Product Catalog

Packaged Rooftop Air Conditioners Voyager™ 3 with Symbio™ 700 Controls

eStage™

27.5 to 50 Tons - 60 Hz

22.9 to 41.7 Tons (81-148 kW) - 50 Hz

March 2023

RT-PRC033Q-EN

Introduction

Packaged Rooftop Air Conditioners

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.

The ReliaTel™control platform offered the same great features and functionality as the original Micro, with additional benefits. Now with the Symbio™ digital controller on board, Voyager 3 features smart building capabilities that take the service, comfort, and sustainability beyond the expected.

The Voyager™ 3 line offers 27.5 to 50 ton, 60 Hz and 23 to 42 ton 50 Hz models. Both 50 and 60 Hz models come in a choice of five sizes to meet the changing demands of the commercial rooftop market.

Trane customers demand products that provide exceptional reliability, meet stringent performance requirements, and are competitively priced. Trane delivers with Voyager 3.

Voyager 3 features cutting edge technologies: reliable 3-D™ Scroll compressors, eStage™ for premium efficiency, Trane engineered Symbio™ controls, computer-aided run testing, and Integrated Comfort™ Systems.

So, whether you're a contractor, the engineer, or an owner you can be certain Voyager Products are built to meet your needs.

It's Hard To Stop A Trane®.

Copyright

Trademarks

Revision History

- Updates to the Model Number Description chapter.
- Introduction of Symbio 700 controls.

Table of Contents

Features and Benefits 6
- Standard Features 6
- Optional Features 6
- Outstanding Optional Features 7
- Quality and Reliability 10
- Unmatched Product Support 13

Application Considerations 14
- 60/50 Hz Units 14

Selection Procedure 18
- 60 Hz Units 18
- 50 Hz Units 21

Model Number Description 24
- 60 Hz Description 24
- 50 Hz Description 26

General Data 28

Performance Adjustment Factors 36

Performance Data (60 Hz Units) 38

Performance Data (50Hz Units) 53

Controls 79
- Enhanced BAS Integration and Connectivity 79
- Secure Remote Connectivity with Trane Connect 79
- Serviceability 79
- Flexibility 81
- Economizer Controls 82
- Zone Sensors 82
- Air-Fi Wireless Communicating Zone Sensors 83
- Thermostats 84

Electrical Data 85
- Electrical Service Sizing 85

Dimensional Data 93
- Fresh Air, Power Exhaust Hoods 93

Weights 100

Mechanical Specifications 103
General 103
Outside Air 105
Exhaust Air 105
Miscellaneous Unit Options 106

Features and Benefits

Standard Features

- R-410A refrigerant
- Factory installed Symbio™ 700 controls with Advanced Diagnostic capabilities
- Variable frequency drive
- Compressor lead-lag
- Crankcase heaters
- Emergency stop input
- Frostat™ coil frost protection on all units
- Occupied-Unoccupied switching
- Phase monitor
- Temperature discharge limit (TDL)
- Timed override activation
- FC supply fans
- Supply airflow proving
- Supply air overpressurization protection on VAV units
- Dedicated downflow, horizontal, or mixed airflow configurations
- Trane 3-D™ Scroll compressors
- Two inch standard efficiency filters
- Sloped condensate drain pan
- Cleanable, IAQ-enhancing, foil faced insulation on all interior surfaces exposed to the unit air stream
- cULus listing on standard options
- Discharge air temperature sensor

Optional Features

Cabinet

- Factory or field installed condenser coil guards
- Factory or field installed condenser hail guards
- Hinged service access
- Downflow/upflow, horizontal, or mixed airflow configurations
- Sloped stainless steel evaporator coil drain pans

Controls

- Statitrac™ direct space pressure control
- Trane Air Quality Traq™ (outside air measurement)
- BACnet Communication Interface (BCI)
- LonTalk® Communication Interface (LCI)
- Air-Fi™ Wireless Communications Interface (WCI)
- CO_2 sensors for space comfort control (SCC) or discharge air control (DAC)
- Ventilation override
- Condensate Overflow Switch
- Symbio 700 Expansion Modules

Electrical

- Factory mounted disconnect with external handle (non-fused)
- Factory powered or field powered 15A GFI convenience outlet
- High Fault SCCR
- Through-the-base electrical provision

Filtration

- MERV 8 high efficiency 2” or 4” throwaway filters
- MERV 14 high efficiency 4” filters
- Clogged filter switch

Heat

- Natural Gas or LP (kit) heat with two stage and modulating options
- Natural gas and LP elevation kits
- Stainless steel heat exchanger (gas heat only)
- Electric heat

Mechanical

- Multi-speed, VAV, or SZ VAV Control
- Motors with Internal Shaft Grounding Ring
- 50% fresh air tracking power exhaust
- 100% fresh air tracking power exhaust
- 50% power exhaust
- 100% power exhaust
- Ultra low leak power exhaust
- Barometric relief
- Economizer with differential (comparative) enthalpy control
- Economizer with dry bulb control
- Economizer with reference enthalpy control
- Ultra low leak economizer with Fault Detection and Diagnostics (FDD)
- Manual fresh air damper
- Economizer with differential dry bulb control

Refrigeration

- Corrosion protected condenser coil
- Modulating hot gas reheat
- Service valves

Outstanding Optional Features

Single Zone VAV (SZVAV)

Single Zone VAV (SZVAV) is designed for use in single zone applications such as gymnasiums, auditoriums, manufacturing facilities, retail box stores, and any large open spaces where there is a diversity in the load profile. It is an ideal replacement to "yesterday's" constant-volume (CV) systems, as it reduces operating costs while improving occupant comfort.

SZVAV systems combine Trane application, control and system integration knowledge to exactly match fan speed with cooling and heating loads, regardless of the operating condition. Trane algorithms meet and/or exceed ASHRAE 90.1 SZVAV energy-saving recommendations and those of CA Title 24. The

result is an optimized balance between zone temperature control and system energy savings. Depending on your specific application, energy savings can be as much as 20+%.

Note: *Building system modeling in energy simulation software such as TRACE is recommended to evaluate performance improvements for your application.*

SZVAV is fully integrated into the control system. It provides the simplest and fastest commissioning in the industry through proven factory-installed, wired, and tested system controllers. All control modules, logic boards and sensors are factory installed and tested to ensure the highest quality and most reliable system available. This means no special programming of algorithms, or hunting at the jobsite for field installed sensors, boards, etc. SZVAV is a quick and simple solution for many applications and is available from your most trusted rooftop VAV system solution provider -Trane.

Delivered VAV

Trane provides true pressure independent variable air volume with Voyager 3 delivered VAV. The system is auto-configured to reduce programming and set-up time on the job. Generally available only on sophisticated larger models, this Voyager 3 system can economically handle comfort requirements for any zone in the facility.

The system consists of:

- Voyager 3 VAV packaged rooftops
- Up to 32 VariTrane™ VAV boxes with DDC (direct digital controls)
- VariTrac™ Central Control Panel (CCP) with Operator Display (OD)

The VariTrac Central Control Panel acts as a communications hub by coordinating the actions of the VAV rooftop and the VAV boxes. Single duct or fan powered VAV boxes are available, along with an option for factory-installed local heat. For more details, see VAV-SLM003-EN.

Power Exhaust

Provides exhaust of the return air when using an economizer to maintain proper building pressurization. Great for relieving most building over pressurization problems.

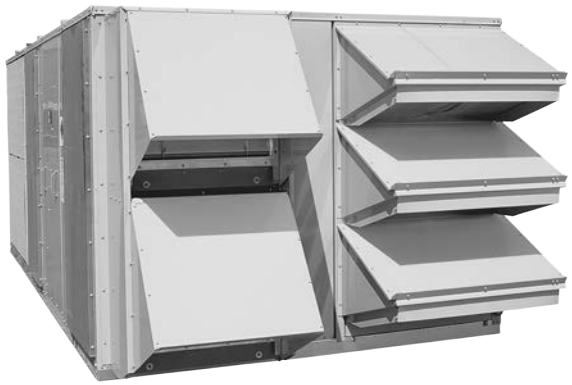
Fresh Air Tracking Power Exhaust Option

Provides exhaust of the return air to maintain proper building pressurization by proportionally controlling the exhaust air to the economizer dampers; in other words, the exhaust damper “tracks” the outside air damper position.

Statitrac™ Direct Space Building Pressurization Control

Trane's Statitrac™ control is a highly accurate and efficient method of maintaining building pressure control with a large rooftop air conditioner. Statitrac space pressure control turns the exhaust fans on and modulates exhaust dampers to maintain space pressure within the space pressure deadband. Proper building pressurization eliminates annoying door whistling, doors standing open, and odors from other zones.

Downflow and Horizontal Economizers



The economizers come with four control options: dry bulb temperature, comparative enthalpy, reference enthalpy, and differential dry bulb temperature. The photo shows the three fresh air hoods on the horizontal discharge configuration.

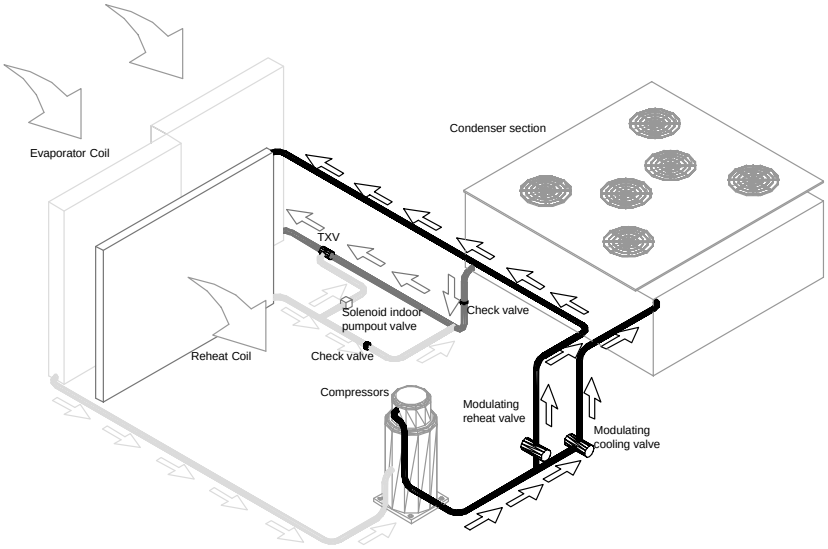
Trane Air Quality (Traq™) Outside Air Measurement System

Trane Air Quality (Traq) outside air measurement system uses velocity pressure sensing rings to measure airflow in the outside air opening from 40 cfm/ton to maximum airflow. Measurement accuracy is at least ±15%, meeting requirements of LEED IE Q Credit 1.

Modulating Hot Gas Reheat

By its very nature, the colder the air, the less moisture it contains. With hot gas reheat, hot refrigerant gas leaving the compressor is diverted to a hot gas reheat coil. The cold air leaving the DX coil is then reheated to an acceptable temperature and returned as dehumidified air to the facility space. The modulation of the hot gas reheat helps maintain both temperature and humidity levels in cooling mode, while reducing unit operating costs and saving energy.

Figure 1. Hot gas reheat



Condenser Guards

Two options for condenser guards are available: standard guards and hail (louvered) guards. Condenser hail guards protect the unit condenser coil from hail, debris damage, and vandalism.

Trane Factory Built Roof Curbs

Available for all units.

Motor Shaft Grounding Ring

Motors with internal Shaft grounding rings can be used with VFDs to provide a conductive discharge path away from the motor bearings to ground. Not available with 25HP motor.

Stainless Steel Sloped Drain Pans

The non-porous, stainless steel surface on these drain pans avoids the harboring of dirt and bacteria, while discouraging microbial growth and helping to promote indoor air quality. The material is easy to clean, long lasting, and extremely durable, thus minimizing drain pan deterioration and premature leakage. The stainless steel drain pans are sloped, allowing for easy and fast water exit.

Condensate Overflow Switch

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

eStage™ - Standard and High Efficiency Units

Through compressor staging on a single circuit, this option allows units to have a maximum 25% load at the first stage allowing the unit to meet Title 24, along with providing increased full load and part load unit efficiency.

Quality and Reliability

Easy to Install, Service and Maintain

Because today's owners are very cost-conscious when it comes to service and maintenance, this unit was designed with direct input from service contractors. This valuable information helped to design a product that would get the service technician off the job quicker and save the owner money. This product line 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.

Rigorous Testing

Our units are rigorously rain tested to ensure water integrity. Actual shipping tests are performed to determine packaging requirements. Units are test shipped around the country to determine the best packaging. Factory shake tests are 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. A 100% coil leak test is performed at the factory. The condenser coils are leak tested at 660 psig and evaporators to 450 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 ensure it lives up to rigorous Trane requirements.

Conversionless Units

The dedicated design units require no panel removal or alteration time to convert the airflow discharge in the field— a major cost savings during installation.

Horizontal units come complete with duct flanges so the contractor doesn't have to field fabricate them. These duct flanges are a time and cost saver.

Tubular Heat Exchanger (Gas Heat Only)

The Voyager™ tubular gas heat exchangers are available in both low and high heat capacities with the ability to burn natural gas as standard and LP with a field-installed kit. All gas heat configurations are offered in either two stage or 10:1 modulating operation. Turndown on modulating furnaces with LP fuel will be limited to 6:1 for the equivalent 10:1 natural gas furnace.

Each heat exchanger is fabricated using stainless steel burners and corrosion-resistant aluminized steel tubes as standard on all two-stage models, with options for a complete stainless steel construction. Modulating heat is only offered with a complete stainless steel construction.

This assortment of configurations provides a suitable solution for a variety of applications. All Voyager™ tubular gas heat exchangers are tested under ANSI Z83.8/CSA 2.6 and meet the 2023 Department of Energy efficiency code for 81% steady state efficiency. Integral to the heat exchanger assembly, an induced draft blower is used to pull the gas mixture through the burner tubes. A direct spark ignition system, which doubles as a safety device to prove the flame, is used to ignite the gas mixture.

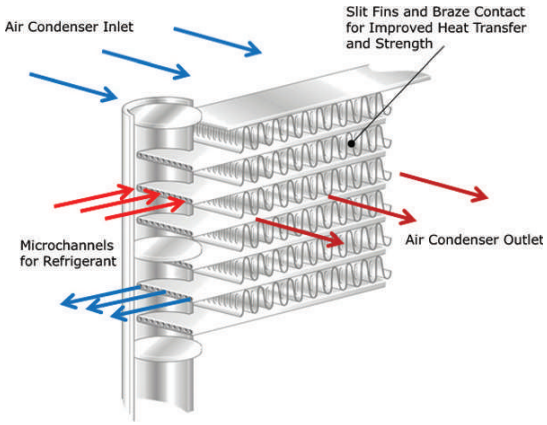
Low Ambient Cooling

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

Microchannel Condenser Coil

Microchannel condensing coils are all-aluminum coils with fully-brazed construction. This design reduces risk of leaks and provides increased coil rigidity — making them more rugged on the jobsite. Their flat streamlined tubes with small ports and metallurgical tube-to-fin bond allow for exceptional heat transfer. Microchannel all-aluminum construction provides several additional benefits:

- Light weight (simplifies coil handling)
- Easy to recycle
- Minimize galvanic corrosion



Symbio Controls

Enhanced BAS Integration and Connectivity

- Open standard communications
  - BACnet® over Zigbee (Air-Fi Wireless)
  - BACnet MS/TP
  - BACnet IP
  - Modbus™ RTU
  - Modbus TCP/IP
  - LonTalk®
- Securely access, troubleshoot, and monitor equipment from anywhere via Trane Connect™

Serviceability

- Wireless mobile app interface (iPhone and Android) to simplify startup/service
- On-board user interface
- Data Trending
- Real-time, clear language diagnostics

- Historical alarm logs
- Backup and Restore functionality to reduce commissioning and service time

Flexibility

- Future-ready upgradable software, supporting changing codes and new sequences of operation
- Standard, consistent pre-engineered applications that meet industry standards
- Built-in Schedules (requires Tracer® TU)
- Expandable inputs and outputs (requires Tracer TU)
- Ability to add custom programmed sequences (requires Tracer TU)

Phase Monitor

This unit features a three-phase line monitor module that protects against phase loss, phase reversal and phase unbalance. It is intended to protect compressors from reverse rotation. It has an operating input voltage range of 190–600 Vac, and LED indicators for **"ON"** and **"FAULT"**. There are no field adjustments and the module will automatically reset from a fault condition.

Supply Airflow Proving

Fan status is checked through the VFD. Any alarms sent to the Symbio board disable all unit functions and a diagnostic will be annunciated on the onboard user interface and/or mobile app.

Pressure Cutouts

Low and high pressure cutouts are standard on all models.

Single Point Power

A single electrical connection powers the unit.

Sloped Drain Pans

Every unit has a non-corrosive, sloped drain pan made of pre-painted steel and standard on all units.

Temperature Discharge Limit (TDL)

A bi-metal element discharge line thermostat is installed as a standard feature on the discharge line of each system. This standard feature provides extra protection to the compressors against high discharge temperatures in case of loss of charge, extremely high ambient and other conditions which could drive the discharge temperature higher.

Variable Frequency Drives (VFD)

Variable Frequency Drives are factory installed and tested to provide supply fan motor speed modulation, as well as modulating gas heat. VFD's on the supply fan, as compared to inlet guide vanes or discharge dampers, are quieter, more efficient, and are eligible for utility rebates. The VFD's are available with or without a bypass option. Bypass control will simply provide full nominal airflow in the event of drive failure.

Modulating gas heat models with VFD's allow tighter space temperature control with less temperature swing.

Unmatched Product Support

Our Sales Representatives are a support group that can assist you with:

- Product
- Application
- Service
- Training
- Special Applications
- Specifications
- Computer Programs and more

Application Considerations

60/50 Hz Units

Exhaust Air Options

When is it necessary to provide building exhaust?

Whenever an outdoor air economizer is used, a building generally requires an exhaust system. The purpose of the exhaust system is to exhaust the proper amount of air to prevent over or under-pressurization of the building.

A building may have all or part of its exhaust system in the rooftop unit. Often, a building provides exhaust external to the air conditioning equipment. This external exhaust must be considered when selecting the rooftop exhaust system.

Voyager™ 3 rooftop units offer four types of exhaust systems:

- 50% or 100% Power exhaust fan
- 50% or 100% Fresh Air Tracking Power Exhaust Fan(s)
- 100% Power Exhaust with Statitrac™ Building Pressure Control
- Barometric relief dampers

Application Recommendations

Power Exhaust Fan (with or without Fresh Air Tracking)

The exhaust fan option is either a single fan for exhausting approximately half of the air-moving capabilities of the supply fan system or dual fans for 100% exhaust. Either exhaust capability arrangement is configured as an on/off non-modulating exhaust or an on/off exhaust with an actuator controlled damper to track the position of the fresh air damper.

For non-100% air applications, the 50% non-tracking power exhaust fan generally should not be selected for more than 40 to 50% of design supply airflow. Since it is an on/off non-modulating fan, it does not vary exhaust cfm with the amount of outside air entering the building. Therefore, if selected for more than 40 to 50% of supply airflow, the building may become under pressurized when economizer operation is allowing lesser amounts of outdoor air into the building. If, however, building pressure is not of a critical nature, the non-modulating exhaust fan may be sized for more than 50% of design supply airflow. Consult Table 26, p. 52 (60Hz) or Table 53, p. 78 (50Hz) for specific exhaust fan capabilities with Voyager 3 units.

100% Power Exhaust with Statitrac™ Building Pressure Control

This control is available only with 100% power exhaust. The exhaust dampers are modulated in response to building pressure. Statitrac, a differential pressure control system, uses a differential pressure transducer to compare indoor building pressure to atmospheric pressure. The exhaust fans are turned on when required to lower building static pressure to setpoint. The Statitrac control system then modulates the exhaust dampers to control the building pressure to within the adjustable, specified deadband that is set at the RTVM board. Economizer and return air dampers are modulated independent of the exhaust dampers based on ventilation control and economizer cooling requests. Statitrac can only lower building pressure; it cannot raise it. To lower building pressure, Statitrac exhausts air from the space using the power exhaust. To raise building pressure, more air must be supplied to the space, as with economizer operation. Additional relief, such as a bathroom exhaust fan or relief fan, as well as other units serving the space, will affect building pressure and must be taken into account.

Barometric Relief Dampers

Barometric relief dampers consist of gravity dampers which open with increased building pressure. As the building pressure increases, the pressure in the unit return section also increases, opening the dampers and relieving air. Barometric relief may be used to provide relief for single story buildings with no return ductwork and exhaust requirements less than 25%.

Altitude Corrections

The rooftop performance tables and curves of this catalog are based on standard air (.075 lbs/ft). If the rooftop airflow requirements are at other than standard conditions (sea level), an air density correction is needed to project accurate unit performance.

Figure 3, p. 37 shows the air density ratio at various temperatures and elevations. Trane rooftops are designed to operate between 40° and 90°F leaving air temperature.

The procedure to use when selecting a supply or exhaust fan on a rooftop for elevations and temperatures other than standard is as follows:

1. First, determine the air density ratio using Figure 3, p. 37.
2. Divide the static pressure at the nonstandard condition by the air density ratio to obtain the corrected static pressure.
3. Use the actual cfm and the corrected static pressure to determine the fan rpm and bhp from the rooftop performance tables or curves.
4. The fan rpm is correct as selected.
5. Bhp must be multiplied by the air density ratio to obtain the actual operating bhp.

   In order to better illustrate this procedure, the following examples are used:

60 Hz

Consider a 30 ton rooftop unit that is to deliver 11,000 actual cfm at 1.50 inches total static pressure (tsp), 55°F leaving air temperature, at an elevation of 5,000 ft.

- From Figure 3, p. 37, the air density ratio is 0.86.
- Tsp=1.50 inches/0.86=1.74 inches tsp.
- From the performance tables: a 30 ton rooftop will deliver 11,000 cfm at 1.74 inches tsp at 632 rpm and 6.2 bhp.
- The rpm is correct as selected — 632 rpm.
- Bhp = 6.2 x 0.86 = 5.33.

Compressor MBh, SHR, and kW should be calculated at standard and then converted to actual using the correction factors in Table 8, p. 37. Apply these factors to the capacities selected at standard cfm so as to correct for the reduced mass flow rate across the condenser.

Heat selections other than gas heat will not be affected by altitude. Nominal gas capacity (output) should be multiplied by the factors given in Table 9, p. 37 before calculating the heating supply air temperature.

50 Hz

Consider a 29 ton (105 kW) rooftop unit that is to deliver 9,160 actual cfm (4323 L/s) at 1.50 inches total static pressure (tsp) (38 mm, 373 Pa), 55°F (12.8°C) leaving air temperature, at an elevation of 5,000 ft (1524 m).

- From Figure 3, p. 37, the air density ratio is 0.86.
- Tsp = 1.50 inches/0.86 = 1.74 inches tsp. 374/.86 = 434 Pa.
- From the performance tables: a 29-ton (105 kW) rooftop will deliver 9,160 cfm at 1.74 inches tsp (4323 L/s at 434 Pa) at 618 rpm and 4.96 bhp (3.7 kW).
- The rpm is correct as selected – 618 rpm.
- Bhp = 4.96 x 0.86 = 4.27 bhp actual. kW = 3.7 x 0.86 = 3.18 kW

Compressor MBh, SHR, and kW should be calculated at standard and then converted to actual using the correction factors in Table 8, p. 37. Apply these factors to the capacities selected at standard cfm so as to correct for the reduced mass flow rate across the condenser.

Heat selections other than gas heat will not be affected by altitude.

Acoustical Considerations

Proper placement of rooftops is critical to reducing transmitted sound levels to the building. The ideal time to make provisions to reduce sound transmissions is during the design phase. The most

economical means of avoiding an acoustical problem is to place the rooftop(s) away from acoustically critical areas. If possible, rooftops should not be located directly above areas such as: offices, conference rooms, executive office areas and classrooms. Instead, ideal locations might be over corridors, utility rooms, toilets or other areas where higher sound levels directly below the unit(s) are acceptable.

Several basic guidelines for unit placement should be followed to minimize sound transmission through the building structure:

- Never cantilever the compressor end of the unit. A structural cross member must support this end of the unit.
- Locate the unit center of gravity which is close to, or over, a column or main support beam.
- If the roof structure is very light, roof joists must be replaced by a structural shape in the critical areas described above.
- If several units are to be placed on one span, they should be staggered to reduce deflection over that span.

It is impossible to totally quantify the effect of building structure on sound transmission, since this depends on the response of the roof and building members to the sound and vibration of the unit components. However, the guidelines listed above are experience- proven guidelines which will help reduce sound transmissions.

Clearance Requirements

The recommended clearances identified with unit dimensions should be maintained to assure adequate serviceability, maximum capacity and peak operating efficiency. A reduction in unit clearance could result in condenser coil starvation or warm condenser air recirculation. If the clearances shown are not possible on a particular job, consider the following:

- Do the clearances available allow for major service work such as changing compressors or coils?
- Do the clearances available allow for proper outside air intake, exhaust air removal and condenser airflow?
- If screening around the unit is being used, is there a possibility of air recirculation from the exhaust to the outside air intake or from condenser exhaust to condenser intake?

Actual clearances which appear inadequate should be reviewed with a local Trane sales engineer. When two or more units are to be placed side by side, the distance between the units should be increased to 150% of the recommended single unit clearance. The units should also be staggered for two reasons:

- To reduce span deflection if more than one unit is placed on a single span. Reducing deflection discourages sound transmission.
- To assure proper diffusion of exhaust air before contact with the outside air intake of adjacent unit.

Duct Design

It is important to note that the rated capacities of the rooftop can be met only if the rooftop is properly installed in the field. A well designed duct system is essential in meeting these capacities.

The satisfactory distribution of air throughout the system requires that there be an unrestricted and uniform airflow from the rooftop discharge duct. This discharge section should be straight for at least several duct diameters to allow the conversion of fan energy from velocity pressure to static pressure.

When job conditions dictate elbows be installed near the rooftop outlet, the loss of capacity and static pressure may be reduced through proper direction of the bend in the elbow. The high velocity side of the rooftop outlet should be directed at the outside radius of the elbow rather than the inside.

Modulating Hot Gas Reheat

Often supply fan VAV modulation or staged compressor control sufficient in handling building humidity in a wide range of indoor load conditions. Applications where non-peak load conditions can be dominated by latent loads are candidates for the Hot Gas Reheat option. This includes many applications subject to ASHRAE Standard 62 requirements.

When a Hot Gas Reheat coil is energized, it increases the air temperature after exiting the evaporator coil. While this provides dehumidification, this is not a dehumidifier. The main function of the Packaged RTU is to provide zone temperature control. For times when dehumidification is needed, the hot gas reheat will be energized.

Applications which should be investigated before using the standard modulating hot gas reheat option, and will require additional investigation include the following:

- Process applications
- Units utilized as a make-up air or 100% outside air units
- Zones with dramatically varying load conditions (sanctuaries, locker rooms, gymnasiums, etc.

The Modulating Hot Gas Reheat standard option is available on 60Hz units only. Generally, the standard Modulating Hot Gas Reheat option requires a call for cooling to initiate. If there is no call for cooling, and there is a desire for dehumidification, another solution will need to be investigated. The IntelliPak™ packaged rooftop systems include non-standard solutions which can be considered for these types of applications.

Natural Gas Heating Considerations

Trane offers heavy gauge 409 stainless steel throughout the construction of UL recognized, natural gas tubular exchangers. These heat exchangers can be applied with confidence, particularly with full modulation control, when mixed air temperatures are below 50°F, and low ambient temperatures can cause condensation to form on the heat exchanger. The Voyager™ natural gas heat exchangers are not recommended for applications with mixed air conditions entering the heat exchanger below 30°F to ensure adequate leaving air heating temperature.

Selection Procedure

60 Hz Units

Five basic areas:

- Cooling capacity
- Heating capacity
- Air delivery
- Unit electrical requirements
- Unit designation

Cooling Capacity Selection

- Summer design conditions — 95 DB/76 WB, 95°F entering air to condenser.
- Summer room design conditions — 76 DB/66 WB.
- Total peak cooling load — 321 MBh (26.75 tons).
- Total peak supply cfm — 12000 cfm.
- External static pressure — 1.2 inches.
- Return air temperatures — 80 DB/66 WB.
- Return air cfm — 10800 cfm.
- Outside air ventilation cfm and load — 1200 cfm and 18.23 MBh (1.52 tons).
- Unit accessories include:
  - Aluminized heat exchanger — high heat module.
  - 2” hi-efficiency throwaway filters.
  - Economizer.

Step 1 — Determine Nominal Capacity

A summation of the peak cooling load and the outside air ventilation load shows: 26.75 tons + 1.52 tons = 28.27 required unit capacity. From , 30-ton unit capacity at 80 DB/67 WB, 95°F entering the condenser and 12,000 total peak supply cfm, is 353 MBh (29.4 tons). Thus, a nominal 30 ton unit is selected.

Step 2 — Determine Supply Fan and Exhaust Fan BHP

Having selected a nominal 30 ton unit, the supply fan and exhaust fan motor bhp must be determined.

Determine unit static pressure at design supply cfm (see):

External static pressure = 1.20 inches

Heat exchanger = High Heat: 0.14 inches

High efficiency filter 2”= 0.23 inches

Indoor coil = 0.34 inches

Economizer = 0.07 inches

Unit total static pressure = 1.98 inches

Using total cfm of 12000 and total static pressure of 1.98 inches, Figure 4, p. 49 shows 7.78 bhp with 676 rpm.

Step 3 — Determine Evaporator Coil Entering Air Conditions

- Mixed air dry bulb temperature determination:

  Using the minimum percent of OA (1,200 cfm ÷ 12,000 cfm = 10 percent), determine the mixture dry bulb to the evaporator. RADB +%OA (OADB - RADB) = 80 + (0.10) (95 - 80) = 80 + 1.5 = 81.5°F

- Approximate wet bulb mixture temperature:

  RAWB + OA (OAWB - RAWB) = 66 + (0.10) (76-66) = 68 + 1 = 67°F.

A psychrometric chart can be used to more accurately determine the mixture temperature to the evaporator coil.

Step 4 — Determine Total Required Unit Cooling Capacity

Required capacity = total peak load + O.A. load + supply air fan motor heat. From Figure 2, p. 20, the supply air fan motor heat for 7.78 bhp = 22.1 MBh. Capacity = 321 + 18.23 + 22.1 = 361.3 MBh (30.1 tons)

Step 5 — Determine Unit Capacity

From , unit capacity at 81.5 DB. 67 WB entering the evaporator, 12000 supply air cfm, 95°F entering the condenser is 355 MBh (29.6 tons) 290 sensible MBh.

Step 6 — Determine Leaving Air Temperature

Unit sensible heat capacity, corrected for supply air fan motor heat 290 - 22.1 = 267.9 MBh.

Supply air dry bulb temperature difference = 267.9 MBh ÷ (1.085 x 12,000 cfm) = 20.6°F.

Supply air dry bulb: 81.5 - 20.6 = 60.9.

Unit enthalpy difference = 355 ÷ (4.5 x 12,000) = 6.57 Btu/lb.

Btu/lb leaving enthalpy = h (ent WB) = 31.62 Btu/lb.

Leaving enthalpy = 31.62 Btu/lb - 6.57 Btu/lb = 25.1 Btu/lb.

From Table 7, p. 36, the leaving air wet bulb temperature corresponding to an enthalpy of 25.1 Btu/lb = 58°F.

Leaving air temperatures = 60.9°F/58°F

Heating Capacity Selection

- Winter outdoor design conditions — 0°F.
- Total return air temperature — 72°F.
- Winter outside air minimum ventilation load and cfm — 1,200 cfm and 87.2 MBh.
- Peak heating load 225 MBh.

Utilizing Unit Selection in the Cooling Capacity Procedure

Mixed air temperature = RADB +%O.A. (OADB - RADB) = 72 + (0.10) (0-72) = 64.8°F.

Supply air fan motor heat temperature rise = 20,600 BTU ÷ (1.085 x 12,000) cfm = 1.6°F.

Mixed air temperature entering heat module = 64.8 + 1.6 = 66.4°F.

Total winter heating load = peak heating + ventilation load - total fan motor heat = 225 + 87.2 - 22.1 = 290.1 MBh.

Electric Heating System

Unit operating on 480/60/3 power supply. From Table 21, p. 48, 90 kw may be selected for a nominal 30-ton unit operating on 480-volt power. The high heat module — 90 KW or 307 MBh will satisfy the winter heating load of 290.1 MBh.

shows an air temperature rise of 23.6°F for 12,000 cfm through the 90 kw heat module.

Unit supply temperature at design heating conditions = mixed air temperature + air temperature rise = 66.4 + 23.6 = 90°F.

Natural Gas Heating System

Assume natural gas supply — 1000 Btu/ft3. From Table 22, p. 48 select the high heat module (486 MBh output) to satisfy 290.1 at unit cfm.

Table 22, p. 48 also shows air temperature rise of 37.3°F for 12,000 cfm through heating module.

Unit supply temperature design heating conditions = mixed air temperature + air temperature rise = 66.4 + 37.3 = 103.7°F.

Modulating Hot Gas Reheat Selection

Note: *Please note that hot gas reheat operation will not be allowed when there is a call for cooling or heating.*

Utilize the Trane Select Assist selection program or contact a local Trane sales office to calculate leaving unit air temperature, latent capacity, reheat sensible capacity, leaving unit dew point, and moisture removal when the unit is in hot gas reheat operation.

The hot gas reheat Trane Select Assist selection requires the following customer input values: supply fan airflow, ambient air temperatures, entering air temperatures, and a desired reheat set point temperature. If the conditions provided are not within the reheat operating envelope an error will be generated in the Trane Select Assist program. If the reheat set point is not obtainable at the provided conditions the customer will be required to make adjustments to the conditions or change the reheat set point value.

Air Delivery Procedure

Supply air fan bhp and rpm selection. Unit supply air fan performance shown in Figure 4, p. 49 includes pressure drops for dampers and casing losses. Static pressure drops of accessory components such as heating systems, and filters if used, must be added to external unit static pressure for total static pressure determination.

The supply air fan motor selected in the previous cooling capacity determination example was 7.78 bhp with 676 rpm. Thus, the supply fan motor selected is 7.5 hp.

To select the drive, refer Table 24, p. 51 for a 30-ton unit. Select the appropriate drive for the applicable rpm range. Drive selection letter C with a range of 650 rpm, is required for 676 rpm. Where altitude is significantly above sea level, use Table 8, p. 37, Table 9, p. 37 and Figure 3, p. 37 for applicable correction factors.

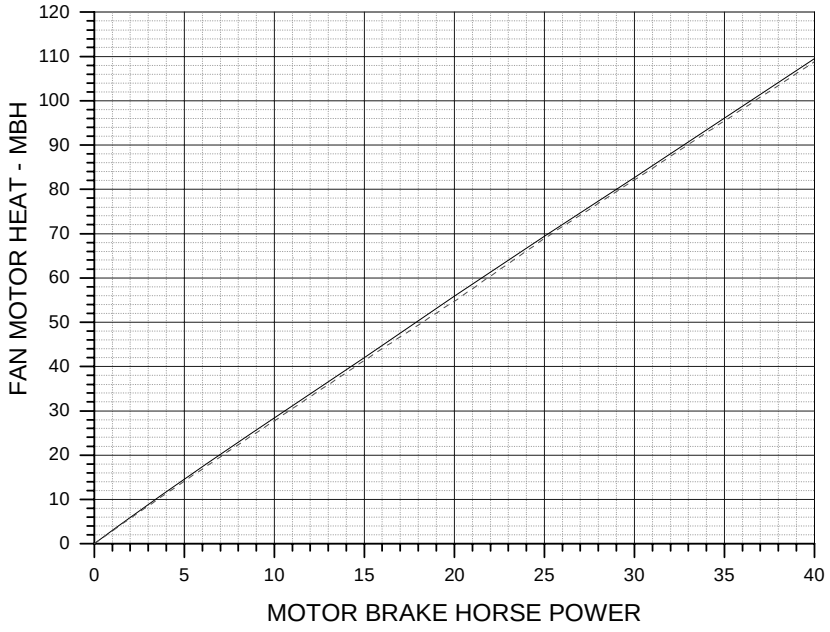
Unit Electrical Requirements

Selection procedures for electrical requirements for wire sizing amps, maximum fuse sizing and dual element fuses are given in the electrical service selection of this catalog.

Unit Designation

After determining specific unit characteristics utilizing the selection procedure and additional job information, the complete unit model number can be developed using the model number nomenclature page.

Figure 2. Fan motor heat



50 Hz Units

Five basic areas:

- Cooling capacity
- Heating capacity
- Air delivery
- Unit electrical requirements
- Unit designation

Cooling Capacity Selection

- Summer design conditions – 95 DB/76 WB (35/24.4°C), 95°F (35°C) entering air to condenser.
- Summer room design conditions – 76 DB/66 WB (24.4/18.9°C).
- Total peak cooling load – 270 MBh (79 kW) (22.5 tons).
- Total peak supply cfm – 10,000 cfm (4720 L/s).
- External static pressure – 1.24 inches wc (310 Pa).
- Return air temperatures – 80 DB/66°F WB (26.7/18.9°C).
- Return air cfm – 3540 cfm (1671 L/s).
- Outside air ventilation cfm and load – 1000 cfm and 15.19 MBh (1.27 tons or 4.45 kW) 472 L/s.
- Unit accessories include:
  - Aluminized heat exchanger – high heat module.
  - 2” Hi-efficiency throwaway filters.
  - Exhaust fan.
  - Economizer cycle.

Step 1 — Determine Nominal Capacity

A summation of the peak cooling load and the outside air ventilation load shows: 22.5 tons + 1.27 tons = 23.77 (79 kW + 4.45 kW = 83.45) required unit capacity. From , 25.4 ton (89 kW) unit capacity at 80 DB/ 67 WB (27/19°C), 95°F entering the condenser and 10,000 total peak supply cfm (4720 L/s) is 297 MBh (24.75 tons).

Step 2 — Determine Supply Fan and Exhaust Fan BHP

Having selected the correct unit, the supply fan and exhaust fan motor bhp must be determined:

Using , determine unit static pressure at design supply cfm:

External static pressure = 1.24 inches (310 Pa)

Heat exchanger = 0.12 inches (30 Pa)

High efficiency filter 2” (50 mm) = 0.18 inches (45 Pa)

Economizer = 0.07 inches (17 Pa)

Unit total static pressure = 1.61 inches (402 Pa)

Using total cfm of 10,000 (4720 L/s) and total static pressure of 1.61 inches (41 mm), refer to Figure 6, p. 74.It shows 5.11 bhp (3.8 kW) with 601 rpm.

Step 3 — Determine Evaporator Coil Entering Air Conditions

- Mixed air dry bulb temperature determination:

Using the minimum percent of OA (1,000 cfm ÷ 10,000 cfm = 10 percent), determine the mixture dry bulb to the evaporator. RADB +% OA (OADB - RADB) = 80 + (0.10) (95 - 80) = 80 + 1.5 = 81.5°F (26.7 + 1.5 = 28°C).

- Approximate Wet Bulb Mixture Temperature:

RAWB + OA (OAWB - RAWB) = 66 + (0.10) (76-66) = 68 + 1 = 67°F.

A psychrometric chart can be used to more accurately determine the mixture temperature to the evaporator coil.

Step 4 — Determine Total Required Unit Cooling Capacity

Required capacity = total peak load + O.A. load + supply air fan motor heat. From Figure 2, p. 20, the supply air fan motor heat for 5.11 bhp = 14 MBh. Capacity = 270 + 15 + 14 = 299 MBh (89 kW)

Step 5 — Determine Unit Capacity

From unit capacity at 81.5 DB/67 WB entering the evaporator, 10,000 supply air cfm, 95°F (35°C) entering the condenser about 298 MBh (87 kW) with 243 MBh (71.1 kW) sensible.

Step 6 — Determine Leaving Air Temperature

Unit sensible heat capacity, corrected for supply air fan motor heat 243 - 14 = 229 MBh (67 kW).

Supply air dry bulb temperature difference = 229 MBh ÷ (1.085 x 10,000 cfm) = 21.1°F (-6.1°C)

Supply air dry bulb: 81.5-21.1 = 60.4 (15.8°C)

Unit enthalpy difference = 298 ÷ (4.5 x 10,000) = 6.62

Btu/lb leaving enthalpy = h (ent WB) = 31.62

Leaving enthalpy = 31.62 Btu/lb - 6.62 Btu/lb = 25 Btu/lb.

From Table 7, p. 36 the leaving air wet bulb temperature corresponding to an enthalpy of 25 Btu/lb = 57.8ºF (14.3ºC).

Leaving air temperatures = 60.4 DB/57.8 WB (15.8/14.3°C).

Heating Capacity Selection

- Winter outdoor design conditions – 0°F (-17.8°C).
- Total return air temperature – 72°F (22.2°C).
- Winter outside air minimum ventilation load and cfm – 1,000 cfm and 87.2 MBh.
- Peak heating load 150 MBh.

Utilizing Unit selection in the Cooling Capacity Procedure

Mixed air temperature = RADB +% O.A. (OADB - RADB) = 72 + (0.10) (0-72) = 64.8°F.

Supply air fan motor heat temperature rise = 20,600 Btu ÷ (1.085 x 10,000) cfm= 1.9°F.

Mixed air temperature entering heat module = 64.8 + 1.9 = 66.7°F.

Total winter heating load = peak heating + ventilation load - total fan motor heat = 150 + 87.2 - 14 = 223.2 MBh.

Electric Heating System

Unit operating on 415 power supply. From , kW may be selected for TE*305 unit to satisfy the winter heating load. The 67 kW module will do the job.

This table also shows an air temperature rise of 21.2°F for 10,000 cfm through the 67 kW heat module.

Unit supply temperature at design heating conditions = mixed air temperature + air temperature rise = 66.7 + 21.2 = 87.9°F.

Air Delivery Procedure

Supply air fan bhp and rpm selection. Unit supply air fan performance shown in Figure 6, p. 74 and Figure 7, p. 74 includes pressure drops for dampers and casing losses. Static pressure drops of accessory components such as heating systems, and filters if used, must be added to external unit static pressure for total static pressure determination.

The supply air fan motor selected in the previous cooling capacity determination example was 5.11 bhp with 601 rpm. Thus, the supply fan motor selected is 7.5 hp.

To select the drive, enter for a 25.4 unit. Select the appropriate drive for the applicable rpm range. Drive selection letter D with a range of 583 rpm, is required for 601 rpm. Where altitude is significantly above sea level, use Table 8, p. 37, Table 9, p. 37 and Figure 3, p. 37 for applicable correction factors.

Unit Electrical Requirements

Selection procedures for electrical requirements for wire sizing amps, maximum fuse sizing and dual element fuses are given in the electrical service selection of this catalog.

Unit Designation

After determining specific unit characteristics utilizing the selection procedure and additional job information, the complete unit model number can be developed using the model number nomenclature page.

Model Number Description

60 Hz Description

Digit 1, 2 — Unit Function

TC = DX Cooling, No Heat
TE = DX Cooling, Electric Heat
YC = DX Cooling, Natural Gas Heat

Digit 3 — Unit Airflow Design

D = Downflow Supply and Upflow Return
H = Horizontal Supply and Horizontal Return
F = Horizontal Supply and Upflow Return
R = Downflow Supply and Horizontal Return

Digit 4, 5, 6 — Nominal Cooling Capacity

330 = 27.5 Tons
360 = 30 Tons
420 = 35 Tons
480 = 40 Tons
600 = 50 Tons

Digit 7 — Major Development Sequence

C = R-410A Refrigerant + Symbio 700

Digit 8 — Power Supply[1]

E = 208/60/3
F = 230/60/3
4 = 460/60/3
5 = 575/60/3

Digit 9 — Heating Capacity[2]

0 = No Heat (TC Only)
L = Low Heat (YC Only)
H = High Heat (YC Only)
J = Low Heat-Stainless Steel Gas Heat Exchanger (YC Only)
K = High Heat-Stainless Steel Gas Heat Exchangers (YC Only)
M = Low Heat-Stainless Steel Gas Heat Exchanger w/ Modulating Control (27.5-35 Tons YC only)
P = High Heat-Stainless Steel Gas Heat Exchangers w/ Modulating Control (27.5-35 Tons YC Only)
R = Low Heat-Stainless Steel Gas Heat Exchanger w/ Modulating Control (40-50 Tons YC Only)
T = High Heat-Stainless Steel Gas Heat Exchangers w/ Modulating Control (40-50 Tons YC Only)

Note: *When second digit is "E" for Electric Heat, the following values apply in the ninth digit.*

A = 36 kW (27 kW for 208V)
B = 54 kW (41 kW for 208V)
C = 72 kW
D = 90 kW
E = 108 kW

Digit 10 — Design Sequence

A = First

Digit 11 — Exhaust[4]

0 = None
1 = Barometric Relief (Available w/ Economizer only)
2 = 100% Power Exhaust Fan (Available w/ Economizer Only)
3 = 50% Power Exhaust Fan (Available w/ Economizer Only)
4 = 100% Fresh Air Tracking Power Exhaust Fan (Available w/ Economizer Only)
5 = 50% Fresh Air Tracking Power Exhaust Fan (Available w/ Economizer Only)
6 = 100% Power Exhaust w/ Statitrac™
7 = 100% Power Exhaust Fan w/ Ultra Low Leak Exhaust Damper (Available w/ Economizer Only)
8 = 50% Power Exhaust Fan w/ Ultra Low Leak Exhaust Damper (Available w/ Economizer Only)
9 = 100% Power Exhaust w/ Ultra Low Leak Exhaust Damper w/ Statitrac™

Digit 12 — Filter

A = 2" MERV 4, Std Eff, Throwaway Filters
B = 2" MERV 8, High Eff, Throwaway Filters
C = 4" MERV 8, High Eff, Throwaway Filters
D = 4" MERV 14, High Eff, Throwaway Filters

Digit 13 — Supply Fan Motor, HP

1 = 7.5 HP
2 = 10 HP
3 = 15 HP
4 = 20 HP
9 = 25 HP

Digit 14 — Supply Air Fan Drive Selections

A = 550 RPM
B = 600 RPM
C = 650 RPM
D = 700 RPM
E = 750 RPM
G = 800 RPM
H = 500 RPM
J = 525 RPM
K = 575 RPM
L = 625 RPM
M = 675 RPM
N = 725 RPM
P = 775 RPM
Q = 825 RPM
R = 850 RPM
S = 900 RPM

Digit 15 — Outside Air Selection

A = No Outside Air
B = 0-25% Manual Damper
C = 0-100% Economizer, Dry Bulb Control
D = 0-100% Economizer, Reference Enthalpy Control
E = 0-100% Economizer, Differential Enthalpy Control
F = "C" Option and Low Leak Fresh Air Damper
G = "D" Option and Low Leak Fresh Air Damper
H = "E" Option and Low Leak Fresh Air Damper
J = "C" Option and Ultra Low Leak Outside Air Damper
K = "D" Option and Ultra Low Leak Outside Air Damper
L = "E" Option and Ultra Low Leak Outside Air Damper
1 = Option "C" with Traq
2 = Option "D" with Traq
3 = Option "E" with Traq
4 = Option "F" with Traq
5 = Option "G" with Traq
6 = Option "H" with Traq
7 = Option "C" with Traq w/ Ultra Low Leak Outside Air Damper
8 = Option "D" with Traq w/ Ultra Low Leak Outside Air Damper
9 = Option "E" with Traq w/ Ultra Low Leak Outside Air Damper

Digit 16 — System Control

8 = Multi-speed Fan
E = Multi-speed Fan w/ Bypass
F = Multi-speed Fan w/ Motor Shaft Grounding Ring
G = Multi-speed Fan w/ Bypass & Motor Shaft Grounding Ring

4 = VAV Supply Air Temperature Control
5 = VAV Supply Air Temperature Control w/Bypass
A = VAV Supply Air Temperature Control w/ Motor Shaft Grounding Ring
B = VAV Supply Air Temperature Control w/ Bypass & Motor Shaft Grounding Ring

6 = Single Zone VAV
7 = Single Zone VAV w/ Bypass
C = Single Zone VAV w/ Motor Shaft Grounding Ring
D = Single Zone VAV w/ Bypass & Motor Shaft Grounding Ring

Note: *Zone sensors are not included with option and must be ordered as a separate accessory.*

Note: *Shaft Grounding ring not available with 25HP motor.*

Miscellaneous Options

Digit 17

0 = No Service Valves

A = Service Valves

Discharge service valves are standard and included in all units.

Digit 18

B = Through the Base Electrical Provision

Digit 19

C = Non-Fused Disconnect Switch w/ External Handle

Digit 20

D = Factory-Powered 15A GFI Convenience Outlet and Non-Fused Disconnect Switch w/ External Handle

Digit 21

E = Field-Powered 15A GFI Convenience Outlet

Digit 22

***** = Unused Digit

Digit 23

G = Ventilation Override

Digit 24

H = Hinged Service Access

Digit 25

H = Condenser Louvered Hail Guards
J = Condenser Coil Guards (standard)

Digit 26

0 = None
K = Advanced Control and LonTalk Comm (LCI)
B = Advanced Control and BACnet/Modbus Comm (BCI)
A = Advanced Control and AirFi Wireless (WCI)

Digit 27

0 = 5kA SCCR
D = High Fault 65kA SCCR Disconnect[5]
E = High Fault 65kA SCCR Disconnect w/Powered Convenience Outlet[5]

Digit 28

0 = Standard Drain Pan
M = Stainless Steel Drain Pan
1 = Standard Drain Pan w/ Condensate Overflow Switch
2 = Stainless Steel Drain Pan w/ Condensate Overflow Switch

Digit 29 — Efficiency/ Condenser Coil Options

0 = Standard Efficiency Unit (eStage)
J = Standard Efficiency Unit (eStage) w/ Corrosion Protected Condenser Coil
K = High Efficiency Unit (eStage)
L = High Efficiency Unit (eStage) w/ Corrosion Protected Condenser Coil

Digit 30 — Not used

Digit 31 — Miscellaneous Options

P = Discharge Temperature Sensor
R = Clogged Filter Switch

Digit 32 — Modulating Hot Gas Reheat Option

T = Modulating Hot Gas Reheat

Digit 33 — Control Expansion Modules

0 = None
A = Symbio 700 XM- 30 Expansion Module
B = Symbio 700 XM- 32 Expansion Module
C = Symbio 700 XM- 30 & XM-32 Expansion Modules
D = Symbio 700 XM- 30 & XM-30 Expansion Modules
E = Symbio 700 XM- 32 & XM-32 Expansion Modules

Model Number Notes

Notes:

1. All voltages are across the line starting only.
2. Electric Heat KW ratings are based upon voltage ratings of 208/240/480/ 600 V. For a 240 V heater derated to 208 V, the resulting kW rating decreases from 36 kW to 27 kW, and from 54 kW to 41 kW. Voltage offerings are shown in following table (see Table 22, p. 56 for additional information).
3. The service digit for each model number contains 33 digits; all 33 digits must be referenced.
4. Ventilation override exhaust mode is not available for the exhaust fan with fresh air tracking power exhaust. VOM is available for the exhaust fan without fresh air tracking power exhaust.
5. 575 VAC option is 25kA.

Tons	Elec. Heater Rated Volt.	KW				
		27/ 36	41/ 54	72	90	108
27.5 to 35	208	x	x			
	240	x	x			
	480	x	x	x	x	
	600		x	x	x	
40 and 50	208		x			
	240		x			
	480		x	x	x	x
	600		x	x	x	x

50 Hz Description

Digit 1, 2 — Unit Function

TC = DX Cooling, No Heat
TE = DX Cooling, Electric Heat

Digit 3 — Unit Airflow Design

D = Downflow Supply and Upflow Return
H = Horizontal Supply and Horizontal Return
F = Horizontal Supply and Upflow Return
R = Downflow Supply and Horizontal Return

Digit 4, 5, 6 — Nominal Cooling Capacity

275 = 22.9 Tons (82 kW)
305 = 25.4 Tons (89 kW)
350 = 29.2 Tons (105 kW)
400 = 33.3 Tons (120 kW)
500 = 41.7 Tons (148 kW)

Digit 7 — Major Development Sequence

C = R-410A Refrigerant + Symbio 700

Digit 8 — Power Supply[1]

C = 380/50/3
D = 415/50/3

Digit 9 — Heating Capacity[2]

Note: *When second digit is "E" for Electric Heat, the following values apply in the ninth digit.*

380V / 415V

A = 23 kW / 27 kW
B = 34 kW / 40 kW
C = 45 kW / 54 kW
D = 56 kW / 67 kW
E = 68 kW / 81 kW

Digit 10 — Design Sequence

A = First

Digit 11 — Exhaust[4]

0 = None
1 = Barometric Relief (Available w/ Economizer only)
2 = 100% Power Exhaust Fan (Available w/ Economizer Only)
3 = 50% Power Exhaust Fan (Available w/ Economizer Only)
4 = 100% Fresh Air Tracking Power Exhaust Fan (Available w/ Economizer Only)
5 = 50% Fresh Air Tracking Power Exhaust Fan (Available w/ Economizer Only)
6 = 100% Power Exhaust w/ Statitrac™
7 = 100% Power Exhaust Fan w/ Ultra Low Leak Exhaust Damper (Available w/ Economizer Only)
8 = 50% Power Exhaust Fan w/ Ultra Low Leak Exhaust Damper (Available w/ Economizer Only)
9 = 100% Power Exhaust w/ Ultra Low Leak Exhaust Damper w/ Statitrac™

Digit 12 — Filter

A = 2" (51mm) MERV 4, Std Eff, Throwaway Filters
B = 2" MERV (51mm) 8, High Eff, Throwaway Filters
C = 4" (102mm) MERV 8, High Eff, Throwaway Filters
D = 4" (102mm) MERV 14, High Eff, Throwaway Filters

Digit 13 — Supply Fan Motor, HP

1 = 7.5 HP (5.6 kW)
2 = 10 HP (7.5 kW)
3 = 15 HP (10 kW)
4 = 20 HP (15 kW)

Digit 14 — Supply Air Fan Drive Selections

A = 458 RPM
B = 500 RPM
C = 541 RPM
D = 583 RPM
E = 625 RPM
G = 664 RPM
H = 417 RPM
J = 437 RPM
K = 479 RPM
L = 521 RPM
M = 562 RPM
N = 604 RPM
P = 646 RPM
R = 708 RPM

Digit 15 — Outside Air Selection

A = No Outside Air
B = 0-25% Manual Damper
C = 0-100% Economizer, Dry Bulb Control
D = 0-100% Economizer, Reference Enthalpy Control
E = 0-100% Economizer, Differential Enthalpy Control
F = "C" Option and Low Leak Fresh Air Damper
G = "D" Option and Low Leak Fresh Air Damper
H = "E" Option and Low Leak Fresh Air Damper
J = "C" Option and Ultra Low Leak Outside Air Damper
K = "D" Option and Ultra Low Leak Outside Air Damper
L = "E" Option and Ultra Low Leak Outside Air Damper
1 = Option "C" with Traq
2 = Option "D" with Traq
3 = Option "E" with Traq
4 = Option "F" with Traq
5 = Option "G" with Traq
6 = Option "H" with Traq
7 = Option "C" with Traq w/ Ultra Low Leak Outside Air Damper
8 = Option "D" with Traq w/ Ultra Low Leak Outside Air Damper
9 = Option "E" with Traq w/ Ultra Low Leak Outside Air Damper

Digit 16 — System Control

8 = Multi-speed Fan
E = Multi-speed Fan w/ Bypass
F = Multi-speed Fan w/ Motor Shaft Grounding Ring
G = Multi-speed Fan w/ Bypass & Motor Shaft Grounding Ring

4 = VAV Supply Air Temperature Control
5 = VAV Supply Air Temperature Control w/Bypass
A = VAV Supply Air Temperature Control w/ Motor Shaft Grounding Ring
B = VAV Supply Air Temperature Control w/ Bypass & Motor Shaft Grounding Ring

6 = Single Zone VAV
7 = Single Zone VAV w/ Bypass
C = Single Zone VAV w/ Motor Shaft Grounding Ring
D = Single Zone VAV w/ Bypass & Motor Shaft Grounding Ring

Note: *Zone sensors are not included with option and must be ordered as a separate accessory.*

Miscellaneous Options

Digit 17

0 = No Service Valves

A = Service Valves

Discharge service valves are standard and included in all units.

Digit 18

B = Through the Base Electrical Provision

Digit 19

C = Non-Fused Disconnect Switch w/ External Handle

Digit 20

***** = Unused Digit

Digit 21

***** = Unused Digit

Digit 22

***** = Unused Digit

Digit 23

G = Ventilation Override

Digit 24

H = Hinged Service Access

Digit 25

H = Condenser Louvered Hail Guards
J = Condenser Coil Guards (standard)

Digit 26

0 = None
K = Advanced Control and LonTalk Comm (LCI)
B = Advanced Control and BACnet/Modbus Comm (BCI)
A = Advanced Control and AirFi Wireless (WCI)

Digit 27

0 = 5kA SCCR
D = High Fault 65kA SCCR Disconnect

Digit 28

0 = Standard Drain Pan
M = Stainless Steel Drain Pan
1 = Standard Drain Pan w/ Condensate Overflow Switch
2 = Stainless Steel Drain Pan w/ Condensate Overflow Switch

Digit 29 — Efficiency/ Condenser Coil Options

0 = Standard Efficiency (eStage) Unit
J = Standard Efficiency (eStage) Unit with Corrosion Protected Condenser Coil
K = High Efficiency Unit (eStage)
L = High Efficiency Unit (eStage) with Corrosion Protected Condenser Coil

Digit 30 — Not used

Digit 31 — Miscellaneous Options

P = Discharge Temperature Sensor
R = Clogged Filter Switch

Digit 32

***** = Unused Digit

Digit 33 — Control Expansion Modules

0 = None
A = Symbio 700 XM- 30 Expansion Module
B = Symbio 700 XM- 32 Expansion Module
C = Symbio 700 XM- 30 & XM-32 Expansion Modules
D = Symbio 700 XM- 30 & XM-30 Expansion Modules
E = Symbio 700 XM- 32 & XM-32 Expansion Modules

Model Number Notes

Notes:

1. All voltages are across the line starting only.
2. Electric Heat KW ratings are based upon voltage ratings of 380/415 V. Heaters A, B, C, D are used with 22.9-29.2 ton (82-105 kW) units only and heaters B, C, D, E are used with 33.3-41.7 ton (120-148 kW) units only.
3. The service digit for each model number contains 33 digits; all 33 digits must be referenced.
4. Ventilation override exhaust mode is not available for the exhaust fan with fresh air tracking power exhaust. VOM is available for the exhaust fan without fresh air tracking power exhaust.

General Data

Table 1. General data - 27.5 - 35 tons (60 Hz)

	27.5 Tons				30 Tons				35 Tons			
Cooling Performance[a] [b]												
Net Capacity/EER/IEER (Multi-speed)/IEER (VAV) - Std Efficiency	CLG:322000/11.0/14.7/14.9 EH:322000/10.9/14.7/14.9 GH(Low):321000/10.8/14.7/14.9 GH(High):321000/10.8/14.5/14.8				CLG:337000/10.7/14.6/14.8 EH:337000/10.6/14.6/14.8 GH(Low):335000/10.4/14.4/14.6 GH(High):336000/10.5/14.3/14.5				CLG:378000/10.4/13.8/13.9 EH:377000/10.3/13.7/13.8 GH(Low):374000/10.1/13.4/13.5 GH(High):376000/10.2/13.4/13.5			
Net Capacity/EER/IEER (Multi-speed)/IEER (VAV) - High Efficiency	CLG:330000/11.5/15.4/15.6 EH:330000/11.5/15.4/15.5 GH(Low):328000/11.2/15.1/15.3 GH(High):328000/11.3/15.0/15.2				CLG:351000/11.4/15.3/15.5 EH:350000/11.3/15.2/15.4 GH(Low):348000/11.0/15.0/15.2 GH(High)349000/11.1/14.9/15.1				CLG:396000/10.8/15.4/15.6 EH:395000/10.7/15.3/15.6 GH(Low):392000/10.4/14.9/15.3 GH(High):394000/10.6/14.9/15.2			
	Two Stage		**Modulating**		**Two Stage**		**Modulating**		**Two Stage**		**Modulating**	
Natural Gas Heat[c] [d]	**Low**	**High**	**Low**	**High**	**Low**	**High**	**Low**	**High**	**Low**	**High**	**Low**	**High**
Heating Input (BTUH)	350000	600000	350000	600000	350000	600000	350000	600000	350000	600000	350000	600000
Heating Output (BTUH)	283500	486000	283500	486000	283500	486000	283500	486000	283500	486000	283500	486000
Steady State Efficiency (%)[e]	81	81	81	81	81	81	81	81	81	81	81	81
No. Burners	1	1	1	1	1	1	1	1	1	1	1	1
No. Stages/Turn down rate	2	2	10:1	10:1	2	2	10:1	10:1	2	2	10:1	10:1
Electric Heat												
kW Range[f]	27-90				27-90				27-90			
Capacity Steps	2				2				2			
Compressor - Std Efficiency												
Qty/Type/Refrigerant/Circuits	3/Scroll/R-410A/1				3/Scroll/R-410A/1				3/Scroll/R-410A/1			
Size (Nominal)	6/9/9				6/10/10				6/11/11			
Unit Capacity Steps (%)	100/75/63/37/25				100/76/62/38/24				100/78/61/39/22			
Compressor - High Efficiency												
Qty/Type/Refrigerant/Circuits	3/Scroll/R-410A/1				3/Scroll/R-410A/1				3/Scroll/R-410A/1			
Size (Nominal)	6/9/9				6/10/10				7/11/11			
Unit Capacity Steps (%)	100/75/63/37/25				100/76/62/38/24				100/76/62/38/24			
Outdoor Coil - Std Efficiency												
Type	Microchannel				Microchannel				Microchannel			
Face Area (sq. ft.)	49.9				49.9				49.9			
Rows	1				1				1			
Outdoor Coil - High Efficiency												
Type	Microchannel				Microchannel				Microchannel			
Face Area (sq. ft.)	49.9				49.9				49.9			
Rows	2				2				2			
Indoor Coil - Std Efficiency												
Tube Size (in.) OD	3/8				3/8				3/8			
Face Area (sq. ft.)	31.7				31.7				31.7			
Rows/Fins Per Foot	4/180				4/180				4/180			
Refrigerant Control	TXV				TXV				TXV			
No. of Circuits	1				1				1			
Drain Connection No./Size (in)	1/1.25				1/1.25				1/1.25			
Type	PVC				PVC				PVC			
Indoor Coil - High Efficiency												
Tube Size (in.) OD	3/8				3/8				3/8			
Face Area (sq. ft.)	31.7				31.7				31.7			
Rows/Fins Per Foot	5/180				5/180				5/180			
Refrigerant Control	TXV				TXV				TXV			
No. of Circuits	1				1				1			
Drain Connection No./Size (in)	1/1.25				1/1.25				1/1.25			
Type	PVC				PVC				PVC			
Outdoor Fan Type	Propeller				Propeller				Propeller			
No. Used/Diameter	3/28.00				3/28.00				3/28.00			

Table 1. General data - 27.5 - 35 tons (60 Hz) (continued)

	27.5 Tons	30 Tons	35 Tons
Drive Type/No. Speeds	Direct/1	Direct/1	Direct/1
CFM	21,200	21,200	21,200
No. Motors/HP/RPM	3/1.0/1140	3/1.0/1140	3/1.0/1140
Indoor Fan Type	FC	FC	FC
No. Used	1	1	1
Diameter/Width (in)	22.38/22.00	22.38/22.00	22.38/22.00
Drive Type/No. Speeds	Belt/1	Belt/1	Belt/1
No. Motors/HP Range	1/7.50-15.00	1/7.50-15.00	1/7.50/10.00-20.00
CFM Range[g]	8250-12100	9000-13200	10500-15400
Exhaust Fan Type	Propeller	Propeller	Propeller
Diameter (in)	26.00	26.00	26.00
Drive Type/No. Speeds/Motor Frame Size	Direct/1/56	Direct/1/56	Direct/1/56
Motor HP/RPM	1.0/1140	1.0/1140	1.0/1140
Filters - Type Furnished	Throwaway	Throwaway	Throwaway
No./ Recommended Size (in)[h]	16/16x20x2	16/16x20x2	16/16x20x2
Min. Outside Air Temp for Mechanical Cooling	0°F	0°F	0°F
Refrigerant Charge - Std Efficiency (Pounds of R-410A)			
Standard	37.8	37.8	38.3
Optional Hot Gas Reheat	40.8	40.8	41.3
Refrigerant Charge - High Efficiency (Pounds of R-410A)			
Standard	48.0	48.0	48.0
Optional Hot Gas Reheat	51.0	51.0	51.0

[a] 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 340/360.

[b] EER and/or IEER are rated at AHRI conditions and in accordance with DOE test procedures. For simplified verification of your specific unit EER/IEER, and capacity at operating conditions, it is strongly recommended that a TOPSS (Trane Official Product Selection System) report be run.

[c] 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 4,500 feet.

[d] Standard gas furnaces: Second Stage is total heating capacity—Second Stage/First Stage; Modulating gas furnaces: High Fire is total heating capacity— High Fire/Low Fire.

[e] Heating Performance is AHRI and DOE certified

[f] Maximum KW @ 208V = 41, @ 240V = 54.

[g] Cooling only CFM range.

[h] Filter dimensions listed are nominal. For actual filter and rack sizes see the Unit Installation, Operation, Maintenance Guide.

Table 2. General data — 40 & 50 tons (60 Hz)

	40 Tons				50 Tons			
Cooling Performance[a] [b]								
Net Capacity/EER/IEER (Multi-speed)/IEER (VAV) - Std Efficiency	CLG:451000/11.2/15.1/15.2 EH:450000/11.1/15.0/15.2 GH(Low):449000/11.0/14.9/15.2 GH(High):447000/10.8/14.7/15.0				CLG:534000/10.5/14.7/14.9 EH:533000/10.3/14.6/14.8 GH(Low):531000/10.2/14.4/14.7 GH(High):528000/10.0/14.1/14.4			
Net Capacity/EER/IEER (Multi-speed)/IEER (VAV) - High Efficiency	CLG:459000/11.3/15.5/15.8 EH:458000/11.2/15.4/15.7 GH(Low):457000/11.1/15.2/15.6 GH(High):455000/10.9/15.0/15.4				CLG:538000/10.4/15.2/15.6 EH:536000/10.2/15.0/15.5 GH(Low):535000/10.1/14.8/15.2 GH(High):532000/9.9/14.5/15.0			
Natural Gas Heat[c] [d]	**Two Stage**		**Modulating**		**Two Stage**		**Modulating**	
	Low	**High**	**Low**	**High**	**Low**	**High**	**Low**	**High**
Heating Input (BTUH)	400000	800000	400000	800000	400000	800000	400000	800000
Heating Output (BTUH)	324000	648000	324000	648000	324000	648000	324000	648000
Steady State Efficiency (%)[e]	81	81	81	81	81	81	81	81
No. Burners	1	2	1	2	1	2	1	2
No. Stages/Turn down rate	2	2	10:1	10:1	2	2	10:1	10:1
Electric Heat								
kW Range[f]	41-108				41-108			
Capacity Steps	2				2			
Compressor - Std Efficiency								
Qty/Type/Refrigerant/Circuits	3/Scroll/R-410A/1				3/Scroll/R-410A/1			
Size (Nominal)	8/13/13				10/15/15			
Unit Capacity Steps (%)	100/77/61/39/23				100/75/62/38/25			
Compressor - High Efficiency								
Qty/Type/Refrigerant/Circuits	3/Scroll/R-410A/1				3/Scroll/R-410A/1			
Size (Nominal)	8/13/13				10/15/15			
Unit Capacity Steps (%)	100/77/61/39/23				100/75/62/38/25			
Outdoor Coil - Std Efficiency								
Type	Microchannel				Microchannel			
Face Area (sq. ft.)	65.4				65.4			
Rows	2				2			
Outdoor Coil - High Efficiency								
Type	Microchannel				Microchannel			
Face Area (sq. ft.)	65.4				65.4			
Rows	2				2			
Indoor Coil - Std Efficiency								
Tube Size (in.) OD	3/8				3/8			
Face Area (sq. ft.)	36.7				36.7			
Rows/Fins Per Foot	5/180				5/180			
Refrigerant Control	TXV				TXV			
No. of Circuits	1				1			
Drain Connection No./Size (in)	1/1.25				1/1.25			
Type	PVC				PVC			
Indoor Coil - High Efficiency								
Tube Size (in.) OD	3/8				3/8			
Face Area (sq. ft.)	36.7				36.7			
Rows/Fins Per Foot	6/180				6/180			
Refrigerant Control	TXV				TXV			
No. of Circuits	1				1			
Drain Connection No./Size (in)	1/1.25				1/1.25			
Type	PVC				PVC			
Outdoor Fan Type	Propeller				Propeller			
No. Used/Diameter	4/28.00				4/28.00			
Drive Type/No. Speeds	Direct/1				Direct/1			
CFM	28,900				28,900			
No. Motors/HP/RPM	4/1.0/1140				4/1.0/1140			
Indoor Fan Type	FC				FC			
No. Used	1				1			

Table 2. General data — 40 & 50 tons (60 Hz) (continued)

	40 Tons	50 Tons
Diameter/Width (in)	25.00/25.00	25.00/25.00
Drive Type/No. Speeds	Belt/1	Belt/1
No. Motors/HP Range	1/10.00-20.00	1/10.00/15.00-25.00
CFM Range[g]	12000-17600	15000-22000
Exhaust Fan Type	Propeller	Propeller
Diameter (in)	28.00	28.00
Drive Type/No. Speeds/Motor Frame Size	Direct/1/56	Direct/1/56
Motor HP/RPM	1.5/1140	1.5/1140
Filters - Type Furnished	Throwaway	Throwaway
No./ Recommended Size (in)[h]	17/16x20x2	17/16x20x2
Min. Outside Air Temp for Mechanical Cooling	0°F	0°F
Refrigerant Charge - Std Efficiency (Pounds of R-410A)		
Standard	61.0	55.6
Optional Hot Gas Reheat	67.1	61.2
Refrigerant Charge - High Efficiency (Pounds of R-410A)		
Standard	64.6	64.0
Optional Hot Gas Reheat	70.7	69.6

[a] 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 340/360.

[b] EER and/or IEER are rated at AHRI conditions and in accordance with DOE test procedures. For simplified verification of your specific unit EER/IEER, and capacity at operating conditions, it is strongly recommended that a TOPSS (Trane Official Product Selection System) report be run.

[c] 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 4,500 feet.

[d] Standard gas furnaces: Second Stage is total heating capacity—Second Stage/First Stage; Modulating gas furnaces: High Fire is total heating capacity— High Fire/Low Fire.

[e] Heating Performance is AHRI and DOE certified

[f] Maximum KW @ 208V = 41, @ 240V = 54.

[g] Cooling only CFM range.

[h] Filter dimensions listed are nominal. For actual filter and rack sizes see the Unit Installation, Operation, Maintenance Guide.

Table 3. Economizer outdoor air damper leakage (of rated airflow) (60 Hz)

	Delta P Across Dampers (in. WC)	
	0.5 (In.)	1.0 (In.)
Standard	1.5%	2.5%
Low Leak	0.5%	1.0%
Ultra Low Leak	0.0%	0.1%

Notes:

1. Standard and Low Leak data based on tests completed in accordance with AMCA Standard 500.
2. Ultra Low Leak dampers are rated AMCA class 1A; leak rate = 3 CFM per sq-ft face area at 1.0" WC.

Table 4. General data — 22.9 - 29.2 tons (50 Hz)

	TC/TE*275 (22.9 Tons)	TC/TE*305 (25.4 Tons)	TC/TE*350 (29.2 Tons)
Cooling Performance[a]			
Nominal Gross Capacity- Std Efficiency	281,000 (82.4 kW)	295,000 (86.3 kW)	333,000 (97.7 kW)
Nominal Gross Capacity- High Efficiency	290,000 (85.1 kW)	309,000 (90.5 kW)	350,000 (102.5 kW)
Compressor - Std Efficiency			
Qty/Type/Refrigerant/Circuits	3/Scroll/R-410A/1	3/Scroll/R-410A/1	3/Scroll/R-410A/1
Size (Nominal)	6/9/9	6/10/10	6/11/11
Unit Capacity Steps (%)	100/75/63/37/25	100/76/62/38/24	100/78/61/39/22
Compressor - High Efficiency, eStage			
Qty/Type/Refrigerant/Circuits	3/Scroll/R-410A/1	3/Scroll/R-410A/1	3/Scroll/R-410A/1
Size (Nominal)	6/9/9	6/10/10	7/11/11
Unit Capacity Steps (%)	100/75/63/37/25	100/76/62/38/24	100/76/62/38/24
Outdoor Coil - Std Efficiency			
Type	Microchannel	Microchannel	Microchannel
Face Area (sq. ft.)	49.9 (4.6)	49.9 (4.6)	49.9 (4.6)
Rows	1	1	1
Outdoor Coil - High Efficiency			
Type	Microchannel	Microchannel	Microchannel
Face Area (sq. ft.)	49.9 (4.6)	49.9 (4.6)	49.9 (4.6)
Rows	2	2	2
Indoor Coil - Std Efficiency			
Tube Size OD - in. (mm)	0.375 (9.5)	0.375 (9.5)	0.375 (9.5)
Face Area - sq. ft (sq. m)	31.7 (2.9)	31.7 (2.9)	31.7 (2.9)
Rows/Fins Per Foot	4/180	4/180	4/180
Refrigerant Control	TXV	TXV	TXV
Drain Connection No./Size - in (mm)	1/1.25 (1/32)	1/1.25 (1/32)	1/1.25 (1/32)
Indoor Coil - High Efficiency			
Tube Size OD - in. (mm)	0.375 (9.5)	0.375 (9.5)	0.375 (9.5)
Face Area - sq. ft (sq. m)	31.7 (2.9)	31.7 (2.9)	31.7 (2.9)
Rows/Fins Per Foot	5/180	5/180	5/180
Refrigerant Control	TXV	TXV	TXV
Drain Connection No./Size - in (mm)	1/1.25 (1/32)	1/1.25 (1/32)	1/1.25 (1/32)
Outdoor Fan Type	Propeller	Propeller	Propeller
No. Used	3	3	3
Diameter - in. (mm)	28.0 (711)	28.0 (711)	28.0 (711)
Drive Type/No. Speeds	Direct/1	Direct/1	Direct/1
CFM (L/s)	17,100 (8070)	17,100 (8070)	17,100 (8070)
No. Motors (RPM)	3 (950)	3 (950)	3 (950)
Motors - HP (kW)	0.75 (0.56)	0.75 (0.56)	0.75 (0.56)
Indoor Fan Type/No. Used	FC/1	FC/1	FC/1
Diameter - in. (mm)	22.4 (568)	22.4 (568)	22.4 (568)
Width - in. (mm)	22.0 (559)	22.0 (559)	22.0 (559)
Drive Type	Belt	Belt	Belt
No. Speeds/No. Motors	1/1	1/1	1/1
Motors - HP (kW)	7.5-10(5.6-7.5)	7.5-15 (5.6-10)	7.5-15 (5.6-10)
Exhaust Fan Type	Propeller	Propeller	Propeller
Diameter - in. (mm)	26.00 (660)	26.00 (660)	26.00 (660)
Drive Type/No. Speeds/Motor Frame Size	Direct/1/56	Direct/1/56	Direct/1/56
Motor - HP (kW)/RPM	0.75 (0.56)/950	0.75 (0.56)/950	0.75 (0.56)/950
Filters - Type Furnished	Throwaway	Throwaway	Throwaway
No.	16	16	16
Recommended Size - in (mm)	16 x 20 x 2 (406 x 508 x 51)	16 x 20 x 2 (406 x 508 x 51)	16 x 20 x 2 (406 x 508 x 51)
Refrigerant Charge - Std Efficiency (Pounds of R-410A)			
Standard	37.8	37.8	38.3
Optional Hot Gas Reheat	40.8	40.8	41.3

Table 4. General data — 22.9 - 29.2 tons (50 Hz) (continued)

	TC/TE*275 (22.9 Tons)	TC/TE*305 (25.4 Tons)	TC/TE*350 (29.2 Tons)
Refrigerant Charge - High Efficiency (Pounds of R-410A)			
Standard	48.0	48.0	48.0
Optional Hot Gas Reheat	51.0	51.0	51.0

(a) Cooling performance is rated at 95°F (35°C) ambient, 80°F (27°C) entering dry bulb, 67°F (19°C) entering wet bulb. Gross capacity does not include the effect of fan motor heat.

Table 5. General data — 33.3 and 41.7 tons (50 Hz)

	TC/TE*400 (33.3 Tons)	TC/TE*500 (41.7 Tons)
Cooling Performance[a]		
Nominal Gross Capacity- Std Efficiency	401,000 (117.5 kW)	472,000 (138.2 kW)
Nominal Gross Capacity- High Efficiency	407,000 (119.4 kW)	485,000 (142.2 kW)
Compressor - Std Efficiency		
Qty/Type/Refrigerant/Circuits	3/Scroll/R-410A/2	3/Scroll/R-410A/2
Size (Nominal)	8/13/13	10/15/15
Unit Capacity Steps (%)	100/77/61/39/23	100/75/62/38/25
Compressor - High Efficiency		
Qty/Type/Refrigerant/Circuits	3/Scroll/R-410A/1	3/Scroll/R-410A/1
Size (Nominal)	8/13/13	10/15/15
Unit Capacity Steps (%)	100/77/61/39/23	100/75/62/38/25
Outdoor Coil - Std Efficiency		
Type	Microchannel	Microchannel
Face Area - sq. ft. (sq. m)	65.4 (6.1)	65.4 (6.1)
Rows	2	2
Outdoor Coil - High Efficiency		
Type	Microchannel	Microchannel
Face Area (sq. ft.)	65.4 (6.1)	65.4 (6.1)
Rows	2	2
Indoor Coil - Std Efficiency		
Tube Size OD - in. (mm)	0.375 (9.5)	0.375 (9.5)
Face Area - sq. ft (sq. m)	36.7 (3.4)	36.7 (3.4)
Rows/Fins Per Foot	5/180	5/180
Refrigerant Control	TXV	TXV
Drain Connection No./Size - in (mm)	1/1.25 (1/32)	1/1.25 (1/32)
Indoor Coil - High Efficiency		
Tube Size OD - in. (mm)	0.375 (9.5)	0.375 (9.5)
Face Area - sq. ft (sq. m)	36.7 (3.4)	36.7 (3.4)
Rows/Fins Per Foot	6/180	6/180
Refrigerant Control	TXV	TXV
Drain Connection No./Size - in (mm)	1/1.25 (1/32)	1/1.25 (1/32)
Outdoor Fan Type	Propeller	Propeller
No. Used	4	4
Diameter - in. (mm)	28.0 (711)	28.0 (711)
Drive Type/No. Speeds	Direct/1	Direct/1
CFM (L/s)	24,900 (11750)	24,900 (11750)
No. Motors (RPM)	4 (950)	4 (950)
Motors - HP (kW)	0.75 (0.56)	0.75 (0.56)
Indoor Fan Type/No. Used	FC/1	FC/1
Diameter - in. (mm)	25.0 (635)	25.0 (635)
Width - in. (mm)	25.0 (635)	25.0 (635)
Drive Type	Belt	Belt
No. Speeds/No. Motors	1/1	1/1
Motors - HP (kW)	10.0-15.0 (7.5-10.0)	10.0-20.0 (7.5-15.0)
Exhaust Fan Type	Propeller	Propeller
Diameter - in. (mm)	28.00 (711)	28.00 (711)
Drive Type/No. Speeds/Motor Frame Size	Direct/1/56	Direct/1/56
Motor - HP (kW)/RPM	1.0 (0.75)/950	1.0 (0.75)/950
Filters - Type Furnished	Throwaway	Throwaway
No.	17	17
Recommended Size - in (mm)	16 x 20 x 2 (406 x 508 x 51)	16 x 20 x 2 (406 x 508 x 51)
Refrigerant Charge - Std Efficiency (Pounds of R-410A)		
Standard	61.0	55.6
Optional Hot Gas Reheat	67.1	61.2
Refrigerant Charge - High Efficiency (Pounds of R-410A)		

Table 5. General data — 33.3 and 41.7 tons (50 Hz) (continued)

	TC/TE*400 (33.3 Tons)	TC/TE*500 (41.7 Tons)
Standard	64.6	64.0
Optional Hot Gas Reheat	70.7	69.6

(a) Cooling performance is rated at 95°F (35°C) ambient, 80°F (27°C) entering dry bulb, 67°F (19°C) entering wet bulb. Gross capacity does not include the effect of fan motor heat.

Table 6. Economizer outdoor air damper leakage (of rated airflow) (50 Hz)

	Delta P Across Dampers (in. WC)	
	0.5 (In.)	**1.0 (In.)**
Standard	1.5%	2.5%
Low Leak	0.5%	1.0%
Ultra Low Leak	0.0%	0.1%

Notes:

1. Standard and Low Leak data based on tests completed in accordance with AMCA Standard 500.
2. Ultra Low Leak dampers are rated AMCA class 1A; leak rate = 3 CFM per sq-ft face area at 1.0" WC.

Performance Adjustment Factors

Table 7. Enthalpy of saturated air

Wet Bulb Temperature		Btu Per lb
°F	°C	
40	4.4	15.23
41	5.0	15.70
42	5.5	16.17
43	6.1	16.66
44	6.7	17.15
45	7.2	17.65
46	7.8	18.16
47	8.3	18.68
48	8.9	19.21
49	9.4	19.75
50	10.0	20.30
51	10.6	20.86
52	11.1	21.44
53	11.7	22.02
54	12.2	22.62
55	12.8	23.22
56	13.3	23.84
57	13.9	24.48
58	14.4	25.12
59	15.0	25.78
60	15.6	26.46
61	16.1	27.15
62	16.7	27.85
63	17.2	28.57
64	17.8	29.31
65	18.3	30.06
66	18.9	30.83
67	19.4	31.62
68	20.0	32.42
69	20.6	33.25
70	21.1	34.09
71	21.7	34.95
72	22.2	35.83
73	22.8	36.74
74	23.3	37.66
75	23.9	38.61

Figure 3. Air density ratios

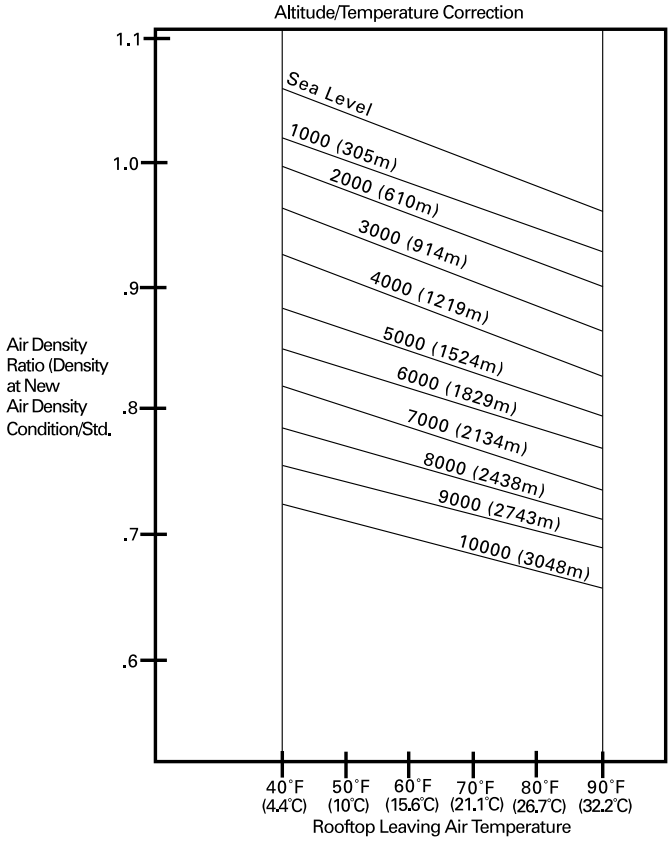


Table 8. Cooling capacity altitude correction factors

	Altitude ft. (m)							
	Sea Level	**1000 (304.8)**	**2000 (609.6)**	**3000 (914.4)**	**4000 (1219.2)**	**5000 (1524.0)**	**6000 (1828.8)**	**7000 (2133.6)**
Cooling Capacity Multiplier	1.00	0.99	0.99	0.98	0.97	0.96	0.95	0.94
KW Correction Multiplier (Compressors)	1.00	1.01	1.02	1.03	1.04	1.05	1.06	1.07
SHR Correction Multiplier	1.00	0.98	0.95	0.93	0.91	0.89	0.87	0.85
Maximum Condenser Ambient	115°F (46.1°C)	114°F (45.6°C)	113°F (45.0°C)	112°F (44.4°C)	111°F (43.9° C)	110°F (43.3°C)	109°F (42.8°C)	108°F (42.2°C)

Note: SHR = Sensible Heat Ratio.

Table 9. Gas heating capacity altitude correction factors

	Altitude ft. (m)								
	Sea Level To 2000 (Sea Level To 609.6)	**2000 To 2999 (609.6 To 914.1)**	**3000 To 3999 (914.4 To 1218.9)**	**4000 To 4999 (1219.2 To 1523.7)**	**5000 To 5999 (1524.0 To 1828.5)**	**6000 To 6999 (1828.8 To 2133.3)**	**7000 To 7999 (2133.6 To 2438.1)**	**8000 To 8999 (2438.4 To 2742.9)**	**9000 To 9999 (2743.2 To 3047.7)**
Capacity Multiplier	1.00	0.96	0.92	0.88	0.84	0.80	0.76	0.72	0.68

Performance Data (60 Hz Units)

Table 10. 27.5 ton standard efficiency, gross cooling capacities (MBh)—60 Hz

CFM	Ent DB (°F)	Ambient Temperature (°F) 85 Entering Wet Bulb Temp (°F) 61 TGC	61 SHC	67 TGC	67 SHC	73 TGC	73 SHC	Ambient Temperature (°F) 95 Entering Wet Bulb Temp (°F) 61 TGC	61 SHC	67 TGC	67 SHC	73 TGC	73 SHC	Ambient Temperature (°F) 105 Entering Wet Bulb Temp (°F) 61 TGC	61 SHC	67 TGC	67 SHC	73 TGC	73 SHC
8000	75	309	241	344	190	374	133	292	232	325	180	353	124	273	222	305	170	330	114
	80	311	282	345	233	374	176	294	272	327	224	354	167	276	262	306	214	330	157
	85	316	316	346	276	375	219	303	303	328	267	354	210	287	287	307	257	330	200
	90	334	334	348	316	375	262	320	320	330	307	354	253	303	303	310	296	329	242
9300	75	320	263	354	202	380	136	302	253	334	193	358	127	282	243	313	183	334	117
	80	323	310	355	252	380	186	305	300	336	243	358	176	286	286	314	233	333	166
	85	335	335	356	302	380	236	320	320	337	289	358	226	303	303	315	279	332	216
	90	353	353	359	348	381	285	337	337	340	338	358	276	318	318	319	319	332	265
10400	75	327	277	360	212	384	138	308	267	340	203	361	129	288	256	317	193	336	119
	80	331	331	361	268	384	194	314	314	341	259	361	184	296	296	318	248	335	174
	85	348	348	362	320	384	249	332	332	343	310	360	240	313	313	320	299	334	229
	90	365	365	366	366	383	305	347	347	347	347	360	295	326	326	326	326	334	285
11000	75	330	286	363	218	386	139	312	276	342	208	363	130	291	265	320	198	338	120
	80	336	336	364	277	386	198	319	319	343	267	362	188	301	301	321	257	335	178
	85	354	354	365	331	385	257	337	337	345	320	361	247	318	318	323	309	334	236
	90	369	369	370	370	385	316	351	351	351	351	362	301	328	328	328	328	334	289
12100	75	336	303	367	227	389	141	317	292	346	218	365	132	296	281	323	207	339	122
	80	345	345	368	292	388	206	328	328	347	277	363	196	309	309	324	266	336	186
	85	363	363	369	350	388	271	345	345	349	340	363	261	324	324	326	326	336	250
	90	376	376	376	376	388	329	356	356	356	356	363	318	331	331	331	331	335	306

CFM	Ent DB (°F)	Ambient Temperature (°F) 118 Entering Wet Bulb Temp (°F) 61 TGC	61 SHC	67 TGC	67 SHC	73 TGC	73 SHC
8000	75	246	205	275	157	296	100
	80	250	248	277	200	295	143
	85	264	264	278	240	294	185
	90	279	279	281	281	294	228
9300	75	254	225	282	169	299	103
	80	262	262	283	219	297	151
	85	278	278	285	263	295	201
	90	290	290	290	290	295	245
10400	75	260	241	286	178	301	105
	80	271	271	287	229	297	159
	85	286	286	289	283	296	214
	90	293	293	293	293	295	262
11000	75	263	249	287	184	302	106
	80	275	275	288	236	297	163
	85	289	289	290	290	296	222
	90	294	294	294	294	294	271
12100	75	267	265	290	193	303	108
	80	282	282	291	250	298	171
	85	293	293	293	293	296	235
	90	294	294	294	294	292	287

Notes:

1. All capacities shown are gross and have not considered indoor fan heat. To obtain net cooling, subtract indoor fan heat.
2. TGC = Total gross capacity.
3. SHC = Sensible heat capacity.

Table 11. 27.5 ton high efficiency, gross cooling capacities (MBh)—60 Hz

CFM	Ent DB (°F)	Ambient Temperature (°F) 85 Entering Wet Bulb Temp (°F) 61 TGC	61 SHC	67 TGC	67 SHC	73 TGC	73 SHC	Ambient Temperature (°F) 95 Entering Wet Bulb Temp (°F) 61 TGC	61 SHC	67 TGC	67 SHC	73 TGC	73 SHC	Ambient Temperature (°F) 105 Entering Wet Bulb Temp (°F) 61 TGC	61 SHC	67 TGC	67 SHC	73 TGC	73 SHC
8000	75	316	238	355	186	395	132	296	225	334	173	371	119	275	211	310	160	345	105
	80	317	281	356	231	396	176	298	268	335	218	373	163	277	254	312	204	347	150
	85	322	322	358	275	396	220	306	306	337	262	374	208	287	287	313	248	348	194
	90	342	342	359	317	397	264	325	325	339	304	374	252	306	306	316	290	349	238
9300	75	328	261	367	200	405	136	308	248	345	187	381	123	285	232	320	173	354	109
	80	331	310	369	252	406	187	311	297	346	238	382	174	289	282	322	224	355	160
	85	344	344	370	303	407	238	326	326	348	288	383	226	306	306	324	273	356	212
	90	365	365	373	352	407	290	346	346	352	338	384	277	325	325	328	324	357	263
10400	75	336	277	375	211	412	139	315	264	352	198	387	126	292	249	327	184	360	112
	80	341	334	377	269	413	196	321	321	354	255	388	183	299	299	328	241	361	169
	85	360	360	379	323	413	253	341	341	356	310	389	240	320	320	331	295	361	226
	90	380	380	383	380	414	310	361	361	361	361	389	297	339	339	339	339	362	284
11000	75	340	287	379	217	415	141	319	273	356	204	390	128	296	258	330	189	362	114
	80	346	346	380	278	416	201	327	327	357	264	391	188	306	306	331	250	363	174
	85	367	367	383	335	416	261	348	348	360	321	391	248	326	326	334	307	364	234
	90	388	388	388	388	416	322	368	368	368	368	392	309	345	345	345	345	365	291
12100	75	347	304	385	228	420	144	325	290	361	214	395	131	302	275	334	200	366	117
	80	357	357	386	294	421	210	337	337	362	278	395	197	316	316	336	263	367	183
	85	379	379	389	357	420	276	359	359	366	343	395	263	336	336	340	328	367	249
	90	399	399	400	400	421	339	378	378	379	379	396	325	354	354	355	355	368	310

CFM	Ent DB (°F)	Ambient Temperature (°F) 118 Entering Wet Bulb Temp (°F) 61 TGC	61 SHC	67 TGC	67 SHC	73 TGC	73 SHC
8000	75	245	193	277	141	308	86
	80	248	235	278	185	310	130
	85	261	261	280	229	311	174
	90	278	278	283	271	312	218
9300	75	254	212	285	153	315	90
	80	259	259	287	205	317	141
	85	277	277	289	253	318	192
	90	295	295	296	296	319	243
10400	75	260	229	291	164	320	93
	80	270	270	292	219	321	150
	85	289	289	296	275	322	207
	90	306	306	307	307	323	260
11000	75	263	238	293	170	322	94
	80	276	276	295	227	323	154
	85	295	295	299	286	324	215
	90	312	312	312	312	325	270
12100	75	268	255	297	180	326	97
	80	284	284	299	242	327	163
	85	303	303	304	304	327	229
	90	319	319	320	320	327	289

Notes:

1. All capacities shown are gross and have not considered indoor fan heat. To obtain net cooling, subtract indoor fan heat.
2. TGC = Total gross capacity.
3. SHC = Sensible heat capacity.

Performance Data (60 Hz Units)

Table 12. 30 ton standard efficiency, gross cooling capacities (Mbh)—60 Hz

CFM	Ent DB (°F)	Ambient Temperature (°F) 85 Entering Wet Bulb Temp (°F) 61 TGC	61 SHC	67 TGC	67 SHC	73 TGC	73 SHC	Ambient Temperature (°F) 95 Entering Wet Bulb Temp (°F) 61 TGC	61 SHC	67 TGC	67 SHC	73 TGC	73 SHC	Ambient Temperature (°F) 105 Entering Wet Bulb Temp (°F) 61 TGC	61 SHC	67 TGC	67 SHC	73 TGC	73 SHC
9000	75	329	262	364	203	393	139	311	252	344	193	371	130	290	241	322	183	346	119
	80	332	308	365	251	393	187	314	298	345	242	371	178	294	286	323	231	346	167
	85	341	341	366	299	393	235	325	325	346	290	371	226	307	307	324	279	346	215
	90	358	358	368	344	393	283	342	342	348	334	371	274	324	324	327	323	346	263
10000	75	338	282	372	214	399	142	319	269	351	204	376	132	298	257	327	193	351	122
	80	342	333	372	269	399	196	323	323	352	259	375	186	303	303	328	248	350	176
	85	356	356	373	320	399	251	339	339	353	310	375	241	320	320	330	298	349	230
	90	373	373	376	373	399	305	355	355	356	356	376	295	335	335	335	335	349	284
11400	75	345	298	377	225	403	144	326	287	356	215	379	135	304	275	332	204	354	124
	80	350	350	378	286	403	205	332	332	357	276	379	195	313	313	333	265	352	184
	85	368	368	379	342	403	266	350	350	358	331	379	256	330	330	335	320	352	245
	90	384	384	384	384	403	327	365	365	365	365	379	317	342	342	343	343	352	300
12000	75	348	306	380	230	405	145	328	295	358	220	381	136	306	284	334	209	355	125
	80	355	355	380	294	405	210	337	337	359	284	380	200	318	318	335	269	353	189
	85	373	373	382	353	405	274	354	354	361	342	380	263	333	333	337	331	353	252
	90	388	388	388	388	405	338	368	368	368	368	381	322	345	345	345	345	353	310
13200	75	354	324	384	241	408	148	334	313	361	230	384	138	311	301	337	220	357	128
	80	364	364	384	311	408	218	346	346	362	296	383	208	325	325	338	284	355	197
	85	381	381	386	374	408	289	362	362	364	364	383	279	340	340	340	340	355	268
	90	395	395	396	396	409	354	374	374	375	375	384	342	350	350	350	350	356	330

CFM	Ent DB (°F)	Ambient Temperature (°F) 118 Entering Wet Bulb Temp (°F) 61 TGC	61 SHC	67 TGC	67 SHC	73 TGC	73 SHC
9000	75	262	227	290	171	311	108
	80	266	273	291	219	311	156
	85	282	288	292	264	310	204
	90	296	303	297	303	310	251
10000	75	268	245	295	182	315	111
	80	277	283	296	236	313	164
	85	292	299	298	286	312	218
	90	305	312	305	312	312	273
11400	75	274	262	298	192	317	113
	80	286	292	299	249	315	173
	85	300	307	302	307	314	233
	90	309	317	309	317	314	288
12000	75	276	271	300	198	318	114
	80	289	296	301	256	316	177
	85	303	310	303	311	314	241
	90	311	319	311	319	315	297
13200	75	280	288	302	208	320	117
	80	295	302	303	271	317	186
	85	307	315	307	315	316	256
	90	315	323	315	323	316	317

Notes:

1. All capacities shown are gross and have not considered indoor fan heat. To obtain net cooling, subtract indoor fan heat.
2. TGC = Total gross capacity.
3. SHC = Sensible heat capacity.

Table 13. 30 ton high efficiency, gross cooling capacities (Mbh)—60 Hz

CFM	Ent DB (°F)	Ambient Temperature (°F) 85 Entering Wet Bulb Temp (°F) 61 TGC	61 SHC	67 TGC	67 SHC	73 TGC	73 SHC	Ambient Temperature (°F) 95 Entering Wet Bulb Temp (°F) 61 TGC	61 SHC	67 TGC	67 SHC	73 TGC	73 SHC	Ambient Temperature (°F) 105 Entering Wet Bulb Temp (°F) 61 TGC	61 SHC	67 TGC	67 SHC	73 TGC	73 SHC
9000	75	340	262	381	204	422	142	319	249	358	190	396	128	296	234	333	175	368	114
	80	343	310	383	253	423	191	322	296	360	240	398	178	299	282	334	225	370	163
	85	351	351	384	303	423	241	333	333	361	290	399	228	313	313	336	275	371	213
	90	372	372	386	351	424	290	353	353	364	337	399	277	332	332	339	322	372	263
10200	75	350	283	391	216	430	145	329	267	368	202	404	132	305	252	341	187	375	117
	80	354	337	393	272	431	201	333	323	369	258	406	188	310	308	343	244	377	173
	85	370	370	394	326	432	257	351	351	371	312	406	244	329	329	345	297	378	229
	90	391	391	398	382	432	313	371	371	375	368	407	300	349	349	350	350	378	285
11400	75	359	301	399	228	437	149	337	286	375	214	411	135	312	271	347	199	381	120
	80	365	363	401	291	438	211	343	343	376	277	412	197	321	321	349	262	382	183
	85	386	386	403	350	438	273	365	365	379	336	412	260	342	342	352	321	383	245
	90	407	407	408	408	438	336	386	386	387	387	413	323	362	362	363	363	384	304
12000	75	363	310	403	234	440	150	340	296	378	220	413	137	315	280	350	205	383	122
	80	370	370	404	300	441	216	350	350	379	286	414	202	327	327	352	268	384	187
	85	393	393	407	362	440	281	372	372	382	348	414	268	348	348	355	332	385	253
	90	414	414	415	415	441	347	392	392	393	393	415	330	368	368	368	368	386	315
13200	75	370	329	408	245	445	153	347	314	383	231	418	140	321	298	355	216	388	125
	80	382	382	410	314	445	225	361	361	385	300	418	212	337	337	357	284	388	197
	85	405	405	413	385	445	297	383	383	388	371	418	284	358	358	361	355	388	269
	90	425	425	426	426	445	365	403	403	403	403	419	351	377	377	377	377	389	335

CFM	Ent DB (°F)	Ambient Temperature (°F) 118 Entering Wet Bulb Temp (°F) 61 TGC	61 SHC	67 TGC	67 SHC	73 TGC	73 SHC
9000	75	264	213	297	155	329	94
	80	267	261	298	205	330	143
	85	284	284	300	253	331	193
	90	302	302	304	301	332	242
10200	75	271	231	304	167	335	97
	80	279	279	305	223	336	153
	85	298	298	308	276	337	209
	90	316	316	317	317	338	262
11400	75	278	250	309	178	339	100
	80	290	290	311	238	340	162
	85	309	309	314	299	341	225
	90	327	327	328	328	342	283
12000	75	280	259	311	184	341	102
	80	295	295	313	246	342	167
	85	314	314	317	310	342	233
	90	332	332	332	332	343	293
13200	75	286	277	315	195	345	105
	80	304	304	318	262	345	177
	85	323	323	323	323	345	244
	90	339	339	340	340	346	313

Notes:

1. All capacities shown are gross and have not considered indoor fan heat. To obtain net cooling, subtract indoor fan heat.
2. TGC = Total gross capacity.
3. SHC = Sensible heat capacity.

Performance Data (60 Hz Units)

Table 14. 35 ton standard efficiency, gross cooling capacities (Mbh)—60 Hz

CFM	Ent DB (°F)	Ambient Temperature (°F) 85 Entering Wet Bulb Temp (°F) 61 TGC	61 SHC	67 TGC	67 SHC	73 TGC	73 SHC	Ambient Temperature (°F) 95 Entering Wet Bulb Temp (°F) 61 TGC	61 SHC	67 TGC	67 SHC	73 TGC	73 SHC	Ambient Temperature (°F) 105 Entering Wet Bulb Temp (°F) 61 TGC	61 SHC	67 TGC	67 SHC	73 TGC	73 SHC
10500	75	373	305	410	235	439	158	353	295	388	225	414	149	331	284	364	214	387	138
	80	376	359	411	292	439	215	356	348	389	282	414	205	335	335	365	271	386	195
	85	388	388	412	348	438	272	371	371	390	338	414	262	351	351	366	324	385	251
	90	407	407	414	401	438	329	389	389	393	391	413	319	368	368	370	370	385	308
11900	75	382	328	418	248	443	161	361	314	395	237	418	151	338	302	370	227	389	140
	80	386	386	418	312	443	225	366	366	396	302	417	215	345	345	370	291	388	204
	85	403	403	419	372	443	290	385	385	397	361	417	279	364	364	372	349	387	268
	90	421	421	423	423	443	354	401	401	402	402	416	344	378	378	379	379	387	332
13300	75	389	346	423	260	447	164	368	335	400	250	420	153	345	323	374	239	391	143
	80	396	396	424	332	446	236	377	377	400	322	419	225	356	356	374	310	389	214
	85	415	415	425	398	446	307	396	396	402	387	419	297	373	373	377	375	388	286
	90	431	431	431	431	446	379	409	409	409	409	419	362	383	383	383	383	388	350
14000	75	392	356	425	266	448	165	371	345	402	256	421	155	347	333	375	245	392	144
	80	401	401	426	341	448	241	382	382	402	331	420	230	361	361	376	314	390	219
	85	420	420	427	410	447	316	400	400	404	399	419	306	376	376	378	378	389	294
	90	435	435	435	435	448	385	412	412	412	412	420	374	385	385	385	385	389	361
15400	75	398	377	429	278	451	168	376	365	405	268	424	158	352	352	378	257	394	147
	80	410	410	429	361	450	251	390	390	405	344	422	240	368	368	379	332	391	229
	85	428	428	431	431	450	334	406	406	408	408	421	323	381	381	381	381	390	312
	90	441	441	441	441	450	409	416	416	416	416	422	397	388	388	388	388	389	384

CFM	Ent DB (°F)	Ambient Temperature (°F) 118 Entering Wet Bulb Temp (°F) 61 TGC	61 SHC	67 TGC	67 SHC	73 TGC	73 SHC
10500	75	301	266	331	200	349	123
	80	307	307	332	256	347	180
	85	325	325	333	308	346	236
	90	339	339	339	339	345	292
11900	75	308	286	335	212	351	126
	80	319	319	336	276	348	189
	85	335	335	338	333	346	253
	90	344	344	344	344	345	310
13300	75	314	307	339	224	352	128
	80	327	327	339	289	348	199
	85	341	341	341	341	346	270
	90	345	345	344	344	345	332
14000	75	316	316	340	230	353	130
	80	331	331	340	298	348	204
	85	343	343	342	342	346	283
	90	345	345	345	345	344	342
15400	75	321	321	342	242	354	132
	80	336	336	342	315	349	214
	85	344	344	344	344	346	296
	90	344	344	344	344	342	342

Notes:

1. All capacities shown are gross and have not considered indoor fan heat. To obtain net cooling, subtract indoor fan heat.
2. TGC = Total gross capacity.
3. SHC = Sensible heat capacity.

Table 15. 35 ton high efficiency, gross cooling capacities (Mbh)—60 Hz

CFM	Ent DB (°F)	Ambient Temperature (°F) 85 Entering Wet Bulb Temp (°F) 61 TGC	61 SHC	67 TGC	67 SHC	73 TGC	73 SHC	Ambient Temperature (°F) 95 Entering Wet Bulb Temp (°F) 61 TGC	61 SHC	67 TGC	67 SHC	73 TGC	73 SHC	Ambient Temperature (°F) 105 Entering Wet Bulb Temp (°F) 61 TGC	61 SHC	67 TGC	67 SHC	73 TGC	73 SHC
10500	75	389	304	434	235	476	160	365	289	408	220	447	145	339	273	378	203	415	129
	80	392	360	435	293	476	218	369	345	409	278	448	203	343	328	380	261	416	187
	85	404	404	437	350	477	276	383	383	411	335	448	261	360	360	382	317	416	245
	90	427	427	439	405	477	333	405	405	414	390	449	319	381	381	385	374	417	303
11900	75	400	328	444	248	484	164	375	310	417	233	455	149	348	293	387	217	422	133
	80	405	390	445	314	484	229	381	375	418	299	455	214	354	354	388	282	422	198
	85	424	424	447	377	484	294	401	401	421	361	455	280	376	376	391	344	422	263
	90	447	447	451	441	485	359	423	423	425	425	456	345	397	397	398	398	423	329
13300	75	409	348	452	262	491	167	384	332	424	246	461	153	356	315	393	230	427	137
	80	416	416	453	335	491	240	393	393	425	320	461	225	368	368	394	303	427	209
	85	440	440	456	404	490	313	417	417	428	388	461	298	390	390	398	371	427	282
	90	462	462	463	463	490	385	438	438	438	438	461	367	410	410	410	410	427	350
14000	75	414	359	455	268	494	169	388	343	427	253	463	154	359	326	396	236	429	138
	80	422	422	457	345	493	245	400	400	429	330	463	231	374	374	397	309	429	214
	85	447	447	459	417	492	322	423	423	432	401	463	307	396	396	401	384	429	291
	90	469	469	469	469	493	398	444	444	444	444	463	379	415	415	415	415	429	362
15400	75	421	380	461	281	499	173	394	364	432	266	468	158	366	347	400	249	433	142
	80	435	435	463	362	497	256	411	411	434	346	467	241	384	384	402	328	432	225
	85	459	459	466	444	496	340	434	434	438	428	466	325	405	405	407	407	432	309
	90	480	480	480	480	497	418	454	454	454	454	467	403	423	423	424	424	432	385

CFM	Ent DB (°F)	Ambient Temperature (°F) 118 Entering Wet Bulb Temp (°F) 61 TGC	61 SHC	67 TGC	67 SHC	73 TGC	73 SHC
10500	75	302	249	337	181	370	108
	80	307	306	339	239	370	165
	85	326	326	341	294	371	223
	90	345	345	346	346	371	280
11900	75	310	270	344	194	375	111
	80	320	320	346	260	376	176
	85	341	341	349	321	375	241
	90	359	359	359	359	376	302
13300	75	317	291	349	207	380	115
	80	332	332	351	276	379	187
	85	352	352	355	347	379	259
	90	369	369	369	369	379	326
14000	75	320	302	352	214	382	116
	80	337	337	354	285	381	192
	85	357	357	358	358	380	270
	90	373	373	373	373	381	337
15400	75	325	323	355	227	385	120
	80	345	345	358	304	384	203
	85	364	364	365	365	383	280
	90	379	379	379	379	383	361

Notes:

1. All capacities shown are gross and have not considered indoor fan heat. To obtain net cooling, subtract indoor fan heat.
2. TGC = Total gross capacity.
3. SHC = Sensible heat capacity.

Performance Data (60 Hz Units)

Table 16. 40 ton standard efficiency, gross cooling capacities (Mbh)—60 Hz

CFM	Ent DB (°F)	Ambient Temperature (°F) 85 Entering Wet Bulb Temp (°F) 61 TGC	61 SHC	67 TGC	67 SHC	73 TGC	73 SHC	Ambient Temperature (°F) 95 Entering Wet Bulb Temp (°F) 61 TGC	61 SHC	67 TGC	67 SHC	73 TGC	73 SHC	Ambient Temperature (°F) 105 Entering Wet Bulb Temp (°F) 61 TGC	61 SHC	67 TGC	67 SHC	73 TGC	73 SHC
12000	75	438	354	490	276	543	194	413	340	463	262	511	180	385	325	432	247	476	165
	80	442	416	493	342	546	261	418	402	466	329	516	248	390	386	435	314	481	233
	85	457	457	494	408	549	328	436	436	468	395	518	314	412	412	437	375	484	300
	90	484	484	498	470	550	394	462	462	472	456	520	381	438	438	443	440	486	366
13600	75	451	381	502	292	554	198	424	362	474	278	521	185	395	346	442	263	485	170
	80	457	450	505	367	558	275	432	432	477	354	526	261	404	404	445	339	491	246
	85	479	479	508	437	560	350	457	457	479	422	529	337	432	432	448	407	494	322
	90	507	507	514	511	561	425	484	484	487	487	531	412	458	458	458	458	495	397
15200	75	461	401	512	308	562	203	434	386	483	294	529	189	404	370	450	279	491	174
	80	470	470	515	392	567	288	445	445	485	378	534	274	420	420	453	363	498	260
	85	498	498	519	468	569	372	474	474	490	453	537	359	448	448	458	437	501	344
	90	528	528	528	528	570	456	503	503	504	504	539	443	475	475	476	476	503	419
16000	75	466	414	517	315	566	205	439	399	486	301	532	191	408	382	453	286	494	176
	80	476	476	520	404	571	295	454	454	489	390	538	281	427	427	456	366	501	266
	85	507	507	524	484	573	383	482	482	495	469	540	370	455	455	462	453	503	355
	90	536	536	537	537	574	471	511	511	512	512	542	449	482	482	483	483	506	433
17600	75	474	438	524	331	572	209	447	423	493	316	537	195	416	406	459	301	499	180
	80	491	491	527	420	577	307	467	467	496	404	544	294	439	439	462	388	506	279
	85	522	522	533	515	579	405	496	496	503	500	546	391	468	468	470	470	508	376
	90	552	552	552	552	580	492	525	525	526	526	548	477	495	495	495	495	511	460

CFM	Ent DB (°F)	Ambient Temperature (°F) 118 Entering Wet Bulb Temp (°F) 61 TGC	61 SHC	67 TGC	67 SHC	73 TGC	73 SHC
12000	75	345	299	388	227	427	145
	80	353	353	391	294	433	213
	85	378	378	394	354	436	280
	90	402	402	403	403	438	346
13600	75	354	323	396	243	434	150
	80	369	369	399	318	441	226
	85	395	395	404	384	444	302
	90	420	420	420	420	446	369
15200	75	362	347	403	258	439	154
	80	383	383	406	333	447	239
	85	409	409	413	413	449	323
	90	434	434	435	435	452	396
16000	75	366	359	406	265	441	156
	80	389	389	410	343	449	246
	85	415	415	417	417	451	334
	90	440	440	441	441	454	410
17600	75	373	373	410	280	445	160
	80	399	399	415	364	453	258
	85	426	426	426	426	455	343
	90	450	450	450	450	458	437

Notes:

1. All capacities shown are gross and have not considered indoor fan heat. To obtain net cooling, subtract indoor fan heat.
2. TGC = Total gross capacity.
3. SHC = Sensible heat capacity.

Table 17. 40 ton high efficiency, gross cooling capacities (Mbh)—60 Hz

CFM	Ent DB (°F)	Ambient Temperature (°F) 85 Entering Wet Bulb Temp (°F) 61 TGC	61 SHC	67 TGC	67 SHC	73 TGC	73 SHC	Ambient Temperature (°F) 95 Entering Wet Bulb Temp (°F) 61 TGC	61 SHC	67 TGC	67 SHC	73 TGC	73 SHC	Ambient Temperature (°F) 105 Entering Wet Bulb Temp (°F) 61 TGC	61 SHC	67 TGC	67 SHC	73 TGC	73 SHC
12000	75	447	358	499	279	551	197	421	344	471	266	519	183	392	324	440	251	484	168
	80	451	420	502	346	555	264	426	406	474	332	525	251	398	390	443	317	490	236
	85	467	467	504	412	557	331	445	445	476	395	527	317	420	420	445	379	493	303
	90	493	493	508	474	559	397	471	471	481	460	529	384	446	446	451	444	494	369
13600	75	460	381	512	296	562	202	433	366	483	282	529	188	403	349	450	266	492	173
	80	466	455	515	371	567	278	440	440	485	357	535	264	413	413	453	342	499	249
	85	489	489	517	441	568	353	467	467	489	426	537	340	441	441	457	410	502	325
	90	518	518	523	515	569	428	494	494	496	496	539	415	467	467	468	468	503	394
15200	75	470	406	522	311	571	206	443	390	491	297	537	192	412	373	458	282	499	177
	80	479	479	525	395	575	291	456	456	494	381	543	277	429	429	461	359	506	262
	85	509	509	529	472	577	375	485	485	499	457	545	361	457	457	466	441	508	347
	90	538	538	539	539	578	459	513	513	514	514	546	438	484	484	485	485	510	422
16000	75	475	418	526	319	574	209	447	403	495	305	540	195	416	385	461	289	502	179
	80	488	488	529	408	579	297	464	464	498	386	546	284	436	436	464	369	509	269
	85	518	518	534	488	580	386	493	493	504	473	548	372	464	464	471	456	511	357
	90	547	547	548	548	581	466	521	521	522	522	550	452	492	492	492	492	513	436
17600	75	484	442	533	334	581	213	456	426	501	320	546	199	424	409	466	304	506	183
	80	502	502	537	424	585	310	477	477	506	408	552	297	449	449	471	391	514	282
	85	533	533	543	519	586	407	507	507	513	503	553	394	478	478	479	479	516	379
	90	562	562	563	563	586	494	535	535	536	536	555	479	504	504	505	505	518	463

CFM	Ent DB (°F)	Ambient Temperature (°F) 118 Entering Wet Bulb Temp (°F) 61 TGC	61 SHC	67 TGC	67 SHC	73 TGC	73 SHC
12000	75	351	302	395	230	435	148
	80	360	360	398	296	441	215
	85	385	385	402	357	444	282
	90	410	410	411	411	446	349
13600	75	361	326	403	245	442	153
	80	377	377	406	314	448	229
	85	403	403	412	388	451	304
	90	428	428	429	429	453	372
15200	75	369	350	409	260	446	157
	80	391	391	414	335	454	242
	85	418	418	420	418	457	326
	90	443	443	443	443	459	399
16000	75	373	361	412	268	448	159
	80	397	397	417	346	457	248
	85	424	424	425	425	459	327
	90	449	449	449	449	461	412
17600	75	380	380	417	283	451	163
	80	408	408	423	367	461	261
	85	435	435	435	435	463	345
	90	459	459	459	459	465	439

Notes:

1. All capacities shown are gross and have not considered indoor fan heat. To obtain net cooling, subtract indoor fan heat.
2. TGC = Total gross capacity.
3. SHC = Sensible heat capacity.

Performance Data (60 Hz Units)

Table 18. 50 ton standard efficiency, gross cooling capacities (MBh)—60 Hz

CFM	Ent DB (°F)	Ambient Temperature (°F) 85 Entering Wet Bulb Temp (°F) 61 TGC	61 SHC	67 TGC	67 SHC	73 TGC	73 SHC	Ambient Temperature (°F) 95 Entering Wet Bulb Temp (°F) 61 TGC	61 SHC	67 TGC	67 SHC	73 TGC	73 SHC	Ambient Temperature (°F) 105 Entering Wet Bulb Temp (°F) 61 TGC	61 SHC	67 TGC	67 SHC	73 TGC	73 SHC
15000	75	529	435	588	335	643	229	501	420	556	320	607	213	469	403	520	303	567	197
	80	533	513	590	418	643	312	506	498	558	402	608	297	475	475	522	386	568	280
	85	553	553	591	500	644	395	528	528	560	485	608	380	501	501	525	469	568	363
	90	583	583	596	578	644	477	558	558	565	562	609	462	529	529	532	532	569	446
17000	75	542	468	600	354	652	233	512	453	567	339	615	218	480	430	530	322	574	202
	80	549	549	602	448	652	327	521	521	569	432	615	312	491	491	532	416	574	296
	85	577	577	604	542	653	421	551	551	572	520	616	406	521	521	536	502	574	389
	90	608	608	612	612	653	515	580	580	581	581	616	499	548	548	549	549	574	483
19000	75	553	495	610	373	659	238	523	478	576	357	621	223	489	461	538	340	579	206
	80	564	564	612	478	659	343	538	538	577	462	621	327	508	508	540	445	579	311
	85	597	597	615	575	659	447	569	569	582	559	621	432	537	537	545	541	578	415
	90	627	627	628	628	659	552	597	597	598	598	620	536	563	563	563	563	578	510
20000	75	558	510	614	382	662	240	527	494	579	367	624	225	493	475	541	350	581	208
	80	572	572	616	492	662	350	546	546	581	477	623	335	515	515	543	460	580	318
	85	606	606	620	594	661	460	577	577	586	578	622	445	544	544	549	549	579	428
	90	635	635	636	636	661	570	604	604	604	604	622	555	568	568	568	568	579	527
22000	75	567	541	621	401	667	244	536	524	586	385	628	229	501	501	547	368	585	213
	80	589	589	623	522	666	366	560	560	588	498	627	350	528	528	549	479	583	333
	85	621	621	628	628	665	487	590	590	594	594	625	471	556	556	556	556	581	454
	90	648	648	648	648	667	598	614	614	615	615	626	580	576	576	576	576	582	561

CFM	Ent DB (°F)	Ambient Temperature (°F) 118 Entering Wet Bulb Temp (°F) 61 TGC	61 SHC	67 TGC	67 SHC	73 TGC	73 SHC
15000	75	425	376	471	281	511	175
	80	434	434	473	363	511	257
	85	461	461	476	440	511	340
	90	487	487	487	487	511	422
17000	75	435	406	479	299	516	179
	80	452	452	481	393	516	273
	85	479	479	486	478	515	366
	90	502	502	502	502	515	451
19000	75	443	436	485	318	520	184
	80	466	466	487	414	518	287
	85	492	492	493	493	517	392
	90	511	511	511	511	517	484
20000	75	447	447	488	327	522	186
	80	472	472	490	427	519	295
	85	497	497	497	497	517	404
	90	514	514	514	514	517	501
22000	75	454	454	492	345	525	190
	80	482	482	495	454	521	310
	85	505	505	506	506	519	431
	90	518	518	518	518	518	518

Notes:

1. All capacities shown are gross and have not considered indoor fan heat. To obtain net cooling, subtract indoor fan heat.
2. TGC = Total gross capacity.
3. SHC = Sensible heat capacity.

Table 19. 50 ton high efficiency, gross cooling capacities (MBh)—60 Hz

CFM	Ent DB (°F)	Ambient Temperature (°F) 85 Entering Wet Bulb Temp (°F) 61 TGC	61 SHC	67 TGC	67 SHC	73 TGC	73 SHC	Ambient Temperature (°F) 95 Entering Wet Bulb Temp (°F) 61 TGC	61 SHC	67 TGC	67 SHC	73 TGC	73 SHC	Ambient Temperature (°F) 105 Entering Wet Bulb Temp (°F) 61 TGC	61 SHC	67 TGC	67 SHC	73 TGC	73 SHC
15000	75	538	442	595	341	647	235	508	421	561	326	610	221	476	403	526	310	569	204
	80	543	518	598	424	653	319	515	502	565	409	617	304	484	484	528	393	577	289
	85	565	565	600	501	655	402	539	539	568	484	619	387	511	511	532	467	580	372
	90	595	595	606	582	656	485	568	568	574	566	621	470	539	539	540	540	581	454
17000	75	551	467	607	360	658	241	521	450	572	345	620	226	487	432	535	329	577	209
	80	559	559	610	454	664	335	531	531	576	439	627	320	501	501	538	413	586	305
	85	589	589	614	539	665	429	561	561	581	522	629	414	531	531	544	504	588	398
	90	620	620	622	622	666	522	591	591	592	592	630	498	559	559	560	560	590	480
19000	75	562	496	617	379	666	246	531	479	581	364	627	231	497	461	542	347	583	214
	80	576	576	620	474	672	351	548	548	585	457	634	336	517	517	547	438	593	320
	85	609	609	625	576	673	456	580	580	591	559	636	441	547	547	554	541	595	425
	90	640	640	641	641	675	548	610	610	610	610	638	532	576	576	576	576	597	514
20000	75	567	511	621	388	670	248	536	494	585	373	629	233	501	475	545	356	585	217
	80	585	585	624	487	676	359	556	556	589	470	638	344	524	524	550	451	595	328
	85	618	618	630	595	677	469	588	588	596	578	639	454	555	555	558	558	597	439
	90	648	648	649	649	678	565	617	617	618	618	641	548	582	582	583	583	599	530
22000	75	576	540	628	407	675	253	544	522	591	391	634	238	509	503	550	374	588	221
	80	600	600	632	513	682	375	570	570	596	495	643	360	537	537	557	476	600	344
	85	633	633	639	632	682	495	602	602	605	605	644	481	567	567	568	568	602	445
	90	663	663	663	663	684	598	630	630	631	631	646	581	594	594	594	594	604	563

CFM	Ent DB (°F)	Ambient Temperature (°F) 118 Entering Wet Bulb Temp (°F) 61 TGC	61 SHC	67 TGC	67 SHC	73 TGC	73 SHC
15000	75	431	378	476	288	514	183
	80	443	443	478	362	522	267
	85	470	470	483	443	525	350
	90	496	496	497	497	527	422
17000	75	441	407	483	307	520	188
	80	460	460	487	388	529	283
	85	487	487	493	479	532	377
	90	514	514	514	514	534	456
19000	75	449	435	489	325	525	193
	80	474	474	494	412	535	299
	85	502	502	503	503	537	404
	90	527	527	528	528	540	488
20000	75	453	448	491	334	526	195
	80	480	480	497	424	537	307
	85	508	508	508	508	540	397
	90	533	533	533	533	542	504
22000	75	461	461	495	352	529	200
	80	490	490	503	449	541	323
	85	518	518	519	519	544	418
	90	542	542	542	542	546	536

Notes:

1. All capacities shown are gross and have not considered indoor fan heat. To obtain net cooling, subtract indoor fan heat.
2. TGC = Total gross capacity.
3. SHC = Sensible heat capacity.

Performance Data (60 Hz Units)

Table 20. Electric heat air temperature rise—60 Hz

KW Input	Total MBH	CFM														
		8000	9000	1000-0	1100-0	1200-0	1300-0	1400-0	1500-0	1600-0	1700-0	1800-0	1900-0	2000-0	2100-0	2200-0
36	123	14.2	12.6	11.3	10.3	9.5	8.7	8.1	7.6	—	—	—	—	—	—	—
54	184	21.3	18.9	17.0	15.5	14.2	13.1	12.2	11.3	10.6	10.0	9.5	9.0	8.5	8.1	7.7
72	246	28.4	25.2	22.7	20.6	18.9	17.4	16.2	15.1	14.2	13.3	12.6	11.9	11.3	10.8	10.3
90	307	35.4	31.5	28.4	25.8	23.6	21.8	20.3	18.9	17.7	16.7	15.8	14.9	14.2	13.5	12.9
108	369	—	—	—	—	28.4	26.2	24.3	22.7	21.3	20.0	18.9	17.9	17.0	16.2	15.5

Table 21. Available electric heat KW ranges—60 Hz

Nominal Unit Size Tons	Electric Heat Rated Voltage			
	208	240	480	600
27.5	27-41	36-54	36-90	54-90
30.0	27-41	36-54	36-90	54-90
35.0	27-41	36-54	36-90	54-90
40.0	41	54	54-108	54-108
50.0	41	54	54-108	54-108

Notes:

1. kW ranges in this table are based on heater operating at 208, 240, 480, and 600 volts.
2. For other than rated voltage, kW = (Applied Voltage/Rate Voltage)2 x Rated kW.
3. Electric heaters up to 54 kW are single element heaters, those above 54 kW are dual element heaters.

Table 22. Gas input/output ranges—60 Hz

Tonnage	Gas Type	Heat option	Two-Stage[a]		Modulating		Air Temp. Rise (ºF)
			Input (MBh)	Output (MBh)	Input Range (MBh)	Output Range (MBh)	
27.5 - 35	Natural	Low	350/263	284/213	35-350	28-284	10-40
		High	600/396	486/321	60-600	49-486	25-55
40-50		Low	400/300	324/243	40-400	32-324	5-35
		High	800/600	648/486	80-800	65-648	20-50
27.5 - 35	LP	Low	350/263	284/213	58–350	47–284	10–40
		High	600/396	486/321	86–515[b]	70–417[b]	25–55
40-50		Low	400/300	324/243	67–400	54–324	5–35
		High	800/600	648/486	133–800	108–648	20–50

[a] Second stage/ first stage

[b] The 600MBH Mod option derates to 515MBH

Figure 4. Supply fan performance—27.5 -35 ton—60 Hz

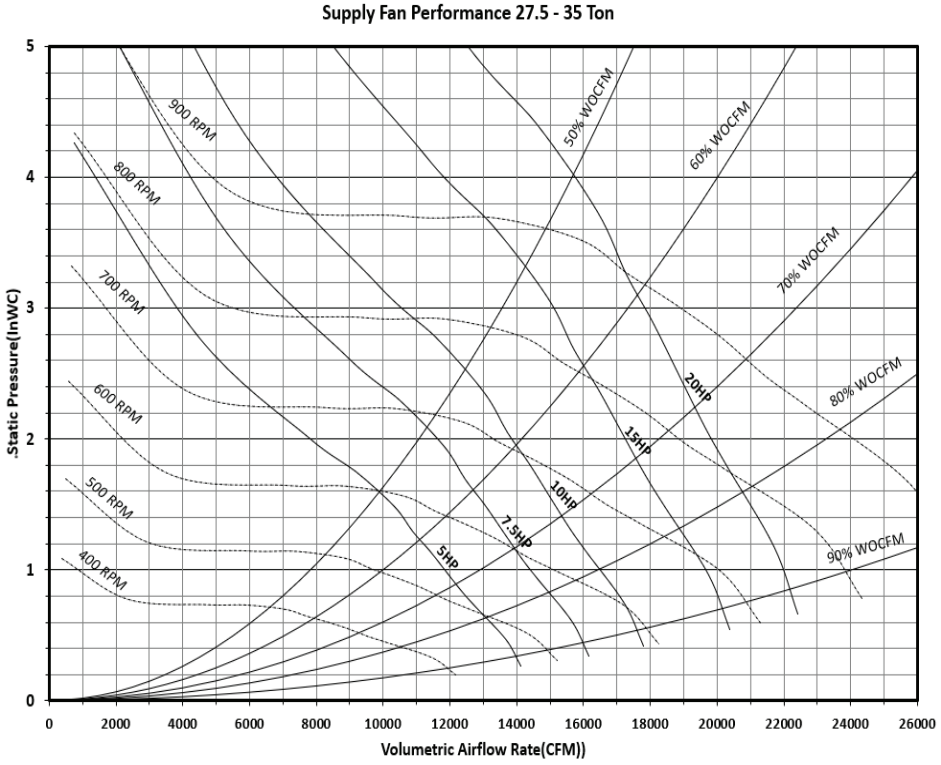


Figure 5. Supply fan performance — 40 and 50 ton—60 Hz

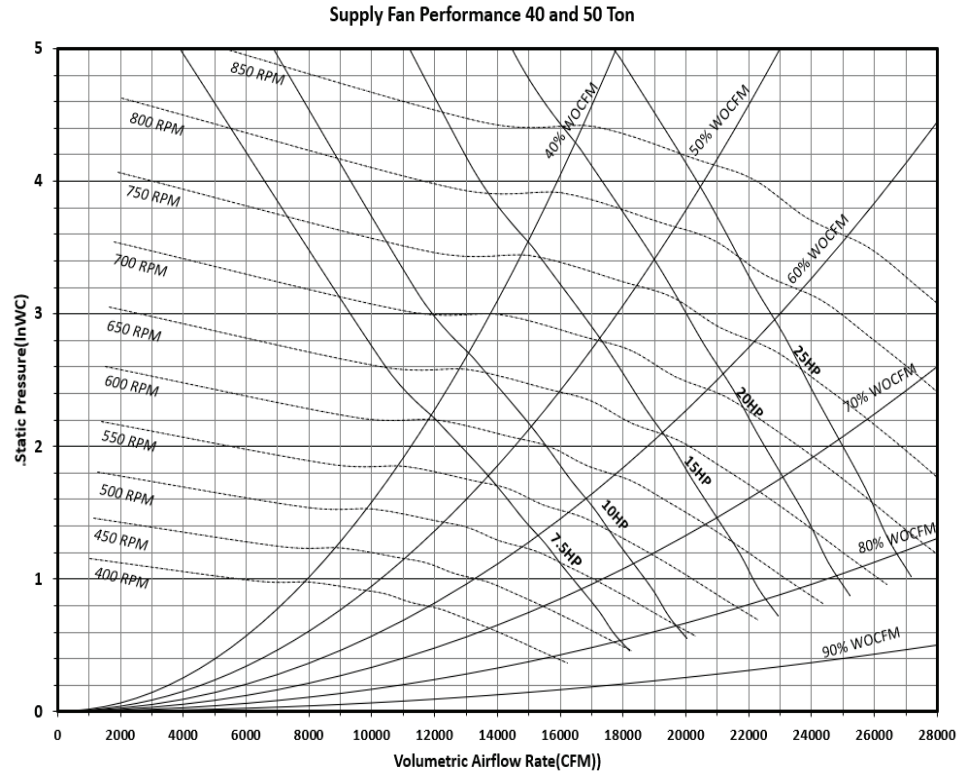


Table 23. Component static pressure drops (in. W.G.) — 60 Hz

Nom. Tons	CFM Std Air	Heating System				Standard Efficiency ID Coil		High Efficiency ID Coil		Filters				Econo-mizer	Hot Gas Reheat Coil
		Gas Heat		Electric Heat						Throw-away	MERV 8 High Eff		MERV 14 High Eff		
		Low	High	1 Ele-ment	2 Ele-ments	Dry	Wet	Dry	Wet	2"	2"	4"	4"		
27.5	8000	0.26	0.23	0.05	0.06	0.16	0.25	0.20	0.31	0.07	0.10	0.09	0.24	0.04	0.08
	9000	0.34	0.25	0.07	0.07	0.19	0.29	0.24	0.36	0.08	0.11	0.11	0.28	0.04	0.10
	10000	0.42	0.26	0.08	0.09	0.23	0.35	0.29	0.43	0.09	0.12	0.12	0.32	0.05	0.12
	11000	0.50	0.28	0.10	0.11	0.27	0.40	0.34	0.49	0.11	0.13	0.14	0.37	0.06	0.14
	12000	0.60	0.29	0.12	0.13	0.31	0.45	0.39	0.56	0.12	0.15	0.16	0.41	0.07	0.17
30	9000	0.34	0.25	0.07	0.07	0.19	0.29	0.24	0.36	0.08	0.11	0.11	0.28	0.04	0.10
	10000	0.42	0.26	0.08	0.09	0.23	0.35	0.29	0.43	0.09	0.12	0.12	0.32	0.05	0.12
	11000	0.50	0.28	0.10	0.11	0.27	0.40	0.34	0.49	0.11	0.13	0.14	0.37	0.06	0.14
	12000	0.60	0.29	0.12	0.13	0.31	0.45	0.39	0.56	0.12	0.15	0.16	0.41	0.07	0.17
	13000	0.71	0.31	0.14	0.15	0.36	0.51	0.44	0.63	0.14	0.16	0.18	0.46	0.09	0.20
35	10500	0.46	0.27	0.09	0.10	0.25	0.37	0.31	0.46	0.10	0.13	0.13	0.35	0.06	0.13
	11500	0.55	0.29	0.11	0.12	0.29	0.42	0.36	0.53	0.11	0.14	0.15	0.39	0.07	0.16
	12500	0.65	0.30	0.13	0.14	0.33	0.48	0.41	0.60	0.13	0.16	0.17	0.44	0.08	0.18
	13500	0.76	0.32	0.15	0.16	0.38	0.53	0.48	0.66	0.15	0.17	0.19	0.49	0.10	0.22
	14500	0.88	0.33	0.18	0.19	0.42	0.59	0.53	0.74	0.16	0.19	0.21	0.54	0.11	0.25
	15400	1.00	0.35	0.20	0.21	0.46	0.64	0.57	0.80	0.18	0.21	0.23	0.59	0.12	0.28
40	12000	0.27	0.49	0.08	0.13	0.30	0.45	0.36	0.54	0.11	0.14	0.14	0.38	0.07	0.06
	13000	0.30	0.54	0.10	0.15	0.35	0.51	0.42	0.61	0.13	0.16	0.16	0.43	0.08	0.07
	14000	0.33	0.59	0.11	0.18	0.39	0.58	0.47	0.68	0.14	0.18	0.18	0.47	0.09	0.08
	15000	0.37	0.64	0.13	0.20	0.44	0.63	0.53	0.76	0.16	0.20	0.20	0.52	0.10	0.09
	16000	0.40	0.70	0.15	0.23	0.49	0.69	0.59	0.83	0.17	0.22	0.22	0.57	0.11	0.10
	17000	0.43	0.75	0.17	0.26	0.54	0.75	0.65	0.90	0.19	0.25	0.25	0.62	0.12	0.11
50	15000	0.37	0.64	0.13	0.20	0.44	0.63	0.53	0.76	0.16	0.20	0.20	0.52	0.10	0.09
	16000	0.40	0.70	0.15	0.23	0.49	0.69	0.59	0.83	0.17	0.22	0.22	0.57	0.11	0.10
	17000	0.43	0.75	0.17	0.26	0.54	0.75	0.65	0.90	0.19	0.25	0.25	0.62	0.12	0.11
	18000	0.47	0.80	0.19	0.29	0.59	0.82	0.71	0.98	0.21	0.27	0.27	0.67	0.14	0.13
	19000	0.50	0.85	0.21	0.32	0.65	0.89	0.78	1.07	0.22	0.30	0.30	0.73	0.16	0.14
	20000	0.54	0.91	0.23	0.36	0.71	0.96	0.85	1.15	0.24	0.33	0.33	0.79	0.18	0.16
	21000	0.58	0.96	0.25	0.39	0.76	1.03	0.92	1.23	0.26	0.36	0.36	0.85	0.21	0.18
	22000	0.62	1.01	0.27	0.42	0.82	1.09	0.98	1.31	0.28	0.39	0.39	0.91	0.24	0.20

Note: Static pressure drops of accessory components must be added to external static pressure to enter fan selection tables.

Table 24. Supply air fan drive selections—60 Hz

Nominal Tons	7.5 HP		10 HP		15 HP		20 HP		25 HP	
	RPM	Drive No.	RPM	Drive No.	RPM	Drive No.	RPM	Drive No.	RPM	Drive No.
27.5	550	A								
	600	B								
	650	C								
			700	D						
			750	E						
			800	G	800	G				
					850	R				
30	550	A								
	600	B								
	650	C								
			700	D						
			750	E	750	E				
					800	G				
					850	R				
					900	S				
35	600	B								
			650	C						
			700	D	700	D				
			750	E	750	E				
					800	G				
					850	R	850	R		
							900	S		
40			500	H						
			525	J						
			575	K						
					625	L				
					675	M				
					725	N	725	N		
							775	P		
							800	G		
50			525	J						
			575	K						
					625	L				
					675	M	675	M		
					725	N	725	N	725	N
							775	P	775	P
									825	Q

Table 25. Power exhaust fan performance—27.5-35 ton—60 Hz

	Power Exhaust Selection			
	50%		100%	
	Damper Open Position			
	min	max	min	max
Return Duct Static (in. wc)	CFM			
0.0	3812	6866	7624	13742
0.1	3497	5296	6995	10591
0.2	3190	4458	6325	9000
0.3	2884	3812	5768	7635
0.4	2621	3359	5241	6719
0.5	2342	2885	4683	5771

Note: These values are the minimum and maximum positions for non-tracking power exhaust. Fresh air tracking and Statitrac options can fully close the exhaust dampers in their operation, and are thus able to reach lower airflows. Statitrac requires 100% power exhaust.

Table 26. Power exhaust fan performance—40-50—60 Hz

	Power Exhaust Selection			
	50%		100%	
	Damper Open Position			
	min	max	min	max
Return Duct Static (in. wc)	CFM			
0.0	4854	8035	9708	16069
0.1	4575	7410	9151	14820
0.2	4262	6450	8552	13496
0.3	4011	6027	8021	12054
0.4	3718	5526	7436	11051
0.5	3467	5186	6933	10373

Note: These values are the minimum and maximum positions for non-tracking power exhaust. Fresh air tracking and Statitrac options can fully close the exhaust dampers in their operation, and are thus able to reach lower airflows. Statitrac requires 100% power exhaust.

Performance Data (50Hz Units)

Table 27. 22.9 ton standard efficiency, gross cooling capacities (MBh) — 50Hz

ID Airflow CFM	Ent DB (°F)	Ambient Temperature (°F) 85 Entering Wet Bulb Temp (°F) 61 TGC	61 SHC	67 TGC	67 SHC	73 TGC	73 SHC	Ambient Temperature (°F) 95 Entering Wet Bulb Temp (°F) 61 TGC	61 SHC	67 TGC	67 SHC	73 TGC	73 SHC	Ambient Temperature (°F) 105 Entering Wet Bulb Temp (°F) 61 TGC	61 SHC	67 TGC	67 SHC	73 TGC	73 SHC
6900	75	255	202	284	158	308	109	241	194	268	150	290	101	224	185	250	141	270	92
	80	257	237	285	195	308	146	243	229	269	187	290	138	227	220	252	178	269	129
	85	264	264	286	232	307	182	252	252	270	224	289	174	238	238	253	213	268	165
	90	279	279	288	266	307	219	266	266	272	258	289	211	252	252	255	249	268	202
7700	75	261	215	290	165	311	110	246	205	273	157	293	102	230	195	255	148	272	94
	80	264	254	291	207	311	151	250	246	274	199	292	143	234	234	256	190	270	134
	85	275	275	292	246	310	192	262	262	276	237	291	184	248	248	257	228	270	175
	90	290	290	294	286	310	234	276	276	278	277	291	225	260	260	260	260	270	216
8700	75	268	229	295	174	314	112	253	220	278	166	295	104	236	210	259	157	274	96
	80	272	272	296	221	313	158	258	258	279	213	294	150	243	243	260	204	272	141
	85	287	287	297	264	314	205	273	273	281	255	294	197	257	257	262	246	271	188
	90	300	300	300	300	314	252	285	285	285	285	294	239	266	266	266	266	271	229
9100	75	271	235	297	178	315	113	255	226	280	170	296	105	238	216	261	161	275	96
	80	275	275	298	227	315	161	262	262	281	219	295	153	246	246	262	206	272	144
	85	291	291	299	271	315	210	276	276	282	263	295	202	260	260	263	253	272	193
	90	303	303	303	303	315	255	287	287	287	287	295	246	267	267	267	267	271	235
10000	75	275	248	300	186	318	115	259	239	283	178	298	107	242	229	263	169	276	98
	80	283	283	301	236	317	168	269	269	284	227	297	160	253	253	264	217	274	151
	85	298	298	302	287	317	222	282	282	285	278	296	213	265	265	265	265	272	204
	90	308	308	308	308	317	270	290	290	290	290	296	260	270	270	270	270	271	249

ID Airflow CFM	Ent DB (°F)	Ambient Temperature (°F) 118 Entering Wet Bulb Temp (°F) 61 TGC	61 SHC	67 TGC	67 SHC	73 TGC	73 SHC
6900	75	202	171	225	129	241	80
	80	205	205	226	166	239	116
	85	218	218	228	200	238	153
	90	230	230	230	230	237	189
7700	75	206	182	229	136	242	82
	80	213	213	230	177	239	121
	85	226	226	231	214	238	162
	90	236	236	236	236	238	199
8700	75	211	197	232	145	244	84
	80	221	221	233	187	240	129
	85	233	233	234	232	239	175
	90	237	237	237	237	237	214
9100	75	213	203	233	148	245	84
	80	224	224	234	192	240	131
	85	235	235	235	235	238	180
	90	237	237	237	237	236	220
10000	75	217	216	235	156	246	86
	80	229	229	236	203	241	138
	85	237	237	237	237	238	183
	90	236	236	235	235	235	233

Notes:

1. All capacities shown are gross and have not considered indoor fan heat. To obtain net cooling, subtract indoor fan heat.
2. TGC = Total gross capacity.
3. SHC = Sensible heat capacity.

Performance Data (50Hz Units)

Table 28. 22.9 ton high efficiency, gross cooling capacities (MBh) — 50Hz

ID Airflow CFM	Ent DB (°F)	Ambient Temperature (°F) 85 Entering Wet Bulb Temp (°F) 61 TGC	61 SHC	67 TGC	67 SHC	73 TGC	73 SHC	Ambient Temperature (°F) 95 Entering Wet Bulb Temp (°F) 61 TGC	61 SHC	67 TGC	67 SHC	73 TGC	73 SHC	Ambient Temperature (°F) 105 Entering Wet Bulb Temp (°F) 61 TGC	61 SHC	67 TGC	67 SHC	73 TGC	73 SHC
6900	75	259	197	292	153	324	106	242	186	274	142	304	95	224	174	253	129	281	82
	80	261	234	293	191	325	144	244	223	275	180	305	133	226	210	254	168	283	120
	85	267	267	294	229	325	182	252	252	276	218	306	171	236	236	256	206	283	159
	90	284	284	296	266	326	220	268	268	278	254	306	209	252	252	258	242	284	196
7700	75	267	211	299	162	330	109	249	200	280	150	309	97	230	186	259	137	286	85
	80	269	252	300	204	331	151	252	240	281	192	310	139	233	228	260	180	288	127
	85	280	280	301	247	331	193	265	265	283	234	311	182	248	248	262	221	288	169
	90	297	297	304	287	332	236	281	281	285	275	311	224	263	263	265	262	289	212
8700	75	274	227	306	172	336	112	256	215	287	160	315	100	236	202	265	147	292	88
	80	278	274	307	220	337	159	261	261	288	208	316	148	243	243	266	195	292	135
	85	294	294	309	265	337	207	278	278	290	253	316	195	260	260	268	240	293	183
	90	311	311	313	313	337	254	294	294	295	295	316	243	275	275	276	276	293	228
9100	75	277	233	309	176	339	113	259	221	289	164	317	101	239	208	267	151	293	89
	80	281	281	310	226	339	162	265	265	290	214	317	151	247	247	268	199	294	138
	85	299	299	312	273	339	212	282	282	292	261	318	200	264	264	270	248	294	188
	90	316	316	317	317	339	262	299	299	299	299	318	248	279	279	280	280	295	235
10000	75	282	247	313	184	343	115	264	235	293	172	321	104	243	222	270	160	297	91
	80	291	291	314	239	343	169	274	274	294	225	321	158	255	255	272	212	297	145
	85	309	309	317	291	342	224	291	291	297	279	321	212	272	272	275	265	297	200
	90	325	325	326	326	342	276	307	307	308	308	321	264	287	287	287	287	297	250

ID Airflow CFM	Ent DB (°F)	Ambient Temperature (°F) 118 Entering Wet Bulb Temp (°F) 61 TGC	61 SHC	67 TGC	67 SHC	73 TGC	73 SHC
6900	75	198	157	224	112	249	65
	80	200	193	225	150	251	103
	85	213	213	227	187	251	141
	90	227	227	229	224	268	187
7700	75	203	169	229	120	254	68
	80	207	207	230	163	255	110
	85	223	223	232	203	255	152
	90	237	237	238	238	256	194
8700	75	208	184	234	130	258	70
	80	218	218	235	175	259	118
	85	233	233	238	222	259	165
	90	247	247	248	248	259	210
9100	75	210	190	235	134	259	72
	80	221	221	237	181	260	121
	85	237	237	240	230	260	170
	90	250	250	251	251	261	216
10000	75	215	204	239	142	262	74
	80	228	228	240	193	262	128
	85	244	244	244	244	263	179
	90	256	256	257	257	263	232

Notes:

1. All capacities shown are gross and have not considered indoor fan heat. To obtain net cooling, subtract indoor fan heat.
2. TGC = Total gross capacity.
3. SHC = Sensible heat capacity.

Table 29. 82 kw (22.9 ton) standard efficiency, gross cooling capacities (kw) — 50Hz

ID Airflow L/s	Ent DB (°C)	Ambient Temperature (°C) 29.4 Entering Wet Bulb Temp (°C) 16.1 TGC	16.1 SHC	19.4 TGC	19.4 SHC	22.8 TGC	22.8 SHC	Ambient Temperature (°C) 35 Entering Wet Bulb Temp (°C) 16.1 TGC	16.1 SHC	19.4 TGC	19.4 SHC	22.8 TGC	22.8 SHC	Ambient Temperature (°C) 40.6 Entering Wet Bulb Temp (°C) 16.1 TGC	16.1 SHC	19.4 TGC	19.4 SHC	22.8 TGC	22.8 SHC
3256	23.9	74.8	59.2	83.3	46.2	90.2	31.8	70.5	56.8	78.6	43.8	84.9	29.5	65.8	54.3	73.4	41.3	79.1	27.0
	26.7	75.3	69.5	83.6	57.1	90.1	42.7	71.1	67.0	79.0	54.7	84.9	40.3	66.5	64.4	73.7	52.2	78.9	37.7
	29.4	77.4	77.4	83.8	67.9	90.0	53.5	73.8	73.8	79.2	65.6	84.8	51.1	69.8	69.8	74.1	62.4	78.6	48.5
	32.2	81.7	81.7	84.3	78.1	90.1	64.3	78.0	78.0	79.8	75.7	84.7	61.9	73.8	73.8	74.7	73.0	78.6	59.3
3634	23.9	76.6	63.1	85.0	48.4	91.1	32.3	72.2	60.0	80.1	46.0	85.8	30.0	67.3	57.3	74.7	43.5	79.8	27.5
	26.7	77.4	74.5	85.3	60.6	91.0	44.3	73.2	72.0	80.4	58.2	85.5	41.9	68.5	68.5	75.1	55.6	79.2	39.3
	29.4	80.7	80.7	85.5	72.0	91.0	56.4	76.9	76.9	80.8	69.5	85.4	54.0	72.6	72.6	75.4	66.7	79.0	51.3
	32.2	85.0	85.0	86.1	83.8	90.9	68.5	81.0	81.0	81.5	81.3	85.4	66.1	76.3	76.3	76.3	76.3	79.0	63.4
4106	23.9	78.6	67.0	86.6	51.1	92.0	32.9	74.1	64.5	81.6	48.7	86.5	30.5	69.0	61.6	76.0	46.1	80.4	28.0
	26.7	79.8	79.8	86.8	64.8	91.9	46.4	75.5	75.5	81.8	62.4	86.1	44.0	71.2	71.2	76.2	59.8	79.6	41.3
	29.4	84.1	84.1	87.1	77.4	91.9	60.1	80.0	80.0	82.2	74.8	86.1	57.7	75.3	75.3	76.7	72.0	79.5	55.0
	32.2	87.9	87.9	88.0	88.0	92.0	73.8	83.4	83.4	83.5	83.5	86.2	70.2	78.0	78.0	78.1	78.1	79.5	67.1
4295	23.9	79.3	68.8	87.1	52.1	92.4	33.1	74.7	66.2	82.0	49.7	86.8	30.8	69.6	63.4	76.4	47.1	80.6	28.2
	26.7	80.7	80.7	87.3	66.4	92.2	47.3	76.7	76.7	82.2	64.1	86.4	44.9	72.2	72.2	76.6	60.3	79.8	42.2
	29.4	85.2	85.2	87.6	79.5	92.3	61.6	81.0	81.0	82.7	76.9	86.4	59.2	76.1	76.1	77.1	74.1	79.6	56.4
	32.2	88.7	88.7	88.8	88.8	92.4	74.8	84.0	84.0	84.1	84.1	86.4	72.0	78.3	78.3	78.3	78.3	79.5	69.0
4719	23.9	80.7	72.7	88.1	54.5	93.1	33.7	76.0	70.1	82.9	52.1	87.3	31.3	70.8	67.2	77.1	49.4	81.0	28.8
	26.7	83.0	83.0	88.2	69.1	92.9	49.3	78.8	78.8	83.1	66.5	86.9	46.8	74.1	74.1	77.4	63.6	80.2	44.1
	29.4	87.3	87.3	88.6	84.2	92.9	65.0	82.8	82.8	83.5	81.6	86.8	62.5	77.5	77.5	77.7	77.7	79.8	59.7
	32.2	90.2	90.2	90.2	90.2	92.9	79.1	85.0	85.0	85.1	85.1	86.7	76.3	79.1	79.1	79.1	79.1	79.4	73.0

ID Airflow L/s	Ent DB (°C)	Ambient Temperature (°C) 47.8 Entering Wet Bulb Temp (°C) 16.1 TGC	16.1 SHC	19.4 TGC	19.4 SHC	22.8 TGC	22.8 SHC
3256	23.9	59.1	50.0	66.0	37.7	70.6	23.5
	26.7	60.1	60.1	66.3	48.6	70.0	34.0
	29.4	64.0	64.0	66.7	58.6	69.6	44.7
	32.2	67.5	67.5	67.5	67.5	69.6	55.5
3634	23.9	60.5	53.5	67.1	39.9	71.1	23.9
	26.7	62.4	62.4	67.3	52.0	70.1	35.6
	29.4	66.3	66.3	67.8	62.9	69.8	47.6
	32.2	69.1	69.1	69.1	69.1	69.7	58.3
4106	23.9	62.0	57.7	68.0	42.5	71.5	24.5
	26.7	64.8	64.8	68.3	54.8	70.4	37.7
	29.4	68.3	68.3	68.7	68.0	69.9	51.2
	32.2	69.4	69.4	69.4	69.4	69.4	62.7
4295	23.9	62.5	59.4	68.3	43.5	71.7	24.7
	26.7	65.7	65.7	68.6	56.3	70.4	38.5
	29.4	68.8	68.8	68.9	68.9	69.9	52.6
	32.2	69.6	69.6	69.6	69.6	69.1	64.4
4719	23.9	63.6	63.2	68.9	45.8	72.1	25.3
	26.7	67.2	67.2	69.1	59.4	70.6	40.4
	29.4	69.4	69.4	69.4	69.4	69.8	53.5
	32.2	69.1	69.1	69.0	69.0	68.8	68.3

Notes:

1. All capacities shown are gross and have not considered indoor fan heat. To obtain net cooling, subtract indoor fan heat.
2. TGC = Total gross capacity.
3. SHC = Sensible heat capacity.

Performance Data (50Hz Units)

Table 30. 85 kw (22.9 ton) high efficiency, gross cooling capacities (kw) — 50Hz

ID Airflow L/s	Ent DB (°C)	Ambient Temperature (°C) 29.4						Ambient Temperature (°C) 35						Ambient Temperature (°C) 40.6					
		Entering Wet Bulb Temp (°C)						Entering Wet Bulb Temp (°C)						Entering Wet Bulb Temp (°C)					
		16.1		19.4		22.8		16.1		19.4		22.8		16.1		19.4		22.8	
		TGC	SHC	TGC	SHC	TGC	SHC	TGC	SHC	TGC	SHC	TGC	SHC	TGC	SHC	TGC	SHC	TGC	SHC
3256	23.9	76.0	57.8	85.6	44.9	95.0	31.1	71.0	54.5	80.2	41.5	89.0	27.7	65.6	50.9	74.2	37.9	82.5	24.1
	26.7	76.5	68.7	85.9	56.1	95.2	42.3	71.6	65.3	80.5	52.7	89.3	38.9	66.2	61.6	74.5	49.1	82.8	35.3
	29.4	78.3	78.3	86.2	67.2	95.4	53.4	74.0	74.0	80.9	63.9	89.6	50.1	69.2	69.2	74.9	60.3	83.1	46.5
	32.2	83.1	83.1	86.7	78.0	95.5	64.5	78.7	78.7	81.4	74.6	89.7	61.2	73.7	73.7	75.6	70.9	83.3	57.6
3634	23.9	78.1	62.0	87.7	47.4	96.8	31.9	73.0	58.6	82.1	43.9	90.7	28.5	67.3	54.5	75.9	40.3	84.0	24.9
	26.7	78.8	73.9	88.0	59.8	97.0	44.3	73.8	70.5	82.4	56.4	91.0	40.9	68.3	66.8	76.3	52.8	84.3	37.2
	29.4	82.2	82.2	88.3	72.3	97.1	56.7	77.6	77.6	82.9	68.4	91.1	53.3	72.5	72.5	76.8	64.7	84.5	49.6
	32.2	87.1	87.1	89.0	84.1	97.2	69.0	82.4	82.4	83.6	80.6	91.3	65.7	77.2	77.2	77.7	76.9	84.6	62.0
4106	23.9	80.4	66.5	89.8	50.3	98.6	32.8	75.1	62.9	84.0	46.8	92.3	29.3	69.3	59.2	77.6	43.1	85.4	25.7
	26.7	81.5	80.4	90.1	64.4	98.7	46.7	76.4	76.4	84.3	60.9	92.5	43.2	71.2	71.2	78.0	57.2	85.7	39.6
	29.4	86.3	86.3	90.6	77.8	98.7	60.6	81.5	81.5	84.9	74.2	92.6	57.2	76.1	76.1	78.6	70.4	85.8	53.6
	32.2	91.3	91.3	91.6	91.6	98.8	74.5	86.3	86.3	86.4	86.4	92.8	71.2	80.7	80.7	80.8	80.8	86.0	66.9
4295	23.9	81.2	68.3	90.4	51.5	99.2	33.1	75.8	64.8	84.6	48.0	92.9	29.7	70.0	61.0	78.2	44.3	86.0	26.0
	26.7	82.5	82.5	90.8	66.2	99.3	47.6	77.7	77.7	85.0	62.7	93.1	44.2	72.4	72.4	78.6	58.4	86.1	40.5
	29.4	87.7	87.7	91.3	80.1	99.3	62.1	82.8	82.8	85.6	76.5	93.1	58.8	77.3	77.3	79.3	72.7	86.2	55.1
	32.2	92.7	92.7	92.8	92.8	99.3	76.7	87.6	87.6	87.7	87.7	93.3	72.7	81.8	81.8	82.0	82.0	86.4	68.9
4719	23.9	82.8	72.5	91.8	54.0	100.5	33.8	77.3	68.9	85.8	50.5	94.0	30.4	71.3	65.0	79.2	46.8	87.0	26.8
	26.7	85.3	85.3	92.1	70.1	100.4	49.7	80.3	80.3	86.3	65.9	94.1	46.3	74.8	74.8	79.7	62.0	87.0	42.6
	29.4	90.6	90.6	92.8	85.2	100.3	65.6	85.4	85.4	87.0	81.6	94.0	62.2	79.7	79.7	80.6	77.8	87.0	58.6
	32.2	95.4	95.4	95.5	95.5	100.4	80.7	90.0	90.0	90.2	90.2	94.2	77.2	84.0	84.0	84.1	84.1	87.1	73.4

ID Airflow L/s	Ent DB (°C)	Ambient Temperature (°C) 47.8					
		Entering Wet Bulb Temp (°C)					
		16.1		19.4		22.8	
		TGC	SHC	TGC	SHC	TGC	SHC
3256	23.9	57.9	46.1	65.7	32.9	73.1	19.1
	26.7	58.6	56.7	66.1	44.1	73.5	30.3
	29.4	62.3	62.3	66.5	54.9	73.7	41.4
	32.2	66.6	66.6	67.2	65.8	78.5	54.7
3634	23.9	59.5	49.4	67.1	35.2	74.3	19.8
	26.7	60.8	60.8	67.5	47.7	74.6	32.2
	29.4	65.3	65.3	68.1	59.5	74.8	44.5
	32.2	69.6	69.6	69.7	69.7	75.0	56.9
4106	23.9	61.1	53.9	68.5	38.0	75.6	20.6
	26.7	63.8	63.8	69.0	51.4	75.8	34.5
	29.4	68.3	68.3	69.7	65.1	75.8	48.4
	32.2	72.5	72.5	72.6	72.6	76.0	61.5
4295	23.9	61.7	55.7	69.0	39.1	76.0	21.0
	26.7	64.8	64.8	69.5	53.0	76.2	35.4
	29.4	69.4	69.4	70.3	67.4	76.2	50.0
	32.2	73.4	73.4	73.5	73.5	76.4	63.4
4719	23.9	62.9	59.7	69.9	41.6	76.9	21.7
	26.7	66.9	66.9	70.5	56.6	76.9	37.5
	29.4	71.4	71.4	71.5	71.5	77.0	52.5
	32.2	75.1	75.1	75.2	75.2	76.9	67.9

Notes:

1. All capacities shown are gross and have not considered indoor fan heat. To obtain net cooling, subtract indoor fan heat.
2. TGC = Total gross capacity.
3. SHC = Sensible heat capacity.

Table 31. 25.4 ton standard efficiency, gross cooling capacities (MBh) — 50 Hz

ID Airflow CFM	Ent DB (°F)	Ambient Temperature (°F) 85 Entering Wet Bulb Temp (°F) 61 TGC	61 SHC	67 TGC	67 SHC	73 TGC	73 SHC	Ambient Temperature (°F) 95 Entering Wet Bulb Temp (°F) 61 TGC	61 SHC	67 TGC	67 SHC	73 TGC	73 SHC	Ambient Temperature (°F) 105 Entering Wet Bulb Temp (°F) 61 TGC	61 SHC	67 TGC	67 SHC	73 TGC	73 SHC
7500	75	270	216	299	167	323	113	255	207	282	158	304	105	237	197	263	149	283	96
	80	272	254	300	207	323	153	257	245	283	198	304	145	240	235	264	189	283	136
	85	281	281	301	247	323	193	267	267	284	238	304	185	252	252	265	227	283	176
	90	295	295	302	284	323	233	281	281	286	275	304	225	265	265	267	266	283	215
8500	75	277	232	305	176	327	116	261	223	288	167	308	107	243	211	268	158	287	98
	80	280	275	306	221	327	161	265	265	288	212	307	152	248	248	269	203	286	143
	85	293	293	307	266	327	206	279	279	290	255	307	197	263	263	270	245	285	188
	90	307	307	309	308	327	251	292	292	293	293	307	243	275	275	275	275	285	230
9500	75	283	245	310	185	331	118	267	236	292	176	311	109	248	225	272	167	289	100
	80	288	288	310	235	330	168	273	273	292	227	310	159	257	257	272	214	287	150
	85	303	303	312	282	331	219	288	288	294	273	310	210	270	270	274	263	287	200
	90	316	316	316	316	331	270	299	299	300	300	311	257	280	280	280	280	288	247
10000	75	286	252	312	189	332	119	269	243	294	180	313	110	251	233	273	171	291	101
	80	292	292	312	242	332	172	277	277	294	234	311	163	260	260	274	220	288	154
	85	307	307	314	291	332	225	291	291	296	282	311	216	273	273	275	272	288	207
	90	319	319	319	319	333	275	302	302	302	302	312	265	282	282	282	282	289	255
11000	75	291	267	315	198	335	121	274	257	296	189	315	112	255	247	276	180	293	104
	80	300	300	316	252	335	179	284	284	297	243	314	170	267	267	276	233	290	161
	85	314	314	317	309	335	238	297	297	299	299	314	229	278	278	278	278	290	220
	90	325	325	325	325	336	292	307	307	307	307	315	282	286	286	287	287	291	271

ID Airflow CFM	Ent DB (°F)	Ambient Temperature (°F) 118 Entering Wet Bulb Temp (°F) 61 TGC	61 SHC	67 TGC	67 SHC	73 TGC	73 SHC
7500	75	213	185	236	139	254	87
	80	217	222	237	179	253	126
	85	230	236	238	216	252	166
	90	242	248	242	248	252	205
8500	75	218	200	240	148	256	89
	80	226	231	241	193	254	133
	85	239	245	242	234	253	178
	90	248	255	248	255	254	219
9500	75	223	215	243	157	259	91
	80	233	239	244	203	255	140
	85	245	251	246	252	255	191
	90	251	258	251	258	255	235
10000	75	225	222	244	161	260	92
	80	236	242	245	209	256	144
	85	247	253	247	254	256	197
	90	253	260	253	260	256	244
11000	75	228	235	246	169	261	94
	80	241	247	247	222	258	151
	85	250	257	250	257	257	203
	90	256	263	256	263	257	260

Notes:

1. All capacities shown are gross and have not considered indoor fan heat. To obtain net cooling, subtract indoor fan heat.
2. TGC = Total gross capacity.
3. SHC = Sensible heat capacity.

Performance Data (50Hz Units)

Table 32. 25.4 ton high efficiency, gross cooling capacities (MBh) — 50 Hz

ID Airflow CFM	Ent DB (°F)	Ambient Temperature (°F) 85 Entering Wet Bulb Temp (°F) 61 TGC	61 SHC	67 TGC	67 SHC	73 TGC	73 SHC	Ambient Temperature (°F) 95 Entering Wet Bulb Temp (°F) 61 TGC	61 SHC	67 TGC	67 SHC	73 TGC	73 SHC	Ambient Temperature (°F) 105 Entering Wet Bulb Temp (°F) 61 TGC	61 SHC	67 TGC	67 SHC	73 TGC	73 SHC
7500	75	277	213	311	165	344	113	259	201	292	153	323	101	239	189	270	140	299	89
	80	279	253	312	206	345	155	261	241	293	194	324	143	242	228	271	181	300	130
	85	287	287	313	248	346	196	271	271	294	236	324	184	254	254	272	223	301	171
	90	304	304	315	287	346	237	288	288	296	275	325	225	270	270	275	262	301	212
8500	75	286	231	319	175	351	116	267	217	299	163	329	104	246	204	276	150	305	91
	80	289	276	321	222	352	163	270	263	300	210	330	151	250	250	278	197	305	138
	85	303	303	322	267	352	210	286	286	302	255	330	198	267	267	280	241	306	185
	90	320	320	325	313	352	256	303	303	305	301	331	244	283	283	284	284	307	231
9500	75	293	246	326	185	357	119	274	233	305	173	334	107	252	219	282	159	309	94
	80	297	297	327	237	357	171	280	280	306	225	335	159	261	261	283	212	310	146
	85	315	315	329	287	357	223	298	298	308	274	335	211	278	278	285	261	310	198
	90	333	333	333	333	357	275	315	315	315	315	336	261	294	294	295	295	311	247
10000	75	296	253	329	190	359	121	277	241	307	177	336	109	255	227	284	164	311	96
	80	302	302	330	245	359	175	285	285	309	233	337	163	265	265	285	217	311	150
	85	321	321	332	297	359	229	303	303	311	284	337	217	283	283	288	270	312	204
	90	338	338	339	339	359	282	320	320	320	320	337	269	298	298	299	299	312	256
11000	75	302	269	333	199	364	123	282	256	311	187	340	111	260	242	287	174	315	98
	80	312	312	335	257	363	183	294	294	313	244	340	171	274	274	289	230	315	158
	85	331	331	337	316	362	243	312	312	316	303	340	231	291	291	293	289	314	218
	90	348	348	348	348	363	299	328	328	328	328	340	286	306	306	306	306	315	273

ID Airflow CFM	Ent DB (°F)	Ambient Temperature (°F) 118 Entering Wet Bulb Temp (°F) 61 TGC	61 SHC	67 TGC	67 SHC	73 TGC	73 SHC
7500	75	211	174	239	126	265	75
	80	214	215	240	168	266	116
	85	229	235	242	207	267	157
	90	244	250	245	248	286	199
8500	75	218	190	244	136	270	78
	80	224	230	246	183	270	124
	85	240	247	248	227	271	171
	90	255	262	256	262	272	215
9500	75	223	205	249	146	273	81
	80	234	240	250	195	274	132
	85	250	256	253	246	274	184
	90	264	271	264	271	275	232
10000	75	225	213	250	150	275	82
	80	238	244	252	202	275	136
	85	254	261	255	256	275	191
	90	267	275	268	275	276	241
11000	75	229	228	254	160	278	85
	80	245	252	256	215	278	144
	85	260	268	261	268	278	200
	90	273	281	273	281	278	272

Notes:

1. All capacities shown are gross and have not considered indoor fan heat. To obtain net cooling, subtract indoor fan heat.
2. TGC = Total gross capacity.
3. SHC = Sensible heat capacity.

Table 33. 86 kw (25.4 ton) standard efficiency, gross cooling capacities (kw)— 50 Hz

ID Airflow L/s	Ent DB (°C)	Ambient Temperature (°C) 29.4 Entering Wet Bulb Temp (°C) 16.1 TGC	16.1 SHC	19.4 TGC	19.4 SHC	22.8 TGC	22.8 SHC	Ambient Temperature (°C) 35 Entering Wet Bulb Temp (°C) 16.1 TGC	16.1 SHC	19.4 TGC	19.4 SHC	22.8 TGC	22.8 SHC	Ambient Temperature (°C) 40.6 Entering Wet Bulb Temp (°C) 16.1 TGC	16.1 SHC	19.4 TGC	19.4 SHC	22.8 TGC	22.8 SHC
3540	23.9	79.2	63.2	87.7	48.8	94.7	33.2	74.6	60.6	82.7	46.3	89.2	30.8	69.6	57.9	77.1	43.6	83.1	28.2
	26.7	79.8	74.3	87.9	60.6	94.7	45.0	75.3	71.7	83.0	58.1	89.2	42.5	70.4	68.9	77.4	55.3	83.0	39.8
	29.4	82.2	82.2	88.1	72.3	94.6	56.7	78.3	78.3	83.2	69.8	89.1	54.2	73.9	73.9	77.7	66.4	82.9	51.5
	32.2	86.5	86.5	88.6	83.3	94.6	68.3	82.5	82.5	83.8	80.7	89.1	65.9	77.8	77.8	78.4	77.9	82.8	63.1
4012	23.9	81.3	68.0	89.5	51.5	96.0	33.9	76.6	65.4	84.3	49.0	90.3	31.4	71.3	61.8	78.5	46.2	84.1	28.8
	26.7	82.2	80.5	89.7	64.8	95.8	47.1	77.6	77.6	84.5	62.3	90.1	44.6	72.7	72.7	78.8	59.5	83.7	41.9
	29.4	85.9	85.9	89.9	78.1	95.8	60.4	81.7	81.7	84.9	74.7	90.0	57.8	77.0	77.0	79.2	71.8	83.5	55.1
	32.2	90.0	90.0	90.6	90.3	95.9	73.6	85.6	85.6	85.7	85.7	90.0	71.1	80.5	80.5	80.6	80.6	83.5	67.4
4483	23.9	83.1	71.8	90.9	54.1	96.9	34.4	78.2	69.1	85.5	51.6	91.2	32.0	72.8	66.1	79.6	48.8	84.8	29.4
	26.7	84.4	84.4	91.0	68.9	96.9	49.3	80.1	80.1	85.7	66.4	90.9	46.7	75.3	75.3	79.8	62.7	84.2	43.9
	29.4	88.8	88.8	91.3	82.7	96.9	64.1	84.3	84.3	86.1	80.0	90.9	61.5	79.2	79.2	80.3	77.0	84.1	58.8
	32.2	92.6	92.6	92.7	92.7	97.1	79.0	87.8	87.8	87.9	87.9	91.1	75.3	82.2	82.2	82.2	82.2	84.3	72.3
4719	23.9	83.8	74.0	91.4	55.4	97.4	34.8	78.9	71.2	86.0	52.9	91.6	32.3	73.5	68.2	80.1	50.1	85.2	29.7
	26.7	85.7	85.7	91.5	71.0	97.3	50.3	81.3	81.3	86.2	68.5	91.2	47.8	76.3	76.3	80.3	64.6	84.5	45.0
	29.4	90.0	90.0	91.9	85.3	97.4	66.0	85.4	85.4	86.7	82.6	91.3	63.4	80.2	80.2	80.7	79.6	84.5	60.6
	32.2	93.5	93.5	93.6	93.6	97.6	80.6	88.6	88.6	88.6	88.6	91.5	77.8	82.7	82.7	82.7	82.7	84.6	74.7
5191	23.9	85.2	78.2	92.4	57.9	98.2	35.4	80.2	75.4	86.9	55.4	92.3	33.0	74.6	72.4	80.8	52.6	85.8	30.3
	26.7	87.9	87.9	92.5	74.0	98.2	52.6	83.3	83.3	87.0	71.2	91.9	50.0	78.1	78.1	81.0	68.2	85.0	47.2
	29.4	92.0	92.0	92.9	90.6	98.2	69.8	87.1	87.1	87.5	87.5	91.9	67.2	81.6	81.6	81.6	81.6	85.0	64.4
	32.2	95.2	95.2	95.3	95.3	98.5	85.5	89.9	89.9	90.0	90.0	92.2	82.6	83.9	83.9	84.0	84.0	85.1	79.5

ID Airflow L/s	Ent DB (°C)	Ambient Temperature (°C) 47.8 Entering Wet Bulb Temp (°C) 16.1 TGC	16.1 SHC	19.4 TGC	19.4 SHC	22.8 TGC	22.8 SHC
3540	23.9	62.5	54.3	69.2	40.7	74.3	25.4
	26.7	63.6	65.1	69.5	52.4	74.1	37.0
	29.4	67.5	69.0	69.8	63.4	73.9	48.6
	32.2	70.9	72.6	71.0	72.7	73.8	60.2
4012	23.9	64.0	58.6	70.4	43.3	75.1	26.0
	26.7	66.3	67.8	70.6	56.6	74.6	39.0
	29.4	70.0	71.7	71.0	68.6	74.2	52.1
	32.2	72.8	74.7	72.8	74.7	74.3	64.2
4483	23.9	65.3	62.9	71.2	45.9	75.8	26.6
	26.7	68.4	70.0	71.5	59.5	74.9	41.1
	29.4	71.8	73.6	72.0	73.8	74.7	55.8
	32.2	73.6	75.7	73.6	75.7	74.8	69.0
4719	23.9	65.9	65.0	71.6	47.1	76.1	26.9
	26.7	69.2	70.9	71.8	61.3	75.1	42.1
	29.4	72.4	74.3	72.4	74.3	74.9	57.7
	32.2	74.1	76.2	74.2	76.2	75.0	71.4
5191	23.9	66.9	68.7	72.2	49.7	76.6	27.6
	26.7	70.7	72.5	72.4	65.0	75.5	44.3
	29.4	73.3	75.3	73.3	75.3	75.3	59.6
	32.2	75.0	77.2	75.0	77.2	75.2	76.1

Notes:

1. All capacities shown are gross and have not considered indoor fan heat. To obtain net cooling, subtract indoor fan heat.
2. TGC = Total gross capacity.
3. SHC = Sensible heat capacity.

Performance Data (50Hz Units)

Table 34. 90 kw (25.4 ton) high efficiency, gross cooling capacities (kw)— 50 Hz

ID Airflow L/s	Ent DB (°C)	Ambient Temperature (°C) 29.4 Entering Wet Bulb Temp (°C) 16.1 TGC	16.1 SHC	19.4 TGC	19.4 SHC	22.8 TGC	22.8 SHC	Ambient Temperature (°C) 35 Entering Wet Bulb Temp (°C) 16.1 TGC	16.1 SHC	19.4 TGC	19.4 SHC	22.8 TGC	22.8 SHC	Ambient Temperature (°C) 40.6 Entering Wet Bulb Temp (°C) 16.1 TGC	16.1 SHC	19.4 TGC	19.4 SHC	22.8 TGC	22.8 SHC
3540	23.9	81.2	62.5	91.2	48.3	100.9	33.2	75.9	59.0	85.4	44.8	94.6	29.7	70.1	55.3	79.0	41.0	87.6	25.9
	26.7	81.8	74.3	91.6	60.5	101.1	45.3	76.6	70.7	85.8	57.0	94.9	41.8	70.9	66.9	79.4	53.2	87.9	38.1
	29.4	84.1	84.1	91.9	72.6	101.3	57.4	79.5	79.5	86.2	69.1	95.1	53.9	74.3	74.3	79.8	65.3	88.1	50.2
	32.2	89.2	89.2	92.4	84.2	101.4	69.5	84.4	84.4	86.8	80.7	95.3	66.0	79.1	79.1	80.6	76.8	88.3	62.2
4012	23.9	83.7	67.6	93.6	51.4	103.0	34.1	78.2	63.6	87.6	47.8	96.4	30.6	72.2	59.7	81.0	43.9	89.2	26.8
	26.7	84.6	80.8	93.9	65.1	103.1	47.8	79.2	77.2	88.0	61.5	96.7	44.2	73.4	73.3	81.4	57.7	89.5	40.4
	29.4	88.7	88.7	94.4	78.3	103.2	61.4	83.7	83.7	88.5	74.7	96.8	57.9	78.3	78.3	81.9	70.7	89.7	54.1
	32.2	93.8	93.8	95.2	91.8	103.3	75.1	88.8	88.8	89.4	88.2	97.0	71.6	83.1	83.1	83.2	83.2	89.9	67.8
4483	23.9	85.8	72.0	95.5	54.2	104.6	35.0	80.2	68.3	89.3	50.6	97.9	31.4	74.0	64.3	82.5	46.7	90.6	27.6
	26.7	87.1	87.1	95.8	69.6	104.7	50.1	82.0	82.0	89.7	66.0	98.1	46.6	76.4	76.4	82.9	62.1	90.8	42.8
	29.4	92.5	92.5	96.4	84.1	104.6	65.3	87.3	87.3	90.4	80.4	98.1	61.8	81.5	81.5	83.7	76.4	90.8	58.0
	32.2	97.6	97.6	97.7	97.7	104.7	80.5	92.2	92.2	92.4	92.4	98.3	76.4	86.2	86.2	86.3	86.3	91.0	72.4
4719	23.9	86.7	74.3	96.3	55.6	105.3	35.4	81.0	70.5	90.1	52.0	98.6	31.8	74.8	66.5	83.2	48.1	91.2	28.0
	26.7	88.6	88.6	96.6	71.8	105.3	51.3	83.5	83.5	90.4	68.2	98.7	47.7	77.8	77.8	83.6	63.5	91.3	43.9
	29.4	94.1	94.1	97.3	87.0	105.2	67.2	88.8	88.8	91.2	83.3	98.7	63.7	82.9	82.9	84.4	79.2	91.3	59.9
	32.2	99.2	99.2	99.4	99.4	105.4	82.5	93.7	93.7	93.8	93.8	98.9	78.9	87.5	87.5	87.6	87.6	91.5	74.9
5191	23.9	88.4	78.8	97.7	58.4	106.6	36.2	82.6	75.1	91.3	54.8	99.7	32.6	76.2	71.0	84.3	50.9	92.2	28.8
	26.7	91.5	91.5	98.0	75.3	106.4	53.6	86.2	86.2	91.8	71.6	99.7	50.0	80.2	80.2	84.8	67.5	92.2	46.2
	29.4	97.0	97.0	98.8	92.6	106.2	71.1	91.5	91.5	92.6	88.9	99.6	67.6	85.3	85.3	85.8	84.8	92.1	63.8
	32.2	101.9	101.9	102.0	102.0	106.3	87.6	96.1	96.1	96.3	96.3	99.7	83.9	89.6	89.6	89.7	89.7	92.2	79.9

ID Airflow L/s	Ent DB (°C)	Ambient Temperature (°C) 47.8 Entering Wet Bulb Temp (°C) 16.1 TGC	16.1 SHC	19.4 TGC	19.4 SHC	22.8 TGC	22.8 SHC
3540	23.9	62.0	51.0	70.0	37.0	77.6	22.0
	26.7	62.8	62.9	70.4	49.2	78.0	34.0
	29.4	67.0	68.7	70.9	60.8	78.1	46.1
	32.2	71.4	73.3	71.8	72.7	83.9	58.2
4012	23.9	63.8	55.6	71.6	39.9	79.0	22.8
	26.7	65.7	67.5	72.0	53.6	79.3	36.4
	29.4	70.4	72.3	72.7	66.6	79.4	50.0
	32.2	74.8	76.8	74.9	76.9	79.6	63.1
4483	23.9	65.3	60.1	72.9	42.7	80.2	23.6
	26.7	68.5	70.3	73.4	57.2	80.3	38.7
	29.4	73.2	75.1	74.1	72.2	80.3	53.9
	32.2	77.3	79.5	77.5	79.5	80.5	68.1
4719	23.9	66.0	62.3	73.4	44.0	80.6	24.0
	26.7	69.6	71.6	73.9	59.2	80.7	39.9
	29.4	74.3	76.4	74.8	75.0	80.7	55.9
	32.2	78.4	80.6	78.5	80.7	80.9	70.6
5191	23.9	67.3	66.7	74.3	46.7	81.5	24.8
	26.7	71.8	73.8	74.9	63.1	81.5	42.2
	29.4	76.3	78.5	76.4	78.5	81.5	58.5
	32.2	80.1	82.4	80.1	82.4	81.4	79.8

Notes:

1. All capacities shown are gross and have not considered indoor fan heat. To obtain net cooling, subtract indoor fan heat.
2. TGC = Total gross capacity.
3. SHC = Sensible heat capacity.

Table 35. 29.2 ton standard efficiency, gross cooling capacities (MBh) —50 Hz

ID Airflow CFM	Ent DB (°F)	Ambient Temperature (°F) 85 Entering Wet Bulb Temp (°F) 61 TGC	61 SHC	67 TGC	67 SHC	73 TGC	73 SHC	Ambient Temperature (°F) 95 Entering Wet Bulb Temp (°F) 61 TGC	61 SHC	67 TGC	67 SHC	73 TGC	73 SHC	Ambient Temperature (°F) 105 Entering Wet Bulb Temp (°F) 61 TGC	61 SHC	67 TGC	67 SHC	73 TGC	73 SHC
8750	75	309	253	341	195	363	131	292	244	322	186	343	122	274	235	301	177	319	113
	80	312	298	341	242	363	178	295	289	323	233	342	169	277	277	302	224	318	160
	85	322	322	342	289	363	225	308	308	324	281	341	217	291	291	303	271	317	207
	90	338	338	344	333	363	272	323	323	326	324	341	264	305	305	306	306	317	254
9900	75	317	272	347	205	367	133	299	260	327	196	345	124	280	250	306	187	321	115
	80	321	321	347	259	366	186	304	304	328	250	344	177	287	287	306	240	319	168
	85	335	335	348	308	366	240	320	320	329	299	344	231	302	302	308	289	318	221
	90	350	350	351	351	366	293	333	333	333	333	343	284	313	313	313	313	318	270
11000	75	323	286	351	215	370	135	305	276	331	206	347	126	285	266	309	196	322	117
	80	328	328	351	274	369	194	313	313	332	265	346	185	295	295	310	251	320	175
	85	345	345	353	328	369	254	328	328	333	319	345	245	309	309	311	309	320	235
	90	357	357	358	358	369	308	338	338	339	339	346	298	316	316	316	316	319	287
11600	75	326	294	353	220	371	136	307	285	333	211	348	127	287	274	310	202	323	118
	80	333	333	353	282	370	199	317	317	333	274	347	189	299	299	311	259	321	180
	85	349	349	354	339	370	261	332	332	335	330	346	252	311	311	312	312	320	242
	90	360	360	360	360	371	318	340	340	340	340	346	308	317	317	317	317	320	297
12800	75	331	312	356	230	373	138	312	302	335	221	350	130	292	292	313	212	325	120
	80	341	341	356	294	373	207	324	324	336	285	348	198	305	305	313	274	322	188
	85	355	355	357	357	372	277	337	337	337	337	348	267	315	315	315	315	321	257
	90	365	365	365	365	372	338	344	344	344	344	347	328	319	319	319	319	319	316

ID Airflow CFM	Ent DB (°F)	Ambient Temperature (°F) 118 Entering Wet Bulb Temp (°F) 61 TGC	61 SHC	67 TGC	67 SHC	73 TGC	73 SHC
8750	75	248	219	273	164	286	100
	80	254	254	273	211	284	147
	85	268	268	275	254	283	194
	90	279	279	279	279	282	236
9900	75	254	236	276	174	288	102
	80	263	263	277	227	284	155
	85	276	276	278	275	283	208
	90	281	281	281	281	282	254
11000	75	258	252	279	183	289	104
	80	270	270	279	237	285	162
	85	280	280	280	280	283	221
	90	282	282	282	282	281	271
11600	75	260	260	280	189	289	105
	80	273	273	280	244	285	167
	85	281	281	281	281	283	228
	90	282	282	282	282	280	280
12800	75	264	264	281	199	291	108
	80	277	277	281	259	285	175
	85	282	282	282	282	283	234
	90	278	278	278	278	277	277

Notes:

1. All capacities shown are gross and have not considered indoor fan heat. To obtain net cooling, subtract indoor fan heat.
2. TGC = Total gross capacity.
3. SHC = Sensible heat capacity.

Performance Data (50Hz Units)

Table 36. 29.2 ton high efficiency , gross cooling capacities (MBh) — 50 Hz

ID Airflow CFM	Ent DB (°F)	Ambient Temperature (°F) 85 Entering Wet Bulb Temp (°F) 61 TGC	61 SHC	67 TGC	67 SHC	73 TGC	73 SHC	Ambient Temperature (°F) 95 Entering Wet Bulb Temp (°F) 61 TGC	61 SHC	67 TGC	67 SHC	73 TGC	73 SHC	Ambient Temperature (°F) 105 Entering Wet Bulb Temp (°F) 61 TGC	61 SHC	67 TGC	67 SHC	73 TGC	73 SHC
8750	75	318	248	355	191	389	129	297	235	332	177	364	115	275	221	307	163	337	101
	80	320	295	356	239	389	177	300	281	333	225	365	163	278	267	308	211	338	149
	85	331	331	357	287	389	224	313	313	335	274	365	211	292	292	310	258	338	197
	90	349	349	359	333	390	272	331	331	337	319	366	259	310	310	313	305	338	245
9900	75	327	266	363	202	396	132	306	252	340	188	371	119	282	238	314	174	343	104
	80	331	320	364	256	396	185	310	306	341	243	371	172	287	287	315	228	343	158
	85	347	347	366	308	395	239	328	328	343	295	371	226	306	306	317	280	342	212
	90	366	366	369	362	395	294	346	346	347	347	371	281	323	323	323	323	343	266
11000	75	331	276	367	208	399	133	309	262	343	194	373	120	288	254	319	184	347	107
	80	336	333	368	265	398	190	315	315	344	252	373	177	298	298	320	242	346	167
	85	354	354	369	320	398	247	334	334	346	306	373	234	316	316	323	301	346	226
	90	373	373	373	373	398	305	352	352	352	352	373	292	332	332	333	333	346	282
11600	75	334	283	369	212	401	134	312	269	345	199	376	121	291	264	321	190	349	109
	80	340	340	370	273	400	194	320	320	346	259	375	181	303	303	322	250	348	171
	85	360	360	372	330	400	254	339	339	349	316	375	241	321	321	325	312	347	234
	90	378	378	378	378	400	314	357	357	357	357	375	298	337	337	337	337	347	293
12800	75	338	294	373	219	404	136	316	280	348	205	378	123	296	282	325	201	353	112
	80	347	347	374	283	403	199	327	327	350	267	377	186	312	312	326	266	351	180
	85	367	367	376	343	402	263	346	346	352	329	377	250	329	329	330	330	350	250
	90	384	384	384	384	402	323	362	362	363	363	377	309	343	343	343	343	350	313

ID Airflow CFM	Ent DB (°F)	Ambient Temperature (°F) 118 Entering Wet Bulb Temp (°F) 61 TGC	61 SHC	67 TGC	67 SHC	73 TGC	73 SHC
8750	75	243	200	272	143	298	82
	80	247	247	273	192	299	130
	85	263	263	275	237	299	177
	90	279	279	280	280	299	225
9900	75	250	217	278	154	303	85
	80	258	258	279	209	303	138
	85	275	275	281	259	302	192
	90	290	290	290	290	303	243
11000	75	255	234	282	164	307	88
	80	267	267	283	221	306	147
	85	284	284	286	280	305	207
	90	297	297	297	297	305	261
11600	75	257	243	283	170	309	89
	80	272	272	285	229	307	151
	85	288	288	288	288	306	215
	90	300	300	300	300	306	271
12800	75	262	260	287	181	312	93
	80	279	279	288	244	310	161
	85	294	294	294	294	308	224
	90	305	305	305	305	307	291

Notes:

1. All capacities shown are gross and have not considered indoor fan heat. To obtain net cooling, subtract indoor fan heat.
2. TGC = Total gross capacity.
3. SHC = Sensible heat capacity.

Table 37. 97 kw (29.2 ton) standard efficiency, gross cooling capacities (kw)— 50 Hz

ID Airflow L/s	Ent DB (°C)	Ambient Temperature (°C) 29.4						Ambient Temperature (°C) 35						Ambient Temperature (°C) 40.6					
		Entering Wet Bulb Temp (°C)						Entering Wet Bulb Temp (°C)						Entering Wet Bulb Temp (°C)					
		16.1		19.4		22.8		16.1		19.4		22.8		16.1		19.4		22.8	
		TGC	SHC	TGC	SHC	TGC	SHC	TGC	SHC	TGC	SHC	TGC	SHC	TGC	SHC	TGC	SHC	TGC	SHC
4130	23.9	90.6	74.2	99.8	57.1	106.5	38.3	85.7	71.6	94.4	54.5	100.4	35.8	80.2	68.8	88.3	51.8	93.5	33.1
	26.7	91.3	87.3	100.1	70.9	106.4	52.2	86.5	84.6	94.6	68.4	100.2	49.7	81.2	81.2	88.5	65.6	93.1	46.9
	29.4	94.5	94.5	100.3	84.8	106.4	66	90.3	90.3	94.9	82.2	100.1	63.5	85.4	85.4	88.8	79.5	93	60.6
	32.2	99.2	99.2	100.9	97.6	106.4	79.9	94.7	94.7	95.6	95	100.1	77.3	89.5	89.5	89.7	89.7	92.9	74.4
4672	23.9	92.8	79.7	101.6	60.1	107.5	38.9	87.7	76.1	95.9	57.5	101.2	36.4	82	73.1	89.6	54.8	94.1	33.7
	26.7	93.9	93.9	101.8	75.8	107.4	54.6	89.1	89.1	96.1	73.2	100.9	52	84	84	89.8	70.4	93.6	49.2
	29.4	98.3	98.3	102.1	90.4	107.3	70.2	93.7	93.7	96.5	87.7	100.7	67.6	88.4	88.4	90.2	84.7	93.3	64.8
	32.2	102.6	102.6	102.9	102.9	107.3	85.9	97.6	97.6	97.7	97.7	100.7	83.3	91.7	91.7	91.7	91.7	93.3	79
5191	23.9	94.6	83.7	102.9	62.9	108.3	39.5	89.3	80.9	97	60.4	101.7	37	83.5	77.9	90.6	57.6	94.5	34.3
	26.7	96.2	96.2	103	80.3	108.1	56.9	91.7	91.7	97.2	77.8	101.3	54.3	86.4	86.4	90.7	73.7	93.8	51.4
	29.4	101.1	101.1	103.3	96.3	108.1	74.3	96.2	96.2	97.6	93.5	101.3	71.7	90.5	90.5	91.1	90.4	93.7	68.8
	32.2	104.7	104.7	104.8	104.8	108.2	90.4	99.2	99.2	99.2	99.2	101.3	87.5	92.5	92.5	92.6	92.6	93.6	84.2
5475	23.9	95.4	86.3	103.4	64.5	108.7	39.9	90.1	83.5	97.5	61.9	102.1	37.3	84.2	80.4	91	59.1	94.7	34.6
	26.7	97.7	97.7	103.5	82.8	108.5	58.2	92.9	92.9	97.6	80.2	101.6	55.5	87.5	87.5	91.1	75.9	94	52.7
	29.4	102.3	102.3	103.9	99.4	108.5	76.6	97.2	97.2	98.1	96.7	101.5	73.9	91.3	91.3	91.5	91.5	93.8	71
	32.2	105.5	105.5	105.5	105.5	108.6	93.3	99.7	99.7	99.8	99.8	101.6	90.4	92.8	92.8	92.9	92.9	93.7	87
6041	23.9	96.9	91.4	104.3	67.5	109.4	40.6	91.5	88.6	98.3	64.9	102.6	38	85.5	85.5	91.6	62.1	95.2	35.3
	26.7	100	100	104.4	86.2	109.2	60.8	95	95	98.4	83.4	102.1	58.1	89.4	89.4	91.7	80.3	94.3	55.2
	29.4	104.2	104.2	104.8	104.8	109.1	81	98.7	98.7	98.8	98.8	101.9	78.3	92.2	92.2	92.2	92.2	94	75.4
	32.2	107	107	107	107	109.2	99.2	100.8	100.8	100.9	100.9	101.8	96.1	93.6	93.6	93.6	93.6	93.6	92.6

ID Airflow L/s	Ambient Temperature (°C) 47.8					
	Entering Wet Bulb Temp (°C)					
	16.1		19.4		22.8	
	TGC	SHC	TGC	SHC	TGC	SHC
4130	72.8	64.2	79.9	48	84	29.4
	74.4	74.4	80.1	61.9	83.2	43
	78.6	78.6	80.5	74.5	82.8	56.7
	81.8	81.8	81.8	81.8	82.7	69.3
4672	74.4	69.1	80.9	51	84.3	30
	77.1	77.1	81.1	66.6	83.3	45.3
	80.9	80.9	81.5	80.5	82.9	60.8
	82.5	82.5	82.5	82.5	82.7	74.5
5191	75.7	73.8	81.6	53.7	84.6	30.6
	79.1	79.1	81.8	69.5	83.4	47.6
	82.1	82.1	82.1	82.1	83	64.8
	82.7	82.6	82.6	82.6	82.4	79.5
5475	76.3	76.3	81.9	55.3	84.8	30.9
	80	80	82	71.6	83.5	48.8
	82.5	82.5	82.5	82.5	82.9	67
	82.6	82.6	82.5	82.5	82.1	82.1
6041	77.5	77.5	82.4	58.2	85.2	31.6
	81.3	81.3	82.4	75.9	83.6	51.3
	82.6	82.6	82.6	82.6	82.8	68.6
	81.6	81.6	81.4	81.4	81.1	81.1

Notes:

1. All capacities shown are gross and have not considered indoor fan heat. To obtain net cooling, subtract indoor fan heat.
2. TGC = Total gross capacity.
3. SHC = Sensible heat capacity.

Performance Data (50Hz Units)

Table 38. 102 kw (29.2 ton) high efficiency, gross cooling capacities (kw) — 50 Hz

ID Airflow L/s	Ent DB (°C)	Ambient Temperature (°C) 29.4						Ambient Temperature (°C) 35						Ambient Temperature (°C) 40.6					
		Entering Wet Bulb Temp (°C)						Entering Wet Bulb Temp (°C)						Entering Wet Bulb Temp (°C)					
		16.1		19.4		22.8		16.1		19.4		22.8		16.1		19.4		22.8	
		TGC	SHC	TGC	SHC	TGC	SHC	TGC	SHC	TGC	SHC	TGC	SHC	TGC	SHC	TGC	SHC	TGC	SHC
4130	23.9	93.2	72.8	104	55.8	114	37.7	87.1	68.9	97.4	51.9	106.8	33.8	80.5	64.8	90.1	47.7	98.8	29.7
	26.7	93.9	86.3	104.3	70	114.1	51.7	87.9	82.4	97.7	66.1	107	47.9	81.4	78.2	90.4	61.9	98.9	43.7
	29.4	96.9	96.9	104.6	84.1	114.2	65.8	91.6	91.6	98.1	80.2	107.1	62	85.7	85.7	90.9	75.5	99	57.8
	32.2	102.4	102.4	105.3	97.5	114.2	79.8	96.9	96.9	98.9	93.6	107.2	76	90.7	90.7	91.7	89.3	99.1	71.8
4672	23.9	95.8	78	106.4	59.2	116	38.6	89.6	74	99.6	55.2	108.6	34.7	82.7	69.6	92	51	100.4	30.6
	26.7	96.9	93.7	106.7	75.1	116	54.4	90.8	89.7	99.9	71.2	108.7	50.5	84.2	84.2	92.3	67	100.4	46.3
	29.4	101.7	101.7	107.2	90.4	115.9	70.2	96	96	100.4	86.4	108.7	66.4	89.7	89.7	92.9	82	100.4	62.2
	32.2	107.2	107.2	108.1	106	115.9	86	101.3	101.3	101.6	101.6	108.7	82.2	94.6	94.6	94.8	94.8	100.5	78.1
5191	23.9	97	80.8	107.5	60.8	116.9	39	90.7	76.7	100.5	56.9	109.5	35.2	84.5	74.6	93.4	54	101.7	31.4
	26.7	98.3	97.5	107.7	77.7	116.8	55.7	92.3	92.3	100.8	73.8	109.4	51.9	87.4	87.4	93.8	70.9	101.5	48.8
	29.4	103.8	103.8	108.3	93.8	116.6	72.5	98	98	101.5	89.7	109.3	68.7	92.7	92.7	94.5	88.1	101.4	66.4
	32.2	109.2	109.2	109.4	109.4	116.6	89.3	103.1	103.1	103.3	103.3	109.4	85.5	97.4	97.4	97.5	97.5	101.5	82.8
5475	23.9	97.9	83.1	108.2	62.2	117.6	39.4	91.5	79	101.2	58.3	110.1	35.6	85.3	77.2	94.1	55.6	102.3	31.9
	26.7	99.6	99.6	108.5	79.9	117.4	56.8	93.8	93.8	101.5	76	109.9	53	88.9	88.9	94.5	73.3	102	50.2
	29.4	105.4	105.4	109.1	96.6	117.2	74.4	99.5	99.5	102.2	92.5	109.8	70.6	94.2	94.2	95.3	91.4	101.8	68.7
	32.2	110.7	110.7	110.9	110.9	117.1	92	104.5	104.5	104.7	104.7	109.9	87.2	98.6	98.6	98.7	98.7	101.8	85.7
6041	23.9	99.1	86.3	109.2	64.1	118.4	39.9	92.6	82.1	102.1	60.2	110.8	36.1	86.9	82.5	95.2	58.8	103.4	32.8
	26.7	101.6	101.6	109.5	83	118.1	58.4	95.7	95.7	102.4	78.1	110.6	54.6	91.5	91.5	95.7	77.9	102.8	52.9
	29.4	107.4	107.4	110.1	100.5	117.8	77	101.3	101.3	103.2	96.4	110.4	73.2	96.5	96.5	96.7	96.7	102.6	73.3
	32.2	112.5	112.5	112.7	112.7	117.8	94.7	106.2	106.2	106.3	106.3	110.4	90.7	100.6	100.6	100.7	100.7	102.5	91.6

ID Airflow L/s	Ent DB (°C)	Ambient Temperature (°C) 47.8					
		Entering Wet Bulb Temp (°C)					
		16.1		19.4		22.8	
		TGC	SHC	TGC	SHC	TGC	SHC
4130	23.9	71.2	58.5	79.8	42	87.5	24
	26.7	72.4	72.4	80.1	56.1	87.6	38
	29.4	77.2	77.2	80.7	69.5	87.6	52
	32.2	81.8	81.8	81.9	81.9	87.7	66
4672	23.9	73.1	63.7	81.4	45.2	88.8	24.9
	26.7	75.7	75.7	81.7	61.1	88.7	40.5
	29.4	80.6	80.6	82.4	75.9	88.7	56.3
	32.2	84.9	84.9	85	85	88.8	71.2
5191	23.9	74.7	68.5	82.5	48.1	89.9	25.7
	26.7	78.3	78.3	83	64.7	89.6	43
	29.4	83.1	83.1	83.8	81.9	89.4	60.5
	32.2	87.1	87.1	87.2	87.2	89.4	76.5
5475	23.9	75.4	71.1	83.1	49.8	90.4	26.2
	26.7	79.6	79.6	83.5	67	90	44.4
	29.4	84.3	84.3	84.5	84.5	89.8	62.8
	32.2	88	88	88	88	89.6	79.4
6041	23.9	76.8	76.3	84	53	91.4	27.1
	26.7	81.8	81.8	84.5	71.6	90.8	47.1
	29.4	86.2	86.2	86.2	86.2	90.4	65.6
	32.2	89.3	89.3	89.4	89.4	90	85.2

Notes:

1. All capacities shown are gross and have not considered indoor fan heat. To obtain net cooling, subtract indoor fan heat.
2. TGC = Total gross capacity.
3. SHC = Sensible heat capacity.

Table 39. 33.3 ton standard efficiency, gross cooling capacities (MBh) —50 Hz

ID Airflow CFM	Ent DB (°F)	Ambient Temperature (°F) 85 Entering Wet Bulb Temp (°F) 61 TGC	61 SHC	67 TGC	67 SHC	73 TGC	73 SHC	Ambient Temperature (°F) 95 Entering Wet Bulb Temp (°F) 61 TGC	61 SHC	67 TGC	67 SHC	73 TGC	73 SHC	Ambient Temperature (°F) 105 Entering Wet Bulb Temp (°F) 61 TGC	61 SHC	67 TGC	67 SHC	73 TGC	73 SHC
10000	75	359	291	403	226	446	158	338	279	379	214	419	146	313	262	353	201	389	133
	80	363	342	405	281	449	214	342	330	381	270	423	202	318	316	355	257	394	189
	85	377	377	406	337	451	270	358	358	383	325	425	258	338	338	357	308	396	245
	90	399	399	410	388	452	325	380	380	387	375	427	313	359	359	362	362	398	301
11300	75	369	309	412	239	454	162	347	296	388	227	427	150	322	282	361	214	396	137
	80	375	370	415	302	458	225	353	353	390	290	432	213	331	331	363	277	401	200
	85	395	395	417	359	460	288	375	375	393	347	434	276	354	354	366	333	404	263
	90	418	418	422	421	461	350	398	398	399	399	435	339	376	376	376	376	405	326
12600	75	378	329	420	252	461	166	355	316	395	240	433	154	329	302	367	227	401	141
	80	386	386	423	322	466	236	366	366	397	310	438	224	344	344	369	290	407	211
	85	410	410	426	385	467	306	390	390	402	372	440	294	367	367	374	358	409	281
	90	435	435	435	435	468	375	413	413	414	414	442	357	389	389	390	390	411	343
13300	75	382	340	424	259	464	167	359	327	398	246	436	155	333	312	370	233	403	142
	80	393	393	427	332	469	242	372	372	401	314	441	230	350	350	372	299	410	217
	85	418	418	431	399	470	315	397	397	406	386	443	303	373	373	378	371	412	291
	90	442	442	443	443	471	382	421	421	421	421	444	369	396	396	396	396	413	355
14600	75	389	360	430	271	469	171	365	346	403	259	440	159	339	331	374	245	407	146
	80	404	404	433	345	474	252	383	383	407	331	446	240	359	359	378	317	414	227
	85	430	430	438	424	475	333	408	408	413	411	447	321	383	383	385	385	415	308
	90	455	455	455	455	476	404	432	432	432	432	449	392	406	406	406	406	417	377

ID Airflow CFM	Ent DB (°F)	Ambient Temperature (°F) 118 Entering Wet Bulb Temp (°F) 61 TGC	61 SHC	67 TGC	67 SHC	73 TGC	73 SHC
10000	75	279	243	315	183	347	116
	80	287	287	318	239	352	172
	85	308	308	321	289	355	228
	90	329	329	329	329	357	283
11300	75	287	262	322	196	353	119
	80	300	300	324	253	358	183
	85	322	322	329	314	361	245
	90	343	343	343	343	363	301
12600	75	293	282	327	208	357	123
	80	311	311	330	270	363	193
	85	333	333	335	335	365	263
	90	354	354	355	355	367	323
13300	75	297	292	329	215	358	124
	80	317	317	333	279	365	199
	85	339	339	339	339	367	273
	90	359	359	360	360	369	335
14600	75	302	302	333	227	361	128
	80	325	325	337	296	368	209
	85	347	347	348	348	370	278
	90	367	367	367	367	372	356

Notes:

1. All capacities shown are gross and have not considered indoor fan heat. To obtain net cooling, subtract indoor fan heat.
2. TGC = Total gross capacity.
3. SHC = Sensible heat capacity.

Performance Data (50Hz Units)

Table 40. 33.3 ton high efficiency, gross cooling capacities (MBh) — 50 Hz

ID Airflow CFM	Ent DB (°F)	Ambient Temperature (°F) 85 Entering Wet Bulb Temp (°F) 61 TGC	61 SHC	67 TGC	67 SHC	73 TGC	73 SHC	Ambient Temperature (°F) 95 Entering Wet Bulb Temp (°F) 61 TGC	61 SHC	67 TGC	67 SHC	73 TGC	73 SHC	Ambient Temperature (°F) 105 Entering Wet Bulb Temp (°F) 61 TGC	61 SHC	67 TGC	67 SHC	73 TGC	73 SHC
10000	75	366	294	409	228	451	160	343	281	385	216	424	148	318	264	358	203	394	135
	80	369	345	411	284	455	216	347	333	387	272	429	204	323	319	361	259	400	191
	85	383	383	413	339	457	272	364	364	389	324	431	260	343	343	363	310	402	247
	90	405	405	416	391	458	327	386	386	393	378	432	315	365	365	368	365	403	302
11300	75	376	312	419	242	460	164	353	299	394	229	432	152	327	285	366	216	401	139
	80	381	374	421	304	464	227	359	359	396	292	437	215	337	337	369	279	407	202
	85	401	401	424	363	465	290	382	382	399	350	439	278	360	360	372	336	409	265
	90	425	425	429	424	466	352	405	405	406	406	440	340	382	382	383	383	410	323
12600	75	385	332	427	254	467	168	361	319	401	242	438	156	335	304	372	229	406	143
	80	393	393	429	324	471	238	373	373	403	307	444	226	350	350	375	292	412	213
	85	418	418	433	388	472	307	397	397	408	375	445	296	373	373	380	361	414	283
	90	442	442	443	443	472	371	420	420	421	421	446	359	396	396	396	396	416	345
13300	75	389	343	431	261	470	170	365	330	404	249	441	158	339	315	375	235	408	144
	80	400	400	433	330	474	243	379	379	407	316	446	232	356	356	378	302	415	219
	85	425	425	437	402	474	317	404	404	412	389	448	305	380	380	384	374	416	292
	90	449	449	450	450	475	383	427	427	428	428	449	371	402	402	403	403	418	357
14600	75	396	363	436	273	475	173	372	349	409	261	445	161	345	334	379	247	411	148
	80	412	412	440	347	479	254	390	390	413	334	451	242	366	366	384	319	419	229
	85	438	438	444	427	479	334	416	416	419	413	452	323	390	390	391	391	420	301
	90	461	461	462	462	479	405	438	438	439	439	452	393	412	412	412	412	421	379

ID Airflow CFM	Ent DB (°F)	Ambient Temperature (°F) 118 Entering Wet Bulb Temp (°F) 61 TGC	61 SHC	67 TGC	67 SHC	73 TGC	73 SHC
10000	75	284	245	320	185	352	118
	80	292	292	322	241	358	174
	85	313	313	326	291	360	229
	90	334	334	335	335	362	280
11300	75	291	264	326	198	358	121
	80	305	305	329	255	364	185
	85	328	328	334	316	366	247
	90	348	348	349	349	368	303
12600	75	298	284	331	210	361	125
	80	317	317	335	272	368	195
	85	339	339	341	341	370	265
	90	360	360	361	361	372	325
13300	75	301	294	333	217	363	126
	80	322	322	338	281	370	201
	85	345	345	345	345	373	265
	90	365	365	366	366	374	337
14600	75	307	307	337	229	365	130
	80	331	331	343	298	374	211
	85	354	354	354	354	376	280
	90	372	372	373	373	376	358

Notes:

1. All capacities shown are gross and have not considered indoor fan heat. To obtain net cooling, subtract indoor fan heat.
2. TGC = Total gross capacity.
3. SHC = Sensible heat capacity.

Table 41. 117 kW (33.3 ton) standard efficiency — 50 Hz

ID Airflow L/s	Ent DB (°C)	Ambient Temperature (°C) 29.4 Entering Wet Bulb Temp (°C) 16.1 TGC	16.1 SHC	19.4 TGC	19.4 SHC	22.8 TGC	22.8 SHC	Ambient Temperature (°C) 35 Entering Wet Bulb Temp (°C) 16.1 TGC	16.1 SHC	19.4 TGC	19.4 SHC	22.8 TGC	22.8 SHC	Ambient Temperature (°C) 40.6 Entering Wet Bulb Temp (°C) 16.1 TGC	16.1 SHC	19.4 TGC	19.4 SHC	22.8 TGC	22.8 SHC
4719	23.9	105.4	85.2	118	66.2	130.6	46.3	99	81.7	111.1	62.7	122.8	42.8	91.8	76.8	103.4	59	114	39
	26.7	106.3	100.3	118.6	82.4	131.6	62.7	100.2	96.7	111.8	79	124	59.3	93.3	92.7	104.1	75.3	115.4	55.5
	29.4	110.4	110.4	119.1	98.6	132.2	79	105	105	112.3	95.2	124.7	75.6	99	99	104.7	90.2	116.2	71.9
	32.2	116.9	116.9	120.1	113.6	132.6	95.2	111.5	111.5	113.4	110	125.1	91.8	105.3	105.3	106.1	106.1	116.7	88.1
5333	23.9	108.2	90.6	120.9	70	133.1	47.4	101.7	86.8	113.7	66.5	125.1	43.9	94.4	82.7	105.7	62.7	116	40.1
	26.7	109.8	108.6	121.6	88.4	134.3	66	103.5	103.5	114.4	84.9	126.5	62.5	97	97	106.4	81.1	117.6	58.8
	29.4	115.6	115.6	122.2	105.4	134.9	84.4	110	110	115.2	101.7	127.1	80.9	103.6	103.6	107.4	97.6	118.3	77.2
	32.2	122.6	122.6	123.8	123.4	135.2	102.6	116.7	116.7	117.1	117.1	127.5	99.2	110.1	110.1	110.3	110.3	118.8	95.5
5947	23.9	110.8	96.5	123.2	73.8	135.2	48.5	104.1	92.7	115.7	70.2	126.9	45	96.5	88.4	107.5	66.4	117.5	41.2
	26.7	113	113	123.9	94.3	136.5	69.2	107.2	107.2	116.5	90.7	128.4	65.7	100.7	100.7	108.2	85	119.3	61.9
	29.4	120.2	120.2	124.9	112.9	136.9	89.6	114.2	114.2	117.7	109.1	129	86.2	107.4	107.4	109.6	105	119.9	82.4
	32.2	127.4	127.4	127.4	127.4	137.2	110	121.2	121.2	121.4	121.4	129.4	104.7	114.1	114.1	114.3	114.3	120.4	100.5
6277	23.9	112	99.6	124.3	75.8	136.1	49.1	105.2	95.8	116.7	72.2	127.7	45.6	97.6	91.5	108.3	68.3	118.2	41.7
	26.7	115.1	115.1	125	97.4	137.4	70.8	109.2	109.2	117.5	92	129.2	67.4	102.4	102.4	109.1	87.7	120	63.6
	29.4	122.4	122.4	126.2	116.8	137.8	92.4	116.2	116.2	118.9	113.1	129.8	89	109.3	109.3	110.7	108.9	120.6	85.2
	32.2	129.6	129.6	129.8	129.8	138.2	111.9	123.3	123.3	123.5	123.5	130.2	108.2	116	116	116.1	116.1	121.2	104.1
6890	23.9	114	105.4	126	79.4	137.5	50.1	107	101.5	118.3	75.8	128.9	46.5	99.3	97.1	109.6	71.9	119.3	42.7
	26.7	118.5	118.5	126.8	101.1	138.9	73.9	112.3	112.3	119.2	97.1	130.6	70.4	105.3	105.3	110.7	92.8	121.2	66.6
	29.4	126.1	126.1	128.3	124.2	139.2	97.5	119.6	119.6	120.9	120.3	131	94.1	112.3	112.3	112.7	112.7	121.7	90.3
	32.2	133.3	133.3	133.4	133.4	139.5	118.5	126.6	126.6	126.7	126.7	131.5	114.8	118.9	118.9	119	119	122.2	110.5

ID Airflow L/s	Ent DB (°C)	Ambient Temperature (°C) 47.8 Entering Wet Bulb Temp (°C) 16.1 TGC	16.1 SHC	19.4 TGC	19.4 SHC	22.8 TGC	22.8 SHC
4719	23.9	81.8	71.1	92.3	53.7	101.8	33.9
	26.7	84.2	84.2	93.1	70	103.3	50.4
	29.4	90.3	90.3	94	84.7	104	66.7
	32.2	96.3	96.3	96.5	96.5	104.5	82.9
5333	23.9	84.1	76.9	94.2	57.4	103.3	35
	26.7	88	88	95	74.1	105.1	53.6
	29.4	94.4	94.4	96.3	92	105.7	71.9
	32.2	100.4	100.4	100.6	100.6	106.3	88.2
5947	23.9	86	82.5	95.7	61.1	104.5	35.9
	26.7	91.3	91.3	96.7	79.2	106.4	56.7
	29.4	97.7	97.7	98.3	98.3	107	77.1
	32.2	103.8	103.8	103.9	103.9	107.6	94.7
6277	23.9	86.9	85.5	96.4	63	105	36.5
	26.7	92.8	92.8	97.5	81.8	107	58.3
	29.4	99.2	99.2	99.4	99.4	107.6	79.9
	32.2	105.3	105.3	105.4	105.4	108.1	98.1
6890	23.9	88.6	88.6	97.5	66.5	105.7	37.4
	26.7	95.3	95.3	98.8	86.8	107.9	61.4
	29.4	101.8	101.8	102	102	108.5	81.6
	32.2	107.5	107.5	107.6	107.6	108.9	104.5

Notes:

1. All capacities shown are gross and have not considered indoor fan heat. To obtain net cooling, subtract indoor fan heat.
2. TGC = Total gross capacity.
3. SHC = Sensible heat capacity.

Performance Data (50Hz Units)

Table 42. 119 kW (33.3 ton) high efficiency, gross cooling capacities (kw) — 50 Hz

ID Airflow L/s	Ent DB (°C)	Ambient Temperature (°C) 29.4 Entering Wet Bulb Temp (°C) 16.1 TGC	16.1 SHC	19.4 TGC	19.4 SHC	22.8 TGC	22.8 SHC	Ambient Temperature (°C) 35 Entering Wet Bulb Temp (°C) 16.1 TGC	16.1 SHC	19.4 TGC	19.4 SHC	22.8 TGC	22.8 SHC	Ambient Temperature (°C) 40.6 Entering Wet Bulb Temp (°C) 16.1 TGC	16.1 SHC	19.4 TGC	19.4 SHC	22.8 TGC	22.8 SHC
4719	23.9	107.1	86	119.8	66.9	132.3	46.9	100.6	82.4	112.9	63.4	124.4	43.4	93.3	77.5	105	59.6	115.5	39.6
	26.7	108.1	101.2	120.5	83.2	133.4	63.3	101.8	97.5	113.5	79.7	125.7	59.9	94.8	93.5	105.7	75.9	117.1	56.1
	29.4	112.2	112.2	121	99.4	133.9	79.6	106.8	106.8	114	95	126.4	76.2	100.7	100.7	106.4	91	117.8	72.4
	32.2	118.8	118.8	122	114.5	134.1	95.7	113.3	113.3	115.2	110.9	126.7	92.4	107	107	107.7	106.9	118.2	88.6
5333	23.9	110.1	91.5	122.8	70.8	134.8	48.1	103.4	87.6	115.5	67.2	126.7	44.6	95.9	83.4	107.3	63.4	117.6	40.7
	26.7	111.6	109.5	123.5	89.2	136	66.6	105.2	105.2	116.1	85.6	128.2	63.1	98.7	98.7	108	81.7	119.2	59.3
	29.4	117.7	117.7	124.2	106.3	136.4	84.9	111.9	111.9	117	102.5	128.7	81.5	105.4	105.4	109	98.4	119.8	77.7
	32.2	124.7	124.7	125.7	124.3	136.6	103.1	118.7	118.7	118.9	118.9	129	99.7	111.9	111.9	112.1	112.1	120.3	94.5
5947	23.9	112.7	97.4	125.2	74.6	136.8	49.2	105.8	93.5	117.5	70.9	128.5	45.7	98.2	89.2	109.1	67	119.1	41.8
	26.7	115.1	115.1	125.8	95	138	69.7	109.2	109.2	118.3	89.9	130	66.2	102.5	102.5	110	85.7	120.9	62.4
	29.4	122.4	122.4	126.9	113.7	138.2	90	116.3	116.3	119.6	109.9	130.4	86.6	109.3	109.3	111.3	105.7	121.4	82.9
	32.2	129.5	129.5	129.7	129.7	138.5	108.8	123.2	123.2	123.4	123.4	130.8	105.2	116	116	116.2	116.2	121.9	101.1
6277	23.9	113.9	100.5	126.2	76.5	137.8	49.7	107	96.6	118.5	72.9	129.3	46.2	99.2	92.2	109.9	69	119.7	42.3
	26.7	117.2	117.2	126.9	96.6	138.9	71.3	111.2	111.2	119.3	92.7	130.8	67.9	104.3	104.3	110.9	88.4	121.6	64.1
	29.4	124.6	124.6	128.1	117.7	139	92.8	118.4	118.4	120.8	113.9	131.2	89.4	111.2	111.2	112.5	109.6	122.1	85.6
	32.2	131.7	131.7	131.9	131.9	139.2	112.4	125.3	125.3	125.5	125.5	131.5	108.7	117.8	117.8	118	118	122.5	104.6
6890	23.9	115.9	106.3	127.9	80.2	139.2	50.8	108.9	102.3	120	76.5	130.4	47.2	101	97.9	111.2	72.5	120.5	43.3
	26.7	120.8	120.8	128.8	101.8	140.3	74.4	114.4	114.4	121.1	97.8	132.1	71	107.3	107.3	112.5	93.5	122.8	67.2
	29.4	128.3	128.3	130.3	125	140.3	97.9	121.8	121.8	122.8	121.1	132.3	94.5	114.4	114.4	114.6	114.6	123.2	88.1
	32.2	135.2	135.2	135.4	135.4	140.4	118.8	128.5	128.5	128.6	128.6	132.6	115.2	120.7	120.7	120.8	120.8	123.5	111

ID Airflow L/s	Ent DB (°C)	Ambient Temperature (°C) 47.8 Entering Wet Bulb Temp (°C) 16.1 TGC	16.1 SHC	19.4 TGC	19.4 SHC	22.8 TGC	22.8 SHC
4719	23.9	83.1	71.7	93.7	54.3	103.3	34.5
	26.7	85.6	85.6	94.5	70.6	104.9	50.9
	29.4	91.8	91.8	95.5	85.3	105.6	67.2
	32.2	97.9	97.9	98.1	98.1	106	82.2
5333	23.9	85.4	77.5	95.6	58	104.9	35.5
	26.7	89.5	89.5	96.5	74.7	106.6	54.1
	29.4	96	96	97.8	92.7	107.3	72.5
	32.2	102.1	102.1	102.3	102.3	107.8	88.8
5947	23.9	87.3	83.1	97.1	61.6	105.9	36.5
	26.7	92.9	92.9	98.3	79.8	108	57.2
	29.4	99.4	99.4	99.9	99.9	108.5	77.6
	32.2	105.5	105.5	105.7	105.7	109.1	95.3
6277	23.9	88.3	86.1	97.7	63.5	106.3	37.1
	26.7	94.5	94.5	99.1	82.4	108.5	58.9
	29.4	101	101	101.1	101.1	109.2	77.7
	32.2	107	107	107.2	107.2	109.6	98.7
6890	23.9	90.1	90.1	98.7	67	107	38
	26.7	97.1	97.1	100.5	87.3	109.5	61.9
	29.4	103.6	103.6	103.8	103.8	110.1	82
	32.2	109.2	109.2	109.3	109.3	110.3	105

Notes:

1. All capacities shown are gross and have not considered indoor fan heat. To obtain net cooling, subtract indoor fan heat.
2. TGC = Total gross capacity.
3. SHC = Sensible heat capacity.

Table 43. 41.7 ton standard efficiency, gross cooling capacities (MBh) — 50 Hz

ID Airflow CFM	Ent DB (°F)	Ambient Temperature (°F) 85 Entering Wet Bulb Temp (°F) 61 TGC	61 SHC	67 TGC	67 SHC	73 TGC	73 SHC	Ambient Temperature (°F) 95 Entering Wet Bulb Temp (°F) 61 TGC	61 SHC	67 TGC	67 SHC	73 TGC	73 SHC	Ambient Temperature (°F) 105 Entering Wet Bulb Temp (°F) 61 TGC	61 SHC	67 TGC	67 SHC	73 TGC	73 SHC
12500	75	430	356	479	273	522	184	406	343	451	260	491	171	379	325	421	245	457	157
	80	434	421	480	342	522	253	410	407	453	329	492	240	385	385	423	314	458	226
	85	453	453	482	411	522	322	432	432	455	398	492	309	408	408	425	379	458	295
	90	478	478	486	475	523	391	456	456	460	460	492	378	431	431	431	431	458	363
14100	75	440	382	488	288	528	188	415	365	460	275	497	175	388	350	429	260	463	161
	80	447	447	490	366	528	266	423	423	462	353	497	252	399	399	431	338	462	238
	85	472	472	492	439	528	343	449	449	464	425	497	330	424	424	434	410	462	315
	90	497	497	498	498	528	420	473	473	473	473	497	407	445	445	446	446	461	393
15800	75	450	405	496	304	534	192	424	391	467	291	502	179	396	375	435	276	467	164
	80	462	462	498	391	533	278	439	439	469	378	501	265	413	413	437	357	465	251
	85	489	489	501	472	532	365	464	464	472	458	500	352	437	437	441	441	464	337
	90	512	512	513	513	532	452	486	486	486	486	500	431	455	455	456	456	463	415
16600	75	454	417	499	312	536	193	428	403	470	298	504	180	399	387	438	283	469	166
	80	469	469	501	403	535	284	445	445	471	390	502	271	419	419	439	368	466	257
	85	495	495	504	487	534	375	470	470	475	473	501	362	442	442	444	444	464	347
	90	517	517	518	518	533	459	490	490	491	491	501	445	459	459	459	459	463	429
18300	75	462	443	505	327	540	197	435	429	475	314	508	184	406	406	442	299	472	170
	80	481	481	506	421	538	297	457	457	477	407	505	284	429	429	444	391	468	269
	85	507	507	510	510	536	397	481	481	482	482	503	384	451	451	450	450	465	369
	90	526	526	527	527	537	489	497	497	497	497	503	474	463	463	463	463	465	457

ID Airflow CFM	Ent DB (°F)	Ambient Temperature (°F) 118 Entering Wet Bulb Temp (°F) 61 TGC	61 SHC	67 TGC	67 SHC	73 TGC	73 SHC
12500	75	342	305	379	226	410	138
	80	352	352	381	295	409	206
	85	374	374	384	358	409	275
	90	394	394	394	394	408	343
14100	75	349	329	385	241	414	141
	80	365	365	387	318	412	218
	85	387	387	390	389	410	295
	90	404	404	404	404	410	365
15800	75	356	354	390	256	417	145
	80	377	377	392	336	414	231
	85	397	397	397	397	459	333
	90	409	409	409	409	410	392
16600	75	359	359	392	263	419	147
	80	381	381	394	346	414	236
	85	400	400	401	401	411	327
	90	409	409	409	409	410	405
18300	75	366	366	396	279	421	151
	80	389	389	398	368	415	249
	85	406	406	406	406	412	338
	90	411	411	411	411	474	458

Notes:

1. All capacities shown are gross and have not considered indoor fan heat. To obtain net cooling, subtract indoor fan heat.
2. TGC = Total gross capacity.
3. SHC = Sensible heat capacity.

Performance Data (50Hz Units)

Table 44. 41.7 ton high efficiency, gross cooling capacities (MBh) — 50 Hz

ID Airflow CFM	Ent DB (°F)	Ambient Temperature (°F) 85 Entering Wet Bulb Temp (°F) 61 TGC	61 SHC	67 TGC	67 SHC	73 TGC	73 SHC	Ambient Temperature (°F) 95 Entering Wet Bulb Temp (°F) 61 TGC	61 SHC	67 TGC	67 SHC	73 TGC	73 SHC	Ambient Temperature (°F) 105 Entering Wet Bulb Temp (°F) 61 TGC	61 SHC	67 TGC	67 SHC	73 TGC	73 SHC
12500	75	443	361	490	281	533	193	418	347	462	268	502	181	391	331	432	254	467	167
	80	448	428	493	350	538	263	424	414	465	337	508	250	397	397	434	323	474	237
	85	466	466	495	414	540	332	445	445	468	400	510	319	420	420	437	385	476	306
	90	492	492	500	481	540	401	469	469	473	468	511	388	444	444	444	444	478	368
14100	75	454	385	500	297	542	198	428	370	471	283	509	185	400	355	439	269	473	171
	80	461	461	503	375	547	276	437	437	474	361	516	263	412	412	442	339	481	250
	85	486	486	506	444	548	353	463	463	478	430	517	341	437	437	447	415	483	327
	90	512	512	513	513	549	424	487	487	488	488	518	410	460	460	461	461	484	395
15800	75	463	409	508	313	549	202	437	395	478	299	515	189	408	379	445	285	478	175
	80	476	476	511	391	554	289	452	452	482	376	522	277	426	426	449	360	487	263
	85	503	503	515	476	554	376	478	478	487	462	523	364	451	451	455	446	488	350
	90	528	528	529	529	555	452	503	503	503	503	524	438	474	474	474	474	490	423
16600	75	467	421	511	320	551	204	441	406	481	307	517	191	411	390	447	292	479	177
	80	483	483	515	402	557	296	458	458	485	387	525	283	431	431	452	370	489	269
	85	510	510	519	491	557	387	485	485	490	476	526	374	457	457	459	459	491	361
	90	535	535	536	536	558	465	509	509	509	509	527	451	479	479	479	479	492	436
18300	75	475	445	517	336	556	208	447	430	486	322	520	195	418	413	451	308	482	181
	80	496	496	521	423	562	309	470	470	491	408	529	297	442	442	458	391	493	283
	85	523	523	527	522	562	409	497	497	498	498	530	382	467	467	467	467	495	365
	90	547	547	547	547	562	493	519	519	520	520	531	479	488	488	488	488	495	463

ID Airflow CFM	Ent DB (°F)	Ambient Temperature (°F) 118 Entering Wet Bulb Temp (°F) 61 TGC	61 SHC	67 TGC	67 SHC	73 TGC	73 SHC
12500	75	352	310	389	235	421	148
	80	363	363	392	297	428	218
	85	386	386	396	364	430	287
	90	408	408	408	408	432	347
14100	75	360	333	395	250	425	152
	80	377	377	399	317	433	231
	85	400	400	404	393	435	309
	90	421	421	422	422	437	373
15800	75	368	356	400	266	428	157
	80	389	389	405	338	438	245
	85	412	412	412	412	440	316
	90	432	432	433	433	441	401
16600	75	371	367	401	273	429	158
	80	393	393	407	347	440	251
	85	417	417	417	417	442	324
	90	436	436	437	437	443	414
18300	75	377	377	405	266	431	162
	80	402	402	412	368	443	264
	85	425	425	426	426	446	341
	90	444	444	444	444	446	440

Notes:

1. All capacities shown are gross and have not considered indoor fan heat. To obtain net cooling, subtract indoor fan heat.
2. TGC = Total gross capacity.
3. SHC = Sensible heat capacity.

Table 45. 138 kW (41.7 ton) standard efficiency, gross cooling capacities (kw)— 50 Hz

ID Airflow L/s	Ent DB (°C)	Ambient Temperature (°C) 29.4 Entering Wet Bulb Temp (°C) 16.1 TGC	16.1 SHC	19.4 TGC	19.4 SHC	22.8 TGC	22.8 SHC	Ambient Temperature (°C) 35 Entering Wet Bulb Temp (°C) 16.1 TGC	16.1 SHC	19.4 TGC	19.4 SHC	22.8 TGC	22.8 SHC	Ambient Temperature (°C) 40.6 Entering Wet Bulb Temp (°C) 16.1 TGC	16.1 SHC	19.4 TGC	19.4 SHC	22.8 TGC	22.8 SHC
5899	23.9	126	104.3	140.3	80	152.9	54	118.9	100.4	132.3	76.1	144	50.2	111.1	95.3	123.5	71.9	134.1	46
	26.7	127.2	123.4	140.7	100.2	153	74.3	120.3	119.4	132.8	96.4	144.2	70.4	112.8	112.8	124	92.2	134.2	66.3
	29.4	132.7	132.7	141.2	120.4	153.1	94.5	126.5	126.5	133.3	116.6	144.2	90.6	119.5	119.5	124.6	111.1	134.3	86.4
	32.2	140.1	140.1	142.3	139.3	153.2	114.6	133.6	133.6	134.7	134.7	144.3	110.7	126.2	126.2	126.4	126.4	134.3	106.5
6654	23.9	129.1	112.1	143.1	84.5	154.9	55.1	121.7	106.9	134.9	80.6	145.8	51.2	113.6	102.5	125.7	76.3	135.6	47.1
	26.7	131	131	143.6	107.3	154.9	77.9	124.1	124.1	135.3	103.4	145.7	74	117.1	117.1	126.2	99.1	135.5	69.8
	29.4	138.3	138.3	144.2	128.7	154.8	100.6	131.7	131.7	136.1	124.6	145.6	96.7	124.2	124.2	127.1	120.1	135.3	92.4
	32.2	145.6	145.6	145.9	145.9	154.7	123.2	138.6	138.6	138.8	138.8	145.5	119.3	130.5	130.5	130.6	130.6	135.2	115.1
7457	23.9	131.9	118.7	145.5	89.2	156.5	56.2	124.3	114.5	136.9	85.2	147.2	52.4	116	110	127.5	80.9	136.8	48.2
	26.7	135.4	135.4	145.8	114.7	156.3	81.6	128.6	128.6	137.4	110.7	146.8	77.7	121.1	121.1	128	104.8	136.3	73.5
	29.4	143.2	143.2	146.7	138.3	156	107	136.1	136.1	138.4	134.1	146.5	103.1	128.1	128.1	129.2	129.2	135.9	98.8
	32.2	150	150	150.2	150.2	155.9	132.4	142.4	142.4	142.5	142.5	146.5	126.5	133.5	133.5	133.6	133.6	135.7	121.8
7834	23.9	133.1	122.3	146.4	91.3	157.2	56.7	125.4	118.1	137.8	87.4	147.8	52.9	117	113.5	128.2	83.1	137.3	48.7
	26.7	137.4	137.4	146.7	118.1	156.8	83.4	130.5	130.5	138.2	114.2	147.2	79.5	122.7	122.7	128.7	107.9	136.7	75.2
	29.4	145.1	145.1	147.7	142.7	156.4	110	137.8	137.8	139.3	138.6	146.8	106.1	129.6	129.6	130.1	130.1	136.1	101.8
	32.2	151.6	151.6	151.8	151.8	156.3	134.6	143.7	143.7	143.8	143.8	146.7	130.4	134.4	134.4	134.5	134.5	135.8	125.6
8637	23.9	135.3	129.9	148	95.9	158.3	57.8	127.5	125.6	139.2	91.9	148.8	54	118.9	118.9	129.5	87.6	138.3	49.8
	26.7	141.1	141.1	148.4	123.5	157.7	87.1	133.9	133.9	139.7	119.2	147.9	83.2	125.8	125.8	130.1	114.5	137.2	79
	29.4	148.6	148.6	149.6	149.6	157.1	116.5	140.9	140.9	141.1	141.1	147.3	112.5	132.1	132	131.9	131.9	136.4	108.2
	32.2	154.3	154.3	154.4	154.4	157.3	143.2	145.7	145.7	145.7	145.7	147.3	138.9	135.6	135.6	135.6	135.6	136.3	134

ID Airflow L/s	Ent DB (°C)	Ambient Temperature (°C) 47.8 Entering Wet Bulb Temp (°C) 16.1 TGC	16.1 SHC	19.4 TGC	19.4 SHC	22.8 TGC	22.8 SHC
5899	23.9	100.1	89.3	111.1	66.2	120.1	40.3
	26.7	103.1	103.1	111.6	86.4	120	60.4
	29.4	109.5	109.5	112.4	105	119.8	80.5
	32.2	115.4	115.4	115.5	115.5	119.7	100.6
6654	23.9	102.4	96.4	112.9	70.5	121.3	41.4
	26.7	107	107	113.4	93.3	120.7	63.9
	29.4	113.4	113.4	114.4	113.9	120.3	86.5
	32.2	118.3	118.3	118.4	118.4	120.1	106.8
7457	23.9	104.4	103.8	114.4	75.1	122.3	42.5
	26.7	110.4	110.4	114.9	98.4	121.2	67.6
	29.4	116.3	116.3	116.3	116.3	134.7	97.5
	32.2	119.8	119.8	119.8	119.8	120.2	115
7834	23.9	105.3	105.3	114.9	77.2	122.7	43
	26.7	111.7	111.7	115.5	101.5	121.4	69.3
	29.4	117.4	117.4	117.5	117.5	120.6	95.8
	32.2	120	120	120	120	120.2	118.8
8637	23.9	107.2	107.2	115.9	81.7	123.4	44.1
	26.7	114.1	114.1	116.5	108	121.7	73
	29.4	119	119	119	119	120.9	98.9
	32.2	120.6	120.6	120.6	120.6	138.9	134.2

Notes:

1. All capacities shown are gross and have not considered indoor fan heat. To obtain net cooling, subtract indoor fan heat.
2. TGC = Total gross capacity.
3. SHC = Sensible heat capacity.

Performance Data (50Hz Units)

Table 46. 142 kW (41.7 ton) high efficiency, gross cooling capacities — 50 Hz

ID Airflow L/s	Ent DB (°C)	Ambient Temperature (°C) 29.4 Entering Wet Bulb Temp (°C) 16.1 TGC	16.1 SHC	19.4 TGC	19.4 SHC	22.8 TGC	22.8 SHC	Ambient Temperature (°C) 35 Entering Wet Bulb Temp (°C) 16.1 TGC	16.1 SHC	19.4 TGC	19.4 SHC	22.8 TGC	22.8 SHC	Ambient Temperature (°C) 40.6 Entering Wet Bulb Temp (°C) 16.1 TGC	16.1 SHC	19.4 TGC	19.4 SHC	22.8 TGC	22.8 SHC
5899	23.9	129.9	105.7	143.7	82.4	156.3	56.7	122.6	101.6	135.5	78.6	147.1	52.9	114.5	97.1	126.5	74.5	137	48.9
	26.7	131.3	125.4	144.5	102.7	157.7	77	124.2	121.4	136.2	98.9	148.9	73.4	116.5	116.5	127.2	94.7	139	69.4
	29.4	136.7	136.7	145.1	121.3	158.2	97.3	130.3	130.3	137.1	117.2	149.4	93.6	123.2	123.2	128.2	112.8	139.6	89.6
	32.2	144.2	144.2	146.4	141.1	158.4	117.4	137.5	137.5	138.6	137.1	149.7	113.8	130.1	130.1	130.3	130.3	140	107.8
6654	23.9	133	112.7	146.6	86.9	158.8	57.9	125.6	108.5	138	83	149.3	54.1	117.2	103.9	128.6	78.9	138.7	50
	26.7	135	135	147.3	109.8	160.3	80.8	128	128	138.8	105.9	151.2	77.1	120.8	120.8	129.5	99.2	141	73.1
	29.4	142.5	142.5	148.3	130.3	160.6	103.6	135.6	135.6	140	126.1	151.6	99.9	127.9	127.9	130.9	121.5	141.6	95.9
	32.2	150	150	150.3	150.3	160.8	124.2	142.9	142.9	143.1	143.1	151.9	120.1	134.9	134.9	135.1	135.1	142	115.7
7457	23.9	135.8	120	149	91.6	160.8	59.2	128.1	115.7	140.1	87.7	150.9	55.4	119.6	111	130.3	83.5	140	51.2
	26.7	139.5	139.5	149.8	114.7	162.3	84.8	132.5	132.5	141.1	110.3	153.1	81.1	124.7	124.7	131.7	105.5	142.7	77.1
	29.4	147.5	147.5	151.1	139.6	162.5	110.2	140.2	140.2	142.6	135.3	153.4	106.6	132.1	132.1	133.4	130.7	143.1	102.6
	32.2	154.9	154.9	155.1	155.1	162.7	132.5	147.3	147.3	147.5	147.5	153.6	128.4	138.8	138.8	139	139	143.5	123.9
7834	23.9	137	123.4	149.9	93.8	161.6	59.8	129.1	119.1	140.9	89.8	151.5	55.9	120.5	114.3	131	85.6	140.4	51.8
	26.7	141.5	141.5	150.8	117.7	163.2	86.6	134.3	134.3	142.1	113.3	153.8	83	126.4	126.4	132.5	108.5	143.3	79
	29.4	149.5	149.5	152.2	143.9	163.3	113.3	142.1	142.1	143.7	139.6	154.1	109.7	133.8	133.8	134.4	134.4	143.8	105.7
	32.2	156.8	156.8	157	157	163.4	136.4	149.1	149.1	149.2	149.2	154.3	132.3	140.4	140.4	140.5	140.5	144.1	127.7
8637	23.9	139.2	130.6	151.6	98.3	162.8	61	131.1	126.1	142.3	94.4	152.4	57.1	122.5	121.2	132.2	90.1	141.3	53
	26.7	145.3	145.3	152.8	124.1	164.7	90.6	137.8	137.8	143.9	119.6	155.2	86.9	129.5	129.5	134.1	114.6	144.5	82.9
	29.4	153.3	153.3	154.4	153	164.7	120	145.5	145.5	145.9	145.9	155.5	111.8	136.9	136.9	137	137	145	107
	32.2	160.2	160.2	160.3	160.3	164.7	144.6	152.1	152.1	152.3	152.3	155.5	140.4	143	143	143.2	143.2	145.2	135.7

ID Airflow L/s	Ent DB (°C)	Ambient Temperature (°C) 47.8 Entering Wet Bulb Temp (°C) 16.1 TGC	16.1 SHC	19.4 TGC	19.4 SHC	22.8 TGC	22.8 SHC
5899	23.9	103.3	90.8	114.1	69	123.3	43.5
	26.7	106.5	106.5	114.8	87	125.4	64
	29.4	113.1	113.1	116	106.7	126	84.2
	32.2	119.4	119.4	119.6	119.6	126.5	101.7
6654	23.9	105.6	97.5	115.8	73.3	124.6	44.7
	26.7	110.5	110.5	116.9	92.8	127	67.7
	29.4	117.1	117.1	118.3	115.2	127.6	90.5
	32.2	123.5	123.5	123.6	123.6	128.1	109.4
7457	23.9	107.7	104.4	117.1	77.9	125.5	45.9
	26.7	113.9	113.9	118.6	98.9	128.3	71.7
	29.4	120.7	120.7	120.8	120.8	129.1	92.6
	32.2	126.7	126.7	126.8	126.8	129.4	117.4
7834	23.9	108.7	107.6	117.7	80	125.9	46.4
	26.7	115.3	115.3	119.3	101.8	128.8	73.6
	29.4	122.1	122.1	122.2	122.2	129.6	95
	32.2	127.9	127.9	128	128	129.9	121.2
8637	23.9	110.6	110.6	118.7	78.1	126.4	47.5
	26.7	117.8	117.8	120.7	107.7	129.8	77.5
	29.4	124.6	124.6	124.7	124.7	130.6	100.1
	32.2	130	130	130.1	130.1	130.8	129

Notes:

1. All capacities shown are gross and have not considered indoor fan heat. To obtain net cooling, subtract indoor fan heat.
2. TGC = Total gross capacity.
3. SHC = Sensible heat capacity.

Table 47. Electric heat air temperature rise (°F) (I-P)—50 Hz

KW Input	Total MBH	CFM												
		7000	8000	9000	10000	11000	12000	13000	14000	15000	16000	17000	18000	19000
26.9	92	12.1	10.6	9.4	8.5	7.7	7.1	—	—	—	—	—	—	—
40.4	138	18.2	15.9	14.1	12.7	11.6	10.6	9.8	9.1	8.5	8.0	7.5	7.1	6.7
53.8	184	24.2	21.2	18.8	16.9	15.4	14.1	13.0	12.1	11.3	10.6	10.0	9.4	8.9
67.3	230	30.3	26.5	23.6	21.2	19.3	17.7	16.3	15.1	14.1	13.2	12.5	11.8	11.2
80.7	275	—	—	—	25.4	23.1	21.2	19.6	18.2	16.9	15.9	15.0	14.1	13.4

Notes:

1. Air temperature rise = (kW x 3413)/(scfm x 1.085).
2. All heaters on constant volume units provide 2 increments of capacity.
3. Air temperature rise in this table are based on heater operating at 415 volts.

Table 48. Electric heat air temperature rise (°C) (SI)—50 Hz

KW Input	L/S												
	3300	3780	4250	4720	5190	5660	6140	6610	7080	7550	8020	8500	8970
26.9	6.8	5.9	5.3	4.7	4.3	4.0	—	—	—	—	—	—	—
40.4	10.2	8.9	7.9	7.1	6.5	5.9	5.5	5.1	4.8	4.5	4.2	4.0	3.8
53.8	13.6	11.9	10.5	9.5	8.6	7.9	7.3	6.8	6.3	5.9	5.6	5.3	5.0
67.3	17.0	14.8	13.2	11.9	10.8	9.9	9.1	8.5	7.9	7.4	7.0	6.6	6.3
80.7	—	—	—	14.2	13.0	11.9	11.0	10.2	9.5	8.9	8.4	7.9	7.5

Notes:

1. Air temperature rise in this table are based on heater operating at 415 volts.
2. All heaters on constant volume units provide 2 increments of capacity.

Table 49. Available electric heat KW ranges—50 Hz

Nominal Unit Size Tons	Nominal Voltage (V)	
	380	415
22.9	23–56	27–67
25.0	23–56	27–67
29.2	23–56	27–67
33.3	34–68	40–81
42.7	34–68	40–81

Note: kW ranges in this table are based on heater operating at nominal voltages 380 or 415.

Figure 6. Supply fan performance – 22.9-29.1 tons

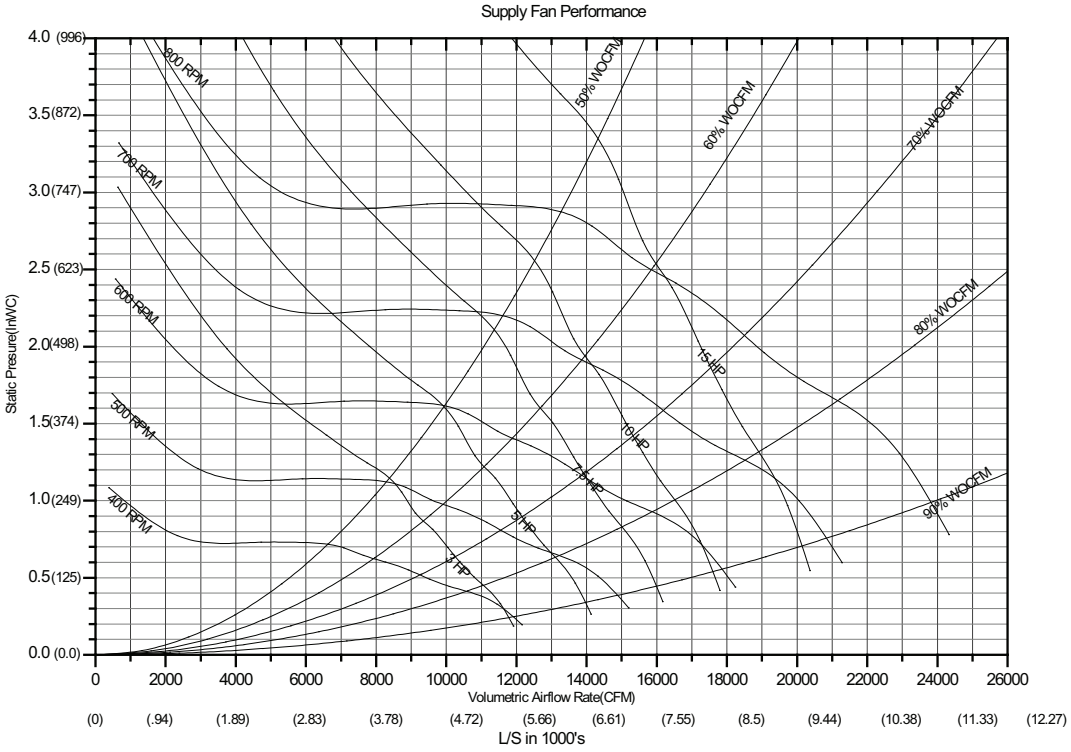


Figure 7. Supply fan performance – 33.3 and 41.7 tons (I-P)

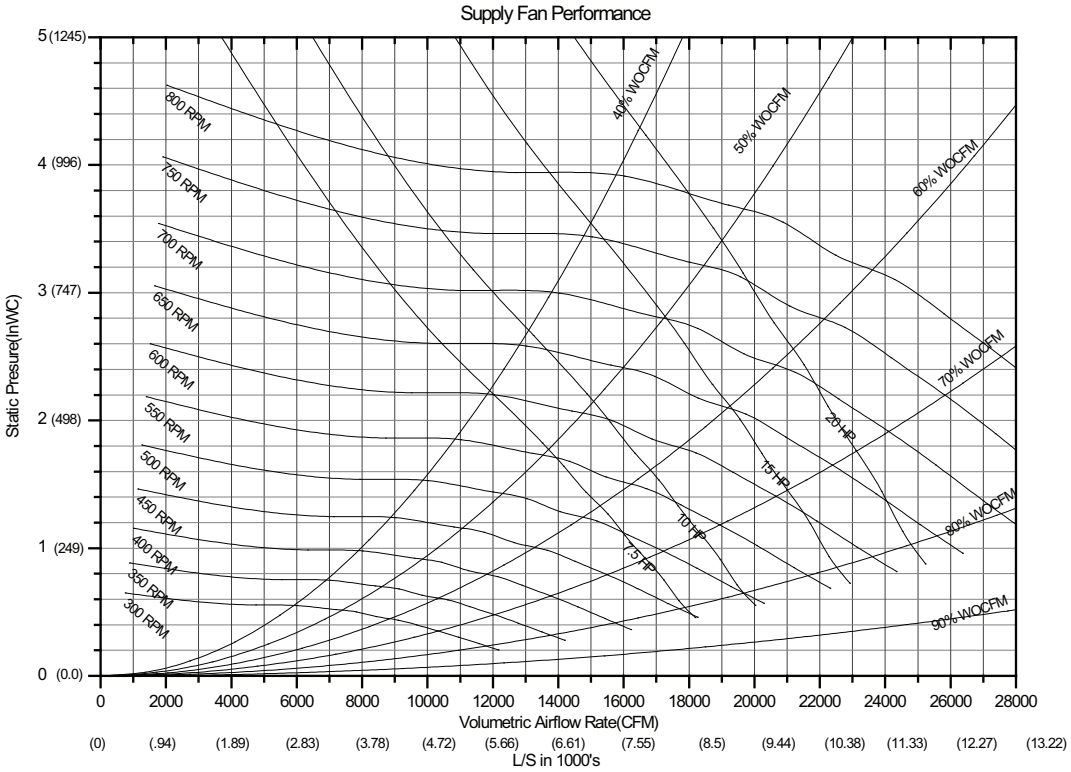


Table 50. Component static pressure drops – in. wg (I-P)

Nom. Tons	CFM Std Air	Heating System				Standard Efficiency ID Coil		High Efficiency ID Coil		Filters				Econo-mizer	Hot Gas Reheat Coil
		Gas Heat		Electric Heat						Throw-away	MERV 8 High Eff		MERV 14 High Eff		
		Low	High	1 Element	2 Ele-ments	Dry	Wet	Dry	Wet	2"	2"	4"	4"		
23 (80)	6670	–	–	0.04	0.05	0.12	0.19	0.15	0.24	0.07	0.10	0.09	0.24	0.033	0.05
	7500	–	–	0.06	0.06	0.15	0.23	0.18	0.29	0.08	0.11	0.11	0.28	0.04	0.07
	8330	–	–	0.07	0.08	0.17	0.27	0.21	0.33	0.09	0.12	0.12	0.32	0.049	0.08
	9170	–	–	0.08	0.09	0.2	0.31	0.25	0.38	0.11	0.13	0.14	0.37	0.059	0.1
	10000	–	–	0.1	0.11	0.23	0.35	0.29	0.43	0.12	0.15	0.16	0.41	0.07	0.12
25 (88)	7500	–	–	0.06	0.06	0.15	0.23	0.18	0.29	0.08	0.11	0.11	0.28	0.04	0.07
	8330	–	–	0.07	0.08	0.17	0.27	0.21	0.33	0.09	0.12	0.12	0.32	0.049	0.08
	9170	–	–	0.08	0.09	0.2	0.31	0.25	0.38	0.11	0.13	0.14	0.37	0.059	0.1
	10000	–	–	0.1	0.11	0.23	0.35	0.29	0.43	0.12	0.15	0.16	0.41	0.07	0.12
29 (103)	8750	–	–	0.08	0.08	0.18	0.28	0.23	0.35	0.14	0.16	0.18	0.46	0.054	0.09
	9580	–	–	0.09	0.1	0.21	0.32	0.26	0.4	0.10	0.13	0.13	0.35	0.065	0.11
	11200	–	–	0.13	0.14	0.28	0.41	0.35	0.51	0.11	0.14	0.15	0.39	0.077	0.15
	12100	–	–	0.15	0.16	0.31	0.46	0.39	0.58	0.13	0.16	0.17	0.44	0.091	0.17
	12800	–	–	0.16	0.18	0.34	0.5	0.42	0.62	0.15	0.17	0.19	0.49	0.1	0.19
33 (118)	10000	–	–	0.07	0.11	0.23	0.35	0.26	0.42	0.16	0.19	0.21	0.54	0.07	0.04
	10800	–	–	0.08	0.13	0.25	0.39	0.3	0.47	0.18	0.21	0.23	0.59	0.076	0.05
	11700	–	–	0.1	0.15	0.29	0.44	0.35	0.53	0.11	0.14	0.14	0.38	0.085	0.05
	12500	–	–	0.11	0.17	0.33	0.49	0.38	0.58	0.13	0.16	0.16	0.43	0.096	0.06
	13300	–	–	0.12	0.19	0.36	0.53	0.43	0.64	0.14	0.18	0.18	0.47	0.107	0.07
	14200	–	–	0.14	0.22	0.4	0.58	0.48	0.7	0.16	0.20	0.20	0.52	0.12	0.08
42 (146)	12500	–	–	0.11	0.17	0.33	0.48	0.4	0.58	0.17	0.22	0.22	0.57	0.095	0.06
	13300	–	–	0.12	0.19	0.36	0.53	0.43	0.64	0.19	0.25	0.25	0.62	0.108	0.07
	14200	–	–	0.16	0.24	0.4	0.58	0.48	0.7	0.16	0.20	0.20	0.52	0.12	0.08
	15800	–	–	0.18	0.27	0.48	0.68	0.58	0.82	0.17	0.22	0.22	0.57	0.136	0.1
	16700	–	–	0.2	0.3	0.53	0.74	0.64	0.89	0.19	0.25	0.25	0.62	0.155	0.11
	18300	–	–	0.23	0.35	0.61	0.84	0.73	1.01	0.21	0.27	0.27	0.67	0.178	0.129

Note: Static pressure drops of accessory components must be added to external static pressure to enter fan performance tables.

Table 51. Supply air fan drive selections—50 Hz

Nominal Tons (kW)	7.5 HP (5.6 kW)		10 HP (7.5 kW)		15 HP (10 kW)		20 HP (15 kW)	
	RPM	Drive No.	RPM	Drive No.	RPM	Drive No.	RPM	Drive No.
23 (80)	498	A						
	500	B						
	541	C						
			583	D				
			625	E				
25 (88)	458	A						
	500	B						
	541	C						
			583	D				
			625	E				
					664	G		
29 (103)	500	B						
			541	C				
			583	D				
			625	E				
					664	G		
					708	R		
33 (108)			417	H				
			437	J				
			479	K				
					521	L		
					562	M		
					604	N		
42 (146)			437	J				
			479	K				
					521	L		
					562	M		
					604	N	604	N
							646	P

Table 52. Power exhaust fan performance—22.9-29.2 tons—50 Hz

	Power Exhaust Selection			
	50%		100%	
	Damper Open Position			
	min	max	min	max
Return Duct Static (Pa)	L/s			
0.0	1499	2701	2999	5405
24.9	1375	2083	2751	4166
49.8	1255	1753	2488	3540
74.7	1134	1499	2269	3003
99.6	1031	1321	2061	2643
124.5	921	1135	1842	2270

Table 53. Power exhaust fan performance—33.3-41.7 tons—50 Hz

	Power Exhaust Selection			
	50%		100%	
	Damper Open Position			
	min	max	min	max
Return Duct Static (Pa)	L/s			
0.0	1909	3160	3818	6321
24.9	1800	2915	3599	5829
49.8	1676	2537	3364	5308
74.7	1577	2371	3155	4741
99.6	1462	2173	2925	4347
124.5	1364	2040	2727	4080

Note: These values are the minimum and maximum positions for non-tracking power exhaust. Fresh air tracking and Statitrac options can fully close the exhaust dampers in their operation, and are thus able to reach lower airflows. Statitrac requires 100% power exhaust.

Controls

Enhanced BAS Integration and Connectivity

- Symbio™ 700 integrates seamlessly with Trane® Tracer® Synchrony and Tracer Ensemble® to deliver optimized building automation and building management features and functions.
- Easily integrate with open standard protocols to connect seamlessly to a BAS (whether that is Trane or non-Trane).
- Digit 21 must equal 1, 2, or 3 for communication support.

BACnet® Communications

Symbio™ 700 includes native BACnet communications which allows the unit to communicate directly with a Tracer or non-Trane Building Automation System via open protocol BACnet MS/TP or IP.

Modbus Communications

Symbio 700 includes native Modbus communications which allows the unit to communicate directly with a Tracer or non-Trane Building Automation System via open protocol Modbus RTU or TCP/IP.

LonTalk® Communications

The optional LonTalk® communications module allows the unit to communicate directly with a Tracer or non-Trane Building Automation System via open protocol LonTalk.

Air-Fi® Wireless Communications

The optional Air-Fi communications module allows the unit to communicate directly with a Tracer Building Automation System via open protocol BACnet over Zigbee wireless.

Secure Remote Connectivity with Trane Connect

The Symbio controller enables secure remote connectivity via Trane Connect to Trane Intelligent Services and remote monitoring. Trane Connect provides anywhere/anytime access to monitor and manage with secure remote access and connectivity options through a multitude of platforms. Peace of mind that the system will be operational and provide comfort to customers.

Serviceability

Symbio Service and Installation Mobile App

The Symbio Service and Installation mobile app is accessible through mobile devices (phones and tablets) via Bluetooth connectivity or via Trane Connect. The intuitive mobile app feels natural to technicians and operators. They'll quickly be able to view equipment status and alarms, perform startup tasks, change configurations, test the equipment's performance in specific modes—and much more. Free for download from App Store (Apple iOS) and Google Play (Android devices).

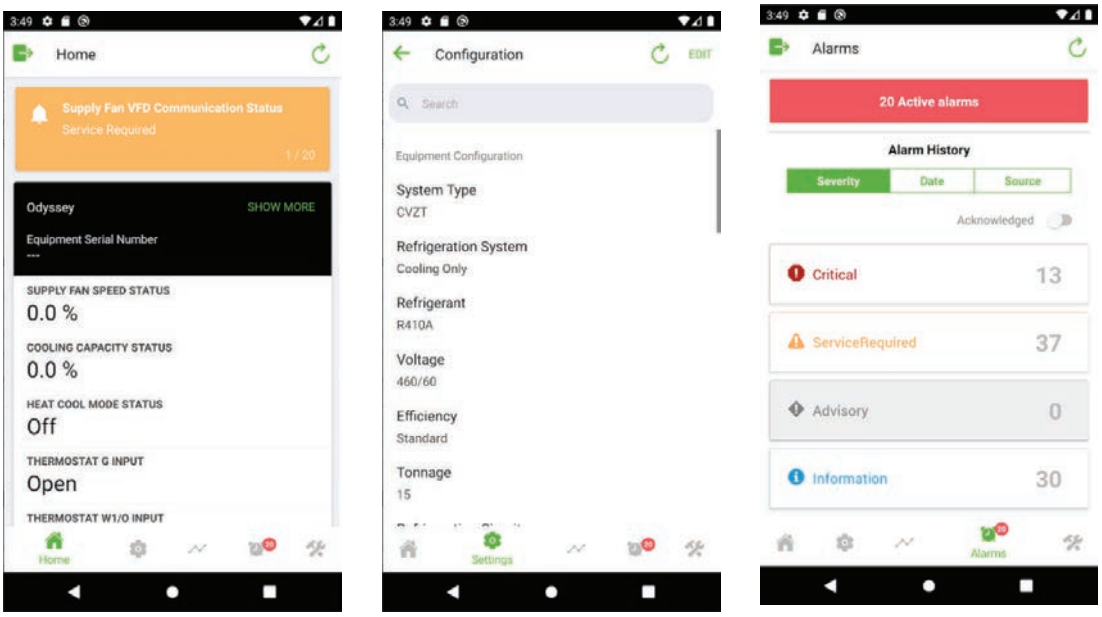
To download the Symbio Service and Installation Mobile App use the links below or scan the code with your mobile phone camera.

Apple download link (https://apps.apple.com/us/app/symbio-service-installation/id1309310176)

Google Play (Android) download link (https://play.google.com/store/apps/details?id=com.trane.mobileservicetool)

Figure 8. Scan code

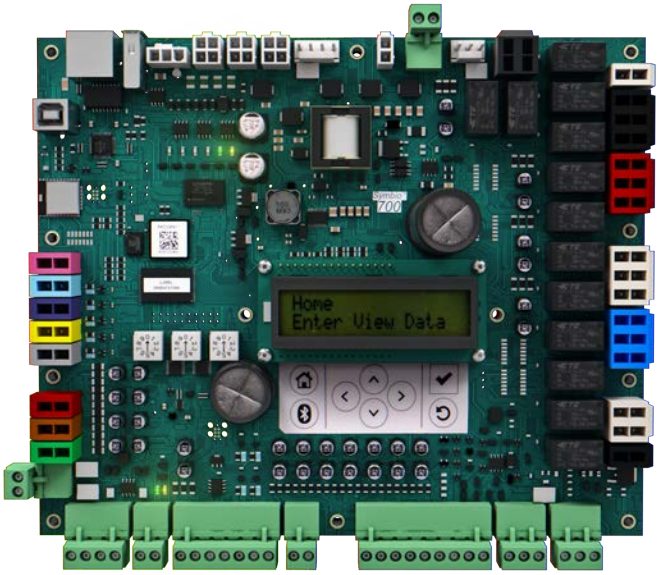
Figure 9. Symbio service and installation mobile app



Onboard User Interface

An integrated onboard user interface that makes setup and continued operation easy. It provides real time operational performance, status, data, and alarms. It also allows the user to interact with, service, troubleshoot, and control their equipment without additional service software tools or when a mobile interface is not available.

Figure 10. Onboard user interface



Service Test Mode

Symbio 700 requires no special tools to run the unit through its paces. Simply navigate to the ‘Service’ section of the on-board user interface or the ‘Tools’ section of the Symbio Service and Installation Mobile App and enter the ‘Service Test Mode’ section. Here the unit can be placed in the desired operating condition for a pre-determined amount of time supporting troubleshooting efforts in the field. The Symbio 700 will return to normal control when the user exits test mode or when the pre-determined, user-selected Service Test time has expired.

Symbio 700 controls with upgradeable software

Trane’s equipment and systems feature engineered, tested, and proven applications that meet industry energy standards and provide the flexibility to customize and update over the life of the equipment. Professional operational algorithms are embedded within the Symbio 700 controller at the Trane factory. Symbio 700 standardizes each equipment unit to maintain standards for comfort, efficiency, and air quality, without additional field programming. Symbio 700 provides the flexibility over the life of the equipment to meet changing customer needs and/or industry standards.

Flexibility

Expansion Modules (requires Tracer® TU)

- XM30 – Provides 4 universal inputs or analog outputs
- XM32 – Provides 4 binary outputs

Field Programming via TGP2 (requires Tracer TU)

- Control ancillary equipment
- Custom sequences

TGP2 and XM Limitations:

- Programs will only have access to available BACnet® points. (Ensures system reliability.)
- TGP2 programs will not have direct I/O control access for factory components. (Compressors will not be able to be directly controlled On/Off without going through factory provided protection sequences.)
- Onboard I/O will not be available to custom applied TGP2 programs. If additional I/O is required for a new control loop, a separate expansion module will be required.

- Customer applied I/O will be limited to a maximum combination of 2 XM modules. Only XM30 or XM32 modules will be supported by the Symbio 700 UC.
- Tracer TU will be required to configure XMs and to create, view, or modify TGP2 programs.

Economizer Controls

There are four options for economizer control, Dry Bulb Temperature, Comparative Enthalpy, Reference Enthalpy and Differential Dry Bulb Temperature.

Dry Bulb Temperature Control

The dry bulb system measures outdoor temperature comparing it to the economizer enable setpoint. If the outdoor temperature is below the economizer enable setpoint, the economizer will operate freely. This system is best suited for arid regions where the humidity levels of outside air would not be detrimental to building comfort and indoor air quality.

Comparative Enthalpy Control

The comparative enthalpy system measures the temperature and humidity of both return air and outside air to determine which source has lower enthalpy. This system allows true comparison of outdoor air and return air enthalpy by measurement of outdoor air and return air temperature and humidity.

Reference Enthalpy Control

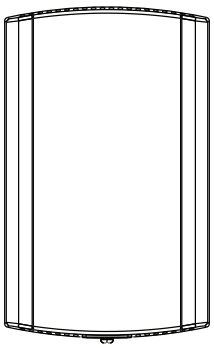
The reference enthalpy system compares outdoor air temperature and humidity to the economizer enthalpy enable setpoint. If outdoor air temperature and humidity are below the economizer enthalpy enable setpoint, the economizer will operate freely. This system provides more sophisticated control where outdoor air humidity levels may not be acceptable for building comfort and indoor air quality.

Differential Dry Bulb Temperature Control

The differential dry bulb system measures the temperature of both return air and outside air to determine when to economize. If outdoor air temperature is below the return air temperature minus a differential, the economizer will operate freely. This system is best suited for arid regions where the humidity levels of outside air would not be detrimental to building comfort and indoor air quality.

Zone Sensors

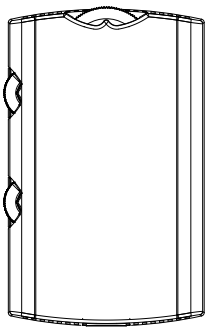
Zone Temperature Only



BAYSENS077

Provides temperature input only. Can be used as a secondary remote temperature input for thermostats.

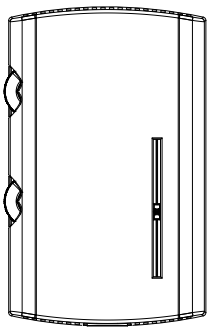
Manual Changeover



BAYSENS106

Heat, Cool or Off System Switch. Fan Auto or Off Switch. Single temperature setpoint thumbwheel.

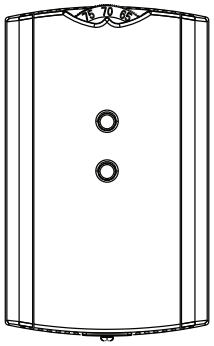
Manual/Automatic Changeover



BAYSENS108

Auto, Heat, Cool or Off System Switch. Fan Auto or Off Switch. Dual temperature setpoint sliders

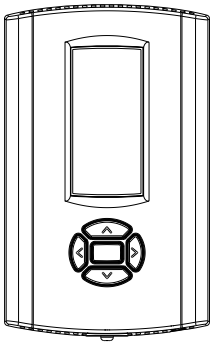
Integrated Comfort™ System



BAYSENS073 / BAYSENS074 / BAYSENS075

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

Wired Display Sensor



BAYSENS135

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

Touchscreen Digital Display Communicating Sensor

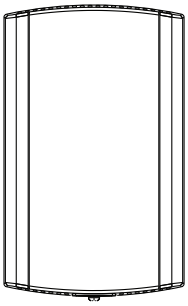
BAYSENS800

Uses BACnet® MS/TP link to communicate zone temperature and setpoints. Auto, Heat, Cool or Off System Switch. Fan Auto or On Switch. 7-day programmable thermostat with night setback.

Note: *Not compatible with VAV units. Requires BACnet communications.*

Air-Fi Wireless Communicating Zone Sensors

Wireless Zone Temperature Only



Measures temperature and optional humidity (with WCS-SH) for use in public spaces where no local user interface is preferred.

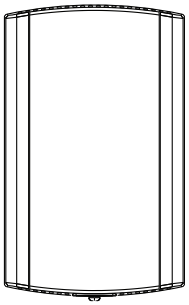
Note: *Requires BACnet communications.*

Wireless Display Sensor

Easy-to-use interface for clear and simple monitoring and control. Can be configured for any Trane system or to meet the customer's preference.

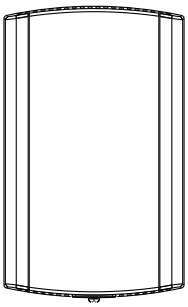
Note: *Requires BACnet communications.*

Wired CO_2 Sensor



The maintenance-free carbon dioxide (CO_2) sensor is primarily used for demand control ventilation applications.

Wired Zone Temperature and Humidity Sensor

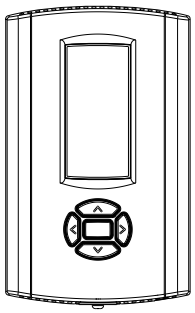


BAYSENS036

Measures temperature and relative humidity. Relative humidity input is used to control activation of dehumidification.

Thermostats

Digital Display Programmable Thermostat (3H/2C)

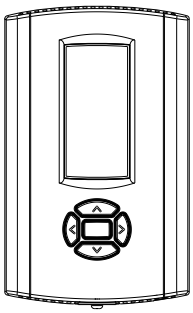


BAYSTAT150

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

Note: *Not compatible with VAV units.*

Digital Display Programmable Thermostat (1H/1C)

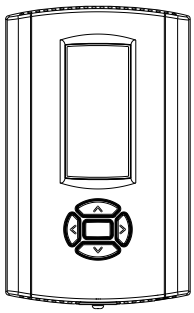


BAYSTAT151

One Heat/One Cool Auto changeover digital display thermostat.

Note: *Not compatible with VAV units.*

Digital Display Thermostat (3H/2C)

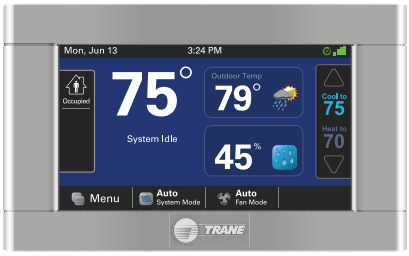


BAYSTAT155

Three Heat/Two Cool Auto changeover display thermostat.

Note: *Not compatible with VAV units.*

Pivot® Web Enabled Smart Thermostat (3H/2C)



BAYSTAT814

Our Pivot Smart Thermostat system is great for commercial buildings. With its intuitive touchscreen and customizable display, it is easy for occupants to use. The Trane Pivot mobile app enables users to control multiple buildings remotely, making changes in seconds to all systems.

Note: *Not compatible with VAV units.*

Touchscreen Programmable Thermostat with Relative Humidity Sensor (3H/2C)

BAYSTAT152

Three Heat, Two Cool digital display thermostat with built-in humidity control. This thermostat combines both humidity and temperature into one.

Note: *Not compatible with VAV units.*

Electrical Data

Electrical Service Sizing

To correctly size electrical service wiring for your unit, find the appropriate calculations listed below. Each type of unit has its own set of calculations for MCA (Minimum Circuit Ampacity), MOP (Maximum Overcurrent Protection), and RDE (Recommended Dual Element fuse size). Read the load definitions that follow and then find the appropriate set of calculations based on your unit type.

Set 1 is for cooling only and cooling with gas heat units, and set 2 is for cooling with electric heat units.

Load Definitions: (To determine load values, see the Electrical Service Sizing Data Tables.)

LOAD1 = CURRENT OF THE LARGEST MOTOR (COMPRESSOR OR FAN MOTOR)

LOAD2 = SUM OF THE CURRENTS OF ALL REMAINING MOTORS

LOAD3 = CURRENT OF ELECTRIC HEATERS

LOAD4 = ANY OTHER LOAD RATED AT 1 AMP OR MORE

Set 1. Cooling Only Rooftop Units and Cooling with Gas Heat Rooftop Units

MCA = (1.25 x LOAD1) + LOAD2 + LOAD4

MOP = (2.25 x LOAD1) + LOAD2 + LOAD4

Select a fuse rating equal to the MOP value. If the MOP value does not equal a standard fuse size as listed in NEC 240-6, select the next lower standard fuse rating.

Note: *If selected MOP is less than the MCA, then reselect the lowest standard maximum fuse size which is equal to or larger than the MCA, provided the reselected fuse size does not exceed 800 amps.*

RDE = (1.5 x LOAD1) + LOAD2 + LOAD4

Select a fuse rating equal to the RDE value. If the RDE value does not equal a standard fuse size as listed in NEC 240-6, select the next higher standard fuse rating.

Note: *If the selected RDE is greater than the selected MOP value, then reselect the RDE value to equal the MOP value.*

Keep in mind when determining LOADS that crankcase heaters are disabled in the cooling mode.

DSS = 1.15 x (LOAD1 + LOAD2 + LOAD4)

Select a disconnect switch size equal to or larger than the DSS value calculated.

Set 2. Rooftop Units with Electric Heat

To arrive at the correct MCA, MOP, and RDE values for these units, you must perform two sets of calculations. First calculate the MCA, MOP, and RDE values as if the unit was in cooling mode (use the equations given in Set 1). Then calculate the MCA, MOP, and RDE values as if the unit was in the heating mode as follows.

Note: *Keep in mind when determining LOADS that the compressors and condenser fans don't run while the unit is in the heating mode and crankcase heaters are disabled in the cooling mode.*

- For units using heaters less than 50 kw: MCA = 1.25 x (LOAD1 + LOAD2 + LOAD4) + (1.25 x LOAD3)
- For units using heaters equal to or greater than 50 kw: MCA = 1.25 x (LOAD1 + LOAD2 + LOAD4) + LOAD3

The nameplate MCA value will be the larger of the cooling mode MCA value or the heating mode MCA value calculated above.

MOP = (2.25 x LOAD1) + LOAD2 + LOAD3 + LOAD4

The selection MOP value will be the larger of the cooling mode MOP value or the heating mode MOP value calculated above.

Select a fuse rating equal to the MOP value. If the MOP value does not equal a standard fuse size as listed in NEC 240-6, select the next lower standard fuse rating.

Note: *If selected MOP is less than the MCA, then reselect the lowest standard maximum fuse size which is equal to or larger than the MCA, provided the reselected fuse size does not exceed 800 amps.*

RDE = (1.5 x LOAD1) + LOAD2 + LOAD3 + LOAD4

The selection RDE value will be the larger of the cooling mode RDE value or the heating mode RDE value calculated above.

Select a fuse rating equal to the RDE value. If the RDE value does not equal a standard fuse size as listed in NEC 240-6, select the next higher standard fuse rating.

Note: *If the selected RDE is greater than the selected MOP value, then reselect the RDE value to equal the MOP value.*

DSS = 1.15 x (LOAD1 + LOAD2 + LOAD3 + LOAD4)

Note: *Keep in mind when determining LOADS that the compressors and condenser fans don't run while the unit is in the heating mode.*

The selection DSS value will be the larger of the cooling mode DSS or the heating mode DSS calculated above.

Select a disconnect switch size equal to or larger than the DSS value calculated.

Table 54. 27.5 - 35 ton electrical service sizing data—60Hz

Model	Elec. Specs	Allowable Voltage Range	Compressor Std Eff			Compressor High Eff, eStage			Fan Motors								
									Supply		Condenser			Exhaust			
			No/Ton	RLA (Ea.)	LRA (Ea.)	No/Ton	RLA (Ea.)	LRA (Ea.)	HP	FLA	No	HP	FLA (Ea.)	50% No.	100% No.	HP	FLA (Ea.)
TC/TE/ YC*330	208/60/3	187-229	1/6, 2/9	27.7,35.0	203, 267	1/6, 2/9	27.7,35.0	203, 267	7.5, 10.0, 15.0	22.8, 25.2, 43.0	3	1.0	4.4	1	2	1.0	4.4
	230/60/3	207-253	1/6, 2/9	27.7,35.0	203, 267	1/6, 2/9	27.7,35.0	203, 267	7.5, 10.0, 15.0	19.6, 25.2, 36.0	3	1.0	4.4	1	2	1.0	4.4
	460/60/3	414-506	1/6, 2/9	14.7,18.9	98, 142	1/6, 2/9	14.7,18.9	98, 142	7.5, 10.0, 15.0	9.8, 12.6, 18.0	3	1.0	2.2	1	2	1.0	2.2
	575/60/3	517-633	1/6, 2/9	12.5,15.2	84, 103	1/6, 2/9	12.5,15.2	84, 103	7.5, 10.0, 15.0	7.8, 10.1, 15.0	3	1.0	1.5	1	2	1.0	1.5
TC/TE/ YC*360	208/60/3	187-229	1/6, 2/10	27.7,40.3	203, 267	1/6, 2/10	27.7,40.3	203, 267	7.5, 10.0, 15.0	22.8, 25.2, 43.0	3	1.0	4.4	1	2	1.0	4.4
	230/60/3	207-253	1/6, 2/10	27.7,40.3	203, 267	1/6, 2/10	27.7,40.3	203, 267	7.5, 10.0, 15.0	19.6, 25.2, 36.0	3	1.0	4.4	1	2	1.0	4.4
	460/60/3	414-506	1/6, 2/10	14.7,20.5	98, 142	1/6, 2/10	14.7,20.5	98, 142	7.5, 10.0, 15.0	9.8, 12.6, 18.0	3	1.0	2.2	1	2	1.0	2.2
	575/60/3	517-633	1/6, 2/10	12.5,15.8	84, 103	1/6, 2/10	12.5,15.8	84, 103	7.5, 10.0, 15.0	7.8, 10.1, 15.0	3	1.0	1.5	1	2	1.0	1.5
TC/TE/ YC*420	208/60/3	187-229	1/6, 2/11	27.7,43.7	203, 304	1/7, 2/11	28.9,43.7	203, 304	7.5, 10.0, 15.0, 20.0	22.8, 25.2, 43.0, 56.1	3	1.0	4.4	1	2	1.0	4.4
	230/60/3	207-253	1/6, 2/11	27.7,43.7	203, 304	1/7, 2/11	28.9,43.7	203, 304	7.5, 10.0, 15.0, 20.0	19.6, 25.2, 36.0, 49.4	3	1.0	4.4	1	2	1.0	4.4
	460/60/3	414-506	1/6, 2/11	14.7,23.7	98, 147	1/7, 2/11	15.8,23.7	98, 147	7.5, 10.0, 15.0, 20.0	9.8, 12.6, 18.0, 24.7	3	1.0	2.2	1	2	1.0	2.2
	575/60/3	517-633	1/6, 2/11	12.5,17.2	84, 122	1/7, 2/11	11.9,17.2	84, 122	7.5, 10.0, 15.0, 20.0	7.8, 10.1, 15.0, 19.5	3	1.0	1.5	1	2	1.0	1.5

Notes:

1. All customer wiring and devices must be installed in accordance with local and national electrical codes.
2. 100% Power Exhaust is with or without Statitrac™.

Table 55. 40 & 50 ton electrical service sizing data—60Hz

Model	Elec. Specs	Allowable Voltage Range	Compressor Std Eff			Compressor High Eff, eStage			Fan Motors								
									Supply		Condenser			Exhaust			
			No/Ton	RLA (Ea.)	LRA (Ea.)	No/Ton	RLA (Ea.)	LRA (Ea.)	HP	FLA	No	HP	FLA (Ea.)	50%	100%	HP	FLA (Ea.)
														No.			
TC/TE/ YC*480	208/60/3	187-229	1/8, 2/13	28.4,46.5	203, 315	1/8, 2/13	28.4,46.5	203, 315	10.0, 15.0, 20.0	25.2, 43.0, 56.1	4	1.0	4.4	1	2	1.5	5.4
	230/60/3	207-253	1/8, 2/13	28.4,46.5	203, 315	1/8, 2/13	28.4,46.5	203, 315	10.0, 15.0, 20.0	25.2, 36.0, 49.4	4	1.0	4.4	1	2	1.5	5.4
	460/60/3	414-506	1/8, 2/13	15.6,25.4	98, 158	1/8, 2/13	15.6,25.4	98, 158	10.0, 15.0, 20.0	12.6, 18.0, 24.7	4	1.0	2.2	1	2	1.5	2.7
	575/60/3	517-633	1/8, 2/13	11.9,19.1	84, 136	1/8, 2/13	11.9,19.1	84, 136	10.0, 15.0, 20.0	10.1, 15.0, 19.5	4	1.0	1.5	1	2	1.5	2.2
TC/TE/ YC*600	208/60/3	187-229	1/10, 2/15	40.3,57.9	267, 345	1/10, 2/15	40.3,57.9	267, 345	10.0, 15.0, 20.0, 25.0	25.2, 43.0, 56.1, 70.0	4	1.0	4.4	1	2	1.5	5.4
	230/60/3	207-253	1/10, 2/15	40.3,57.9	267, 345	1/10, 2/15	40.3,57.9	267, 345	10.0, 15.0, 20.0, 25.0	25.2, 36.0, 49.4, 61.0	4	1.0	4.4	1	2	1.5	5.4
	460/60/3	414-506	1/10, 2/15	20.5,31.7	142, 155	1/10, 2/15	20.5,31.7	142, 155	10.0, 15.0, 20.0, 25.0	12.6, 18.0, 24.7, 30.5	4	1.0	2.2	1	2	1.5	2.7
	575/60/3	517-633	1/10, 2/15	15.8,23.1	103, 126	1/10, 2/15	15.8,23.1	103, 126	10.0, 15.0, 20.0, 25.0	10.1, 15.0, 19.5, 24.5	4	1.0	1.5	1	2	1.5	2.2

Notes:

1. All customer wiring and devices must be installed in accordance with local and national electrical codes.
2. 100% Power Exhaust is with or without Statitrac™.

Table 56. Electrical service sizing data—miscellaneous load —60Hz

Nominal Unit Size (Tons)	FLA Add Unit Voltage			
	200	230	460	575
27.5 - 35	1	1	1	1
40, 50	1	1	1	1

Note: *Miscellaneous Load values are active during heating and cooling mode operation.*

Table 57. Electrical service sizing data — electric heat module (electric heat only)—60Hz

Models: TE(D,H,F,R) 330—600 Electric Heat FLA						
Nominal Unit Size (Tons)	Nominal Unit Voltage	KW Heater				
		36	54	72	90	108
		FLA	FLA	FLA	FLA	FLA
27.5-35	208	74.9	112.4	—	—	—
	230	86.6	129.9	—	—	—
	460	43.3	65.0	86.6	108.3	—
	575	—	52.0	69.3	86.6	—
40- 50	208	—	112.4	—	—	—
	230	—	129.9	—	—	—
	460	—	65.0	86.6	108.3	129.9
	575	—	52.0	69.3	86.6	103.9

Note: *All FLA in this table are based on heater operating at 208, 240, 480, and 600 volts.*

Table 58. Electrical service sizing data, 275–350 units 50Hz

Model	Elec. Specs	Compressor Std Eff			Compressor High Eff, eStage			Fan Motors								
								Supply		Condenser			Exhaust			
		No/Ton	RLA (Ea.)	LRA (Ea.)	No/Ton	RLA (Ea.)	LRA (Ea.)	HP (kW)	FLA	No	HP (kW)	FLA (Ea.)	50% No.	100% No.	HP (kW)	FLA (Ea.)
TC/TE/ YC*305	380-415/50/ 3	1/6, 2/10	14.7,20.5	98, 142	1/6, 2/10	14.7,20.5	98, 142	7.5 (5.6), 10 (6.8), 15 (10.5)	12.1/11.5, 15.2/14.6, 22.0/23.0	3	0.75 (0.56)	4.4	1	2	0.75 (0.56)	1.7
TC/TE/ YC*350	380-415/50/ 3	1/6, 2/11	14.7,23.7	98, 147	1/7, 2/11	15.8,23.7	98, 147	7.5 (5.6), 10 (6.8), 15 (10.5)	12.1/11.5, 15.2/14.6, 22.0/23.0	3	0.75 (0.56)	4.4	1	2	0.75 (0.56)	1.7

All customer wiring and devices must be installed in accordance with local and national electrical codes.

Allowable voltage range for the 380V unit is 342-418V, allowable voltage range for the 415V unit is 373-456.

100% Power Exhaust is with or without Statitrac™.

Table 59. Electrical service sizing data, 400 and 500 units 50Hz

Model	Elec. Specs	Compressor Std Eff			Compressor High Eff, eStage			Fan Motors								
								Supply		Condenser			Exhaust			
		No/Ton	RLA (Ea.)	LRA (Ea.)	No/Ton	RLA (Ea.)	LRA (Ea.)	HP (kW)	FLA	No	HP (kW)	FLA (Ea.)	50%	100%	HP (kW)	FLA (Ea.)
													No.			
TC/TE/ YC*400	380-415/50/ 3	1/8, 2/13	15.6,25.4	98, 158	1/8, 2/13	15.6,25.4	98, 158	10 (6.8), 15 (10.5)	15.2/14.6, 22.0/23.0	4	0.75 (0.56)	4.4	1	2	1.0 (0.75)	2.5
TC/TE/ YC*500	380-415/50/ 3	1/10, 2/15	20.5,31.7	142, 155	1/10, 2/15	20.5,31.7	142, 155	10 (6.8), 15 (10.5), 20 (12.8)	15.2/14.6, 22.0/23.0, 28.0/28.0	4	0.75 (0.56)	4.4	1	2	1.0 (0.75)	2.5

All customer wiring and devices must be installed in accordance with local and national electrical codes.

Allowable voltage range for the 380V unit is 342-418V, allowable voltage range for the 415V unit is 373-456.

100% Power Exhaust is with or without Statitrac™.

Table 60. Electrical service sizing data — miscellaneous load — 50Hz

Nominal Unit Size	FLA Add Unit Voltage	
	380	415
23 - 29	1	1
33 - 42	1	1

Note: *Miscellaneous Load values are active during heating and cooling mode operation.*

Table 61. Electrical service sizing data – electric heat module (electric heat units only) — 50Hz

Models: TE(D,H,F,R) 275 thru 500 Electric Heat FLA						
Nominal Unit Size (Tons)	Nominal Unit Voltage	KW Heater (380/415V)				
		23/27	34/40	45/54	56/67	68/81
23-29	380	34.5	51.1	68.9	85.5	–
	415	37.6	55.6	75.1	93.2	–
33, 42	380	–	51.1	68.9	85.5	103.4
	415	–	55.6	75.1	93.2	112.7

Note: *All FLA in this table are based on heater operating at 380 or 415 volts as shown above.*

Dimensional Data

Fresh Air, Power Exhaust Hoods

Figure 11. Side view showing fresh air and power exhaust hoods for downflow return

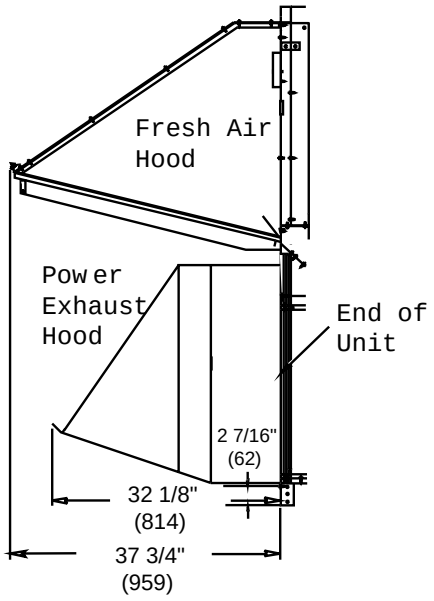
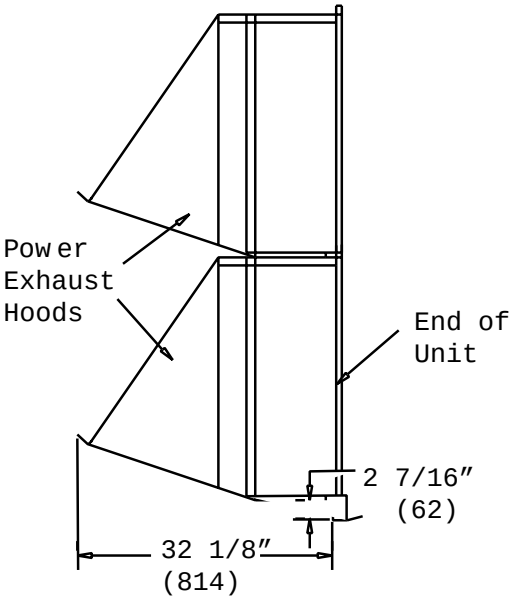


Figure 12. Side view showing power exhaust hoods for horizontal return



Note: *The two horizontal power exhaust hoods and the three horizontal fresh air hoods are located side by side. The fresh air hoods (not shown) extend only 23 15/16” from the end of the unit.*

Figure 13. 60 Hz 27.5-35, 50 Hz 23-29 Tons (TCD, TED, YCD low heat)

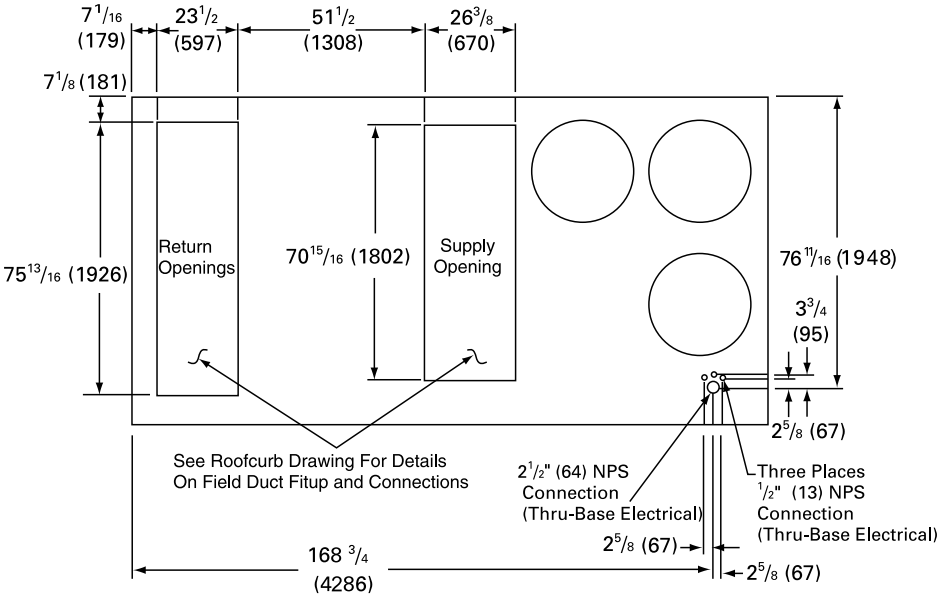
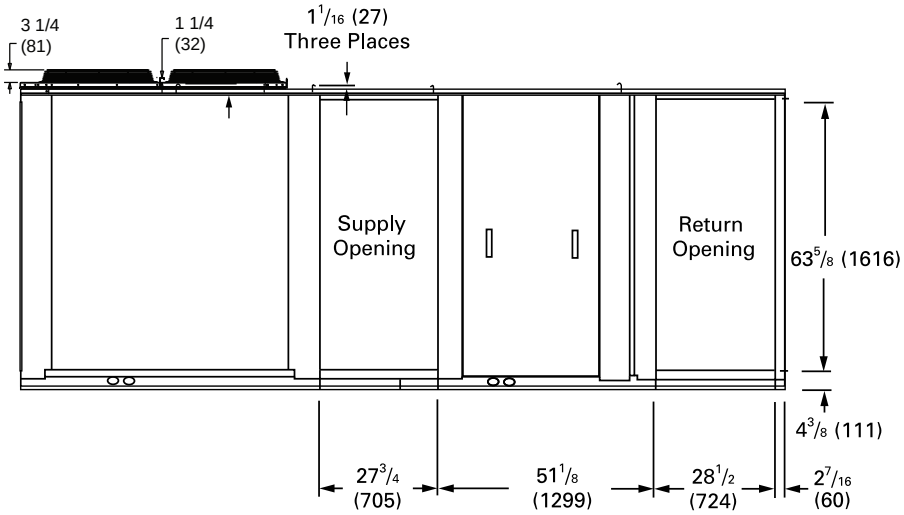


Figure 14. Rear view showing duct openings for horizontal supply and return, 60 Hz 27.5-35, 50Hz 23-29 Tons (TCH, TEH, YCH low heat)



Notes:

- *On horizontal units, the VFD is located between the supply and return ductwork, which makes access limited.*
- *For combination of horizontal and downflow openings (digit 3 = F or R) see Figure 13, p. 94 for appropriate downflow dimensions and Figure 14, p. 94 for appropriate horizontal dimensions.*

Figure 15. 60 Hz 27.5-35, 50 Hz 23-29 tons (TC, TE, YC low heat)

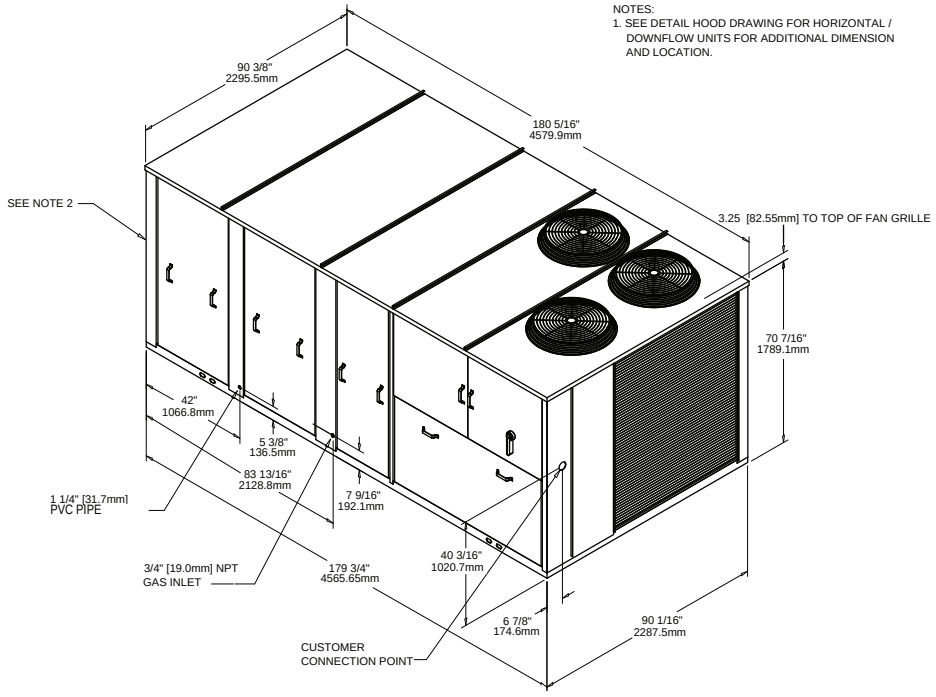
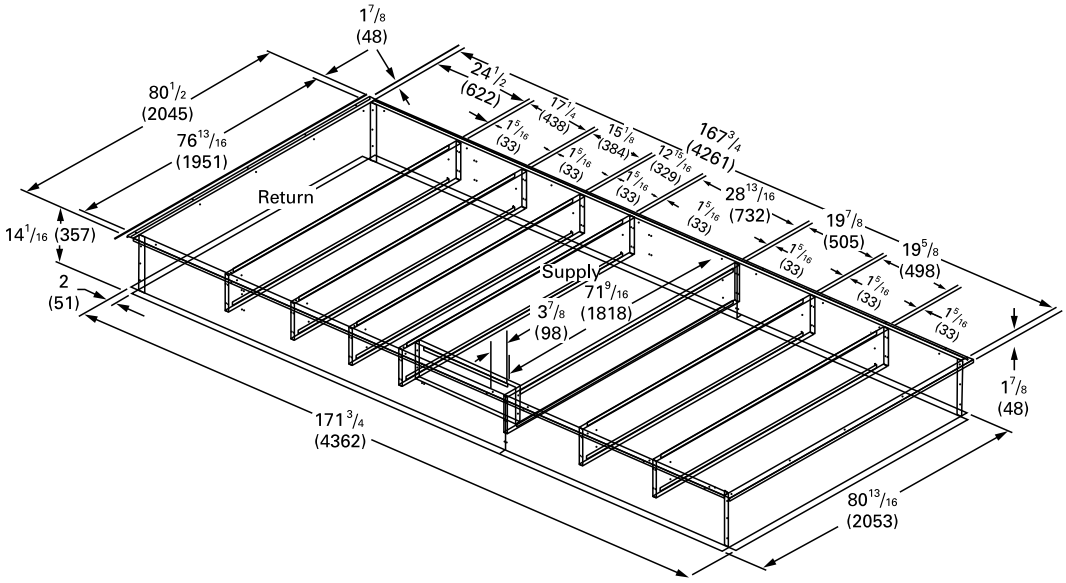


Figure 16. Curb assembly, 60 Hz 27.5-35, 50 Hz 23-29 tons (TC, TE, YC low heat)



Note: *Dimensions in ( ) are mm, 1"= 25.4 mm.*

Figure 17. 60 Hz 27.5-35 tons (YCD high heat)

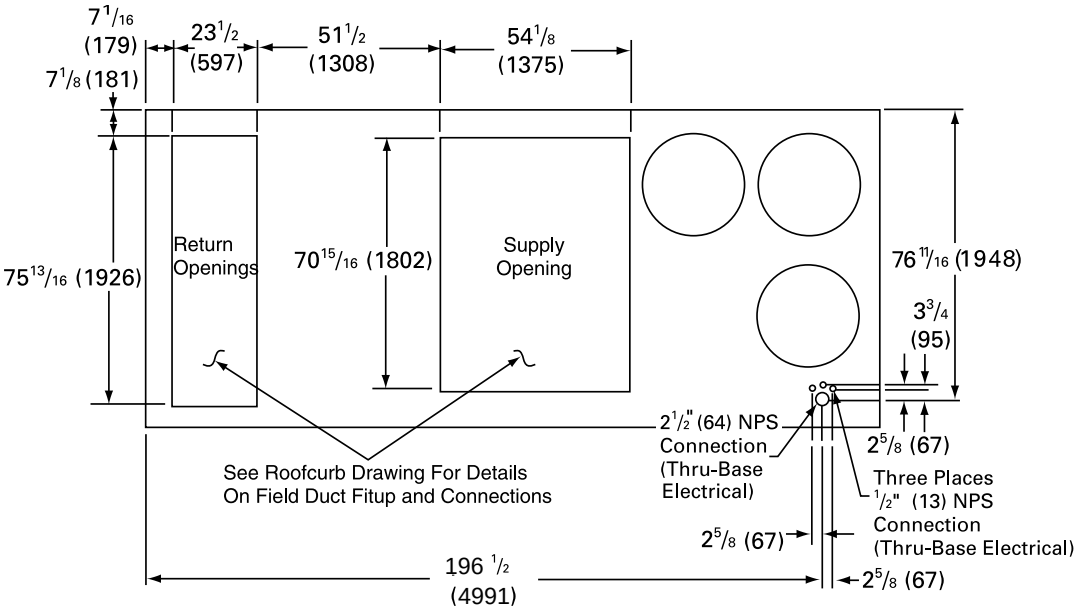
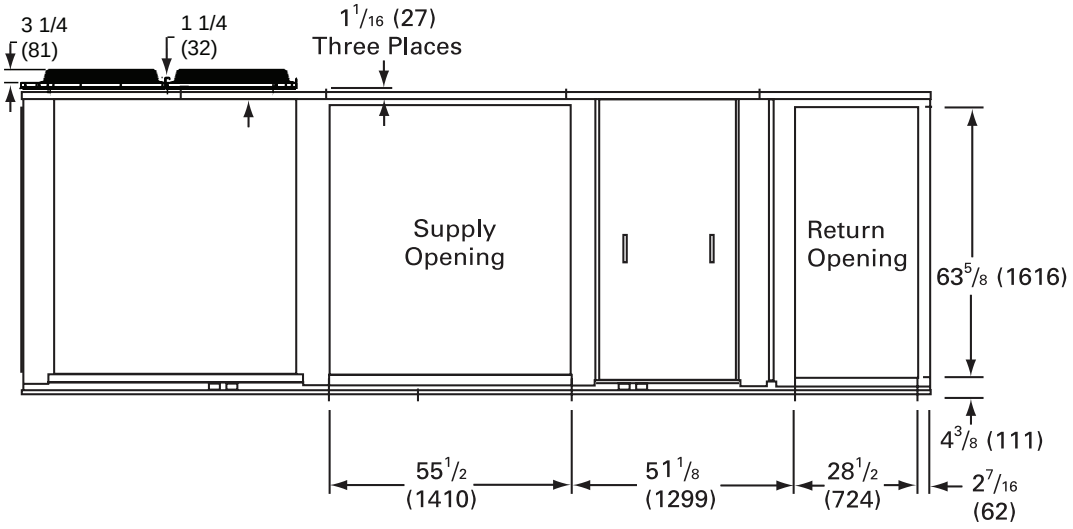


Figure 18. Rear view showing duct openings for horizontal supply and return, 60 Hz 27.5-35 Tons (YCH high heat)



Notes:

- *On horizontal units, the VFD is located between the supply and return ductwork, which makes access limited.*
- *For combination of horizontal and downflow openings (digit 3 = F or R) see Figure 17, p. 96 for appropriate downflow dimensions and Figure 18, p. 96 for appropriate horizontal dimensions.*

Figure 19. 60 Hz 27.5-35 tons (YC high heat)

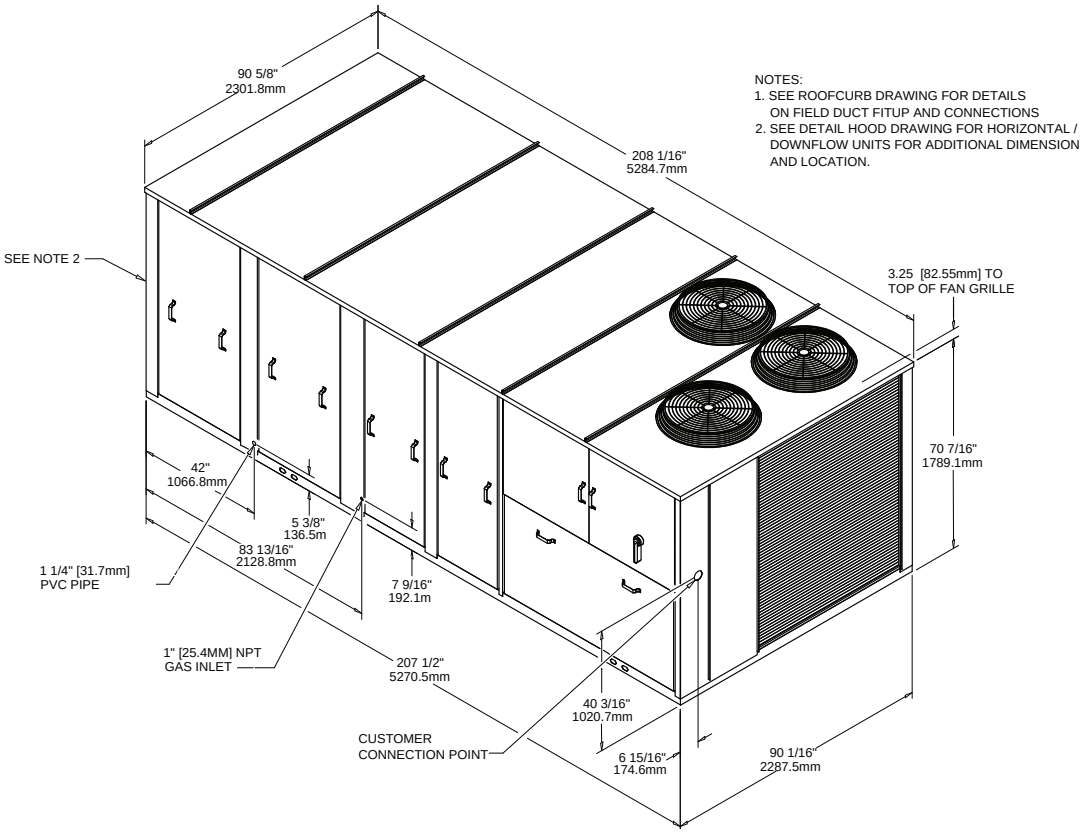
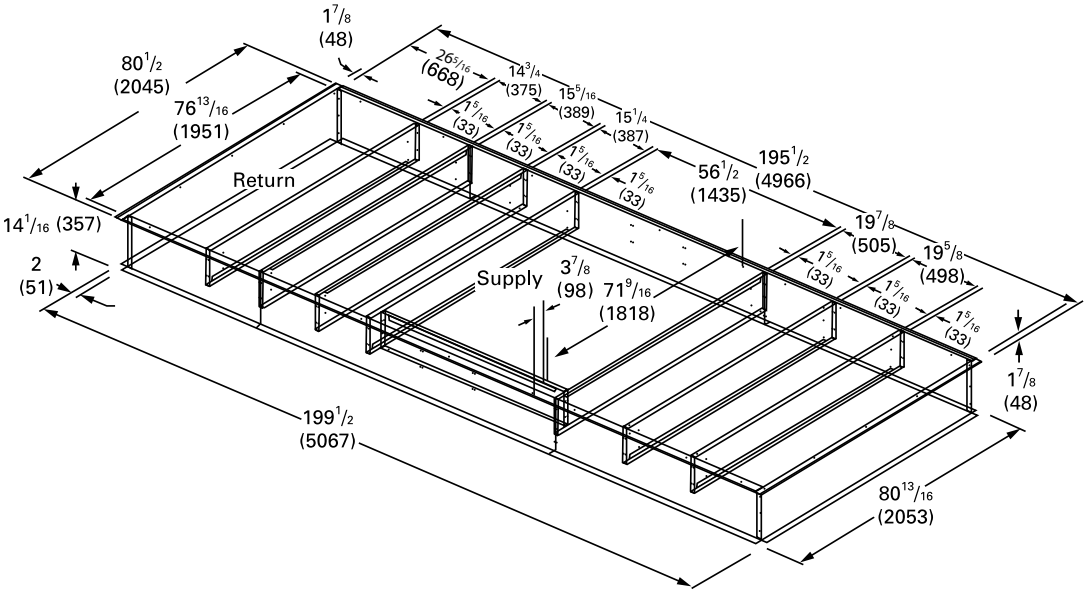


Figure 20. Curb assembly, 60 Hz 27.5-35 tons (YC high heat)



Note: *Dimensions in ( ) are mm, 1"= 25.4 mm.*

Figure 21. 60 Hz 40-50, 50 Hz 33-42 tons (TCD, TED, YCD low and high heat)

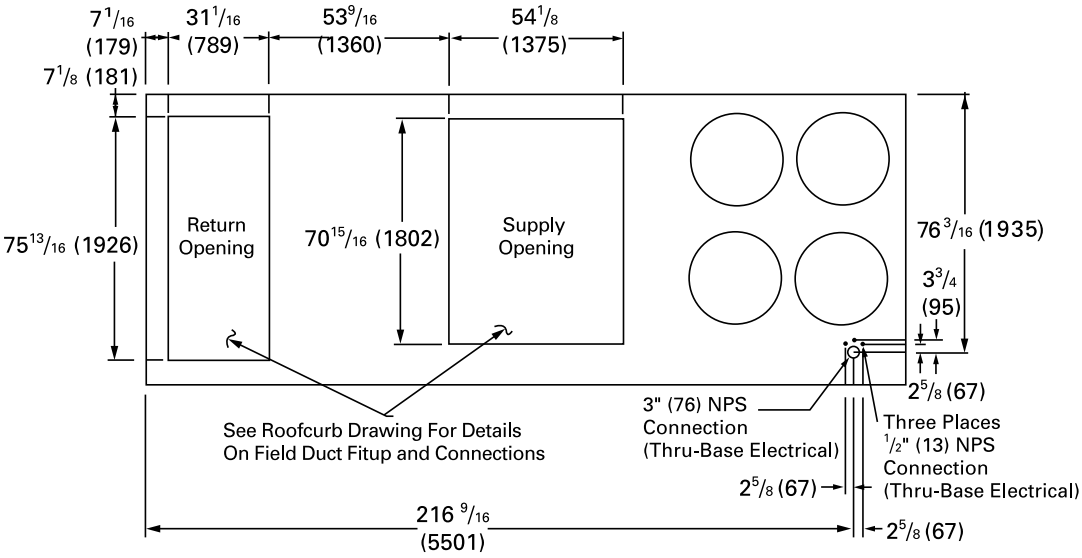
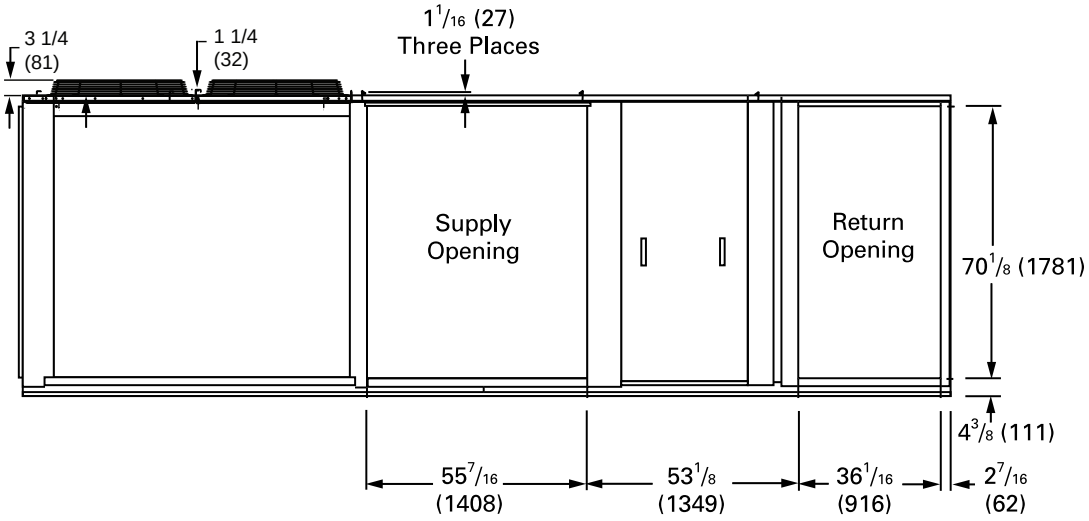


Figure 22. Rear view showing duct openings for horizontal supply and return, 60 Hz 40-50, 50Hz 33-42 Tons (TCH, TEH, YCH low and high heat)



Notes:

- *On horizontal units, the VFD is located between the supply and return ductwork, which makes access limited.*
- *For combination of horizontal and downflow openings (digit 3 = F or R) see Figure 21, p. 98 for appropriate downflow dimensions and Figure 22, p. 98 for appropriate horizontal dimensions.*

Figure 23. 60 Hz 40-50, 50 Hz 33-42 tons (TC, TE, YC low and high heat)

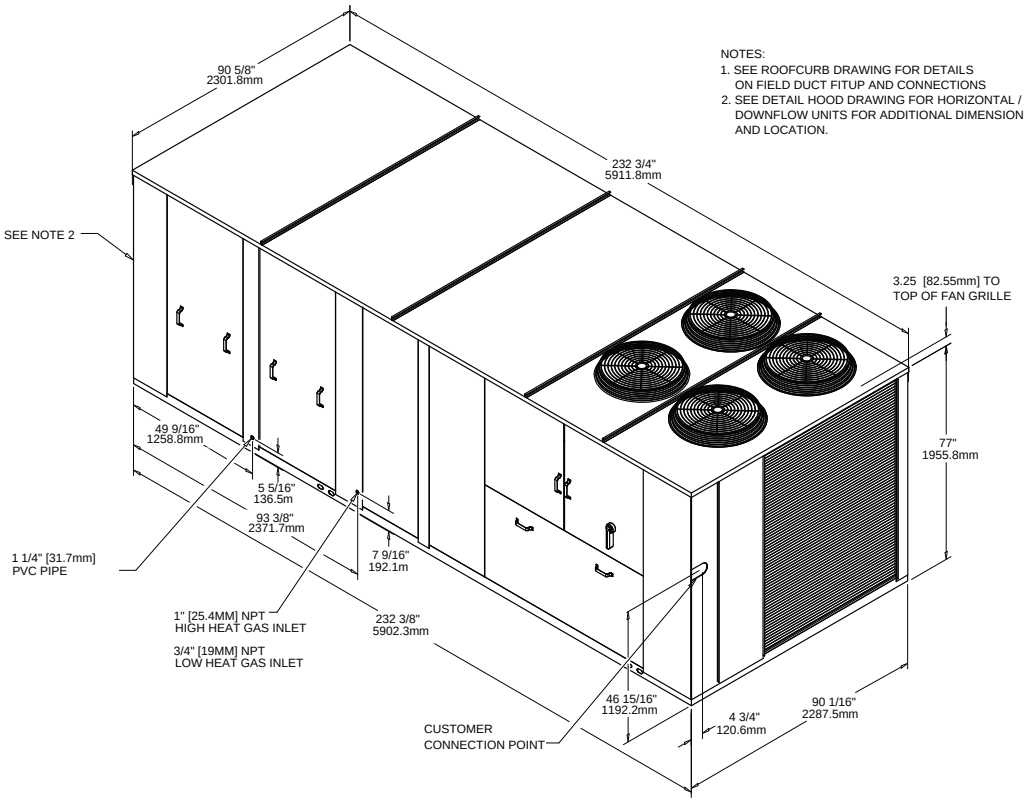
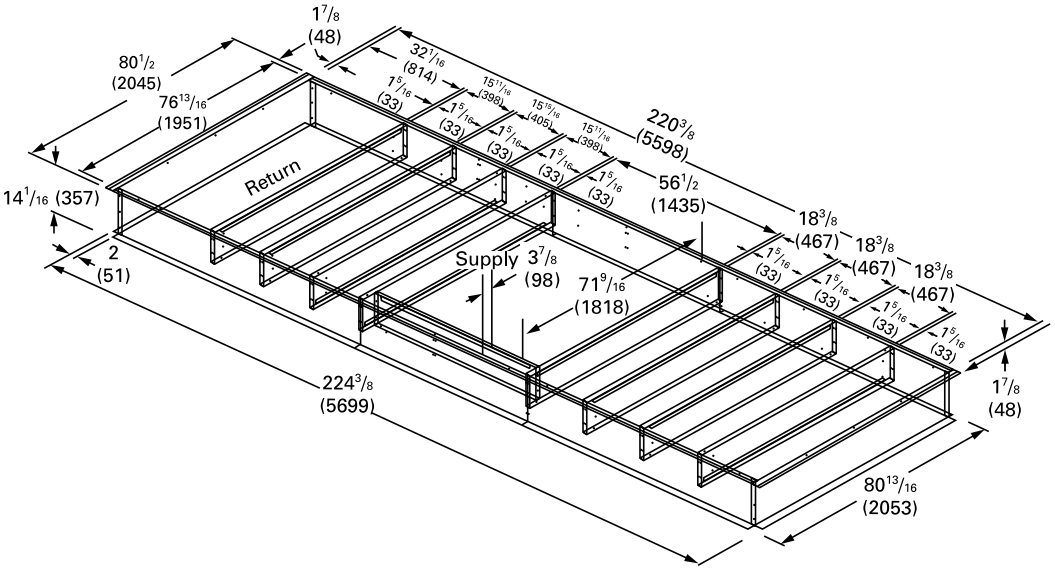


Figure 24. Curb assembly, 60 Hz 40-50, 50 Hz 33-42 tons (TC, TE, YC low and high heat)



Note: *Dimensions in ( ) are mm, 1"= 25.4 mm.*

Weights

Table 62. Approximate units operating weight

Average Unit Weight (lb)				
Unit (60Hz)	**TC**	**TE**	**YC Low**	**YC High**
27.5 Tons	4183	4303	4468	4651
30 Tons	4195	4315	4480	4663
35 Tons	4226	4346	4511	4694
40 Tons	4821	5044	5130	5409
50 Tons	4878	5101	5187	5466

Notes:

1. Weights shown are for standard efficiency units and include the following features: 10HP supply fan motor, supply fan VFD, 100% economizer, 2" MERV 8 filters, SZVAV system control, GFCI, no exhaust, and hail guards.
2. Weights shown are subject to change based on the specific unit configuration.
3. Weights shown represent approximate operating weights and have a ±10% accuracy. To calculate weight for a specific unit configuration, utilize Trane Select Assist™or contact your local Trane® sales representative.

Table 63. Average unit load weight (lb)

Average Unit Point Load Weight (lb)						
Unit (60Hz)	**1**	**2**	**3**	**4**	**5**	**6**
27.5 Tons	880	696	867	683	854	670
30 Tons	878	697	868	687	857	676
35 Tons	874	699	870	695	866	691
40 Tons	1009	818	997	806	985	794
50 Tons	1032	823	1015	807	999	790

Notes:

1. Point Loads shown are for standard efficiency units and include the following features: 10HP supply fan motor, supply fan VFD, 100% economizer, 2" MERV 8 filters, SZVAV system control, GFCI, no exhaust, and hail guards.
2. Point Loads shown are subject to change based on the specific unit configuration
3. Point Loads shown are based on the weights of YC high gas heat units.
4. Point Loads shown are approximate and have a ±10% accuracy. To calculate point loads for a specific unit configuration, utilize Trane Select Assist™or contact your local Trane® sales representative.

Figure 25. Point loading

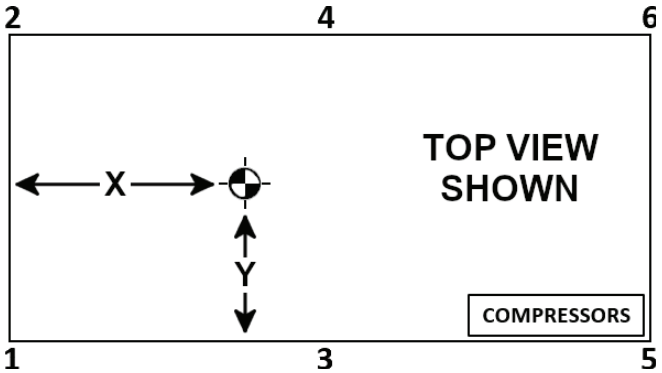


Table 64. Center of gravity

Center of Gravity (inches)								
Unit (60Hz)	**TC**		**TE**		**YC Low**		**YC High**	
	X	Y	X	Y	X	Y	X	Y
27.5 Tons	91.0	40.8	91.1	41.0	91.3	40.2	102.9	40.1
30 Tons	91.2	40.9	91.4	41.0	91.5	40.3	103.1	40.1
35 Tons	91.9	41.1	92.0	41.3	92.2	40.5	103.7	40.4
40 Tons	114.6	41.2	114.7	41.3	114.3	41.9	115.4	40.6
50 Tons	114.1	40.8	114.3	40.9	114.0	41.5	115.0	40.2

Notes:

1. CGs shown are for standard efficiency units and include the following features: 10HP supply fan motor, supply fan VFD, 100% conomizer, 2" MERV 8 filters, SZVAV system control, GFCI, no exhaust, and hail guards.
2. CGs shown are subject to change based on the specific unit configuration.
3. CGs shown are approximate and have a ±10% accuracy. To calculate CG for a specific unit configuration, utilize Trane Select Assist™ or contact your local Trane® sales representative.

Table 65. Approximate operating weights— optional components — lbs./kg

Unit Model (60Hz/50Hz)	Baro. Relief	Power Exhaust	0-25% Man Damper	Econ.	Var. Freq. Drives (VFD's)		Serv. Valves	Thru-the base Elec.	Non-Fused Discon. Switch	Factory GFI with Discon. Switch	Roof Curb		HGRH Coil
					W/O Bypass	With Bypass					Lo	Hi	
**(D,F)330/275	110/50	167/76	50/23	260/117	108/49	114/52	18/8	6/3	30/14	85/38	310/141	330/150	107/49
**(H,R)330/275	145/65	191/87	50/23	285/128	108/49	114/52	18/8	6/3	30/14	85/38	310/141	330/150	107/49
**(D,F)360/305	110/50	167/76	50/23	260/117	108/49	114/52	18/8	6/3	30/14	85/38	310/141	330/150	107/49
**(H,R)360/305	145/65	191/87	50/23	285/128	108/49	114/52	18/8	6/3	30/14	85/38	310/141	330/150	107/49
**(D,F)420/350	110/50	167/76	50/23	260/117	108/49	114/52	18/8	6/3	30/14	85/38	310/141	330/150	107/49
**(H,R)420/350	145/65	191/87	50/23	285/128	108/49	114/52	18/8	6/3	30/14	85/38	310/141	330/150	107/49
**(D,F)480/400	110/50	167/76	50/23	290/131	150/68	158/72	18/8	6/3	30/14	85/38	365/169	365/169	112/51
**(H,R)480/400	145/65	191/87	50/23	300/135	150/68	158/72	18/8	6/3	30/14	85/38	365/169	365/169	112/51
**(D,F)600/500	110/50	167/76	50/23	290/131	150/68	158/72	18/8	6/3	30/14	85/38	365/169	365/169	112/51
**(H,R)600/500	145/65	191/87	50/23	300/135	150/68	158/72	18/8	6/3	30/14	85/38	365/169	365/169	112/51

Condenser Hail Guards	Ultra Low Leak Econ	Ultra Low Leak 50% Exhaust	Ultra Low Leak 100% Exhaust	eStage, High Efficiency
105/48	112/51	34 / 15	74 / 34	251/114
105/48	78/35	34 / 15	77 / 35	251/114
105/48	112/51	34 / 15	74 / 34	251/114
105/48	78 /35	34 / 15	77 / 35	251/114
105/48	112/51	34 / 15	74 / 34	175/79
105/48	78/35	34 / 15	77 / 35	175/79
130/59	114/52	34 / 15	74 / 34	196/89
130/59	100/45	34 / 15	84 / 38	196/89
130/59	114/52	34 / 15	74 / 34	70/32

Table 65. Approximate operating weights— optional components — lbs./kg (continued)

105/48	112/51	34 / 15	74 / 34	251/114
130/59	100/45	34 / 15	84 / 38	70/32

Notes:

1. Basic unit weight includes minimum horsepower supply fan motor.
2. Weights shown represent approximate operating weights and have a ±10% accuracy. To calculate weight for a specific unit configuration, utilize TOPSS™ or contact the local Trane® sales representative. ACTUAL WEIGHTS ARE STAMPED ON THE UNIT NAMEPLATE.

Table 66. Minimum operating clearances for unit installation

	Econ/Exhaust End	Condenser Coil[a] End/Side	Service Side Access
Single Unit[b]	6 Feet (1.82 m)	8 Feet/8 Feet (2.43/2.43 m)	4 Feet (1.21 m)
Multiple Unit[c]	12 Feet (3.65 m)	16 Feet/16 Feet (4.87/4.87 m)	8 Feet (2.43 m)

[a] Condenser coil is located at the end and side of the unit.
[b] Horizontal, downflow, and mixed airflow configuration units, all sizes.
[c] Clearances on multiple unit installations are distances between units.

Mechanical Specifications

General

The units shall be dedicated downflow, horizontal, or mixed airflow configuration. The operating range shall be between 115°F and 0°F in cooling as standard from the factory for all units. Cooling performance shall be rated in accordance with AHRI testing procedures. All units shall be factory assembled, internally wired, fully charged with R-410A refrigerant and 100% run tested to check cooling operation, fan and blower rotation and control sequence before leaving the factory. Wiring internal to the unit shall be numbered for simplified identification. Units shall be UL listed to U.S. and Canadian safety standards.

Certified AHRI Performance

Packaged Rooftop units cooling, heating capacities and efficiencies shall be rated within the scope of the Air-Conditioning, Heating & Refrigeration Institute (AHRI) Certification Program and display the AHRI Certified® mark as a visual confirmation of conformance to the certification sections of AHRI Standard 340-360 (I-P) and ANSI Z83.8/CSA 2.6 and 10 CFR Part 431 pertaining to Commercial Warm Air Furnaces. The applications in this catalog specifically excluded from the AHRI certification program are:

- Ventilation modes
- Heat Recovery

Casing

Unit casing shall be constructed of zinc coated, heavy gauge, galvanized steel phosphatized, and finished with a pre-applied baked polyurethane enamel. All components shall be mounted in a weather resistant steel cabinet with a painted exterior. Cabinet surface shall be tested 672 hours in salt spray in compliance with ASTM B117. Fully gasketed removable access panels. Structural members shall be heavy gauge with access doors and removable panels of heavy gauge. Provide 1/2 inch thick foil faced fiberglass insulation on all exterior panels and roof in contact with the return and conditioned air stream. Where top cover seams exist, they shall be double hemmed and gasket sealed to prevent water leakage. Cabinet construction shall allow for all maintenance on one side of the unit. Service panels shall have handles and shall be removable while providing a water and air tight seal. Control box access shall be hinged. The indoor air section shall be completely insulated with fire resistant, permanent, odorless, foil faced glass fiber material. The base of the unit shall have provisions for crane lifting.

Filters

Two inch, MERV 4, throwaway filters shall be standard on all size units. MERV 8 two inch “high efficiency”, MERV 8 four inch “high efficiency” and MERV 14 four inch “high efficiency” filters shall be optional.

Compressors

The 3-D Scroll shall include a direct-drive, 3600 rpm, suction gas cooled hermetic motor. Dependent on the compressor model, motor protection shall be provided by either a patented motor cap and integral line break motor protector or an external 24 Vac module which provides protection against incorrect phase sequence, excess motor temperatures, over current protection, and phase loss. Trane 3-D compressor shall include centrifugal oil pump, scroll tips seals, internal heat shield that lowers the heat transfer from discharge and suction gas, oil level sight glass and oil charge valve. Some compressor models shall also provide a dip tube that allows for oil draining, in addition to a low leakage internal discharge check valve to help prevent refrigerant migration. Each compressor shall have a crankcase heater installed, properly sized to minimize the amount of liquid refrigerant present in the oil sump during off cycles.

eStage

eStage shall provide five stages of mechanical cooling with the ability to be at or below 25% compressor displacement at stage one.

Refrigerant Circuits

Each refrigerant circuit shall have independent thermostatic expansion devices, service pressure ports and refrigerant line filter driers factory-installed as standard. An area shall be provided for replacement suction line driers.

Evaporator and Condenser Coils

Condenser coils shall have all Aluminum Microchannel coils. Evaporator coils shall be internally finned Copper tubes mechanically bonded to high performance Aluminum plate fins. All coils shall be leak tested at the factory to ensure pressure integrity.The evaporator coil is pressure tested to 450 psig and the condenser coil at 650 psig. All dual circuit evaporator coils shall be of intermingled configuration. Sloped condensate drain pans are standard.

Outdoor Fans

The outdoor fan shall be direct-drive, statically and dynamically balanced, draw through in the vertical discharge position. The fan motor(s) shall be permanently lubricated and have built-in thermal overload protection in a weather tight casing.

Indoor Fan

Units shall have belt driven, FC, centrifugal fans with fixed motor sheaves. Complete fan assemblies shall be statically and dynamically balanced. Fan shaft shall be mounted on grease lubricated ball bearings. All motors shall be circuit breaker protected. All 50 Hz indoor fan motors meet the U.S. Energy Policy Act of 1992 (EPACT). All 60 Hz indoor fan motors meet the Energy Independence & Security Act of 2007 (EISA).

Variable Frequency Drives (VFDs)

VFDs shall be factory installed and tested to provide supply fan motor speed modulation. If the unit is configured for traditional VAV control, the VFD shall receive a signal from the unit controls via Modbus communication based upon supply static pressure and shall cause the drive to accelerate or decelerate as required to maintain the supply static pressure setpoint. The VFD shall receive a feedback signal from the unit controls via Modbus communication based on zone demand if configured for Single Zone VAV control and shall cause the drive to accelerate or decelerate as required to maintain the load of the zone. When subjected to high ambient return conditions the VFD shall reduce its output frequency to maintain operation. Bypass control to provide full nominal air flow in the event of drive failure shall be optional.

Electric Heaters

Electric heat shall be available for factory installation within basic unit. Electric heater elements shall be constructed of heavy-duty nickel chromium elements internally delta connected for 240 volt and wye connected for 480 and 600 volt. Staging shall be achieved through the Symbio indoor options module (IOM). Each heater package shall have multiple automatic reset and single operation high temperature limit controls operating to break line power to the heater element. All heaters shall be individually fused from factory, where required, and meet all NEC and CEC requirements. Power assemblies shall provide single-point connection. Electric heat shall be cULus listed.

Gas Heating Section

The heating section shall have a tubular heat exchanger(s) design with primary and secondary surfaces of corrosion resistant aluminized steel or optional stainless steel (all modulating gas heat units shall have stainless steel).

Heat exchangers shall have a tubular design with in-shot burners. Direct spark ignition shall be provided. All tubes shall be dimpled for proper heat transfer. Heating system shall incorporate induced draft fans and include a chimney that exhausts away from the air intake.

Two stage and modulating gas heat units will be suitable for use with natural gas or propane (field installed kit).

Modulating gas turn down ratio on high fire units shall be accomplished by allowing the furnaces to act independently of one another. The modulating bank shall be activated first and is allowed to modulate itself to meet the heating needs. If the modulating bank is unable to meet the need at high fire, the

second bank shall be turned on and then the first bank again modulates to the appropriate level. This system shall create a range of capacity from low fire on the modulating bank to high fire of both furnaces together.

Outside Air

Manual Outside Air

A manually controllable outside air damper shall be adjustable for up to 25 percent outside air. Manual damper is set at desired position at unit start up.

Economizer

Economizer shall be factory installed. The assembly includes: fully modulating 0-100 percent motor and dampers, minimum position setting(s), preset linkage, wiring harness, and fixed dry bulb control. Solid state enthalpy and differential enthalpy control shall be a factory or field installed option.

Ultra Low Leak Economizer with Fault Detection and Diagnostic (FDD)

The return air and fresh air dampers shall be provided with airfoil blades and independent direct drive actuators. Dampers shall have a leakage rate of 3 CFM/sq-ft at 1.0 in WC pressure differential (AMCA Class 1A). Dampers shall have a functional life of 60,000 opening & closing cycles.

Note: *Based on testing completed in accordance with AMCA Standard 500D.*

Fault Detection and Diagnostic (FDD) control shall also be provided with Ultra Low Leak Economizers. FDD control shall monitor the commanded position of the economizer compared to the feedback position of the damper. If the damper position is outside +/- 10% of the commanded position, a diagnostic shall be generated.

Ventilation Override

Ventilation Override shall allow a binary input from the fire/life safety panel to cause the unit to override standard operation and assume one of three factory preset ventilation sequences, exhaust, pressurization or purge. The three sequences shall be selectable based upon a binary select input.

Outside Air Measurement (Traq™)

A factory mounted airflow measurement station (Traq) shall be provided in the outside air opening to measure airflow. The airflow measurement station shall measure from 40 cfm/ton maximum airflow. The airflow measurement station shall adjust for temperature variations. Measurement accuracy shall meet requirements of LEED IE Q Credit 1 as defined by ASHRAE 62.1-2007.

Exhaust Air

100% Power Exhaust Fan

Power exhaust shall be available on all units and shall be factory installed. It shall assist the barometric relief damper in maintaining building pressurization.

50% Power Exhaust Fan

Power exhaust shall be available on all units and shall be factory installed. It shall assist the barometric relief damper in maintaining building pressurization.

100% Modulating Exhaust Fan with Statitrac™ Control Option

A differential pressure control system (Statitrac™), shall use a differential pressure transducer to compare indoor building pressure to outdoor ambient atmospheric pressure and shall turn the exhaust fans on and off and modulate the barometric exhaust dampers to control the building pressure to within the adjustable, specified dead band that shall be adjustable at the Symbio 700 onboard interface or through the Trane Mobile App.

100% Fresh Air Tracking Power Exhaust

Modulating power exhaust shall be available on all units and shall be factory installed. It shall assist with maintaining building pressurization by exhausting a proportional amount of the entering fresh air.

50% Fresh Air Tracking Power Exhaust

Modulating power exhaust shall be available on the on all units and shall be factory installed. It shall assist with maintaining building pressurization by exhausting a proportional amount of the entering fresh air.

Barometric Relief

The barometric relief damper shall be optional with the economizer. Option shall provide a pressure operated damper for the purpose of space pressure equalization and be gravity closing to prohibit entrance of outside air during the equipment “off” cycle.

Ultra Low Leak Exhaust

The exhaust damper shall be provided with airfoil blades and independent direct drive actuator. Damper shall have a leakage rate of 3 CFM/sq-ft at 1.0 in WC pressure differential (AMCA Class 1A). Damper shall have a functional life of 60,000 opening & closing cycles.

Note: *Based on testing completed in accordance with AMCA Standard 500D.*

Miscellaneous Unit Options

Clogged Filter Indication

This optional factory installed differential pressure switch allows dirty filter indication at the zone sensor with service LED. When closed, the dirty filter switch will light the service LED on the zone sensor and allow the unit to continue normal operation.

Comparative Enthalpy Kit

Field installed enthalpy kit shall provide inputs for economizer control based upon comparison of the enthalpies of the return and outdoor air streams. Also available factory installed.

Condenser Coil Guards

Factory installed condenser vinyl coated wire mesh coil guards shall be available to provide full area protection against debris and vandalism.

Condenser Hail Guards

Hail-protection-quality louvered coil guards shall be available for condenser coil protection from the factory or as a field installed option..

Corrosion Protected Condenser Coil

All Aluminum Microchannel condenser coil protection shall consist of a corrosion resistant coating that shall withstand ASTM B117 Salt Spray test for 6000 hours and ASTM G85 A2 Cyclic Acidified Salt Fog test for 2400 hours. This coating shall be added after coil construction covering all tubes, headers and fin edges, therefore providing optimal protection in more corrosive environments.

Discharge Air Sensing

This option shall provide true discharge air sensing in heating and cooling models. This sensor shall be a status indicator readable through Tracer, Tracker, or LCI. Discharge air sensing shall be standard with Variable Air Volume (VAV) units, Single Zone Variable Air Volume units, and is optional with multi-speed units.

GFI Convenience Outlet (Factory Powered)

A 15A, 115V Ground Fault Interrupter convenience outlet shall be factory installed. It shall be wired and powered from a factory mounted transformer. Unit mounted non-fused disconnect with external handle shall be furnished with factory powered outlet.

GFI Convenience Outlet (Field Powered)

A 15A, 115V Ground Fault Interrupter convenience outlet shall be factory installed and shall be powered by customer provided 115V circuit.

Unit Interrupt Rating (Short Circuit Current Rating-SCCR)

An optional 65,000 Amp rating (480V) and 25,000 Amp rating (600V) shall be applied to the unit enclosure using a non-fused circuit breaker for disconnect switch purposes. Fan motors, compressors, and electric heat circuits shall be included with protective devices that will provide the elevated level of fault protection. The unit shall be marked with approved cULus markings and will adhere to cULus regulations.

High Temperature Thermostats

Field installed, manually resettable high temperature thermostats shall provide input to the unit controls to shut down the system if the temperature sensed at the return is 135ºF or if the discharge temperature is 240ºF.

Hinged Service Access

Filter access panel and supply fan access panel shall be hinged for ease of unit service.

Modulating Hot Gas Reheat

A reheat condenser coil shall be factory installed downstream of the unit evaporator coil. Modulating valves shall control the flow of refrigerant between the indoor reheat and outdoor condensers in response to the unit discharge air temperature in order to dehumidify the space.

LP Conversion Kit

Provided for field conversion of gas/electric units from natural gas to propane.

Modulating Gas

Modulating Gas Heaters shall be made from grades of stainless steel suitable for condensing situations. The natural gas heater shall have a turn down ratio of 10:1.

Motor Shaft Grounding Ring (Optional)

Motors with internal Shaft grounding rings shall be used with VFDs to provide a conductive discharge path away from the motor bearings to ground.

Non-Fused Disconnect Switch

A factory installed non-fused disconnect switch with external handle shall be provided and shall satisfy NEC requirements for a service disconnect. The non-fused disconnect shall be mounted inside the unit control box.

Phase Monitor

Standard on all Voyager 3 units. Protects 3-phase equipment from phase loss, phase reversal, and phase unbalance. Any fault condition shall send the unit into an emergency stop condition that shall not require field adjustments for resets. cULus approved.

Reference Enthalpy Kit

Field installed enthalpy kit shall provide inputs for economizer control based upon comparison of the outside air stream to a definable enthalpy reference point. May also be factory installed.

Remote Potentiometer

A remote potentiometer shall be available to remotely adjust the unit economizer minimum position.

Roof Curb

The roof curb shall be designed to mate with the unit 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 when used with downflow units. Curb design shall comply with NRCA requirements. Curb shall ship knocked down for field assembly and include wood nailer strips.

Service Valves

Discharge service valve standard with all units. Suction service valve optional.

Single Zone Variable Air Volume

Single Zone VAV option shall be provided with all necessary controls to operate a rooftop unit based on maintaining two temperature setpoints: discharge air and zone. Option shall include factory-installed variable frequency drive (VFD) to provide supply fan motor speed modulation. During One Zone VAV cooling, the unit shall maintain zone cooling setpoint by modulating the supply fan speed more or less to meet zone load demand; and the unit will maintain discharge temperature to the discharge cooling setpoint by modulating economizer if available and staging dx cooling.

Stainless Steel Drain Pans

Sloped stainless steel evaporator coil drain pans shall be durable, long-lasting and highly corrosion resistant.

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.

Stainless Steel Heat Exchanger

Stainless steel heat exchangers shall be durable, long-lasting and highly corrosion resistant.

Through-The-Base Electrical Provision

An electrical service entrance shall be provided which allows access to route all high and low voltage electrical wiring inside the curb, through the bottom of the outdoor section of the unit and into the control box area.

Notes

The AHRI Certified mark indicates Trane U.S. Inc. participation in the AHRI Certification program. For verification of individual certified products, go to ahridirectory.org.

Trane - by Trane Technologies (NYSE: TT), a global innovator - creates comfortable, energy efficient indoor environments for commercial and residential applications. For more information, please visit trane. com or tranetechnologies.com.

Trane has a policy of continuous product and product data improvements and reserves the right to change design and specifications without notice. We are committed to using environmentally conscious print practices.

RT-PRC033Q-EN 11 Mar 2023
Supersedes RT-PRC033P-EN (June 2022)