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T-Series Climate Changer® Air Handlers

Sizes 3 through 100

CLCH-DS-9

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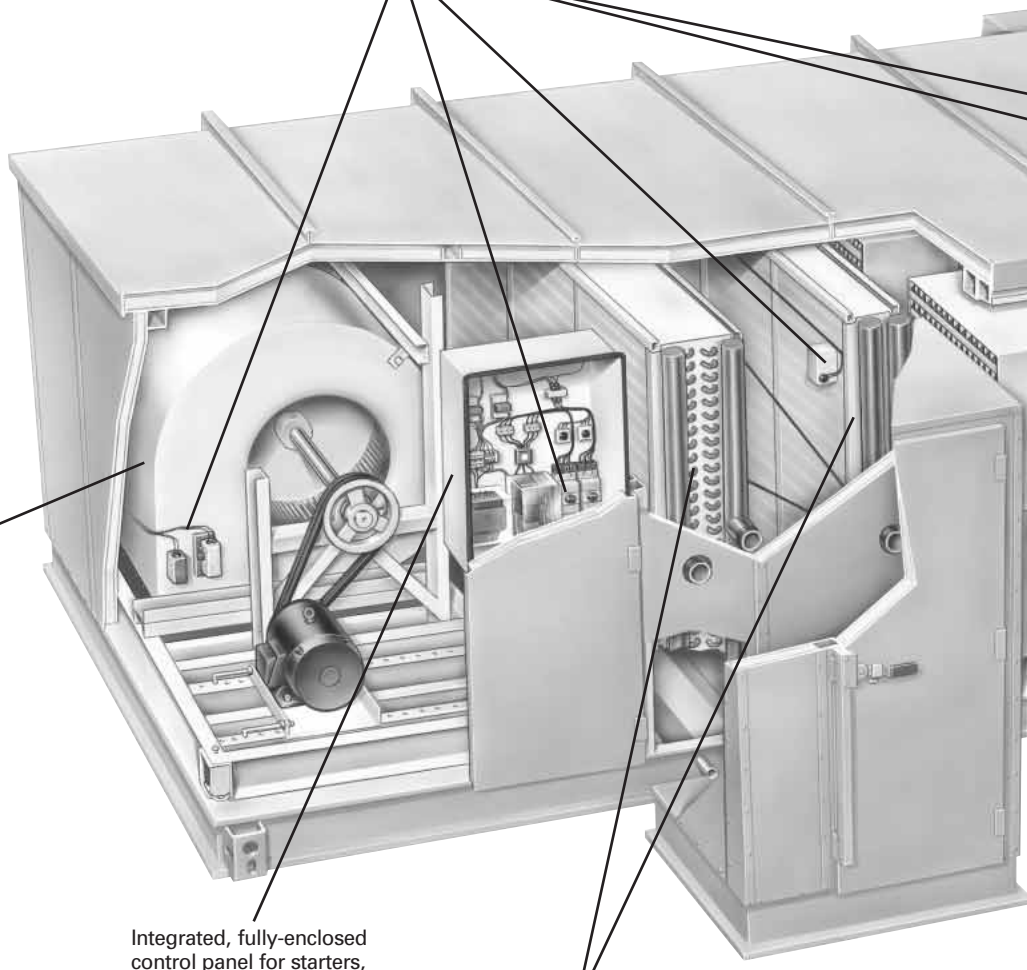
The T-Series Climate Changer® Air Handler …Technology, Tradition, and the Total Comfort Solution

The newest addition to Trane's world-class line of Climate Changer® air handlers is a central-station air handler designed to meet a wide range of customer needs in outdoor applications.

The T-Series Climate Changer air handler (TSC) unites the latest in manufacturing technology with Trane's long-standing tradition of engineering excellence. Trane's design engineers created a new outdoor air handler that incorporates such features as component flexibility and ease of application, integrated standard control options, industrial design, weathertight integrity and technological manufacturing advances. All of this combined with the expertise of Trane's sales engineers makes the T-Series Climate Changer air handler more than just part of your HVAC system…it's part of Trane's Total Comfort Solution.

Controls specifically designed for the T-Series, installed in a factory environment by Trane technicians include:

- End devices
- Motor controllers
- Variable frequency drives
- Unit-mounted DDC controllers
- Traq™ damper ventilation control module
- Standard turnkey controls package that is fully UL Listed



A variety of fan options, including plug, forward curved, airfoil and Trane's Model Q™ vaneaxial fan for acoustically sensitive applications.

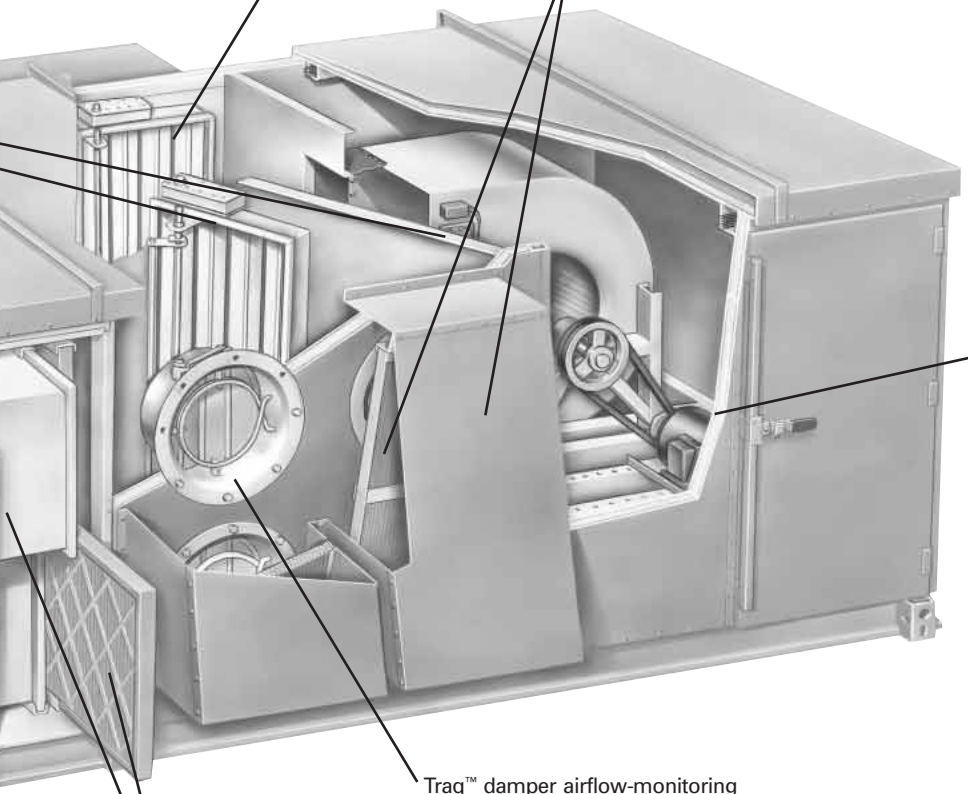
Integrated, fully-enclosed control panel for starters, variable frequency drives and unit-mounted controllers.

A wide range of high-efficiency heating and cooling coils.

Features and Benefits

Common T-Series Climate Changer Air Handler Configurations:

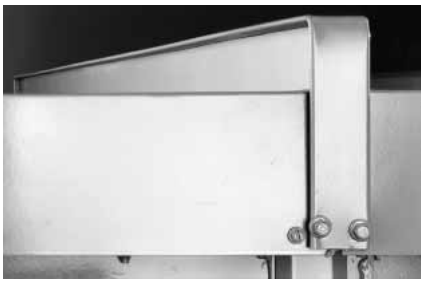
- Horizontal draw-thru, vertical (down) draw-thru or blow-thru units
- Return or exhaust fan economizer systems
- Internal face-and-bypass applications
- Complete factory packaged control systems for "fast track" projects



Features and Benefits

Design Advantages

Form and Function
The T-Series Climate Changer® air handler's form is the result of extensive evaluation of both customer needs and the requirements of an outdoor unit. Trane designed a unit roof that is positively sloped and overhangs all four sides of the air handler. This allows for complete water drainage (no rust-promoting puddles), while the overhang keeps hard-driving rain away from the top of the access doors. To further improve integrity, all unit joints are sealed and fastened with a galvanized steel joint strip.



Galvanized steel joint strip between two roof sections of the T-Series Climate Changer.

The T-Series door utilizes a newly designed latch with a single handle. This allows for easier access, while helping ensure a positive seal across the entire door frame in both draw-thru and blow-thru applications.

Access door with surface-mounted single handle door latch and tempered glass window.

The TSC's handle is surface-mounted, rather than piercing through the door, eliminating the possibility for water entry and improving the thermal performance of the door. The latching mechanism is equipped with features that meet OSHA safety requirements, and can be locked to limit entry.

When installed on a roof curb, the T-Series Climate Changer air handler becomes an integral part of the roof. The inverted U-channel that forms the base of the unit rests on a gasketed roof curb, reducing the chance of leakage.

Unit Construction
Another advantage of the T-Series Climate Changer air handler is its phosphatized, galvanized steel "formulated panels" with rigid, closed-cell insulation. This allows for fewer seams, while providing the unit with unsurpassed panel strength and deflection resistance. The TSC is capable of operation at static pressures of +6/ -4", while the closed-cell insulation provides an R-value of 12 as standard!

Versatility Is Standard

The T-Series Climate Changer air handler is one of the industry's most versatile, cataloged rooftop air handlers. Trane can provide options to meet almost any need in an outdoor central station air handler, and with standard product options.

Standard TSC Features:

- heavy-duty, unitized construction
- closed-cell insulation with R-value up to 12
- pitched, double-wall roof
- double-wall interior panels
- solid, galvanized steel floor
- double-wall doors with a new "single-handle" design
- insulated, galvanized or stainless steel drainpans pitched in two-planes to help ensure positive drainage
- ultra low-leak dampers
- inlet hood with moisture eliminator
- exhaust hood
- painted external unit casing in accordance with the ASTM B117 salt-spray test

Trane offers a wide variety of fans and motors, all available with factory-mounted controls.

Choice of Fans
An extensive array of fan types and options, including inlet guide vanes and variable frequency drives for modulation in variable air volume systems, further enhances the TSC's versatility. Trane offers a wide variety of fans and motors, all available with factory-mounted controls.

Now you can choose the fan that best satisfies each job's supply, exhaust or return fan needs:

- double-width/double-inlet (DWDI) centrifugal fans in forward-curved (FC), backward-inclined (BI) or airfoil (AF) configurations
- single-width/single-inlet (SWSI) plug fans
- airfoil vaneaxial fans (Model Q™)

Each fan is rated in accordance with ARI Standard 430 to ensure cataloged performance. All DWDI fans are ARI Standard 430 certified.

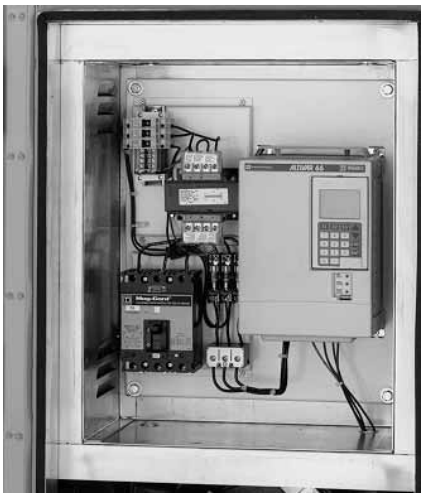
Features and Benefits

Optimized Coils
Flexibility also characterizes the T-Series Climate Changer air handler's coil offerings. The variety of types, sizes, arrangements and materials available lets you select a coil optimized for your application's specific pressure drop and capacity requirements.

Options include:
- 1- to 10-row, 1/2- or 5/8-inch OD chilled water coils
- 1- or 2-row, 1/2 or 5/8-inch OD hot water coils
- 2- to 8-row, 1/2- or 5/8-inch OD refrigerant coils
- 1-row, 1-inch OD, distributing-type (non-freeze) steam coils
- infinitely-variable fin spacing
- stainless-steel coil casing
- copper fins
- red brass tubes
- Delta-Flo™ E and Delta-Flo H, Prima-Flo® and Sigma-Flo® fin surfaces
- baked phenolic coatings
- header drain and vent connections
- fully drainable coils
- half, full and dual serpentine circuited water coils
- standard, intertwined and face-split-circuited refrigerant coils.

All standard heating and cooling coils are engineered and manufactured at Trane's air handling systems manufacturing facility. Cataloged coil performance is certified in accordance with ARI Standard 410.

Optional Features:
- exhaust or return fan economizers
- direct space pressurization control
- additional full-sized, gasketed, double-wall doors
- air blenders
- factory mounted and run-tested controls
- versatile access section lengths to meet specific needs
- assorted filtration options
- external pipe cabinet
- full array of pre- and final filter sections
- extended grease lines
- single-point power on most sizes
- heat-recovery coils (outside the scope of ARI Standard 410's certification)



Integral controls cabinet for starters, variable frequency drives and unit controllers

Turnkey Controls Solutions

T-Series Climate Changer® air handlers offer one of the industry's most comprehensive factory-packaged control systems. Turnkey control packages (factory-mounted and tested systems) help lower installation cost and risk while dramatically improving quality and reliability. The advantage of having Trane technicians install controls (specifically designed for your TSC unit) in a controlled factory environment simply can't be matched with field mounting by a local electrical technician. The entire air handler control system is engineered, mounted, wired and tested before the unit leaves the factory.

That means:
- Control components are properly sized, selected and laboratory-tested for optimal system performance.
- Trained technicians install the controls under ideal conditions using state-of-the-art equipment, eliminating costly field coordination and installation.
- Each control system is fully tested before it leaves the factory. A computer-based test station simulates actual operating conditions, supervises the unit controller, drives the actuators and surveys the input and output devices…all to help assure trouble-free installation and reliable operation when your T-Series Climate Changer air handler reaches the job site.

Trane's factory-mounted and tested controls and end devices save time and money at the jobsite.

Factory installed and tested "turnkey" components include:
- starter packages (control power transformer, starter)
- variable-frequency drive packages (control power transformer, starter, VFD, disconnect)
- disconnects
- unit-mounted DDC controllers
- control valves
- reliable jackshaft-driven electronic actuators for dampers and inlet guide-vanes
- temperature, humidity and pressure sensors
- low-limit switches
- fan and filter status switches
- high- and low-pressure switches
- single-point power on both high and low voltage wiring

Features and Benefits

Integrated Comfort™ System Compatibility

The T- Series Climate Changer air handler's turnkey control package provides standalone air handler operation. But it can also be part of a complete line of control systems that includes unit controllers and Tracer® building management systems to integrate and magnify your control capabilities. When joined by a simple, single twisted-wire pair, they constitute a Trane Integrated Comfort system (ICS) a powerful system architecture that unites Trane HVAC equipment, direct digital control and building management into a single control strategy.

What that means to owners, facility managers, designers and contractors is:

- Single-source responsibility equipment and controls engineered for each other and provided by a single manufacturer simplify job-site coordination efforts and reduce installation time, expense and risk.
- Comprehensive monitoring and diagnostic capabilities — Trane engineers its unit-mounted controls to provide the highest level of useful information possible. Our family of sophisticated Tracer® building management systems coordinates this information and provides a powerful tool for scheduling preventive maintenance, reducing equipment downtime and controlling service expense.

A Tracer Summit building automation system offers facility managers the control they need.

- System optimization — Tracer enables information-sharing and complex control strategies, such as ventilation reset, throughout the HVAC system. It also helps ensure that each subsystem operates in the most efficient manner possible while continuing to satisfy current loads. The result is reduced building energy consumption through effective operation of the entire HVAC system.

BACnet

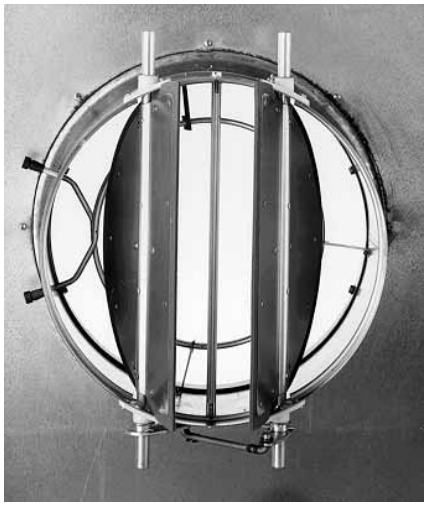
The communication protocol for Tracer Summit®, Trane's premier building automation system, is based on ASHRAE/ANSI BACnet Standard 135-1995. BACnet is a standard, open-communications protocol that allows both integration (connectivity of equipment and controls purchased from multiple suppliers) and interoperability (information-sharing between independent and dissimilar systems within a building or campus).

Indoor Concerns…Outdoor Solutions

The building industry is continuously evolving and the rate of change is accelerating. Technological, economic, regulatory and environmental factors are very different now than they were just a few years ago. The T-Series Climate Changer® air handler's standard and custom capabilities help you address today's multifaceted design issues especially indoor air quality (IAQ) and ASHRAE Standard 62 — while providing the versatility to adapt to tomorrow's challenges.

ASHRAE 62-1989

Basically, ASHRAE Standard 62 requires that an air handling system must bring sufficient outdoor air (OA) into the building, filter the air and control microbial growth. However, applying these principles could mean greater energy consumption, larger, noisier units and increased risk of coil freeze-up. The T-Series Climate Changer air handler lets you configure unique "IAQ-ready" air handling solutions that address all of these concerns.



Internal view of Trane's patented Traq™ Damper for measurement and control of outdoor air.

Controlling Ventilation Airflow

Trane's exclusive airflow-monitoring solution, the Traq™ damper, allows direct measurement and control of outdoor (or return) airflow, and is installed and tested at the factory for ease of use. When applied as part of a Tracer Summit-based Integrated Comfort™ system, ventilation airflow can be controlled dynamically and documented to verify compliance with ASHRAE Standard 62. Factory-mounted and tested to reduce installation and start-up costs, the Traq damper also requires significantly less straight duct than traditional airflow-monitoring stations.

Inhibiting Microbial Growth

The T-Series Climate Changer air handler can be selected with features that minimize microbial growth through proper condensate management, humidity control and easy access for regular maintenance and cleaning, including:

- non-corroding drain pans sloped in two directions to assure positive drainage
- dehumidification solutions (e.g., low sensible-heat-ratio coil selections, or 100% outdoor air units in conjunction with other Trane airside products)
- full-size access doors and access sections in 11 to 60-in. lengths for cleaning of internal components
- antimicrobial treatments for drain pans and filters

Features and Benefits

Removing Airborne Contaminants
Effectively controlling particulate and gaseous contaminants by reducing their concentrations to acceptable levels or removing them from the airstream altogether is another key to ensuring good indoor air quality. That necessitates proper filter selection.

Trane's T-Series Climate Changer® air handler can be equipped with a variety of filtration options:

- pleated media with 20- to 95-percent efficiency (ASHRAE Standard 52-1976)
- bag or cartridge filters with 65- to 95 percent efficiency (ASHRAE Standard 52-1976)
- antimicrobial-treated filters

Recovering Energy
Increased ventilation airflow increases heating and cooling loads, and ultimately, operating costs. Bringing in more fresh air when outdoor temperatures are low also increases the risk of damaging coils. Airside energy recovery addresses both concerns by salvaging heat from the exhaust airstream to precondition outdoor air entering the building. A coil runaround loop may be used in conjunction with other Trane products to achieve a more energy-efficient air handling system. See your local Trane sales engineer for more details.

Trane offers a wide variety of filtration options for the T-Series Climate Changer air handler.

Providing Quiet Comfort
Acceptable space sound levels enhance occupant comfort and productivity. However, system designs that promote good IAQ can adversely affect acoustics: unlined ductwork, air handlers with solid double-wall construction, and increased fan static pressures (resulting from the addition of energy recovery and increased filtration) can magnify the building's background sound.

Controlling noise at its source is the most cost-effective solution for providing quiet comfort in the space. This "source attenuation" can eliminate the need for duct-mounted silencers and thereby lower fan operating costs (by reducing system static pressure). But to control source noise, you must choose:

- The right fan – FC, BI, AF, plug or Model Q™
- The right casing construction – use solid or perforated double-wall
- The right unit configuration – possibly add an inlet or discharge plenum

All of the above choices should be based on AMCA 300 tested data and a working knowledge of acoustics. Trane has the tools (such as the Trane Acoustics Program [TAP™]) and expertise to help with your acoustically-sensitive jobs. Consult your local Trane engineer for assistance.

Total Quality for a Total Solution

The T-Series Climate Changer air handler combines comprehensive performance certification by the Air Conditioning and Refrigeration Institute (ARI) with thorough laboratory testing and advanced manufacturing methods. Together, these elements help assure that each T-Series Climate Changer air handler operates predictably and reliably throughout its life. Unlike other rating methods that check fan performance alone, T-Series Climate Changers are performance-tested in accordance with ARI Standard 430 in a certification process that evaluates the entire air handler on the basis of airflow, static pressure, fan speed and brake horsepower. Heating and cooling coils are rigorously tested in compliance with ARI Standard 410 to assure that they also deliver cataloged performance.

The T-Series Climate Changer air handler and its standard options are listed by Underwriters Laboratories Inc. This product has been evaluated by UL and meets the applicable U.S. and Canadian safety standards. Modifications to the TSC may affect UL Listing. Consult your local Trane office for further information.

Our state-of-the-art manufacturing facility employs a system of "Total Quality Checks" and verifications at each work station to ensure consistent high quality. And through the use of Demand Flow™ Technology (DFT) in our manufacturing facilities, we can better serve you by providing greater product flexibility, ever improving product quality and shorter manufacturing cycles.

Applications

An air handling unit (AHU) is exactly what its name implies: a device that handles - that is, moves and/or conditions -air. It accomplishes this based on the functions required by a given application, as well as the arrangement of components necessary for those functions.

An outdoor central-station air handler, such as the T-Series Climate Changer® air handler, has the added requirement of operating in an outdoor environment, while still meeting all other system needs.

The T-Series Climate Changer air handler can accommodate an extraordinary degree of design versatility, but in order to apply that versatility to each unique situation, a designer must:

- Apply the T-Series Climate Changer air handler in a manner consistent with good HVAC design practices.
- Understand ASHRAE Standard 62-1989, "Ventilation for Acceptable Indoor Air Quality," as it applies to air handler function and layout.
- Know how specific T-Series Climate Changer air handler applications can address design requirements, with arrangements optimized for job requirements, thermal performance and acoustical performance.

With these objectives in mind, the applications section is divided into three topics that present application considerations for effective T-Series Climate Changer air handler design: air handler functions and tasks, arrangements and component features.

Consult your local Trane sales engineer for additional application assistance.

Air Handler Functions

To properly lay out an air handling unit, the designer must focus on its function(s) in the context of the application. Those "functions" are heavily influenced by outdoor air (OA) requirements which, in turn, depend on the condition of the outdoor air (i.e., sensible temperature, relative humidity and cleanliness).

The steps below summarize the procedure for establishing a particular application's OA requirements:

1
Calculate the total system supply airflow using accepted HVAC design practices. Base this calculation on space load and the temperature difference between space and supply air.

2
Determine the total amount of ventilation air needed: this is the OA required to comply with the ventilation requirements of ASHRAE Standard 62-89 or to "make up" for air leaving the building via fixed exhausts (e.g., lavatory fans, lab hoods, exfiltration and any air used for indoor combustion processes), whichever is larger. In most cases, ventilation air volume should equal exhaust air volume to maintain proper building pressurization and air volume.

3
Finally, having established the amount of outdoor air and total supply air required, quantify the return air volume and percentage of outdoor air.

Note: If you are configuring a variable air volume system (VAV), refer to Trane publication CLCH-S-26 for information on optimizing system operation. Contact your Trane sales engineer for more information. Together, these airflow requirements dictate the type of air handler(s) needed and the tasks that must be performed.

Basic Air-Handling Tasks

Mix and Recirculate Air to the Occupied Space

Generically termed standard air handling units (Figure A-1), these air handlers collect air from the occupied space, mix it with outdoor air, treat it and discharge it into the supply airstream.

Bring In Outdoor Air and Treat It

An air handler dedicated to treating outdoor air is referred to as an outdoor air unit, but may also be called a makeup air unit in instances where outdoor air is brought in to replace air exhausted locally from lavatories, kitchens, etc. See Figure A-2. Outdoor air units either discharge air directly into the occupied space or serve as a "pre-conditioner" for other air handling units downstream. For example, a "pre-conditioning" outdoor air unit might pretreat outdoor air before it reaches other standard air handlers, effectively removing the outdoor air load from the standard air handlers.

Applications with clean outdoor air and low to medium humidity levels may be effectively served by a standard air handling unit.

Expel Air from the Building

An exhaust unit is an air handler that does nothing more than collect air from the occupied space and discharge it outside the building. Remember: to balance building pressure, any outdoor airflow entering the building must approximate the exhaust airflow leaving the building.

Maintain Proper Building Pressurization

An important aspect of meeting outdoor air requirements is equalizing outdoor air and exhaust air volumes to maintain proper building pressurization. Building pressurization is an air-handling strategy that regulates pressure differences across the building envelope and between zones or rooms by adjusting the amount of air supplied and removed.

The goal of this strategy is to:

- Assure proper distribution of conditioned and ventilation air throughout the occupied space.
- Avoid discomfort due to temperature stratification and drafts.
- Prevent infiltration of unconditioned air.
- Confine odors and contaminants to specific areas within the building.

Building envelope pressurization is typically achieved by incorporating either an exhaust fan and mixing box or a return fan and economizer in the air handler's design. A brief summary of their respective operating characteristics and application considerations follows. Careful analysis is required to determine which approach best suits each application's unique requirements. To better understand the differences between exhaust-fan and return-fan systems, consult your local Trane sales engineer or refer to Building Pressurization Control (Trane publication AM-CON-17).

Figure A-1 - Standard Air Handling Unit

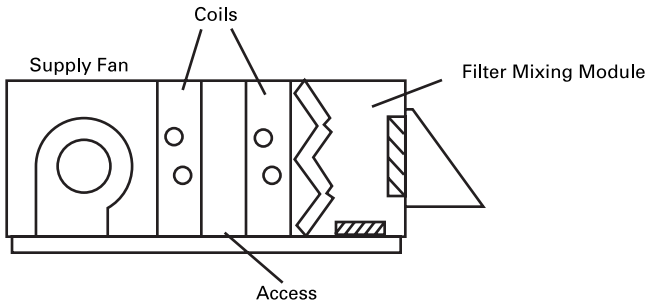
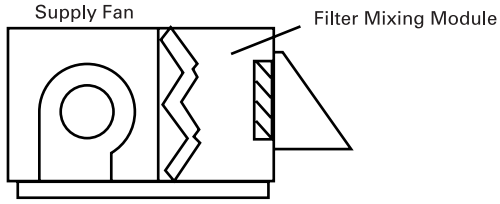


Figure A-2 - Make-Up Air Unit



Applications

Exhaust Fan Economizer
Figure A-3 depicts a typical T-Series Climate Changer® air handler with an exhaust fan and mixing box. To balance the amount of air exhausted from the building with the amount of air brought in, the exhaust fan modulates, running at full capacity only when the economizer brings in 100 percent outdoor air. When the mixing box is at minimum and the exhaust fan is idle, dampers on the mixing box close to prevent outdoor air from being drawn into the air handler through the exhaust section. The exhaust-fan-and-mixing box combination provides strict space pressurization control, as long as the supply fan is sized to handle total system static pressure. First cost and operating cost are usually lower than the return-fan-and-economizer alternative (exhaust fans require less capacity than return fans and run less often).

Application Considerations:
Size the supply fan to handle the static pressure requirements of the higher of the following:
1
100 percent outside air operation (i.e., OA ductwork, OA damper, filters, coils and other accessories in the outdoor airstream, plus supply duct static pressure drop) or
2
100 percent return air operation (i.e., RA ductwork, RA damper, filters, coils and other accessories in the recirculated airstream, plus supply duct static pressure drop).

- Size the exhaust fan to handle 100 percent of the return air (i.e., return duct, exhaust duct and shutoff damper) when the unit is in full economizer mode.
- Control exhaust airflow to maintain the outdoor/indoor static pressure differential within design limits.
- Control the outdoor air and return air dampers to act in a complementary fashion (prevent simultaneous closing); otherwise, serious equipment damage could result.

Return Fan Economizer
Figure A-4 depicts a typical T-Series Climate Changer air handler with a return fan and economizer. The return fan typically runs continuously to balance the amount of air supplied to and removed from the occupied space. While this approach makes precise space pressurization control more difficult, it is better suited to applications with high return static pressures than the exhaust fan alternative; if the supply fan is unable to handle the total system static pressure, the return fan is sized to overcome the return duct's external static pressure. Of course, the return fan's larger size and constant operation also mean higher first and operating costs.

Application Considerations:
- Size the supply fan to handle the static pressure requirements of 100 percent outside air operation (i.e., OA ductwork, OA damper, filters, coils and other accessories in the outdoor airstream, plus supply-duct static pressure).
- Size the return fan to handle the static pressure requirements of 100 percent exhaust air operation (i.e., return duct, exhaust duct and exhaust damper).
- Control the return fan to maintain the outdoor/indoor static pressure differential within design limits.
- Control the outdoor air and return air dampers to act in a complementary fashion (prevent simultaneous closing); otherwise, serious equipment damage could result.

Figure A-3 - Exhaust Fan Economizer System

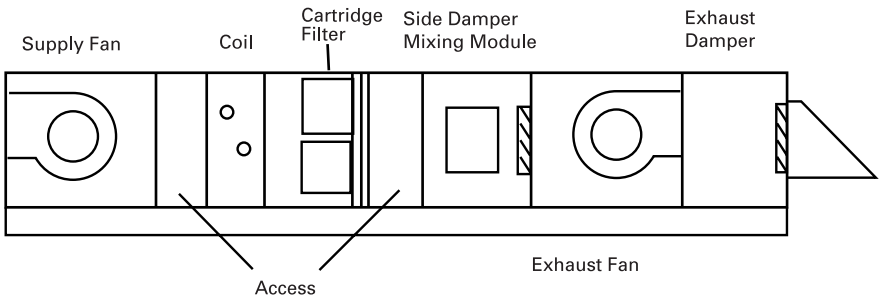
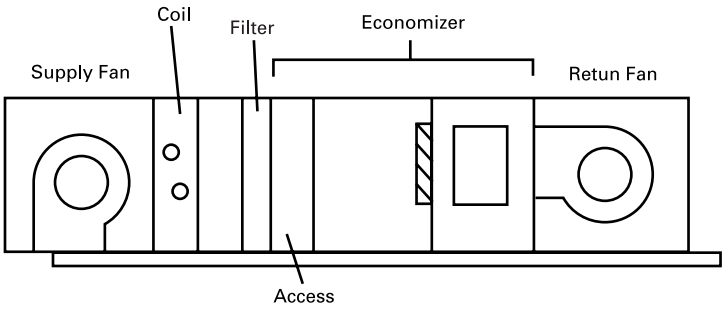


Figure A-4 - Return Fan Economizer System



Barometric Relief Economizer
Figure A-5 depicts a typical T-Series Climate Changer® air handler with a barometric relief economizer. Barometric relief offers some positive space pressure control. The equipment consists of an economizer section with a damper in the return air path that opens upon an increase in pressure difference between the space and the outside.

The supply fan must over-pressurize the space to allow for proper operation of the barometric damper. It should only be used in systems that have extremely low return air static requirements. In other systems, it is recommended that a powered system such as return fan or exhaust fan economizer be used instead of barometric relief.

Application Considerations:

- Size the supply fan to handle 100 percent outside air operation (i.e. OA hood, OA dampers, filters, coil(s) and other accessories, plus supply air ductwork).
- Set up system for maximum delivery at 100 OA economizer mode. Turn on all remote exhaust fans. Measure the space static pressure, and adjust barometric relief damper to produce a slight positive space pressure.
- Only when the unit is at or near 100 percent OA (return air damper is closed) will the exhaust section become sufficiently pressurized to open the barometric damper.

Meeting ASHRAE Requirements

ASHRAE Standard 62-89 sets minimum ventilation rates and defines acceptable indoor air quality (IAQ) to "avoid adverse health effects." It also presents general system and equipment requirements for outdoor airflow, air distribution, design documentation and microbial growth control. In short, Standard 62 dramatically impacts the design, layout and arrangement of the air handler and its components.

Providing Adequate Ventilation Airflow

ASHRAE Standard 62-1989 specifies a per-person outdoor air requirement of 15 to 20 cfm in commercial office spaces. (Other types of occupied spaces such as operating rooms require even higher ventilation rates.) It also mandates provision for measuring the amount of outdoor air brought into the building as proof of compliance. Consequently, it's important to include a means of monitoring airflow in your T-Series Climate Changer air handler designs.

Direct measurement of airflow – i.e., either a factory-mounted Traq™ damper assembly or a duct mounted hot-wire-anemometer or pitot-tube monitoring station provides greater accuracy and reliability than indirect monitoring methods such as mixed-temperature or tracer-gas calculations, fan-inlet monitors, fixed-position dampers or fixed-differential pressure plates.

See "AHU Components: Mixing Box Section" later in this section for a brief summary of the Traq damper's operating characteristics and application considerations.

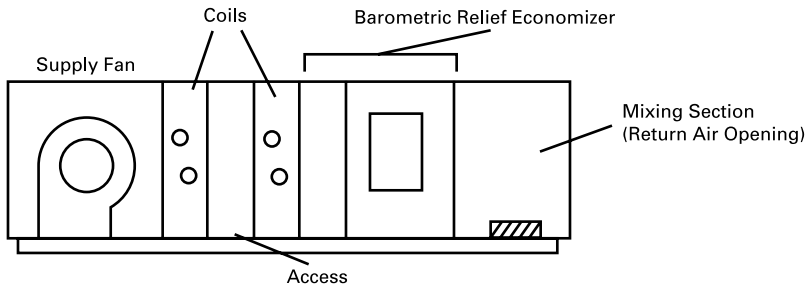
Protecting Hydronic Coils from Freezing

Bringing more outdoor air into the air handler to satisfy Standard 62's ventilation requirement increases the likelihood of air stratification. If a layer of air below freezing moves through the air handler, it can damage unprotected hydronic cooling and heating coils. Traditionally, a low-limit thermostat (or "freeze-stat") installed on the entering-air side of the cooling coil trips when it detects a dangerously low air temperature. That stops the supply fan, closes the outdoor air damper and ultimately degrades the building's indoor air quality.

It's important to design the air handler so that it effectively treats the required amount of outdoor air regardless of temperature without risking coil damage, tripping the low-limit thermostat or compromising indoor air quality. Following are several means of providing coil protection. Choose the technique that best suits the application's requirements.

- Drain the coils. This approach requires fully drainable coils, vent and drain connections on every coil, plus shutoff valves to isolate them from the chiller(s).
- Add glycol to the cooling system water to lower its freezing point.
- Preheat the outdoor airstream with a steam coil, hot-water coil or energy-recovery device to raise its temperature above freezing and eliminate any entrained snow before it reaches the cooling coil.
- Introduce ventilation air downstream of the cooling coil with dual-path or bypass techniques.
- Use an air blender to improve mixing of the outdoor and recirculated airstreams.

Figure A-5 - Barometric Relief Unit



Control Particulate and Gaseous Contaminants

ASHRAE Standard 62-1989 emphasizes the importance of including appropriate filters in the air handling system to control particulate (e.g., dust, fibers) and gaseous (e.g., oxidants, formaldehyde) contaminants.

Controlling Particulates

To provide good indoor air quality, both the Environmental Protection Agency (EPA) and ASHRAE recommend that the concentration of particulate matter in the air not exceed 0.05 to 0.07 mg/m^3. While Standard 62 doesn't set specific particulate filtration guidelines, other design manuals recommend filtration levels of 90 percent arrestance and 40 to 60 percent dust spot efficiency for new air handlers. Filters with dust spot efficiencies greater than 50 percent remove most microorganisms from the passing airstream. National, state or local codes established by government bodies or occupational groups may dictate more specific or stringent filtration requirements for a building, depending on its type and/or location.

Trane offers several types of particulate filters – including pleated, bag and cartridge – that allow you to match filtration efficiency with the application needs. See "AHU Components: Filter Section" for selection and application considerations.

Controlling Gases and Vapors

The presence of undesirable gases and vapors (particularly formaldehyde, radon, oxidants and volatile organic compounds [VOCs]) can be harmful to a building's occupants, materials and contents. Controlling VOC concentrations is particularly challenging: hundreds of them are present, few are unique to any one source, and there are many potential sources, some of which emit several VOCs.

Therefore, a common way to control gaseous contaminants is to dilute them with outdoor air. This approach is especially appealing since many VOCs defy individual treatment. However, it is only practical if the quality of the outdoor air is suitable and if the resulting supply airflow is consistent, appropriate and mixes effectively with the air in the occupied space.

Proper Filter Placement

For effective particulate and gas phase filtration:

- Do not place filters downstream of a blow-thru cooling coil; otherwise moist air (fog) from the cooling coil may develop and saturate the filter.
- Provide easy access to encourage regular filter maintenance.
- Locate filters away from potentially damaging high air velocities. A diffuser is required downstream of a fan in final filter configurations.

Discouraging Microbial Growth

While filtration effectively removes a number of common particulate and gaseous contaminants from the building environment, microbiological or microbial contaminants like molds, fungi and bacteria are sometimes too small to be filtered entirely from the airstream. Designing the air handler to include screens on intake and exhaust openings, an interior steel liner and easy access to heat exchanging components for cleaning purposes helps control microbial growth. Antimicrobial coatings and regular cleaning and disinfecting with nonpolluting cleansers are also beneficial. However, none of these measures totally eliminates the growth of ever-present microorganisms. Consequently, water management becomes another important means of combatting microbial contaminants.

Water Management

Cooling coils collect water from the passing airstream as they cool and dehumidify it. This condensed moisture should be removed to reduce the likelihood of microbial growth. Follow these guidelines when designing the air handler:

- Reduce moisture carryover by sizing the cooling coils for proper airflow velocities at the given conditions and coil fin selection.
- Specify drain pans sloped in two directions to eliminate moisture collecting level seams and promote positive drainage. All T-Series drainpans are double sloped.
- Properly size condensate traps as shown in Figure A-6.
- Promote cleanability – i.e., provide adequate space around the unit, easily removable access panels, and solid interior steel lining to isolate insulation from the airstream and facilitate cleaning.
- Specify antimicrobial coatings for filter and drain pan surfaces where moisture is likely to collect. (Though cooling coil surfaces collect water, too, treatment with an antimicrobial coating is discouraged; such coatings greatly reduce the coil's wetting characteristics and may cause moisture carryover at velocities as low as 200 fpm.)

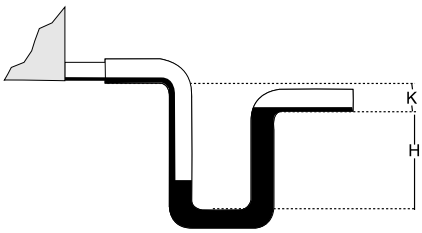
Humidification

Low relative humidities (below 30 percent) in the occupied space are undesirable because they necessitate higher supply air temperatures for thermal comfort, promote static electricity and may favor the transmission of airborne infections such as influenza. Raising the space humidity to an appropriate level requires a humidifier to inject water particles into the passing airstream. To avoid promoting microbial growth, the unit's design must assure that the injected water is fully absorbed within the air handler without collecting on its walls or components.

Three types of commercial humidifiers are generally used in central air handling systems: wetted media, atomized water and steam. Of these, ASHRAE Standard 62-1989 prefers steam "as the moisture source for humidifiers." Its low temperature and pressure make it easy to introduce directly into the passing airstream, and encourage complete absorption in a short distance.

Figure A-6 —

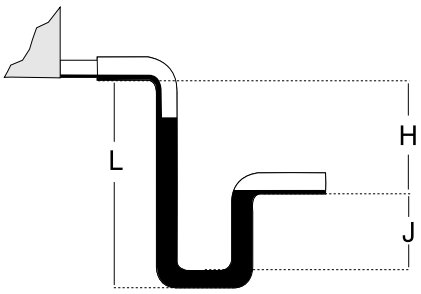
Positive Pressure Trapping



K= min. 1/2"

H= 1/2" plus maximum total static pressure

Negative Pressure Trapping



H= (1" for each 1" of maximum negative static pressure) + 1"

J= half of H

L= H + J + Pipe Diameter + Insulation

AHU Arrangements

Draw-Thru or Blow-Thru

Here are common air handler arrangements, along with general application considerations for each.

Horizontal Draw-Thru

(Figure A-7) Traditional arrangement for air handlers.

Accepted system design practices are generally the only "restrictions" on its application. Note: When using a Model Q™ fan or plug fan section, provide a medium blank section between the coil/filter and the fan for proper air distribution.

Single-Zone Blow-Thru

(Figure A-8) This arrangement places a coil section downstream of a fan section.

To promote proper air distribution through each section and reduce the risk of moisture carryover:

- For units with FC, BI, AF or plug-type fan sections: Add a medium blank section or diffuser between the fan and coil, or a diffuser between the fan and final filter.
- For units with FC, BI or AF-type fan sections: Add a blank section with a drain pan (i.e., medium for unit sizes 03 to 10; medium-large for sizes 12 to 14; large for sizes 17 to 100) or a moisture eliminator immediately downstream of the cooling-coil section.
- Blow-thru configurations with Q-fans require factory approval.

Figure A-7 - Single Zone Draw-Thru Unit

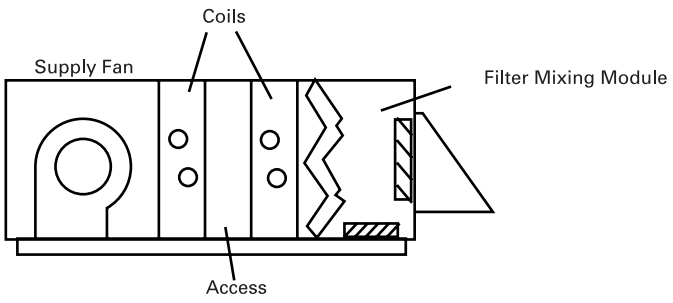
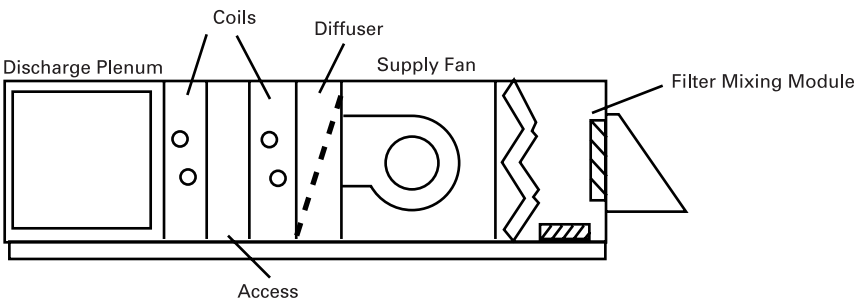


Figure A-8 - Single Zone Blow-Thru Unit



Optimizing an Arrangement for Acoustical Performance

Designers are often challenged to select and arrange the air handler components so that the inlet, discharge and casing-radiated fan generated sound power levels help create a quiet space. To accomplish this, the designer must choose the right fan and determine whether additional unit attenuation is necessary.

Choosing the Right Fan

Obviously, the quieter the noise source (in this case, the fan), the less attenuation is needed along sound transmission paths. Selecting a quieter fan often increases the initial cost of the air handler, but can be a cost-effective system solution because it:

- Reduces the need for path attenuation (e.g., silencers) by diminishing the sound level along all transmission paths
- Reduces energy consumption (i.e., a fan is normally quietest when running at the most efficient point on its operating curve), providing operating cost savings to offset the initial cost.

Trane acoustical tests have shown that a fan's sound power (Lw) level depends on three factors: its type/design, its operating point on the fan curve and its application requirements (e.g., critical octave band frequency). Table A-1 and Table A-2 compare the inlet and outlet sound power levels of four different fans. Together, these charts demonstrate that fan inlet sound is not equivalent to fan outlet sound. More importantly, they underscore the need to obtain accurate, ARI 260 tested sound data from the manufacturer so that appropriate source and/or path attenuation methods can be applied.

The T-Series Climate Changer® air handler gives designers a choice of many different fan types. "AHU Components: Fan Section" later in this section summarizes each fan's application considerations and acoustical characteristics.

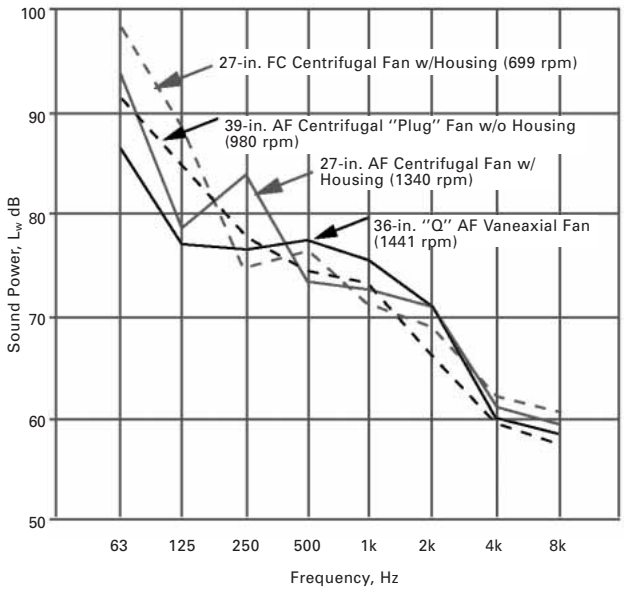


Table A-1 — Comparison of Discharge Sound Power by Fan Type

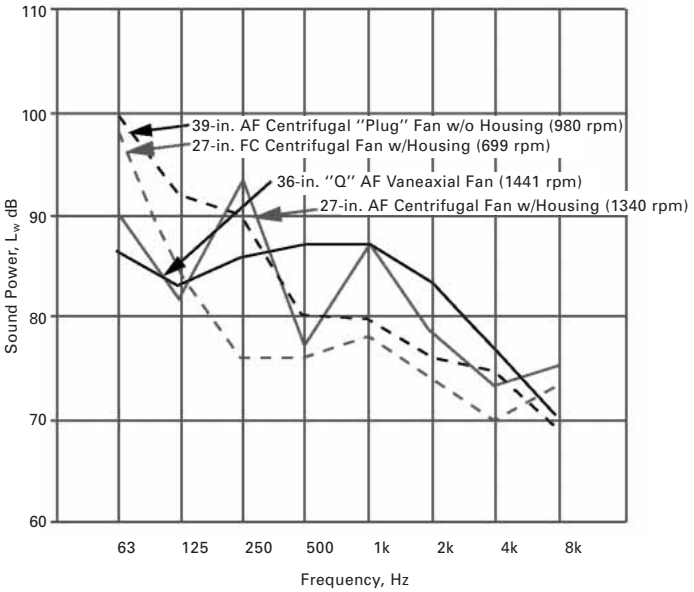


Table A-2 — Comparison of Inlet + Casing Sound Power by Fan Type

AHU Components

T-Series Climate Changer® air handlers adopt a "building-block" approach to air handler design. Each "building block" or section contains one or more components that serve a specific purpose unique to each application. The air-handling functions needed, along with the desired layout and arrangement, ultimately determine what sections the air handler must include.

Moisture Eliminator

Used to remove entrained water from the passing airstream, this section is typically used immediately downstream of a cooling coil section in blow-thru arrangements (not required with plug-type fan sections) to prevent moisture carryover. It may also be used in draw-thru arrangements if the coil carryover velocity is exceeded.

Mixing Box

The mixing box section typically combines the incoming outdoor air with recirculated return air collected from the occupied space, and is commonly included in an air handler's design to improve the mixture of outdoor and recirculated return airflow. When equipped with a Traq™ damper assembly, the mixing box section permits direct measurement of outdoor airflow to verify compliance with ASHRAE Standard 62-1989.

Traq™ Damper Option

Designed to measure and modulate outdoor airflow, the Traq damper assembly consists of one to six butterfly-type dampers. Each damper's bell-mouth inlet guides air uniformly through a flow-sensing ring that accurately measures total and static pressure from 15 to 100 percent of nominal flow. The damper assembly's ventilation control section (VCM) produces a 2 to 10 VDC signal proportional to airflow, recalibrates itself once every 60 seconds and automatically adjusts for temperature variations.

Application Considerations:

- Connecting a Traq damper equipped air handler to a building automation system such as a Tracer® building management system permits: (a) dynamic calculation of the outdoor air needed to adequately ventilate a multi-space VAV system and reset the outdoor air set point accordingly to save energy; (see Trane publication CLCH-S-26) and (b) trend logs and custom reports to document compliance with ASHRAE Standard 62.

Runaround Loop

(Figure A-9) A runaround loop consists of two finned-tube coils (air to-water heat exchangers) piped together; one coil resides in the outdoor airstream and the other in the exhaust airstream. An expansion tank, pump, three-way temperature control valve and working fluid (usually an inhibited solution of ethylene glycol and water) complete the recovery system.

Since the outdoor and exhaust airstreams need not be adjacent, the runaround loop provides design versatility well-suited to building renovations – at a lower first cost than other methods of energy recovery. Complete separation of the airstreams also eliminates the risk of cross-contamination.

Application Considerations:

- Recovery is limited to sensible energy with an effectiveness that typically ranges from 60 to 65 percent.
- Together, the two finned-tube coils may contribute approximately 0.3 to 0.6 in. wg to system static pressure.

Applications

Economizer Section
This section provides a path for return air to be exhausted, allowing the system to provide natural, non-mechanical cooling when outdoor air conditions are suitable. See Figure A-9.

Air Blender Section
The air blender section contains air mixing baffles or "blenders" that rotate the passing airstreams, boosting their velocities for improved mixing. It is usually placed immediately downstream of a mixing box section, and should always be positioned upstream of filters and coils.

Application Considerations:
- Blender face velocity should be in the range of 500 to 2000 fpm for proper mixing.
- When operated at temperatures within its design range, an air blender may eliminate the need for preheat.
- Space is required both upstream and downstream of the blender to allow complete air mixing. (The standard design of the air blender section satisfies these spatial requirements.)

Filter Section
This section removes contaminants from the passing airstream to improve indoor air quality. See "AHU Functions: Comply with ASHRAE Standard 62-1989" earlier in this section.

Particulate Filters
Options include "high-performance" pleated, bag or cartridge filters. All of these filters have a continuous operating range of 0 to 150 F. Factors to consider when determining the proper degree of filtration are:
- Required cleanliness. Higher filter efficiencies cost more, but provide cleaner air and better system performance. Many design manuals recommend filtration levels of 90 percent arrestance and 40 to 60 percent efficiency for new air handlers. National, state and local codes may also specify filter performance.
- Operating resistance to airflow (i.e., pressure drop). Filter resistance and first cost may increase with efficiency.
- Available space. High filtration efficiencies require more space (lower velocity) and may enlarge the air handler's footprint.
- Maintenance. A high degree of filtration can lower cleaning costs in the occupied space.

Air blenders for coil protection are available in sizes 3-100 of the T-Series Climate Changer®

Application Considerations:
- Exceeding the filter's face velocity limit will increase its resistance (as well as fan energy consumption) and necessitate more frequent maintenance or replacement.
- Exercise special care to avoid moisture carryover whenever final filters are used. Never place the filter section downstream of a cooling coil without providing an intervening source of reheat (e.g., fan motor).
- Treating filter media with an antimicrobial coating can reduce the likelihood of microbial contamination.

Gas-Phase Filters
Equipping the filter section with a carbon or potassium-permanganate filter bed will reliably remove a variety of odors and gases (excluding carbon monoxide and carbon dioxide) from the airstream.

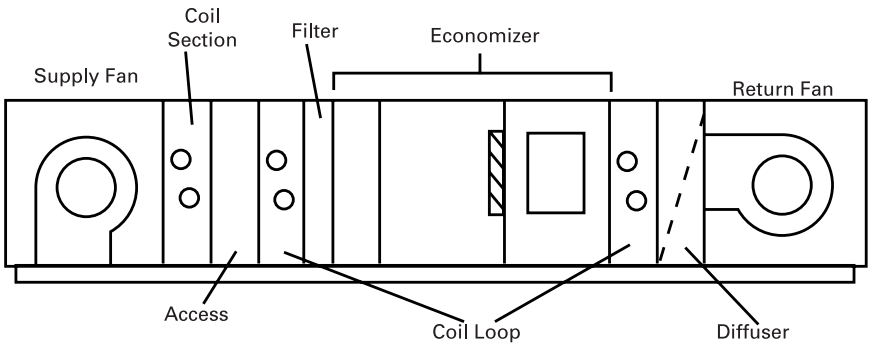
Application Considerations:
- Gas-phase filters must be designed ("tuned") for the specific contaminants to be removed.
- Gas-phase filters are expensive – i.e., first cost is high, and the additional fan energy required to overcome the extra pressure drop increases the air handler's operating cost.
- Effective filtration requires low velocity airflow, increasing the air handler's length/footprint.
- Humidity impairs filtration efficiency. As with particulate filters, never place a gas-phase filter section downstream of a cooling coil without providing an intervening source of reheat (e.g., fan motor).

Access/Blank Section
Incorporate access or blank sections in the air handler design to provide access to internal components for cleaning, maintenance and service, or to promote proper airflow through the unit.

Coil Section
Coil sections temper all (full-face) or part (modified-size) of the passing airstream by heating, cooling or dehumidifying it with a factory mounted coil. To select the right coil for an application's unique requirements, optimize its capacity, face velocity, pressure drop and construction.

Available coils fall into two categories:
- ½-inch "unit coils" are designed exclusively for use in T-Series Climate Changer® air handlers. They have ½-inch OD tubes; designers can choose either 0.016 and 0.025-inch tube walls, and specify 2 to 8 rows.

Figure A-9 - Unit with Economizer and Coil Run-Around Loop



Although they offer fewer options than 5/8-inch "shipping coils," 1/2-inch unit coils have a lower first cost and larger face area; they also require less distance (section length) reducing the air handler's footprint.

- 5/8-inch shipping coils can be applied in either T-Series Climate Changer® air handlers or "built-up" air handling systems. Typified by 5/8-inch OD tubes, these coils can be configure with 1 to 12 rows, and 0.020, 0.024, 0.035 or 0.049-inch tube walls.
- Other coil options available include copper fins, stainless steel casings and 1-inch OD steam coils. Compared to unit coils, shipping coils offer greater design versatility; however, they have a higher first cost, a smaller face area and require a longer section to promote proper air distribution.

Application considerations for chilled water and direct expansion (DX) coils:

- Size the coil to prevent moisture carryover due to high airflow velocities. Velocities up to 600 fpm a re acceptable depending on air conditions and coil fin arrangement.
- Properly size the condensate trap to provide positive drainage; see Figure A-9.
- Specify two-way-sloped drain pans to eliminate level seams and promote condensate flow directly to the drain outlet. Consider stainless steel construction to prolong drain pan life.
- Provide adequate freeze protection for chilled water coils; see "AHU Functions: Comply with ASHRAE Standard 62-1989" earlier in this section.

Application considerations for hot water coils:

- Heating with hot water presents an attractive alternative for buildings without a ready source of steam
- Providing effective freeze protection is more difficult for hot-water preheat coils than it is for steam. To minimize the risk of coil freeze-up, use face-and-bypass dampers and operate the coil at full capacity.

Application considerations for steam coils:

- Properly pipe and trap the coil to provide positive drainage.
- Steam coils are less susceptible to freeze-up than hot water coils. Trane steam distribution coils use steam pressure to blow condensate from the coil. For additional freeze protection, use face-and-bypass dampers and operate the coil at full capacity.

Face-and-Bypass Damper Section

Designed to divert airflow around a coil, the face-and-bypass section can be used to control humidity or provide freeze protection for hydronic coils. Choose from the following damper section configurations:

Internal Face-and-Bypass Dampers

Typically used immediately upstream of a modified-size (i.e., less than 100 percent airflow) coil, this option enables temperature control while operating the preheat coil at full flow. The dampers modulate to bypass air around the heating coil when the outdoor air temperature is warm enough to preclude freezing.

Face-and-Bypass damper in the T-Series Climate Changer® air handler

Application considerations:

- To ensure full airflow coverage across downstream coil banks, provide extra distance after the modified-size coil section.
- The bypass in an internal face-and-bypass damper section is not designed for 100 percent nominal airflow. For applications that require 100 percent bypass, contact your local Trane sales engineer.

Integral Face-and-Bypass Damper and Coil

This custom option, offered in horizontal and vertical coil tube arrangements, encloses the coil fins between dual dampers. If heat is needed, these dampers open; otherwise, they remain closed to prevent "coil wiping" on the leaving side of the coil and avoid unwanted heat pickup.

Application Considerations:

- Vertical coil tube arrangements promote condensate removal and afford better freeze protection.
- Extra distance is required downstream of this section to promote proper air distribution and reduce stratification.

Fan Section

Designers can choose from five fan types to tailor the air handler's performance to application requirements; Table A-3 summarizes and compares the characteristics and application considerations of these fans. When evaluating the merits of each fan type, consider the application's volumetric rate of airflow, static pressure, required sound characteristics and available space, as well as the nature of the load and how the occupied space is used.

To verify that a specific fan's performance will satisfy design requirements, see catalog supplements CLCH-CS-7A and CLCH-CS-7C. The fan curves published there include casing effect. These supplements also discuss how ductwork connections, air density, fan/motor heat, drive losses and use of "high-performance" (> 65 percent efficient) filters affect fan performance.

Applications

Fan Control Method

Depending on the control method used, the air handler fan will provide either a constant or variable volume of supply air. In a constant volume (CV) system, the fan delivers a consistent amount of air; cooling and/or heating devices adjust the temperature of that air for occupant comfort. Since the fan runs at constant horsepower under all load conditions, system operating costs are higher than those of a variable air volume system.

A variable air volume (VAV) system provides occupant comfort by delivering a fluctuating amount of constant temperature air; usually, supply duct static pressure determines how much air the fan provides. Varying fan horsepower with building load can offer substantial energy savings and reduce the building's airflow requirements. Airflow modulation is accomplished in one of two ways: with a variable-frequency drive (VFD) that adjusts fan speed and airflow by varying motor speed or with fan mounted inlet guide vanes (IGV) that limit the amount of air entering the fan. Of these methods, VFD modulation is the quietest and most energy efficient; it can also prolong the life of the fan motor by "soft starting" it. FC fan IGV modulation provides reliable operation at a lower first cost. Avoid using IGVs on other fan types.

Application Consideration:

- Regardless of the fan control method (CV or VAV) used, it is important to provide a means of monitoring outdoor airflow. Over time, filter loading and other system effects can change static pressures and eventually reduce airflow — including ventilation airflow — below the design volume flow rate.

Diffuser Section

Designed to provide even airflow, the diffuser section is typically used immediately upstream of a final-filter or coil section.

Plenum Section

Before leaving the air handler, supply air is sometimes discharged into a plenum section; the airstream's rapid expansion as it passes into the plenum reduces turbulence and creates an end reflection that dampens low-frequency sound. Two configurations enable supply-duct connections from any side; unless otherwise noted, all are available with two-inch, insulated casing walls of solid construction.

Table A-3 — Fan Summary Chart

	FC Fan	BI Fan	AF Fan	Model Q™ Fan	Plug Fan
Fan Type	Centrifugal, housed	Centrifugal, housed	Centrifugal, housed	Vaneaxial	Unhoused
Inlet	Double	Double	Double	Single	Single
Airflow direction	Radial	Radial	Radial	Axial	Pressurized, all direction
Optimal Pressure Range	Low to Medium (0-5 in. wg)	High (4-8 in. wg)	High (4-8 in. wg)	Medium (2-5 in. wg)	Medium (2-5 in. wg)
First Cost (Relative)	Low	Medium	Medium	High	High
Operating Cost (Relative)	Medium	Medium-high	Medium-high	Low	Medium
Typical RPM range	400-1,200	1,000-2,600	1,000-2,600	1,400-2,900	600-1,200
Blade shape	Curved	Flat	Airfoil	Airfoil	Airfoil
Acoustical characteristics	Significant air turbulence that quickly abates; little blade-tone noise.	Significant air turbulence; strong blade tones in 250-Hz octave band.	Significant air turbulence; strong blade tones in 250-Hz octave band.	Little turbulence; quiet at hard-to -attenuate low frequencies.	High inlet noise, but lower discharge noise than FC, BI and AF fans due to uniform discharge velocity and "plenum effect."
Suggested source attenuation	Add a discharge plenum.	Avoid using inlet vanes.	Avoid using inlet vanes.	Avoid using inlet vanes. Add a discharge plenum	Add a discharge plenum or inlet duct silencer.
Space required directly upstream of fan in draw-thru arrangements	None	None	None	Medium blank	Medium blank
Space required directly downstream of fan in blow-thru arrangements	Medium blank or diffuser section.	Medium blank or diffuser section.	Medium blank or diffuser section	Not available.	Medium blank section.
When to use?	Low- to medium -pressure applications.	High-pressure applications.	High-pressure applications.	Quiet applications, especially 6,000-50,000 cfm.	Multiple-duct-arrangement applications. (1, 2)

Notes.
1. Add duct takeoff losses from the plug/plenum fan section to external static pressure; see catalog supplement CLCH-CS-7A for details.
2. The plug fan's uniform discharge velocity may eliminate the need for supply-air ductwork turns and diffusers.

Humidification Section

ASHRAE Standard 62-1989 suggests maintaining a relative humidity of no less than 30 percent to provide a comfortable, healthy indoor environment. The T-Series Climate Changer® air handler's humidification section is a custom option that uses "dry" steam to add moisture to the air. Factory mounting within the air handler lowers the humidifier's installed cost and keeps moisture out of the supply duct, while factory provided controls provide accurate, reliable performance.

Application Considerations:

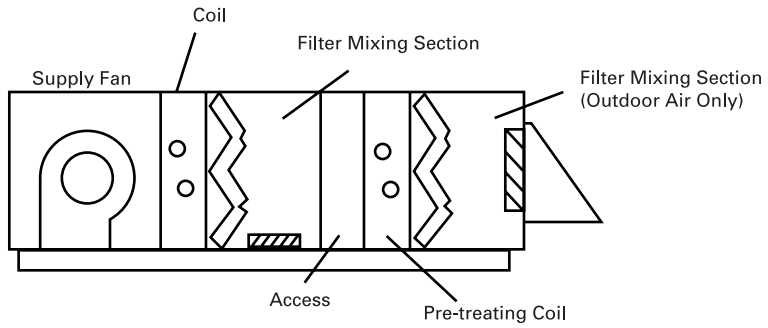
- Never position the humidification section immediately downstream of a housed fan or blow-thru coil section.
- Extra dispersion distance may be needed if the humidification section is placed upstream of a final filter or electric heat coil.
- Vertical airflow turns immediately upstream and downstream of the humidification section necessitate a large section.
- Humidification for the T-Series Climate Changer air handler is available as a custom option by contacting the factory

Inlet Hood Considerations

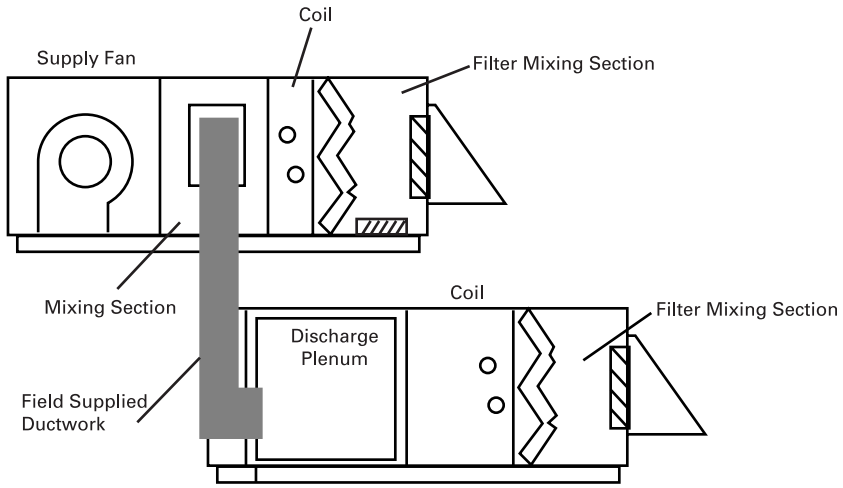
The Trane inlet hood accessory for the T-Series Climate Changer air handler line includes moisture eliminators. Eliminator face velocities below 950 fpm will avoid pulling water through the eliminator fins and into the unit. It is possible for moisture to be carried over into the unit when elimination face velocities are above 950 fpm.

Additional T-Series Climate Changer® Air Handler Arrangements

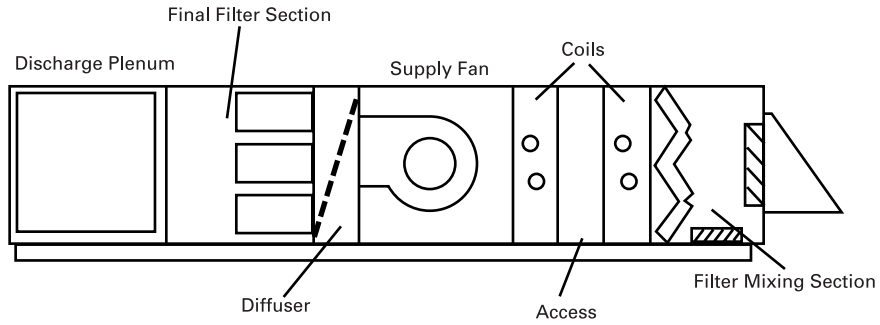
Outdoor Air Pre-Treating Unit



Split Dehumidification Unit



Draw-Thru Unit with Final Filters



T-Series Outside Air Inlet Hood CFM Limitations

Each T-Series unit has a rated nominal cfm (a #3 for example is 1,500 cfm). These nominal cfm's allow for an engineer to quickly base his unit size requirements. Although this is the nominal cfm of a given unit, each unit is capable of producing more cfm, until something limits the ability of the unit to meet this higher cfm requirement such as coil face velocity, filter face velocity or the outside air inlet hood eliminator velocity.

The eliminator in the inlet hood is rated to a maximum of 950 feet per minute. Above this limit, there is a high probability of bringing rain water or snow into the unit, which could migrate to the conditioned space below. When selecting units for your application, remember not to undersize a unit to the point that the inlet hood eliminators can not handle the outside air cfm requirements.

In Table A-4 are the maximum cfm's for the inlet hoods on the back and sides of a mixing module and the side inlet hoods on an economizer module.

Table A-4 — Inlet Hood CFM Limitations

	Mixing Module			Economizer Module	
Unit Size	Back Inlet Hood	1 Side Inlet Hood	2 Side Inlet Hoods	Single Inlet Hood	Dual Inlet Hoods
3	2,337	1,862	3,724	1,862	3,724
6	3,876	1,976	3,952	1,976	3,952
8	4,341	2,384	4,769	2,384	4,769
10	8,949	3,135	6,270	3,135	6,270
12	9,614	3,752	7,505	3,752	7,505
14	10,193	4,314	8,626	4,314	8,626
17	13,870	5,111	10,222	5,111	10,222
21	14,288	5,776	11,552	5,776	11,552
25	17,755	6,773	13,547	6,773	13,547
30	20,786	8,303	16,606	8,303	16,606
35	25,251	9,547	19,095	9,547	19,095
40	28,756	10,858	21,717	10,858	21,717
50	31,825	13,528	27,056	13,528	27,056
66	41,116*	18,078	36,157	18,078	36,157
80	46,217*	21,517	43,035	21,517	43,035
100	57,152*	26,191	52,383	26,191	52,383

*For units with Traq™ dampers located in the back inlet position of a mixing module, use the two-sided inlet hood limits for a mixing module.

Example:

Assume you are selecting a #10 exhaust fan economizer unit at 5,000 cfm and .5" ESP consisting of:

Exhaust damper module
Fan module
Mixing module
Medium access module
Angle filter module
Heating coil module
Cooling coil module
Fan module

Specification requires that no more than 50 percent of the cfm will come from outside air. In this example, the unit could be supplied with one-sided inlet hood, as the maximum cfm through one-sided hood is 3,135.

If 100 percent outside air capability were specified, then the unit would need to be supplied with two-sided inlet hoods.

Applications

Outside Air Inlet Hood Requirements *(Separation Distance)*

Many specifications require that there be a minimum distance between the point that outside air enters an air handler and the roof of a building. This distance is to minimize the possible introduction of contaminants into the conditioned air.

ASHRAE 62-89 recommends that there be at least 9" (or 8" above maximum snow depth) separation from the roof to the outside air intake, however, some specifications, specifically for units in the health care industry require at least 36" of separation distance. When you are configuring T-Series units you need to be sure that the unit in conjunction with a roofcurb will meet the specifications requirements on separation distance.

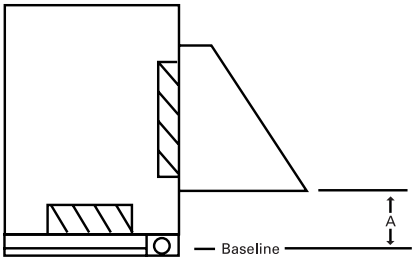
Below is a table that lists the distance from the baseline of the unit to the bottom of the outside air inlet hood for mixing modules with either a back hood or side hood, and for the side inlet hoods for the economizer module.

Inlet Hood Separation Distance From Baseline of Unit (Inches)

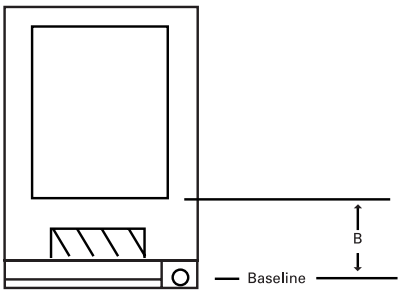
Unit Size	"A"	"B"	"C"
3	6	6 1/8	6 1/8
6	8 1/2	7 5/8	7 5/8
8	12 1/4	7 1/2	7 1/2
10	9 3/4	11 1/2	11 1/2
12	13 3/4	11 3/8	11 3/8
14	15 3/4	9 1/2	9 1/2
17	14	7	7
21	18 1/2	8	8
25	19	7 1/2	7 1/2
30	19	9 3/8	9 3/8
35	22 1/2	11 5/8	11 5/8
40	22 1/2	14 1/2	14 1/2
50	34 1/2	14 3/4	14 3/4
66	40 7/8*	18 5/8	18 5/8
80	50*	20 5/8	20 5/8
100	57*	15 1/2	15 1/2

*For units with Traq™ dampers located in the back inlet position of a mixing module, use the "B" side inlet hood dimension for a mixing module.

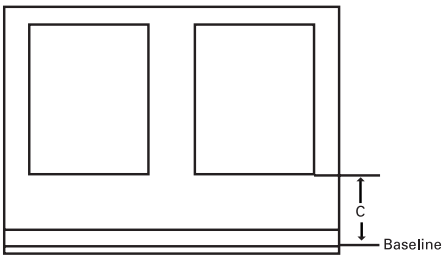
Mixing Module with Back Inlet Hood



Mixing Module with Side Inlet Hood



Economizer Module with Side Inlet Hood(s)



Applications

T-Series Humidification Module Option
ASHRAE Standard 62-1989 suggests maintaining a relative humidity of no less than 30 percent to provide a comfortable, healthy indoor environment. With the T-Series Climate Changer® air handler, a factory mounted steam humidifier is available as a custom option. Factory mounting within the air handler lowers the humidifier's installed cost and keeps moisture out of the supply duct.

Application Considerations:
Never position the humidifier immediately downstream of a housed fan or blow-thru coil module. Additional dispersion distance may be needed if the humidifier is placed upstream of a final filter. To prevent condensation formation, the relative humidity leaving the humidifier should not exceed 83 percent.

Table A-5 lists the modules required to both house the humidifier and dispersion space and maximum capacity of the humidifier at nominal cfm, and 10 to 30 psig steam pressure. A drain pan and an external piping cabinet is required on the module housing the humidifier and can be added to the dispersion space module, when specified. An optional access door can be added when specified to the dispersion space module.

Table A-5 — T-Series Humidification Module Requirements

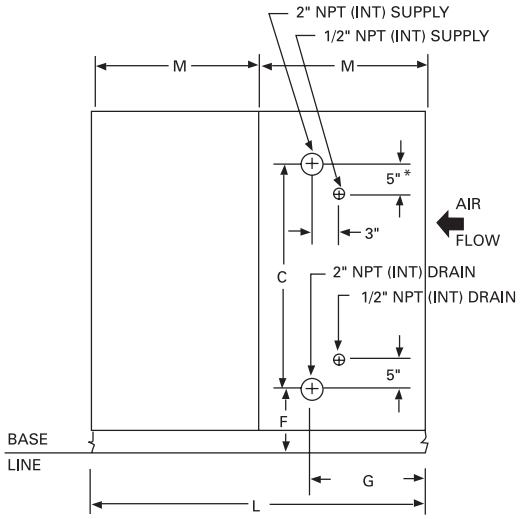
Unit Size	3	6	8	10	12	14	17	21
Maximum Capacity (lbs./hr) at 10 to 30 psig	50	85	95	125	200	215	320	410
Humidifier Module Size	Medium	Medium	Medium	Medium	Medium	Medium	Medium	Medium
Dispersion Space Module Size	Medium	Medium	Medium	Medium	Medium	Medium	Medium	Medium

Unit Size	25	30	35	40	50	66	80	100
Maximum Capacity (lbs./hr) at 10 to 30 psig	510	600	740	775 850(1)	775 1090(2) 1575(3)	775 1575(2) 1620(3)	775 1620(1)	775 1620(1)
Humidifier Module Size	Medium	Medium	Medium	Medium	Small	Small	Small	Small
Dispersion Space Module Size	Medium	Medium	Medium	Medium	Small	Small	Qty 2 Small(4)	Qty 2 Small(4)

(1) 15 to 30 psig
(2) 15 psig
(3) 20 or 30 psig
(4) One small module upstream of humidifier and one small module downstream of humidifier module.

Applications

T-Series Humidifier Piping Locations – Sizes 3 to 66



* = ½" for Size 3

Table A-6 – Humidifier Dimensions Sizes 3 to 66

Unit Size	M	G	F	C	L
3	15½	9	3½	15¾	31
6	15½	9	6	18	31
8	15½	9	9 3/8	21	31
10	15½	9	7 7/8	21	31
12	15½	9	6 7/8	27 1/8	31
14	15½	9	7 7/8	27 1/8	31
17	15½	9	6 7/8	33	31
21	15½	9	6 1/8	39	31
25	15½	9	6 3/8	45	31
30	15½	9	6 3/8	45	31
35	16	9	9	50 7/8	32
40	16	9	9	50 7/8	32
50	14½	7½	11	56 7/8	29
66	14½	7½	19 7/8	68¾	29

Note:
1. All dimensions are in inches

T-Series Humidifier Piping Locations – Sizes 80 and 100

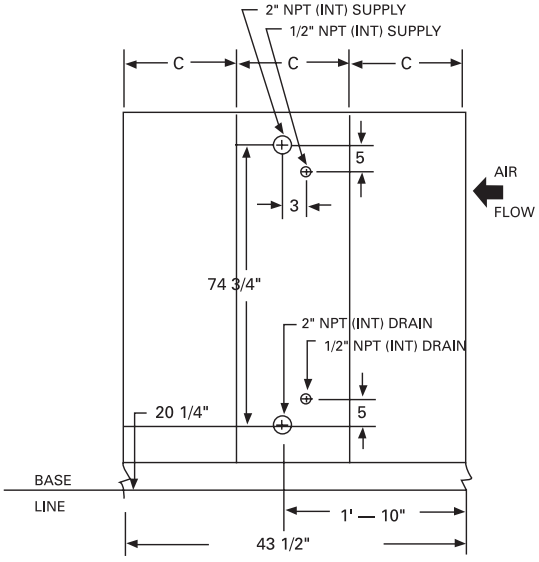


Table A-7 – Humidifier Dimensions Sizes 80 to 100

Unit Size	L	C
80	43½	14½
100	43½	14½

Note:
All dimensions are in inches

Integral Face and Bypass Coil Option
T-Series units are available with an optional integral face and bypass coil or vertical integral face and bypass coil. These coils are capable of maintaining a constant heating discharge air temperature regardless of variations in entering air temperatures, with full steam pressure of hot water flow on the coils at all times. Integral face and bypass coils consist of rectangular aluminum fin (.010" thick) elements, with 5/8" O.D. .035 thick copper tubes completely enclosed in a 14-gauge galvanized steel casing, with 16-gauge dampers. Dampers are arranged to completely enclose and isolate the heating coil elements when no temperature rise is required. Holes in the unit casing for supply and return connections are factory provided to facilitate field piping of the coils. Factory mounted electric, electronic or pneumatic actuators are available when specified. Integral face and bypass are available for unit sizes 6 through 100. Vertical integral face and bypass are available for unit sizes 21 through 100. Integral face and bypass coils are not available on a size 3 T-Series unit.

Tables A-8 and A-9 list the modules required to house the integral face and bypass coil, and the downstream module required for proper air mixing space. External piping cabinets are required on both modules. An optional access door can be added to the downstream module on units with an integral face and bypass coil. On units with a vertical integral face and bypass coil, an access door must be included in the downstream module to facilitate field piping of the supply and return connections on the coil.

It is recommended that a factory selection of a coil be made based on the scheduled performance, prior to configuring a T-Series unit with an integral face and bypass coil, so as to determine whether the unit should be configured around an integral face and bypass or vertical integral face and bypass coil.

Table A-8 — T-Series Module Requirements for Integral Face and Bypass Coils

Unit Size	3	6	8	10	12	14	17	21
Integral Face and Bypass Module Size	Not Available	Large	Large	Large	Large	Large	Large	Large
Downstream Module Size	Not Available	Medium	Medium	Small	Small	Small	Small	Small

Unit Size	25	30	35	40	50	66	80	100
Integral Face and Bypass Module Size	Large	Large	Large	Large	Large	Med/Lrg	Med/Lrg	Med/Lrg
Downstream Module Size	Small	Small	None Required	None Required	None Required	Small	Small	Small

Table A-9 — T-Series Module Requirements for Vertical Integral Face and Bypass Coils

Unit Size	3	6	8	10	12	14	17	21
Vertical Integral Face and Bypass Module Size				Not Available				Large
Downstream Module Size				Not Available				Medium

Unit Size	25	30	35	40	50	66	80	100
Vertical Integral Face and Bypass Module Size	Large	Large	Med/Lrg	Med/Lrg	Med/Lrg	Med/Lrg	Med/Lrg	Med/Lrg
Downstream Module Size	Medium	Medium	Medium	Medium	Medium	Medium	Medium	Medium

HEPA Filter Module Arrangement
HEPA filters are available in the T-Series unit as a custom option. Table A-10 lists the minimum length modules to be included in a T-Series configuration for service access and for housing the HEPA filters. If HEPA filters are in the downstream position on a T-Series unit, a discharge plenum module needs to be included after the blank module.

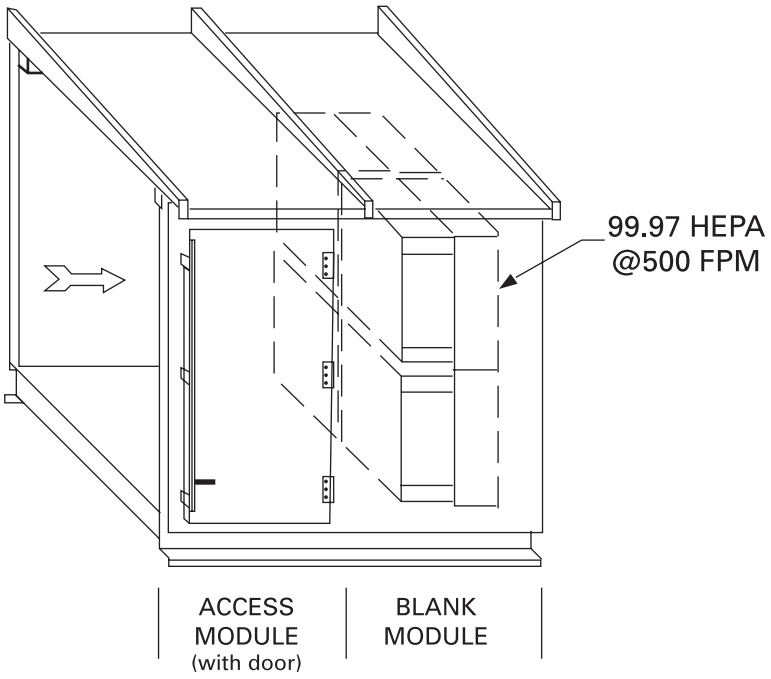


Table A-10 — HEPA Filter Module Arrangement

Unit Size	Access Module Size[1]	Blank Module Size[2]	Ft² of Filter Area	12" Deep 99.97% HEPA Filters Size (") and Quantity				
				24 x 24	24 x 12	12 x 24	30 x 24	24 x 30
3	Large	Medium	4	1				
6	Large	Medium	6	1	1			
8	Large	Medium	7		1		1	
10	ML	Medium	10				2	
12	ML	Medium	14			2		2
14	ML	Medium	14			2		2
17	ML	Medium	16		1	2	2	
21	ML	Medium	16		1	2	2	
25	ML	Medium	24	6				
30	ML	Medium	28	6	2			
35	ML	Medium	34	6	2	3		
40	ML	Medium	40	8		4		
50	Medium	Small	54	12	3			
66	Medium	Small	65	10			5	
80	Medium	Small	80	20				
100	Medium	Small	102	8		5		12

Note:
1. Access door required for filter removal.
2. Minimum size module required to house HEPA filters.

Selection Procedure

Selection Procedure

1
Use specified maximum coil face velocity (typically 500 fpm for cooling, 700 fpm for heating) along with unit cfm and coil type to select unit size from the Quick Select Chart on page 29.
2
Go to the Unit Data (pages 34-65), select the modules required for the system and obtain dimensions and weights for the modules.
3
Select coils by using the Trane coil selection programs.
4
Obtain damper and filter area and pressure drop data from Unit Data pages. Include coils, filters, dampers, plenum, face and bypass, external static pressure, etc. Sum the total static pressure for all modules.

For design filter pressure drop, Trane recommends finding a pressure drop that is halfway between clean and dirty conditions. This is done to limit cfm fluctuation from design conditions as filters load up. Filter pressure drop data in Unit Data are shown at mid-life values.
5
Use the design cfm and total static pressure to choose a fan from the fan curves in the catalog supplements, CLCH-CS-7A, 7B and 7C.
6
Determine the fan brake horsepower and rpm and motor horsepower. (Account for belt and drive losses by adding 2 to 6 percent to the brake horsepower.)

Selection Example

Specified Conditions
Horizontal draw-thru configuration, 1/2" tube coils, double wall construction
scfm = 7,000
external sp = 1.85 in wg.
max cooling face velocity = 550 fpm

Summer Design
coil entering air temperature = 80 F DB/67 F WB
coil leaving air temperature = 55 F DB/54 F WB
entering chilled water temperature = 45 F
water temperature rise = 10 F

Winter Design
coil entering air temperature = 20 F
coil leaving air temperature = 85 F
entering water temperature = 200 F
water temperature drop = 20 F

Procedure
1
Using a 1/2" Unit Coil at 500 fpm to enter the Quick Select Chart on page 29 returns the following:
Size 12 = 6150 cfm
and
Size 14 = 7100 cfm
Design cfm = 7000
Select Size 14.
2
Select modules and obtain dimension and weights
Mixing Box:
L = 34 inches
H = 48.75 inches
W = 74 inches
Wt. = 443 lbs.

Cartridge Filter:
L = 24 1/2 inches
H = 48.75 inches
W = 74 inches
Wt. = 266 lbs.

Small Horizontal Coil:
L = 11 inches
H = 48.75 inches
W = 74 inches
Wt. = 255 lbs.

Medium Access:
L = 15 1/2 inches
H = 48.75 inches
W = 74 inches
Wt. = 105 lbs.

Medium Horizontal Coil:
L = 15 1/2
H = 48.75 inches
W = 74 inches
Wt. = 476 lbs.

Q-Fan:
L = 40 inches
H = 48.75 inches
W = 74 inches
Wt. = 751 lbs.

Note: Total unit length includes above lengths plus six inches to account for unit end panels (three inches each end).
3
Select cooling coil.
6-row type UW coil with 114 fpf and no turbulators.
APD = .64 Inches wg.

Select heating coil.
2-row type UW coil with 72 fpf and no turbulators.
APD = .18 inches wg
4
Sum static pressures:

Inlet Hood:	.14
Mixing Box Dampers:	.05
85% Eff. 12" Cart. Filter:	1.00
Small Horizontal Coil:	.18
Medium Horizontal Coil:	.64
External Static Pressures:	1.85
TOTAL =	3.86

5
Refer to CLCH-CS-7C to find the appropriate fan curve/rpm table. There are two Q-fan options in this unit size, the Q or R. Using the recommendations given in the applications section, select the R fan (21.5" Q-fan).
6
Determine the fan brake horsepower and rpm and motor horsepower.
bhp = 6.98 x 1.03 = 7.18
rpm = 2579

Quick Select

All T-Series Climate Changer® air handler air handler coils are ARI 410 certified. The convention for the coil connection side is as follows: Stand at the leaving air side of the coil, with the air blowing in your face. Typical face velocities are 350 to 500 fpm for cooling and 500 to 700 fpm for heating.

1/2-inch Unit Coils
may be selected for chilled water, hot water or direct expansion applications. These coils maximize the available face area in the section with these options: .016 and .025-inch tube wall thickness, stainless steel casing and baked phenolic coating.

Type UW:
Chilled water or hot water
Single-row serpentine
General purpose

Type UU:
Chilled water or hot water
Dual-row serpentine
Low water pressure drop
High GPM
Available in sizes 12 to 100

Type UF:
Refrigerant
Standard, intertwined and horizontal
Split circuiting available

5/8-inch or 1-inch Shipping Coils
May be selected for chilled water, hot water, refrigerant or steam applications. These coils offer industrial-type options such as: Copper fins, .020, .024, .035 and .049-inch tube wall thicknesses, stainless steel coil casings and baked phenolic coating. Available coil types include: W, WA, WC, WD, D, DD, K, P2, P4, P8, NS and F.

Full:
Standard face area for 5/8-inch and 1-inch coils.

Modified:
Smallest face area for 5/8-inch and 1-inch coils for use in internal face and bypass dampers or low capacity applications.

Table Q-1 — 1/2" Unit Coil Quick Select Chart

Unit Size	Coil Area (sq. ft)	Coil Face Velocity (FPM) CFM 350	450	500	550	600	650	700
3	3.32	1162	1494	1660	1826	1992	2158	2324
6	5.86	2051	2637	2930	3223	3516	3809	4102
8	7.54	2639	3393	3770	4147	4524	4901	5278
10	9.64	3374	4338	4820	5302	5784	6266	6748
12	12.30	4305	5535	6150	6765	7380	7995	8610
14	14.20	4970	6390	7100	7810	8520	9230	9940
17	16.80	5880	7560	8400	9240	10080	10920	11760
21	20.80	7280	9360	10400	11440	12480	13520	14560
25	24.40	8540	10980	12200	13420	14640	15860	17080
30	29.00	10150	13050	14500	15950	17400	18850	20300
35	34.10	11935	15345	17050	18755	20460	22165	23870
40	39.30	13755	17685	19650	21615	23580	25545	27510
50	49.43	17301	22244	24715	27187	29658	32130	34601
66	65.63	22971	29534	32815	36097	39378	42660	45941
80	78.75	27563	35438	39375	43313	47250	51188	55125
100	100.40	35140	45180	50200	55220	60240	65260	70280

Typical face velocities include: 350-500 fpm for cooling, 500-700 fpm for heating.

Table Q-2 — Full Shipping Coil Quick Select Chart

Unit Size	Coil Area (sq. ft)	Coil Face Velocity (FPM) CFM 350	450	500	550	600	650	700
3	2.75	963	1238	1375	1513	1650	1788	1925
6	4.38	1533	1971	2190	2409	2628	2847	3066
8	6.50	2275	2925	3250	3575	3900	4225	4550
10	8.33	2916	3749	4165	4582	4998	5415	5831
12	11.30	3955	5085	5650	6215	6780	7345	7910
14	12.10	4235	5445	6050	6655	7260	7865	8470
17	14.70	5145	6615	7350	8085	8820	9555	10290
21	16.50	5775	7425	8250	9075	9900	10725	11550
25	19.80	6930	8910	9900	10890	11880	12870	13860
30	23.60	8260	10620	11800	12980	14160	15340	16520
35	30.14	10549	13563	15070	16577	18084	19591	21098
40	34.71	12149	15620	17355	19091	20826	22562	24297
50	47.69	16692	21461	23845	26230	28614	30999	33383
66	63.00	22050	28350	31500	34650	37800	40950	44100
80	76.13	26646	34259	38065	41872	45678	49485	53291
100	96.94	33929	43623	48470	53317	58164	63011	67858

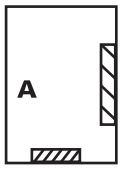
Typical face velocities include: 350-500 fpm for cooling, 500-700 fpm for heating.

Table Q-3 — Modified Shipping Coil Quick Select Chart

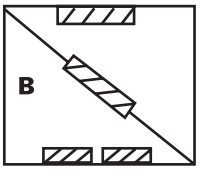
Unit Size	Coil Area (sq. ft)	Coil Face Velocity (FPM) CFM 350	450	500	550	600	650	700
3	1.83	641	824	915	1007	1098	1190	1281
6	2.92	1022	1314	1460	1606	1752	1898	2044
8	4.88	1708	2196	2440	2684	2928	3172	3416
10	6.25	2188	2813	3125	3438	3750	4063	4375
12	9.00	3150	4050	4500	4950	5400	5850	6300
14	9.67	3385	4352	4835	5319	5802	6286	6769
17	13.30	4655	5985	6650	7315	7980	8645	9310
21	15.10	5285	6795	7550	8305	9060	9815	10570
25	17.00	5950	7650	8500	9350	10200	11050	11900
30	20.30	7105	9135	10150	11165	12180	13195	14210
35	21.25	7438	9563	10625	11688	12750	13813	14875
40	24.50	8575	11025	12250	13475	14700	15925	17150
50	36.33	12716	16349	18165	19982	21798	23615	25431
66	49.88	17458	22446	24940	27434	29928	32422	34916
80	60.38	21133	27171	30190	33209	36228	39247	42266
100	76.38	26733	34371	38190	42009	45828	49647	53466

Quick Select

All sections are available as a standard section for unit sizes 3 to 100 unless otherwise specified.
All sections pictured in elevation view unless otherwise specified.
Hoods are not available as a separate section. (Must be ordered as part of an inlet or exhaust section.)

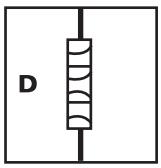


Mixing Box



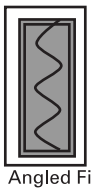
Economizer (plan view)

Exhaust Damper

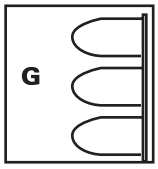


Air Blender

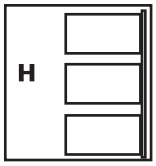
Flat Filter



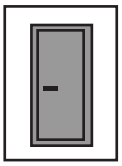
Angled Filter



Bag Filter



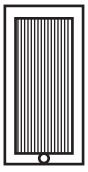
Cartridge Filter


Access (w/Door)

Section Size	Unit
Small	3-100-I
Medium	3-100-J
Med-Lrg	10-100-K
Large	3-100-L


Coil

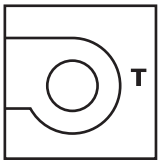
Section Size	Unit
Small	3-100-M
Medium	3-100-N
Med-Lrg	10-100-O
Large	3-50-P



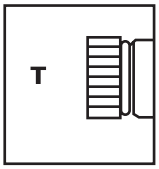
Moisture Eliminator

Internal Face/Bypass

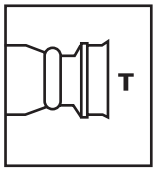
Face Damper



Housed Centrifugal (Horiz. discharge)



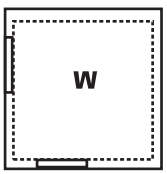
Plug Fan (Sizes 21-100)



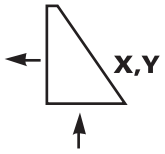
Vaneaxial - Model Q (Sizes 12-100)

Housed Centrifugal (Vertical discharge)

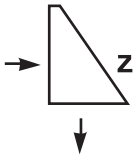
Diffuser



Discharge Plenum



Inlet Hood



Exhaust Hood

Quick Select

Table Q-4 — Section Dimensions (inches) and Weights (pounds)

Trane Unit Size		3	6	8	10	12	14	17	21	25	30	35	40	50	66	80	100
	Height	32.5	35	38.75	41.75	45.75	48.75	52.75	57.25	63.5	63.5	72.75	72.75	85	97	112	124.5
	Width	37	50	54	66	70	74	80	82	84	97	102	115	126	141	141	156
A- Filter / Mixing	Length (L)	36*	27.25	31	34	34	34	34	34	40	40	48	48	48	49	54	60
	Weight (lbs)	225	232	270	367	393	443	490	526	624	687	933	1025	1148	1367	1511	1817
B- Economizer		49	49	49	60.5	60.5	60.5	60.5	60.5	60.5	72	72	84	84	96	96	96
		314	377	419	582	637	677	740	827	902	1118	1291	1544	1785	2147	2382	2984
C- Exhaust		15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	16	16	19	19	19	19
		88	105	115	134	145	154	167	187	201	219	265	283	399	464	506	572
D- Air Blender		40.25	42.75	46.5	49.5	49.5	49.5	49.5	49.5	55.5	55.5	39	34.5	43.5	48	48	58.5
		191	242	279	355	380	399	431	477	562	614	822	888	1080	1257	1386	1640
E- Flat Filter		11	11	11	11	11	11	11	11	11	11	11.5	11.5	14.5	14.5	14.5	14.5
		71	84	91	109	122	130	140	157	164	177	235	249	365	432	477	546
F- Angled Filter		24.75	27.25	31	24.5	24.5	24.5	24.5	24.5	24.5	24.5	31	31	31	29.5	29.5	29.5
		154	199	232	242	261	290	312	338	355	389	545	590	684	797	839	964
G- Bag Filter		36	41	44	34	38	40	44	48.5	54.75	54.75	48	48	48	49	54	60
		189	248	281	285	323	372	426	511	579	632	698	752	852	1046	1163	1414
H- Cartridge Filter		24.75	27.25	31	24.5	24.5	24.5	24.5	24.5	24.5	24.5	31	31	31	29.5	29.5	29.5
		143	181	213	218	235	266	284	317	334	368	494	538	621	761	798	911
I- Sm Blank / Inspection		11	11	11	11	11	11	11	11	11	11	11.5	11.5	14.5	14.5	14.5	14.5
		47	56	61	71	76	80	85	95	100	108	130	139	221	252	262	288
J- Med Blank Access		15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	16	16	19	19	19	19
		62	75	80	95	101	105	113	125	132	143	169	181	269	307	319	350
K- M-L Blank Access		—	—	—	24.5	24.5	24.5	24.5	24.5	24.5	24.5	31	31	31	29.5	29.5	29.5
		—	—	—	161	171	179	192	212	221	241	334	364	429	472	491	538
L- Large Blank / Access		24.75	27.25	31	34	34	34	34	34	40	40	48	48	48	49	54	60
		105	137	164	218	232	243	261	289	361	393	541	584	662	775	870	1056
M- Small Coil		11	11	11	11	11	11	11	11	11	11	11.5	11.5	14.5	14.5	14.5	14.5
Weight includes 2 row UW		117	151	170	210	238	255	285	323	353	390	448	487	757	933	1040	1237
N- Medium Coil		15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	16	16	19	19	19	19
Weight includes 8 row UW		182	250	294	363	431	476	539	641	722	824	891	1017	1444	180	2143	2608
O- M-L Coil		—	—	—	24.5	24.5	24.5	24.5	24.5	24.5	24.5	31	31	31	29.5	29.5	29.5
Weight includes 10 row W		—	—	—	649	788	842	967	1142	1298	1483	1759	1982	2550	3372	3884	4738
P- Large Coil		24.75	27.25	31	34	34	34	34	34	40	40	48	48	48	—	—	—
Weight includes 10 row W		323	439	568	720	864	923	1054	1234	1465	1664	1986	2222	2804	—	—	—
Q- Moisture Eliminator		11	11	11	11	11	11	11	11	11	11	11.5	11.5	14.5	14.5	14.5	14.5
		59	80	93	147	167	182	202	231	254	289	347	385	554	710	786	928
R- Internal Face / Bypass		15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	16	16	19	19	19	19
		98	129	144	185	200	230	252	281	306	343	425	480	645	753	852	1002
S- Face Damper		15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	16	16	19	19	19	19
		98	129	144	185	200	230	252	281	306	343	425	480	645	753	852	1002
T- Front Horiz Disch Fan		60.75	68.25	75	58.5	62.5	64.5	68.5	73	54.75	54.75	62	62	68.5	84	92	96
Weight includes Type A Fan		560	750	845	845	968	1034	1176	1357	1238	1502	2289	2447	2879	3972	4822	5628
U- Bottom Vert Disch Fan		60.75	68.25	75	69.5	73.5	75.5	79.5	84	65.75	65.75	73.5	73.5	73.5	83	84	92
Weight includes Type A fan		560	750	845	916	1045	1113	1261	1451	1338	1610	2419	2586	3100	3972	4822	5628
V- Diffuser		15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	16	16	19	49	54	60
		74	91	98	114	122	130	143	163	173	192	293	322	45	913	1029	1257
W- Discharge Plenum		24.75	27.25	31	34	34	34	34	34	40	40	48	48	48	49	54	60
		92	118	135	195	204	209	224	252	318	337	472	511	571	651	769	928
X- Side Inlet Hood																	
add to Width		17.1	17.4	19.8	19.2	21.7	24.1	28.4	30.3	34.5	33.3	37.6	35.8	43.1	48.4	56.4	67.2
Y- Back Inlet Hood		28	29	35	41	49	57	70	79	96	105	124	131	170	220	273	352
add to Length		17.1	17.1	17.1	20.5	20.5	20.5	24	24	27.6	27.6	31.2	31.2	31.2	34.6	38.2	41.2
		32	46	51	93	99	104	138	141	172	197	238	266	291	368	414	505
Z- Exhaust Hood																	
add to Width or Length		17.1	17.4	19.8	19.2	21.7	24.1	28.4	30.3	34.5	33.3	37.6	35.8	43.1	48.4	56.4	67.2
		20	21	25	28	33	39	49	55	67	70	84	85	113	144	183	242
Unit end panels																	
add to Length		6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
		83	113	130	178	200	217	247	283	312	362	448	497	603	797	887	105

Notes:
Remember to add to the 6" unit end panels (3" on each end) shown above to got the correct unit length.
*#3 mixing boxes w/o filters are only 24.75" long.
Q fans are only available in front horizontal configuration. Add a discharge plenum for down discharge.
Starter/ disconnects are standard on all fan modules.
Dimensions and weights do not include roof curbs, piping cabinets, field installed equipment, etc.
Trane reserves the right to change / improve products and dimensions without notification.

Quick Select

1. Size air handling unit. Use Trane's Customer Direct Service (C.D.S.™) coil selection program to select coils based on capacity requirements and coil type (1/2", 5/8", 1", or reduced area). Choose unit size based on cfm. This chart shows unit sizes, coil areas, and cfm's at 500 fpm. For other face velocities, Trane Unit Size = Coil Area (ft^2) = CFM / max face velocity (fpm).

Trane Unit Size	**3**	**6**	**8**	**10**	**12**	**14**	**17**
1/2" Coil Area (UWUU,UF)(ft^2)	3.32	5.86	7.54	9.64	12.30	14.20	16.80
CFM at 500 fpm	1,660	2,930	3,770	4,820	6,150	7,100	8,400
5/8" and 1" Coil Area (ft^2)	2.75	4.38	6.50	8.33	11.30	12.10	14.70
CFM at 500 fpm	1,375	2,190	3,250	4,165	5,650	6,050	7,350
5/8" and 1" Reduced Area Coil (ft^2)	1.83	2.92	4.88	6.25	9.00	9.67	13.30
CFM at 500 fpm	915	1,460	2,440	3,125	4,500	4,835	6,650
	Note: 6 row UU coils are not available.						

2. Size coil section. Unit size, coil type, and coil rows determine small, medium, medium-large, or large coil section.

Trane Unit Size	**3**	**6**	**8**	**10**	**12**	**14**	**17**
1/2" Coils - max rows							
Small Coil Section	2	2	2	2	2	2	2
Medium Coil Section	8	8	8	8	8	8	8
Medium Large Coil Section	—	—	—	8	8	8	8
Medium Large Coil w/ Access	—	—	—	8	8	8	8
5/8" and 1" Coils - max rows							
Small Coil Section	2	2	2	2	2	2	2
Medium Coil Section	4	4	4	4	4	4	4
Medium Large Coil Section	—-	—	—	8	8	8	8
Medium Large Coil w/ Access	—	—	—	4	4	4	4
Large Coil Section	10	10	10	8	8	8	8
	Note: 6 row UU coils are not available.						

3. Select filter type and check face velocities. Face velocity = CFM / filter area.

Trane Unit Size	**3**	**6**	**8**	**10**	**12**	**14**	**17**
Flat Filter Area (ft^2)	3.5	5.6	6.9	9.7	13.3	15	18.1
Angled Filter Area (ft^2)	5.6	8.9	11.1	13.9	16.7	26.7	28.9
Bag / Cartridge Filter Area (ft^2)	3.3	5.6	6.7	9.3	10	14.7	16.7

4. Design the air handling system. Choose all the required sections.

5. Select a fan. Estimate system static pressure requirements and select a fan. Refer to unit data pages for T-Series Climate Changer air handler section pressure drops.

Trane Unit Size	**3**	**6**	**8**	**10**	**12**	**14**	**17**
Design CFM	1,660	2,930	3,770	4,820	6,150	7,100	8,400
Fan Type A - Low Pressure							
Fan Size / Type	9 1/2 FC	12 1/4 FC	13 1/2 FC	15 FC	16 1/2 FC	18 1/4 FC	20 FC
Max TSP/RPM	2.5/1800	2.5/1403	2.5/1273	2.5/1146	2.5/1042	2.5/942	2.5/859
Motor HP Range (ODP)	1/6-2	1/4-5	1/2-5	1-5	1-7 1/2	1-7 1/2	1-10
Outlet Area (ft^2)	0.84	1.90	2.31	2.79	3.39	4.14	5.05
Fan Type B - Medium Pressure							
Fan Size/ Type	9 1/2 FC	10 1/2 FC	12 1/4 FC	13 1/2 FC	15 FC	16 1/2 FC	18 1/4 FC
Max TSP/RPM	5/2800	5/2365	5.0/2027	5/1839	5/1655	5/1505	5/1360
Motor HP Range (ODP)	1-5	1-5	1-7 1/2	1-7 1/2	1-10	1-10	1-15
Outlet Area (ft^2)	0.65	1.41	1.90	2.31	2.79	3.39	4.14
Fan Type C - High Pressure							
Fan Size / Type	—	—	—	13 1/2 BI	15 BI	16 1/2 BI	18 1/4 BI
Max TSP/RPM				8/3536	8/3183	8/2894	8/2616
Motor HP Range (ODP)				1-7 1/2	1-15	1-15	1-20
Outlet Area (ft^2)				2.31	2.79	3.39	4.14
Fan Type P - Plenum (Plug) Fan							
Fan Size/ Type	—	—	—	—	—	—	—
Max TSP/RPM							
Motor HP Range (ODP)							
Outlet Area (ft^2)							
Fan Type Q - Quiet Airfoil Vaneaxial (Q Fan, smaller diameter)							
Fan Size/ Type	—	—	—	—	19 Q-Fan	19 Q-Fan	21 1/2-Fan
Max TSP/RPM					6/3145	6/3145	6/2780
Motor HP Range (ODP)					1/2-7 1/2	1/2-7 1/2	1/2-10
Outlet Area (ft^2)					2.30	2.30	2.88
Fan Type R - Quiet Airfoil Vaneaxial (Q Fan, larger diameter)							
Fan Size/ Type	—	—	—	—	21 1/2 Q-Fan	21 1/2 Q-Fan	24 1/2 Q-Fan
Max TSP/RPM					6/2780	6/2780	6/2380
Motor HP Range (ODP)					1/2-10	1/2-10	1/2-15
Outlet Area (ft^2)					2.88	2.88	3.73

6. Overall air handling unit dimensions and weights can be totaled from the sections detailed on page 31.

7. Factory mounted, wired, and tested starter/disconnects are standard. Similar disconnect and VFD/disconnect packages are available. Also consider factory mounted, wired, and tested DDC control systems to minimize construction cycles and jobsite coordination.

8. Review and finalize selections using the fan curve catalog CLCH-CS-7A, and/or the Customer Direct Service (C.D.S.) computer selection programs.

9. Contact the local Trane office with questions or to order air handling systems.

Quick Select

21	25	30	35	40	50	66	80	100
20.80	24.40	29.00	34.10	39.30	49.43	65.63	78.75	100.40
10,400	12,200	14,500	17,050	19,650	24,715	32,815	39,375	50,200
16.50	19.80	23.60	30.14	34.71	47.69	63.00	76.13	96.94
8,250	9,900	11,800	15,070	17,355	23,845	31,500	38,065	48,470
15.10	17.00	20.30	21.25	24.50	36.33	49.88	60.38	76.38
7,550	8,500	10,150	10,625	12,250	18,165	24,940	30,190	38,190

21	25	30	35	40	50	66	80	100
2	2	2	2	2	2	2	2	2
8	8	8	8	8	8	8	8	8
8	8	8	8	8	8	—	—	—
8	8	8	8	8	8	—	—	—
2	2	2	1	1	3	3	3	3
4	4	4	4	4	6	6	6	6
8	8	8	8	8	8	8	8	8
4	4	4	6	6	6	—	—	—
8	8	8	8	8	8	8	8	8

21	25	30	35	40	50	66	80	100
20	25	29.1	31.9	36.1	48.3	68.6	83.1	104.7
31.1	38.9	47.2	63.9	72.2	80.6	108.3	137.5	161.1
22	24	28	30.7	36	54.8	73.3	80.7	106.9

21	25	30	35	40	50	66	80	100
10,400	12,200	14,500	17,050	19,650	24,715	32,815	39,375	50,200
22 3/8 FC	25 FC	25 FC	27 5/8 FC	30 1/4 FC	33 FC	33 FC	40 1/4 AF	44 1/2 AF
3/972	3/811	3/811	3/698	3/664	3/580	6/760	5/996	5/901
1-10	1-10	1-20	5-25	5-25	5-30	10-60	15-50	15-60
5.16	6.70	6.70	8.08	9.79	11.69	11.69	20.14	24.62
20 FC	22 3/8 FC	22 3/8 FC	25 FC	27 5/8 FC	30 1/4 FC	36 1/2 AF	36 1/2 AF	40 1/4 AF
5/1241	5/1273	5/1273	5/1062	5/905	5/870	8/1413	8/1413	11/1281
1-15	1-20	1-25	5-30	5-30	5-40	15-75	20-75	25-100
5.05	5.16	5.16	6.73	8.08	9.79	16.54	16.54	20.14
20 BI	22 1/4 BI	22 1/4 BI	24 1/2 AF	27 AF	30 AF	33 AF	33 AF	36 1/2 AF
8/2387	8/2146	8/2146	8/2148	8/1910	8/1719	8/1562	8/1562	8/1413
1-25	1-25	1-30	5-40	5-50	5-60	20-75	20-75	30-100
5.05	6.30	6.30	7.46	9.05	11.17	13.51	13.51	16.54
29 1/8 AF	32 3/8 AF	35 9/16 AF	35 9/16 AF	39 3/8 A	43 7/16 AF	52 7/8 AF	58 1/2 AF	64 3/4 AF
6/1886	6/1611	6/1643	6/1643	6/1412	6/1334	6/968	6/875	6/791
2-15	3-20	3-25	5-30	5-30	5-40	7 1/2-50	7 1/2-60	10-75
—	—	—	—	—	—	—	—	—
24 1/2 Q-Fan	27 Q-Fan	30 Q-Fan	33 Q-Fan	33 Q-Fan	36 1/2 Q-Fan	40 1/4 Q-Fan	44 1/2 Q-Fan	—
6/2380	6/2160	6/1940	6/1822	6/1822	6/1647	6/1636	6/1485	
1/2-15	1/2-15	3/4-20	1-25	1-25	1-30	1 1/2-40	2-50	
3.73	4.54	5.60	6.78	6.78	8.30	10.09	12.33	
27 Q-Fan	30 Q-Fan	33 Q-Fan	36 1/2 Q-Fan	36 1/2 Q-Fan	40 1/4 Q-Fan	44 1/2 Q-Fan	—	—
6/2160	6/1940	6/1822	6/1647	6/1647	6/1492	6/1352		
1/2-15	3/4-20	1-25	1-30	1-30	1 1/2-40	2-50		
4.54	5.60	6.78	8.30	8.30	10.09	12.33		

Table 3-1 — Coil Data

1/2" Unit Coils	Area (Ft^2)	Qty-Size
UW, UF	3.32	1-2 1x23
Shipping Coils		
Full	2.75	1-18x22
Modified	1.83	1-12x22

Table 3-2 — Coil Availability

Module Size	1/2" Unit Coils	Shipping Coils
Small	2 Row	1-2 Row
Medium	2-8 Row	1-4 Row
Large	-	1-10 Row

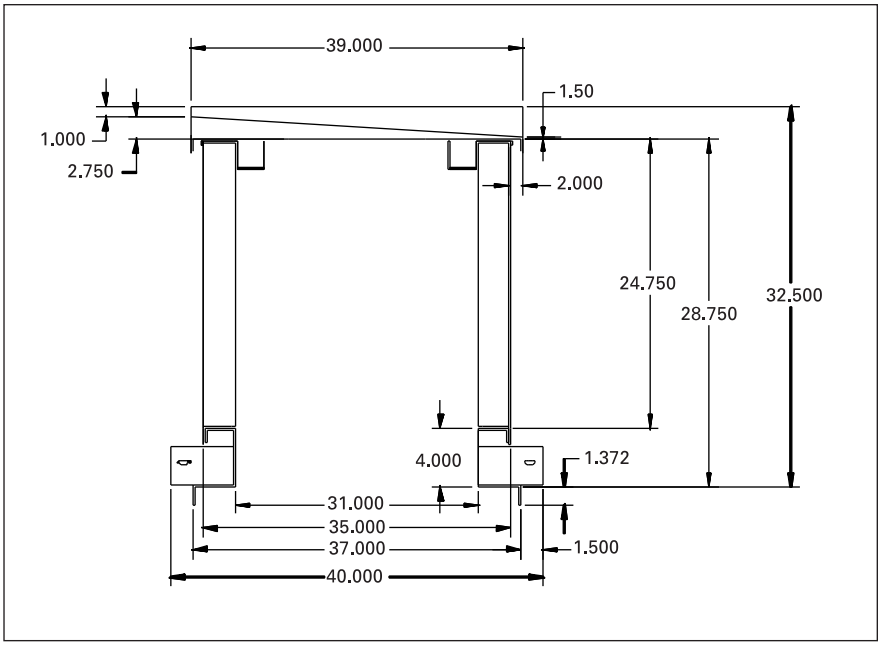
Table 3-3 — 1/2" Unit Coil Water Connection – Sizes (Inches)

	UW
Header Height	21
Supply	1 1/2
Return	1 1/2
Drain and Vent	3/8

Shipping coil connections are located on page 71.
See pages 71-80 for refrigerant coil connections and circuiting.

Sections	Length (inches)	Weight (lbs.)
Filter / Mixing (4)	36	225
Economizer	49	314
Exhaust	15.5	88
Air Blender	40.25	191
Flat Filter	11	71
Angled Filter	24.75	154
Bag Filter	36	189
Cartridge Filter	24.75	143
Small Blank/ Inspection	11	47
Medium Blank / Access	15.5	62
Medium Large Blank/ Access	-	-
Large Blank/ Access	24.75	105
Small Coil	11	117
Medium Coil	15.5	182
Medium Large Coil	-	-
Large Coil	24.75	323
Moisture Eliminator	11	59
Internal Face / Bypass	15.5	98
Face Damper	15.5	98
Front Horizontal Discharge Fan	60.75	-
FC Fan	-	560
BI / AF Fan	-	-
Plenum Fan	-	-
Q Fan (Q)	-	-
Q Fan (R)	-	-
Bottom Vertical Discharge Fan	60.75	-
FC Fan	-	560
BI / AF Fan	-	-
Plenum Fan	-	-
Diffuser	15.5	74
Discharge Plenum	24.75	92
Side Inlet Hood	17.1	28
Back Inlet Hood	17.1	32
Exhaust Hood	17.1	20
Unit End Panels	6	83

1. Access module weights include one access door.
2. Fan module weights include largest ODP motor without IGV.
3. Add mixing module as inlet plenum on horizontal housed or vertical plug return fans.
4. Mixing module without filter is 24.75" in length.



All dimensions are in inches.

Table 3-4 — Unit Pressure Drops (inches WG)

					Damper Face Velocity (FPM)					
Ultra Low Leak Dampers	Area (ft^2)	400	500	600	700	800	900	1000	1100	1200
Back or Bottom Damper	1.75	.03	.04	.06	.08	.10	.12	.15	.19	.22
Side Damper (each)	.87	.02	.03	.05	.06	.08	.10	.12	.15	.18
Protective Grate	1.90	.04	.06	.09	.12	.16	.20	.25	.30	.36
	Area (ft^2)	600	800	1000	1200	1400	1600	1800	2000	2100
Exhaust or Economizer Return Dampers	.87	.05	.09	.13	.20	.27	.35	.46	.55	.60
Internal Face and Bypass	Area (ft^2)	400	500	600	700	800	900	1000	1100	1200
Face Area	1.51	.05	.07	.10	.14	.18	.23	.28	.34	.40
Bypass Area	1.51	.05	.07	.10	.14	.18	.23	.28	.34	.40
Face Damper	3.60	.04	.06	.08	.11	.15	.19	.23	.28	.33
					Accessory Face Velocity (FPM)					
Accessories	Area (ft^2)	400	450	500	550	600	650	700	750	800
Moisture Eliminator	3.32	.01	.01	.02	.03	.03	.03	.04	.04	.05
Diffuser	3.32	.13	.17	.21	.26	.32	.38	.44	.52	.60
					Inlet Hood Face Velocity (FPM)					
Inlet Hoods	Area (ft^2)	.300	400	500	600	700	800	850	900	950
Inlet Hood w/ Moisture Eliminator		.04	.06	.10	.15	.20	.26	.29	.33	.36
Side Inlet Hood	1.96									
Back Inlet Hood	2.46									
Face Velocity (FPM)										
	Area (ft^2)	1000	1200	1400	1600	1800	2000	2200	2400	2600
Air Blenders	1.46	.07	.10	.14	.18	.24	.30	.37	.44	.52
					Filter Face Velocity (FPM)					
Filters**	Area (ft^2)	200	250	300	350	400	450	500	550	600
Flat Filters	3.50									
2" Throwaway	20x25	.27	.29	.30	.32	.34	.37	.39	-	-
2" Pleated Media		.52	.54	.55	.57	.59	.62	.64	.67	.70
4" Pleated Media		.52	.53	.54	.56	.57	.59	.61	.64	.66
Permanent		.51	.51	.52	.52	.53	.53	.54	.55	.56
Angled Filters	5.60									
2" Throwaway	2-16x25	.27	.29	.30	.32	.34	.37	.39	-	-
2" Pleated Media		.52	.54	.55	.57	.59	.62	.64	.67	.70
Permanent		.51	.51	.52	.52	.53	.53	.54	.55	.56
Cartridge/Bag Filters*	3.30									
6" Cartridge - 65% Eff.	20x24	.56	.58	-	-	-	-	-	-	-
6" Cartridge - 85% Eff.		.61	.65	-	-	-	-	-	-	-
6" Cartridge - 95% Eff.		.63	.68	-	-	-	-	-	-	-
12" Cartridge - 65% Eff.		.79	.82	.84	.88	.91	.96	1.00	1.06	1.11
12" Cartridge - 85% Eff.		.80	.82	.85	.89	.93	.98	1.03	1.09	1.15
12" Cartridge - 95% Eff.		.81	.84	.87	.92	.97	1.03	1.09	1.16	1.24
Bag - 65% Eff.		.53	.55	.57	.60	.63	.66	.70	.74	.79
Bag - 85% Eff.		.54	.57	.59	.63	.66	.71	.75	.81	.86
Bag - 95% Eff.		.55	.59	.62	.67	.72	.78	.84	.91	.99

**Filter pressure drops are based on mid-life data
Do not exceed maximum filter face velocities shown.
Actual pressure drops may be less than shown due to variations in filter brands.

* Cartridge/bag filter pressure drops include a 2" throwaway pre-filter pressure drop.

Table 3-5 — Fan Data

	Fan Type	
	A	B
Design CFM	1660	1660
Size/Type	9 1/2 FC	9 1/2 FC
Max TSP/RPM	2.5/1800	5/2800
Bearing Size		
Drive Side	3/4	1 3/16
Opposite Drive Side	3/4	1 3/16
Shaft Size	3/4	1 3/16
Outlet Area (Ft^2)	.84	.65
Motor HP Range	1/6-2	1-5

Unit Sizes

Size 06

Table 6-1 — Coil Data

1/2" Unit Coils	Area (Ft^2)	Qty-Size
UW,UF	5.86	1-23x36
Shipping Coils		
Full	4.38	1-18x35
Modified	2.92	1-12x35

Table 6-2 — Coil Availability

Module Size	1/2" Unit Coils	Shipping Coils
Small	2 Row	1-2 Row
Medium	2-8 Row	1-4 Row
Large	-	1-10 Row

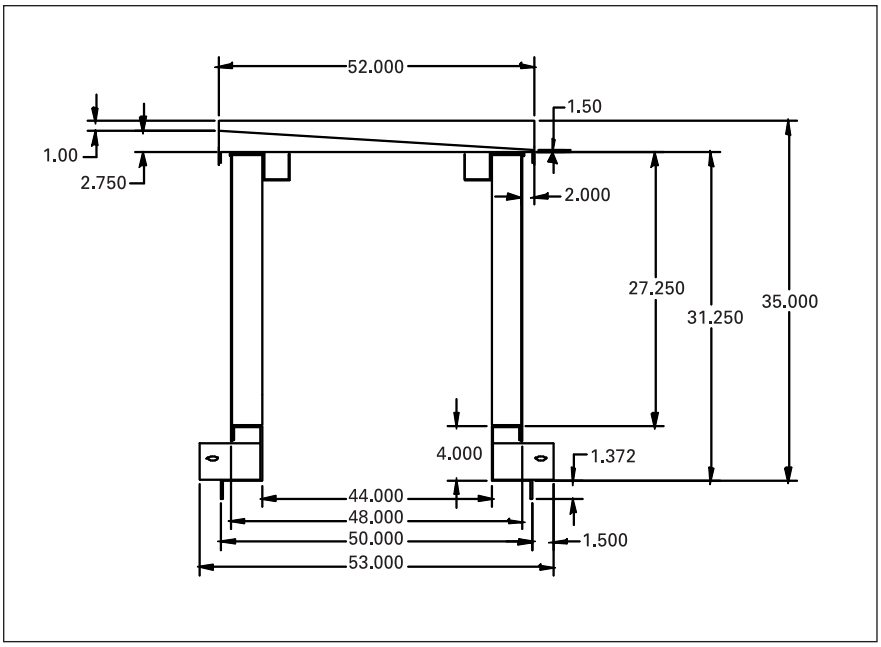
Table 6-3 — 1/2" Unit Coil Water Connection – Sizes (inches)

	UW
Header Height	23
Supply	1 1/2
Return	1 1/2
Drain and Vent	3/8

Shipping coil connections are located on page 71.
See pages 71-80 for refrigerant coil connections and circuiting.

Sections	Length (inches)	Weight (lbs.)
Filter / Mixing	27.25	232
Economizer	49	377
Exhaust	15.5	105
Air Blender	42.75	242
Flat Filter	11	84
Angled Filter	27.25	199
Bag Filter	41	248
Cartridge Filter	27.25	181
Small Blank/ Inspection	11	56
Medium Blank/ Access	15.5	75
Medium Large Blank/ Access	-	-
Large Blank/ Access	27.25	137
Small Coil	11	151
Medium Coil	15.5	250
Medium Large Coil	-	-
Large Coil	27.25	439
Moisture Eliminator	11	80
Internal Face / Bypass	15.5	129
Face Damper	15.5	129
Front Horizontal Discharge Fan	68.25	
FC Fan	-	750
BI / AF Fan	-	-
Plenum Fan	-	-
Q Fan (Q)	-	-
Q Fan (R)	-	-
Bottom Vertical Discharge Fan	68.25	-
FC Fan	-	750
BI / AF Fan	-	-
Plenum Fan	-	-
Diffuser	15.5	91
Discharge Plenum	27.25	118
Side Inlet Hood	17.4	29
Back Inlet Hood	17.1	46
Exhaust Hood	17.4	21
Unit End Panels	6	113

1. Access module weights include one access door.
2. Fan module weights include largest ODP motor without IGV.
3. Add mixing module as inlet plenum on horizontal housed or vertical plug return fans.



All dimensions are in inches.

Table 6-4 — Unit Pressure Drops (Inches WG)

		Damper Face Velocity (FPM)								
Ultra Low Leak Dampers	Area (ft^2)	400	500	600	700	800	900	1000	1100	1200
Back or Bottom Damper	3.01	.02	.03	.05	.06	.08	.10	.13	.15	.18
Side Damper (each)	1.46	.02	.03	.04	.05	.07	.09	.11	.13	.16
Protective Grate	3.20	.04	.06	.09	.12	.16	.20	.25	.30	.36
	Area (ft^2)	600	800	1000	1200	1400	1600	1800	2000	2100
Exhaust or Economizer Return Dampers	1.46	.05	.08	.12	.18	.24	.31	.40	.45	.54
Internal Face and Bypass	Area (ft^2)	400	500	600	700	800	900	1000	1100	1200
Face Area	2.25	.04	.06	.09	.13	.16	.21	.26	.31	.37
Bypass Area	2.25	.04	.06	.09	.13	.16	.21	.26	.31	.37
Face Damper	5.40	.03	.05	.08	.10	.14	.17	.21	.26	.31
		Accessory Face Velocity (FPM)								
Accessories	Area (ft^2)	400	450	500	550	600	650	700	750	800
Moisture Eliminator	5.86	.01	.01	.02	.03	.03	.03	.04	.04	.05
Diffuser	5.86	.13	.17	.21	.26	.32	.38	.44	.52	.60
		Inlet Hood Face Velocity (FPM)								
Inlet Hoods	Area (ft^2)	300	400	500	600	700	800	850	900	950
Inlet Hood w/ Moisture Eliminator		.04	.06	.10	.15	.20	.26	.29	.33	.36
Side Inlet Hood	2.08									
Back Inlet Hood	4.08									
		Face Velocity (FPM)								
	Area (ft^2)	1000	1200	1400	1600	1800	2000	2200	2400	2600
Air Blenders	2.28	.07	.10	.14	.18	.24	.30	.37	.44	.52
		Filter Face Velocity (FPM)								
Filters**	Area (ft^2)	200	250	300	350	400	450	500	550	600
Flat Filters	5.60									
2" Throwaway	2-20x20	.27	.29	.30	.32	.34	.37	.39	-	-
2" Pleated Media		.52	.54	.55	.57	.59	.62	.64	.67	.70
4" Pleated Media		.52	.53	.54	.56	.57	.59	.61	.64	.66
Permanent		.51	.51	.52	.52	.53	.53	.54	.55	.56
Angled Filters	8.90									
2" Throwaway	4-16x20	.27	.29	.30	.32	.34	.37	.39	-	-
2" Pleated Media		.52	.54	.55	.57	.59	.62	.64	.67	.70
Permanent		.51	.51	.52	.52	.53	.53	.54	.55	.56
Cartridge/Bag Filters*	5.60									
6" Cartridge - 65% Eff.	2-20x20	.56	.58	-	-	-	-	-	-	-
6" Cartridge - 85% Eff.		.61	.65	-	-	-	-	-	-	-
6" Cartridge - 95% Eff.		.63	.68	-	-	-	-	-	-	-
12" Cartridge - 65% Eff.		.79	.82	.84	.88	.91	.96	1.00	1.06	1.11
12" Cartridge - 85% Eff.		.80	.82	.85	.89	.93	.98	1.03	1.09	1.15
12" Cartridge - 95% Eff.		.81	.84	.87	.92	.97	1.03	1.09	1.16	1.24
Bag - 65% Eff.		.53	.55	.57	.60	.63	.66	.70	.74	.79
Bag - 85% Eff.		.54	.57	.59	.63	.66	.71	.75	.81	.86
Bag - 95% Eff.		.55	.59	.62	.67	.72	.78	.84	.91	.99

**Filter pressure drops are based on mid-life data.
Do not exceed maximum filter face velocities shown.
Actual pressure drops may be less than shown due to variations in filter brands.
*Cartridge/bag filter pressure drops include a 2" throwaway pre-filter pressure drop.

Table 6-5 — Fan Data

	Fan Type	
	A	B
Design CFM	2930	2930
Size/Type	12 1/4 FC	10 1/2 FC
Max TSP/RPM	2.5/1403	5/2365
Bearing Size		
Drive Side	1	1
Opposite Drive Side	1	1
Shaft Size	1	1
Outlet Area (Ft^2)	1.90	1.41
Motor HP Range	1/4-5	1-5
IGV Torque (Inch-Lb.)		
2000 FPM (4.0" WC)	10.0/3.5	5.7/2.9
3000 FPM (Max. RPM and BHP)	22.5/7.8	19.6/6.5

Torques are shown for open/closed operation at 2000 and 3000 fpm fan outlet velocity.

Unit Sizes

Size 08

Table 8-1 — Coil Data

1/2" Unit Coils	Area (Ft^2)	Qty-Size
UW,UF	7.54	1-27x40
Shipping Coils		
Full	6.50	1-24x39
Modified	4.88	1-18x39

Table 8-2 — Coil Availability

Module Size	1/2" Unit Coils	Shipping Coils
Small	2 Row	1-2 Row
Medium	2-8 Row	1-4 Row
Large	-	1-10 Row

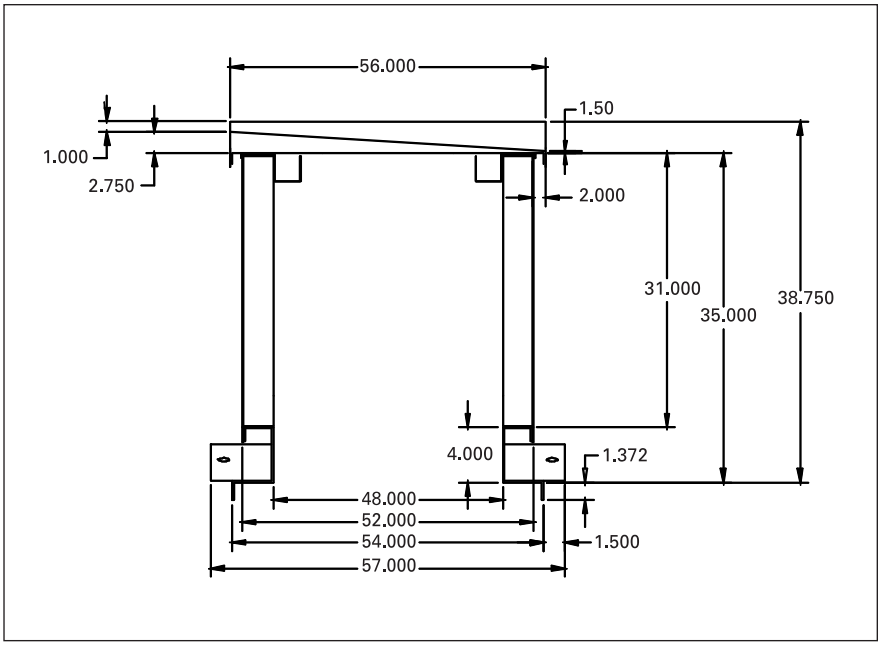
Table 8-3 — 1/2" Unit Coil Water Connection – Sizes (inches)

	UW
Header Height	27
Supply	1 1/2
Return	1 1/2
Drain and Vent	3/8

Shipping coil connections are located on page 71.
See pages 71-80 for refrigerant coil connections and circuiting.

Sections	Length (inches)	Weight (lbs.)
Filter / Mixing	31	270
Economizer	49	419
Exhaust	15.5	115
Air Blender	46.5	279
Flat Filter	11	91
Angled Filter	31	232
Bag Filter	44	281
Cartridge Filter	31	213
Small Blank/ Inspection	11	61
Medium Blank/ Access	15.5	80
Medium Large Blank/ Access	-	-
Large Blank/ Access	31	164
Small Coil	11	170
Medium Coil	15.5	294
Medium Large Coil	-	-
Large Coil	31	568
Moisture Eliminator	11	93
Internal Face / Bypass	15.5	144
Face Damper	15.5	144
Front Horizontal Discharge Fan	75	-
FC Fan	-	845
BI / AF Fan	-	-
Plenum Fan	-	-
Q Fan (Q)	-	-
Q Fan (R)	-	-
Bottom Vertical Discharge Fan	75	-
FC Fan	-	845
BI / AF Fan	-	-
Plenum Fan	-	-
Diffuser	15.5	98
Discharge Plenum	31	135
Side Inlet Hood	19.8	35
Back Inlet Hood	17.1	51
Exhaust Hood	19.8	25
Unit End Panels	6	130

1. Access module weights include one access door.
2. Fan module weights include largest ODP motor without IGV.
3. Add mixing module as inlet plenum on horizontal housed or vertical plug return fans.



All dimensions are in inches.

Table 8-4 — Unit Pressure Drops (Inches WG)

					Damper Face Velocity (FPM)				
Ultra Low Leak Dampers	Area (ft^2)	400	500	600	700	800	900	1000	1100	1200
Back or Bottom Damper	3.40	.02	.03	.04	.06	.08	.10	.12	.15	.18
Side Damper (each)	1.84	.02	.03	.04	.05	.07	.09	.11	.13	.16
Protective Grate	3.60	.04	.06	.09	.12	.16	.20	.25	.30	.36

	Area (ft^2)	600	800	1000	1200	1400	1600	1800	2000	2100
Exhaust or Economizer Return Dampers	1.84	.04	.07	.11	.13	.21	.27	.35	.44	.48

Internal Face and Bypass	Area (ft^2)	400	500	600	700	800	900	1000	1100	1200
Face Area	4.22	.04	.06	.08	.11	.14	.18	.23	.27	.32
Face Damper	7.60	.03	.05	.07	.10	.13	.16	.20	.24	.29

	Area (ft^2)	1400	1600	1800	2000	2200	2400	2600	2800	3000
Bypass Area	2.48	.59	.77	.97	1.20	1.46	1.73	2.03	2.36	2.71

					Accessory Face Velocity (FPM)				
Accessories	Area (ft^2)	400	450	500	550	600	650	700	750	800
Moisture Eliminator	7.54	.01	.01	.02	.03	.03	.03	.04	.04	.05
Diffuser	7.54	.13	.17	.21	.26	.32	.38	.44	.52	.60

					Inlet Hood Face Velocity (FPM)				
Inlet Hoods	Area (ft^2)	300	400	500	600	700	800	850	.900	950
Inlet Hood w/ Moisture Eliminator		.04	.06	.10	.15	.20	.26	.29	.33	.36
Side Inlet Hood	2.51									
Back Inlet Hood	4.57									

					Face Velocity (FPM)				
	Area (ft^2)	1000	1200	1400	1600	1800	2000	2200	2400	2600
Air Blenders	2.76	.07	.10	.14	.18	.24	.30	.37	.44	.52

					Filter Face Velocity (FPM)				
Filters**	Area (ft^2)	200	250	300	350	400	450	500	550	600
Flat Filters	6.90									
2" Throwaway	2-20x25	.27	.29	.30	.32	.34	.37	.39	-	-
2" Pleated Media		.52	.54	.55	.57	.59	.62	.64	.67	.70
4" Pleated Media		.52	.53	.54	.56	.57	.59	.61	.64	.66
Permanent		.51	.51	.52	.52	.53	.53	.54	.55	.56
Angled Filters	11.10									
2" Throwaway	4-20x20	.27	.29	.30	.32	.34	.37	.39	-	-
2" Pleated Media		.52	.54	.55	.57	.59	.62	.64	.67	.70
Permanent		.51	.51	.52	.52	.53	.53	.54	.55	.56
Cartridge/Bag Filters*	6.70									
6" Cartridge - 65% Eff.	2-20x24	.56	.58	-	-	-	-	-	-	-
6" Cartridge - 85% Eff.		.61	.65	-	-	-	-	-	-	-
6" Cartridge - 95% Eff.		.63	.68	-	-	-	-	-	-	-
12″ Cartridge - 65% Eff.		.79	.82	.84	.88	.91	.96	1.00	1.06	1.11
12" Cartridge - 85% Eff.		.80	.82	.85	.89	.93	.98	1.03	1.09	1.15
12″ Cartridge - 95% Eff.		.81	.84	.87	.92	.97	1.03	1.09	1.16	1.24
Bag - 65% Eff.		.53	.55	.57	.60	.63	.66	.70	.74	.79
Bag - 85% Eff.		.54	.57	.59	.63	.66	.71	.75	.81	.86
Bag - 95*/. Eff.		.55	.59	.62	.67	.72	.78	.84	.91	.99

**Filter pressure drops are based on mid-life data.
Do not exceed maximum filter face velocities shown.
Actual pressure drops may be less than shown due to variations in filter brands.
*Cartridge/bag filter pressure drops include a 2" throwaway pre-filter pressure drop.

Table 8-5 — Fan Data

	Fan Type	
	A	B
Design CFM	3770	3770
Size/Type	13 1/2 FC	12 1/4 FC
Max TSP/RPM	2.5/1273	5.0/2027
Bearing Size		
Drive Side	1	13/16
Opposite Drive Side	1	13/16
Shaft Size	1	13/16
Outlet Area (Ft^2)	2.31	1.90
Motor HP Range	1/2-5	1-7 1/2
IGV Torque (Inch-Lb.)		
2000 FPM (4.0" WC)	10.9/3.9	10.0/3.5
3000 FPM (Max. RPM and BHP)	24.5/8.7	22.5/7.8

Torques are shown for open/closed operation at 2000 and 3000 fpm fan outlet velocity.

Unit Sizes

Size 10

Table 10-1 — Coil Data

1/2" Unit Coils	Area (Ft^2)	Qty-Size
UW,UF	9.64	1-27x51
Shipping Coils		
Full	8.33	1-24x50
Modified	6.25	1-18x50

Table 10-2 — Coil Availability

Module Size	1/2" Unit Coils	Shipping Coils
Small	2 Row	1-2 Row
Medium	2-8 Row	1-4 Row
Medium Large Coil	2-8 Row	1-8 Row
Medium Large Coil w/Access	2-8 Row	1-4 Row

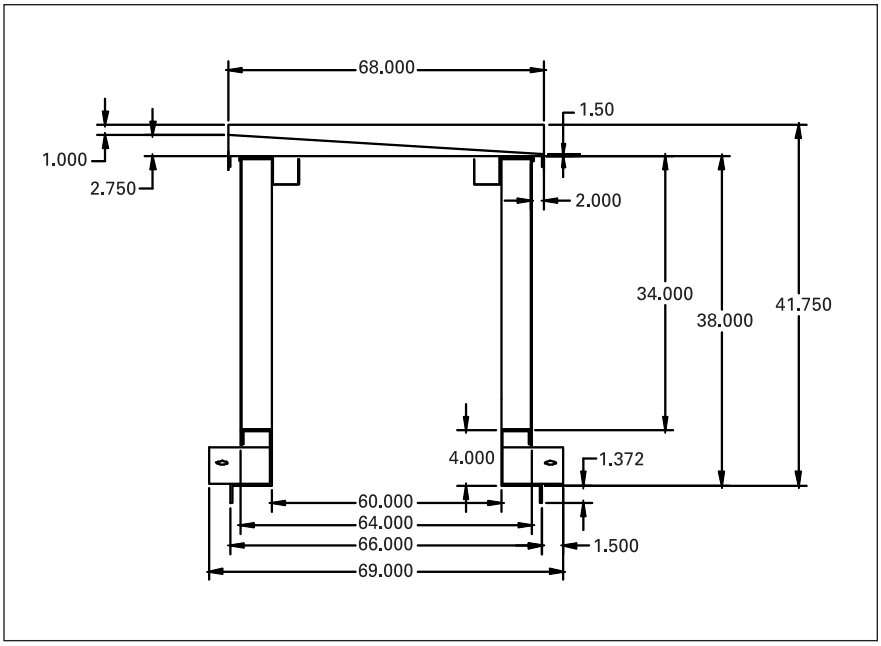
Table 10-3 — 1/2" Unit Coil Water Connection – Sizes (Inches)

	UW
Header Height	27
Supply	1 1/2
Return	1 1/2
Drain and Vent	3/8

Shipping coil connections are located on page 71.
See pages 71-80 for refrigerant coil connections and circuiting.

Sections	Length (inches)	Weight (lbs.)
Filter / Mixing	34	367
Economizer	60.5	582
Exhaust	15.5	134
Air Blender	49.5	355
Flat Filter	11	109
Angled Filter	24.5	242
Bag Filter	34	285
Cartridge Filter	24.5	218
Small Blank/ Inspection	11	71
Medium Blank / Access	15.5	95
Medium Large Blank/ Access	24.5	161
Large Blank / Access	34	218
Small Coil	11	210
Medium Coil	15.5	363
Medium Large Coil	24.5	649
Large Coil	34	720
Moisture Eliminator	11	147
Internal Face / Bypass	15.5	185
Face Damper	15.5	185
Front Horizontal Discharge Fan	58.5	-
FC Fan	-	845
BI/ AF Fan	-	983
Plenum Fan	-	-
Q Fan (Q)	-	-
Q Fan (R)	-	-
Bottom Vertical Discharge Fan	69.5	-
FC Fan	-	916
BI/ AF Fan	-	1055
Plenum Fan	-	-
Diffuser	15.5	114
Discharge Plenum	34	195
Side Inlet Hood	19.2	41
Back Inlet Hood	20.5	93
Exhaust Hood	19.2	28
Unit End Panels	6	178

1. Access module weights include one access door.
2. Fan module weights include largest ODP motor without IGV.
3. Add mixing module as inlet plenum on horizontal housed or vertical plug return fans.



All dimensions are in inches.

Table 10-4 — Unit Pressure Drops (Inches WG)

					Damper Face Velocity (FPM)					
Ultra Low Leak Dampers	Area (ft^2)	400	500	600	700	800	900	1000	1100	1200
Back or Bottom Damper	7.60	.01	.02	.03	.04	.06	.07	.09	.11	.13
Side Damper (each)	2.47	.02	.03	.04	.05	.06	.08	.10	.12	.14
Protective Grate	8.00	.04	.06	.09	.12	.16	.20	.25	.30	.36
	Area (ft^2)	600	800	1000	1200	1400	1600	1800	2000	2100
Exhaust or Economizer Return Dampers	2.47	.04	.07	.11	.16	.21	.27	.35	.44	.48
Internal Face and Bypass*	Area (ft^2)	400	500	600	700	800	900	1000	1100	1200
Face Area	7.60	.03	.05	.07	.10	.13	.16	.20	.24	.29
Face Damper	9.80	.03	.05	.07	.09	.12	.15	.19	.23	.27
	Area (ft^2)	1400	1600	1800	2000	2200	2400	2600	2800	3000
Bypass Area	3.17	.58	.76	.96	1.18	1.43	1.70	2.00	2.32	2.66
					Accessory Face Velocity (FPM)					
Accessories	Area (ft^2)	400	450	500	550	600	650	700	750	800
Moisture Eliminator	9.64	.01	.01	.02	.03	.03	.03	.04	.04	.05
Diffuser	9.64	.21	.26	.32	.39	.46	.54	.63	.72	.82
					Inlet Hood Face Velocity (FPM)					
Inlet Hoods	Area (ft^2)	300	400	500	600	700	800	850	900	950
Inlet Hood w/ Moisture Eliminator		.04	.06	.10	.15	.20	.26	.29	.33	.36
Side Inlet Hood	3.30									
Back Inlet Hood	9.42									
					Face Velocity (FPM)					
	Area (ft^2)	1000	1200	1400	1600	1800	2000	2200	2400	2600
Air Blenders	3.86	.07	.10	.14	.18	.24	.30	.37	.44	.52
					Filter Face Velocity (FPM)					
Filters**	Area (ft^2)	200	250	300	350	400	450	500	550	600
Flat Filters	9.70									
2" Throwaway	2-20x25	.27	.29	.30	.32	.34	.37	.39	-	-
2" Pleated Media	1-16x25	.52	.54	.55	.57	.59	.62	.64	.67	.70
4" Pleated Media		.52	.53	.54	.56	.57	.59	.61	.64	.66
Permanent		.51	.51	.52	.52	.53	.53	.54	.55	.56
Angled Filters	13.90									
2" Throwaway	4-20x25	.27	.29	.30	.32	.34	.37	.39	-	
2" Pleated Media		.52	.54	.55	.57	.59	.62	.64	.67	.70
Permanent		.51	.51	.52	.52	.53	.53	.54	.55	.56
Cartridge/Bag Filters*	9.30									
6" Cartridge - 65% Eff.	3-12x24	.56	.58	-	-	-	-	-	-	-
6" Cartridge - 85% Eff.	1-20x24	.61	.65	-	-	-	-	-	-	-
6' Cartridge - 95% Eff.		.63	.68	-	-	-	-	-	-	-
12" Cartridge - 65% Eff.		.79	.82	.84	.88	.91	.96	1.00	1.06	1.11
12" Cartridge - 85% Eff.		.80	.82	;85	.89	.93	.98	1.03	1.09	1.15
12" Cartridge - 95% Eff.		.81	.84	.87	.92	.97	1.03	1.09	1.16	1.24
Bag - 65% Eff.		.53	.55	.57	.60	.63	.66	.70	.74	.79
Bag - 85% Eff.		.54	.57	.59	.63	.66	.71	.75	.81	.86
Bag - 95% Eff.		.55	.59	.62	.67	.72	.78	.84	.91	.99

**Filter pressure drops are based on mid-life data.
Do not exceed maximum filter face velocities shown.
Actual pressure drops may be less than shown due to variations in filter brands.
*The bypass in an internal face-and-bypass damper is not sized for 100% airflow. For applications that require 100% bypass, consult your local Trane engineer.
*Cartridge/bag filter pressure drops include a 2" throwaway pre-filter pressure drop.

Table 10-5 — Fan Data

	Fan Type		
	A	B	C
Design CFM	4820	4820	4820
Size/Type	15 FC	13 1/2 FC	13 1/2 BI
Max TSP/RPM	2.5/1146	5/1839	8/3536
Bearing Size			
Drive Side	1 3/16	1 3/16	1 11/16
Opposite Drive Side	1 3/16	1 3/16	1 11/16
Shaft Size	1 3/16	1 3/16	1 11/16
Outlet Area (Ft^2)	2.79	2.31	2.31
Motor HP Range	1-5	1-7 1/2	1-7 1/2
IGV Torque (Inch-Lb.)			
2000 FPM (4.0" WC)	14.1/5.0	10.9/3.9	38.0
3000 FPM (Max. RPM and BHP)	31.9/11.4	24.5/8.7	40.0

Torques are shown for open/closed operation at 2000 and 3000 fpm fan outlet velocity.

Unit Sizes

Size 12

Table 12-1 — Coil Data

1/2" Unit Coils	Area (Ft^2)	
UW,UU,UF	12.30	1-32x55
Shipping Coils		
Full	11.30	1 -30x54
Modified	9.00	1-24x54

Table 12-2 — Coil Availability

Module Size	1/2" Unit Coils	Shipping Coils
Small	2 Row	1-2 Row
Medium	2-8 Row	1-4 Row
Medium Large Coil	2-8 Row	1-8 Row
Medium Large Coil w/ Access	2-8 Row	1-4 Row

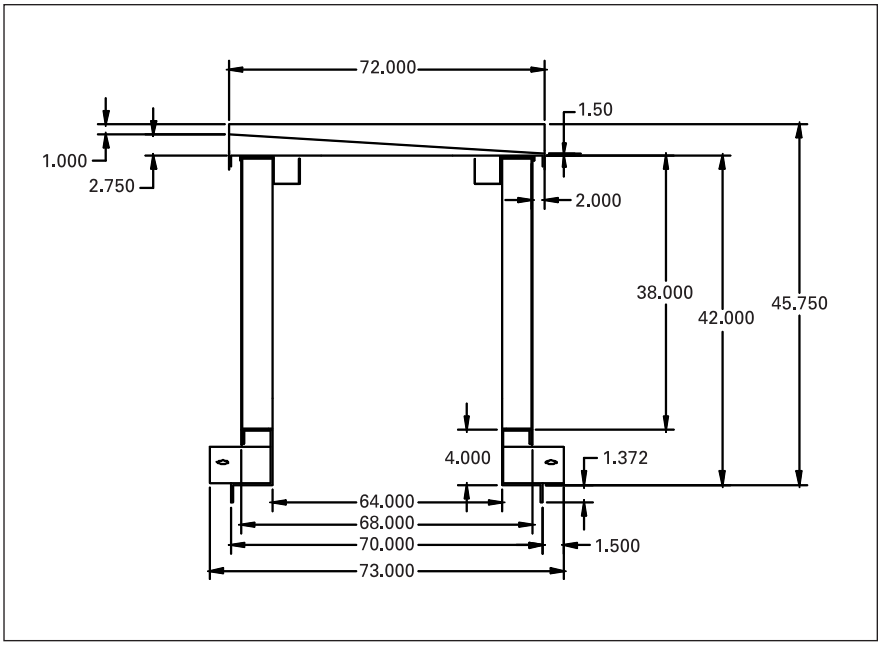
Table 12-3 — 1/2" Unit Coil Water Connection – Sizes (inches)

	UW/UU
Header Height	32
Supply	2
Return	2
Drain and Vent	3/8

SShipping coil connections are located on page 71.
See pages 71-80 for refrigerant coil connections and circuiting.

Sections	Length (inches)	Weight (lbs.)
Filter / Mixing	34	393
Economizer	60.5	637
Exhaust	15.5	145
Air Blender	49.5	380
Flat Filter	11	122
Angled Filter	24.5	261
Bag Filter	38	323
Cartridge Filter	24.5	235
Small Blank / Inspection	11	76
Medium Blank / Access	15.5	101
Medium Large Blank / Access	24.5	171
Large Blank/ Access	34	232
Small Coil	11	238
Medium Coil	15.5	431
Medium Large Coil	24.5	788
Large Coil	34	864
Moisture Eliminator	11	167
Internal Face / Bypass	15.5	200
Face Damper	15.5	200
Front Horizontal Discharge Fan	62.5	-
FC Fan	-	968
BI / AF Fan	-	1212
Plenum Fan	-	-
Q Fan (0)	-	1084
Q Fan (R)	-	1143
Bottom Vertical Discharge Fan	73.5	-
FC Fan	-	1045
BI / AF Fan		1288
Plenum Fan	-	-
Diffuser	15.5	122
Discharge Plenum	34	204
Side Inlet Hood	21.7	49
Back Inlet Hood	20.5	99
Exhaust Hood	21.7	33
Unit End Panels	6	200

1. Access module weights include one access door.
2. Fan module weights include largest ODP motor without IGV.
3. Add mixing module as Inlet plenum on horizontal housed or vertical plug return fans.



All dimensions are in inches.

Table 12-4 — Unit Pressure Drops (inches WG)

					Damper Face Velocity (FPM)				
Ultra Low Leak Dampers	Area (ft^2)	400	500	600	700	800	900	1000	1100	1200
Back or Bottom Damper	8.15	.01	.02	.03	.04	.06	.07	.09	.11	.13
Side Damper (each)	3.01	.01	.02	.03	.04	.05	.07	.09	.10	.12
Protective Grate	8.50	.04	.06	.09	.12	.16	.20	.25	.30	.36

	Area (ft^2)	600	800	1000	1200	1400	1600	1800	2000	2100
Exhaust or Economizer Return Dampers	3.01	.04	.06	.10	.14	.19	.24	.31	.40	.44

Internal Face and Bypass*	Area (ft^2)	400	500	600	700	800	900	1000	1100	1200
Face Area	8.15	.03	.05	.07	.10	.13	.16	.20	.24	.28
Face Damper	12.80	.03	.04	.06	.09	.11	.14	.18	.22	.26

	Area (ft^2)	1400	1600	1800	2000	2200	2400	2600	2800	3000
Bypass Area	3.40	.58	.75	.95	1.17	1.42	1.69	1.98	2.30	2.64

					Accessory Face Velocity (FPM)				
Accessories	Area (ft^2)	400	450	500	550	600	650	700	750	800
Moisture Eliminator	12.30	.01	.01	.02	.03	.03	.03	.04	.04	.05
Diffuser	12.30	.21	.26	.32	.39	.46	.54	.63	.72	.82

					Inlet Hood Face Velocity (FPM)				
Inlet Hoods	Area (ft^2)	300	400	500	600	700	800	850	900	950
Inlet Hood w/ Moisture Eliminator		.04	.06	.10	.15	.20	.26	.29	.33	.36
Side Inlet Hood	3.95									
Back Inlet Hood	10.12									

					Face Velocity (FPM)				
	Area (ft^2)	1000	1200	1400	1600	1800	2000	2200	2400	2600
Air Blenders	5.14	.07	.10	.14	.18	.24	.30	.37	.44	.52

					Filter Face Velocity (FPM)				
Filters**	Area (ft^2)	200	250	300	350	400	450	500	550	600
Flat Filters	13.30									
2" Throwaway	6-16x20	.27	.29	.30	.32	.34	.37	.39	-	-
2" Pleated Media		.52	.54	.55	.57	.59	.62	.64	.67	.70
4" Pleated Media		.52	.53	.54	.56	.57	.59	.61	.64	.66
Permanent		.51	.51	.52	.52	.53	.53	.54	.55	.56
Angled Filters	16.70									
2" Throwaway	6-20x20	.27	.29	.30	.32	.34	'.37	.39	-	-
2" Pleated Media		.52	.54	.55	.57	.59	.62	.64	.67	.70
Permanent		.51	.51	.52	.52	.53	.53	.54	.55	.56
Cartridge/Bag Filters*	10.00									
6" Cartridge - 65% Eff.	3-20x24	.56	.58	-	-	-	-	-	-	-
6" Cartridge - 85% Eff.		.61	.65	-	-	-	-	-	-	-
6" Cartridge - 95% Eff.		.63	.68	-	-	-	-	-	-	-
12" Cartridge - 65% Eff.		.79	.82	.84	.88	.91	.96	1.00	1.06	1.11
12" Cartridge - 85% Eff.		.80	.82	.85	.89	.93	.98	1.03	1.09	1.15
12" Cartridge - 95% Eff.		.81	.84	.87	.92	.97	1.03	1.09	1.16	1.24
Bag - 65% Eff.		.53	.55	.57	.60	.63	.66	.70	.74	.79
Bag - 85% Eff.		.54	.57	.59	.63	.66	.71	.75	.81	.86
Bag - 95% Eff.		.55	.59	.62	.67	.72	.78	.84	.91	.99

**Filter pressure drops are based on mid-life data.
Do not exceed maximum filter face velocities shown.
Actual pressure drops may be less than shown due to variations in filter brands.

Table 12-5 — Fan Data

	Fan Type				
	A	B	C	Q	R
Design CFM	6150	6150	6150	6150	6150
Size/Type	16 1/2 FC	15 FC	15 BI	19 Q-Fan	21 1/2 Q-Fan
Max TSP/RPM	2.5/1042	5/1655	8/3183	6/3145	6/2780
Bearing Size					
Drive Side	13/16	1 7/16	1 15/16	15/16	13/16
Opposite Drive Side	13/16	17/16	1	15/16	13/16
Shaft Size	1 3/16	1 7/16	1 15/16	15/16	13/16
Outlet Area (Ft^2)	3.39	2.79	2.79	2.30	2.88
Motor HP Range	1-7 1/2	1-10	1-15	1/2-7 1/2	1/2-10
IGV Torque (Inch-Lb.)					
2000 FPM (4.0" WC)	18.0/6.4	14.1/5.0	38.0	-	-
3000 FPM (Max. RPM and BHP)	40.5/14.4	31.9/11.4	40.0	-	-

Torques are shown for open/closed operation at 2000 and 3000 fpm fan outlet velocity.

Unit Sizes

Size 14

Table 14-1 — Coil Data

1/2" Unit Coils	Area (Ft^2)	
UW,UU,UF	14.20	1-35x59
Shipping Coils		
Full	12.10	1-30x58
Modified	9.67	1-24x58

Table 14-2 — Coil Availability

Module Size	1/2" Unit Coils	Shipping Coils
Small	2 Row	1-2 Row
Medium	2-8 Row	1-4 Row
Medium Large Coil	2-8 Row	1-8 Row
Medium Large Coil w/ Access	2-8 Row	1-4 Row

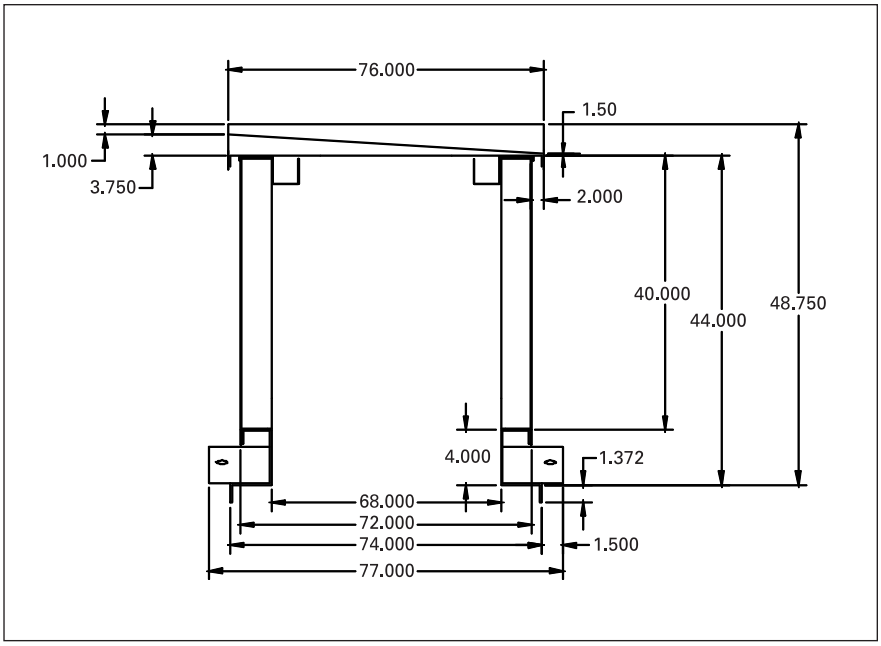
Table 14-3 — 1/2" Unit Coil Water Connection – Sizes (Inches)

	UW/UU
Header Height	35
Supply	2
Return	2
Drain and Vent	3/8

Shipping coil connections are located on page 71.
See pages 71-80 for refrigerant coil connections and circuiting.

Sections	Length (inches)	Weight (lbs.)
Filter / Mixing	34	443
Economizer	60.5	677
Exhaust	15.5	154
Air Blender	49.5	399
Flat Filter	11	130
Angled Filter	24.5	290
Bag Filter	40	372
Cartridge Filter	24.5	266
Small Blank / Inspection	11	80
Medium Blank/ Access	15.5	105
Medium Large Blank/ Access	24.5	179
Large Blank/ Access	34	243
Small Coil	11	255
Medium Coil	15.5	476
Medium Large Coil	24.5	842
Large Coil	34	923
Moisture Eliminator	11	182
Internal Face / Bypass	15.5	230
Face Damper	15.5	230
Front Horizontal Discharge Fan	64.5	-
FC Fan	-	1034
81 / AF Fan	-	1298
Plenum Fan	-	-
Q Fan (Q)	-	1133
Q Fan (R)	-	1192
Bottom Vertical Discharge Fan	75.5	-
FC Fan	-	1113
BI / AF Fan	-	1378
Plenum Fan	-	-
Diffuser	15.5	130
Discharge Plenum	34	209
Side Inlet Hood	24.1	57
Back Inlet Hood	20,5	104
Exhaust Hood	24.1	39
Unit End Panels	6	217

1. Access module weights include one access door.
2. Fan module weights include largest ODP motor without IGV.
3. Add mixing module as inlet plenum on horizontal housed or vertical plug return fans.



All dimensions are in inches.

Table 14-4 — Unit Pressure Drops (Inches WG)

					Damper Face Velocity (FPM)				
Ultra Low Leak Dampers	Area (ft^2)	400	500	600	700	800	900	1000	1100	1200
Back or Bottom Damper	8.70	.01	.02	.03	.04	.06	.07	.09	.10	.12
Side Damper (each)	3.56	.01	.02	.03	.04	.05	.06	.07	.09	.11
Protective Grate	9.10	.04	.06	.09	.12	.16	.20	.25	.30	.36

	Area (ft^2)	600	800	1000	1200	1400	1600	1800	2000	2100
Exhaust or Economizer Return Dampers	3.56	.03	.05	.09	.12	.16	.21	.27	.34	.39

Internal Face and Bypass*	Area (ft^2)	400	500	600	700	800	900	1000	1100	1200
Face Area	10.88	.03	.05	.07	.09	.12	.15	.18	.22	.27
Face Damper	13.70	.03	.04	.06	.09	.11	.14	.18	.21	.25

	Area (ft^2)	1400	1600	1800	2000	2200	2400	2600	2800	3000
Bypass Area	3.51	.58	.76	.96	1.18	1.43	1.70	2.00	2.32	2.66

					Accessory Face Velocity (FPM)					
Accessories	Area (ft^2)	400	450	500	550	600	650	700	750	800
Moisture Eliminator	14.20	.01	.01	.02	.03	.03	.03	.04	.04	.05
Diffuser	14.20	.21	.26	.32	.39	46	.54	.63	.72	.82

					Inlet Hood Face Velocity (FPM)					
Inlet Hoods	Area (ft^2)	300	400	500	600	700	800	850	900	950
Inlet Hood w/ Moisture Eliminator		.04	.06	.10	.15	.20	.26	.29	.33	.36
Side Inlet Hood	4.54									
Back Inlet Hood	10.73									

					Face Velocity (FPM)					
	Area (ft^2)	1000	1200	1400	1600	1800	2000	2200	2400	2600
Air Blenders	5.85	.07	.10	.14	.18	.24	.30	.37	.44	.52

					Filter Face Velocity (FPM)					
Filters**	Area (ft^2)	200	250	300	350	400	450	500	550	600
Flat Filters	15.00									
2" Throwaway	3-16x20	.27	.29	.30	.32	.34	.37	.39	-	-
2" Pleated Media	3-20x20	.52	.54	.55	.57	.59	.62	.64	.67	.70
4" Pleated Media		.52	.53	.54	.56	.57	.59	.61	.64	.66
Permanent		.51	.51	.52	.52	.53	.53	.54	.55	.56
Angled Filters	26.70									
2" Throwaway	12-16x20	.27	.29	.30	.32	.34	.37	.39	-	-
2" Pleated Media		.52	.54	.55	.57	.59	.62	.64	.67	.70
Permanent		.51	.51	.52	.52	.53	.53	.54	.55	.56
Cartridge/Bag Filters*	14.70									
6" Cartridge - 65% Eff.	2-12x24	.56	.58	-	-	-	-	-	-	-
6" Cartridge - 85% Eff.	2-20x24	.61	.65	-	-	-	-	-	-	-
6" Cartridge - 95% Eff.	1-24x24	.63	.68	-	-	-	-	-	-	-
12" Cartridge - 65% Eff.		.79	.82	.84	.88	.91	.96	1.00	1.06	1.11
12" Cartridge - 85% Eff.		.80	.82	.85	.89	.93	.98	1.03	1.09	1.15
12" Cartridge - 95% Eff.		.81	.84	.87	.92	.97	1.03	1.09	1.16	1.24
Bag - 65% Eff.		.53	.55	.57	.60	.63	.66	.70	.74	.79
Bag - 85% Eff.		.54	.57	.59	.63	.66	.71	.75	.81	.86
Bag - 95% Eff.		.55	.59	.62	.67	.72	.78	.84	.91	.99

**Filter pressure drops are based on mid-life data.
Do not exceed maximum filter face velocities shown.
Actual pressure drops may be less than shown due to variations in filter brands.
*The bypass in an internal face-and-bypass damper is not sized for 100% airflow. For applications that require 100% bypass, consult your local Trane engineer.
*Cartridge/bag filter pressure drops include a 2" throwaway pre-filter pressure drop.

Table 14-5 — Fan Data

	Fan Type				
	A	B	C	Q	R
Design CFM	7100	7100	7100	7100	7100
Size/Type	18 1/4 FC	16 1/2 FC	16 1/2 BI	19 Q-Fan	21 1/2 Q-Fan
Max TSP/RPM	2.5/942	5/1505	8/2894	6/3145	6/2780
Bearing Size					
Drive Side	1 3/16	1 7/16	1 15/16	15/16	1 3/16
Opposite Drive Side	1 3/16	1 7/16	1	15/16	1 3/16
Shaft Size	1 3/16	1 7/16	1 15/16	15/16	13/16
Outlet Area (Ft^2)	4.14	3.39	3.39	2.30	2.88
Motor HP Range	1-7 1/2	1-10	1-15	1/2-7 1/2	1/2-10
IGV Torque (Inch-Lb.)					
2000 FPM (4.0" WC)	23.1/8.3	18.0/6.4	44.0	-	-
3000 FPM (Max. RPM and BHP)	52.2/18.6	40.5/14.4	50.0	-	-

Torques are shown for open/closed operation at 2000 and 3000 fpm fan outlet velocity.

Unit Sizes

Size 17

Table 17-1 — Coil Data

1/2" Unit Coils	Area (Ft^2)	Qty.-Size
UW,UU,UF	16.80	1-37x65
Shipping Coils		
Full	14.70	1-33x64
Modified	13.30	1-30x64

Table 17-2 — Coil Availability

Module Size	1/2" Unit Coils	Shipping Coils
Small	2 Row	1-2 Row
Medium	2-8 Row	1-4 Row
Medium Large Coil	2-8 Row	1-8 Row
Medium Large Coil w/ Access	2-8 Row	1-4 Row

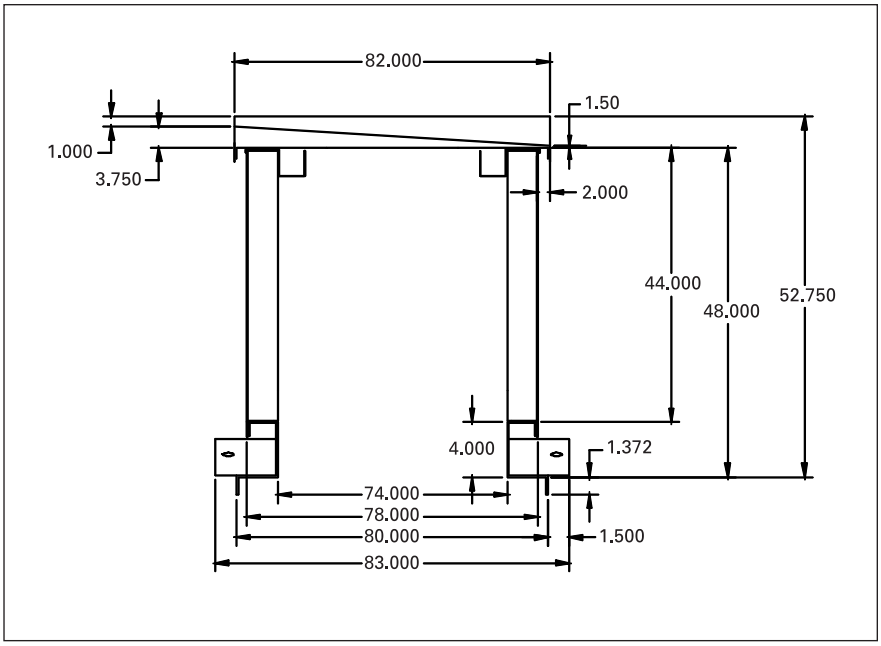
Table 17-3 — 1/2" Unit Coil Water Connection – Sizes (Inches)

	UW/UU
Header Height	37
Supply	2
Return	2
Drain and Vent	3/8

Shipping coil connections are located on page 71.
See pages 71-80 for refrigerant coil connections and circuiting.

Sections	Length (inches)	Weight (lbs.)
	34	490
Economizer	60.5	740
Exhaust	15.5	167
Air Blender	49.5	431
Flat Filter	11	140
Angled Filter	24.5	312
Ban Filter	44	426
Cartridge Filter	24.5	284
Small Blank / Inspection	11	85
Medium Blank / Access	15.5	113
Medium Large Blank / Access	24.5	192
Large Blank / Access	34	261
Small Coil	11	285
Medium Coil	15.5	539
Medium Large Coil	24.5	967
Large Coil	34	1054
Moisture Eliminator	11	202
Internal Face / Bypass	15.5	252
Face Damper	15.5	252
Front Horizontal Discharge Fan	68.5	-
FC Fan	-	1176
BI / AF Fan	-	1497
Plenum Fan	-	
Q Fan (Q)	-	1312
Q Fan (R)	-	1455
Bottom Vertical Discharge Fan	79.5	-
FC Fan	-	1261
BI / AF Fan	-	1582
Plenum Fan	-	-
Diffuser	15.5	143
Discharge Plenum	34	224
Side Inlet Hood	28.4	70
Back Inlet Hood	24	138
Exhaust Hood	28.4	49
Unit End Panels	6	247

1. Access module weights include one access door.
2. Fan module weights include largest ODP motor without IGV.
3. Add mixing module as inlet plenum on horizontal housed or vertical plug return fans.



All dimensions are in inches.

Table 17-4 — Unit Pressure Drops (Inches WG)

					Damper Face Velocity (FPM)				
Ultra Low Leak Dampers	Area (ft^2)	400	500	600	700	800	900	1000	1100	1200
Back or Bottom Damper	12. 29	.01	.02	.03	.04	.05	.06	.07	.09	.11
Side Damper (each)	4.11	.02	.02	.03	.03	.05	.06	.06	.07	.09
Protective Grate	12.80	.04	.06	.09	.12	.16	.20	.25	.30	.36
	Area (ft^2)	600	800	1000	1200	1400	1600	1800	2000	2100
Exhaust or Economizer Return Dampers	4.11	.03	.05	.07	.11	.14	.18	.23	.27	.31
Internal Face and Bypass*	Area (ft^2)	400	500	600	700	800	900	1000	1100	1200
Face Area	11.94	.03	.05	.07	.09	.12	.15	.18	.22	.26
Face Damper	17.80	.03	.04	.06	.08	.11	.14	.17	.20	.24
	Area (ft^2)	1400	1600	1800	2000	2200	2400	2600	2800	3000
Bypass Area	3.85	.57	.75	.95	1.17	1.42	1.68	1.98	2.29	2.63
					Accessory Face Velocity (FPM)					
Accessories	Area (ft^2)	400	450	500	550	600	650	700	750	800
Moisture Eliminator	16.80	.01	.01	.02	.03	.03	.03	.04	.04	.05
Diffuser	16.80	.21	.26	.32	.39	.46	.54	63	.72	.82
					Inlet Hood Face Velocity (FPM)					
Inlet Hoods	Area (ft^2)	300	400	500	600	700	800	850	900	950
Inlet Hood w/ Moisture Eliminator		.04	.06	.10	.15	.20	.26	.29	.33	.36
Side Inlet Hood	5.38									
Back Inlet Hood	14.60									
					Face Velocity (FPM)					
	Area (ft^2)	1000	1200	1400	1600	1800	2000	2200	2400	2600
Air Blenders	6.60	.67	.10	.14	.18	.24	.30	.37	.44	.52
					Filter Face Velocity (FPM)					
Filters**	Area (ft^2)	200	250	300	350	400	450	500	550	600
Flat Filters	18.10									
2" Throwaway	4-20x20	.27	.29	.30	.32	.34	.37	.39	-	-
2" Pleated Media	2-20x25	.52	.54	.55	.57	.59	.62	.64	.67	.70
4" Pleated Media		.52	.53	.54	.56	.57	.59	.61	.64	.66
Permanent		.51	.51	.52	.52	.53	.53	.54	.55	.56
Angled Filters	28.90									
2" Throwaway	8-16x20	.27	.29	.30	.32	.34	37	.39	-	-
2" Pleated Media	4-16x25	.52	.54	.55	.57	.59	.62	.64	.67	.70
Permanent		.51	.51	.52	.52	.53	.53	.54	.55	.56
Cartridge/Bag Filters*	16.7 0									
6" Cartridge - 65% Eff.	6-20x20	.56	.58	-	-	-	-	-	-	-
6" Cartridge - 85% Eff.		.61	.65	-	-	-	-	-	-	-
6" Cartridge - 95% Eff.		.63	.68	-	-	-	-	-	-	-
12" Cartridge - 65% Eff.		.79	.82	.84	.88	.91	.96	1.00	1.06	1.11
12" Cartridge - 85% Eff.		.80	.82	.85	.89	.93	.98	1.03	1.09	1.15
12" Cartridge - 95% Elf.		.81	.84	.97	.92	.97	1.03	1.09	1.16	1.24
Bag - 65% Eff.		.53	.55	.57	.60	.63	.66	.70	.74	.79
Bag - 85% Eff.		.54	.57	.59	.63	.66	.71	.75	.81	.86
Bag - 95% Eff.		.55	.59	.62	.67	.72	.78	.84	.91	.99

**Filter pressure drops are based on mid-life data.
Do not exceed maximum filter face velocities shown.
Actual pressure drops may be less than shown due to variations in filter brands.
*The bypass in an internal face-and-bypass damper is not sized for 100% airflow. For applications that require 100% bypass, consult your local Trane engineer.
*Cartridge/bag filter pressure drops include a 2" throwaway pre-filter pressure drop.

Table 17-5 — Fan Data

	Fan Type				
	A	B	C	Q	R
Design	8400	8400	8400	8400	8400
Size/Type	20 FC	18 1/4 FC	18 1/4 BI	21 1/2 Q-Fan	24 1/2 Q-Fan
Max TSP/RPM	2.5/859	5/1360	8/2616	6/2780	6/2380
Bearing Size					
Drive Side	1 7/16	1 11/16	2 3/16	1 3/16	1 3/16
Opposite Drive Side	1 7/16	1 11/16	1	1 3/16	1 3/16
Shaft Size	1 7/16	1 11/16	2 3/16	1 3/16	1 3/16
Outlet Area (Ft^2)	5.05	4.14	4.14	2.88	3.73
Motor HP Range	1-10	1-15	1-20	1/2-10	1/2-15
IGV Torque (Inch-Lb.)					
2000 FPM (4.0" WC)	24.0/9.0	23.1/8.3	54.0	-	-
3000 FPM (Max. RPM and BHP)	54.0/19.5	52.2/18.6	60.00	-	-

Torques are shown for open/closed operation at 2000 and 3000 fpm fan outlet velocity.

Unit Sizes

Size 21

Table 21-1 – Coil Data

1/2" Unit Coils	Area (Ft^2)	Qty-Size
UW,UU,UF	20.80	1-45x67
Shipping Coils		
Full	16.50	2-18x66
Modified	15.10	1-33x36

Table 21-2 — Coil Availability

Module Size	1/2" Unit Coils	Shipping Coils
Small	2 Row	1-2 Row
Medium	2-8 Row	1-4 Row
Medium Large Coil	2-8 Row	1-8 Row
Medium Large Coil w/ Access	2-8 Row	1-4 Row

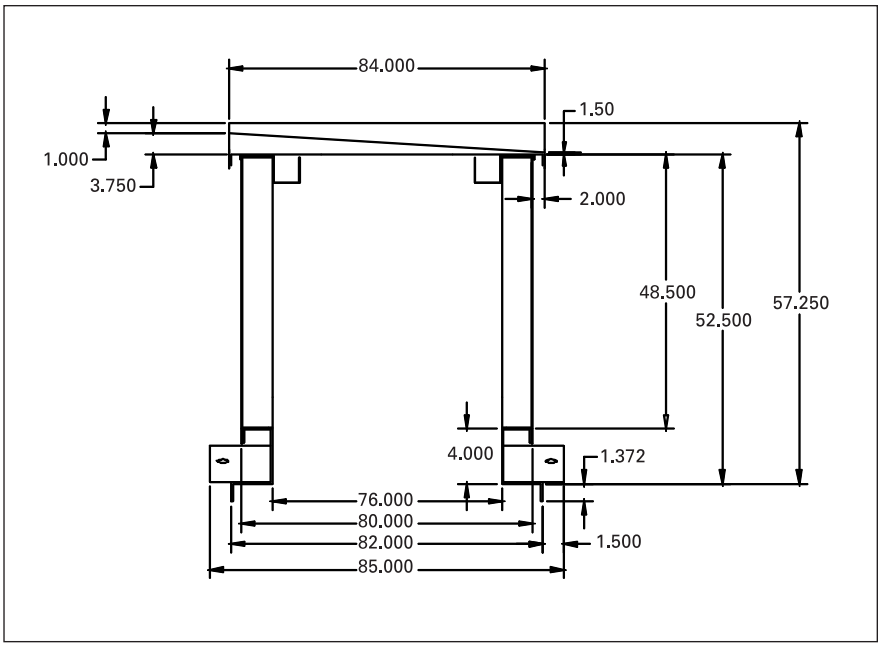
Table 21-3 — 1/2" Unit Coil Water Connection - Sizes (Inches)

Header Height	45
Supply	2 1/2
Return	2 1/2
Drain and Vent	3/8

Shipping coil connections are located on page 71.
See pages 71-80 for refrigerant coil connections and circuiting.

Sections	Length (inches)	Weight (lbs.)
Filter / Mixing	34	526
Economizer	60.5	827
Exhaust	15.5	187
Air Blender	49.5	477
Flat Filter	11	157
Angled Filter	24.5	338
Bag Filter	48.5	511
Cartridge Filter	24.5	317
Small. Blank / Inspection	11	95
Medium Blank / Access	15.5	125
Medium Large Blank/ Access	24.5	212
Large Blank / Access	34	289
Small Coil	11	323
Medium Coil	15.5	641
Medium Large Coil	24.5	1142
Large Coil	34	1234
Moisture Eliminator	11	231
Internal Face / Bypass	15.5	281
Face Damper	15.5	281
Front Horizontal Discharge Fan	73	-
FC Fan	-	1357
BI / AF Fan	-	1743
Plenum Fan	-	1745
Q Fan (Q)	-	1598
Q Fan (R)	-	1669
Bottom Vertical Discharge Fan	84	-
FC Fan	-	1451
BI / AF Fan		1838
Plenum Fan	-	1839
Diffuser	15.5	163
Discharge Planum	34	252
Side Inlet Hood	30.3	79
Back Inlet Hood	24	141
Exhaust Hood	30.3	55
Unit End Panels	6	283

1. Access module weights include one access door.
2. Fan module weights include largest ODP motor without IGV.
3. Add mixing module as inlet plenum on horizontal housed or vertical plug return fans.



All dimensions are in inches.

Table 21-4 — Unit Pressure Drops (Inches WG)

					Damper Face Velocity (FPM)				
Ultra Low Leak Dampers	Area (ft^2)	400	500	600	700	800	900	1000	1100	1200
Back or Bottom Dampers	12.65	.01	.02	.03	.04	.05	.06	.07	.09	.11
Side Damper (each)	4.79	.01	.01	.02	.03	.04	.05	.05	.06	.08
Protective Grate	13.10	.04	.06	.09	.12	.16	.20	.25	.30	.36

	Area (ft^2)	600	800	1000	1200	1400	1600	1800	2000	2100
Exhaust or Economizer Return Dampers	4.79	.03	.05	.06	.09	.12	.16	.21	.25	.28

Internal Face and Bypass*	Area (ft^2)	400	500	600	700	800	900	1000	1100	1200
Face Area	15.07	.03	.04	.06	.08	.11	.14	.17	.21	.25
Face Damper	21.10	.03	.04	.06	.08	.10	.13	.16	.19	.23

	Area (ft^2)	1400	1600	1800	2000	2200	2400	2600	2800	3000
Bypass Area	3.97	.57	.75	.95	1.17	1.41	1.68	1.97	2.29	2.63

					Accessory Face Velocity (FPM)				
Accessories	Area (ft^2)	400	450	500	550	600	650	700	750	800
Moisture Eliminator	20.80	.01	.01	.02	.03	.03	.03	.04	.04	.05
Diffuser	20.80	.21	.26	.32	.39	.46	.54	.63	.72	.82

					Inlet Hood Face Velocity (FPM)				
Inlet Hoods	Area (ft^2)	300	400	500	600	700	800	850	900	950
Inlet Hood w/ Moisture Eliminator		.04	.06	.10	.15	.20	.26	.29	.33	.36
Side Inlet Hood	6.08									
Back Inlet Hood	15.04									

					Face Velocity (FPM)				
	Area (ft^2)	1000	1200	1400	1600	1800	2000	2200	2400	2600
Air Blenders	7.72	.07	.10	.14	.18	.24	.30	.37	.44	.52

					Filter Face Velocity (FPM)				
Filters**	Area (ft^2)	200	250	300	350	400	450	500	550	600
Flat Filters	20.00									
2" Throwaway	4-20x20	.27	.29	.30	.32	.34	.37	.39	-	-
2" Pleated Media	4-16x20	.52	.54	.55	.57	.59	.62	.64	.67	.70
2" Pleated Media		.52	.53	.54	.56	.57	.59	.61	.64	.66
Permanent		.51	.51	.52	.52	.53	.53	.54	.55	.56
Angled Filters	31.10									
2" Throwaway	4-16x20	.27	.29	.30	.32	.34	.37	.39	-	-
2" Pleated Media	8-16x25	.52	.54	.55	.57	.59	.62	.64	.67	.70
Permanent		.51	.51	.52	.52	.53	.53	.54	.55	.56
Cartridge/Bag Filters*	22.00									
6" Cartridge - 65% Eff.	3-20x24	.56	.58	-	-	-	-	-		-
6" Cartridge - 85% Eff.	3-24x24	.61	.65	-	-	-	-	-	-	-
6" Cartridge - 95% Eff		.63	.68	-	-	-	-	-	-	-
12" Cartridge - 65% Eff.		.79	.82	.84	.88	.91	.96	1.00	1.06	1.11
12" Cartridge - 85% Eff.		.80	.82	.85	.89	.93	.98	1.03	1.09	1.15
12" Cartridge - 95% Eff.		.81	.84	.87	.92	.97	1.03	1.09	1.16	1.24
Bag - 65% Eff.		.53	.55	.57	.60	.63	.66	.70	.74	.79
Bag - 85% Eff.		.54	.57	.59	.63	.66	.71	.75	.81	.86
Bag - 95% Eff.		.55	.59	.62	.67	.72	.78	.84	.91	.99

**Filter pressure drops are based on mid-life data.
Do not exceed maximum filter face velocities shown.
Actual pressure drops may be less than shown due to variations in filter brands.
*The bypass in an internal face-and-bypass damper is not sized for 100% airflow. For applications that require 100% bypass, consult your local Trane engineer.
*Cartridge/bag filter pressure drops include a 2" throwaway pre-filter pressure drop.

Table 21-5 — Fan Data

	Fan Type					
	A	B	C	P	Q	R
Design CFM	10400	10400	10400	10400	10400	10400
Size /Type	22 3/8 FC	20 FC	20 BI	29 1/8 AF	24 1/2 Q-Fan	27 Q-Fan
Max TSP/RPM	3/972	5/1241	8/2387	6/1886	6/2380	6/2160
Drive Side	17/16	1 11/16	27/16	17/16	1 3/16	17/16
Opposite Drive Side	17/16	1 11/16	13/16	1 7/16	13/16	1 7/16
Shaft Size	17/16	1 11/16	27/16	1 7/16	1 3/16	1 7/16
Outlet Area (Ft^2)	5.16	5.05	5.05	-	3.73	4.54
Motor HP Range	1-10	1-15	1-25	2-15	1/2-15	1/2-15
IGV Torque (Inch-Lb.)						
2000 FPM (4.0" WC)	25.0/9.5	24.0/9.0	66.0	68.0	-	-
3000 FPM (Max. RPM and BHP)	56.0/21.0	54.0/19.5	74.0	89.0	-	-

Torques are shown for open/closed operation at 2000 and 3000 fpm fan outlet velocity.

Unit Sizes

Size 25

Table 25-1 — Coil Data

1/2" Unit Coils	Area (Ft^2)	Qty-Size
UW,UU,UF	24.40	1-51x69
Shipping Coils		
Full	19.80	1-18x68
		1-24x68
Modified	17.00	2-18x68

Table 25-2 — Coil Availability

Module Size	1/2" Unit Coils	Shipping Coils
Small	2 Row	1-2 Row
Medium	2-8 Row	1-4 Row
Medium Large Coil	2-8 Row	1-8 Row
Medium Large Coil w/ Access	2-8 Row	1-4 Row

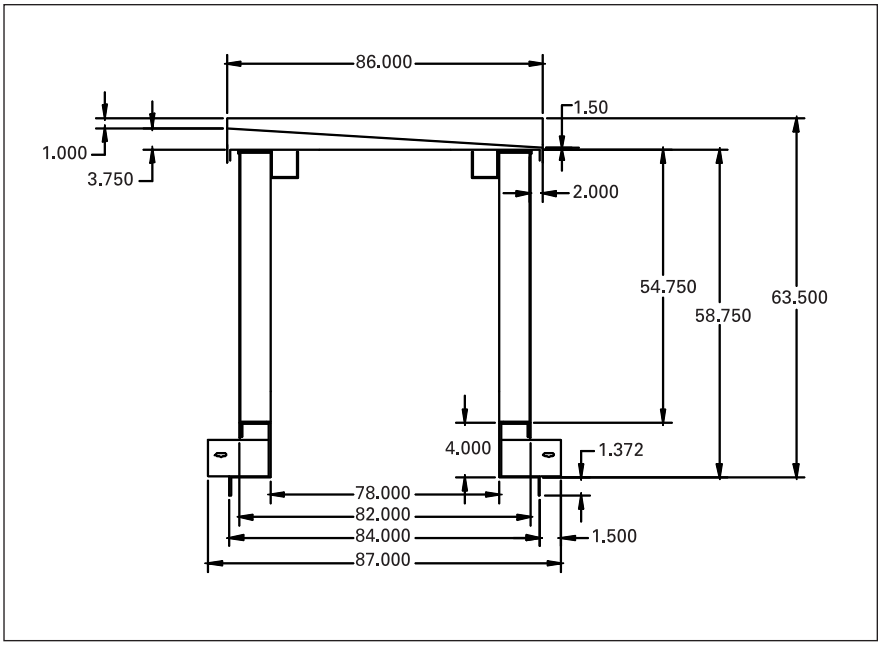
Table 25-3 — 1/2" Unit Coil Water Connection - Sizes (inches)

	UW/UU
Header Height	51
Supply	2 1/2
Return	2 1/2
Drain and Vent	3/8

Shipping coil connections are located on page 71.
See pages 71-80 for refrigerant coil connections and circuiting.

Sections	Length (inches)	Weight (lbs.)
Economizer	60.5	902
Exhaust	15.5	201
Air Blender	55.5	562
Flat Filter	11	164
Angled Filter	24.5	355
Bag Filter	54.75	579
Cartridge Filter	24.5	334
Small Blank/ Inspection	11	100
Medium Blank/ Access	15.5	132
Medium Large Blank / Access	24.5	221
Large Blank / Access	40	361
Small Coil	11	353
Medium Coil	15.5	722
Medium Large Coil	24.5	1298
Large Coil	40	1465
Moisture Eliminator	11	254
Internal Face/ Bypass	15.5	306
Face Damper	15,5	306
Front Horizontal Discharge Fan	54.75	-
FC Fan	-	1238
BI / AF Fan	-	1666
Plenum Fan	-	1705
Q Fan (Q)	-	1581
Q Fan (R)	-	1696
Bottom Vertical Discharge Fan	65.75	-
FC Fan	-	1338
BI / AF Fan		1766
Plenum Fan	-	1804
Diffuser	15.5	173
Discharge Plenum	40	318
Side Inlet Hood	34.5	96
Back Inlet Hood	27.6	172
Exhaust Hood	34.5	67
Unit End Panels	6	312

1. Access module weights include one access door.
2. Fan module weights include largest ODP motor without IGV.
3. Add mixing module as inlet plenum on horizontal housed or vertical plug return fans.



All dimensions are in inches.

Table 25-4 — Unit Pressure Drops (Inches WG)

				Damper Face Velocity (FPM)					
Ultra Low Leak Dampers	Area (ft^2)	400	500	600	700	800	900	1000	1100	1200
Back or Bottom Damper	15.94	.01	.02	.02	.03	.04	.05	.07	.08	.10
Side Damper (each)	5.61	.01	.01	.02	.02	.03	.04	.05	.05	.06
Protective Grate	16.40	.04	.06	.09	.12	.16	.20	.25	.30	.36

	Area (ft^2)	600	800	1000	1200	1400	1600	1800	2000	2100
Exhaust or Economizer Return Dampers	5.61	.02	.04	.05	.08	.10	.14	.18	.22	.24

Internal Face and Bypass*	Area (ft^2)	400	500	600	700	800	900	1000	1100	1200
Face Area	18.36	.03	.04	.06	.08	.11	.13	.17	.20	.24
Face Damper	24.60	.03	.04	.06	.08	.10	.13	.16	.19	.22

	Area (ft^2)	1400	1600	1800	2000	2200	2400	2600	2800	3000
Bypass Area	4.08	.59	.78	.98	1.21	1.47	1.75	2.05	2.38	2.73

				Accessory Face Velocity (FPM)						
Accessories	Area (ft^2)	400	450	500	550	600	650	700	750	800
Moisture Eliminator	24.40	.01	.01	.02	.03	.03	.03	.04	.04	.05
Diffuser	24.40	.21	.26	.32	.39	.46	.54	.63	.72	.82

				Inlet Hood Face Velocity (FPM)						
Inlet Hoods	Area (ft^2)	300	400	500	600	700	800	850	900	950
Inlet Hood w/ Moisture Eliminator		.04	.06	.10	.15	.20	.26	.29	.33	.36
Side Inlet Hood	7.13									
Back Inlet Hood	18.69									

					Face Velocity (FPM)					
	Area (ft^2)	1000	1200	1400	1600	1800	2000	2200	2400	2600
Air Blenders	8.96	.07	.10	.14	.18	.24	.30	.37	.44	.52

					Filter Face Velocity (FPM)					
Filters**	Area (ft^2)	200	250	300	350	400	450	500	550	600
Flat Filters	25.00									
2" Throwaway	4-20x25	.27	.29	.30	.32	.34	.37	.39	-	-
2" Pleated Media	4-16x25	.52	.54	.55	.57	.59	.62	.64	.67	.70
4" Pleated Media		.52	.53	.54	.56	.57	.59	.61	.64	.66
Permanent		.51	.51	.52	.52	.53	.53	.54	.55	.56
Angled Filters	38.90									
2" Throwaway	4-20x20	.27	.29	.30	.32	.34	.37	.39	-	-
2" Pleated Media	8-20x25	.52	.54	.55	.57	.59	.62	.64	.67	.70
Permanent		.51	.51	.52	.52	.53	.53	.54	.55	.56
Cartridge/Bag Filters*	24.00									
6" Cartridge - 65% Eff.	6-24x24	.56	.58	-	-	-	-	-	-	-
6" Cartridge - 85% Eff.		.61	.65	-	-	-	-	-	-	-
6" Cartridge - 95% Eff.		.63	.68	-	-	-	-	-	-	-
12" Cartridge - 65% Eff.		.79	.82	.84	.88	.91	.96	1.00	1.06	1.11
12" Cartridge - 85% Eff.		.80	.82	.85	.89	.95	.98	1.03	1.09	1.15
12" Cartridge - 95% Eff.		.81	.84	.87	.92	.97	1.03	1.09	1.16	1.24
Bag - 65% Eff.		.53	.55	.57	.60	.63	.66	.70	.74	.79
Bag - 85% Eff.		.54	.57	.59	.63	.66	.71	.75	.81	.86
Bag - 95% Eff.		.55	.59	.62	.67	.72	.78	.84	.91	.99

**Filter pressure drops are based on mid-life data.
Do not exceed maximum filter face velocities shown.
Actual pressure drops may be less than shown due to variations in filter brands.
*The bypass in an internal face-and-bypass damper is not sized for 100% airflow. For applications that require 100% bypass, consult your local Trane engineer.
*Cartridge/bag filter pressure drops include a 2" throwaway pre-filter pressure drop.

Table 25-5 — Fan Data

	Fan Type					
	A	B	C	P	Q	R
Design CFM	12200	12200	12200	12200	12200	12200
Size/Type	25 FC	22 3/8 FC	22 1/4 BI	32 3/8 AF	27 Q-Fan	30 Q-Fan
Max TSP/RPM	3/811	5/1273	8/2146	6/1611	6/2160	6/1940
Bearing Size						
Drive Side	1 11/16	2 3/16	2 11/16	1 11/16	1 7/16	1 7/16
Opposite Drive Side	1 11/16	1	1 7/16	1 11/16	1 7/16	1 7/16
Shaft Size	1 11/16	2 3/16	2 11/16	1 11/16	1 7/16	1 7/16
Outlet Area (Ft^2)	6.70	5.16	6.30	-	4.54	5.60
Motor HP Range	1-10	1-20	1-25	3-20	1/2-15	3/4-20
IGV Torque (Inch-Lb.)						
2000 FPM (4.0" WC)	26.5/10.0	25.0/9.5	90.0	81.0	-	-
3000 FPM (Max. RPM and BHP)	59.7/22.5	56.0/21.0	100.0	119.0	-	-

Torques are shown for open/closed operation at 2000 and 3000 fpm fan outlet velocity.

Unit Sizes

Table 30-1 — Coil Data

1/2" Unit Coils	Area (Ft^2)	Qty-Size
UW,UU,UF	29.00	1-51x82
Shipping Coils		
Full	23.60	1-18x81
		1-24x81
Modified	20.30	2-18x81

Table 30-2 — Coil Availability

Module Size	1/2" Unit Coils	Shipping Coils
Small	2 Row	1-2 Row
Medium	2-8 Row	1-4 Row
Medium Large Coil	2-8 Row	1-8 Row
Medium Large Coil w/ Access	2-8 Row	1-4 Row

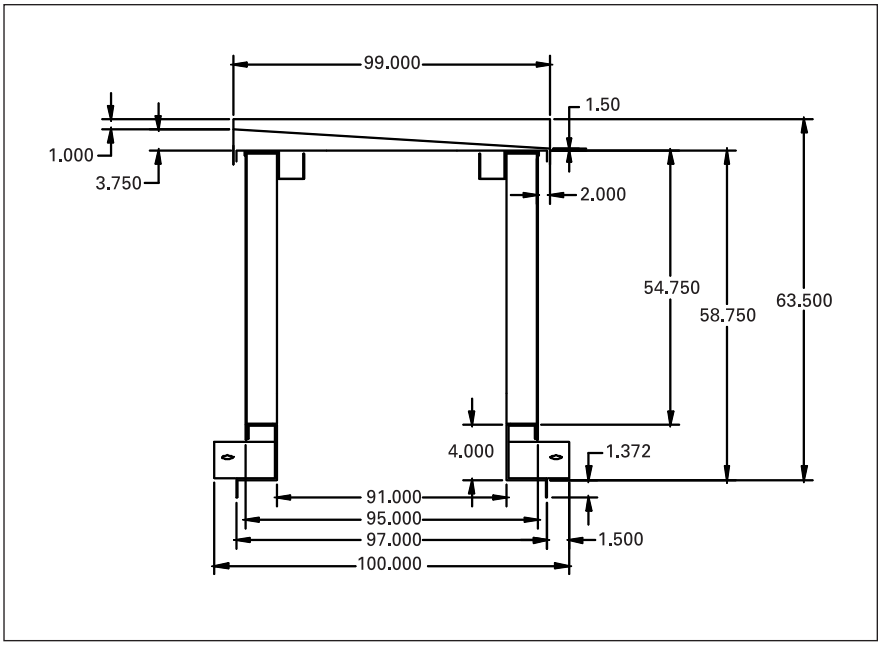
Table 30-3 — 1/2" Unit Coil Water Connection – Sizes (inches)

	UW/UU
Header Height	51
supply	2 1/2
Return	2 1/2
Drain and Vent	3/8

Shipping coil connections are located on page 71.
See pages 71-80 for refrigerant coil connections and circuiting.

Sections	Length (inches)	Weight (lbs.)
Filter / Mixing	40	687
Economizer	72	1118
Exhaust	15.5	219
Air Blender	55.5	614
Flat Filter	11	177
Angled Filter	24.5	389
Bag Filter	54.75	632
Cartridge Filter	24.5	368
Small Blank/ Inspection	11	108
Medium Blank/ Access	15.5	143
Medium Large Blank/ Access	24.5	241
Large Blank/ Access	40	393
Small Coil	11	390
Medium Coil	15.5	824
Medium Large Coil	24.5	1483
Large Coil	40	1664
Moisture Eliminator	11	289
Internal Face / Bypass	15.5	343
Face Damper	15.5	343
Front Horizontal Discharge Fan	54.75	-
FC Fan	-	1502
BI / AF Fan	-	1889
Plenum Fan	-	1852
Q Fan (Q)	-	1839
Q Fan (R)	-	1955
Bottom Vertical Discharge Fan	65.75	-
FC Fan	-	1610
BI/ AF Fan	-	1997
Plenum Fan	-	1960
Diffuser	15.5	192
Discharge Plenum	40	337
Side Inlet Hood	33.3	105
Back Inlet Hood	27.6	197
Exhaust Hood	33.3	70
Unit End Panels	6	362

1. Access module weights include one access door.
2. Fan module weights include largest ODP motor without IGV.
3. Add mixing module as inlet plenum on horizontal housed or vertical plug return fans.



All dimensions are in inches.

Table 30-4 — Unit Pressure Drops (Inches WG)

					Damper Face Velocity (FPM)					
Ultra Low Leak Dampers	Area (ft^2)	400	500	600	700	800	900	1000	1100	1200
Back or Bottom Damper	18.75	.01	.02	.02	.03	.04	.05	.06	.07	.09
Side Damper (each)	6.99	.01	.01	.02	.02	.03	.04	.05	.05	.06
Protective Grate	19.30	.04	.06	.09	.12	.16	.20	.25	.30	.36
	Area (ft^2)	600	800	1000	1200	1400	1600	1800	2000	2100
Exhaust or Economizer Return Dampers	6.99	.02	.03	.05	.06	.09	.11	.14	.18	.19
Internal Face and Bypass*	Area (ft^2)	400	500	600	700	800	900	1000	1100	1200
Face Area	21.69	.03	.04	.06	.08	.10	.13	.16	.19	.23
Face Damper	29.00	.02	.04	.05	.07	.10	.12	.15	.18	.22
	Area (ft^2)	1400	1600	1800	2000	2200	2400	2600	2800	3000
Bypass Area	4.82	.56	.74	.93	1.15	1.39	1.66	1.95	2.26	2.59
					Accessory Face Velocity (FPM)					
Accessories	Area (ft^2)	400	450	500	550	600	650	700	750	800
Moisture Eliminator	29.00	.01	.01	.02	.03	.03	.03	.04	.04	.05
Diffuser	29.00	.21	.26	.32	.39	.46	.54	.63	.72	.82
					Inlet Hood Face Velocity (FPM)					
Inlet Hoods	Area (ft^2)	300	400	500	600	700	800	850	900	950
Inlet Hood w/ Moisture Eliminator		.04	.06	.10	.15	.20	.26	.29	.33	.36
Side Inlet Hood	8.74									
Back Inlet Hood	21.88									
					Face Velocity (FPM)					
	Area (ft^2)	1000	1200	1400	1600	1800	2000	2200	2400	2600
Air Blenders	11.70	.07	.10	.14	.18	.24	.30	.37	.44	.52
					Filter Face Velocity (FPM)					
Filters**	Area (ft^2)	200	250	300	350	400	450	500	550	600
Flat Filters	29.10									
2" Throwaway	8-16x25	.27	.29	.30	.32	.34	.37	.39	-	-
2" Pleated Media	2-20x25	.52	.54	.55	.57	.59	.62	.64	.67	.70
4" Pleated Media		.52	.53	.54	.56	.57	.59	.61	.64	.66
Permanent		.51	.51	.52	.52	.53	.53	.54	55	.56
Angled Filters	47.20									
2" Throwaway	12-20x20	.27	.29	.30	.32	.34	.37	.39	-	-
2" Pleated Media	4-20x25	.52	.54	.55	.57	.59	.62	.64	.67	.70
Permanent		.51	.51	.52	.52	.53	.53	.54	.55	.56
Cartridge/Bag Filters*	28.00									
6" Cartridge - 65% Eff.	6-24x24	.56	.58	-	-	-	-	-	-	
6" Cartridge - 85% Eff.	2-12x24	.61	.65	-	-	-	-	-	-	
6" Cartridge - 95% Eff.		.63	.68	-	-	-	-	-	-	
12" Cartridge - 65% Eff.		.79	.82	.84	.88	.91	.96	1.00	1.06	1.11
12" Cartridge - 85% Eff.		.80	.82	.85	.89	.93	.98	1.03	1.09	1.15
12" Cartridge - 95% Eff.		.81	.84	.87	.92	.97	1.03	1.09	1.16	1.24
Bag - 65% Eff.		.53	.55	.57	.60	.63	.66	.70	.74	.79
Bag - 85% Eff.		.54	.57	.59	.63	.66	.71	.75	.81	.86
Bag - 95% Eff.		.55	.59	.62	.67	.72	.78	.84	.91	.99

**Filter pressure drops are based on mid-life data.
Do not exceed maximum filter face velocities shown.
Actual pressure drops may be less than shown due to variations in filter brands.
*The bypass in an internal face-and-bypass damper is not sized for 100% airflow. For applications that require 100% bypass, consult your local Trane engineer.
*Cartridge/bag filter pressure drops include a 2" throwaway pre-filter pressure drop.

Table 30-5 — Fan Data

	Fan Type					
	A	B	C	P	Q	R
Design CFM	14500	14500	14500	14500	14500	14500
Size/Type	25 FC	22 3/8 FC	22 1/4 BI	35 9/16 AF	30 Q-Fan	33 Q-Fan
Max TSP/RPM	3/811	5/1273	8/2146	6/1643	6/1940	6/1822
Bearing Size						
Drive Side	1 11/16	23/16	2 11/16	1 11/16	17/16	1 7/16
Opposite Drive Side	1 11/16		17/16	1 11/16	1 7/16	17/16
Shaft Size	1 11/16	23/16	2 11116	1 11/16	1 7/16	17/16
Outlet Area (Ft^2)	6.70	5.16	6.30	-	5.60	6.78
Motor HP Range	1-20	1-25	1-30	3-25	3/4-20	1-25
IGV Torque (Inch-Lb.)						
2000 FPM (4.0 WC)	26.5/10.0	25.0/9.5	90.0	97.0	-	-
3000 FPM (Max. RPM and BHP)	59.7/22.5	56.0/21.0	100.0	141.0	-	-

Torques are shown for open/closed operation at 2000 and 3000 fpm fan outlet velocity.

Unit Sizes

Size 35

Table 35-1 — Coil Data

1/2" Unit Coils	Area (Ft^2)	Qty-Size
UW,UU,UF	34.10	1-57x86
Shipping Coils		
Full	30.14	1-18x85
		1-33x85
Modified	21.25	2-18x85

Table 35-2 — Coil Availability

Module Size	1/2" Unit Coils	Shipping Coils
Small	2 Row	1 Row
Medium	2-8 Row	1-4 Row
Medium Large Coil	2-8 Row	1-8 Row
Medium Large Coil w/ Access	2-8 Row	1-4 Row

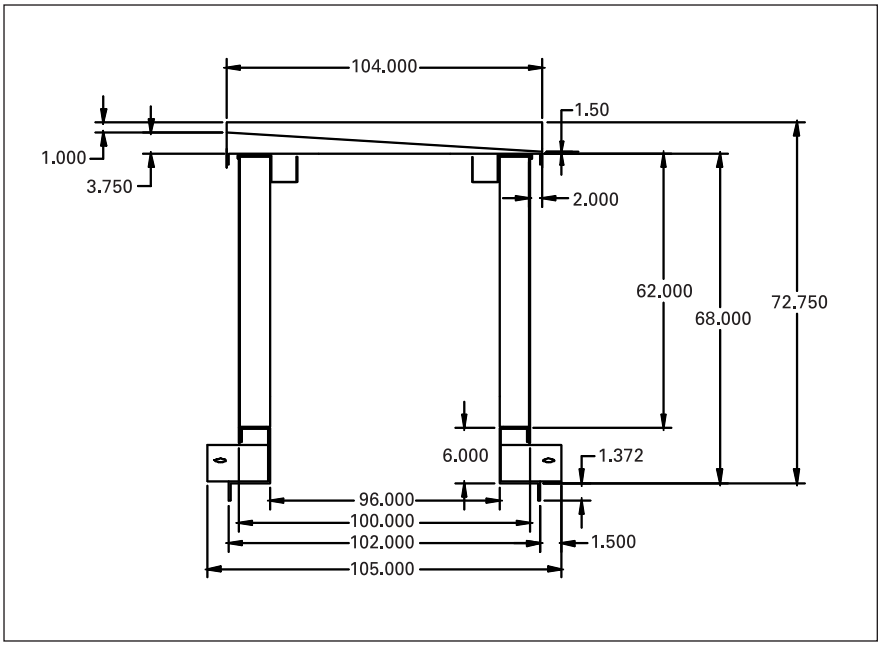
Table 35-3 — 1/2" Unit Coil Water Connection - Sizes (inches)

	UW/UU
Header Height	57
Supply	2 1/2
Return	2 1/2
Drain and Vent	3/8

Shipping coil connections are located on page 71.
See pages 71-80 for refrigerant coil connections and circuiting.

Sections	Length (inches)	Weight (lbs.)
Filter /Mixing	48	933
Economizer	72	1291
Exhaust	16	265
Air Blender	39	822
Flat Filter	11.5	235
Angled Filter	31	545
Bag Filter	48	698
Cartridge Filter	31	494
Small Blank/ Inspection	11.5	130
Medium Blank/ Access	16	169
Medium Large Blank/ Access	31	334
Large Blank/ Access	48	541
Small Coil	11.5	448
Medium Coil	16	897
Medium Large Coil	31	1759
Large Coil	48	1986
Moisture Eliminator	11.5	347
Internal Face I Bypass	16	425
Face Damper	16	425
Front Horizontal Discharge Fan	62	-
FC Fan	-	2289
BI / AF Fan	-	2389
Plenum Fan	-	1426
Q Fan (Q)	-	2842
Q Fan (R)	-	3018
Bottom Vortical Discharge Fan	73.5	-
FC Fan	-	2419
BI / AF Fan	-	2518
Plenum Fan	-	1555
Diffuser	16	293
Discharge Plenum	48	472
Side Inlet Hood	37.6	124
Back Inlet Hood	31.2	238
Exhaust Hood	37.6	84
Unit End Panels	6	448

1. Access module weights include one access door.
2. Fan module weights include largest ODP motor without IGV.
3. Add mixing module as inlet plenum on horizontal housed or vertical plug return fans.



All dimensions are in inches.

Table 35-4 — Unit Pressure Drops (Inches WG)

					Damper Face Velocity (FPM)				
Ultra Low Leak Dampers	Area (ft^2)	400	500	600	700	800	900	1000	1100	1200
Back or Bottom Damper	22.46	.01	.01	.02	.03	.04	.05	.06	.07	.08
Side Damper (each)	8.22	.01	.01	.02	.02	.03	.04	.05	.05	.06
Protective Grate	23.90	.04	.06	.09	.12	.16	.20	.25	.30	.36
	Area (ft^2)	600	800	1000	1200	1400	1600	1800	2000	2100
Exhaust or Economizer Return Dampers	8.22	.02	.03	.05	.06	.09	.11	.14	.18	.19
Internal Face and Bypass*	Area (ft^2)	400	500	600	700	800	900	1000	1100	1200
Face Area	22.46	.03	.04	.06	.08	.10	.13	.16	.19	.23
Face Damper	32.80	.02	.04	.05	.07	.09	.12	.15	.18	.21
	Area (ft^2)	1400	1600	1800	2000	2200	2400	2600	2800	3000
Bypass Area	8.49	.55	.72	.91	1.12	1.35	1.61	1.89	2.19	2.52
					Accessory Face Velocity (FPM)					
Accessories	Area (ft^2)	400	450	500	550	600	650	700	750	800
Moisture Eliminator	34.10	.01	.01	.02	.03	.03	.03	.04	.04	.05
Diffuser	34.10	.53	.67	.83	1.00	1.19	1.40	1.62	1.86	2.12
					Inlet Hood Face Velocity (FPM)					
Inlet Hoods	Area (ft^2)	300	400	500	600	700	800	850	900	950
Inlet Hood w/ Moisture Eliminator		.04	.06	.10	.15	.20	.26	.29	.33	.36
Side Inlet Hood	10.05									
Back Inlet Hood	26.58									
					Face Velocity (FPM)					
	Area (ft^2)	1000	1200	1400	1600	1800	2000	2200	2400	
Air Blenders	13.20	.07	.10	.14	.18	.24	.30	.37	.44	.52
					Filter Face Velocity (FPM)					
Filters**	Area (ft^2)	200	250	300	350	400	450	500	550	600
Flat Filters	31.90									
2" Throwaway	6-20x25	.27	.29	.30	.32	.34	.37	.39	-	-
2" Pleated Media;	4-16x25	.52	.54	.55	.57	.59	.62	.64	.67	.70
4" Pleated Media		.52	.53	.54	.56	.57	.59	.61	.64	.66
Permanent		.51	.51	.52	.52	.53	.53	.54	.55	.56
Angled Filters	63.90									
2" Throwaway	12-20x25	.27	.29	.30	.32	.34	.37	.39	-	-
2" Pleated Media	8-16x25	.52	.54	.55	.57	.59	.62	.64	.67	.70
Permanent		.51	.51	.52	.52	.53	.53	.54	.55	.56
Cartridge/Bag Filters*	30.70									
6" Cartridge - 65% Eff.	6-24x24	.56	.58	-	-	-	-	-	-	-
6" Cartridge - 85% Eff.	2-24x20	.61	.65	-	-	-	-	-	-	
6" Cartridge - 95% Eff.		.63	.68	-	-	-	-	-	-	-
12" Cartridge - 65% Eff.		.79	.82	.84	.88	.91	.96	1.00	1.06	1.11
12" Cartridge - 85% Eff.		.80	.82	.85	.89	.93	.98	1.03	1.09	1.15
12" Cartridge - 95% Eff.		.81	.84	.87	.92	.97	1.03	1.09	1.16	1.24
Bag - 65% Eff.		.53	.55	.57	.60	.63	.66	.70	.74	.79
Bag - 85% Eff.		.54	.57	.59	.63	.66	.71	.75	.81	.86
Bag - 95% Eff.		.55	.59	.62	.67	.72	.78	.84	.91	.99

**Filter pressure drops are based on mid-life data.
Do not exceed maximum filter face velocities shown.
Actual pressure drops may be less than shown due to variations in filter brands.
*The bypass in an internal face-and-bypass damper is not sized for 100% airflow. For applications that require 100% bypass, consult your local Trane engineer.
*Cartridge/bag filter pressure drops include a 2" throwaway pre-filter pressure drop.

Table 35-5 — Fan Data

	Fan Type					
	A	B	C	P	Q	R
Design CFM	17050	17050	17050	17050	17050	17050
Size/Type	27 5/8 FC	25 FC	24 1/2 AF	35 9/16 AF	33 Q-Fan	36 1/2 Q-Fan
Max TSP/RPM	3/698	5/1062	8/2148	6/1643	6/1822	6/1647
Bearing Size						
Drive Side	2 3/16	2 7/16	2 3/16	1 15/16	17/16	1 11/16
Opposite Drive Side	1	1 3/16	1 7/16	1 7/16	1 7/16	1 11/16
Shaft Size	2 3/16	2 7/16	2 15/16	1 15/16	1 7/16	1 11/16
Outlet Area (Ft^2)	8.08	6.73	7.46	-	6.78	8.30
Motor HP Range	5-25	5-30	5-40	5-30	1-25	1-30
IGV Torque (Inch-Lb.)						
2000 FPM (4.0" WC)	115/46	26/10	31/7	110.0	-	-
3000 FPM (Max. RPM and BHP)	200/104	59/22	70/17	162.0	-	-

Torques are shown for open/closed operation at 2000 and 3000 fpm fan outlet velocity.

Unit Sizes

Table 40-1 — Coil Data

1/2" Unit Coils	Area (Ft^2)	Qty-Size
UW,UU,UF	39.30	1-57x99
Shipping Coils		
Full	34.71	1-18x98
		1-33x98
Modified	24.50	2-18x98

Table 40-2 — Coil Availability

Module Size	1/2" Unit Coils	Shipping Coils
Small	2 Row	1 Row
Medium	2-8 Row	1-4 Row
Medium Large Coil	2-8 Row	1-8 Row
Medium Large Coil w/ Access	2-8 Row	1-4 Row

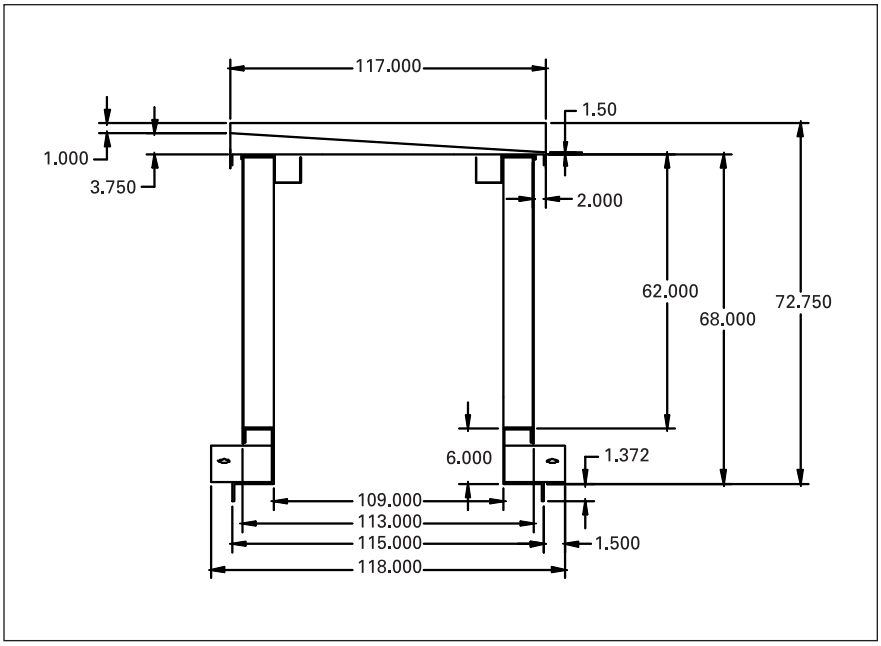
Table 40-3 — 1/2" Unit Coil Water Connection - Sizes (inches)

	UW/UU
Header Height	57
Supply	2 1/2
Return	2 1/2
Drain and Vent	3/8

Shipping coil connections are located on page 71.
See pages 71-80 for refrigerant coil connections and circuiting.

Sections	Length (inches)	Weight (lbs.)
Filter/ Mixing	48	1025
Economizer	84	1544
Exhaust	16	283
Air Blender	34.5	888
Flat Filter	11.5	249
Angled Filter	31	590
Bag Filter	48	752
Cartridge Filter	31	538
Small Blank / Inspection	11.5	139
Medium Blank/ Access	16	181
Medium Large Blank/ Access	31	364
Large Blank / Access	48	584
Small Coil	1.5	487
Medium Coil	16	1017
Medium Large Coil	31	1982
Large Coil	48	2222
Moisture Eliminator	11.5	385
Internal Face / Bypass	16	480
Face Damper	16	480
Front Horizontal Discharge Fan	62	-
FC Fan	-	2447
BI / AF Fan	-	2556
Plenum Fan	-	1494
Q Fan (Q)	-	2982
Q Fan (R)	-	3158
Bottom Vertical Discharge Fan	73.5	-
FC Fan	-	2586
BI/ AF Fan	-	2695
Plenum Fan	-	1633
Diffuser	16	322
Discharge Plenum	48	511
Side Inlet Hood	35.8	131
Back Inlet Hood	31.2	266
Exhaust Hood	35.8	85
Unit End Panels	6	497

1. Access module weights include one access door.
2. Fan module weights include largest ODP motor without IGV.
3. Add mixing module as inlet plenum on horizontal housed or vertical plug return fans.



All dimensions are in inches.

Table 40-4 — Unit Pressure Drops (Inches WG)

					Damper Face Velocity (FPM)					
Ultra Low Leak Dampers	Area (ft^2)	400	500	600	700	800	900	1000	1100	1200
Back or Bottom Damper	25.03	.01	.01	.02	.03	.03	.04	.05	.06	.08
Side Damper (each)	9.43	.01	.01	.02	.02	.03	.04	.05	.05	.06
Protective Grate	27.30	.04	.06	.09	.12	.16	.20	.25	.30	.36
	Area (ft^2)	600	800	1000	1200	1400	1600	1800	2000	2100
Exhaust or Economizer Return Dampers	9.43	.02	.03	.05	.06	.09	.11	.14	.18	.19
Internal Face and Bypass*	Area (ft^2)	400	500	600	700	800	900	1000	1100	1200
Face Area	25.03	.03	.04	.06	.08	.10	.13	.15	.19	.22
Face Damper	36.50	.02	.04	.05	.07	.09	.12	.14	.17	.21
	Area (ft^2)	1400	1600	1800	2000	2200	2400	2600	2800	3000
Bypass Area	9.46	.57	.74	.94	1.16	1.41	1.67	1.97	2.28	2.62
					Accessory Face Velocity (FPM)					
Accessories	Area(ft^2)	400	450	500	550	600	650	700	750	800
Moisture Eliminator	39.30	.01	.01	.02	.03	.03	.03	.04	.04	.05
Diffuser	39.30	.53	.67	.83	1.00	1.19	1.40	1.62	1.86	2.12
					Inlet Hood Face Velocity (FPM)					
Inlet Hoods	Area (ft^2)	300	400	500	600	700	800	850	900	950
Inlet Hood w/ Moisture Eliminator		.04	.06	.10	.15	.20	.26	.29	.33	.36
Side Inlet Hood	11.43									
Back Inlet Hood	30.27									
					Face Velocity (FPM)					
	Area (ft^2)	1000	1200	1400	1600	1800	2000	2200	2400	2600
Air Blenders	14.80	.07	.10	.14	.18	.24	.30	.37	.44	.52
					Filter Face Velocity (FPM)					
Filters**	Area (ft^2)	200	250	300	350	400	450	500	550	600
Flat Filters	36.10									
2" Throwaway	4-20x25	.27	.29	.30	.32	.34	.37	.39	-	-
2" Pleated Media	8-16x25	.52	.54	.55	.57	.59	.62	.64	.67	.70
4" Pleated Media		.52	.53	.54	.56	.57	.59	.61	.64	.66
Permanent		.51	.51	.52	.52	.5	.53	.54	.55	.56
Angled Filters	72.20									
2" Throwaway	8-20x25	.27	.29	.30	.32	.34	.37	.39	-	-
2" Pleated Media	16-16x25	.52	.54	.55	.57	.59	.62	.64	.67	.70
Permanent		.51	.51	.52	.52	.53	.53	.54	.55	.56
Cartridge/Bag Filters*	36.00									
6" Cartridge - 65% Eff.	8-24x24	.56	.58	-	-	-	-	-	-	-
6" Cartridge - 85% Eff.	2-24x12	.61	.65	-	-	-	-	-	-	
6" Cartridge - 95% Eff.		.63	.68	-	-	-	-	-	-	-
12" Cartridge - 65% Eff.		.79	.82	.84	.88	.91	.96	1.00	1.06	1.11
12" Cartridge - 85% Eff.		.80	.82	.85	.89	.93	.98	1.03	1.09	1.15
12" Cartridge - 95% Eff.		.81	.84	.87	.92	.97	1.03	1.09	1.16	1.24
Bag - 65% Eff.		.53	.55	.57	.60	.63	.66	.70	.74	.79
Bag - 85% Eff.		.54	.57	.59	.63	.66	.71	.75	.81	.86
Bag - 95% Eff.		.55	.59	.62	.67	.72	.78	.84	.91	.99

**Filter pressure drops are based on mid-life data.
Do not exceed maximum filter face velocities shown.
Actual pressure drops may be less than shown due to variations in filter brands.
*The bypass in an internal face-and-bypass damper is not sized for 100% airflow. For applications that require 100% bypass, consult your local Trane engineer.
*Cartridge/bag filter pressure drops include a 2" throwaway pre-filter pressure drop.

Table 40-5 — Fan Data

	Fan Type					
	A	B	C	P	Q	R
Design CFM	19650	19650	19650	19650	19650	19650
Size/Type	30 1/4 FC	27 5/8 FC	27 AF	39 3/8 AF	33 Q-Fan	36 1/2 Q-Fan
Max TSP/RPM	3/664	5/905	8/1910	6/1412	6/1822	6/1647
Bearing Size						
Drive Side	27/16	27/16	23/16	1 15/16	17/16	1 11/16
Opposite Drive Side	13/16	13/16	1 7/16	1 7/16	1 7/16	1 11/16
Shaft Size	27/16	27/16	37/16	1 15/16	1 7/16	1 11/16
Outlet Area (Ft^2)	9.79	8.08	9.05	-	6.78	8.30
Motor HP Range	5-25	5-30	5-50	5-30	1-25	1-30
IGV Torque (Inch-Lb.)						
2000 FPM (4.0" WC)	150/65	115/46	46/11	128.0	-	-
3000 FPM (Max. RPM and BHP)	220/120	200/104	103/25	181.0	-	-

Torques are shown for open/closed operation at 2000 and 3000 fpm fan outlet velocity.

Unit Sizes

Size 50

Table 50-1 — Coil Data

1/2" Unit Coils	Area (Ft^2)	Qty-Size
"UW,UU,UF"	49.43	2-32x110
Shipping Coils		
Full	47.69	1-30x109
		1-33x109
Modified	36.33	2-24x109

Table 50-2 — Coil Availability

Module Size	1/2" Unit Coils	Shipping Coils
Small	2 Row	1-3 Row
Medium	2-8 Row	1-4 Row
Medium Large Coil	2-8 Row	1-8 Row
Medium Large Coil w/ Access	2-8 Row	1-4 Row

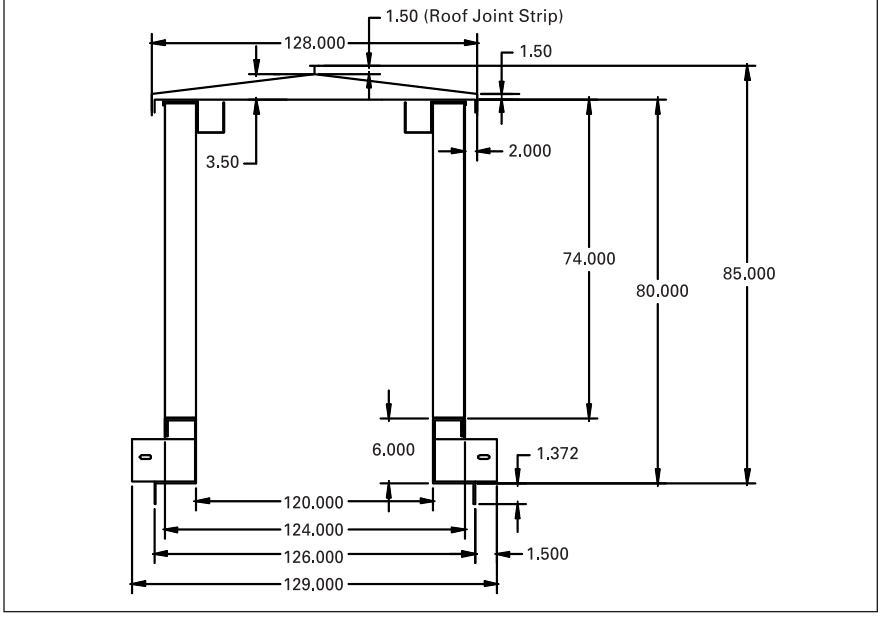
Table 50-3 — 1/2' Unit Coil Water Connection - Sizes (Inches)

	UW/UU
Header Height	2-32
Supply	2
Return	2
Drain and Vent	3/8

Shipping coil connections are located on page 71.
See pages 71-80 for refrigerant coil connections and circuiting.

Sections	Length (inches)	Weight (lbs.)
Filter / Mixing	48	1148
Economizer	84	1785
Exhaust	19	399
Air Blender	43.5	1080
Flat Filter	14.5	365
Angled Filter	31	684
Bag Filter	48	852
Cartridge Filter	31	621
Small Blank/ Inspection	14.5	221
Medium Blank/ Access	19	269
Medium Large Blank / Access	31	429
Large Blank/ Access	48	662
Small Coil	14.5	757
Medium Coil	19	1444
Medium Large Coil	31	2550
Large Coil	48	2804
Moisture Eliminator	14.5	554
Internal Face / Bypass	19	645
Face Damper	19	645
Front Horizontal Discharge Fan	68.5	-
FC Fan	-	2879
BI / AF Fan	-	3154
Plenum Fan	-	1758
Q Fan (Q)	-	3505
Q Fan (R)	-	3704
Bottom Vertical Discharge Fan	83	-
FC Fan	-	3100
BI / AF Fan	-	3374
Plenum Fan	-	1979
Diffuser	19	445
Discharge Plenum	48	571
Side Inlet Hood	43.1	170
Back Inlet Hood	31.2	291
Exhaust Hood	43.1	113
Unit End Panels	6	603

1. Access module weights include one access door.
2. Fan module weights include largest ODP motor without IGV.
3. Add mixing module as inlet plenum on horizontal housed or vertical plug return fans.



All dimensions are in inches.

Table 50-4 — Unit Pressure Drops (Inches WG)

					Damper Face Velocity (FPM)					
Ultra Low Leak Dampers	Area (ft^2)	400	500	600	700	800	900	1000	1100	1200
Back or Bottom Damper	27.86	.01	.01	.02	.02	.03	.04	.05	.06	.07
Side Dam per (each)	12.03	.01	.01	.02	.02	.03	.04	.05	.05	.06
Protective Grate	30.10	.04	.06	.09	.12	.16	.20	.25	.30	.36
	Area (ft^2)	600	800	1000	1200	1400	1600	1800	000	2100
Exhaust or Economizer Return Dampers	12.03	.02	.03	.05	.06	.09	.11	.14	.18	.19
Internal Face and Bypass*	Area (ft^2)	400	500	600	700	800	900	1000	1100	1200
Face Area	36.52	.02	.04	.05	.07	.09	.12	.14	.17	.21
Face Damper	49.30	.02	.03	.05	.07	.09	.11	.13	.16	.19
	Area (ft^2)	140	1600	1800	2000	2200	2400	2600	2800	3000
Bypass Area	10.53	.56	.73	*.93*	1.14	1.38	1.65	.93	2.24	2.57
					Accessory Face Velocity (FPM)					
Accessories	Area (ft^2)	400	450	500	550	600	650	700	750	800
Moisture Eliminator	49.43	.01	.01	.02	.03	.03	.03	.04	.04	.05
Diffuser	49.43	.53	.67	.83	1.00	1.19	1.40	1.62	1.86	2.12
					Inlet Hood Face Velocity (FPM)					
Inlet Hoods	Area (ft^2)	300	400	500	600	700	800	850	900	950
Inlet Hood w/ Moisture Eliminator		.04	.06	.10	.15	.20	.26	.29	.33	.36
Side Inlet Hood	14.24									
Back Inlet Hood	33.50									
					Face Velocity (FPM)					
	Area (ft^2)	1000	1200	1400	1600	1800	2000	2200	2400	2600
Air Blenders	19.80	.07	.10	.14	.18	.24	.30	.37	.44	.52
					Filter Face Velocity (FPM)					
Filters**	Area (ft^2)	200	250	300	350	400	450	500	550	600
Flat Filters	48.30									
2″ Throwaway	12-20x25	.27	.29	.30	.32	.34	.37	.39	—	—
2" Pleated Media	3-16x20	.52	.54	.55	.57	.59	.62	.64	.67	.70
4″ Pleated Media		.52	.53	.54	.56	.57	.59	.61	.64	.66
Permanent		.51	.51	.52	.52	.53	.53	.54	.55	.56
Angled Filters	80.60									
2″ Throwaway	20-20x25	.27	.29	.30	.32	.34	.37	.39	—	—
2″ Pleated Media	4-16x25	.52	.54	.55	.57	.59	.62	.64	.67	.70
Permanent		.51	.51	.52	.52	.53	.53	.54	.55	.56
Cartridge/Bag Filters*	54.80									
6" Cartridge - 65% Eff.	8-24x24	.56	.58	—	—	—	—	—	—	—
6" Cartridge - 85% Eff.	6-24x20	.61	.65	—	—	—	—	—	—	—
6" Cartridge - 95% Eff.	1-20x20	.63	.68	—	—	—	—	—	—	—
12" Cartridge - 65% Eff.		.79	.82	.84	.88			1.00	1.06	1.11
12" Cartridge - 85% Eff.		.80	.82	.85	.89	.93	.98	1.03	1.09	1.15
12" Cartridge - 95% Eff.		.81	.84	.87	.92	.91	1.03	1.09	1.16	1.24
Bag - 65% Eff.		.53	.55	.57	.60	.63	.66	.70	.74	.79
Bag - 85% Eff.		.54	.57	.59	.63	.66	.71	.75	.81	.86
Bag - 95% Eff.		.55	.59	.62	.67	.72	.78	.84	.91	.99

**Filter pressure drops are based on mid-life data.
Do not exceed maximum filter face velocities shown.
Actual pressure drops may be less than shown due to variations in filter brands.
*The bypass in an internal face-and-bypass damper is not sized for 100% airflow. For applications that require 100% bypass, consult your local Trane engineer.
*Cartridge/bag filter pressure drops include a 2" throwaway pre-filter pressure drop.

Table 50-5 — Fan Data

	Fan Type					
	A	B	C	P	Q	R
	24715	24715	24715	24715	24715	24715
Size/Type	33 FC	30 1/4 FC	30 AF	43 7/16 AF	36 1/2 Q-Fan	40 1/4 Q-Fan
Max TSP/RPM	3/580	5/870	8/1719	6/1334	6/1647	6/1492
Bearing Size						
Drive Side	2 7/16	2 11/16	2 7/16	2 3/16	1 11/16	1 11/16
Opposite Drive Side	1 3/16	1 7/16	1 11/16	1 7/16	1 11/16	1 11/16
Shaft Size	2 7/16	2 11/16	3 15/16	2 3/16	1 11/16	1 11/16
Outlet Area (Ft^2)	11. 69	9 .79	11.17	—	8.30	10.09
Motor HP Range	5-30	5-40	5-60	5-40	1-30	1 1/2-40
IGV Torque (Inch-Lb.)						
2000 FPM (4.0" WC)	215/100	150/65	62/15	160.0	—	NA
3000 FPM (Max. RPM and BHP)	310/180	220/120	142/35	227.0	—	—

Torques are shown for open/closed operation at 2000 and 3000 fpm fan outlet velocity. For plug fans torques shown at 4.0″ WC and at Max. RPM and BHP.

Unit Sizes

Size 66

Table 66-1 — Coil Data

1/2" Unit Coils	Area (Ft^2)	Qty-Size
UW,UU,UF	65.63	2-37x126
Shipping Coils		
Full	63.00	3-24x126
Modified	49.88	1-24x126
		1-33x126

Table 66-2 — Coil Availability

Module Size	1/2" Unit Coils	Shipping Coils
Small	2 Row	1-3 Row
Medium	2-8 Row	1-6 Row
Medium Large	-	1-8 Row

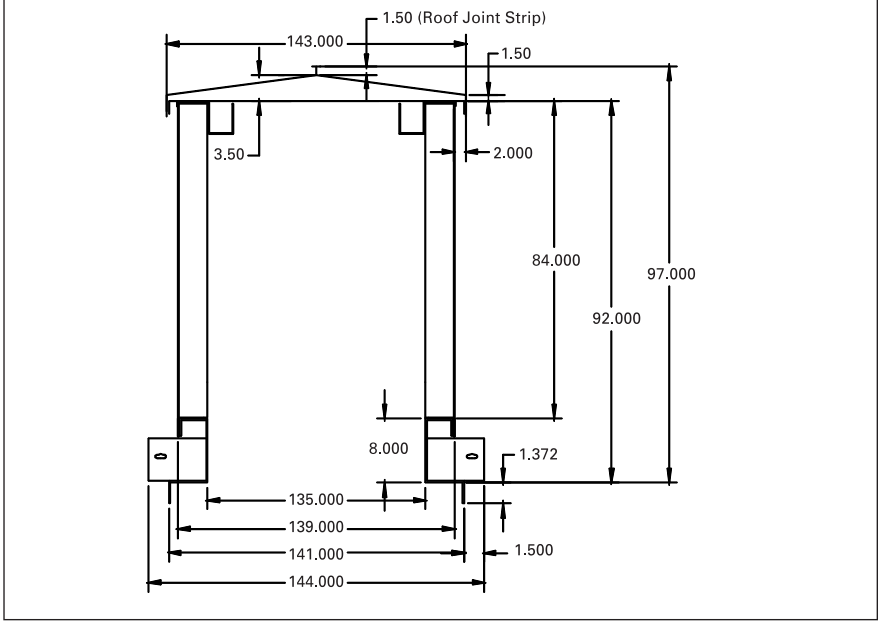
Table 66-3 — 1/2" Unit Coil Water Connection - Sizes (inches)

	UW/UU
Header Height	2-37
Supply	2
Return	2
Drain and Vent	3/8

Shipping coil connections are located on page 71.
See pages 71-80 for refrigerant coil connections and circuiting.

Sections	Length (inches)	Weight (lbs.)
Filter/ Mixing	49	1367
Economizer	96	2147
Exhaust	19	464
Air Blender	48	1257
Flat Filter	14.5	432
Angled Filter	29.5	797
Bag Filter	49	1046
Cartridge Filter	29.5	761
Small Blank / Inspection	14.5	252
Medium Blank /Access	19	307
Medium Large Blank/ Access	29.5	472
Large Blank/ Access	49	775
Small Coil	14.5	933
Medium Coil	19	1850
Medium Large Coil	29.5	3372
Large Coil	-	-
Moisture Eliminator	14.5	710
Internal Face / Bypass	19	753
Face Damper	19	753
Front Horizontal Discharge Fan	84	-
FC Fan	-	3972
BI / AF Fan	-	4398
Plenum Fan	-	3922
Q Fan (Q)	-	4961
Q Fan (R)	-	5128
Bottom Vertical Discharge Fan	84	-
FC Fan	-	3972
BI / AF Fan	-	4398
Plenum Fan	-	3922
Diffuser	49	913
Discharge Plenum	49	651
Side Inlet Hood	48.4	220
Back Inlet Hood	34.6	368
Exhaust Hood	48.4	144
Unit End Panels	6	797

1. Access module weights include one access door.
2. Fan module weights include largest ODP motor without IGV.
3. Add mixing module as inlet plenum on horizontal housed or vertical plug return fans.



All dimensions are in inches.

Table 66-4 — Unit Pressure Drops (inches WG)

					Damper Face Velocity (FPM)				
Ultra Low Leak Dampers	Area (ft^2)	400	500	600	700	800	900	1000	1100	1200
Back or Bottom Damper	36.05	.01	.01	.02	.02	.03	.03	.04	.05	.06
Side Damper (each)	15.92	.01	.01	.02	.02	.03	.04	.05	.05	.06
Protective Grate	40.30	.04	.06	.09	.12	.16	.20	.25	.30	.36

	Area (ft^2)	600	800	1000	1200	1400	1600	1800	2000	2100
Exhaust or Economizer Return Dampers	15.92	.02	.03	.05	.06	.09	.11	.14	.18	.19

Internal Face and Bypass*	Area (ft^2)	400	500	600	700	800	900	1000	1100	1200
Face Area	51.42	.02	.03	.05	.07	.09	.11	.13	.16	.19
Face Damper	64.30	.02	.03	.05	.06	.08	.10	.13	.15	.18

	Area (ft^2)	1400	1600	1800	2000	2200	2400	2600	2800	3000
Bypass Area	16.91	.43	.56	.71	.87	1.06	1.26	1.48	1.71	1.97

					Accessory Face Velocity (FPM)					
Accessories	Area (ft^2)	400	450	500	550	600	650	700	750	800
Moisture Eliminator	65.63	.01	.01	.02	.03	.03	.03	.04	.04	.05
Diffuser	65.63	.53	.67	.83	1.00	1.19	1.40	1.62	1.86	2.12

					Inlet Hood Face Velocity (FPM)					
Inlet Hoods	Area (ft^2)	300	400	500	600	700	800	850	900	950
Inlet Hood w/ Moisture Eliminator		.04	.06	.10	.15	.20	.26	.29	.33	.36
Side Inlet Hood	19.03									
Back Inlet Hood	43.28									

					Face Velocity (FPM)					
	Area (ft^2)	1000	1200	1400	1600	1800	2000	2200	2400	2600
Air Blenders	27.41	.07	.10	.14	.18	.24	.30	.37	.44	.52

					Filter Face Velocity (FPM)					
Filters**	Area (ft^2)	200	250	300	350	400	450	500	550	600
Flat Filters	68.60									
2" Throwaway	2-16x25	.27	.29	.30	.32	.34	.37	.39	-	-
2" Pleated Media	4-16x20	.52	.54	.55	.57	.59	.62	.64	.67	.70
4" Pleated Media	6-20x25	.52	.53	.54	.56	.57	.59	.61	.64	.66
Permanent	12-20x20	.51	.51	.52	.52	.53	.53	.54	.55	.56
Angled Filters	108.30									
2" Throwaway	12-20x25	.27	.29	.30	.32	.34	-37	.39	-	-
2" Pleated Media	24-20x20	.52	.54	.55	.57	.59	.62	.64	.67	.70
Permanent		.51	.51	.52	.52	.53	.53	.54	.55	.56
Cartridge/Bag Filters*	73.30									
6" Cartridge - 65% Eff.	12-20x24	.56	.58	—	—	—	—	—	—	—
6" Cartridge - 85% Eff.	12-20x20	.61	.65	—	—	—	—	—	—	—
6" Cartridge - 95% Eff.		.63	.68	—	—	—	—	—	—	—
12" Cartridge - 65% Eff.		.79	.82	.84	.88	.91	.96	1.00	1.06	1.11
12" Cartridge - 85% Eff.		.80	.82	.85	.89	.93	.98	1.03	1.09	1.15
12" Cartridge - 95% Eff.		.81	.84	.87	.92	.97	1.03	1.09	1.16	1.24
Bag - 65% Eff.		.53	.55	.57	.60	.63	.66	.70	.74	.79
Bag - 85% Eff.		.54	.57	.59	.63	.66	.71	.75	.81	.86
Bag - 95% Eff.		.55	.59	.62	.67	.72	.78	.84	.91	.99

**Filter pressure drops are based on mid-life data.
Do not exceed maximum filter face velocities shown.
Actual pressure drops may be less than shown due to variations in filter brands.
*The bypass in an internal face-and-bypass damper is not sized for 100% airflow. For applications that require 100% bypass, consult your local Trane engineer.
*Cartridge/bag filter pressure drops include a 2" throwaway pre-filter pressure drop.

Table 66-5 — Fan Data

	Fan Type					
	A	B	C	P	Q	R
Design CFM	32815	32815	32815	32815	32815	32815
Size/Type	33 FC	36 1/2 AF	33 AF	52 7/8 AF	40 1/4 Q-Fan	44 1/2 Q-Fan
Max TSP/RPM	6/760	8/1413	8/1562	6/968	6/1636	6/1352
Bearing Size						
Drive Side	2 7/16	2 7/16	2 7/16	2 7/16	1 11/16	1 15/16
Opposite Drive Side	1 7/16	1 7/16	1 7/16	1 7/16	1 11/16	1 15/16
Shaft Drive	2 7/16	3 15/16	3 15/16	2 7/16	1 11/16	1 15/16
Outlet Area (Ft^2)	11.69	16.54	13.51	—	10.09	12.33
Motor HP Range	10-60	15-75	20-75	7 1/2-50	1 1/2-40	2-50
IGV Torque (Inch-Lb.)						
2000 FPM (4.0" WC)	215/100	113/27	84/20	217.0	—	—
3000 FPM (Max. RPM and BHP)	310/180	256/63	189/46	289.0	—	—

Torques are shown for open/closed operation at 2000 and 3000 fpm fan outlet velocity. For plug fans torques shown at 4.0" WC and at Max. RPM and BHP.

Unit Sizes

Table 80-1 — Coil Data

1/2" Unit Coils	Area (Ft^2)	Qty-Size
UW,UU,UF	78.75	2-45x 126
Shipping Coils		
Full	76.13	1-24x126
		1-30x126
		1-33x126
Modified	60.38	2-18x126
		1-33x126

Table 80-2 — Coil Availability

Module Size	1/2" Unit Coils	Shipping Coils
Small	2 Row	1-3 Row
Medium	2-8 Row	1-6 Row
Medium Large	-	1-8 Row

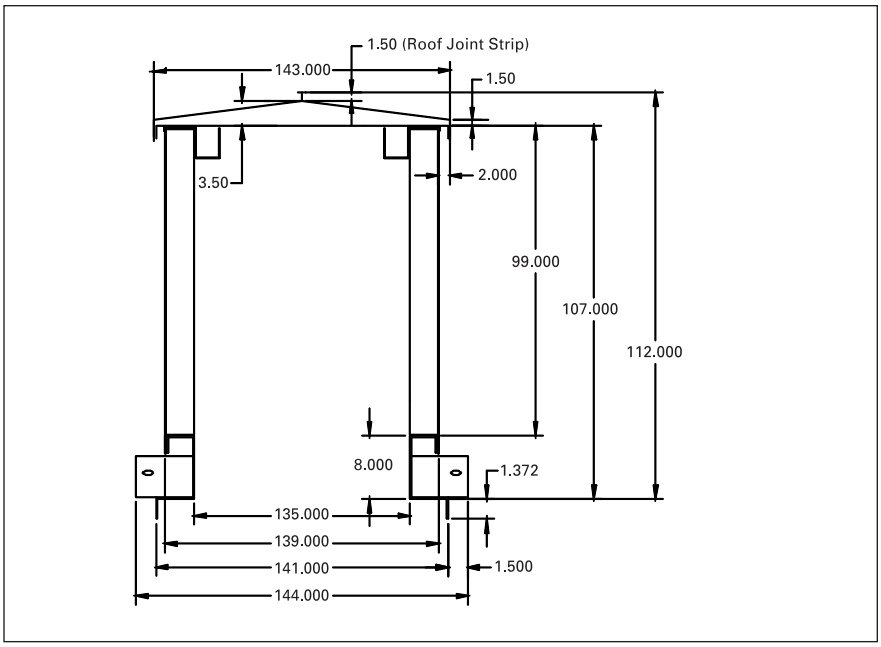
Table 80-3 — 1/2" Unit Coil Water Connection - Sizes (inches)

	UW/UU
Header Height	2-45
Supply	2 1/2
Return	2 1/2
Drain and Vent	3/8

Shipping coil connections are located on page 71.
See pages 71-80 for refrigerant coil connections and circuiting..

Sections	Length (inches)	Weight (lbs.)
Filter/ Mixing	54	1511
Economizer	96	2382
Exhaust	19	506
Air Blender	48	1386
Flat Filter	14.5	477
Angled Filter	29.5	839
Bag Filter	54	1163
Cartridge Filter	29.5	798
Small Blank/ Inspection	14.5	262
Medium Blank/ Access	19	319
Medium Large Blank/ Access	29.5	491
Large Blank/ Access	54	870
Small Coil	14.5	1040
Medium Coil	19	2143
Medium Large Coil	29.5	3884
Large Coil	-	-
Moisture Eliminator	14.5	786
Internal Face / Bypass	19	852
Face Damper	19	852
Front Horizontal Discharge Fan	92	-
FC Fan	-	-
BI / AF Fan	-	4822
Plenum Fan	-	4649
Q Fan (Q)	-	5497
Q Fan (R)	-	-
Bottom Vertical Discharge Fan	92	-
FC Fan	-	-
BI / AF Fan	-	4822
Plenum Fan	-	4649
Diffuser	54	1029
Discharge Plenum	54	769
Side Inlet Hood	56.4	273
Back Inlet Hood	38.2	414
Exhaust Hood	56.4	183
Unit End Panels	6	887

1. Access module weights include one access door.
2. Fan module weights include largest ODP motor without IGV.
3. Add mixing module as inlet plenum on horizontal housed or vertical plug return fans.



All dimensions are in inches.

Table 80-4 — Unit Pressure Drops (Inches WG)

					Damper Face Velocity (FPM)				
Ultra Low Leak Dampers	Area (ft^2)	400	500	600	700	800	900	1000	1100	1200
Back or Bottom Damper	40.90	.01	.01	.01	.02	.03	.03	.04	.05	.06
Side Damper (each)	19.26	.01	.01	.02	.02	.03	.04	.05	.05	.06
Protective Grate	44.90	.04	.06	.09	.12	.16	.20	.25	.30	.36
	Area (ft^2)	600	800	1000	1200	1400	1600	1800	2000	2100
Exhaust or Economizer Return Dampers	19.2	6.02	.03	.05	.06	.09	.11	.14	.18	.19
Internal Face and Bypass*	Area (ft^2)	400	500	600	700	800	900	1000	1100	1200
Face Area	61.29	.02	.03	.05	.06	.08	.10	.13	.15	.18
Face Damper	79.20	.02	.03	.04	.06	.08	.10	.12	.15	.18
	Area (ft^2)	1400	1600	1800	2000	2200	2400	2600	2800	3000
Bypass Area	16.91	.43	.56	.71	.87	1.06	1.26	1.48	1.71	1.97
					Accessory Face Velocity (FPM)					
Accessories	Area (ft^2)	400	450	500	550	600	650	700	750	800
Moisture-Eliminator	78.75	.01	.01	.02	.03	.03	.03	.04	.04	.05
Diffuser	78.75	.53	.67	.83	1.00	1.19	1.40	1.62	1.86	2.12
					Inlet Hood Face Velocity (FPM)					
Inlet Hoods	Area (ft^2)	300	400	500	600	700	800	850	900	950
Inlet Hood w/ Moisture Eliminator		.04	.06	.10	.15	.20	.26	.29	.33	.36
Side Inlet Hood	22.65									
Back Inlet Hood	48.65									
					Face Velocity (FPM)					
	Area (ft^2)	1000	1200	1400	1600	1800	2000	2200	2400	2600
Air Blenders	28.86	.07	.10	.14	.18	.24	.30	.37	.44	.52
					Filter Face Velocity (FPM)					
Filters**	Area (ft^2)	200	250	300	350	400	450	500	550	600
Flat Filters	83.10									
2" Throwaway	4-16x25	.27	.29	.30	.32	.34	.37	.39	-	-
2" Pleated Media	8-16x20	.52	.54	.55	.57	.59	.62	.64		.70
4" Pleated Media	6-20x25	.52	.53	.54	.56	.57	.59	.61	.64	.66
Permanent	12-20x20	.51	.51	.52	.52	.53	.53	.54	.55	.56
Angled Filters	137.50									
2" Throwaway	30-20x25	.27	.29	.30	.32	.34	.37	.39	-	-
2" Pleated Media	12-16x25	.52	.54	.56	.57	.59	.62	.64	.67	.70
Permanent		.51	.51	.52	.52	.53	.53	.54	.55	.56
Cartridge/Bag Filters*	80.70									
6" Cartridge - 65% Eff.	6-20x24	.56	.58	-	-	-	-	-	-	-
6" Cartridge - 85% Eft.	6-20x20	.61	.65	-	-	-	-	-	-	-
6" Cartridge - 95% Eff.	6-24x24	.63	.68	-	-	-	-	-	-	-
12" Cartridge - 65% Eff.	6-24x20	.79	.82	.84	.88	.91	.96	1.00	1.06	1.11
12" Cartridge - 85% Eff.		.80	.82	.85	.89	.93	.98	1.03	1.09	1.15
12" Cartridge - 95% Eff.		.81	.84	.87	.92	.97	1.03	1.09	1.16	1.24
Bag - 65% Eff.		.53	.55	.57	.60	.63	.66	.70	.74	.79
Bag - 85% Eff.		.54	.57	.59	.63	.66	.71	.75	.81	.86
Bag - 95% Eff.		.55	.59	.62	.67	.72	.78	.84	.91	.99

**Filter pressure drops are based on mid-life data.
Do not exceed maximum filter face velocities shown
Actual pressure drops may be less than shown due to variations in filter brands.
*The bypass in an internal face-and-bypass damper is not sized for 100% airflow. For applications that require 100% bypass, consult your local Trane engineer.
*Cartridge/bag filter pressure drops include a 2" throwaway pre-filter pressure drop.

Table 80-5 — Fan Data

	Fan Type				
	A	B	C	P	Q
Design CFM	39375	39375	39375	39375	39375
Size/Type	40 1/4 AF	36 1/2 AF	33 AF	58 1/2 AF	44 1/2 Q-Fan
Max TSP/RPM	5/996	8/1413	8/1562	6/875	6/1485
Bearing Size					
Drive Side	2 3/16	2 7/16	2 7/16	2 11/16	1 15/16
Opposite Drive Side	1 7/16	1 7/16	1 7/16	1 7/16	1 15/16
Shaft Size	3 7/16	3 15/16	3 15/16	2 11/16	1 15/16
Outlet Area (Ft^2)	20.14	16.54	13.51	-	12.33
Motor HP Range	15-50	20-75	20-75	7 1/2-60	2-50
IGV Torque (Inch-Lb.)					
2000 FPM (4.0" WC)	100/62	113/27	84/20	262.0	-
3000 FPM (Max. RPM and BHP)	216/140	256/63	189/46	361.0	-

Torques are shown for open/closed operation at 2000 and 3000 fpm fan outlet velocity.
For plug fans torques at shown 4.0" WC and at Max. RPM and BHP.

Unit Sizes

Table 100-1 – Coil Data

1/2" Unit Coils	Area (Ft^2)	Qty-Size
UW,UU,UF	100.40	2-51x141
Shipping Coils		
Full	96.94	3-33x141
Modified	76.38	2-24x141
		1-30x141

Table 100-2 – Coil Availability

Module Size	1/2" Unit Coils	Shipping Coils
Small	2 Row	1-3 Row
Medium	2-8 Row	1-6 Row
Medium Large	-	1-8 Row

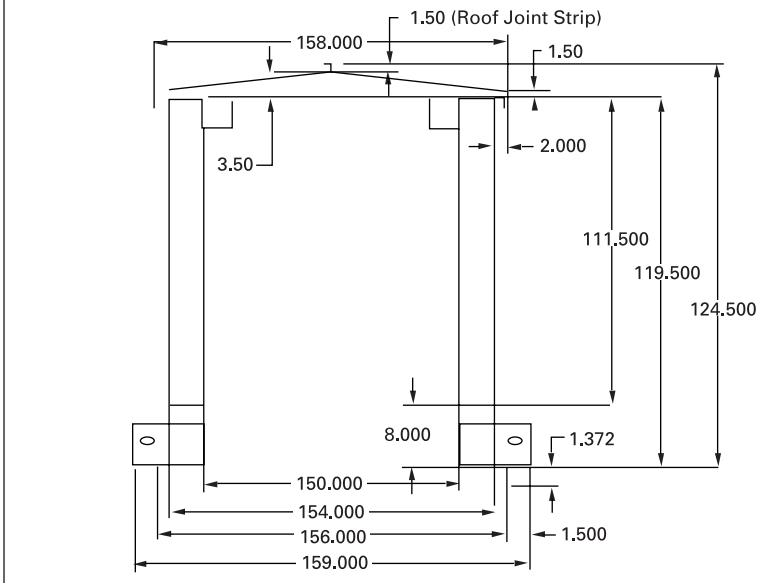
Table 100-3 —1/2" Unit Coil Water Connection - Sizes (Inches)

	UW/UU
Header Height	2-51
Supply	2 1/2
Return	2 1/2
Drain and Vent	3/8

Shipping coil connections are located on page 71.
See pages 71-80 for refrigerant coil connections and circuiting.

Sections	Length (inches)	Weight (lbs.)
Filter / Mixing	60	1817
Economizer	96	2984
Exhaust	19	572
Air Blender	58.5	1640
Flat Filter	14.5	546
Angled Filter	29.5	964
Bag Filter	60	1414
Cartridge Filter	29.5	911
Small Blank / Inspection	14.5	288
Medium Blank/ Access	19	350
Medium Large Blank/ Access	29.5	538
Large Blank/ Access	60	1056
Small Coil	14.5	1237
Medium Coil	19	2608
Medium Large Coil	29.5	4738
Large Coil	-	-
Moisture Eliminator	14.5	928
Internal Face / Bypass	19	1002
Face Damper	19	1002
Front Horizontal Discharge Fan	96	-
FC Fan	-	-
BI / AF Fan	-	5628
Plenum Fan	-	5585
Q Fan (Q)	-	-
Q Fan (R)	-	-
Bottom Vertical Discharge Fan	96	-
FC Fan	-	-
BI / AF Fan	-	5628
Plenum Fan	-	5585
Diffuser	60	1257
Discharge Plenum	60	928
Side Inlet Hood	67.2	352
Back Inlet Hood	41.2	505
Exhaust Hood	67.2	242
Unit End Panels	6	1051

1. Access module weights include one access door.
2. Fan module weights include largest ODP motor without IGV.
3. Add mixing module as inlet plenum on horizontal housed or vertical plug return fans.



All dimensions are in inches.

Table 100-4 — Unit Pressure Drops (Inches WG)

					Damper Face Velocity (FPM)					
Ultra Low Leak Dampers	Area (ft^2)	400	500	600	700	800	900	1000	1100	1200
Back or Bottom Damper	51.40	.01	.01	.01	.02	.02	.03	.03	.04	.05
Side Damper (each)	23.88	.00	.00	.00	.00	.00	.00	.00	.00	.00
Protective Grate	56.10	.04	.06	.09	.12	.16	.20	.25	.30	.36
	Area (ft^2)	600	800	1000	1200	1400	1600	1800	2000	2100
Exhaust or Economizer Return Dampers	23.88	.02	.03	.05	.06	.09	.11	.14	.18	.19
Internal Face and Bypass*	Area (ft^2)	400	500	600	700	800	900	1000	1100	1200
Face Area	76.64	.02	.03	.04	.06	.08	.10	.12	.15	.17
Face Damper	99.90	.02	.03	.04	.06	.07	.09	.12	.14	.17
	Area (ft^2)	1400	1600	1800	2000	2200	2400	2600	2800	3000
Bypass Area	18.96	.42	.55	.70	.87	1.05	1.25	1.46	1.70	1.95
					Accessory Face Velocity (FPM)					
Accessories	Area (ft^2)	400	450	500	550	600	650	700	750	800
Moisture Eliminator	100.40	.01	.01	.02	.03	.03	.03	.04	.04	.05
Diffuser	100.40	.53	.67	.83	1.00	1.19	1.40	1.62	1.86	2.12
					Inlet Hood Face Velocity (FPM)					
Inlet Hoods	Area (ft^2)	300	400	500	600	700	800	850	900	950
Inlet-Hood w/ Moisture Eliminator		.04	.06	.10	.15	.20	.26	.29	.33	.36
Side Inlet Hood	27.57									
Back Inlet Hood	60.16									
					Face Velocity (FPM)					
	Area (ft^2)	1000	1200	1400	1600	1800	2000	2200	2400	2600
Air Blenders	37.70	.07	.10	.14	.18	.24	.30	.37	.44	-.52
					Filter Face Velocity (FPM)					
Filters**	Area (ft^2)	200	250	300	350	400	450	500	550	600
Flat Filters	104.70									
2" Throwaway	20-16x25	.27	.29	.30	.32	.34	.37	.39	-	-
2" Pleated Media	4-16x20	.52	.54	.55	.57	.59	.62	.64	.67	.70
4" Pleated Media	10-20x25	.52	.53	.54	.56	.57	.59	.61	.64	.66
Permanent	2-20x20	.51	.51	.52	.52	.53	.53	.54	.55	.56
Angled Filters	161.10									
2" Throwaway	40-20x25	.27	.29	.30	.32	.34	.37	.39	-	-
2" Pleated Media	8-20x20	.52	.54	.55	.57	.59	.62	.64	.67	.70
Permanent		.51	.51	.52	.52	.53	.53	.54	.55	.56
Cartridge/Bag Filters*	106.90									
6" Cartridge - 65% Eff.	8-20x24	.56	.58	-	-	-	-	-	-	-
6" Cartridge - 85% Eff.	20-20x20	.61	.65	-	-	-	-	-	-	-
6" Cartridge - 95% Eff.	5-24x20	.63	.68	-	-	-	-	-	-	-
12" Cartridge - 65% Eff.	2-24x24	.79	.82	.84	.88	.91	.96	1.00	1.06	1.11
12" Cartridge - 85% Eff.		.80	.82	.85	.89	.93	.98	1.03	1.09	1.15
12" Cartridge - 95% Eff.		.81	.84	.87	.92	.97	1.03	1.09	1.16	1.24
Bag - 65% Eff.		.53	.55	.57	.60	.63	.66	.70	.74	.79
Bag - 85% Eff.		.54	.57	.59	.63	.66	.71	.75	.81	.86
Bag - 95% Eff.		.55	.59	.62	.67	.72	.78	.84	.91	.99

**Filter pressure drops are based on mid-life data.
Do not exceed maximum filter face velocities shown.
Actual pressure drops may be less than shown due to variations in filter brands.
*The bypass in an internal face-and-bypass damper is not sized for 100% airflow. For applications that require 100% bypass, consult your local Trane engineer.
*Cartridge/bag filter pressure drops include a 2" throwaway pre-filter pressure drop.

Table 100-5 — Fan Data

	Fan Type			
	A	B	C	P
Design CFM	50200	50200	50200	50200
Size/Type	44 1/2 AF	40 1/4 AF	36 1/2 AF	64 3/4 AF
Max TSP/RPM	5/901	8/1281	8/1413	6/791
Bearing Size				
Drive Side	2 7/16	2 15/16	2 15/16	2 15/16
Opposite Drive Side	1 7/16	1 7/16	1 7/16	1 11/16
Shaft Size	3 7/16	1 7/16	4 1/2	2 15/16
Outlet Area (Ft^2)	24.62	20.14	16.54	-
Motor HP Range	15-60	25-100	30-100	10-75
IGV Torque (Inch-Lb.)				
2000 FPM (4.0" WC)	124/80	100/62	113/27	330.0
3000 FPM (Max. RPM and BHP)	278/181	216/140	256/63	446.0

Torques are shown for open/closed operation at 2000 and 3000 FPM fan outlet velocity.
For plug fans torques shown at 4.0" WC and at Max. RPM and BHP.

General Data

T-Series External Piping Cabinet
Table G-1 lists the T-Series external piping cabinet sizes by unit size, and cabinet depth, and Table G-2 lists external cabinet weights. If external cabinets are ordered on contiguous modules, on the same side of the unit (I.E. small coil module, medium access module, medium coil module, with external cabinets on the RH side on each module), then the external cabinet must be the same depth on each module. External cabinets are available as an option on coil, access, face and bypass, and eliminator modules.

In addition, if a module is ordered with an access door and an external cabinet, the module access door cannot be on the same side of the unit as the external cabinet.

Space inside the piping cabinets may limit the ability to house control valves, balancing valves, etc., along with coil piping. The actual required space needs to be verified when configuring a unit.

Table G-1 — External Cabinet Length and Width

	Module Size/Cabinet Length (inches)				Cabinet Depth (inches)		
Unit Size	Small	Medium	Medium-Large	Large	Reduced	Standard	Extended
3	11	15 ½	NA	24 ¾	15 ½	31	46 ½
6	11	15 ½	NA	27 ¼	15 ½	31	46 ½
8	11	15 ½	NA	31	15 ½	31	46 ½
10	11	15 ½	24 ½	34	15 ½	31	46 ½
12	11	15 ½	24 ½	34	15 ½	31	46 ½
14	11	15 ½	24 ½	34	15 ½	31	46 ½
17	11	15 ½	24 ½	34	15 ½	31	46 ½
21	11	15 ½	24 ½	34	15 ½	31	46 ½
25	11	15 ½	24 ½	40	15 ½	31	46 ½
30	11	15 ½	24 ½	40	15 ½	31	46 ½
35	11 ½	16	31	48	16	32	48
40	11 ½	16	31	48	16	32	48
50	14 ½	19	31	48	19	38	52 ½
66	14 ½	19	29 ½	49	19	38	52 ½
80	14 ½	19	29 ½	54	19	38	52 ½
100	14 ½	19	29 ½	60	19	38	52 ½

Table G-2 — External Cabinet Weights (lbs.)

Unit	Small			Medium			Medium-Large			Large		
Size	Reduced	Standard	Extended	Reduced	Standard	Extended	Reduced	Standard	Extended	Reduced	Standard	Extended
3	63	94	125	71	104	136	- Not Available -			88	124	159
6	67	99	132	75	109	143	- Not Available -			98	136	174
8	72	107	142	81	117	154	- Not Available -			112	153	195
10	77	113	150	86	124	162	112	154	195	128	172	217
12	82	122	161	92	133	173	120	164	208	136	183	230
14	85	126	166	95	137	179	124	169	214	141	189	237
17	91	134	177	101	146	190	132	180	227	149	200	250
21	99	145	191	109	157	204	141	192	242	159	213	267
25	108	157	207	119	170	221	154	208	262	185	244	304
30	108	157	207	119	170	221	154	208	262	185	244	304
35	131	188	246	145	205	264	193	258	322	231	302	372
40	131	188	246	145	205	264	193	258	322	231	302	372
50	162	237	312	186	264	342	230	313	396	273	363	453
66	184	270	355	210	299	388	257	351	445	307	409	510
80	210	307	404	239	339	439	292	398	503	362	477	591
100	231	338	444	263	373	482	322	437	551	417	543	670

General Data

T-Series Perforated Double Wall Weight Add

Table G-3 lists the additional weight that should be added to a T-Series discharge plenum module, when 2" perforated double wall is included. Discharge plenum weights can be found in the T-Series quick select chart. Module floor, access door(s) (if ordered), or side discharge wall(s) (if ordered) are not covered with a 2" perforated liner.

Table G-3 — T-Series Perforated Double Wall Weight Add

Unit Size	3	6	8	10	12	14	17	21
Perforated Weight Add (lbs.)	39	46	53	63	74	86	101	119

Unit Size	25	30	35	40	50	66	80	100
Perforated Weight Add (lbs.)	139	163	191	224	262	308	361	423

T-Series Curb Weight

The 14" standard curb for a T-Series unit weighs 10 lbs per linear foot. To calculate the total curb weight, add the unit length and width, multiply by two, and then multiply by 10 lbs, or use the table below to calculate the curb weight.

Table G-4 — Curb Weights

Unit Size	3	6	8	10	12	14	17	21
Curb End Weight (lbs)	61.6	83.3	90	110	116.6	123.3	133.28	136.6
Curb Size Weight	Take total unit length in inches, and multiply by 1.67 lbs and add to the above curb end weight							

Unit Size	25	30	35	40	50	66	80	100
Curb End Weight (lbs)	139.9	161.6	169.9	191.6	209.9	234.9	234.9	259.9
Curb Size Weight	Take total unit length in inches, and multiply by 1.67 lbs and add to the above curb end weight							

Example – Size #21 T-Series unit with mixing module, small coil module, medium access module, medium coil module, and fan module (down discharge), total unit length is 166". Total curb weight would be 413.8 lbs ((166 x 1.67) + 136.6).

T-Series Traq™ Damper Sizes and Quantities

Table G-5 lists sizes and quantities of back and side Traq dampers by unit size. Back Traq dampers are available only on mixing modules. Side Traq damper(s) are available on mixing modules, and in the 2nd outside air damper location in an economizer module. Traq dampers cannot be ordered in both the side and back damper position of a mixing module, or in the bottom damper position of a mixing module. Traq dampers are not available in the 1st outside air damper position, the return air damper position, or in the exhaust air damper position of an economizer module.

Table G-5 — T-Series Traq Damper Sizes and Quantities

	Back Traq Dampers		Side Traq Dampers (per side)	
Unit Size	Diameter(")	Quantity	Diameter(")	Quantity
3	13	1	13	1
6	13	2	13	1
8	13	2	13	1
10	13	3	16	1
12	16	3	16	1
14	16	3	16	1
17	16	3	13	2
21	20	2	13	2
25	24	2	16	2
30	20	3	16	2
35	24	3	20	2
40	24	3	28	1
50	28	3	20	2
66	28	4	24	2
80	28	5	28	2
100	28	6	24	3

General Data

T-Series Traq Damper Air Pressure Drops

Table G-6 is to be used for calculation of Traq damper pressure drops, when located in the back position of a mixing module. Table G-7 is to be used for calculation of Traq damper pressure drops, when located in the side(s) of a mixing module, or in the 2nd outside air damper location in an economizer module.

Table G-6 – Back Traq Damper Area and Pressure Drop

Unit Size	Damper Area (Ft^2)	Air Velocity through Damper																		
		800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	2500
3	.9	.04	.05	.07	.08	.09	.11	.13	.15	.17	.19	.21	.25	.26	.29	.31	.34	.36	.39
6	1.8	.04	.05	.06	.07	.08	.10	.11	.13	.15	.17	.19	.21	.23	.26		*		
8	1.8	.04	.05	.07	.08	.10	.11	.13	.15	.17	.20	.22	.24	.27	.30	.33	.36	.39	*
10	2.7	.04	.05	.07	.08	.09	.11	.13	.15	.17	.19	.21	.24	.26	.29	.32	.35	.38	.41
12	4.1	.04	.05	.06	.07	.08	.10	.11	.13	.15	.16	.18	.21	.23	.25	.27	.30	*	
14	4.1	.04	.05	.06	.07	.09	.10	.12	.14	.16	.18	.20	.22	.25	.27	.30	.32	.35	.38
17	4.1	.04	.06	.07	.08	.10	.12	.13	.15	.18	.20	.22	.25	.28	.30	.33	.35	.38	.41
21	4.3	.04	.05	.06	.07	.08	.10	.12	.13	.15	.17	.19	.21	.24	.26	.29	.32	.35	.38
25	6.2	.04	.05	.06	.08	.09	.11	.13	.15	.17	.19	.21	.23	.26	.29	.32	.35	.38	.41
30	6.5	.04	.04	.06	.07	.08	.09	.11	.12	.14	.16	.18	.20	.22	.24	.26	.29	.32	.34
35	9.4	.04	.05	.06	.07	.09	.10	.12	.14	.16	.18	.20	.22	.25	.27	.29	.32	.35	.38
40	9.4	.04	.05	.07	.08	.10	.11	.13	.15	.17	.19	.22	.24	.27	.29	.31	.34	.37	.41
50	12.8	.04	.05	.07	.08	.10	.11	.13	.15	.17	.19	.21	.24	.26	.29	.32	.35	.38	.41
66	12.6	.04	.05	.06	.07	.08	.10	.12	.13	.15	.17	.19	.21	.24	.26	.29	.32	.35	.38
80	17.1	.04	.05	.06	.07	.08	.10	.12	.13	.15	.17	.19	.21	.24	.26	.29	.32	.35	.38
100	18.8	.04	.05	.07	.08	.10	.11	.13	.15	.17	.19	.22	.24	.27	.29	.31	.34	.37	.40

* - Exceeds maximum inlet hood velocity

Table G-7 – Side Traq Damper Area and Pressure Drop

Unit Size	Damper Area (Ft^2)	Air Velocity through Damper																		
		800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	2500
3	.92	.04	.05	.07	.08	.09	.11	.13	.15	.17	.19	.21	.24	.26			*		
6	.92	.04	.05	.07	.08	.09	.11	.13	.15	.17	.19	.21	.24	.26	.29		*		
8	.92	.04	.05	.07	.08	.09	.11	.13	.15	.17	.19	.21	.24	.26	.29	.32	.35	.38	.41
10	1.40	.04	.05	.07	.08	.09	.11	.13	.15	.17	.19	.21	.24	.26	.29	.32		*	
12	1.40	.04	.05	.07	.08	.09	.11	.13	.15	.17	.19	.21	.24	.26	.29	.32	.35	.38	.41
14	1.40	.04	.05	.07	.08	.09	.11	.13	.15	.17	.19	.21	.24	.26	.29	.32	.35	.38	.41
17	1.85	.04	.05	.06	.07	.08	.10	.11	.13	.15	.17	.19	.21	.23	.26	.29	.32	.35	.38
21	1.85	.04	.05	.06	.07	.08	.10	.11	.13	.15	.17	.19	.21	.23	.26	.29	.32	.35	.38
25	2.79	.04	.05	.06	.07	.08	.10	.12	.13	.15	.17	.19	.21	.24	.26	.28	.31	.34	*
30	2.79	.04	.05	.06	.07	.08	.10	.12	.13	.15	.17	.19	.21	.24	.26	.28	.31	.34	.37
35	4.36	.04	.05	.06	.07	.08	.10	.12	.13	.15	.17	.19	.21	.24	.26	.29		*	
40	4.28	.04	.05	.06	.07	.08	.10	.12	.13	.15	.17	.19	.21	.24	.26	.29	.32	.35	.39
50	4.36	.04	.05	.06	.07	.08	.10	.12	.13	.15	.17	.19	.21	.24	.26	.29	.32	.35	.39
66	6.28	.04	.05	.06	.07	.08	.10	.12	.13	.15	.17	.19	.21	.24	.26	.29	.32	.35	.38
80	8.56	.04	.05	.06	.07	.08	.10	.12	.13	.15	.17	.19	.21	.24	.26	.29	.32	.35	.38
100	9.42	.04	.05	.07	.08	.10	.11	.13	.15	.17	.19	.22	.24	.27	.29	.31	.34	.37	.40

***** - Exceeds maximum inlet hood velocity

Note –

Damper area and velocity are per each side on a mixing module with side Traq dampers, or the area and velocity through the 2nd outside air damper position on an economizer module.

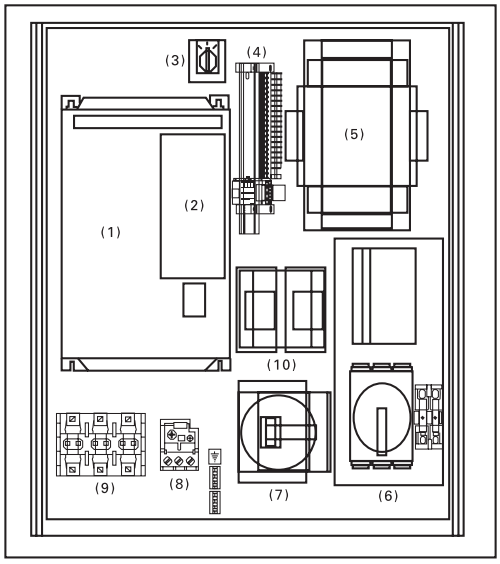
General Data

T-Series VFD Input Line Current Requirements
Table G-8 addresses the input line current requirements for a T-Series factory mounted VFD. The line current is for each VFD on the unit.

Table G-8 — T-Series VFD Line Input Requirements

	Voltage		
Motor Horsepower	200	230	460
1	6.3	5.8	2.9
1½	10.9	9.2	4.9
2	10.9	9.2	4.9
3	14.8	12.4	6.7
5	22.3	18.7	10.0
7½	31.1	26.2	14.1
10	39.4	33.2	17.8
15	55.6	46.9	25.0
20	70.8	60.0	32.1
25	85.2	81.2	38.9
30	97.7	81.2	44.2
40	124.7	102.4	57.3
50		123.0	68.5
60			86.6
75			106.2
100			138.2
For units with controls, add the following to the supply fan VFD	2	1.8	.9

Typical T-Series VFD Layout



1. Drive
2. Keypad
3. Key operated drive-off or drive-off-bypass[a] switch
4. Terminal strip
5. Transformer – 100va[a], 500va[b], or 2Kva [C]
6. Main disconnect switch[C]
7. Drive disconnect switch
8. Electronic overload[a]
9. Drive fuses
10. Bypass contactors[a]

(a) - only when ordered with bypass
(b) - only when ordered with controls
(c) - future option

General Data

Table G-9 — Shipping Coil Water and Steam Connection Sizes

Coil Type	Header Height	Supply	Return	Drain/Vent
W,WA	18,24,30,33	2 1/2	2 1/2	1/2
W	42,48,54	2 1/2	2 1/2	1/2
D,DD,WD,K	18,24,30,33	2 1/2	2 1/2	1/2
P2	18,24,30	3/4	3/4	1/2
P4	18,24,30	1	1	1/2
P8	18,24,30	1 1/4	1 1/4	1/2
WC	18	1	1	1/2
WC	24	1 1/4	1 1/4	1/2
WC	30,33	2 1/2	1 1/2	1/2
NS	18	2	1	1
NS	24	2 1/2	1 1/4	1 1/4
NS	30,33	3	1 1/4	1 1/4

All fittings have female threads.

Table G-10 — 5/8" Type F Refrigerant Coil Connections (Inches)

Header Height	Circuiting	No. of Circuiting	1 Distributor		2 Distributors	
			Liquid	Suction	Liquid	Suction
18	Full	12	1 3/8	2 1/8	1 1/8	2 1/8
	Half	6	1 1/8	2 1/8	7/8	1 5/8
	Quarter	3	7/8	1 5/8	N/A	N/A
	Eighth	2	7/8	1 3/8	5/8	5/8
	Sixteenth	1	5/8	5/8	N/A	N/A
24	Full	16	N/A	N/A	1 1/8	2 1/8
	Half	8	1 1/8	2 1/8	7/8	1 3/8
	Quarter	4	7/8	1 5/8	7/8	1 3/8
	Eighth	2	7/8	1 3/8	5/8	5/8
30	Full	20	N/A	N/A	1 3/8	2 1/8
	Half	10	1 3/8	2 1/8	7/8	2 1/8
	Quarter	5	7/8	2 1/8	N/A	N/A
	Eighth	4	7/8	1 5/8	7/8	1 3/8
	Sixteenth	2	7/8	1 3/8	5/8	5/8
33	Full	22	N/A	N/A	1 3/8	2 1/8
	Half	11	1 3/8	2 1/8	Note 1	2 1/8
	Quarter	7	1 1/8	2 1/8	7/8	1 5/8
	Eighth	3	7/8	1 5/8	N/A	N/A

Same end connections only.
1. 6-circuit connection is 1 1/8-inches, 5-circuit is 7/8 inches.

Table G-11 — UF Refrigerant Coil Connections (Inches)

Unit Size	Header Height	Rows	Dist. Tube	No. Circuits	Circuiting	1 Distributors		2 Distributors		4 Distributors	
						Liquid	Suction	Liquid	Suction	Liquid	Suction
3	21	4,6,8	1/4	16	Full			1 1/8	1 5/8		
			3/16	16				1 1/8	1 5/8		
		4,6	1/4	8	Half	1 1/8	1 5/8	7/8	1 3/8		
			3/16	8		1 1/8	1 5/8	5/8	1 3/8		
		4	1/4	4	Qtr.	7/8	1 3/8	7/8	1 3/8		
			3/16	4		5/8	1 3/8	5/8	1 3/8		
6	23	4,6,8	1/4	18	Full			1 1/8	1 5/8		
			3/16	18				1 1/8	1 5/8		
		4,6	1/4	9	Half	1 1/8	1 5/8	7/8	1 3/8		
			3/16	9		1 1/8	1 5/8	Note 1	1 3/8		
		4	1/4	4	Qtr.	7/8	1 3/8	7/8	1 3/8		
			3/16	4		5/8	1 3/8	5/8	1 3/8		
8,10	27	4,6,8	1/4	21	Full			Note 2	1 5/8		
			3/16	21				1 1/8	1 5/8		
		4,6	1/4	10	Half	1 1/8	1 5/8	7/8	1 3/8		
			3/16	10		1 1/8	1 5/8	7/8	1 3/8		
		4	1/4	5	Qtr.	7/8	1 3/8	7/8	1 3/8		
			3/16	5		7/8	1 3/8	5/8	1 3/8		
12	32	4,6,8	1/4	25	Full			1 3/8	1 5/8		
			3/16	25				1 1/8	1 5/8		
		4,6	1/4	12	Half	1 3/8	1 5/8	1 1/8	1 3/8		
			3/16	12		1 1/8	1 5/8	7/8	1 3/8		
		4	1/4	6	Qtr.	1 1/8	1 5/8	7/8	1 3/8		
			3/16	6		7/8	1 3/8	5/8	1 3/8		
14	35	4,6,8	1/4	27	Full			1 3/8	1 5/8		
			3/16	27				1 1/8	1 5/8		
		4,6	1/4	13	Half	1 3/8	1 5/8	1 1/8	1 3/8		
			3/16	13		1 1/8	1 5/8	7/8	1 3/8		
17	37	4,6,8	1/4	29	Full					1 1/8	Note 3
			3/16	29						Note 4	Note 3
		4,6	1/4	14	Half			1 1/8	1 3/8		
			3/16	14				7/8	1 3/8		
21	45	4,6,8	1/4	35	Full					1 1/8	1 5/8
			3/16	35						1 1/8	1 5/8
		4,6	1/4	17	Half			1 1/8	1 5/8	7/8	1 3/8
			3/16	17				1 1/8	1 5/8	Note 5	1 3/8
25,30	51	4,6,8	1/4	40	Full					1 1/8	1 5/8
			3/16	40						1 1/8	1 5/8
		4,6	1/4	20	Half			1 1/8	1 5/8	7/8	1 3/8
			3/16	20				1 1/8	1 5/8	7/8	1 3/8

Notes:
Number of connections — Size (Inches)
1. 1- 5/8, 1- 7/8
2. 1-1 1/8 and 1-1 3/8
3. 3-1 3/8 and 1-1 5/8
4. 3 7/8 and 1-1 1/8
5. 3 5/8 and 1 7/8

Table G-12 — UF Refrigerant Coil Connections (Inches)

Unit Size	Header Height	Rows	Dist. Tube	No. Circuits	Circuiting	2 Distributors		4 Distributors		8 Distributors	
						Liquid	Suction	Liquid	Suction	Liquid	Suction
35,40	57	4,6,8	1/4	45	Full			1 3/8	1 5/8		
			3/16	45				1 1/8	1 5/8		
		4,6	1/4	22	Half	1 3/8	1 5/8	Note 1	1 3/8		
			3/16	22		1 1/8	1 5/8	7/8	1 3/8		
50	2-32	4,6,8	1/4	50	Full			1 3/8	1 5/8		
			3/16	50				1 1/8	1 5/8		
		4,6	1/4	24	Half	1 3/8	1 5/8	1 1/8	1 3/8		
			3/16	24		1 1/8	1 5/8	7/8	1 3/8		
		4	1/4	12	Qtr.	1 1/8	1 3/8	7/8	1 3/8		
			3/16	12		1 1/8	1 3/8	5/8	1 3/8		
66	2-37	4,6,8	1/4	58	Full					1 1/8	Note 2
			3/16	58						Note 3	Note 2
		4	1/4	29	Half			1 1/8	1 3/8		
			3/16	29				7/8	1 3/8		
80	2-45	4,6,8	1/4	70	Full					1 1/8	1 5/8
			3/16	70						1 1/8	1 5/8
		4	1/4	35	Half			1 1/8	1 5/8	7/8	1 3/8
			3/16	35				1 1/8	1 5/8	Note 4	1 3/8
100	2-51	4,6,8	1/4	80	Full					1 1/8	1 5/8
			3/16	80						1 1/8	1 5/8
		4,6	1/4	40	Half			1 1/8	1 5/8	7/8	1 3/8
			3/16	40				1 1/8	1 5/8	7/8	1 3/8

Notes:
Number of connections — Size (Inches):
1. 2 7/8, 2-1 1/8
2. 6-1 3/8 and 2-1 5/8

Coil Circuiting
Standard circuiting on Type UF coils means that the number of distributors is minimized. In the cases where more than one distributor is required, the coil is horizontally split (so as the coil is unloaded, sections of the face of the coil are de-energized).

Intertwined circuiting means that each distributor feeds alternating tubes along the whole face of the coil. This results in the full face of the coil (half for sizes 17 to 40) remaining energized under part-load conditions.

The terms "Full," "Half" and "Quarter" refer to the number of tubes in a coil row which are fed refrigerant: Full - all the tubes, Half- half, etc. The refrigerant in a half-circuited coil makes twice as many passes through the coil as the refrigerant in a full circuited coil. The notation "3/1" for distributor and "11/12" for circuits per distributor means that 3 distributors feed 11 circuits each, and that 1 distributor feeds 12 circuits. All coil circuiting tables follow this convention. The circuiting presented here is by unit size. Unit sizes 50 to 100 have two stacked Type UF coils.

Table G-13 — Type UF Coil Circuiting

		STANDARD						INTERTWINED					
		Full		Half		Quarter		Full		Half		Quarter	
Unit	Coil	A		B		C		A		B		C	
Size	Rows	Dist.	Cir/Dist.	Dist.	Cir/Dist.	Dist.	Cir/Dist.	Dist.	Cir/Dist.	Dist.	Cir/Dist.	Dist.	Cir/Dist.
	4	2	8	1	8	1	4	2	8	2	4	2	2
3	6	2	8	1	8			2	8	2	4		
	8	2	8					2	8				
	4	2	9	1	9	1	4	2	9	2	4/5	2	2
6	6	2	9	1	9	2	9	2	4/5				
	8	2	9					2	9				
	4	2	10/11	1	10	1	5	2	10/11	2	5	2	2/3
8,10	6	2	10/11	1	10			2	10/11	2	5		
	8	2	10/11					2	10/11				
	4	2	12/13	1	12	1	6	2	12/13	2	6	2	3
12	6	2	12/13	1	12			2	12/13	2	6		
	8	2	12/13					2	12/13				
	4	2	13/14	1	13			2	13/14	2	6/7		
14	6	2	13/14	1	13			2	13/14	2	6/7		
	8	2	13/14					2	13/14				
	4	3/1	7/8	2	7			3/1	7/8	2	7		
17	6	3/1	7/8	2	7			3/1	7/8	2	7		
	8	3/1	7/8					3/1	7/8				
	4	1/3	8/9	2	8/9			1/3	8/9	3/1	4/5		
21	6	1/3	8/9	2	8/9			1/3	8/9	3/1	4/5		
	8	1/3	8/9					1/3	8/9				
	4	4	10	2	10			4	10	4	5		
25,30	6	4	10	2	10			4	10	4	5		
	8	4	10					4	10				
	4	3/1	11/12	2	11			3/1	11/12	2/2	5/6		
35,40	6	3/1	11/12	2	11			3/1	11/12	2/2	5/6		
	8	3/1	11/12					3/1	11/12				
	4	2/2	12/13	2	12			2/2	12/13	4	6		
50	6	2/2	12/13	2	12			2/2	12/13	4	6		
	8	2/2	12/13					2/2	12/13				
	4	6/2	7/8	4	7			6/2	7/8	4	7		
66	6	6/2	7/8	4	7			6/2	7/8	4	7		
	8	6/2	7/8					6/2	7/8				
	4	2/6	8/9	2/2	8/9			2/6	8/9	6/2	4/5		
80	6	2/6	8/9	2/2	8/9			2/6	8/9	6/2	4/5		
	8	2/6	8/9					2/6	8/9				
	4	8	10	4	10			8	10	8	5		
100	6	8	10	4	10			8	10	8	5		
	8	8	10					8	10				

Table G-14 — Type F Coil Circuiting — Full

			STANDARD									
			Full		Half		Quarter		Eighth		Sixteenth	
Unit	Header	Coil	A		B		C		D		E	
Size	Height	Rows	Dist.	Cir/Dist.	Dist.	Cir/Dist.	Dist.	Cir/Dist.	Dist.	Cir/Dist.	Dist.	Cir/Dist.
3,6	18″	2,3	1	12	1	6	1	3	1	2	1	1
		4	1	12	1	6	1	3	1	2		
		6,8	1	12	1	6	1	3				
8,10	24″	2,3,4	2	8	1	8	1	4	1	2		
		6,8	2	8	1	8	1	4				
12,14	30″	2	2	10	1	10	1	5	1	4	1	2
		3,4	2	10	1	10	1	5	1	4		
		6,8	2	10	1	10						
17	33″	2,3	2	11	1	11	1	7	1	3		
		4,6	2	11	1	11	1	7				
		8	2	11	1	11						
21	2-18″	2,3	2	12	2	6	2	3	2	2	2	1
		4	2	12	2	6	2	3	2	2		
		6,8	2	12	2	6	2	3				
25,30	1-18″	2,3,4	1/2	12/8	2	6/8	2	3/4	2	2		
	1-24″	6,8	1/2	12/8	2	6/8	2	3/4				
35,40	1-18″	2,3	1/2	12/11	2	6/11	2	3/7				
	1-33″	4,6	1/2	12/11	2	6/11	2	3/7				
		8	1/2	12/11	2	6/11						
50		2,3	2/2	10/11	2	10/11	2	5/7	2	4/3		
	1-30″	4,6	2/2	10/11	2	10/11	2	5/7				
	1-33″	8	2/2	10/11	2	10/11						
66	3-24″	2,3,4	6	8	3	8	3	4	3	2		
		6,8	6	8	3	8	3	4				
80	1-24″	2,3	2/2/2	8/10/11	3	8/10/11	3	4/5/7	3	2/4/3		
	1-30″	4,6	2/2/2	8/10/11	3	8/10/11	3	4/5/7				
	1-33″	8	2/2/2	8/10/11	3	8/10/11						
100	3-33″	2,3	6	11	3	11	3	7	3	3		
		4,6	6	11	3	11	3	7				
		8	6	11	3	11						

The notation “1/2” for distributor and “12/8” for circuits per distributor means that 1 distributor feeds 12 circuits and that 2 distributors feed 8 circuits each.

Table G-15 — Type F Coil Circuiting — Full

			HORIZONTAL SPLIT									
			Full		Half		Quarter		Eighth		Sixteenth	
Unit	Header	Coil	A		B		C		D		E	
Size	Height	Rows	Dist.	Cir/Dist.	Dist.	Cir/Dist.	Dist.	Cir/Dist.	Dist.	Cir/Dist.	Dist.	Cir/Dist.
3,6	18″	2,3,4	2	6	2	3			2	1		
		6,8	2	6	2	3						
8,10	24″	2,3,4	2	8	2	4	2	2	2	1		
		6,8	2	8	2	4	2	2				
12,14	30″	2	2	10	2	5			2	2	2	1
		3,4	2	10	2	5			2	2		
		6,8	2	10	2	5						
17	33″	2,3,4,6	2	11	2	5/6	2	3/4				
		8	2	11	2	5/6						
21	2-18″	2,3,4	4	6	4	3			4	1		
		6,8	4	6	4	3						
25,30	1-18″	2,3,4	2/2	6/8	2/2	3/4			4	1		
	1-24″	6,8	2/2	6/8	2/2	3/4						
35,40	1-18″											
	1-33″	2,3,4,6,8	2/2	6/11	2/1/1	3/5/6						
50	1-30″											
	1-33″	2,3,4,6,8	2/2	10/11	3/1	5/6						
66	3-24″	2,3,4	6	8	6	4	6	2	6	1		
		6,8	6	8	6	4	6	2				
80	1-24″											
	1-30″											
	1-33″	2,3,4,6,8	2/2/2	8/10/11	2/3/1	4/5/6						
100	3-33″	2,3,4,6,8	6	11	3/3	5/6	3/3	3/4				

Table G-16— Type F Coil Circuiting — Full

			VERTICAL SPLIT																	
			Full		1/2		Full- 1/2		1/2-Full		1/2- 1/4		1/4- 1/2		1/4- 1/4		1/4- 1/8		1/8- 1/8	
Unit	Hdr	Coil	A		B		A/B		B/A											
Size	Ht.	Rows	Dist.	Cir/Dist.	Dist.	Cir/Dist.	Dist.	Cir/Dist.	Dist.	Cir/Dist.	Dist.	Cir/Dist.	Dist.	Cir/Dist.	Dist.	Cir/Dist.	Dist.	Cir/Dist.	Dist.	Cir/Dist.
3,6	18″	4	2	12	2	6	1/1	12/6			1/1	6/3			2	3				
		6,8	2	12	2	6			1/1	6/12			1/1	3/6	2	3				
8,10	24″	4	4	8	2	8	3	8			1/1	8/4			2	4				
		6,8	4	8	2	8			3	8			1/1	4/8	2	4				
12,14	30″	4	4	10	2	10	3	10			1/1	10/5			2	5	1/1	5/4	2	4
		6	4	10	2	10			3	10			1/1	5/10	2	5			2	4
		8	4	10	2	10			3	10			1/1	5/10	2	5				
17	33″	4	4	11	2	11	3	11			1/1	11/7			2	7				
		6,8	4	11	2	11			3	11			1/1	7/11	2	7				
21	2-18″	4	4	12	4	6	2/2	12/6			2/2	6/3			4	3				
		6,8	4	12	4	6			2/2	6/12			2/2	3/6	4	3				
25,30	1-18″	4	2	12	2	6	1/1	12/6			1/1	6/3			2	3				
	1-24″		4	8	2	8	3	8			1/1	8/4			2	4				
		6,8	2	12	2	6			1/1	6/12			1/1	3/6	2	3				
			4	8	2	8			3	8			1/1	4/8	2	4				
35,40	1-18″	4	2	12	2	6	1/1	12/6			1/1	6/3			2	3				
	1-33″		4	11	2	11	3	11			1/1	11/7			2	7				
		6,8	2	12	2	6			1/1	6/12			1/1	3/6	2	3				
			4	11	2	11			3	11			1/1	7/11	2	7				
50	1-30″	4	4	10	2	10	3	10			1/1	10/5			2	5				
	1-33″		4	11	2	11	3	11			1/1	11/7			2	7				
		6,8	4	10	2	10			3	10			1/1	5/10	2	5				
			4	11	2	11			3	11			1/1	7/11	2	7				
66	3-24″	4	12	8	6	8	9	8			3/3	8/4			6	4				
		6,8	12	8	6	8			9	8			3/3	4/8	6	4				
80	1-24″	4	4	8	2	8	3	8			1/1	8/4			2	4				
	1-30″		4	10	2	10	3	10			1/1	10/5			2	5				
	1-33″		4	11	2	11	3	11			1/1	11/7			2	7				
		6,8	4	8	2	8			3	8			1/1	4/8	2	4				
			4	10	2	10			3	10			1/1	5/10	2	5				
			4	11	2	11			3	11			1/1	7/11	2	7				
100	3-33″	4	12	11	6	11	9	11			3/3	11/7			6	7				
		6,8	12	11	6	11			9	11			3/3	7/11	6	7				

Table G-17 — Type F Coil Circuiting — Modified

			STANDARD									
			Full		Half		Quarter		Eighth		Sixteenth	
Unit	Header	Coil	A		B		C		D		E	
Size	Height	Rows	Dist.	Cir/Dist.	Dist.	Cir/Dist.	Dist.	Cir/Dist.	Dist.	Cir/Dist.	Dist.	Cir/Dist.
3,6	12″	2,3,4,6	1	8	1	4	1	2	1	1		
		8	1	8	1	4	1	2				
8,10	18″	2,3	1	12	1	6	1	3	1	2	1	1
		4	1	12	1	6	1	3	1	2		
		6,8	1	12	1	6	1	3				
12,14	24″	2,3,4	2	8	1	8	1	4	1	2		
		6,8	2	8	1	8	1	4				
17	30″	2	2	10	1	10	1	5	1	4	1	2
		3, 4	2	10	1	10	1	5	1	4		
		6, 8	2	10	1	10						
21	33″	2,3	2	11	1	11	1	7	1	3		
		4,6	2	11	1	11	1	7				
		8	2	11	1	11						
25,30,	2-18″	2,3	2	12	2	6	2	3	2	2	2	1
35,40		4	2	12	2	6	2	3	2	2		
		6,8	2	12	2	6	2	3				
50	2-24″	2,3,4	4	8	2	8	2	4	2	2		
		6,8	4	8	2	8	2	4				
66	1-24″	2,3	2/2	8/11	2	8/11	2	4/7	2	2/3		
	1-33″	4,6	2/2	8/11	2	8/11	2	4/7				
		8	2/2	8/11	2	8/11						
80	2-18″	2,3	1/2	12/11	1/2	6/11	1/2	3/7	1/2	2/3		
	1-33″	4,6	1/2	12/11	1/2	6/11	1/2	3/7				
		8	1/2	12/11	1/2	6/11						
100		2,3	4/2	8/10	2/1	8/10	2/1	4/5	2/1	2/4		
	2-24″	4,6	4/2	8/10	2/1	8/10	2/1	4/5				
	1-30″	8	4/2	8/10	2/1	8/10						

The notation “2/2” for distributor and “8/11” for circuits per distributor means that 2 distributors feed 8 circuits each and that 2 distributors feed 11 circuits each.

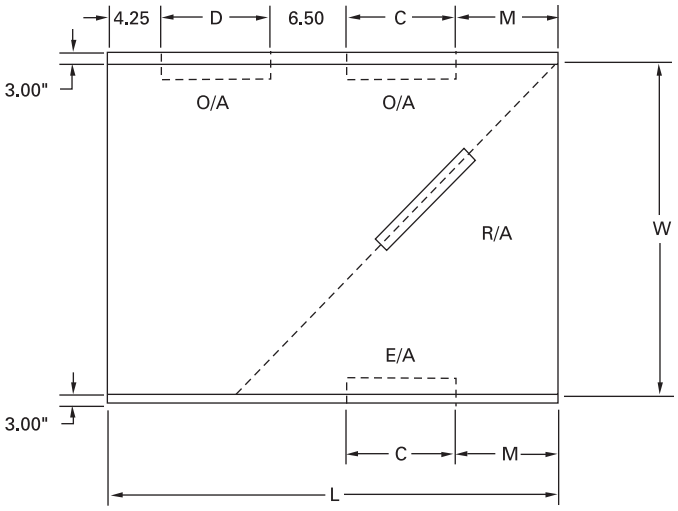
Table G-18 — Type F Coil Circuiting — Modified

			HORIZONTAL SPLIT									
			Full		Half		Quarter		Eighth		Sixteenth	
Unit	Header	Coil	A		B		C		D		E	
Size	Height	Rows	Dist.	Cir/Dist.	Dist.	Cir/Dist.	Dist.	Cir/Dist.	Dist.	Cir/Dist.	Dist.	Cir/Dist.
3,6	12″	2,3,4,6,8	2	4	2	2	2	1				
8,10	18″	2,3,4	2	6	2	3	2	1				
		6,8	2	6	2	3						
12,14	24″	2,3,4	2	8	2	4	2	2	2	1		
		6,8	2	8	2	4	2	2				
17	30″	2	2	10	2	5			2	2	2	1
		3,4	2	10	2	5			2	2		
		6,8	2	10	2	5						
21	33″	2,3,4,6	2	11	2	5/6	2	3/4				
		8	2	11	2	5/6						
25,30	2-18″	2,3,4	4	6	4	3			4	1		
35,40		6,8	4	6	4	3						
50	2-24″	2,3,4	4	8	4	4	4	2	4	1		
		6,8	4	8	4	4	4	2				
66	1-24″	2,3,4,6	2/2	8/11	2/1/1	4/5/6	2/1/1	2/3/4				
	1-33″	8	2/2	8/11	2/1/1	4/5/6						
80	2-18″											
	1-33″	2,3,4,6,8	4/2	6/11	4/1/1	3/5/6						
100	2-24″	2,3	4/2	8/10	4/2	4/5			4/2	1/2		
	1-30″	4,6,8	4/2	8/10	4/2	4/5						

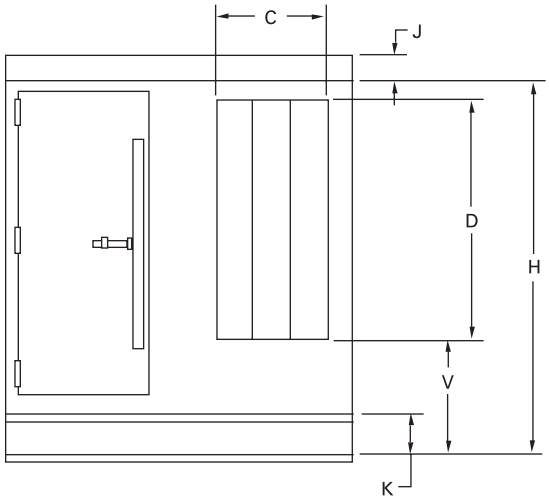
Table G-19 — Type F Coil Circuiting — Modified

			VERTICAL SPLIT																	
			Full		1/2		Full- 1/2		1/2-Full		1/2- 1/4		1/4- 1/2		1/4- 1/4		1/4- 1/8		1/8- 1/8	
Unit	Hdr	Coil	A		B		A/B		B/A											
Size	Ht.	Rows	Dist.	Cir/Dist.	Dist.	Cir/Dist.	Dist.	Cir/Dist.	Dist.	Cir/Dist.	Dist.	Cir/Dist.	Dist.	Cir/Dist.	Dist.	Cir/Dist.	Dist.	Cir/Dist.	Dist.	Cir/Dist.
3,6	12″	4	2	8	2	4	1/1	8/4			1/1	4/2			2	2				
		6,8	2	8	2	4			1/1	4/8			1/1	2/4	2	2				
8,10	18″	4	2	12	2	6	1/1	12/6			1/1	6/3			2	3				
		6,8	2	12	2	6			1/1	6/12			1/1	3/6	2	3				
12,14	24″	4	4	8	2	8	3	8			1/1	8/4			2	4				
		6,8	4	8	2	8			3	8			1/1	4/8	2	4				
17	30″	4	4	10	2	10	3	10			1/1	10/5			2	5	1/1	5/4	2	4
		6	4	10	2	10			3	10			1/1	5/10	2	5			2	4
		8	4	10	2	10			3	10			1/1	5/10	2	5				
21	33″	4	4	11	2	11	3	11			1/1	11/7			2	7				
		6,8	4	11	2	11			3	11			1/1	7/11	2	7				
25,30	2-18″	4	4	12	4	6	2/2	12/6			2/2	6/3			4	3				
35,40		6,8	4	12	4	6			2/2	6/12			2/2	3/6	4	3				
50	2-24″	4	8	8	4	8	6	8			2/2	8/4			4	4				
		6,8	8	8	4	8			6	8			2/2	4/8	4	4				
66	1-24″	4	4	8	2	8	3	8			1/1	8/4			2	4				
			4	11	2	11	3	11			1/1	11/7			2	7				
	1-33″	6,8	4	8	2	8			3	8			1/1	4/8	2	4				
			4	11	2	11			3	11			1/1	7/11	2	7				
80	2-18″	4	4	12	4	6	2/2	12/6			2/2	6/3			4	3				
			4	11	2	11	3	11			1/1	11/7			2	7				
	1-33″	6,8	4	12	4	6			2/2	6/12			2/2	3/6	4	3				
			4	11	2	11			3	11			1/1	7/11	2	7				
100	2-24″	4	8	8	4	8	6	8			2/2	8/4			4	4				
			4	10	2	10	3	10			1/1	10/5			2	5				
	1-30″	6,8	8	8	4	8			6	8			2/2	4/8	4	4				
			4	10	2	10			3	10			1/1	5/10	2	5				

TSC Economizer



TOP ELEVATION



SIDE ELEVATION

NOTE: RIGHT HAND CONFIGURATION SHOWN.

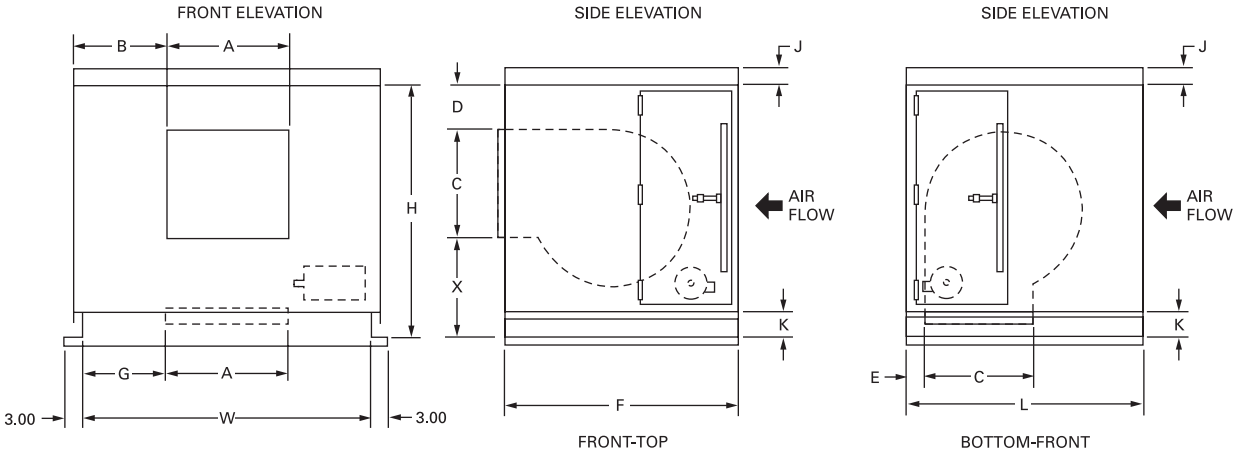
AIR FLOW

				WITH DAMPER					
UNIT SIZE	L	W	H	C	D	M	V	K	J
3	49	31	28.75	17	12	3.88	13.63	4	3.75
6	49	44	31.25	17	18	5.13	10.13	4	3.75
8	49	48	35	17	22	7.00	9.88	4	3.75
10	60.5	60	38	22.75	21	8.00	13.88	4	3.75
12	60.5	64	42	22.75	25	8.00	13.88	4	3.75
14	60.5	68	44	22.75	29	8.00	11.88	4	4.75
17	60.5	74	48	22.75	33	8.00	11.88	4	4.75
21	60.5	76	52.5	22.75	38	8.00	11.38	4	4.75
25	60.5	78	58.75	22.75	44	8.63	11.63	4	4.75
30	72	91	58.75	28.50	44	8.00	11.63	4	4.75
35	72	96	68	28.50	51	9.75	13.63	6	4.75
40	84	109	68	34.25	48	6.88	16.63	6	4.75
50	84	120	80	34.25	60	6.88	16.63	6	5
66	96	135	92	40	68	4.50	20.63	8	5
80	96	135	107	40	81	7.00	22.63	8	5
100	96	150	119.5	40	99	10.00	17.13	8	5

All Dimensions are in Inches

Jobsite Connections

TSC Fan



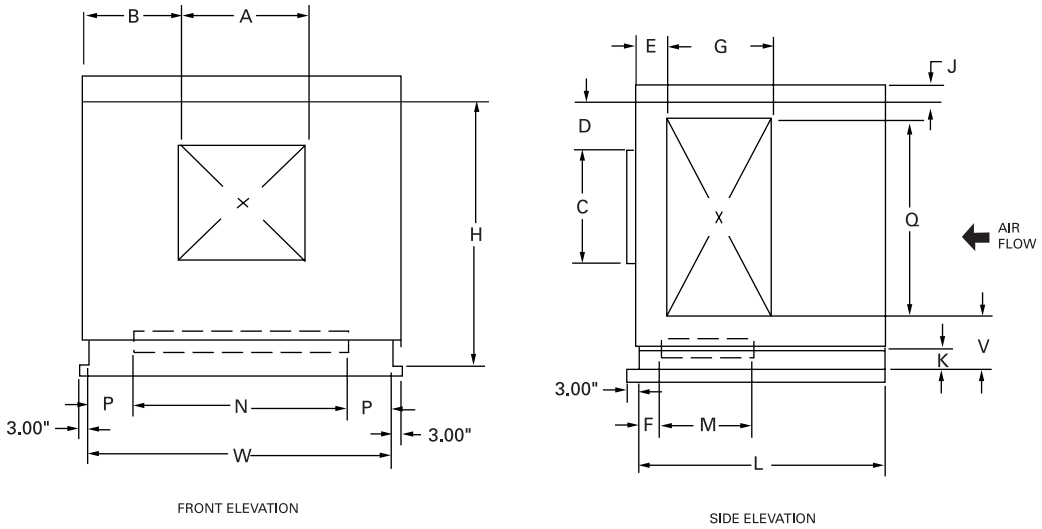
Note: Motor location may be right or left; right hand shown.

UNIT SIZE	FAN SIZE	A	B	C	D	E	G	F	L	W	H	J	K	X
3A	9 1/2 FC	12	11.5	10.5	8.13	29.63	9.5	60.75	60.75	31	28.75	3.75	4	10.125
3B	9 1/2 FC	9.5	12.75	10.5	8.13	29.63	10.75	60.75	60.75	31	28.75	3.75	4	10.125
6A	12 1/4 FC	16.63	15.83	16.88	4.88	32.5	13.63	68.25	68.25	44	31.25	3.75	4	9.5
6B	10 1/2 FC	14.5	16.75	14.5	6.5	32.5	14.75	68.25	68.25	44	31.25	3.75	4	10.25
8A	13 1/2 FC	18.5	16.75	18.5	6	37	14.75	75	75	48	35	3.75	4	10.5
10A	15 FC	20.5	14.88	20.0	6.25	31.63	12.88	58.5	69.5	60	38	3.75	4	11.75
10B	13 1/2 FC	18.5	14.38	18.5	6.38	32.5	12.38	58.5	69.5	60	38	3.75	4	13.125
10C	13 1/2 BI	18.5	13.88	18.5	6.13	32.13	11.88	58.5	69.5	60	38	3.75	4	13.375
12A	16 1/2 FC	22.5	15.25	22.25	6.13	32.75	13.25	62.5	73.5	64	42	3.75	4	13.625
12B	15 FC	20.63	14.88	20.0	6.13	33	12.8	62.5	73.5	64	42	3.75	4	15.875
12C	15 BI	20.5	14	20.0	6.13	33.38	12.0	62.5	73.5	64	42	37.5	4	15.875
14A	18 1/4 FC	24.63	15.88	24.63	6.38	32.38	13.88	64.5	75.5	68	44	4.75	4	13
14B	16 1/2 FC	22.5	15.38	22.38	6.38	34.5	13.38	64.5	75.5	68	44	4.75	4	15.25
14C	16 1/2 BI	22.5	14.13	22.38	6.25	33.5	12.13	64.5	75.5	68	44	4.75	4	15.375
17A	20 FC	27.0	16.38	27.38	6.38	32.5	14.38	68.5	79.5	74	48	4.75	4	14.25
17B	18 1/4 FC	24.63	15.88	24.63	6.38	32.88	13.88	68.5	79.5	74	48	4.75	4	17
17C	18 1/4 BI	24.63	14.75	24.63	6.25	33.25	12.75	68.5	79.5	74	48	4.75	4	17.125
21A	22 3/8 FC	27.5	15.38	27.38	6.25	34.38	13.38	73	84	76	52.50	4.75	4	18.875
21B	20 FC	27.0	16.38	27.38	6.13	34.75	14.38	73	84	76	52.50	4.75	4	19
21C	20 BI	27.0	14.88	27.38	6.13	32.88	12.88	73	84	76	52.50	4.75	4	19
25A	25 FC	31.5	16.5	31.5	6.38	10	14.5	54.75	65.75	78	58.75	4.75	4	20.875
25B	22 3/8 FC	27.5	15.5	27.38	6.38	10.5	13.5	54.75	65.75	78	58.75	4.75	4	25
25C	22 1/4 BI	30.0	14.88	30.5	6.25	10.88	12.88	54.75	65.75	78	58.75	4.75	4	22
30A	25 FC	31.5	22	31.5	6.25	10	20.0	54.75	65.75	91	58.75	4.75	4	21
30B	22 3/8 FC	27.63	25.88	27.38	6.25	10.38	23.88	54.75	65.75	91	58.75	4.75	4	25.125
30C	22 1/4 BI	30.13	23.38	30.5	6.25	11	21.38	54.75	65.75	91	58.75	4.75	4	22
35A	27 5/8 FC	34.63	18.88	34.38	8.13	7.00	16.88	62	73.5	96	68	4.75	6	25.5
35B	25 FC	31.5	20.38	31.5	12	9.25	18.38	62	73.5	96	68	4.75	6	24.5
35C	24 1/2 AF	35.5	18.5	31.13	12	9.25	16.5	62	73.5	96	68	4.75	6	24.875
40A	30 1/4 FC	37.88	21.5	37.88	7.13	6.63	19.5	62	73.5	109	68	4.75	6	23
40B	27 5/8 FC	25.63	23.13	34.38	8.25	7.00	21.13	62	73.5	109	68	4.75	6	25.375
40C	27 AF	39	20	34.25	8.88	6.75	18	62	73.5	109	68	4.75	6	24.875
50A	33 FC	41.38	25.5	41.38	121	7	23.5	68.5	83	120	80	5	6	26.625
50B	30 1/4 FC	37.88	27.38	37.88	14	11.25	25.38	68.5	83	120	80	5	6	28.125
50C	30 AF	43.25	24.5	38.0	15	11.63	22.5	68.5	83	120	80	5	6	27
66A	33 FC	41.5	39.75	41.5	13.5	20.13	37.75	84	84	135	92	5	8	37
66B	36 1/2 FC	52.38	34.38	45	7.13	13.63	32.38	84	84	135	92	5	8	39.875
66C	33 AF	47.5	36.75	41.63	12.5	19.13	34.75	84	84	135	92	5	8	37.875
80A	40 1/4 AF	57.88	31.63	50.75	16.25	15.13	29.63	92	92	135	107	5	8	40
80B	36 1/2 AF	52.5	34.25	46.13	22.13	21.50	32.25	92	92	135	107	5	8	38.75
80C	33 AF	47.5	36.75	41.63	27.5	26	34.75	92	92	135	107	5	8	37.875
100A	44 1/2 AF	63.88	36	56	22.13	10.25	34	96	96	150	119.5	5	8	41.375
100B	40 1/4 AF	58	39	50.88	28.75	18.13	37	96	96	150	119.5	5	8	39.875
100C	36 1/2 AF	52.5	41.75	46.13	34.63	24.5	39.75	96	96	150	119.5	5	8	38.75

All Dimensions are in Inches

Jobsite Connections

TSC Front Plenum

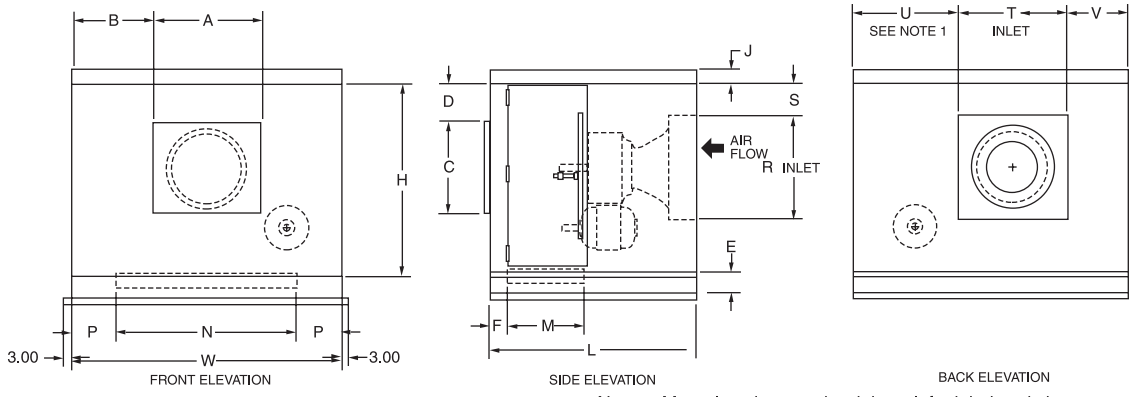


UNIT SIZE	A	B	C	D	L	W	H	K	J	F	M	N	P	G	Q	E	V
3	12	11.5	10.56	8.13	24.75	31	28.75	4	3.75	9.13	13.88	17.63	6.63	14.25	9.25	7.25	13.63
6	16.63	15.69	16.86	4.75	27.25	44	31.25	4	3.75	4.63	13.88	30.63	6.63	14.25	15.25	8.50	10.13
8	18.5	15.75	18.5	6.00	31	48	35	4	3.75	3.50	13.88	34.63	6.63	14.25	19.25	10.38	9.88
10	20.56	14.81	20	6.25	34	60	38	4	3.75	2.50	19.63	55.13	2.5	20.00	18.25	6.63	13.88
12	22.44	15.25	22.25	6.13	34	64	42	4	3.75	2.50	19.63	59.13	2.5	20.00	22.25	6.63	13.88
14	24.63	15.88	24.63	6.38	34	68	44	4	4.75	2.50	19.63	63.13	2.5	20.00	26.25	6.63	17.88
17	27.06	16.38	27.38	6.38	34	74	48	4	4.75	1.75	23.38	69.13	2.5	20.00	30.25	6.63	11.88
21	27.56	15.38	27.38	6.25	34	76	52.5	4	4.75	2.50	25.38	71.13	2.5	20.00	35.25	6.63	11.38
25	31.44	16.44	31.44	6.38	40	78	58.75	4	4.75	2.50	31.13	73.13	2.5	20.00	41.25	12	11.63
30	31.5	22	31.44	6.25	40	91	58.75	4	4.75	2.50	31.13	86.13	2.5	25.75	41.25	6.88	11.63
35	34.63	18.81	34.38	8.13	48	96	68	6	4.75	3	36.88	90.13	3	26.25	48.50	12.88	13.63
40	37.88	21.5	37.88	7.13	48	109	68	6	4.75	3	36.88	103.13	3	32.00	45.50	10	16.63
50	41.41	25.5	41.41	1.00	48	120	80	6	5	3	36.88	114.13	3	32.00	57.50	10	16.63
66	41.44	38.75	41.44	13.50	49	135	92	8	5	2.75	43.50	130.25	2.38	37.75	65.50	7.63	20.63
80	57.81	30.63	50.72	16.25	54	135	107	8	5	2.38	49.25	130.25	2.38	37.75	78.50	10.13	22.63
100	63.88	35.13	56.06	22.13	60	150	119.5	8	5	2.50	55	145.25	2.38	37.75	96.50	13.13	17.13

All Dimensions are in Inches.

Jobsite Connections

TSC plug fan



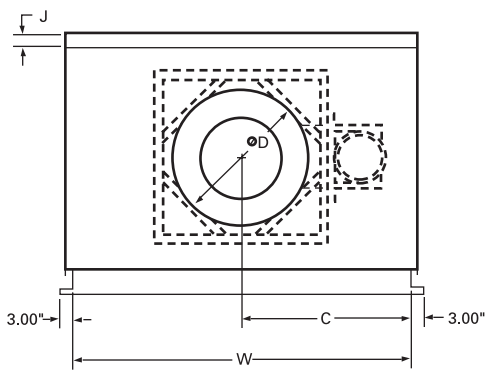
Note: Motor location may be right or left; right hand shown.

	Front-Top Discharge Dimensions					Bottom-Front Discharge Dimensions				
Unit Size	A	B	C	D	L	F	L	M	N	P
21	27.56″	15.38″	27.38″	6.25″	73″	34″	84″	25.38″	71.13″	2.5″
25	31.44″	16.44″	31.44″	6.38″	54.75″	9.5″	65.75″	31.13″	73.13″	2.5″
30	31.5″	22″	31.44″	6.25″	54.75″	9.5″	65.75″	31.13″	86.13″	2.5″
35	34.63″	18.81″	34.38″	8.13″	62″	12.5″	73.5″	33.85″	90.13″	3″
40	37.88″	21.5″	37.88″	7.13″	62″	12.5″	73.5″	33.85″	103.13″	3″
50	41.41″	25.5″	41.41″	12″	68.5″	12.5″	83″	36.88″	114.13″	3″
66	41.44″	38.75″	41.44″	13.5″	84″	5.25″	84″	43.5″	130.25″	2.38″
80	57.81″	30.63″	50.72″	16.25″	92″	4.88″	92″	49.25″	130.25″	2.38″
100	63.88″	35.13″	56.06″	22.13″	96″	5″	96″	55″	145.25″	2.38″

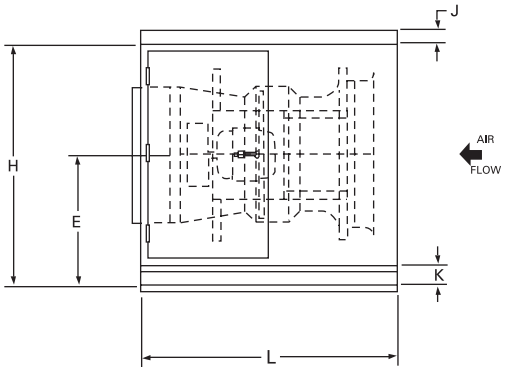
	Module Dimension						Fan Inlet Dimensions		
Unit Size	E	J	H	W	R	S	T	U	V
21	4″	4.75″	52.5″	76″	35.5″	8.63″	35.88″	30.38″	13.88″
25	4″	4.75″	58.75″	78″	41.63″	8.63″	37.88″	30.38″	13.88″
30	4″	4.75″	58.75″	91″	41.75″	8.63″	46.5″	32.88″	15.63″
35	6″	4.75″	68″	96″	43.75″	12″	46.75″	33.75″	19.5″
40	6″	4.75″	68″	109″	43.75″	12″	51.75″	33.75″	27.5″
50	6″	5″	80″	120″	55.75″	12″	59.38″	34.38″	30.38″
66	8″	5″	92″	135″	63.88″	7.75″	69″	47.38″	22.5″
80	8″	5″	107″	135″	78.63″	7.75″	73″	47.38″	18.5″
100	8″	5″	119.5″	150″	91.38″	7.75″	84.5″	47.38″	22″

Jobsite Connections

TSC Q-Fan



FRONT ELEVATION



SIDE ELEVATION

Note: Motor location may be right or left; right hand shown.

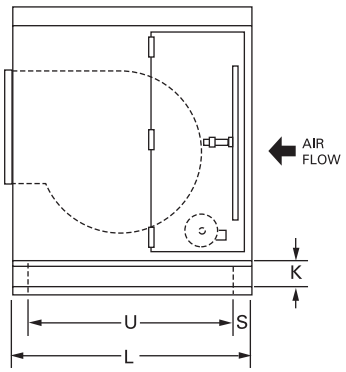
UNIT SIZE	FAN SIZE	C	D	E	L	W	H	J	K
12 Q	19	32	20	19.50	62.50	64	42	3.75	4
12 R	21	32.50	23	20.75	62.50	64	42	3.75	4
14 Q	19	34	20	21.50	64.50	68	44	4.75	4
14 R	21	34	23	22.13	64.50	68	44	4.75	4
17 Q	21	37	23	23.63	68.50	74	48	4.75	4
17 R	24	37	26	24	68.50	74	48	4.75	4
21 Q	24	38	26	25.88	73	76	52.5	4.75	4
25 Q	27	39	29	29	54.75	78	58.75	4.75	4
25 R	27	39	29	29	54.75	78	58.75	4.75	4
30 Q	30	45.50	32	29.13	54.75	91	58.75	4.75	4
30 R	33	45.50	35.88	29.75	54.75	91	58.75	4.75	4
35 Q	33	48	35.88	33.75	62	96	68	4.75	6
35 R	36	48	40	36.25	62	96	68	4.75	6
40 Q	33	54.50	38.55	33.75	62	109	68	5	6
40 R	36	54.50	40	36.25	62	109	68	5	6
50 Q	36	60	40	40.25	68.50	120	80	5	6
50 R	40	60	44	40	68.50	120	80	5	6
66 Q	40	72	44	52.13	84	135	92	5	8
66 R	44	72	48	52.13	84	135	92	5	7
80 Q	44	72	48	59.75	92	135	107	5	8

All Dimensions are in Inches.

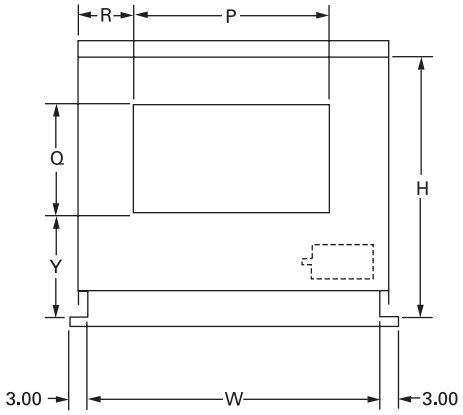
Jobsite Connections

Return/Exhaust Fan Opening Dimensions

The drawings below are to be used for determining opening sizes and dimension locations for housed return or exhaust fans. Bottom opening is available on return or exhaust fan modules; back opening is available only on a return fan module. When using a plug fan as a return fan, use page 84 when return air is to be brought horizontally into the unit. If return air is being brought vertically into the unit, and then into the plug return fan, a mixing module with a bottom opening must be included upstream of the plug return fan.



Side Elevation

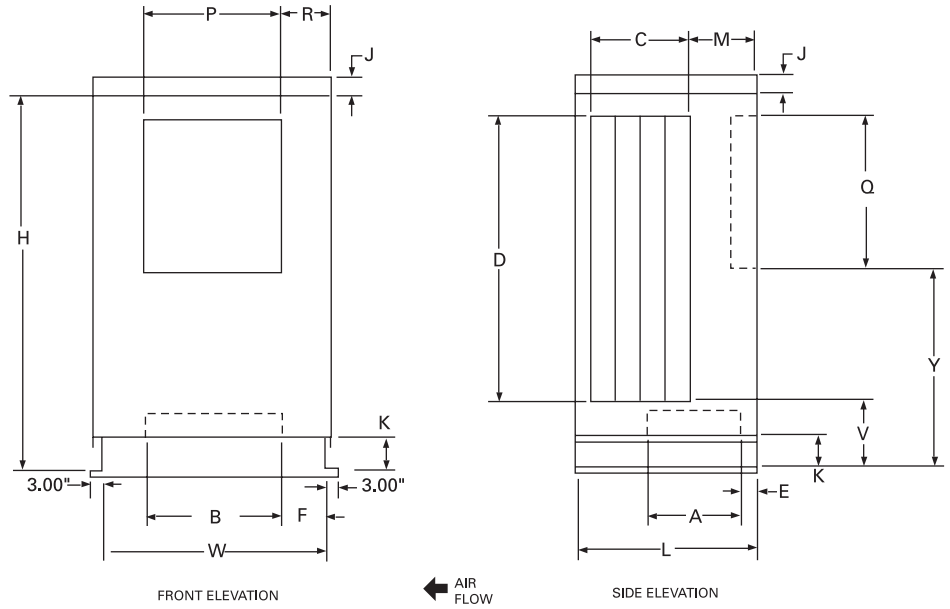


Back Elevation

Unit/ Fan Size	H	K	L	P	Q	R	S	U	W	Y
3A,B	28 ¾	4	60 ¾	18 ¼	14 ½	8 3/8	4 7/8	26 ¼	31	8 ½
6A,B	31 ¼	4	68 ¼	31 ¼	14 ½	8 3/8	4 7/8	31 ¼	44	11
8A,B	35	4	75	35 ¼	14 ½	8 3/8	4 7/8	34 ¼	48	14 ¾
10A,B,C	38	4	58 ½	56 ¼	20 ½	3 7/8	7	20	60	11 ¾
12A,B,C	42	4	62 ½	60 ¼	20 ½	3 7/8	7	24	64	15 ¾
14A,B,C	44	4	64 ½	64 ¼	20 ½	3 7/8	7	26	68	17 ¾
17A,B,C	48	4	68 ½	70 ¼	26 ¼	3 7/8	7	30	74	16
21A,B,C	52 ½	4	73	72 ¼	26 ¼	3 7/8	7	34 ½	76	20 ½
25A,B,C	58 ¾	4	54 ¾	74 ¼	32	3 7/8	7	40 ¾	78	21 ½
30A,B,C	58 ¾	4	54 ¾	87 ¼	32	3 7/8	7	40 ¾	91	21 ½
35A,B,C	68	6	62	91 ¼	37 ¾	4 3/8	6 ½	49	96	24 ½
40A,B,C	68	6	62	104 ¼	37 ¾	4 3/8	6 ½	49	109	24 ½
50A,B,C	80	6	68 ½	115 ¼	37 ¾	4 3/8	6 ½	55 ½	120	36 ½
66A,B,C	92	8	84	130 ¼	43 ½	4 3/8	2 ½	79	135	42 ¾
80A,B,C	107	8	92	136 ¼	49 ¼	4 3/8	2 ½	87	135	52
100A,B,C	119 ½	8	96	145 ¼	55	4 3/8	2 ½	91	150	58 ¾

Jobsite Connections

TSC Mixing Box



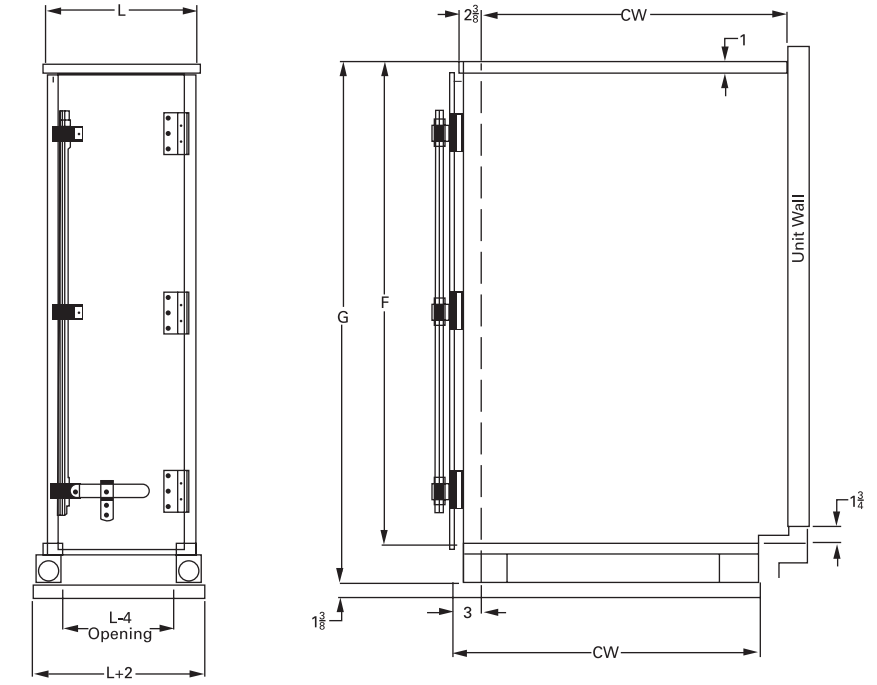
				WITHOUT DAMPERS			WITH DAMPERS					WITHOUT DAMPERS				WITH DAMPERS			
UNIT SIZE	L	W	H	A	B	E	A	B	E	J	K	C	D	M	V	C	D	M	V
3	24.75	31	28.75	13.88	17.63	9.13	13.88	17.63	9.13	3.75	4	14.25	12.25	5.25	15.13	17	12	3.88	13.63
6	27.25	44	31.25	13.88	30.63	4.5	13.88	30.63	4.5	3.75	4	14.25	18.25	6.5	11.63	17	18	5.13	10.13
8	31	48	35	13.88	34.63	3.5	13.88	34.63	3.5	3.75	4	14.25	22.25	8.38	11.38	17	22	7	9.88
10	34	60	38	19.63	55.13	2.5	19.63	55.13	2.5	3.75	4	20	21.25	9.38	15.38	22.75	21	8	13.88
12	34	64	42	19.63	59.13	2.5	19.63	59.13	2.5	3.75	4	20	25.25	9.38	15.38	22.75	25	8	13.88
14	34	68	44	19.63	63.13	2.5	19.63	63.13	2.5	4.75	4	20	29.25	9.38	13.38	22.75	29	8	11.88
17	34	74	48	25.38	69.13	1.75	23.38	69.13	1.75	4.75	4	20	33.25	9.38	13.38	22.75	33	8	11.88
21	34	76	52.5	25.38	71.13	2.5	23.38	71.13	2.5	4.75	4	20	38.25	9.38	12.88	22.75	38	8	11.38
25	40	78	58.75	31.13	73.13	2.5	31.13	73.13	2.5	4.75	4	20	44.25	10	13.13	22.75	44	8.63	11.63
30	40	91	58.75	31.13	86.13	2.5	31.13	86.13	2.5	4.75	4	25.75	44.25	9.38	13.13	28.5	44	8	11.63
35	48	96	68	36.88	90.13	3.0	36.88	90.13	3.0	4.75	6	26.25	51.25	10.88	15.13	28.5	51	8	11.63
40	48	109	68	36.88	103.13	3.0	36.88	103.13	3.0	4.75	6	32	48.25	8	18.13	34.25	48	6.88	16.63
50	48	120	80	36.88	114.13	3.0	36.88	114.13	3.0	5	6	32	60.25	8	18.13	34.25	60	6.88	16.63
66	49	135	92	43.5	130.25	2.75	43.5	130.25	2.75	5	8	37.75	68.25	5.63	22.13	40	68	4.5	20.63
80	54	135	107	49.25	130.25	2.38	49.25	130.25	2.38	5	8	37.75	81.25	8.13	24.13	40	81	7	22.63
100	60	150	119.5	55.00	145.25	2.50	55.00	145.25	2.50	5	8	37.75	99.25	11.13	18.63	40	99	10	17.13

	WITHOUT DAMPERS					WITH DAMPERS				
UNIT SIZE	P	Q	F	Y	R	P	Q	F	Y	R
3	18.25	14.5	6.63	8.5	8.38	21	17	6.63	8.38	5.63
6	31.25	14.5	6.63	11	8.38	34	17	6.63	10.88	5.63
8	35.25	14.5	6.63	14.75	8.38	38	17	6.63	14.63	5.63
10	56.25	20.5	2.5	11.75	3.88	58.5	22.75	2.5	11.63	1.13
12	60.25	20.5	2.5	15.75	3.88	62.5	22.75	2.5	15.63	1.13
14	64.25	20.5	2.5	17.75	3.88	66.5	22.75	2.5	17.63	1.13
17	70.25	26.25	2.5	16	3.88	72.5	28.5	2.5	15.88	1.13
21	72.25	26.25	2.5	20.5	3.88	74.5	28.5	2.5	20.38	1.13
25	74.25	32	2.5	21.5	3.88	76.5	34.25	2.5	20.88	1.13
30	87.25	32	2.5	21.5	3.88	89.5	34.25	2.5	20.88	1.13
35	91.25	37.75	3	24.5	4.38	93.5	40	3	24.38	2.13
40	104.25	37.75	3	24.5	4.38	106.5	40	3	24.38	2.13
50	115.25	37.75	3	36.5	4.38	117.5	40	3	36.38	2.13
66	130.25	43.5	2.38	42.75	4.38	132.5	45.75	2.38	42.63	2.13
80	136.25	49.25	2.38	52	4.38	132.5	51.5	2.38	51.88	2.13
100	145.25	55	2.38	58.75	4.38	147.5	57.25	2.38	58.63	2.13

All Dimensions are in Inches.

Jobsite Connections

T-Series External Cabinet Drawing



LEFT SIDE UNIT VIEW

FRONT UNIT VIEW

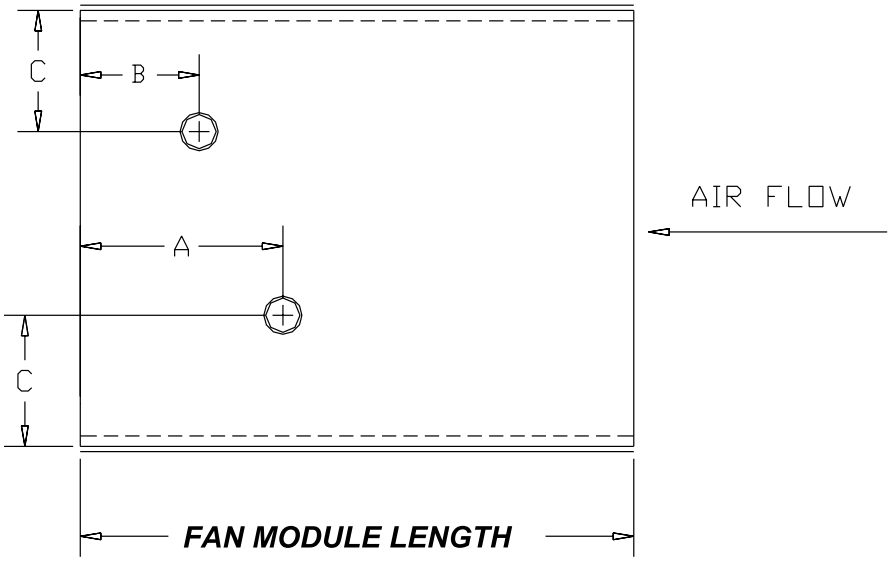
Table JC-1 – Pipe Cabinet Dimensions

Unit Size	Cabinet Depth - CW			F	G
	Standard	Reduced	Extended		
3	31	15 ½	46 ½	24 ¾	28 ¾
6	31	15 ½	46 ½	27 ¼	31 ¼
8	31	15 ½	46 ½	31	35
10	31	15 ½	46 ½	34	38
12	31	15 ½	46 ½	38	42
14	31	15 ½	46 ½	40	44
17	31	15 ½	46 ½	44	48
21	31	15 ½	46 ½	48 ½	52 ½
25	31	15 ½	46 ½	54 ¾	58 ¾
30	31	15 ½	46 ½	54 ¾	58 ¾
35	32	16	48	62	68
40	32	16	48	62	68
50	38	19	52 ½	74	78
66	38	19	52 ½	84	92
80	38	19	52 ½	99	107
100	38	19	52 ½	111 ½	119 ½

Note:
1. All dimension are in inches
2. "L" = Length of section or consecutive sections which have cabinets.
3. External cabinet optional only on coil, access, bypass and eliminator modules.
4. Single section cabinet shown with optional access door. See unit drawing for door size(s).
Optional access door available for each section area, hinged toward air leaving side.

Jobsite Connections

Electrical Location – Sizes 3 to 50

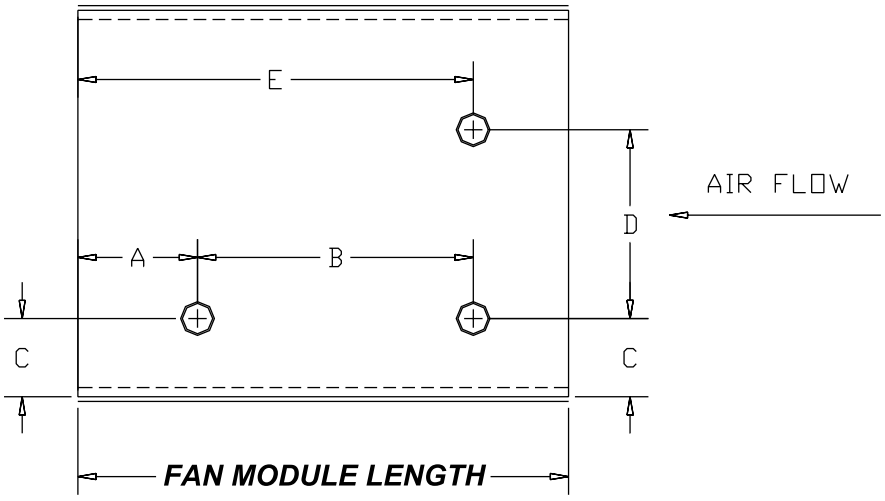


Front Top Discharge				Bottom Front Discharge			
Unit Size	A	B	C	Unit Size	A	B	C
3	18 7/8	5 7/8	5	3	18 7/8	5 7/8	5
6	20 1/8	7 1/8	5	6	20 1/8	7 1/8	5
8	22	9	5	8	22	9	5
10	18 3/4	5 3/4	5	10	18 3/4	5 3/4	5
12	18 3/4	5 3/4	5	12	18 3/4	5 3/4	5
14	18 3/4	5 3/4	5	14	18 3/4	5 3/4	5
17	18 3/4	5 3/4	5	17	18 3/4	5 3/4	5
21	18 3/4	5 3/4	5	21	18 3/4	5 3/4	5
25	13 3/4 A,B,C Fan 41 P,Q,R Fan	13 3/4 A,B,C Fan 41 P,Q,R Fan	5 1/2 A,B,C Fan 12 1/2 P,Q,R Fan	25	43 3/4 A,B,C Fan 44 1/8 P Fan	43 3/4 A,B,C Fan 44 1/8 P Fan	5 1/2 A,B,C Fan 9 1/4 P Fan
30	13 3/4 A,B,C Fan 41 P,Q,R Fan	13 3/4 A,B,C Fan 41 P,Q,R Fan	6 1/2 A,B,C Fan 12 P,Q,R Fan	30	43 3/4 A,B,C Fan 44 1/8 P Fan	43 3/4 A,B,C Fan 44 1/8 P Fan	6 1/2 A,B,C Fan 9 1/2 P Fan
35	15 1/2 A,B,C Fan 46 1/2 P,Q,R Fan	15 1/2 A,B,C Fan 46 1/2 P,Q,R Fan	16	35	46 1/2 A,B,C Fan 49 3/8 P Fan	46 1/2 A,B,C Fan 49 3/8 P Fan	16 A,B,C Fan 11 P Fan
40	15 1/2 A,B,C Fan 46 1/2 P,Q,R Fan	15 1/2 A,B,C Fan 46 1/2 P,Q,R Fan	18 1/2	40	46 1/2 A,B,C Fan 49 3/8 P Fan	46 1/2 A,B,C Fan 49 3/8 P Fan	18 1/2 A,B,C Fan 11 P Fan
50	17 1/8 A,B,C Fan 51 3/8 P,Q,R Fan	17 1/8 A,B,C Fan 51 3/8 P,Q,R Fan	21	50	52 A,B,C Fan 53 5/8 P Fan	52 A,B,C Fan 53 5/8 P Fan	21 A,B,C Fan 10 1/4 P Fan

Dimension are in inches. High voltage connection on drive side of fan module.

Jobsite Connections

Electrical Location – Sizes 66 to 100



Front Top Discharge				Bottom Front Discharge			
Unit Size	A	B	C	Unit Size	A	B	C
66	9 ½ A,B,C Fan 51 ½ P,Q,R Fan	23	5 ¼	66	51 ½ A,B,C Fan	23 A,B,C Fan	5 ¼ A,B,C Fan
80	11 ½ A,B,C Fan 57 ½ P,Q Fan	23	5 ¼	80	57 ½ A,B,C Fan	23 A,B,C Fan	5 ¼ A,B,C Fan
100	13 ¾ A,B,C Fan 59 ¼ P Fan	23	5 ¼	100	59 ¼ A,B,C Fan	23 A,B,C Fan	5 ¼ A,B,C Fan

Unit Size	E	D	C
66	60 P Fan	7 P Fan	19 ½ P Fan
80	71 ¾ P Fan	7 P Fan	20 P Fan
100	76 5/8 P Fan	7 P Fan	19 ½ P Fan

1. Dimension are in inches.
2. For RH drive, high voltage on air entering side of module.
3. For LH drive, high voltage on air leaving side of module.

Jobsite Connections

Table JC-2 and JC-3 T-Series Electrical Connection Sizes
The following tables list the size of the electrical pipe nipples protruding from the floor of T-Series fan modules. All electrical pipe nipples are threaded on both ends.

Table JC-2 — Electrical Connection Sizes (200 and 230 volt) by Motor Horsepower

	200 Volts				230 Volts			
Unit Size	1″ Nipple	2″ Nipple	2 ½″ Nipple	3″ Nipple	1″ Nipple	2″ Nipple	2 ½″ Nipple	3″ Nipple
3	1 to 5				1 to 5			
6	1 to 5				1 to 5			
8	1 to 7.5				1 to 7.5			
10	1 to 7.5				1 to 7.5			
12	1 to 15				1 to 15			
14	1 to 15				1 to 15			
17	1 to 15	20			1 to 20			
21	1 to 15	20, 25			1 to 20	25		
25	1 to 15	20, 25			1 to 20	25		
30	1 to 15	20 to 30			1 to 20	25, 30		
35	1 to 15	20 to 40			1 to 20	25 to 40		
40	1 to 15	20 to 40			1 to 20	25 to 50		
50	1 to 15	20 to 40			1 to 20	25 to 50		
66	1.5 to 15	20 to 40			1.5 to 20	25 to 50		
80	2 to 15	20 to 40			2 to 20	25 to 50		
100	10, 15	20 to 40			10 to 20	25 to 50		

Table JC-3 — Electrical Connection Sizes (460 and 575 volt) by Motor Horsepower

	460 Volts				575 Volts			
Unit Size	1″ Nipple	2″ Nipple	2 ½″ Nipple	3″ Nipple	1″ Nipple	2″ Nipple	2 ½″ Nipple	3″ Nipple
3	1 to 5				1 to 5			
6	1 to 5				1 to 5			
8	1 to 7.5				1 to 7.5			
10	1 to 7.5				1 to 7.5			
12	1 to 15				1 to 15			
14	1 to 15				1 to 15			
17	1 to 20				1 to 20			
21	1 to 25				1 to 25			
25	1 to 25				1 to 25			
30	1 to 30				1 to 30			
35	1 to 40				1 to 40			
40	1 to 40	50			1 to 50			
50	1 to 40	50, 60			1 to 60			
66	1.5 to 40	50 to 75			1.5 to 60	75		
80	2 to 40	50 to 75			2 to 60	75		
100	10 to 40	50 to 100			10 to 60	75, 100		

NOTE
(1) All low voltage (control) pipes are 1″.
(2) All pipes have external threads.

Mechanical Specifications

General

The units must be rigged and lifted in strict accordance with the Installation Operation and Maintenance manual (TSC-IM-1). The units are to be installed in strict accordance with the specifications. Unit shall be UL and CUL Listed. Units may be shipped fully assembled up to size 80 or disassembled to the minimum component size according to shipping or jobsite requirements. Units shipped in one piece will have a minimum of six points of lift. These lift points will be permanently attached to the unit base and be designed to accept standard rigging devices. Units shipped in sections will a minimum of four points of lift.

Unit Construction

Unit panels shall be solid double-wall construction. Fiberglass insulation with a perforated liner can be added to sections as specified on the schedule. All exterior wall panels shall be made of galvanized steel. The casing shall be able to withstand up to 1.5 times design static pressure, or 8" WC, whichever is less, with no more than 0.005 inch deflection per inch of panel span.

The unit base design will allow unit to rest on top of roofcurb when field installed. Entire length and width under base will be sealed for additional water management protection.

Insulation

Unit shall be factory insulated. Panels and unit roof shall be of double-wall construction with interior and exterior panels and insulation. Panel insulation system shall provide a minimum R value of 12. Insulation shall conform to NFPA 90 requirements.

Unit Paint

External surface of unit casing shall be prepared and coated with a minimum 1.5 mil enamel finish or equal. Units supplied with casing exterior factory painted shall be able to withstand a salt spray test in accordance with ASTM B117 for a minimum of 500 consecutive hours. Unit casing exterior will be provided with manufacturer's standard color, or alternative color when required.

Unit Roof

Unit roof will be constructed of two pieces. Inner roof will be installed in such a manner as to prevent air bypass between internal components. Outer roof will be sloped a minimum .25" per foot either from one side of unit to other, or from center to sides of the unit. Roof assembly will overhang all walls of units by 2" minimum.

External Pipe Cabinet

Piping cabinet shall be supplied by the manufacturer (factory assembled) and shall be of the same construction as the main unit casing. Piping cabinet shall be mounted external to the unit and shipped separate to be field installed. Piping cabinet shall have removable panels or optional access door of the same construction as the unit door.

Drain Pans

Coils and moisture eliminators shall be provided with a galvanized or stainless steel, two-way sloping IAQ drain pan to allow for proper condensate removal. Access or blank sections may be provided with an IAQ drain pan when specified.

Access Doors

Access doors shall be constructed with a double-wall of solid G90 galvanized steel interior panel. Automotive style gasketing around the full perimeter of the access door shall be used to prevent air leakage. Door gasketing shall be mounted to the perimeter of the door and shall seal against a raised door frame. Door frame shall channel water away from gasket. Door shall have a protective flange to shield gasket from exposure. Preferred door handle shall not penetrate door casing. Door shall have a single handle latch.

View Window

A view window made of tempered glass in door shall be provided by section as specified on the schedule.

Marine Light

A factory-mounted, 120-volt, weather resistant (enclosed and gasketed), UL listed wet location fluorescent light fixture shall be provided in sections of unit as specified. Fixture shall be complete with junction box, Lexan housing and lens, magnetic ballast and 70 watt bulb.

Fans

The vibration levels of the complete fan assembly shall be checked and excessive vibration (including that caused by fan imbalance) shall be eliminated in the factory. Fan shaft shall be properly sized and protectively coated with lubricating oil. Fan wheels shall be keyed to fan shaft to prevent slipping. Fan shafts shall be solid and designed so that fan shaft does not pass through its first critical speed as the unit comes up to its rated rpm. Fan shafts shall not exceed 75 percent of their first critical speed at any cataloged rpm. Fan shall be provided with an access door on the drive side of the fan.

a

FC Fans — Fan shall be double-width, double-inlet, multiblade type as produced by the unit manufacturer. Fan shall be forward curved (FC) as required for stable operation and optimum energy efficiency. Fan shall be equipped with self-aligning, antifriction bearings with an L-50 life of 200,000 hours. Fan performance shall be certified as complying with ARI Standard 430-89.

b

BI Fans — Fan shall be double-width, double-inlet, multiblade type as produced by the unit manufacturer. Fan shall be backward inclined (BI) as required for stable operation and optimum energy efficiency. Fan shall be equipped with self-aligning, antifriction bearings with an L-50 life of 200,000 hours. Fan performance shall be certified as complying with ARI Standard 430-89.

c

AF Fans — Fan shall be double-width, double-inlet, multiblade type as produced by the unit manufacturer. Fan shall be backward-inclined airfoil (AF) as required for stable operation and optimum energy efficiency. Fan shall be equipped with self-aligning, antifriction bearings with an L-50 life of 200,000 hours. Fan performance shall be certified as complying with ARI Standard 430-89.

d

Plug Fans — Fan shall be single-width, single-inlet, multiblade type plug fan. The fan blades shall be backward inclined airfoil (AF). Plug fans shall be equipped with self-aligning, antifriction pillow block bearings with an L-50 life of 400,000 hours. Fan performance shall be tested in accordance with AMCA 210.

e
Vaneaxial Fans — Fan shall be a vaneaxial type fan as produced by the manufacturer. Fan shall have tapered inlet and outlet shells over fan hub assemblies for uniformly accelerating air through the blade area. A cast aluminum diffuser, consisting of radially-projected straightening vanes with airfoil cross sections, shall straighten air as it leaves the blades. The leading edge of the vanes shall be curved to reduce tonal noise generation. Vaneaxial fans shall be equipped with self-aligning, antifriction bearings with an L-50 life of 200,000 hours at maximum cataloged operating conditions. Bearing grease lines shall extend through fan shell for easy servicing. Fan performance shall be tested in accordance with AMCA 210.

Fan Modulation
a
Inlet Guide Vanes — For variable air volume applications, airflow of centrifugal type fans shall be modulated by inlet guide vanes.
b
Variable Frequency Drive — For variable air volume applications, airflow shall be modulated by a variable frequency drive controlling fan speed.

Fan Isolation
Fan connection shall be isolated from unit casing by a flexible canvas duct.
a
One-Inch Spring Isolators — Fan and motor assembly (sizes 3-8) shall be internally isolated from the unit casing with 1-inch deflection spring isolators, furnished and installed by the unit manufacturer.
b
Two-inch Spring Isolators — Fan and motor assembly (sizes 10-100) shall be internally isolated from the unit casing with two-inch deflection spring isolators, furnished and installed by the unit manufacturer. The isolation system shall be designed to resist loads produced by external forces such as earthquakes and conform to the current requirements for Seismic Zone IV.

Drives
a
Variable Pitch - Drives shall be variable pitch, suitable for adjustment within ±5 percent of specified rpm.
b
Fixed Pitch - Drives shall be constant speed with fixed pitch sheaves.
c
1.2 Service Factor - Drives shall be selected at 1.2 service factor.
d
1.5 Service Factor - Drives shall be selected at 1.5 service factor.

Motors
Motor shall be mounted integral to an isolated fan assembly furnished by the unit manufacturer. Motor shall be mounted inside the unit casing on a slide base to permit adjustment of drive belt tension. Motors shall comply with NEMA MG-1.
a
High Efficiency E+ Open Drip-Proof - Motor shall be a T-frame, squirrel cage, open drip-proof with size, type and electrical characteristics as shown on equipment schedule.
b
High Efficiency E+ Totally-Enclosed Fan-Cooled - Motor shall be T-frame, squirrel cage, totally-enclosed fan-cooled with size, type and electrical characteristics as shown on equipment schedule.

Motor Options
a
200 or 230 Volt/3 Ph/60 Hz
b
460 Volt/3 Ph/60 Hz
c
75 Volt/3 Ph/60 Hz
d
115 Volt/l Ph/60 Hz
e
High efficiency E+3 motors

Fan Options
a
Grease Lines — Grease lines of both bearings shall be extended to the fan support bracket on the drive side.
b
Inverter test shall be performance to check vibration at unloaded conditions. Fan vibration levels shall be checked from 100% to 30% of required operating rpm.
c
Door Guards — Expanded metal screen shall be mounted on door opening to prevent unauthorized entry to fan.

Coils
Coils shall be manufactured by the supplier of the air handling unit. Coils shall be installed such that headers and return bends are enclosed by unit casings. Coils shall be removable by unbolting the wall panels in the coil section. Coil connections shall be clearly labeled on outside of units. Coils shall have aluminum plate fins and seamless copper tubes. Fins shall have collars drawn, belled and firmly bonded to tubes by mechanical expansion of the tubes. Soldering or tinning shall not be used in the bonding process. Fin surfaces shall be cleaned prior to installation in the unit to remove any oil or dirt that may have accumulated on the fin surfaces during manufacturing of the coil. Capacities, pressure drops and selection procedure shall be certified in accordance with ARI Standard 410.

Coil casing shall be a minimum 16-gauge G90 galvanized or 304 stainless steel with formed end supports and top and bottom channels. If two or more coils are stacked in the unit, intermediate drain channels shall be installed between coils to drain condensate to the main drain pans without flooding the lower coils or passing condensate through the airstream of the lower coil.

Water Coils
Coils shall be burst tested to 300 psig and proof tested under water to 200 psig.

1/2" Unit Coils (UW or UU)
Headers are to be constructed of round copper pipe with steel pipe connections. The steel pipe shall be attached to the copper pipe in such a manner as to inhibit galvanic corrosion of header system. Fin surface shall be Delta-Flo™ .005 aluminum fins.

Options
a
Tubes shall be 1/2 inch OD, .016 inch copper.
b
Tubes shall be 1/2 inch OD, 0.025 inch copper.

5/8" Shipping Coils (W, WA, WD, D, DD, K, P or WC)
Headers are to be constructed cast iron. Tubes shall be mechanically bonded to prevent water leakage due to thermal stresses and water pressure.

Options
a
Tubes shall be 5/8 inch OD, 0.020 inch copper.
b
Tubes shall be 5/8 inch OD, 0.024 inch copper.
c
Tubes shall be 5/8 inch OD, 0.035 inch copper.
d
Tubes shall be 5/8 inch OD, 0.049 inch red brass.
e
Fin surface shall be Sigma Flo® .0075 aluminum.
f
Fin surface shall be Prima Flo® .0075 aluminum.
g
Fin surface shall be Sigma Flo® .0045 copper.

Refrigerant Cooling Coils (UF or F)
Coils shall be burst tested to 450 psig and proof tested to 300 psig air pressure under water. After testing, coil circuiting will be air dried, charged with dry nitrogen, and sealed to ensure that circuiting is free of any water or contaminants. Liquid and suction headers shall be constructed of copper and shall penetrate unit casings to allow for sweat connections to refrigerant lines. Coils shall have equalizing vertical distributors sized according to the capacities of the coils.

Steam Heating Coils (NS)
Non-freeze steam-distributing type coils shall be provided. Steam coils shall be pitched in the unit for proper drainage of steam condensate from coils. Coils shall be burst tested to 300 psig and proof tested to 200 psig air pressure under water. Headers are to be constructed of cast iron or round copper pipe. Inner tubes shall have orifices that ensure even steam distribution across the coil face. Orifices shall be directed toward the return connections to ensure that the steam condensate is adequately removed from the coil.
a
Tube construction shall be 5/8 inch OD copper inner tube and 1 inch OD .031 inch copper outer tube.
b
Tube construction shall be 5/8 inch OD copper inner tube and one inch OD .049 inch red brass outer tube.

Filters
Filter sections shall have filter racks, an access door for filter removal and block-offs as required to prevent air bypass around filters. Units shall be supplied with two-inch or four-inch flat, two-inch angled, cartridge or bag filters.
a
Throwaway — Filters shall be of throwaway type and shall have two-inch fiberglass media contained in a rigid frame. Filters shall have a rigid supporting maze across both the entering and leaving faces of the media. Filters shall be sized so as not to exceed scheduled face velocities.
b
Pleated Media — Filters shall be two-inch or four-inch thick non-woven fabric, treated with adhesive and continuously laminated to a supported steel wire grid. Filters shall have a rated average dust spot efficiency of not less than 25 to 35 percent when tested in accordance with ASHRAE 52-76 atmospheric dust spot method.
c
Permanent — Filters shall be two-inch all metal, viscous-imprisonment type, capable of operating up to 600 fpm face velocity without loss of filter efficiency and holding capacity. Filter media shall be layers of cleanable wire maze. Filter frame shall be constructed of galvanized steel.

Throwaway or Pleated Media Options
I
Anti-Microbial — Filters shall be provided with a antimicrobial coating to inhibit the growth of microbes.
a
Cartridge Filters — Filter shall be constructed by pleating a continuous sheet of fine-fiber media into closely spaced pleats with safe-edged aluminum separators. This filter shall be sealed into a metal frame assembled in a rigid manner. All cartridge filters shall be furnished with a two-inch prefilter to provide extended cartridge life. Manufacturer shall supply side access filter rack capable of holding cartridge filters and prefilters.
b
Bag Filters — Filters shall be fine fiber, all glass media with spun backing to keep glass fibers from eroding downstream. Stitching method shall permit bag to retain pleat shape without the use of wire basket support. Manufacturer shall supply two-inch prefilters and side access filter rack capable of holding bag filters and prefilters.

Bag or Cartridge Filter Options
I
Percent Efficiency — Efficiency of filter shall be in the range of 60 to 65 percent as determined by ASHRAE Standard 52-76.
II
Percent Efficiency — Efficiency of filter shall be in the range of 80 to 85 percent as determined by ASHRAE Standard 52-76.
III
Percent Efficiency — Efficiency of filter shall be in the range of 90 to 95 percent as determined by ASHRAE Standard 52-76.

Blank/Access/Inspection
Unit length shall be extended at specified points of the unit allowing additional access/inspection for unit components and space for field installed components as needed. Removable panels or optional access door shall be provided for easy access.

Traq™ Damper Mixing Box, Mixing Box, Filter Mixing Box and Economizer
A section shall be provided that supports damper assembly for outside, return and/or exhaust air.

Dampers
Dampers shall modulate the volume of outside, return or exhaust air. Dampers shall be Ruskin CD60 type double-skin ultra low-leak airfoil design or equivalent with metal compressible jamb seals and extruded blade edge seals on all blades. The dampers shall be rated for a maximum leakage rate of less than 1 percent of nominal airflow at 1 inch wg. Blades shall rotate on stainless steel sleeve bearings. Dampers shall be arranged in parallel or opposed blade configuration.

Mechanical Specifications

Traq Dampers — Airflow Monitoring Station
A factory-mounted damper shall be provided in the outdoor air opening to measure airflow. Damper blades shall be galvanized steel, housed in a galvanized steel frame and mechanically fastened to a rotating axle rod. The dampers shall be rated for a maximum leakage rate of less than one percent of nominal airflow at one inch wg. The airflow measurement station shall measure up to 100 percent of total outside air and/or return air. The airflow monitoring device shall adjust for temperature variations. The airflow monitoring output shall be a 2-10 VDC signal proportional to velocity. The accuracy of the airflow measurement station shall be ±5 percent.

Air Blenders
An Air Blender® brand blender shall be provided by unit manufacturer for properly mixing outside and return air, to prevent air stratification and reduce the risk of coil freeze-up. The proper blender size and space upstream and downstream shall conform to the manufacturer's recommendation to allow for proper performance.

Turning and Discharge Plenums
Plenums shall be provided to efficiently turn air and provide for sound attenuation.

Diffusers
A diffuser shall be provided immediately downstream of the fan to provide equal air distribution to blow-thru components immediately downstream of diffuser. Diffuser shall be installed at an angle in order to smooth out the velocity profile of housed fan.

Moisture Eliminator
A section consisting of a vertically-mounted, maintenance-free moisture eliminator shall be provided. Eliminator shall have G90 galvanized steel sine wave fins for effective moisture removal.

Face or Face and Bypass
Ultra low-leakage face and bypass dampers shall be provided as scheduled on drawings. Dampers shall be Ruskin CD60 type double-skin airfoil design or equivalent. Damper blades shall be of minimum 14-gauge galvanized steel and damper frames of minimum 16-gauge galvanized steel. Blades shall be of opposed blade action, with metal compressible jamb seals and extruded vinyl blade edge seals. Blades shall rotate on stainless steel sleeve bearings. Face damper and bypass damper shall be mechanically linked together and provide end driven control shafts. Leakage rate shall not exceed 5 cfm/foot^2 at 1 inch wg and 9 cfm/foot^2 at 4 inch wg. Damper section shall be supplied with an access door.

Inlet Hood
For units with outside air requirements, manufacturer shall provide inlet hood for each outside air damper with high performance moisture eliminator to prevent water carryover into unit casing from outside air. Hoods shall be sized for 100% of nominal damper capacities. Outlet hood shall be provided on exhaust air openings.

Exhaust Damper
For units supplied with an exhaust fan economizer cycle, a section shall be supplied to house the exhaust damper. Dampers shall be Ruskin CD60 type double-skin airfoil design or equivalent. Damper blades shall be of minimum 14-gauge galvanized steel and damper frames of minimum 16-gauge galvanized steel. Blades shall rotate on stainless steel sleeve bearings. Leakage rate shall not exceed 5 cfm/foot^2 at 1 inch wg and 9 cfm/foot^2 at 4 inch wg. Section shall be supplied with an access door, and an exhaust hood.

Combination Starter / Line Break Switch
Combination starter/ Line Break Switch packages shall be factory mounted and wired by the air handling unit manufacturer. The package shall include:

a
Line break switch
b
Hand-Off-Auto (HOA) selector switch
c
Control transformer
d
Overload shall be factory-set for the exact motor used in the air handler
e
Starter shall include adjustable trip switch which opens the contacts if a short-circuit occurs

When ordered with an optional factory mounted control system, an oversized control transformer shall be provided to power the temperature controls. Power wiring from the transformer to the controls, start/stop relay and start/stop wiring to the HOA switch shall be factory wired and tested.

Factory-mounted controls shall be covered by the air handler manufacturer's standard warranty.

Combination Variable Frequency Drive /Disconnects
A combination VFD/disconnect packages shall be factory mounted and wired by the air handling unit manufacturer. The package shall include:

a
Variable frequency drive
- Pulse Width Modulated Drive w/IGBT transistors
- LCD display and keypad
- English language electrical values, parameters, self test, faults and diagnostics
- Power, pending fault, and fault LED indicator lights
- Form C fault contacts
- 4-20 mA or 0-10 V speed input signal

b
Circuit breaker disconnect
c
Hand-Off-Auto (HOA) selector switch
d
Current limiting NEMA Class T fuses
e
NEMA 1 enclosure
f
Auto restart after momentary power loss
g
Critical frequency avoidance
h
Voltage and FLA shall be factory-set for the exact motor used in the air handler

An optional three contactor bypass with a key operated drive-off-bypass selector switch is available.

When ordered with an optional factory mounted control system, an oversized control transformer shall be provided to power the temperature controls. Power wiring from this transformer to the controls, start/stop relay, start/stop wiring to the HOA switch and analog speed signal wiring to the VFD is to be wired and tested at the factory.

Factory-mounted controls shall be covered by the air handler manufacturer's standard warranty. When the optional start-up service is performed by a certified Square D technician, Square D will extend the warranty to three year parts and labor.

Mechanical Specifications

Factory-Mounted Direct Digital Control (DDC) Systems

Factory-mounted DDC systems shall be engineered, mounted, wired and tested by the air handling unit manufacturer to reduce installed costs, save time, and improve reliability. Each control system shall be fully functional in a standalone mode or can be tied to a building automation system with a simple pair of wires.

Direct Digital Controller

A dedicated programmable direct digital controller with the appropriate point capabilities shall be unit mounted (remote mounting is also available) on each air handling unit. A screen and keypad shall be provided to facilitate local monitoring, trouble shooting and changing of setpoints.

Factory-Mounted Control Options

a

Mixing Box Damper Actuators Spring return actuators shall be mounted with the outside air damper linked normally closed and the return air damper linked normally open.

b

Traq Dampers with Airflow Measuring Stations — Velocity Control Modules (VCM) shall provide a 2-10 VDC signal which corresponds to cfm for controlling and documenting airflow.

c

Face / Bypass and Multizone Damper Actuators — Non-spring return actuators shall linked as indicated on the order and control drawings.

d

Inlet Guide Vane Actuators — Spring return actuators shall be mounted with the IGVs linked normally closed. On units larger than #66, non spring return is acceptable, but a high static switch shall be provided to protect the ductwork.

e

Fan Discharge Temperature Sensors — Thermister type sensor shall be mounted in the fan discharge.

f

Averaging Temperature Sensors — A 20' capillary tube averaging RTD sensor shall be serpentined with capillary clips across the unit as engineered by the air handling unit manufacturer.

g

Low-Limit Switches — A 20' capillary tube manual-reset low limit switch shall be serpentined with capillary clips across the unit as engineered by the air handling unit manufacturer.

h

Airflow Switches — A differential pressure switch piped to the discharge and suction sides of the fan shall indicate fan status.

i

Dirty Filter Switches — A differential pressure switch piped to both sides of the filter shall indicate filter status.

j

Customer Interface Relays — 10 amp DPDT relays shall be provided as required for each binary output of the controller for customer interface to: supply, return and exhaust fan motor starters; relief dampers; pumps; condensing units; etc.

k

Electronic or pneumatic end devices.

Field-Mounted Control Options

a

Control Valves — Control valves shall be provided by the air handling unit manufacturer and field piped by the piping contractor. Power and signal wiring shall be by a simple quick connect.

b

Space Temperature Sensors Thermister type sensors shall be provided as required for field wiring.

c

Outside Air Sensors — Thermistor type sensors shall be provided as required for field wiring.

All factory-mounted controls shall be covered by the air handling manufacturer's standard warranty.

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