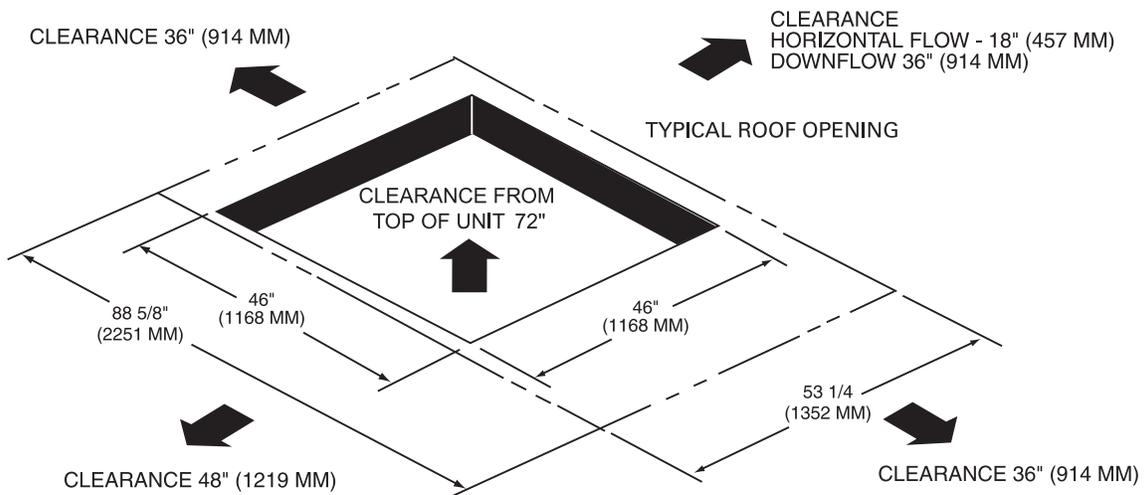
**Figure 13. Cooling and gas/electric - 4-5 tons high efficiency - horizontal airflow supply and return**

**Note:** All dimensions are in inches/millimeters.



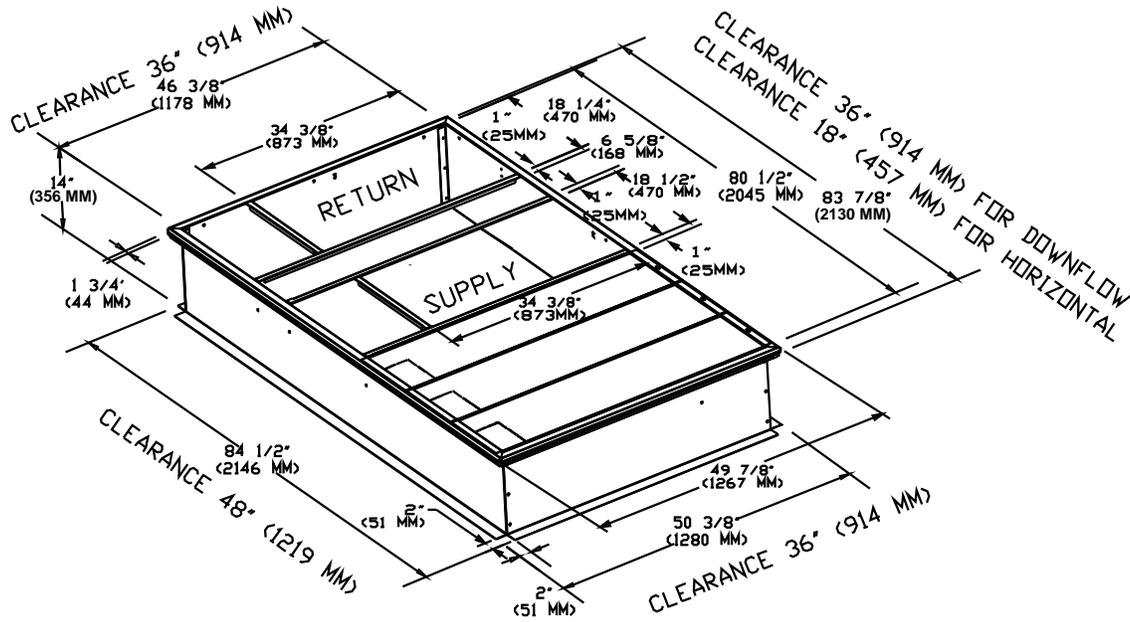
**Figure 14. Cooling and gas/electric - 4-5 tons high efficiency - unit clearance and roof opening**

**Note:** All dimensions are in inches/millimeters.



**Figure 15. Cooling and gas/electric - 4-5 tons high efficiency - roof curb**

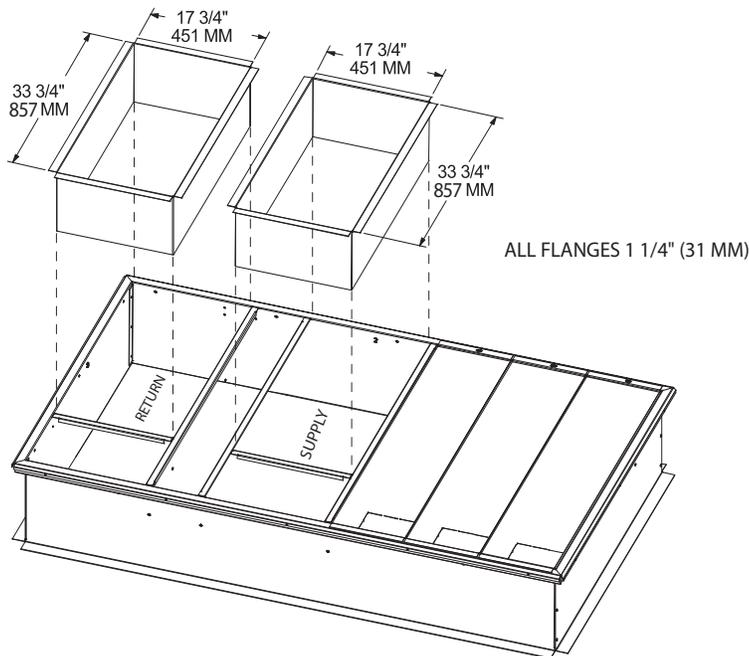
Note: All dimensions are in inches/millimeters.



**Figure 16. Cooling and gas/electric - 4-5 tons high efficiency - downflow duct connections field fabricated**

Note: All dimensions are in inches/millimeters.

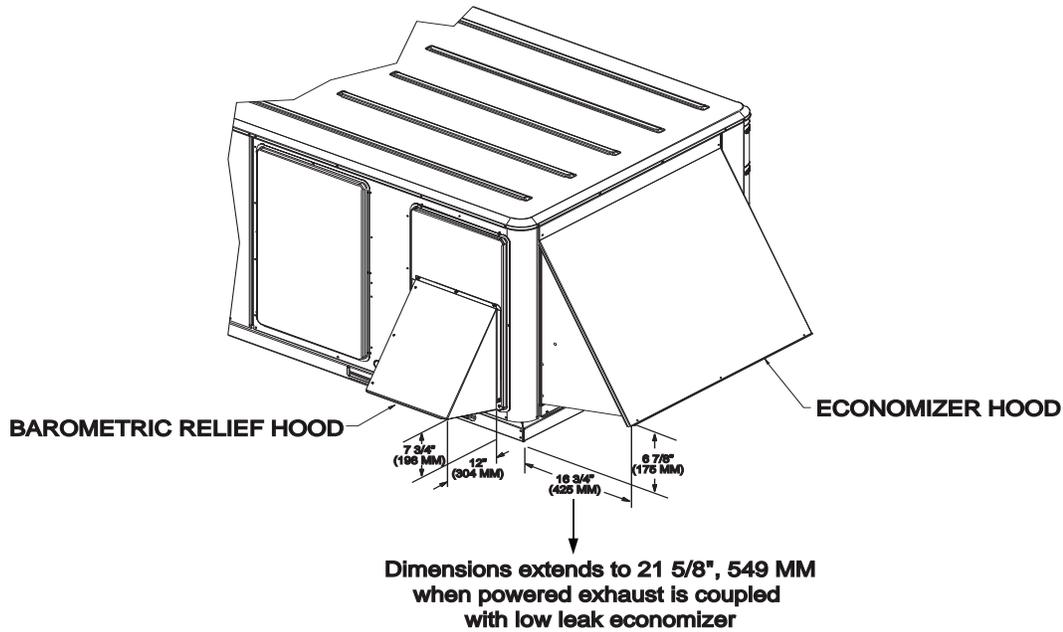
Note: See "Clearance required from duct to combustible surfaces (inches)," p. 18 for duct clearance to combustible materials.



## Dimensional Data

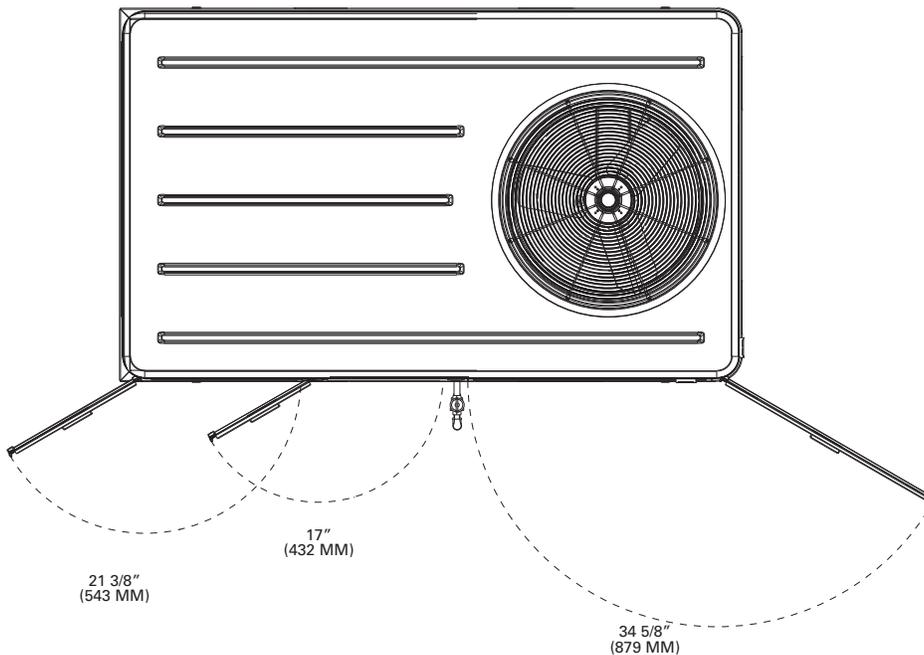
**Figure 17. Cooling and gas/electric - 4-5 tons high efficiency - economizer, manual or motorized fresh air damper**

**Note:** All dimensions are in inches/millimeters.



**Figure 18. Cooling and gas/electric - 4-5 tons high efficiency - swing diameter for hinged door(s) option**

**Note:** All dimensions are in inches/millimeters.



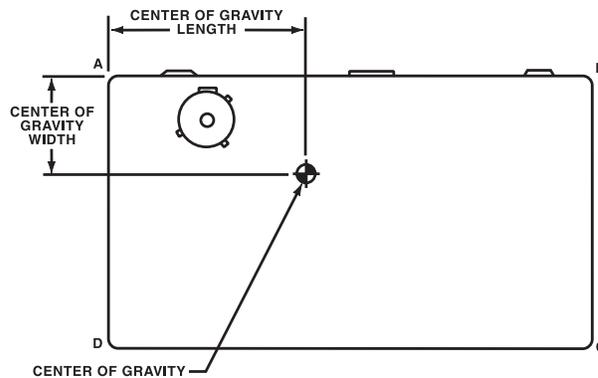
# Weights

**Table 30. Maximum unit & corner weights (lbs) and center of gravity dimensions (in.) - cooling models**

Tons	Unit Model No.	Maximum Model Weights <sup>(a)</sup>		Corner Weights <sup>(b)</sup>				Center of Gravity (in.)	
		Shipping	Net	A	B	C	D	Length	Width
3	THC037E	614	544	163	144	111	125	33	19
4	THC047E	787	692	220	178	132	163	40	23
5	THC067E	841	746	241	193	139	173	39	22

(a) Weights are approximate.

(b) Corner weights are given for information only.



**Table 31. Maximum unit & corner weights (lbs) and center of gravity dimensions (in.) - gas/electric models**

Tons	Unit Model No.	Maximum Model Weights <sup>(a)</sup>		Corner Weights <sup>(b)</sup>				Center of Gravity (in.)	
		Shipping	Net	A	B	C	D	Length	Width
3	YHC037E	676	606	178	162	126	139	33	19
4	YHC047E	858	763	238	200	148	176	40	23
5	YHC067E	917	822	261	218	156	187	40	22

(a) Weights are approximate.

(b) Corner weights are given for information only.

**Table 32. Factory installed options (fiops)/accessory net weights (lbs)<sup>(a),(b)</sup>**

Accessory	T/YHC037E	T/YHC047E-067E
	Net Weight	
	3 Tons	4-5 Tons
460V/575V IDM Transformer <sup>(c)</sup>	29	29
Barometric Relief	7	10
Belt Drive Option (3 phase only)	31	31
Coil Guards	12	20
Economizer	26	36
Electric Heaters <sup>(d)</sup>	15	30
Hinged Doors	10	12
Low Leak Economizer	68	93
Manual Outside Air Damper	16	26
Motorized Outside Air Damper	20	30

continued on next page



## Weights

**Table 32. Factory installed options (fiops)/accessory net weights (lbs)<sup>(a),(b)</sup> (continued)**

Accessory	T/YHC037E	T/YHC047E-067E
	Net Weight	Net Weight
	3 Tons	4-5 Tons
Novar Control	8	8
Oversized Motor	5	8
Powered Convenience Outlet	38	38
Powered Exhaust	40	40
Reheat Coil	12	14
Roof Curb	61	78
Smoke Detector, Supply	5	5
Smoke Detector, Return	7	7
Stainless Steel Heat Exchanger <sup>(e)</sup>	4	6
Through the Base Electrical	8	13
Through the Base Gas	5	5
Unit Mounted Circuit Breaker	5	5
Unit Mounted Disconnect	5	5

(a) Weights for options not listed are <5 lbs.

(b) Net weight should be added to unit weight when ordering factory-installed accessories.

(c) Apply weight with all 460V/575V units.

(d) Applicable to Cooling units only.

(e) Applicable to Gas/Electric units only.



# Mechanical Specifications

## General

The units shall be convertible airflow. The operating range shall be between 125°F and 0°F in cooling as standard from the factory for units with microprocessor controls. Cooling performance shall be rated in accordance with AHRI testing procedures. All units shall be factory assembled, internally wired, fully charged with R-410A, and 100 percent run tested to check cooling operation, fan and blower rotation, and control sequence before leaving the factory. Wiring internal to the unit shall be colored and numbered for simplified identification. Units shall be cULus listed and labeled, classified in accordance for Central Cooling Air Conditioners.

## Casing

Unit casing shall be constructed of zinc coated, heavy gauge, galvanized steel. Exterior surfaces shall be cleaned, phosphatized, and finished with a weather-resistant baked enamel finish. Unit's surface shall be tested 672 hours in a salt spray test in compliance with ASTM B117. Cabinet construction shall allow for all maintenance on one side of the unit. Service panels shall have lifting handles and be removed and reinstalled by removing two fasteners while providing a water and air tight seal. All exposed vertical panels and top covers in the indoor air section shall be insulated with a cleanable foil-faced, fire-retardant permanent, odorless glass fiber material. The base of the unit shall be insulated with 1/8 inch, foil-faced, closed-cell insulation. All insulation edges shall be either captured or sealed. The unit's base pan shall have no penetrations within the perimeter of the curb other than the raised 1 1/8 inch high downflow supply/return openings to provide an added water integrity precaution, if the condensate drain backs up. The base of the unit shall have provisions for forklift and crane lifting, with forklift capabilities on three sides of the unit.

## Compressors

All units shall have direct-drive, hermetic, variable stage scroll type compressors with centrifugal type oil pumps. Motor shall be suction gas-cooled and shall have a voltage utilization range of plus or minus 10 percent of unit nameplate voltage. Internal overloads shall be provided with the scroll compressors.

Crankcase heaters shall be included on all 3-5 ton units.

Variable speed compressors are outstanding for humidity control and light load cooling conditions.

## Controls

Unit shall be completely factory-wired with necessary controls and contactor pressure lugs or terminal block for power wiring. Unit shall provide an external location for mounting a fused disconnect device.

Microprocessor controls provide for all 24V control functions. The resident control algorithms shall make all heating, cooling, and/or ventilating decisions in response to electronic signals from sensors measuring indoor and outdoor temperatures. The control algorithm maintains accurate temperature control, minimizes drift from set point, and provides better building comfort. A centralized microprocessor shall provide anti-short cycle timing and time delay between compressors to provide a higher level of machine protection.

## Enhanced Dehumidification

Enhanced Dehumidification will be available on all units equipped with a Space Humidity sensor, regardless of whether the unit is configured with traditional Hot Gas Reheat (see page 10). Humidity levels are decreased while increasing the comfort level in an air space through advanced controls of compressor and indoor fan operation.

## Evaporator and Condenser Coils

Internally finned, 5/16" copper tubes mechanically bonded to a configured aluminum plate fin shall be standard. Coils shall be leak tested at the factory to ensure the pressure integrity. The evaporator coil and condenser coil shall be leak tested to 600 psig. The assembled unit shall be leak tested to 465 psig. The condenser coil shall have a patent pending 1+1+1 hybrid coil designed with slight



## Mechanical Specifications

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gaps for ease of cleaning. A plastic, dual-sloped, removable and reversible condensate drain pan with through-the-base condensate drain is standard.

### Filters

Throwaway filters shall be standard on all units. Optional 2-inch MERV 8 and MERV 13 filters shall also be available.

### Gas Heating Section

The heating section shall have a progressive tubular heat exchanger design using stainless steel burners and corrosion resistant steel throughout. An induced draft combustion blower shall be used to pull the combustion products through the firing tubes. The heater shall use a direct spark ignition (DSI) system. On initial call for heat, the combustion blower shall purge the heat exchanger for 20 seconds before ignition. After three unsuccessful ignition attempts, the entire heating system shall be locked out until manually reset at the thermostat/zone sensor. Units shall be suitable for use with natural gas or propane (field-installed kit) and also comply with the California requirement for low NOx emissions (Gas/Electric Only).

### High Pressure Control

All units include High Pressure Cutout as standard.

### Indoor Fan

All 3-5 ton units have variable speed, direct drive motors. All motors shall be thermally protected. All indoor fan motors meet the U.S. Energy Policy Act of 1992 (EPACT).

### Outdoor Fans

The outdoor fan shall be direct-drive, statically balanced, draw-through in the vertical discharge position. The fan motor shall be permanently lubricated and shall have built-in thermal overload protection.

### Phase Monitoring Protection

Precedent™ units with 3-phase power are equipped with phase monitoring protection as standard. These devices protect motors and compressors against problems caused by phase loss, phase imbalance and phase reversal indication.

### Refrigerant Circuits

Each refrigerant circuit offer thermal expansion valve as standard. Service pressure ports, and refrigerant line filter driers are factory-installed as standard. An area shall be provided for replacement suction line driers.

### Unit Top

The top cover shall be one piece construction or where seams exist, it shall be outside the indoor air-conditioned section. The ribbed top adds extra strength and prevents water from pooling on unit top.

## Factory Installed Options

### Black Epoxy Pre-Coated Coils

The black epoxy coils have a thermoset vinyl coating that is bonded to the aluminum fin stock prior to the fin-stamping process. The pre-coated coils are an economical option for protection in mildly corrosive environments.

### CO<sub>2</sub> Sensor Wiring

The unit wiring for field installed CO<sub>2</sub> sensors. Factory-installed CO<sub>2</sub> sensor wiring saves time and ensures proper unit connections for the field installed CO<sub>2</sub> sensor kits.

### **Condensate Overflow Switch**

This option shall shut the unit down in the event that a clogged condensate drain line prevents proper condensate removal from the unit.

### **CompleteCoat™ Coils**

The cathodic epoxy type electrodisposition coating is formulated for high edge build to plate fin and tube heat exchangers. The coating is selected to provide excellent resistance and durability to corrosive effects of alkalies, acids, alcohols, petroleum, seawater, salt air and corrosive environments.

The option shall be equipped with crankcase heater(s), low pressure switch(es), Froststat™, and a thermostatic expansion valve(s) (TXV) as standard.

### **Dehumidification (Hot Gas Reheat Option)**

When a unit is configured with the dehumidification option, the unit will attempt to satisfy space humidity requirements utilizing the enhanced dehumidification control sequence (see page 8).

This option allows for increased outdoor air ventilation. It reduces humidity levels while increasing comfort level in the air space. Cooling can operate without a demand for dehumidification. The hot gas reheat coil is designed to deliver maximum reheat temperatures.

### **Fault Detection & Diagnostics (FDD)**

This offering meets the mandatory requirement of CA Title 24 of fully configurable diagnostics allowing fault history and reading fault codes at the unit. This option provides detection of the following faults: Air temperature sensor failure/fault and notification of acceptable economizer mode. The FDD system shall be certified by the Energy Commission as meeting the requirements.

### **Heat Exchanger**

The compact cabinet features a tubular heat exchanger in low, medium and high heat capacities.

The heat exchanger is fabricated using stainless steel burners and corrosion-resistant aluminized steel tubes as standard on all models. It has an induced draft blower to pull the gas mixture through the burner tubes. The heater has a direct spark ignition system which doubles as a safety device to prove the flame.

Gas/Electric Precedent models exceed all California seasonal efficiency requirements. They also perform better than required to meet the California NOx emission requirements.

### **Hinged Access Doors**

Sheet metal hinges are available on the Filter/Evaporator, Supply Fan/Heat, and the Compressor/Control Access Doors.

### **Human Interface**

The Human Interface shall have a 5 inch color touchscreen display that conforms to FCC Part 15 Class B with an Ingress Protection Rating of IP24. The display text shall be readable by a person with 20/20 vision at a distance of 3 feet and 60° angle at lighting levels ranging from 100 lux - 25,000 lux. Also, the display shall operate at temperatures of -40° C to 70° C. Firmware and unit configurations shall be able to be restored via a USB storage device.

### **Multiple-Zone VAV Control**

Multiple-zone VAV control shall vary the speed of the indoor fan to maintain the duct static pressure at a setpoint. In cooling mode, the compressors shall be cycled (or economizer modulated) to maintain the supply air temperature (SAT) at the desired setpoint. In heating mode, the indoor fan shall operate at maximum speed whenever the heater operating.



## Mechanical Specifications

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### Novar Return Air Zone Sensor

This option, when used in conjunction with Novar Controls, will contain a factory provided and wired zone temperature sensor located in the return air stream.

### Novar Unit Controls

Optional Novar rooftop unit controls shall be installed and tested. The Novar electronic thermostat module will interface to the unit microprocessor and will control the unit to the desired stage of cooling or heating.

### Powered or Unpowered Convenience Outlet

This is a GFCI, 120V/15amp, 2 plug, convenience outlet, either powered or unpowered. When the convenience outlet is powered, a service receptacle disconnect will be available. The convenience outlet is powered from the line side of the disconnect or circuit breaker, and therefore will not be affected by the position of the disconnect or circuit breaker. This option can only be ordered when the Through-the-Base Electrical with either the Disconnect Switch or Circuit Breaker option is ordered.

### Single Zone VAV<sup>1</sup> – One Zone Variable Air Volume Mode

Single-zone VAV shall vary the indoor fan speed as the zone cooling or heating load changes, while cooling capacity is cycled to maintain the supply air temperature at setpoint. The indoor fan shall operate at maximum speed whenever the heater operating.

**Note:** SZVAV requires the use of a zone temperature sensor.

### Stainless Steel Drain Pan

This option provides excellent corrosion and oxidation resistance. Drain pan shall be reversible and constructed of 304 stainless steel.

### Stainless Steel Heat Exchanger

The optional stainless steel heat exchanger is constructed of 409 stainless steel. It is resistant to corrosion and oxidation and easy to clean.

The high strength to weight ratio allows for high ventilation rates with gas units. It is an excellent option to compliment the dehumidification option as a high outside air ventilation unit.

With this option, a 10-year stainless steel heat exchanger warranty is standard.

### Supply, Return, and Plenum Air Smoke Detector

With this option installed, if smoke is detected, all unit operation will be shut down. Reset will be manual at the unit. In order for the supply air smoke detector or return air smoke detector to properly sense smoke in the supply air stream or the return air stream, the air velocity entering the smoke detector unit must be between 500 - 4000 feet per minute. Equipment covered in this manual will develop an airflow velocity that falls within these limits over the entire airflow range specified in the evaporator fan performance table. Supply and/or Return Smoke Detectors may not be used with the Plenum Smoke Detector.

### Thermal Expansion Valve

Thermal Expansion Valve is standard for all models.

### Through-the-Base Electrical Access

An electrical service entrance shall be provided allowing electrical access for both control and main power connections inside the curb and through the base of the unit. Option will allow for field installation of liquid-tight conduit and an external field-installed disconnect switch.

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<sup>1</sup> Single-Zone VAV requires the use of a zone temperature sensor. If a unit is configured for SZVAV, but is connected to a conventional thermostat, the unit will revert to multiple-speed (two-speed) indoor fan control

**Through-the-Base Electrical with Circuit Breaker**

This option is a thermal magnetic, molded case, HACR Circuit Breaker with provisions for through the base electrical connections. The circuit breaker will be installed in a water tight enclosure in the unit with access through a swinging door. Wiring will be provided from the switch to the unit high voltage terminal block. The circuit breaker will provide overcurrent protection, be sized per NEC and cULus guidelines, and be agency recognized by cULus.

**Through-the-Base Electrical with Disconnect Switch**

This 3-pole, molded case, disconnect switch with provisions for through the base electrical connections are available. The disconnect switch will be installed in the unit in a water tight enclosure with access through a swinging door. Wiring will be provided from the switch to the unit high voltage terminal block. The switch will be cULus agency recognized.

**Note:** *The disconnect switch will be sized per NEC and cULus guidelines but will not be used in place of unit overcurrent protection.*

**Through-the-Base Gas Piping**

The unit shall include a standard through the base gas provision. This option shall have all piping necessary including, black steel, manual gas shut-off valve, elbows, and union. The manual shut-off valve shall include a 1/8" NPT pressure tap. This assembly will require minor field labor to install (Gas/Electric Only).

**Two-Inch Filters**

Two-inch MERV 8 and MERV 13 media filters shall be available on all models.

**Factory or Field Installed Options****Clogged Filter/Fan Failure Switch**

A dedicated differential pressure switch is available to achieve active fan failure indication and/or clogged filter indication. These indications will be registered with either a zone sensor with status indication lights or an Integrated Comfort™ System. This option is available for microprocessor controlled units.

**Differential Pressure Switches**

These sensors allow individual fan failure and dirty filter indication for microprocessor controlled units. The fan failure switch will disable all unit functions and "flash" the Service LED on the zone sensor. The dirty filter switch will light the Service LED on the zone sensor and will allow continued unit operation.

**Discharge Air Temperature Sensing**

This option provides true discharge air temperature sensing in heating models. This sensor is a status indicator readable through Tracer™ or Tracker™. This option is available for microprocessor controlled units.

**Economizer (Standard)**

This accessory shall be available with or without barometric relief. The assembly includes fully modulating 0-100 percent motor and dampers, minimum position setting, preset linkage, wiring harness with plug, spring return actuator and fixed dry bulb control. The barometric relief shall provide a pressure operated damper that shall be gravity closing and shall prohibit entrance of outside air during the equipment "off" cycle. Optional solid state or differential enthalpy control shall be available for either factory or field installation. The economizer arrives in the shipping position and shall be moved to the operating position by the installing contractor.



## Mechanical Specifications

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### Electric Heaters

Electric heat modules shall be available for installation within basic unit. Electric heater elements shall be constructed of heavy-duty nickel chromium elements internally delta connected for 240V, wye connected for 480V and 600 V. Staging shall be achieved through ReliaTel™. Each heater package shall have automatically reset high limit control operating through heating element contactors. All heaters shall be individually fused from the factory, where required, and shall meet all NEC and CEC requirements when properly installed. Power assemblies shall provide single-point connection. Electric heat modules shall be cULus listed.

### Frostat™

This option is to be utilized as a safety device. The Frostat opens when temperatures on the evaporator coil fall below 10°F. The temperature will need to rise to 50°F before closing. This option should be utilized in low airflow or high outside air applications (cooling only).

### LonTalk® Communication Interface

This option shall be provided to allow the unit to communicate as a Tracer™ LCI-R device or directly with generic LonTalk Network Building Automation System Controls.

### Low Leak Economizer

This accessory meets low leak requirements for ASHRAE 90.1, IECC, and CA Title 24 standards (3 cfm/ft<sup>2</sup>@1" wg exterior air, 4 cfm/ft<sup>2</sup>@1" wg return air). This option allows 100% outdoor air supply from 0-100% modulating dampers and is standard with barometric relief. It can be paired with powered exhaust for additional building pressure relief. This option can be paired with or without Fault Detection & Diagnostics (FDD) to meet current mandatory CA Title 24 requirements. Available on downflow units only.

### BACnet® Communication Interface

This option shall be provided to allow the unit to communicate directly with a generic open protocol BACnet MS/TP Network Building Automation System Controls.

### Reference or Comparative Enthalpy

Reference Enthalpy is used to measure and communicate outdoor humidity. The unit receives and uses this information to provide improved comfort cooling while using the economizer. Comparative Enthalpy measures and communicates humidity for both outdoor and return air conditions, and return air temperature. The unit receives and uses this information to maximize use of economizer cooling, and to provide maximum occupant comfort control. Reference or Comparative Enthalpy option shall be available when a factory or field installed Downflow Economizer is ordered. This option is available on all downflow models.

### Tool-less Hail Guards

Tool-less, hail protection quality coil guards are available for condenser coil protection.

## Field Installed Options

### CO<sub>2</sub> Sensor

The CO<sub>2</sub> sensor shall have the ability to monitor the concentration (parts per million, ppm) of CO<sub>2</sub> (Carbon Dioxide) in the air. As the CO<sub>2</sub> concentration changes, the outside air damper modulates to meet the current ventilation needs of the zone.

Two field installed kits are offered; CO<sub>2</sub> sensor and wiring or CO<sub>2</sub> sensor only. The CO<sub>2</sub> sensor only kit should be ordered with factory installed CO<sub>2</sub> sensor wiring. Factory installed CO<sub>2</sub> sensor wiring saves set-up time and ensures proper unit connections for the CO<sub>2</sub> sensor.

### **Duct Mounted Humidity Sensor**

This duct-mounted humidity sensor is used to control activation of the hot gas reheat dehumidification option. The humidity sensor can be set for humidity levels between 40% and 60% relative humidity by adjusting the ReliaTel Options Module.

### **High Static Drive**

The high static drive option shall allow the standard motor to operate with improved external static capabilities.

### **Low Leak Economizer**

This accessory meets low leak requirements for ASHRAE 90.1, IECC, and CA Title 24 standards (3 cfm/ft<sup>2</sup>@1" wg exterior air, 4 cfm/ft<sup>2</sup>@1" wg return air). This option allows 100% outdoor air supply from 0-100% modulating dampers and is standard with barometric relief. It can be paired with powered exhaust for additional building pressure relief. Available on downflow units only.

### **Manual Outside Air Damper**

This rain hood and screen shall provide up to 50 percent outside air.

### **Motorized Outside Air Damper**

Manually set outdoor air dampers shall provide up to 50 percent outside air. Once set, outdoor air dampers shall open to set position when indoor fan starts. The damper shall close to the full closed position when indoor fan shuts down.

### **Powered Exhaust**

The powered exhaust, available for 3-5 ton units, shall provide exhaust of return air, when using an economizer, to maintain better building pressurization.

### **Programmable Night Setback**

Auto or manual changeover with seven-day programming. Keyboard selection of Heat, Cool, Fan, Auto, or On. All programmable sensors have System On, Heat, Cool, Service LED/indicators as standard. Night Setback Sensors have one (1) Occupied, one (1) Un-occupied, and one (1) Override program per day.

### **Remote Potentiometer**

The minimum position setting of the economizer shall be adjusted with this accessory.

### **Roof Curb**

The roof curb shall be designed to mate with the unit's downflow supply and return and provide support and a water tight installation when installed properly. The roof curb design shall allow field-fabricated rectangular supply/return ductwork to be connected directly to the curb. Curb shall be shipped knocked down for field assembly and shall include wood nailer strips.

### **Thermostat**

Variable stage heating and cooling operation or one stage heating and cooling shall be available in either manual or automatic changeover. Automatic programmable electronic with night set back shall also be available.

### **Ventilation Override Accessory**

With the Ventilation Override Accessory installed, the unit can be set to transition up to 3 different pre-programmed sequences for Smoke Purge, Pressurization, and Exhaust. The transition occurs when a binary input on the RTOM is closed (shorted). This would typically be a hard wired relay output from a smoke detector or fire control panel. The ventilation override accessory shall be available as field installed.



## Mechanical Specifications

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### **Wall Mounted Humidity Sensor**

This wall-mounted humidity sensor is used to control activation of the hot gas reheat dehumidification option. The humidity sensor can be set for humidity levels between 40% and 60% relative humidity by adjusting the ReliaTel Options Module.

### **Wireless Zone Sensor**

LCD display that provides heat, cool, auto or off. Includes two temperature setpoints and a lockable setting with °F or °C indicators.

### **Zone Sensor**

This control shall be provided to interface with the Micro equipped units and shall be available in either manual, automatic programmable with night setback, with system malfunction lights, or remote sensor options.





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