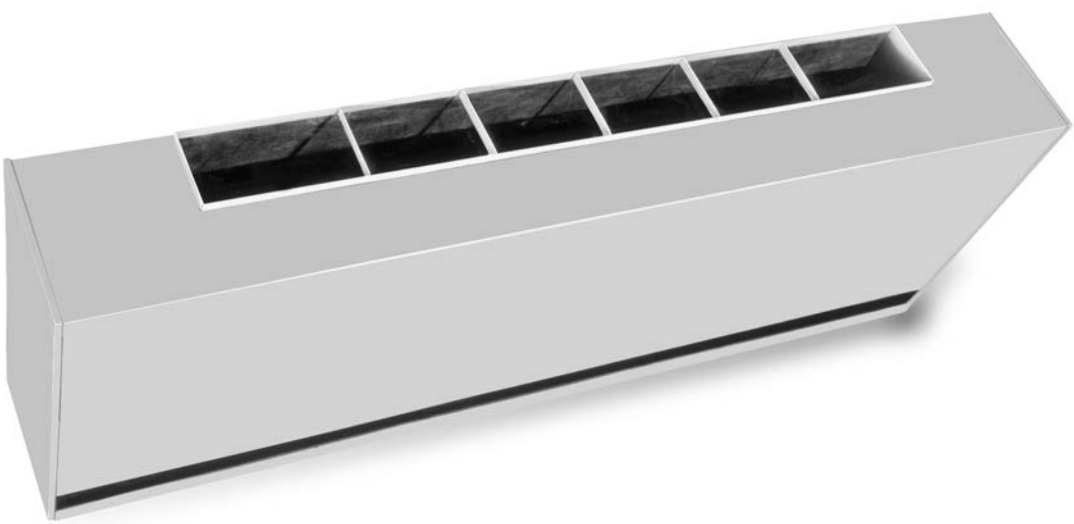
Product Catalog

Horizontal Classroom Unit Ventilator

750 cfm to 2000 cfm



February 2013

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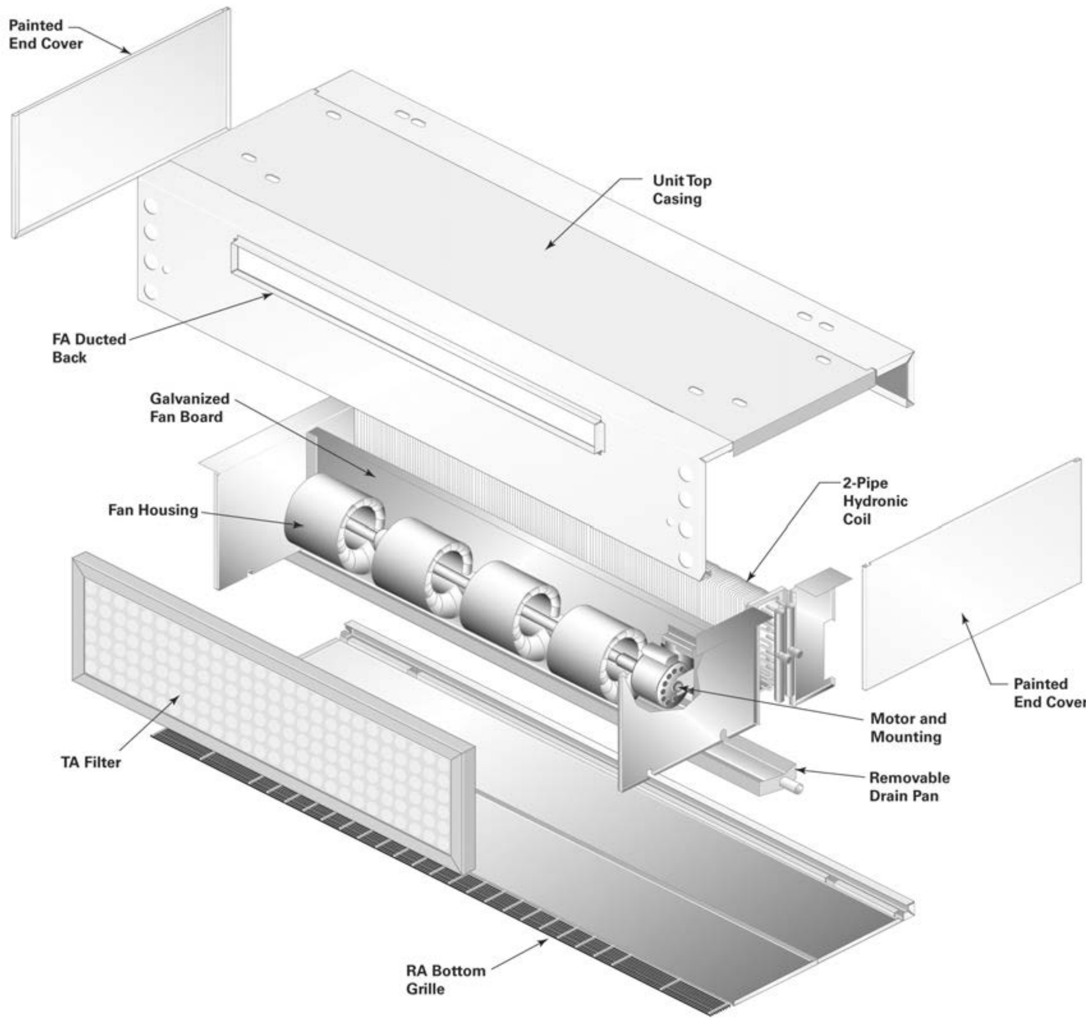
Introduction

Trane Horizontal Classroom Unit Ventilator



A Classroom Choice in HVAC

Classroom unit ventilators have been cost effective way to heat and cool schools for over half a century. Many schools choose classroom unit ventilators because of their ability to heat, cool and ventilate, as well as their durable cabinet design and small foot print. Because the unit ventilator is a single-space system, one unit installed in the classroom handles only that room's airflow, thus minimizing the potential for cross contamination between classrooms.

The ceiling-hung, ducted, horizontal unit ventilator may provide benefits in sound sensitive applications. The horizontal equipment can be located above the ceiling and away from direct contact with students. They may also be located in a corridor or mezzanine, then ducted into the classroom. Properly designed supply- and return-air ducts can help attenuate HVAC equipment and air noise. Locating the units outside of the classroom can also improve access and serviceability of the equipment.

Trane's commitment to providing premium quality products has led to the exclusive use of Electronically Commutated Motors (ECM) in all Unit Ventilator models. These brushless DC motors incorporate the latest technology for optimized energy efficiency, acoustical abatement, maintenance free and extended motor life. Each motor has a built-in microprocessor that allows for programmability, soft ramp-up, better airflow control, and serial communication.

Additionally, this is the industry’s first solution that is factory-mounted, -wired, and -programmed for infinite modulation of fan speed based on space loads, using the Tracer UC400.

Trane unit ventilators are ETL listed, and AHRI-840 certified insuring peek performance to meet today’s classroom habitat.

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Features and Benefits

Made for the Classroom

Equipment Size

The horizontal unit ventilator delivers from 750 cfm to 2000 cfm. Trane's unit ventilator is sized to fit any replacement or new construction application.

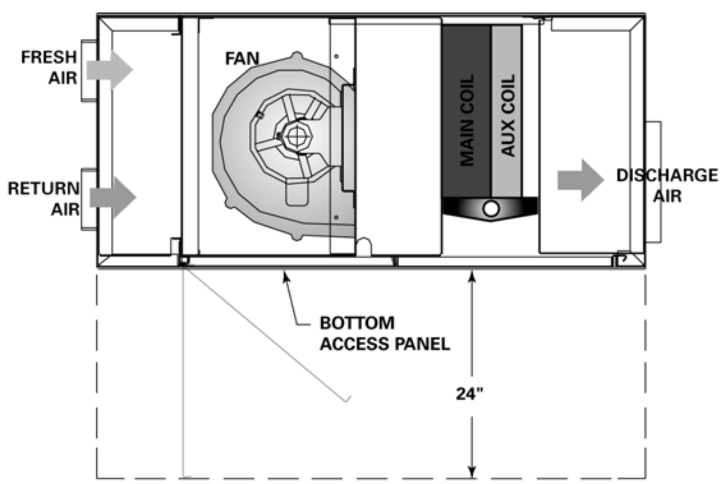
Cabinet Finish

The unit cabinetry is made of durable industrial grade metal for hard wearing applications. All steel surfaces are cleaned, phosphatized, rinsed and dried before applying a final paint finished on metal that may be exposed to the room decor.

Access

Access to the air filter is made through the bottom of the unit providing effortless access for filter change-out. The access panel is available with a safety chain option for protection from dropping the panel during normal maintenance situations.

Figure 1. Cabinet access



Spacious End Pockets

The 13-1/2-inch wide by 30-inch high by 15-1/4-inch deep (standard) to provide uncomplicated field installation of valves, piping, and controls. Several large knockouts are provided in both the left and right end pockets for electrical and piping connections.

Control Connections

All electrical connections are made in the left-hand end pocket for equipment not specified with electric heat. Units equipped with the electric heat option have in-coming power connections made in the right-hand end pocket.

Fan Board

The fan board assembly is acoustically designed in a single, rigid assembly that includes the fans, fan housing, bearings, fan shaft and motor. The fan motor is mounted on the heavy gauge, galvanized fan board assembly to help resist corrosion while increasing strength and rigidity. The fan board is removable through two metal screws for service or maintenance/cleaning of the fan housings.

Energy Efficiency

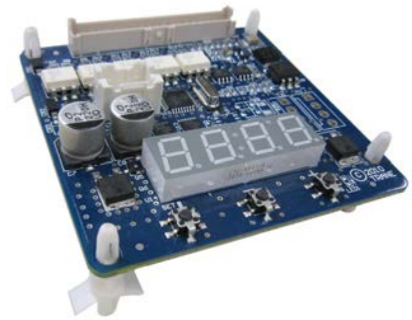
Trane's commitment to providing premium quality products has led to the exclusive use of Electronically Commutated Motors (ECM) in all Unit Ventilators. These brushless DC motors incorporate the latest technology for optimized energy efficiency, acoustical abatement, maintenance free and extended motor life. Each motor has a built-in microprocessor that allows for programmability, soft ramp-up, better airflow control, and serial communication.

- Trane units equipped with ECMs are significantly more efficient than the standard Permanent Split Capacitor (PSC) motor.
- Lower operating costs on average of 50 percent (versus a PSC motor).
- The Reduced FLA feature allows units to ship with a nameplate FLA rating much lower than a typical ECM unit.

Electronically Commutate Motor (ECM)

The fan motor is a variable speed electronically commutated motor with overload protection. The motor is wired to either termination board so the unit can be control with either three fan speeds or 0 Vdc to 10 Vdc. The motor speed is not affected by damper positions. Standard motors are rated up to 0.25 ESP (external static pressure). High static motors are rated from 0.25 ESP to 0.45 ESP. Bearings for the motor are permanently lubricated requiring little maintenance over the lifetime of the equipment.

Figure 2. Fan motor



The motor is removable without complete disassembly of the fan board. Simply remove the two motor quick-connects and loosen the shaft coupling.

Filter

Filters for the horizontal unit ventilator are of 1-inch, throwaway, MERV 8, or MERV 13. They are shipped with the equipment for installation/start-up purposes. Extra filters may be ordered separately for maintenance of the equipment.

Drain Pan

The unit drain pan is positively sloped to assure proper drainage. The pan is insulated on the bottom to help prevent condensate formation. The pan is simple to remove for cleaning purposes by loosening two front screws.

Piping

Hydronic piping for the unit ventilator may be factory installed or field provided. It fits painlessly inside the unit end pockets, permitting quick hook-up during the installing phase. The motorized valves include a trouble-free, pop-top actuator allowing the maintenance or service technician access to the motor without removing the valve body from the piping package.

Coils

Through the various coil combinations offered by Trane, room conditions can be met. Two-pipe and four pipe combinations are available to support any application. Coil selections include hydronic, steam, direct expansion (DX) and electric. For heating coils, Trane provides steam, hot water and electric options. Cooling coils are available as cold water and DX. Access to the coil for cleaning purposes is fundamentally one of the greatest features Trane provides as part of the equipment. Maintaining a clean coil inherently increases the efficiency adds to the life of the equipment, and helps to maintain proper indoor air quality.

Outside/Return-Air Damper Design

The outside/return air (OA/RA) damper is a dual blade system to ensure proper modulation and mixing of the air to AHRI-840 economizing standards.

The optional outside air actuator is spring return. The spring return system closes the OA damper if power is lost to the building and provides for a positive seal. This helps inhibit over cooling or freeze-up of the system during electrical outages or system shut-down.

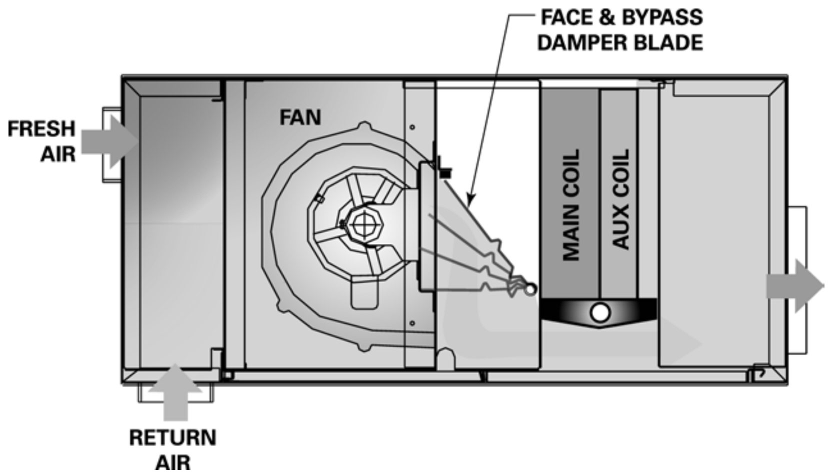
When ordered with factory mounted Trane® controls, the actuator is 3-point floating arrangement. A 2–10 Vdc or 3-point floating actuator is available when Customer Supplied Terminal Interface (CSTI) are specified.

Face and Bypass

The optional face and bypass design can provide active energy savings to the owner. This design works best during seasonal changeover when outside air temperature are in their prime. It also supports morning warm-up when lighter temperatures can easily be drawn into the system before normal classroom operation begins.

The design allows the damper to bypass the cooing coil to supply cool, untreated OA into the room. An optional 2-position isolation valve enhances this system by closing off water to the coil to prevent the room temperature from rising to far above or below the intended setpoint.

Figure 3. Face and bypass damper



Controls

- This is the industry's first solution that is factory-mounted, -wired, and -programmed for infinite modulation of fan speed based on space loads, using the Tracer™ UC400.
- Auto Fan Speed control with the Tracer ZN520 ramps the fan speed up and down to meet space loads.
- All controls are factory-mounted and tested to minimize field setup and improve reliability.
- Controls are wired with a 24-Vac transformer to keep only a single source power connection requirement to the unit.
- All wall-mounted zone sensors require only low voltage control wiring from the device to the unit control box. (No line voltage.)
- The controller automatically determines the unit's correct operating mode (heat/cool) by utilizing a proportional/integral (PI) control algorithm to maintain the space temperature at the active setpoint, allowing total comfort control.
- Entering water temperature sampling eliminates the need for inefficient bleedlines to sense automatic changeover on two-pipe changeover units.
- The random start-up feature helps reduce electrical demand peaks by randomly staggering multiple units at start-up.
- Occupied/unoccupied operation allows the controller to utilize unoccupied temperature setpoints for energy savings.
- Warm-up and cool-down energy features are standard with Trane controls.
- To customize unit control, Tracer TU or Rover™ software will allow field modification of Tracer ZN520 default settings. Tracer UC400 uses Tracer TU.
- Maximize system efficiency with free cooling economizers and modulating valves on units with Tracer ZN520 and Tracer UC400.

Trane offers a broad range in control packages to fit both retrofit and new applications. From the field convertible end-device package to a complete building automation system, Trane controls integrate the highest quality components within their unit ventilator to allow greater optimization of the entire system.

Certification Standards

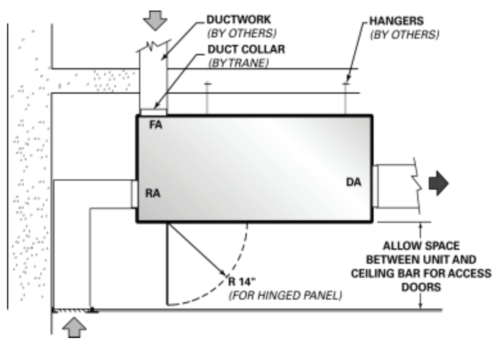
Comfort, energy and IAQ are all major issues that need to be considered in today's school designs. Therefore, it is important that designers of these systems have accurate information to make system decisions. That is why the industry has developed performance standards and certification programs which ensure that the equipment information provided to the design community is correct and comparable across different manufacturers. The following list of certifications identifies Trane's commitment in providing the highest quality equipment to their customers.

- **AHRI-840**
- **UL®**
- **Rated in accordance to AHRI 350 (sound)**
- **LonMark®**

Application Considerations

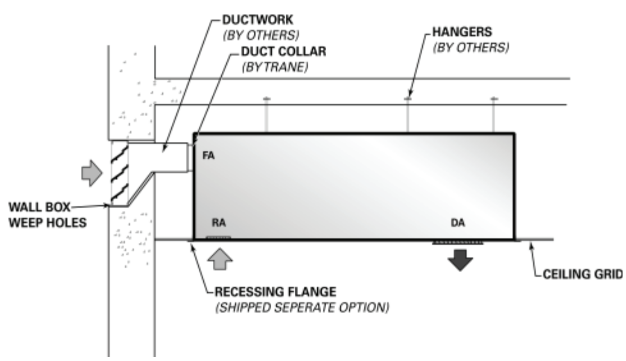
Fully Recessed Unit

The horizontal unit ventilator may be fully recessed into the ceiling space to provide greater noise reduction to the space. With this application, duct collars on the outside air inlet, return air inlet and discharge air outlet are available for ease of duct work connection to the equipment.



Partially Exposed Unit

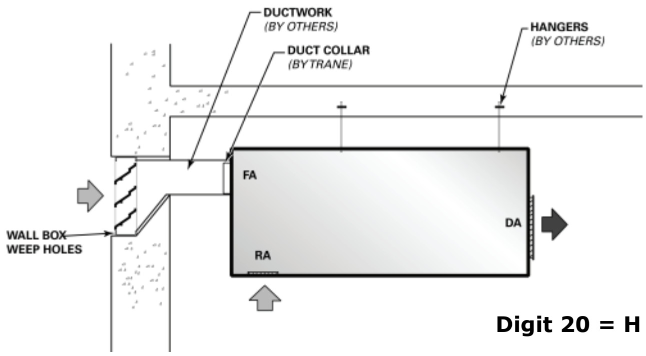
In situations where greater access to system components is a must (such as filter change-out), a partially exposed unit may be a practical solution. With the partially exposed return/discharge air bottom arrangement, the unit cabinet width increases by 13-1/8 inches for 075–150 unit sizes, and by 14-1/8 inches on the size 200 unit.



Fully Exposed Unit

The horizontal unit ventilator may be fully exposed to the classroom or institution. The most typical arrangement for this application includes a fresh air, ducted upper back with a return air, bar grille on the bottom. Combined with a front discharge grille, this arrangement provides a cost effective way to support individual fresh-air ventilation, while freeing up precious floor space.

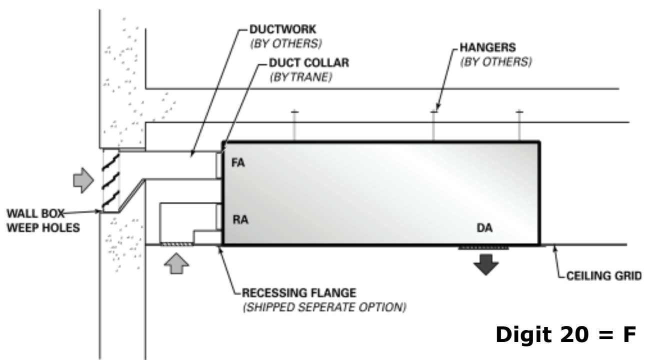
Note: *All horizontal units have an appliance grade paint finish.*



Digit 20 = H

Partially Exposed Unit

Another example of a partially exposed unit ventilator includes a fresh air upper back, with a return air lower back, combined with a bottom, double-deflection discharge. This application requires field supplied duct work to the added to the return air side of the unit ventilator.



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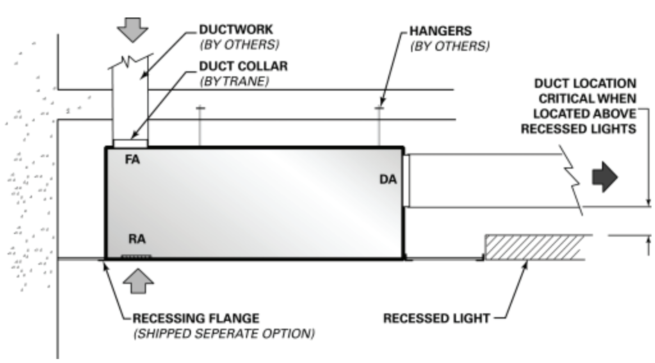
Partially Exposed Unit

A ducted discharge option is available to support the many design layouts expected of the mechanical system. The location of the discharge ducting could be critical during installation due to such issues as recessed lighting. Trane provides three selectable ducted discharge locations to reduce interference of other trades on the job site.

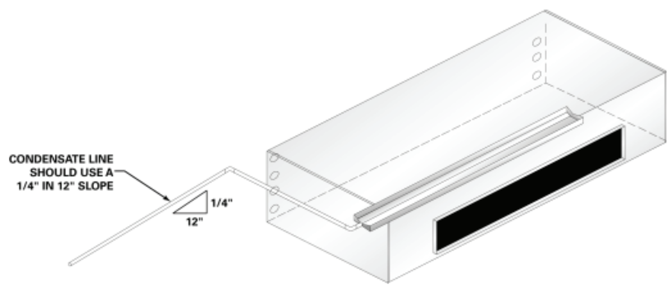


Note: *When a high ESP motor is used on the ducted system, the return air should enter through a rear duct connection. The return-air should pass through a lined return air duct with at least one 90° elbow to lessen airflow noise.*

Condensate Piping

The horizontal unit ventilator drain pan connection is located on the same side as the cooling coil connections (hydronic and DX coils). The stubout size is 3 /4” outside diameter.

All field supplied condensate lines to the unit should contain 1/4” in 12” slope away from the unit ventilator to aid in condensate removal. This is typical for most local codes. A trap is also recommended somewhere in the condensate system.



Note: *Drain pan connections are field convertible.*

Ducted Applications

A well designed duct system is beneficial to obtaining satisfactory fan performance. Determining resistance losses for the duct work system is also necessary for acceptable fan performance. Assistance in the design of duct work can be found in the ASHRAE Handbook. The unit ventilator is designed to operate against ESP thru 0.45”. The ESP is determined by adding the discharge air static pressure to the greater of either the outdoor air static pressure or the return air static pressure.

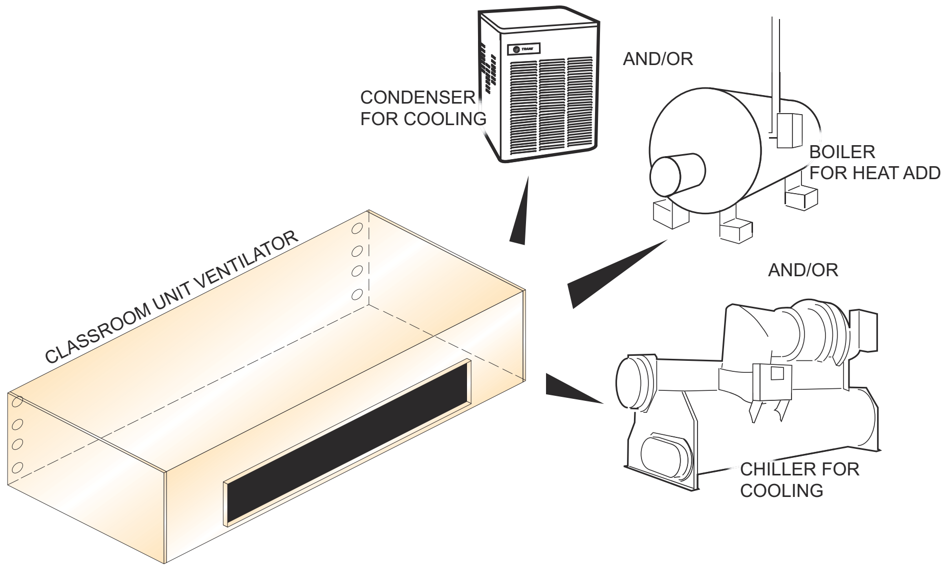
The Applied Unit Ventilator

A Choice in System Design

The beauty of the classroom unit ventilator stems beyond its ability to heat and cool. The Trane unit ventilator design provides an opportunity to create a comfortable atmosphere for living, learning and playing, while providing energy efficiency savings with market-leading technology. Some of the featured benefits of a unit ventilator are:

- Individual room control.
- Fresh air ventilation and filtration.
- Individual dehumidification sequences per zone.
- Energy savings solutions through economizing functions.
- A choice in heating/cooling applied systems.
- And, because the equipment is mounted directly in the space, installation costs are minimal compared to other HVAC systems.

System choice for the classroom unit ventilator



Wide Variety of Heating/Cooling Coils

Trane's unit ventilator offers a wide variety of coil configurations.

In environments where cooling needs are of main interest, a two-pipe coil coupled with a chiller, or a direct expansion coil joined with a condensing unit may be used.

For heat specific applications, Trane offers a two-pipe hot water only unit to be combined with a boiler. Electric heat and steam options are also available for heat fixed conditions.

When there is seasonal heating and cooling, a two-pipe chilled water/hot water changeover system may be applicable to the mechanical design. This system requires a chiller and a boiler to support the changeover necessity. However, where space constraints may present a concern, the Trane unit ventilator may be equipped with a direct expansion coil for cooling, with an auxiliary electric heat coil, hot water coil, or steam coil for heating.

Four-pipe chilled water/hot water systems are also available. This system is typically applied when both heating and cooling may be simultaneously called for in the school structure.

Building Automation

As part of the building automation system, the mechanical HVAC system may be optimized to lower energy consumption. By running only the mechanical devices that are required to support the building load at a given time of day or night, true energy consumption savings may be achieved.

Maintenance and serviceability faults through the unit sensing devices are easily defined and cured with an automated system.

With factory shipped direct digital controls, installation and start-up of the system are more simple.

Condensate

Proper condensate trapping is required for the classroom unit ventilator's with hydronic and direct expansion coils. In a properly trapped system, when condensate forms during normal operation, the water level in the trap rises until there is a constant flow of water through the pipe. It is imperative to maintain water in the trap, and not allow the trap to dry out during heating season.

Equipment should be installed level to avoid condensate build-up around the coil.

Performance

Application of this product should be within the catalogs airflow and unit performance. The Trane Official Product Selection System (TOPSS™) will aid in the selection process for a set of given conditions. If this program has not been made available, ask a local Trane sales account manager to supply the desired selections or provide a copy of the program.

Ventilation for Acceptable IAQ

Supplying proper ventilation to a classroom is challenging. The various rooms that make up a school are forever changing in their proper ventilation needs. Building occupants and their activities generate pollutants that heighten the ventilation requirements. And because of this intermittent occupancy, the ventilation frequency of a classroom is constantly on the move.

Ventilation systems dilute and remove indoor contaminants, while mechanical heating and cooling systems control the indoor temperature and humidity. Supplying an adequate amount of fresh air to an occupied classroom is necessary for good indoor air quality. IAQ should be considered a top priority in the school environment because children are still developing physically and are more likely to suffer the consequences of indoor pollutants. For this reason, air quality in schools is of particular concern. Proper conditioning of the indoor air is more than a quality issue; it encompasses the safety and stewardship of our investment in the students, staff and facility. The beauty of a classroom unit ventilator is its ability to provide heating, cooling, ventilation and dehumidification as a single-zone system.

ASHRAE Control Cycles

There are a variety of control systems available in unit ventilators. The exact method of controlling the amount of outside air and heating capacity can vary. However, all systems provide a sequence of operation designed to provide rapid classroom warm-up and increasing amount of ventilation air to offset classroom overheating. Reasons for classroom overheating can include:

- Sun or solar heat produced through large glass areas in a school.
- Lighting.
- Students

To help supply proper ventilation to these fluctuating heat gains, the Trane unit ventilator is designed to provide rapid classroom warm-up and increasing amounts of ventilation air to offset classroom overheating.

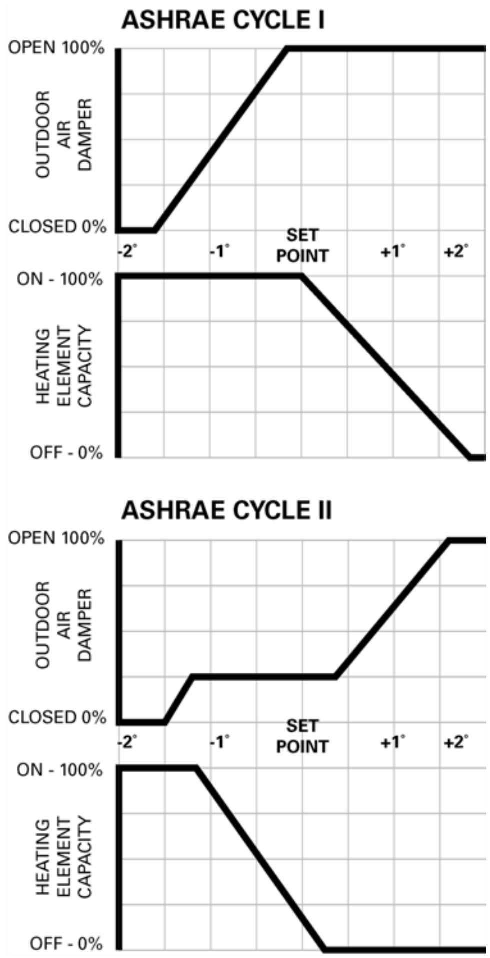
ASHRAE Cycle I. All standard unit ventilator cycles automatically close the outside air damper whenever maximum heating capacity is required. As room temperature approaches the comfort setpoint, the outside air damper opens fully, and the unit handles 100 percent outside air. Unit capacity is then controlled by modulating the heating element capacity.

ASHRAE Cycle I is typically used in areas where a large quantity of outdoor air is required to offset the air being exhausted to relieve the room of unpleasant odors and particles.

ASHRAE Cycle II. ASHRAE Cycle II is the most widely used ventilation control. Similar to Cycle I, the outside air damper is closed during warm-up. But with Cycle II, the unit handles recirculated air through the return air system. As temperature approaches the comfort setting, the outside air damper opens to admit a predetermined minimum amount of outside air. This minimum has been established by local code requirements and good engineering practices per AHRI-840. Unit capacity is controlled by varying the heating element output. If room temperature rises above the comfort setting, the heating element is turned off and an increasing amount of outside air is admitted until only outside air is being delivered.

ASHRAE Cycle II is a very economical control sequence often referred to as integrated economizing. This design supports optimum ventilation and provides the greatest energy savings. This is further proof of why AHRI-840 certification is important in minimizing energy consumption through economizer performance.

Figure 4. ASHRAE cycle graph



Freeze Protection

The most important advantage the Trane blow-thru design provides is additional protection against coil freeze-up. In contrast, draw-thru configurations allow little mixing of the return and outside air stream while locating the coil very close to the outside air inlet. This process creates “cold spots” on the coil which could lead to coil freeze-up.

With a blow-thru design, face and bypass with isolation valve control is not necessary (as with other manufacturers) to provide proper freeze protection to the unit ventilator. This adds cost and more mechanical components that could break down. The placement of the coil above the fan allows enough space for the coil to avoid “cold spots” that could cause freezing.

Selection Procedures

Selecting a Unit Ventilator

Trane horizontal classroom unit ventilators provide air delivery and capacities necessary to meet the requirements of modern school classrooms. They are available with the industry's widest selection of coils to precisely satisfy heating, ventilating and air conditioning loads with the best individual type of system. Unit ventilator selection involves three basic steps.

- Determine the classroom/space unit cooling and/or heating loads.
- Determine the unit size.
- Select the coil.

Capacity Required

The first step in unit ventilator selection is to determine room heating and air conditioning loads. The calculation of this load is essential if the equipment is to be economical in first cost and operating cost.

Adequate ventilation is mandatory in classroom air conditioning design. The amount is often specified by local or state codes and, in air conditioned schools, may be either the same or less than that specified for heating systems. The usual requirement is between 15 and 25 cfm of outside air per occupant, based on the intended use of the room. For instance, a chemistry laboratory normally requires more ventilation for odor control than a low occupancy speech clinic.

Ventilation is an important concern and should be accurately determined to assure good indoor air quality. Purposely oversizing units should be avoided, since it can cause comfort and control issues.

Unit Size

Unit ventilator size is determined by three factors:

- Total air circulation.
- Ventilation cooling economizer capacity required.
- Total cooling or heating capacity required.

Total air circulation, if not specified by code, should be sufficient to ensure comfort conditions throughout the room. This is usually from six to nine air changes per hour, but can vary with room design and exposure. Often rooms with large sun exposure require additional circulation to avoid hot spots.

Ventilation cooling capacity is determined by the amount of outside air delivered with the outside air damper fully open, and the temperature difference between the outside air and the classroom. In air conditioning applications, ventilation cooling capacities should maintain the comfort setting in the classroom whenever the outside air temperature is below the unit or system changeover temperature.

Example:

Ventilation cooling capacity = $1.085 \times cfm_t \times (T_1 - T_2)$

cfm_t = *Total air capacity of unit with outside air damper open 100%*

T_1 = *Room temperature*

T_2 = *Outside air temperature*

In classrooms with exceptionally heavy air conditioning loads, unit size may be determined by the total cooling requirement. Good practice dictates 375 to 425 cfm per ton of hydronic cooling capacity. Normally, however, Trane classroom air conditioner coils have sufficient capacities.

Example:

Given: Air circulation specified = 8 air changes per hour

Classroom size = 35 ft long x 25 ft wide x 10 ft high

Inside design air temperature = 75°F

Ventilation cooling required at 58°F = 29,000 BTU

CFM required = [8 changes/hr x (35 x 25 x 10) ft^3*] / (60 minutes/hr) = 1170 cfm*

Checking ventilation cooling capacity:

29,800 BTU = 1.085 x CFM x (80-58)

CFM = 1250

This indicates that a 1250 cfm unit would have satisfactory ventilation cooling capacity at the design changeover point of 58°F. Coil capacity will become confirmed when the coil is selected.

Coil Selection

Selecting the correct coil is done through Trane's Official Product Selection System (TOPSS).

For your convenience, TOPSS has a mixed air calculator built into the program.

Model Number Descriptions

Digit 1, 2, 3 — Unit Configuration

HUV = Horizontal Unit Ventilator

Digit 4 — Development Sequence

C = Third Generation

Digit 5, 6, 7 — Development Sequence

075 = 750 CFM
100 = 1000 CFM
125 = 1250 CFM
150 = 1500 CFM
200 = 2000 CFM

Digit 8 — Unit Incoming Power Supply

1 = 120V/60/1
2 = 208V/60/1
3 = 208V/60/3
4 = 240V/60/1
5 = 240V/60/3
6 = 277V/60/1
8 = 480V/60/3-Phase 4-Wire Power Supply

Digit 9 — Motor

0 = Free Discharge ECM
4 = Free Discharge ECM, Low Acoustics
7 = Free Discharge ECM, Low FLA Option
N = Free Discharge, Low Acoustics, Low FLA
A = High Static ECM
E = High Static ECM, Low Acoustics
H = High Static ECM, Low FLA Option
K = High Static ECM, Low Acoustics, Low FLA

Digit 10, 11 — Design Sequence

** = Design Sequence

Digit 12, 13 — Coil Letter Designation

(Single Coil Options)

AA = 2 R, 12 FPI CW/HW Changeover
AB = 2 R, 16 FPI CW/HW Changeover
AC = 3 R, 12 FPI CW/HW Changeover
AD = 4 R, 12 FPI CW/HW Changeover
AE = 4 R, 16 FPI CW/HW Changeover
H1 = 1 R, 12 FPI Heating Coil
H2 = 1 R, 14 FPI Heating Coil
H3 = 1 R, 16 FPI Heating Coil
H4 = 2 R, 12 FPI Heating Coil
H5 = 2 R, 14 FPI Heating Coil
H6 = 2 R, 16 FPI Heating Coil
K1 = 1 R Low Capacity Steam Coil
K2 = 1 R High Capacity Steam Coil
E4 = 4 Element Heating Only Coil
E6 = 6 Element Heating Only Coil
E8 = 8 Element Heating Only Coil
G0 = 2 R, 12 FPI DX Coil

(Coupled Coil Options)

DA = 1 R, 12 FPI HW Coil with 2 R, 12 FPI CW Coil
DC = 1 R, 12 FPI HW Coil with 2 R, 14 FPI CW Coil
DD = 1 R, 12 FPI HW Coil with 3 R, 12 FPI CW Coil
DE = 1 R, 14 FPI HW Coil with 3 R, 14 FPI CW Coil
DK = 1 R Steam with 3 R CW Coil
X3 = 3 Element Elec Coil with 3 R CW Coil (2 R on Sz 125)
X4 = 4 Element Elec Coil with 3 R CW Coil (2 R on Sz 125)
X6 = 6 Element Elec Coil with 3 R CW Coil (2 R on Sz 125)
GK = 1 R Steam Coil with 2 R DX Coil
GA = 1 R Heating coil with 2 R DX Coil
G3 = 3 Element Elec Heat Coil with 2 R DX Coil
G4 = 4 Element Elec Heat Coil with 2 R DX Coil
G6 = 6 Element Elec Heat Coil with 2 R DX Coil
R1 = 3 R, 12 FPI CW Coil with 1 R, 12 FPI HW Coil
R2 = 3 R, 14 FPI CW Coil with 1 R, 12 FPI HW Coil

Digit 14 — Coil Connections

A = Right Hand Supply
B = Left Hand Supply
C = Left Hand Cool/Right Hand Heat
D = Right Hand Cool/Left Hand Heat

Digit 15 — Control Types

0 = Unit-Mounted Speed Switch
Q = Tracer ZN520
R = Tracer ZN520 w/Low Temp
T = Tracer ZN520 w/Time Clock
U = Tracer ZN520 w/Low Temp & Time Clock
X = Tracer ZN520 ICS w/Fan Status
Y = Tracer ZN520 ICS w/Low Temp & Fan Status
8 = CSTI
9 = CSTI w/Low Temp
L = Tracer UC400
M = Tracer UC400 w/Time Clock

Digit 16 — Heating/Change Over Coil Control

0 = None
1 = Face & Bypass Damper Actuator
2 = 2-Pipe Face & Bypass Damper Control
3 = 4-Pipe Face & Bypass Damper Control & Isolation Valve
4 = Single Stage Electric Heat Control
5 = Dual Stage Electric Heat
7 = Face & Bypass Damper w/2-Pipe Control & Isolation Valve
9 = 2-Way 1/2-in. 3.3 CV; 3-Wire Mod
W = 2-Way 1/2-in. 1.9 CV; 3-Wire Mod
G = 2-Way 3/4-in. 4.7 CV; 3-Wire Mod
H = 2-Way 1-in. 6.6 CV; 3-Wire Mod
Z = 3-Way 1/2-in. 1.9 CV; 3-Wire Mod
Q = 3-Way 1/2-in. 3.8 CV; 3-Wire Mod
R = 3-Way 3/4-in. 6.6 CV; 3-Wire Mod
T = Steam: 3-Wire Mod 1/2-in. 1.9 CV
U = Steam: 3-Wire Mod 1/2-in. 4.7 CV
V = Steam: 3-Wire Mod 3/4-in. 8.6 CV

Digit 17 — Cooling Coil Control

0 = None
1 = Single Stage DX Controls
A = Field-Supplied Analog Valves
W = 2-Way 1/2-in. 1.9 CV; 3-Wire Mod
G = 2-Way 3/4-in. 4.7 CV; 3-Wire Mod
H = 2-Way 1-in. 6.6 CV; 3-Wire Mod
Z = 3-Way 1/2-in. 1.5 CV; 3-Wire Mod
Q = 3-Way 1/2-in. 3.8 CV; 3-Wire Mod
R = 3-Way 3/4-in. 6.6 CV; 3-Wire Mod

Digit 18 — Damper Configuration

0 = Field Installed Damper Actuator
1 = 100% Return Air/No Damper or Actuator

(Modulating ASHRAE Cycle II)

F = RA/OA Damper and Actuator (2–10 Vdc)
A = RA/OA Damper and Actuator (3-Point Modulating)
E = RA/OA Damper and Actuator with Exhaust (3-Point Mod)

(Two Position Control)

D = Damper w/Manual Quad Adjust

Digit 19 — Zone Sensor/Fan Speed Switch

0 = No Sensor - Unit Mounted Fan Speed Switch
J = Wall Mt Zone Sensor (OALMH; Setpoint Dial; On/Cancel)
K = Wall Mt Zone Sensor (OALMH; Setpoint Dial)
L = UNIT Mt Zone Sensor (OALMH; Setpoint Dial)
M = Wall Mount Display Sensor w/Setpoint Adjust
P = Wall Mt Sensor (Setpoint dial; On/Cancel) w/Unit-Mt Speed Switch
Q = Wall Mt Sensor (Setpoint Dial) w/Unit Speed Switch
3 = Wireless Display Sensor (H-L-A-O)
4 = Wireless Sensor - Ext Adjust

Digit 20 — Inlet Arrangement

A = FA Duct Top/RA Duct Lower Back
B = FA Duct Top/RA Duct Bottom
C = FA Duct Top/RA Bar Grille Bottom
D = FA Duct Top/RA Open Bottom
E = 100% FA Duct Top
F = FA Duct Upper Back/RA Duct Lower Back
G = FA Duct Upper Back/RA Duct Bottom
H = FA Duct Upper Back/RA Bar Grille Bottom
J = FA Duct Upper Back/RA Open Bottom (no grille)
K = 100% FA Duct Upper Back
L = 100% RA Duct Lower Back
M = 100% RA Duct Bottom
N = 100% RA Bar Grille Bottom
P = 100% RA Open Bottom (no grille)

Digit 21 — Discharge Arrangement

1 = Bar Grille Discharge
2 = Duct Collar Discharge 7-1/8 in. from Top
3 = Duct Collar Discharge 3/4 in. from Top
4 = Duct Collar Discharge 3-5/8 in. from Top
5 = Front Double Deflection Grille Discharge
6 = Front Double Deflection Opening Only (no grille)
7 = Bottom w/Double Deflection Grille

Digit 22 — Unit Access Panel

0 = Std. Horizontal Access Panel
1 = Safety Chain/Std. Access Panel
2 = Removable Access Panel
3 = Safety Chain/Removable Access Panel

Digit 23 — Recessing Flange

0 = No Recessing Flange
1 = Standard Recessing Flange

Digit 24 — Piping Package

0 = No Factory Installed Piping Package
A = Package 1; Standard Package
C = Package 2; Standard Package w/Circuit Setter
D = Package 3; Standard Package w/Strainer and Circuit Setter

Digit 25 — Filter

1 = Throwaway Filter
2 = MERV 8 Filter
3 = MERV 13 Filter

Digit 26 — Color Selection

1 = Deluxe Beige Cabinet
2 = Cameo White Cabinet
3 = Soft Dove Cabinet
4 = Stone Gray Cabinet
5 = Driftwood Gray Cabinet

Digit 27 — Motor Disconnect

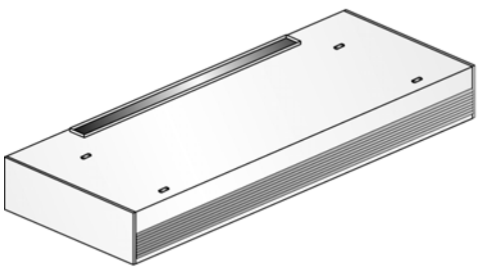
0 = No Disconnect
A = Non-Fused Toggle
B = Circuit Breaker

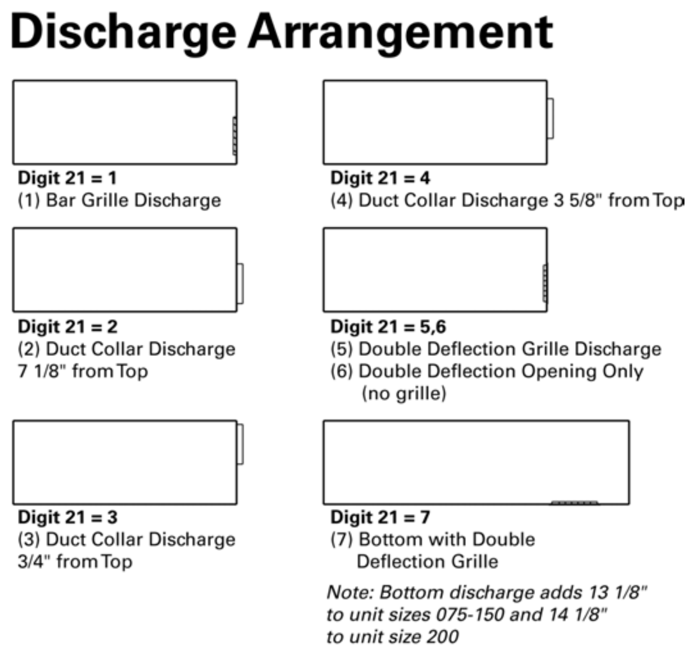
Digit 28 — Control Accessories

0 = None
A = $C0^2$ Sensor
B = Wall Mounted Relative Humidity Sensor

General Data

Discharge and Inlet Arrangements





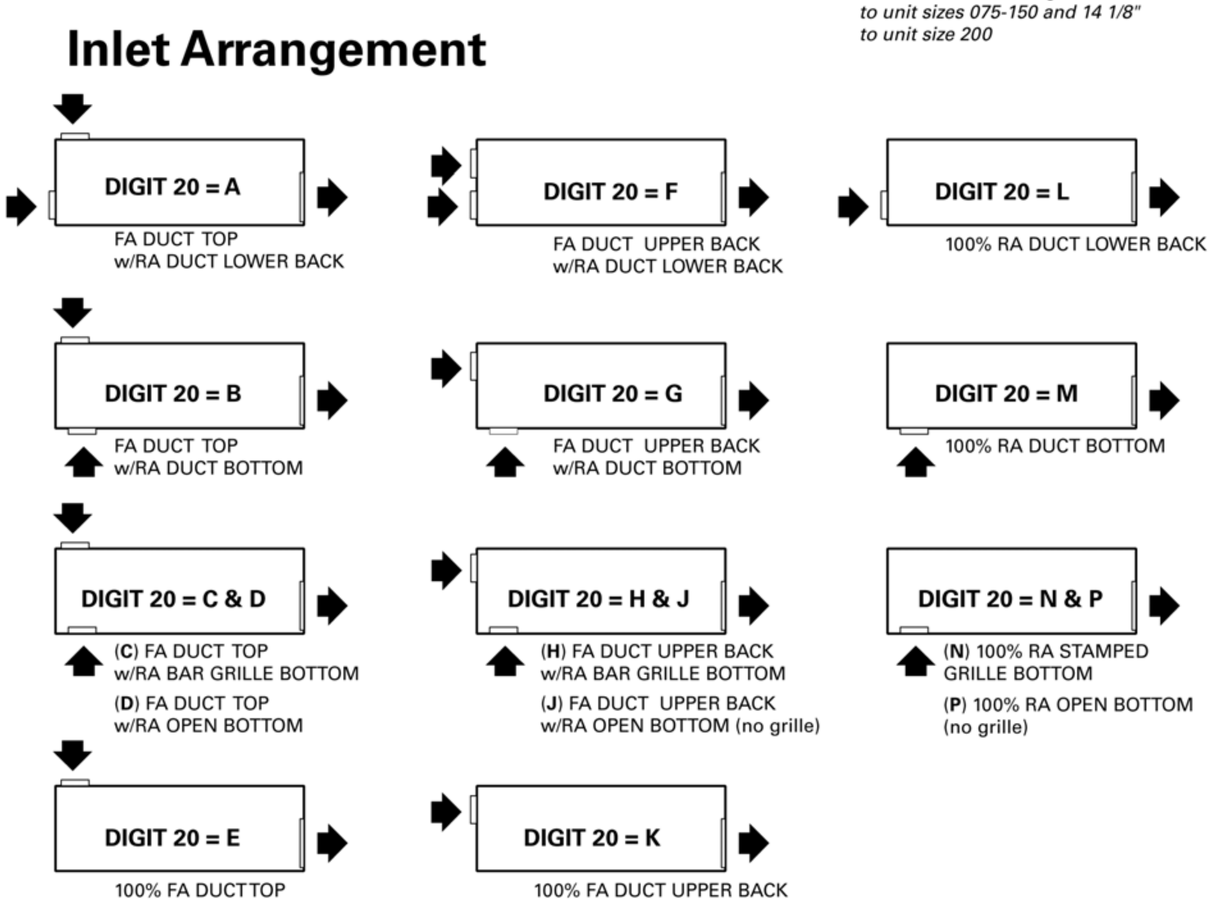


Table 1. Weights and measurements: horizontal unit ventilators

Unit Size	075	100	125	150	200
Unit Length (in.)	70-1/4	82-1/4	94-1/4	106-1/4	106-1/4
Unit Height (in.)	16-5/8	16-5/8	16-5/8	16-5/8	17-5/8
Unit Width (Front Discharge) (in.)	35-5/8	35-5/8	35-5/8	35-5/8	43-1/8
Unit Width (Bottom Discharge) (in.)	48-3/4	48-3/4	48-3/4	48-3/4	57-1/4
Shipping Weight (lb)[(a)]	340*	375*	435*	500*	600*
Filter Size (inches-actual)	41-1/2 x 15-1/4 x 1	53-1/2 x 15-1/4 x 1	65-1/2 x 15-1/4 x 1	77-1/2 x 15-1/4 x 1	77-1/2 x 15-1/4 x 1

(a) Working weight is approximately 10% less than shipping weight. Trane recommends 1/4-inch rods for hanging suspension

Table 2. Standard motor data (typical for AA coil)

Unit Size	Volts	RPM (Nominal)	CFM (Nominal)	Amps (FLA)	Watts	HP
75	115/60/1	1050	750	13	135	1
100	115/60/1	1050	1000	13	180	1
125	115/60/1	1050	1250	13	191	1
150	115/60/1	1050	1500	13	221	1
200	115/60/1	875	2000	13	311	1

Table 3. Hi-ESP motor data (typical for AA coil)

Unit Size	Volts	RPM (Nominal)	CFM (Nominal)	Amps (FLA)	Watts	HP
75	115/60/1	1330	750	13	198	1
100	115/60/1	1330	1000	13	287	1
125	115/60/1	1330	1250	13	305	1
150	115/60/1	1330	1500	13	357	1
200	115/60/1	1200	2000	13	770	1

Table 4. Coil area

Unit Size	Length (in)	Width (in)	Face Area (in^2)
075	42	12	504
100	54	12	648
125	66	12	792
150	78	12	936
200	78	12	936

Table 5. Inlet grille free area

	Horizontal Minimum Free Area	
Unit Size	Outlet (in^2)	Inlet (in^2)
075	232	144
100	296	192
125	364	240
150 and 200	430	288

Table 6. Coil volume (gallons)

Coil Type	Unit Size	Volume (gal)
AA, AB	075	0.72
	100	0.85
	125	0.99
	150–200	1.57
AC	075	0.97
	100	1.17
	125	1.40
	150–200	2.27
AD & AE	075	1.25
	100	1.51
	125	1.80
	150–200	2.96
DA–DC	075	0.86
	100	0.98
	125	1.13
	150–200	1.71
DD–DE	075	1.11
	100	1.30
	125	1.53
	150–200	2.39
DK	075	0.97
	100	1.17
	125	1.39
	150-200	2.25
H1–H3	075	0.24
	100	0.30
	125	0.35
	150–200	0.68
H4–H6	075	0.72
	100	0.85
	125	0.99
	150–200	1.57
R1–R2	075	1.21
	100	1.47
	125	1.73
	150–200	2.94
X3–X6	075	0.97
	100	1.17
	125	0.99
	150–200	2.26

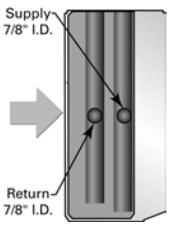
Table 7. Coil specifications

Hydronic Main Coil

- Wavy plate finned
- Hydrostatically tested at 350 psi

Piping packages for the main coil assembly are always supplied as a 3/4-inch package.

Left-hand configuration shown.



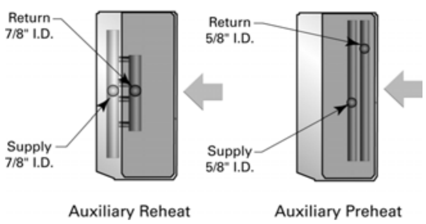
Coil Type: AA, AB, AC, AD, AE, H1, H2, H3, H4, H5, H6, DA, DC, DD, DE, X3–X6, DK, R1, R2

Hydronic Auxiliary Coil

- Wavy plate finned
- Hydrostatically tested at 350 psi

Piping packages for the main coil assembly are always supplied as a 3/4-inch package.

Right-hand configuration shown.



Coil Type: DA, DC, DD, DE, FA, R1, R2

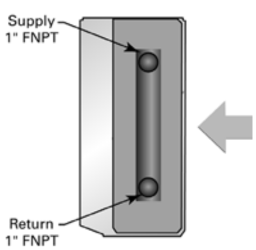
Note: A manual air vent is provided on all hydronic coils. The vent allows air to be purged from the coil during start-up, or maintenance. The air vent is located on the return header. Similarly, a drain plug is located at the bottom of the MAIN coil return header.

Steam Main Coil

- 1-Row, tube-in-tube distributing coil
- 1-inch female pipe connection

Piping packages for steam coils are field provided. Equipment specified with Trane controls will benefit from an optional 2-position isolation valve to be used for close-off to the steam coil when the damper is in full bypass position.

Right-hand configuration shown.



Coil Type: K1, K2

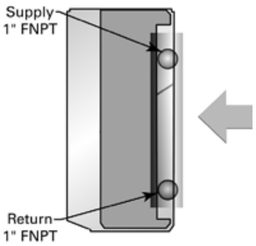
Table 7. Coil specifications (continued)

Steam Auxiliary Coil

- 1-Row, tube-in-tube distributing coil
- 1-inch female pipe connection

Piping packages for steam coils are field provided. The modulating piping valve (option) is shipped loose and field installed.

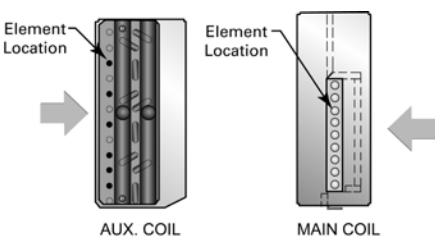
Right-hand configuration shown.



Coil Type: DK, FK

Electric Heat Coil

- Electric preheat coils consist of special resistance elements inserted in the coils fin surface for maximum element life, heat transfer and safety.
- Units include a high temperature cut-out with a continuous sensing element. This device interrupts electrical power whenever excessive temperatures are sensed along the leaving air side of the coil.
- Electric heat units include a panel interlock switch to disconnect power to the heating element when the access panel is opened.
- Power connection is made in the right hand end pocket.
- A circuit breaker option is available through the equipment model number.

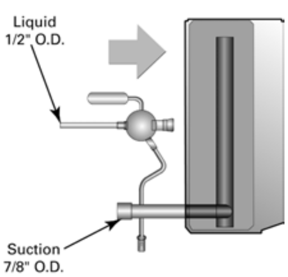


Coil Type: X3, X4, X6, E4, E6, E7, E9

Direct Expansion Coil—R-410A

- The R-410A direct expansion (DX) refrigerant coil includes a factory mounted adjustable thermal expansion valve (TXV) set to 90 psig superheat and an equalizing tube.
- 50 VA transformer
- Time delay relay
- Frost detection sensor
- Outside air sensor

Available in a left-hand configuration only.



Coil Type: G3–G6, G0, GA

Table 8. Coil row-fin information

Style	Coil Type	Size	Type	Cooling Rows	Cooling fpi	Heating Rows	Heating fpi
2-Pipe	Changeover Cool or Heat		AA	2	12	2	12
			AB	2	14	2	14
			AC	3	12	3	12
			AD	4	12	4	12
			AE	4	14	4	14
2-Pipe	Heating Only		H1	NA	NA	1	12
			H2	NA	NA	1	14
			H3	NA	NA	1	16
			H4	NA	NA	2	12
			H5	NA	NA	2	14
			H6	NA	NA	2	16
2-Pipe	DX Cooling Only	075	G0	2	12	NA	NA
		100	G0	2	12	NA	NA
		125	G0	2	12	NA	NA
		150	G0	2	12	NA	NA
		200	G0	2	14	NA	NA
2-Pipe	Steam Heating Only—Standard Capacity		K1	NA	NA	1	8
2-Pipe	Steam Heating Only—High Capacity	075	K2	NA	NA	1	10
		100	K2	NA	NA	1	13
		125	K2	NA	NA	1	10
		150	K2	NA	NA	1	14
		200	K2	NA	NA	1	14
4-Pipe	Cold Water Cool / Hot Water Heat		DA	2	12	1	12
			DC	2	14	1	14
			DD	3	12	1	12
			DE	3	14	1	14
4-Pipe	Cold Water Cool / Hot Water Re-Heat		R1	3	12	1	12
			R2	3	14	1	12
4-Pipe	Cold Water Cool / Steam Heating	075	DK	3	12	1	11
		100	DK	3	12	1	12
		125	DK	3	12	1	11
		150	DK	3	12	1	14
		200	DK	4	12	1	14
4-Pipe	Cold Water Cool / Electric Heating	075	X3–X6	3	12	Electric	
		100	X3–X6	3	12	Electric	
		125	X3–X6	2	14	Electric	
		150	X3–X6	3	12	Electric	
		200	X3–X6	3	14	Electric	
4-Pipe	DX Cool / Hot Water Heat	075	GA	2	12	1	12
		200	GA	2	14	1	14
4-Pipe	DX Cool / Steam Heating	075	GK	2	12	1	11
		100	GK	2	12	1	12
		125	GK	2	12	1	11
		150	GK	2	12	1	14
		200	GK	2	14	1	14
4-Pipe	DX Cool / Electric Heating	075	G3–G6	2	12	Electric	
		200	G3–G6	2	14	Electric	

Table 9. Control methodology

	Fan Speed
FSS	3 or infinite[a]
CSTI	3 or infinite[a]
Tracer ZN520	3
Tracer UC400	Infinite

(a) With a field-supplied 2–10 Vdc controller.

Table 10. Control sequences

	Fan Speeds
DX operation[a]	1
Electric heat operation[a]	1
Sidewall Exhaust[b]	2
ERSA[b]	2

(a) Fan speed during sequence operation.
(b) Unit Ventilator when operating with option.

Performance Data

A-Coils

AHRI Cooling performance is based on 80/67°F entering air temperature, 45°F entering chilled water temperature with a 10°F ΔT. Heating performance is based on 70°F entering air temp, 180°F entering water temperature with a 40°F ΔT. All performance measured on high speed tap, 115 V. Free discharge units: 0.0 ESP, with throwaway filter. High static units: 0.20 ESP, without filter.

Table 11. A-Coils, 2-pipe coil with free discharge EC motor

			Cooling				Heating			
Size	Coil Type	Airflow (cfm)	Total Capacity (MBh)	Sensible Capacity (MBh)	Flow Rate (gpm)	WPD (ft H_2O)	Total Capacity (MBh)	Flow Rate (gpm)	WPD (ft H_2O)	Motor Power (W)
075	AA	875	19.12	15.62	3.81	1.49	52.00	2.60	0.70	135
	AB	825	21.80	16.49	4.34	1.88	57.80	2.89	0.80	135
	AC	815	27.63	19.28	5.51	4.09	63.90	3.19	1.40	135
	AD	780	21.13	16.70	4.21	0.67	67.20	3.36	0.40	135
	AE	760	19.64	15.28	3.91	0.59	71.70	3.58	0.50	135
100	AA	1090	25.18	9.02	5.02	2.89	67.00	3.35	1.20	180
	AB	1030	28.47	20.09	5.67	3.60	74.40	3.72	1.50	180
	AC	1025	33.88	22.89	6.75	7.02	81.90	4.09	2.50	180
	AD	975	30.23	21.17	6.02	1.49	96.60	4.33	0.70	180
	AE	1015	32.03	21.56	6.38	1.65	97.30	4.87	0.90	180
125	AA	1240	33.47	25.57	6.67	5.55	79.00	3.95	1.90	191
	AB	1300	40.07	28.39	7.99	7.64	94.40	4.75	2.70	191
	AC	1290	42.72	30.03	8.51	4.45	101.20	5.06	1.60	191
	AD	1240	46.56	31.33	9.28	3.66	110.70	5.54	1.30	191
	AE	1265	48.38	31.40	9.64	3.93	122.30	6.11	1.60	191
150	AA	1600	42.25	31.85	8.42	9.53	100.30	5.01	3.30	221
	AB	1525	46.68	32.38	9.30	11.38	112.10	5.60	4.10	221
	AC	1510	50.09	34.12	9.98	6.66	119.90	5.99	2.40	221
	AD	1600	56.11	36.64	11.18	5.70	141.80	7.09	2.30	221
	AE	1485	56.68	35.73	11.30	5.81	144.80	7.24	2.30	221
200	AA	2085	51.50	40.18	10.26	13.55	120.00	6.00	4.60	311
	AB	1985	58.90	42.59	11.74	17.21	135.40	6.77	5.70	311
	AC	1970	64.10	44.91	12.78	10.34	146.40	7.32	3.40	311
	AD	1885	71.18	47.35	14.19	8.78	161.70	8.08	2.90	311
	AE	1785	70.97	45.41	14.14	8.73	169.30	8.47	3.10	311

Table 12. A-coil, 2-pipe coil with high static EC motor

			Cooling				Heating			
Size	Coil Type	Airflow (cfm)	Total Capacity (MBh)	Sensible Capacity (MBh)	Flow Rate (gpm)	WPD (ft H_2O)	Total Capacity (MBh)	Flow Rate (gpm)	WPD (ft H_2O)	Motor Power (W)
075	AA	780	17.24	14.07	3.44	1.24	48.00	2.40	0.60	198
	AB	760	20.09	15.16	4.00	1.62	54.40	2.72	0.70	198
	AC	755	25.81	17.92	5.14	3.62	60.20	3.01	1.20	198
	AD	740	18.96	15.35	3.78	0.55	64.20	3.21	0.40	198
	AE	795	22.56	16.92	4.50	0.76	74.50	3.73	0.50	198
100	AA	1115	28.38	21.70	5.66	3.57	68.00	3.40	1.30	287
	AB	1090	32.67	23.42	6.51	4.59	77.50	3.88	1.60	287
	AC	1085	38.77	26.52	7.73	8.91	85.50	4.28	2.70	287
	AD	1055	37.26	25.97	7.43	2.17	92.40	4.62	0.80	287
	AE	1005	36.82	24.68	7.34	2.13	96.40	4.82	0.90	287
125	AA	1255	34.55	26.50	6.88	5.87	79.60	3.98	2.00	305
	AB	1225	39.67	28.07	7.91	7.51	90.40	4.52	2.50	305
	AC	1220	42.27	29.69	8.42	4.37	96.90	4.85	1.40	305
	AD	1350	51.35	34.70	10.23	4.38	118.70	5.93	1.50	305
	AE	1295	51.45	33.47	10.25	4.39	124.80	6.24	1.60	305
150	AA	1490	37.40	27.72	7.45	7.68	95.40	4.77	3.10	357
	AB	1450	42.55	29.09	8.48	9.65	108.00	5.40	3.80	357
	AC	1445	45.63	30.84	9.09	5.65	115.80	5.79	2.20	357
	AD	1715	55.74	36.38	11.11	5.63	150.00	7.50	2.50	357
	AE	1635	55.39	34.88	11.04	5.57	157.20	7.86	2.70	357
200	AA	2095	50.67	39.43	10.10	13.16	120.40	6.02	4.60	770
	AB	2005	57.94	41.78	11.55	16.71	136.40	6.82	5.80	770
	AC	1990	62.87	43.94	12.53	9.99	147.40	7.37	3.40	770
	AD	1895	69.14	45.88	13.78	8.32	162.40	8.12	2.90	770
	AE	1770	68.74	43.88	13.70	8.24	168.10	8.40	3.10	770

AHRI Cooling performance is based on 80/67° F entering air temperature, 45°F entering chilled water temperature with a 10°F ΔT. Heating performance is based on 70°F entering air temp, 180°F entering water temperature with a 40°F ΔT. All performance measured on high speed tap, 115 V. Free discharge units: 0.0 ESP, with throwaway filter. High static units: 0.20 ESP, without filter.

Table 13. D-coil, 4-pipe with free discharge EC motor

			Cooling				Heating			
Size	Coil Type	Airflow (cfm)	Total Capacity (MBh)	Sensible Capacity (MBh)	Flow Rate (gpm)	WPD (ft H_2O)	Total Capacity (MBh)	Flow Rate (gpm)	WPD (ft H_2O)	Motor Power (W)
075	DA	815	18.16	14.82	3.62	1.36	51.20	2.56	0.50	135
	DC	780	19.20	14.93	3.83	1.50	56.70	2.83	0.70	135
	DD	780	26.73	18.60	5.33	3.85	49.70	2.48	0.50	135
	DE	760	26.81	18.21	5.34	3.87	55.60	2.78	0.60	135
100	DA	1025	24.21	18.20	4.83	2.70	66.30	3.32	1.00	180
	DC	975	24.95	17.96	4.97	2.84	73.00	3.65	1.20	180
	DD	975	32.41	21.82	6.46	6.49	64.00	3.20	0.90	180
	DE	1015	34.38	22.76	6.85	7.21	73.90	3.69	1.20	180
125	DA	1290	34.12	26.13	6.80	5.74	84.00	4.20	1.70	191
	DC	1240	36.25	26.17	7.22	6.40	93.10	4.66	2.00	191
	DD	1240	41.81	29.35	8.33	4.46	81.60	4.08	1.60	191
	DE	1265	46.51	31.39	9.27	5.62	94.50	4.73	2.10	191
150	DA	1510	40.06	29.98	7.98	8.67	99.60	4.98	2.50	221
	DC	1600	43.37	30.73	8.64	9.98	118.60	5.93	3.40	221
	DD	1600	50.24	34.23	10.01	6.96	103.70	5.19	2.70	221
	DE	1485	54.23	35.59	10.81	8.28	112.30	5.61	3.10	221
200	DA	1970	49.82	38.66	9.93	12.77	119.80	5.99	3.50	311
	DC	1885	52.99	38.79	10.59	14.25	133.60	6.68	4.30	311
	DD	1885	62.56	43.67	12.47	10.31	116.20	5.81	3.30	311
	DE	1785	67.01	44.90	13.35	12.13	128.50	6.43	4.00	311

Table 14. D-coils, 4-pipe with high static EC motor

			Cooling				Heating			
Size	Coil Type	Airflow (cfm)	Total Capacity (MBh)	Sensible Capacity (MBh)	Flow Rate (gpm)	WPD (ft H_2O)	Total Capacity (MBh)	Flow Rate (gpm)	WPD (ft H_2O)	Motor Power (W)
075	DA	755	16.75	13.68	3.34	1.18	48.50	2.43	0.50	198
	DC	740	17.99	13.99	3.59	1.34	54.40	2.72	0.60	198
	DD	740	25.33	17.57	5.05	3.50	47.80	2.39	0.50	198
	DE	795	28.38	19.35	5.66	4.28	57.50	2.87	0.70	198
100	DA	1085	27.68	21.10	5.52	3.42	69.00	3.45	1.10	287
	DC	1055	29.55	21.60	5.89	3.84	77.40	3.87	1.30	287
	DD	1055	38.03	25.97	7.58	8.61	67.70	3.39	1.00	287
	DE	1005	38.15	25.45	7.60	8.66	73.30	3.66	1.20	287
125	DA	1220	33.80	25.85	6.74	5.65	80.70	4.03	1.50	305
	DC	1350	39.46	28.79	7.86	7.43	99.20	4.96	2.30	305
	DD	1350	45.76	32.35	9.12	5.24	86.70	4.34	1.80	305
	DE	1295	49.25	33.38	9.81	6.23	96.20	4.81	2.10	305
150	DA	1445	36.80	27.22	7.33	7.46	96.50	4.83	2.30	357
	DC	1715	43.12	30.52	8.59	9.88	124.80	6.24	3.80	357
	DD	1715	49.93	34.00	9.95	6.88	108.90	5.45	2.90	357
	DE	1635	53.07	34.77	10.58	7.97	120.60	6.03	3.50	357
200	DA	1990	48.96	37.88	9.76	12.38	120.60	6.03	3.50	770
	DC	1895	51.69	37.68	10.30	13.63	134.10	6.71	4.30	770
	DD	1895	60.89	42.37	12.14	9.82	116.70	5.83	3.30	770
	DE	1770	65.04	43.44	12.96	11.49	127.70	6.38	3.90	770

AHRI Cooling performance is based on 80/67° F entering air temperature, 45°F entering chilled water temperature with a 10°F ΔT. Heating performance is based on 70°F entering air temp, 180°F entering water temperature with a 40°F ΔT. All performance measured on high speed tap, 115 V. Free discharge units: 0.0 ESP, with throwaway filter. High static units: 0.20 ESP, without filter.

Table 15. 2-Pipe coil, HW data

HUV Size	Coil Type	Heating Total Capacity (MBh)	Heating Flow Rate (gpm)	Heating WPD (ft H_2O)
075	H1	41.18	2.06	2.85
	H2	45.12	2.26	3.36
	H3	48.74	2.44	3.86
	H4	53.49	2.67	0.70
	H5	57.95	2.90	0.81
	H6	61.84	3.09	0.91
100	H1	52.90	2.65	0.97
	H2	57.98	2.90	1.15
	H3	62.65	3.13	1.33
	H4	71.90	3.59	1.41
	H5	77.92	3.90	1.63
	H6	83.19	4.16	1.84
125	H1	66.45	3.32	1.67
	H2	72.85	3.64	1.98
	H3	78.73	3.94	2.28
	H4	90.36	4.52	2.45
	H5	97.97	4.90	2.83
	H6	104.61	5.23	3.19
150	H1	99.89	4.99	2.70
	H2	124.35	6.22	4.03
	H3	131.66	6.58	4.48
	H4	108.87	5.44	3.88
	H5	118.05	5.90	4.49
	H6	126.08	6.30	5.05
200	H1	120.35	6.02	3.80
	H2	152.05	7.60	5.84
	H3	161.68	8.08	6.54
	H4	132.52	6.63	5.52
	H5	144.37	7.22	6.44
	H6	154.87	7.74	7.32

Table 16. X-coils, 2-pipe with free discharge EC motor

Size	Coil Type	Cooling Total Capacity (MBh)	Cooling Sensible Capacity (MBh)	Cooling Flow Rate (gpm)	Cooling WPD (ft H_2O)
075	X3	26.73	18.60	5.33	3.85
	X4	26.73	18.60	5.33	3.85
	X6	26.73	18.60	5.33	3.85
100	X3	32.41	21.82	6.46	6.49
	X4	32.41	21.82	6.46	6.49
	X6	32.41	21.82	6.46	6.49
125	X3	39.67	27.73	7.91	7.51
	X4	39.67	27.73	7.91	7.51
	X6	39.67	27.73	7.91	7.51
150	X3	50.24	34.23	10.01	6.96
	X4	50.24	34.23	10.01	6.96
	X6	50.24	34.23	10.01	6.96
200	X3	72.21	48.78	14.39	13.34
	X4	72.21	48.78	14.39	13.34
	X6	72.21	48.78	14.39	13.34

Performance Data

GA-, DK-, R1-, R2-Coils

AHRI Cooling performance is based on 80/67 °F entering air temperature, 45°F entering chilled water temperature with a 10°F ΔT. Heating performance is based on 70°F entering air temp, 180°F entering water temperature with a 40°F ΔT. All performance measured on high speed tap, 115 V. Free discharge units: 0.0 ESP, with throwaway filter. High static units: 0.20 ESP, without filter.

Table 17. R1-, R2-, GA-coils, 4-pipe with free discharge EC motor, heating data

		Heating		
Unit Size	Coil Type	Total Capacity (MBh)	Flow Rate (gpm)	WPD (ft $H_2 0$)
075	R1	30.38	1.52	1.66
	R2	36.27	1.81	2.29
	GA	53.61	2.68	0.59
100	R1	38.03	1.90	0.54
	R2	45.30	2.27	0.74
	GA	72.06	3.60	1.14
125	R1	48.31	2.42	0.94
	R2	57.62	2.88	1.30
	GA	90.57	4.53	1.91
150	R1	68.42	3.42	1.36
	R2	81.16	4.06	1.85
	GA	102.98	5.15	2.63
200	R1	81.33	4.07	1.86
	R2	96.80	4.84	2.56
	GA	136.30	6.81	4.45

Table 18. R1-, R2-, DK-coils, 4-pipe with free discharge EC motor, cooling data

		Cooling			
Unit Size	Coil Type	Total Capacity (MBh)	Sensible Capacity (MBh)	Flow Rate (gpm)	WPD (ft $H_2 0$)
075	R1	26.73	18.60	5.33	3.85
	R2	26.81	18.21	5.34	3.87
	DK	17.47	13.97	3.48	1.27
100	R1	32.41	21.82	6.46	6.49
	R2	34.38	22.76	6.85	7.21
	DK	23.03	16.94	4.59	2.47
125	R1	41.81	29.35	8.33	4.46
	R2	46.51	31.39	9.27	5.40
	DK	33.47	24.34	6.67	5.55
150	R1	50.24	34.23	10.01	6.96
	R2	54.23	35.59	10.81	7.98
	DK	40.17	28.34	8.01	8.71
200	R1	62.56	43.67	12.47	10.31
	R2	67.07	44.90	13.35	11.67
	DK	48.70	35.47	9.71	12.26

Table 19. R-410A cooling only[a]

HUV Unit Size	Condensing Unit	EWB (°F)	T-Btu/hr[b]	S-Btu/hr EDB 72°F	S-Btu/hr EDB 76°F	S-Btu/hr EDB 80°F
075	4TTB3018	63	18865	12052	15467	18574
		67	19919	7972	11532	15060
		71	21029	3638	7170	10878
	4TTB3024	63	23108	13307	16931	20805
		67	24057	9023	12633	16291
		71	25428	4477	7832	11784
100	4TTB3024	63	24820	15965	20784	24543
		67	26117	10448	15251	19950
		71	27544	4735	9536	14353
	4TTB3030	63	28395	17201	21904	26087
		67	29886	11643	16360	21069
		71	31529	5709	10447	15301
125	4TTB3030	63	30441	19769	25504	30266
		67	31903	12951	18875	24723
		71	33583	5690	11569	17730
	4TTB3036	63	35117	21393	27320	32571
		67	36701	14277	20254	26132
		71	38881	6927	13004	19506
150	4TTB3036	63	36851	23892	31008	36531
		67	38641	15616	22735	29964
		71	40353	6867	14159	21323
	4TTB3042	63	41204	25231	32327	39155
		67	42745	16873	23916	30966
		71	44884	7964	15092	22325
200	4TTB3042	63	43734	30169	38934	43734
		67	45733	19218	28689	38535
		71	47505	7509	17362	26976
	4TTB3048	63	47482	30769	39826	47125
		67	49200	20140	29313	38635
		71	51420	8828	17852	27549

(a) R-410A DX coils are rated at 95°F dry bulb/80°F wet bulb ambient outside air temperature, 25 feet of suction and liquid line, 400 cfm per Ton nominal.
(b) Total Capacity calculated from outdoor 95°F dry bulb/80°F wet bulb and 80°F indoor DB standard air conditions.

Table 20. Electric heat capacity

Unit Size	Coil Type	No of Elem.	Elem. kW	Total kW	TMBH
075	G3, X3	3	1.95	5.85	19.98
	E4, G4, X4	4	1.95	7.80	26.64
	E6, G6, X6	6	1.95	11.70	39.96
	E7	7	1.95	13.65	46.61
	E9	9	1.95	17.55	59.93
100	G3, X3	3	2.60	7.80	26.64
	E4, G4, X4	4	2.60	10.40	35.52
	E6, G6, X6	6	2.60	15.60	53.27
	E7	7	2.60	18.20	62.15
	E9	9	2.60	23.40	79.91
125	G3, X3	3	3.25	9.75	33.30
	E4, G4, X4	4	3.25	13.00	44.40
	E6, G6, X6	6	3.25	19.50	66.60
	E7	7	3.25	22.75	77.69
	E9	9	3.25	29.25	99.89
150	G3, X3	3	3.80	11.40	38.91
	E4, G4, X4	4	3.80	15.20	51.91
	E6, G6, X6	6	3.80	22.80	77.86
	E7	7	3.80	26.60	90.84
	E9	9	3.80	34.20	116.79
200	G3, X3	3	3.80	11.40	38.93
	E4, G4, X4	4	3.80	15.20	51.91
	E6, G6, X6	6	3.80	22.80	77.86
	E7	7	3.80	26.60	90.84
	E9	9	3.80	34.20	116.79

Table 21. Steam coil capacity

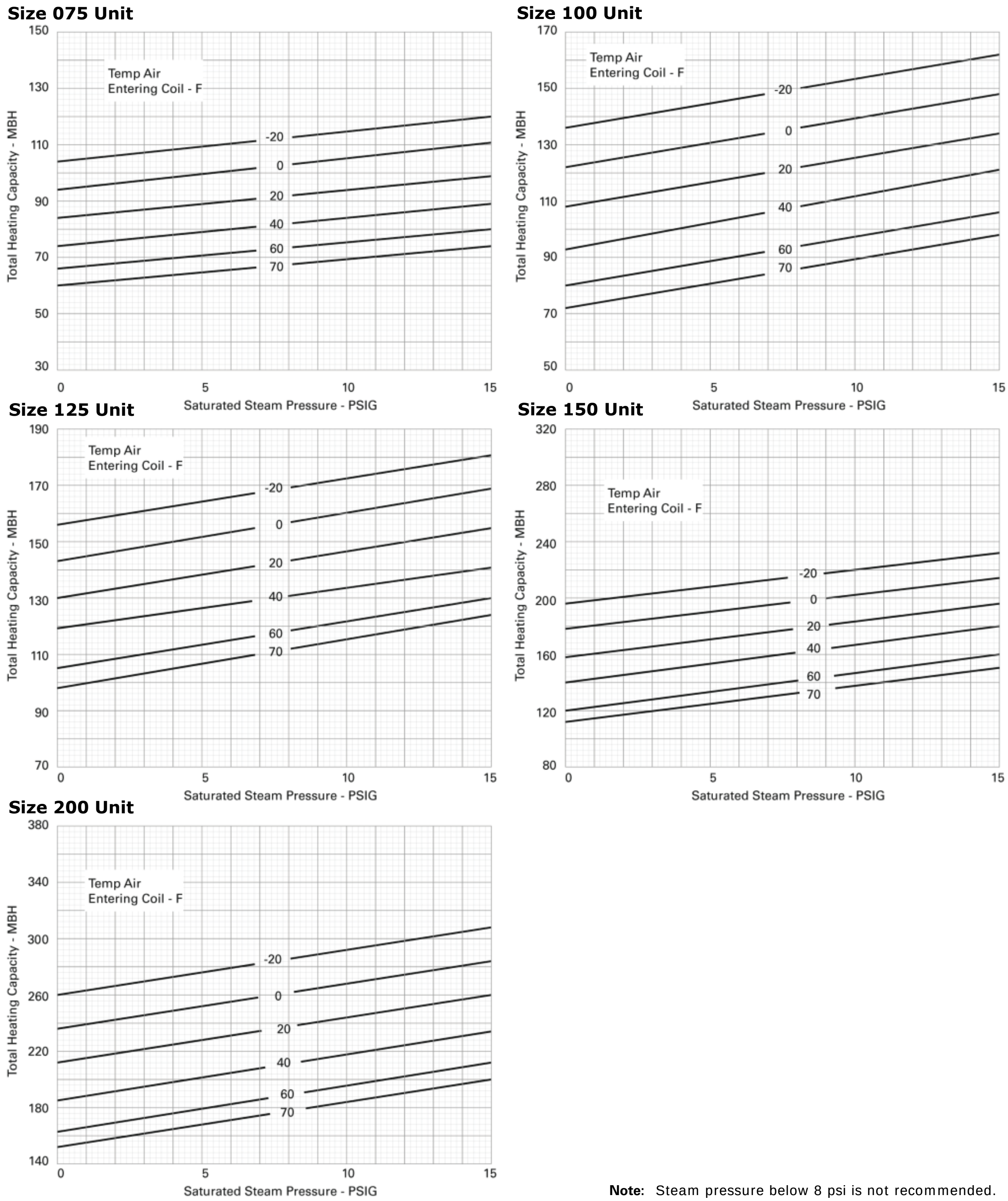
Unit Size	Coil Type	EAT	TMBH 5 PSIG	TMBH 10 PSIG	TMBH 15 PSIG
075	K1	-20	85.89	89.98	93.48
		0	78.94	83.04	86.54
		20	72.00	76.10	79.59
		40	65.06	69.16	72.65
		60	58.12	62.21	65.71
		70	54.65	58.74	62.24
	K2	-20	101.18	106.01	110.12
		0	93.00	97.83	101.94
		20	84.82	89.65	93.77
		40	76.64	81.47	85.59
		60	68.46	73.29	77.41
		70	64.38	69.20	73.32
100	K1	-20	112.93	118.31	122.91
		0	103.80	109.19	113.78
		20	94.67	100.06	104.65
		40	85.54	90.93	95.52
		60	76.41	81.80	86.40
		70	71.85	77.24	81.83
	K2	-20	158.08	165.61	172.05
		0	145.30	152.84	159.27
		20	132.52	140.06	146.49
		40	119.74	127.28	133.71
		60	106.96	114.50	120.93
		70	100.57	108.11	114.55
125	K1	-20	139.94	146.61	152.31
		0	128.63	135.30	140.99
		20	117.31	123.99	129.68
		40	106.00	112.68	118.37
		60	94.69	101.36	107.06
		70	89.03	95.71	101.40
	K2	-20	164.93	172.79	179.50
		0	151.60	159.46	166.17
		20	138.26	146.13	152.84
		40	131.78	132.80	139.51
		60	111.60	119.47	126.18
		70	104.93	112.80	119.51
150	K1	-20	166.93	174.89	181.68
		0	153.44	161.40	168.19
		20	139.94	147.90	154.70
		40	126.45	134.41	141.20
		60	112.96	120.92	127.71
		70	106.21	114.17	120.96
	K2	-20	243.70	256.14	263.74
		0	224.72	236.38	246.33
		20	204.96	216.62	226.57
		40	185.20	196.86	206.80
		60	165.43	177.09	187.04
		70	155.55	167.21	177.16
200	K2	-20	286.51	306.05	317.93
		0	266.20	282.43	294.32
		20	244.09	258.82	270.71
		40	221.28	235.21	274.09
		60	197.66	211.59	223.48
		70	185.86	199.79	211.67

Notes:
1. Condensate trap for the steam coil option is field installed.
2. Static pressure for the K1, K2 options should be modeled after the H1 coil option.
3. Steam coils that function at 5 psig or less should not utilize valve control. Valve control may starve the coil, causing stratification.

Performance Data

DK-, GK-Steam Coils

Figure 5. DK, GK Steam coils performance data



Note: Steam pressure below 8 psi is not recommended.

Table 22. Minimum Circuit Ampacity (MCA) for standard and high static motors (115 V)

Unit Size	HP	Amps
75	1	16.25
100	1	16.25
120	1	16.25
150	1	16.25
200	1	16.25

Table 23. Minimum Circuit Ampacity (MCA) for electric heat coils with standard motors

Unit Size	No. of Elem	Coil kW	208 V 1ph	240 V 1ph	277 V 1ph	208 V 3ph	240 V 3ph	480 V 3ph
75	3	5.85	43.84	38.53	32.59	29.01	25.67	14.99
100		7.8	55.56	48.69	41.39	35.78	31.55	17.93
120		9.75	67.28	58.84	50.19	42.56	37.42	20.86
150		11.4	77.2	67.44	57.63	48.29	42.38	23.35
200		11.4	77.2	67.44	57.63	48.29	42.38	23.35
75	4	7.8	55.56	48.69	41.39	35.78	31.55	17.93
100		10.4	71.19	62.23	53.12	44.81	39.37	21.84
120		13	86.81	75.77	64.85	53.85	47.20	25.76
150		15.2	100.03	87.23	74.78	61.49	53.82	29.07
200		15.2	100.03	87.23	74.78	61.49	53.82	29.07
75	6	11.7	NA	69.00	58.99	49.33	43.29	23.80
100		15.6	NA	89.31	76.58	62.88	55.03	29.67
120		19.5	NA	109.63	94.18	76.43	66.77	35.54
150		22.8	NA	126.81	109.08	87.89	76.70	40.51
200		22.8	NA	126.81	109.08	87.89	76.70	40.51

Table 24. Additional Minimum Circuit Ampacity (MCA)

Volts	Amps
120	0.94
208	0.55
240	0.48
277	0.41
480	0.41

Table 25. Minimum Circuit Ampacity (MCA) for electric heat coils with high static motor

Unit Size	No. of Elem	Coil kW	208 V 1ph	240 V 1ph	277 V 1ph	208 V 3ph	240 V 3ph	480 V 3ph
75	3	5.85	43.84	38.53	32.59	29.01	25.67	14.99
100		7.8	55.56	48.69	41.39	35.78	31.55	17.93
120		9.75	67.28	58.84	50.19	42.56	37.42	20.86
150		11.4	77.2	67.44	57.63	48.29	42.38	23.35
200		11.4	77.2	67.44	57.63	48.29	42.38	23.35
75	4	7.8	55.56	48.69	41.39	35.78	31.55	17.93
100		10.4	71.19	62.23	53.12	44.81	39.37	21.84
120		13	86.81	75.77	64.85	53.85	47.20	25.76
150		15.2	100.03	87.23	74.78	61.49	53.82	29.07
200		15.2	100.03	87.23	74.78	61.49	53.82	29.07
75	6	11.7	NA	69.00	58.99	49.33	43.29	23.80
100		15.6	NA	89.31	76.58	62.88	55.03	29.67
120		19.5	NA	109.63	94.18	76.43	66.77	35.54
150		22.8	NA	126.81	109.08	87.89	76.70	40.51
200		22.8	NA	126.81	109.08	87.89	76.70	40.51

Table 26. Minimum Circuit Ampacity (FLA) for EC motors

Motor Type	HP	Amps
Standard EC motors	1	13
High Static EC motors	1	13

Minimum Circuit Ampacity (MCA) and Maximum Fuse Size (MFS) Calculations for Unit Ventilators with Electric Heat (Single Phase) Heater Amps = (Heater kW x 1000)/Heater Voltage

Note: *Use 120 V heater voltage for 115 V units. Use 240 V heater voltage for 230V units.*

MCA = 1.25 x (heater amps + all motor FLAs)

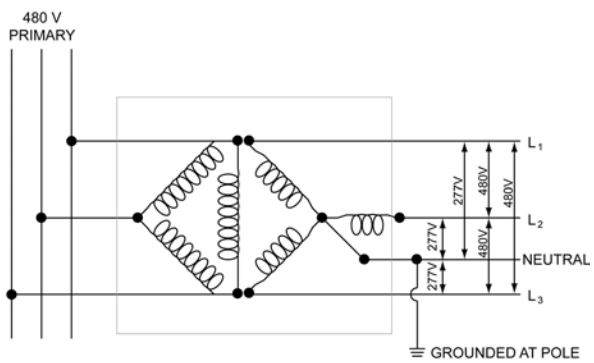
MFS or HACR Type Circuit Breaker = (2.25 x Largest Motor FLA) + Second Motor FLA + Heater Amps (If Applicable)

HACR (Heating, Air-Conditioning and Refrigeration) type circuit breakers are required in the branch circuit wiring for all Unit Ventilators with electric heat.

Refer to Figure 26, p. 35 for motor FLAs.

Select a standard fuse size or HACR type circuit breaker equal to the MCA. Use the next larger standard size if the MCA does not equal a standard size. Standard Fuse Sizes are: 15, 20, 25, 30, 35, 40, 45, 50, 60 amps (increase to 150 amps)

Unit Ventilator electric heat MBh = (Heater kW) (3.413)



Note: Incoming power to the unit ventilator is 3-phase, 4-wire for a 480 Volt system (3-hot, 1-neutral). This does not include an equipment ground.

Glycol in an HVAC System

Because the detrimental effects of glycol are lower at high temperatures, little concern is given to capacity loss or increased pump power when glycol is added to heating systems. This is why it is not uncommon to see glycol percentages up to 40 percent in the heating loop of a system. However, the same is not true for cooling systems. Concentrations of this level are intolerable in cooling systems where fluid temperatures are lower. The viscosity of the glycol increases as the temperature of the mixture drops. This not only decreases the effectiveness of the heat transfer, but it also makes the mixture more difficult to pump. To make things worse, as the percentage of glycol increases, the risk of having laminar flow in the coil increases. This again is because glycol is more viscous than water.

With these effects in mind it is important to use a minimum amount of glycol to protect the HVAC system.

Burst Protection vs. Freeze Protection

Burst protection is sufficient in systems where there is adequate space to accommodate the expansion of an ice/slush mixture. The protection works as follows: As the temperature drops below the solution's freeze point, ice crystals begin to form. Because the water freezes first, the remaining glycol solution is further concentrated and remains fluid. The combination of ice crystals and fluid make a flowable slush. The volume increases as this slush forms and flows into the available expansion volume (usually an expansion tank). When a sufficient concentration of glycol is present, no damage to the system will occur.

Freeze protection is required in cases where no ice crystals can be permitted to form or where there is inadequate expansion volume available. HVAC systems intended to start-up in cold weather after prolonged winter shutdowns may require freeze protection. Table 27 is provided by Dow Chemical Co. for its ethylene and propylene glycol products.

Table 27. Percentage volume glycol concentration

	For Freeze Protection		For Burst Protection	
Temperature (°F)	Ethylene Glycol	Propylene Glycol	Ethylene Glycol	Propylene Glycol
20	16%	17%	11%	11%
10	25%	26%	17%	18%
0	33%	34%	22%	23%
-10	39%	41%	26%	28%
-20	44%	45%	30%	30%
-30	48%	49%	30%	33%
-40	52%	51%	30%	35%
-50	56%	53%	30%	35%
-60	60%	55%	30%	35%

Table 27 shows that a 30 percent ethylene glycol solution is enough to protect a system down to -60°F. Because of the benefits of burst protection, excessive glycol only degrades the heat transfer and increases the pressure drop of the fluid without providing additional system protection. Use glycol correctly.

Table 28 reflects sound power ratings for the horizontal classroom unit ventilator. To calculate the noise criteria (NC) for a unit, subtract the actual room effect from the sound power number in each octave band. These numbers may be graphed on a NC chart.

Note: *Because room affects vary greatly, request exact numbers per the specific job from the design engineer. By obtaining these exact numbers, the most accurate results of the installed unit may be calculated.*

Data obtained in the reverberant rooms conforming to ANSI S12.31 and ANSI S12.32

Table 28. Horizontal octave band sound power ratings (sound power in db ref: 10^{-12} watts)

Octave Band	1	2	3	4	5	6	7	8
Center of Frequency	**63**	**125**	**250**	**500**	**1000**	**2000**	**4000**	**8000**
075 High Speed	66	67	61	60	56	53	48	41
075 Med Speed	62	63	57	56	52	49	44	37
075 Low Speed	59	60	54	53	49	46	41	34
100 High Speed	66	67	61	60	56	52	48	41
100 Med Speed	62	63	57	56	52	48	44	37
100 Low Speed	59	61	55	54	43	45	38	29
120 High Speed	70	71	65	64	60	56	51	44
120 Med Speed	66	67	61	60	56	52	47	40
120 Low Speed	63	64	58	57	53	49	44	37
150 High Speed	65	68	62	60	56	52	45	38
150 Med Speed	61	64	58	56	52	48	41	34
150 Low Speed	57	63	54	53	47	42	33	25
200 High Speed	73	75	68	64	60	57	53	45
200 Med Speed	67	69	62	58	54	51	47	39
200 Low Speed	64	74	59	60	49	45	37	29

Piping

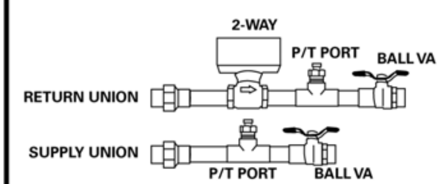
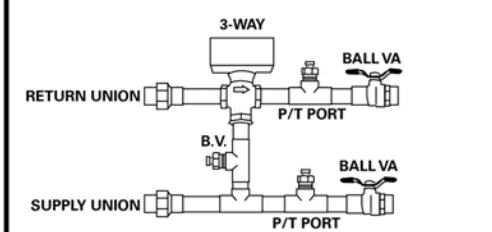
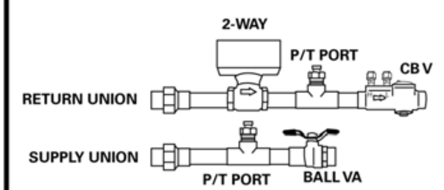
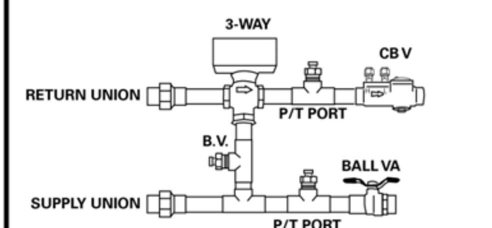
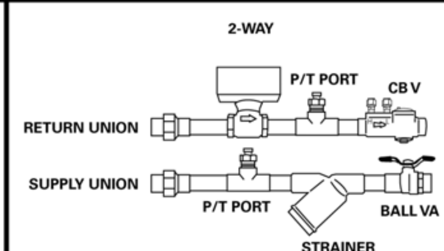
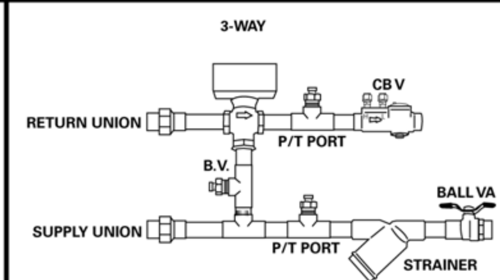
Factory Installed Piping Packages

Trane's factory mounts piping packages for hydronic specified coils when Tracer™ ZN520, Tracer UC400, or CSTI controls are designated.

Note: *Valves for steam coils are not factory piped.*

Piping packages are available in either 2-way, or 3-way configurations. The 3-point floating valve is piped on the return side of the coil. Piping packages are factory leak tested to 300 psig to ensure joint integrity.

Note: *Insulation for the piping packages is field provided and field installed.*

Package A -Two coil union connections -Two shut-off ball valves -Two pressure/temperature ports -Bypass balancing valve (3-way packages ONLY)		
Package C -Two coil union connections -Shut-off ball valves (supply) -Two pressure/temperature ports -Circuit balancing valve (return) -Bypass balancing valve (3-way packages ONLY)		
Package D -Two coil union connections -Shut-off ball valves (supply) -Strainer (one at supply for debris straining) -Two pressure/temperature ports -Circuit balancing valve (return) -Bypass balancing valve (3-way packages ONLY)		

Controls

Why Trane Controls?

Whether involved in a retrofit or in new construction applications, Trane has the control design to fit the systems requirements. The broad range of control packages offer a range from a field convertible end-device package, to a complete building automation system solution with LonTalk® controls.

The good news is Trane® controls are factory-mounted, -wired, -tested and configured or programmed with Trane® application expertise to provide comfort, efficiency, and reliability, as well as, single-source warranty and service. With Trane's integrated controls, the installed costs are lower because the equipment has turn-key factory controls and every component of the system is optimized to fit with the controller. Trane installs not only the controller, but also the hardware that works intimately with the controller to allow the system to function properly (i.e., piping package, valves, dampers, actuators, etc.). When a classroom unit ventilator with Trane® controls arrives to the jobsite, it is completely ready for quick installation.

Table 29. Controller input/output summary

	ZN520	UC400
Binary Outputs		X
3-Speed Fan	X	X
2-Position Hydronic Valve	X	X
2-Position Fresh Air Damper		X
1-Stage Electric Heat	X	X
3-Wire Economizer Damper	X	X
3-Wire Hydronic Valve	X	X
2-Stage Electric Heat	X	X
Reheat (hydronic or electric)	X	X
Generic	X	(a)
Binary Inputs		
Condensate Overflow Detection	X	X
Low Temperature Detection	X	X
Occupancy	X	X
Generic Input	X	(a)
Analog Inputs		
Zone Temperature	X	X
Setpoint	X	X
Fan Mode: Auto, High, Medium, Low	X	X
Entering Water	X	X
Discharge Air	X	X
Outside Air	X	X
Generic	X	(a)
Analog Outputs		
Variable speed fan		X
Field supplied analog valves		X

(a) The generic input and output are for use with a Tracer Summit system only.

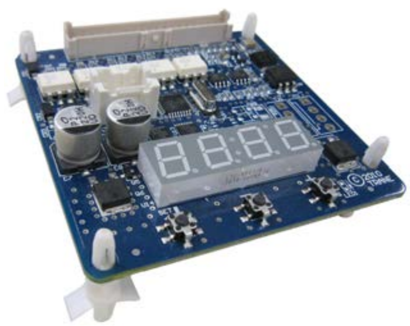
Table 30. Controller function summary

	ZN520	UC400
Control Functions		
Entering Water Temp. Sampling (Purge)	X	X
Auto Changeover	X	X
Fan Cycling		
Warm-Up	X	
Pre-Cool	X	
Data Sharing (Master/Slave)	X	
Random Start	X	X
Dehumidification	X	X
Single Zone VAV		X
Staged Capacity (2-Stage Electric Supplementary)	X	X
Other Functions		
Manual Test	X	in TU
Maintenance Timer	X	X
Setpoint Limits	X	X

ECM Engine Controller

The Electronically Commutated Motor (ECM) engine controls and reports the performance of up to two Trane Brushless DC (BLDC) motors.

Figure 6. ECM engine controller



- The engine also coordinates the operation of the fan in response to electric heat behavior and electric behavior in response to hydronic heat behavior.
- The engine incorporates a user interface that allows adjustment of certain unit parameters and provides constant feedback on motor operation.
- The engine integrates service and troubleshooting tools.
- The engine integrates a versatile configurable auxiliary temperature sensor.
- The engine incorporates various safety and lockout features, such as maintaining proper fan speeds if electric heat is called for.

Status Display

Figure 7. Status display

The ECM engine board contains a four-digit, seven-segment display that is used to present information in a format close to real-world language, while having a small-form factor. Most characters are immediately recognizable; however, please consult Table 31 and Table 32 for the graphical representation of each alphanumeric character.

Table 31. Screen representation of alphabetical characters

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
A	b	C	d	E	F	9	H	I	J	H	L	m	n	O	P	q	r	S	t	U	u	w	H	y	Z

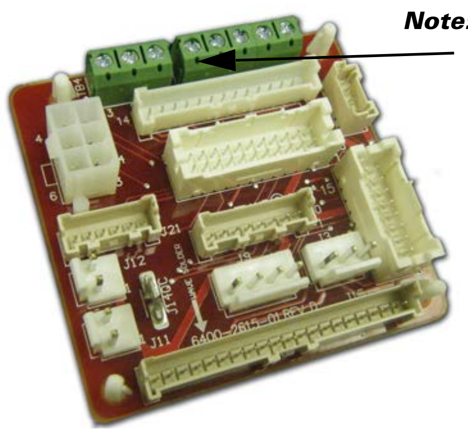
Table 32. Screen representation of numeric characters

1	2	3	4	5	6	7	8	9	0
1	2	3	4	5	6	7	8	9	0

Unit-Mounted Speed Switch

Figure 8. Fan speed switch

Figure 9. Adapter board



Note: *Customer Low-Voltage Interface for Fan Speeds, Variable Fan Speed, and 24 Vac Supply*

The adapter allows direct customer interfacing through the use of terminal strips. Standard interfacing includes:

- Fan Speeds (H, M, L) (for wall mounted fan speed switches)
- Variable speed (0–10V) inputs

The standard adapter board eliminates many separate wiring harnesses in the panel and allows simple, mistake-proofed single-plug interfacing of:

- The ECM engine controller
- Transformers
- Motors
- Valves
- Dampers
- Electric heat control
- Fan speed switches
- Main power (except electric heat)

The manual fan mode switch is available for unit ventilators that do not have Trane factory-mounted control packages. This four-position switch (off, high, medium, low) allows manual fan mode selection and is available unit or wall mounted. The unit-mounted option operates on line voltage. The wall-mounted option is low-voltage and has three 24-volt relays using a factory-wired transformer and relays to control the fan motor.

Customer Supplied Terminal Interface (CSTI)

Figure 10. CSTI adapter board

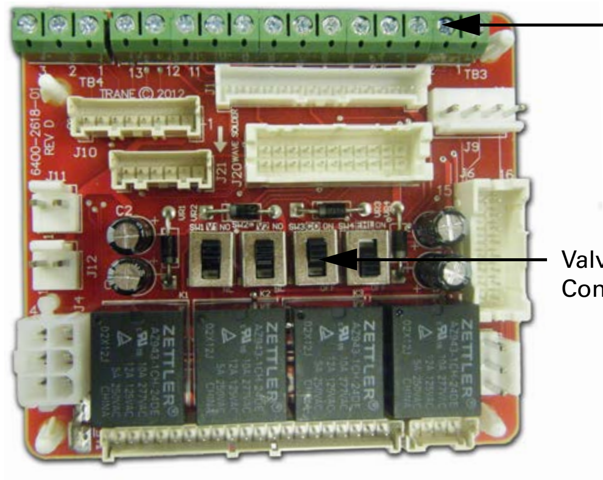
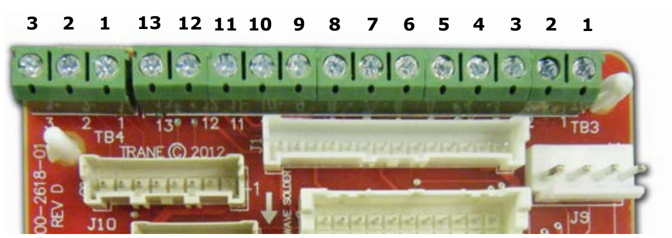


Figure 11. CSTI adapter board field connections



1. VSP 10V
2. VSP 0–10V
3. VSP DC COM

1. 24 Vac Y (hot)
2. 24 Vac Y (gnd)
3. High
4. Medium
5. Low
6. V1Op/Cooling
7. V1C1 (not std)
8. Not used
9. Not used
10. V2Op/EH1St/Heating
11. V2C1/EH2St (not std)
12. Damper Open
13. Dmp Cl (not std)

The control interface is intended to be used with a field-supplied, low-voltage thermostat or controller. The control box contains a relay board which includes a line voltage to 24-volt transformer, quiet contactors (for electric heat units), and an optional disconnect switch. All end devices are wired to a low-voltage terminal block and are run-tested, so the only a power connection and thermostat connection is needed to commission the unit. Changeover sensors and controls are provided whenever a change-over coil is selected. When N.O. valves are selected, inverting relays are provided for use with standard thermostats.

The CSTI adapter board provides all the hookups of the standard adapter board, but in addition, provides hookups for valve control (main and auxiliary coils), electric heat control, and damper control. Screw terminal blocks provide convenient access to fan controls and to end device control. In addition, a courtesy 10-Vdc supply is provided for use with an external potentiometer or rheostat. The 10-Vdc supply supports up to 10 mA draw.

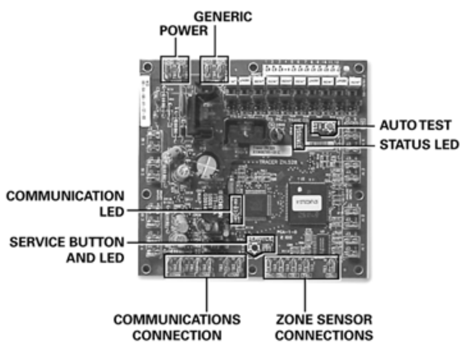
Tracer ZN520 Zone Controller

Features Include

- Automatic fan-speed reset
- Automatic ventilation reset
- Active dehumidification
- Manual output test
- Filter maintenance
- Master slave
- Water valve override
- Freeze avoidance
- Interoperability
- Three generic I/O ports

The Tracer ZN520 is a factory-installed, -tested and -commissioned LonTalk® control designed to provide control of the classroom unit ventilator and the fan-coil products (see Figure 12).

Figure 12. Tracer ZN520 control board

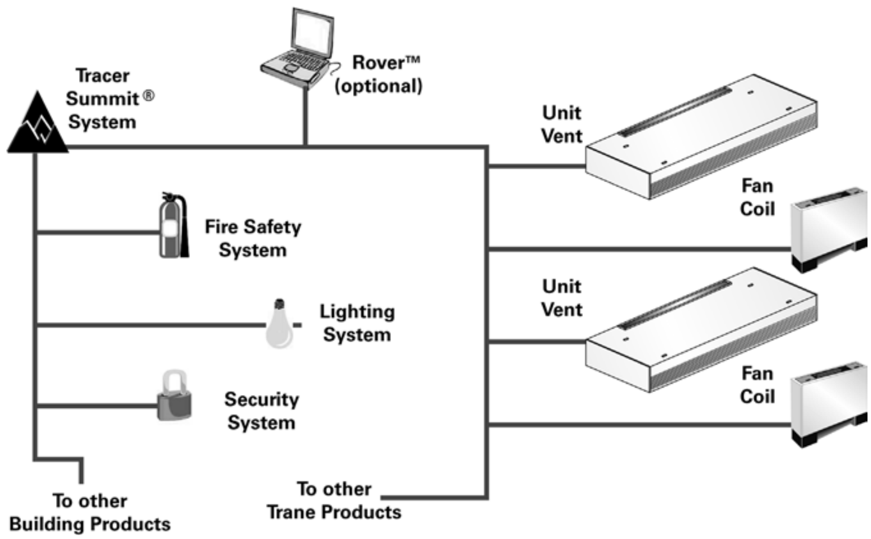


The Tracer ZN520 controller is designed to be used in the following applications:

- As part of the Trane Tracer Summit™ building automation system, the Tracer ZN520 becomes an important part of the Trane Integrated Comfort™ system (ICS).
- The Tracer ZN520 can function as a completely standalone controller in situations where a building automation system (BAS) is not present.
- For situations when a non-Trane BAS is present, the Tracer ZN520 can be used as an interoperable unit controller.

Through building management of the HVAC system, optimizing energy consumption becomes possible at a classroom level. Each unit is capable of functioning independently of one another during occupied and unoccupied hours of the day. This allows the temperature setpoint and ventilation setting to be changed automatically based on classroom usage (see Figure 13, p. 46).

Figure 13. Tracer ZN520 system



Two Systems in One

In an ICS environment, the Tracer ZN520 is pre-designed to install quickly and easily into the system. Since the controller and the unit are factory tested and commissioned, the start-up time for the entire system is minimized. Trane becomes the single source of responsibility for the equipment, unit controls, and building automation system.

As a standalone controller, the Tracer ZN520 is ideally suited for fix-on-fail replacement of units with old pneumatic controllers, or in situations where a BAS will be added at a later date. Once power is applied to the controller, it will automatically start up and run based upon the setpoint on the local zone sensor. An individual time clock can be added to the unit for local scheduling.

The Tracer ZN520 is certified to the interoperable LONMARK® Space Comfort Controller profile. This allows the controller to be used with another vendor's BAS and thereby still provide the high quality of factory installation and testing. In addition, the Tracer ZN520 provides one of the most extensive interoperable data lists of any controller of its type in the industry.

Tracer ZN520 Features Include:

Automatic Fan and Ventilation Reset. With the Tracer ZN520 controller, a two speed fan control for the unit ventilator delivers the airflow output customized to support the cfm space needs. When less cfm is necessary to meet the load of the classroom (typically 75 to 80 percent of the time), the equipment operates on low speed. However, if the room temperature rises, the controller will switch to high speed, and the outside air damper will adjust to satisfy the space needs. This helps maintain the proper amount of ventilation air to the occupants independent of the fan speed. As part of the ventilation strategy, the controller will reposition the outside air damper to confirm the minimum outside air cfm is met at both operating conditions.

Manual Output Test . The Tracer ZN520 controller includes a manual output test function. This function may be initiated from the blue test push button on the controller or through the Rover service tool. This feature is used to manually exercise the outputs in a defined sequence.

The purpose of this test sequence is to verify output and end device operation. The manual output test function may also be used in the following situations:

- Reset latching diagnostics
- Verify output wiring and operation

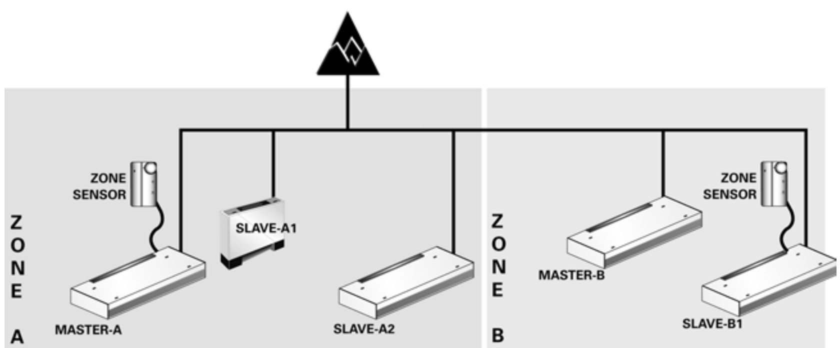
- Force the water valve(s) open to balance the hydronic system during installation set-up or service.

Filter Maintenance. Filter status for the controller is based on the cumulative run hours of the unit fan. The controller compares the amount of fan run time against an adjustable fan run hour (stored in the controller) to determine when maintenance is recommended for the unit. The run-hours value may be user edited as required (through Rover). The valid range for the fan run hours limit is 0 to 5000 hours with a default of 600 hours. Once the run hours limit has been exceeded, the controller generates a *maintenance required diagnostic* (unit will not shut-down). The user will be notified of this diagnostic through the building automation system or when a Trane Service Tool is communicating with the controller.

Active Dehumidification. On unit ventilators with reheat coils, the Tracer ZN520 can provide active dehumidification to the classroom. This means that the classroom relative humidity can be kept below an adjustable setpoint independent outdoor weather conditions. Indoor humidity levels are recommended by ASHRAE to be kept below 60% in order to minimize microbial growth and the life span of airborne illness causing germs.

Master Slave *(Data Sharing)*. Because the Tracer ZN520 controller utilizes LonWorks® technology, the controller can send or receive data (setpoint, heat/cool mode, fan request, space temperature, etc.) to and from other controllers on the communication link with or without the existence of a building automation system. This applies to applications where multiple units might share one zone sensor for both stand-alone (with communication wiring between units) and a building automation system (see Figure 14).

Figure 14. Master slave system layout



Water Valve Override. The Tracer ZN520 can be commanded via the Rover service tool to open all hydronic valves 100%. This allows for the faster water balancing of each unit and the entire system when the command is sent globally to all controllers. A properly balanced system is essential for proper and efficient operation.

Hydronic Coil Freeze Protection (Freeze Avoidance). Unit ventilator systems in cold climates need to take precautions to avoid hydronic coil freeze-up. The Tracer ZN520 does this from three different aspects. Any of these methods of protections will result in the unit fan being disabled, the outside air damper being shut, and the hydronic valves being opened 100 percent.

The three methods of freeze avoidance include:

1. A binary freeze protection thermostat is mounted on the coil and will cause a latching diagnostic if the coil temperature falls below 35°F.
2. An analog discharge air sensor monitors the temperature of the air coming off of the coil and if the temperature falls below 40°F the outside air damper is closed, the fan is turned off and the valves are fully opened.

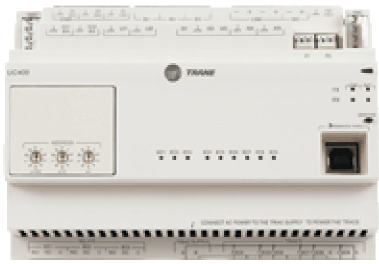
3. When in the unoccupied mode the Tracer ZN520 has an adjustable freeze avoidance setpoint. If the outside air temperature is below the setpoint the unit will open the valves to allow water to flow through the coils.

Interoperability. Interoperability allows the owner freedom to select multiple vendors, and multiple products. With this advantage, the owner can choose the best products, the best application, and the best service from a variety of suppliers to meet their evolving building control needs in a cost effective manner.

Generic Binary Input/Output. The three generic binary inputs/outputs are not part of the normal control, but are actually controlled through he Tracer Summit system (when present) to issue commands to the Tracer ZN520 control to turn the generic inputs/outputs of add-on equipment (such as baseboard heating, exhaust fans, occupancy sensor, lighting, etc.) on and off. This binary port is not affected when other binary diagnostics interrupt unit operation.

Tracer UC400

Figure 15.



The Tracer UC400 controller delivers single zone VAV control and can be used in a stand-alone application or as part of a Trane Integrated Comfort System (ICS).

In the stand-alone configuration, Tracer UC400 receives operation commands from the zone sensor and/or the auto changeover sensor (on auto changeover units). The entering water temperature is read from the auto changeover sensor and determines if the unit is capable of cooling or heating. The zone sensor module is capable of transmitting the following information to the controller:

- Timed override on/cancel request
- Zone setpoint
- Current zone temperature
- Fan mode selection (off-auto-high-med-low)

For optimal system performance, unit ventilators can operate as part of an Integrated Comfort System (ICS) building automation system controlled by Tracer Summit. The controller is linked directly to the Summit control panel via a twisted pair communication wire, requiring no additional interface device (i.e., a command unit). The Trane ICS system can monitor or override Tracer UC400 control points. This includes such points as temperature and output positions.

Tracer UC400 Zone Controller Features Include

- Single Zone VAV
- Automatic ventilation reset
- Active dehumidification
- Filter maintenance
- Water valve override
- Freeze avoidance
- Interoperability
- Unused I/O can be as generic I/O

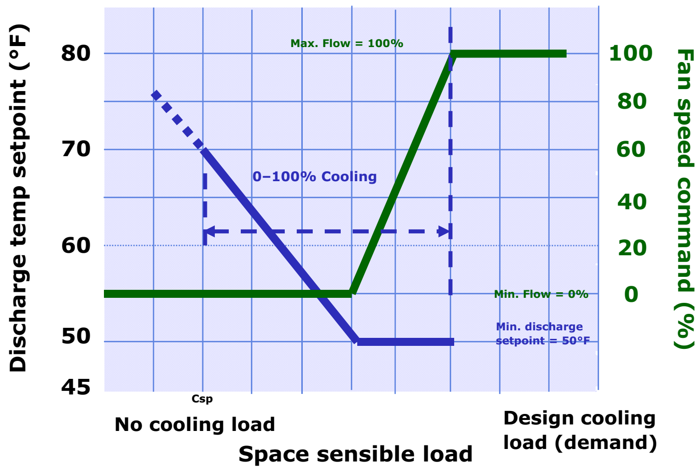
The Tracer UC400 is a factory-installed, -tested, and -commissioned BACnet® MS/TP control designed to provide control of the classroom unit ventilator (see Figure 15). The Tracer UC400 controller is designed to be used in the following applications: as stand-alone operation, part of the Trane Tracer SC building automation system, or part of another BACnet MS/TP Building Automation System. The Tracer UC400 can function as a completely standalone controller in situations where a building automation system (BAS) is not present.

The Tracer UC400 is designed to install quickly and easily into the system. Since the controller and the unit are factory-tested and -commissioned, the start-up time for the entire system is minimized. Trane becomes the single source of responsibility for the equipment, unit controls, and building automation system. As a standalone controller, the Tracer UC400 is ideally suited for fix-on-fail replacement of units with old pneumatic controllers, or in situations where a BAS will be added at a later date. Once power is applied to the controller, it will automatically start up and run based upon the setpoint on the local zone sensor. An individual time clock can be added to the unit for local scheduling. The Tracer UC400 is BTL listed as B-ASC profile. This ensures the controller to be used with other BACnet® building automation systems.

Tracer UC400 Features Include

Single Zone VAV with Fully Modulating Fan Speed. The Tracer UC400 will minimize fan speed, and in turn energy usage, by only delivering the air flow needed.

Figure 16. Cool mode nominal hydronic cooling control



Ventilation Reset. With the Tracer UC400 the unit ventilator delivers the airflow the space needs. When the air flow adjusts the outside air damper will also adjust to satisfy the space needs. This helps maintain the proper amount of ventilation air to the occupants independent of the fan speed. As part of the ventilation strategy, the controller will reposition the outside air damper to confirm the minimum outside airflow is met at both operating conditions.

Filter Maintenance. Filter status for the controller is based on the cumulative run hours of the unit fan. The controller compares the amount of fan run time against an adjustable fan run hour (stored in the controller) to determine when maintenance is recommended for the unit. The run-hours value may be user edited as required. The valid range for the fan run hours limit is 0 to 5000 hours with a default of 600 hours. Once the run hours limit has been exceeded, the controller generates a maintenance required diagnostic (unit will not shut-down). The user will be notified of this diagnostic through the building automation system or when a Trane® service tool is communicating with the controller.

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1. A binary freeze protection thermostat is mounted on the coil and will cause a latching diagnostic if the coil temperature falls below 35°F.

2. An analog discharge air sensor monitors the temperature of the air coming off of the coil and if the temperature falls below 40°F the outside air damper is closed, the fan is turned off and the valves are fully opened.
3. When in the unoccupied mode, the controller has an adjustable freeze avoidance setpoint. If the outside air temperature is below the setpoint, the unit will open the valves to allow water to flow through the coils.

Zone Sensors

Zone sensors are available as either unit, wall, or split-mounted options for design flexibility. Unit ventilators with the unit-mounted zone sensor option include a thermistor in the unit's return air path. Wall-mounted zone sensor options have an internal thermistor. Zone sensors operate on 24 Vac.

Figure 17. Wireless temp sensor with display (SP, OALH, COMM) Digit 19 = 3

X13790822-04 (wall)
X13790855-01 (unit)

Figure 18. Wireless temp sensor (SP, OALMH, COMM) Digit 19 = 4

X13790492-01 (wall)
X13790855-01 (unit)

Figure 19. Wall mtd temp sensor (SP, OCC/UNOCC, OA, LMH, COMM) Digit 19 = J

X13790842-01 (wall)
X13651467-02 (comm)

Figure 20. Unit mtd temp sensor (SP, OALH, COMM) Digit 19 = L

X13790843-01 (unit)

Controls

Zone Sensors

Figure 21. Split mtd zone sensor, unit mtd fan speed switch, and wall mtd setpoint dial with On/Cancel Digit 19 = P

X13511527-01 (wall)
X13790849-01 (unit)
X13651467-02 (comm)

Figure 22. Split mtd zone sensor, unit mtd fan speed switch, and wall mtd setpoint dial Digit 19 = Q

X13511529-01 (wall)
X13790849-01 (unit)
X13651467-02 (comm)

Figure 23. Wall mtd temp sensor (SP, OALMH, COMM) Digit 19 = K

X13790841-01 (wall)
X13651467-02 (comm)

Figure 24. Wall mtd display temp sensor (SP, OCC/UNOCC, OALMH, COMM) Digit 19 = M

X13790886-04 (wall)
X13651467-02 (comm)

Table 33. Face and bypass actuator specification

Power Supply	24 Vac ± 20% 50/60 Hz 24 Vac ± 10%
Power Consumption	2 W
Transformer Sizing	3 VA (class 2-power source)
Angle of Rotation	Maximum 95° Adjustable with mechanical stop
Torque	35 inch/lb
Direction of Rotation	Reversible with switch L/R
Position Indication	Clip-on indicator
Manual Override	External push button
Noise Level	Less than 35 dB
Control Signal	3-point floating

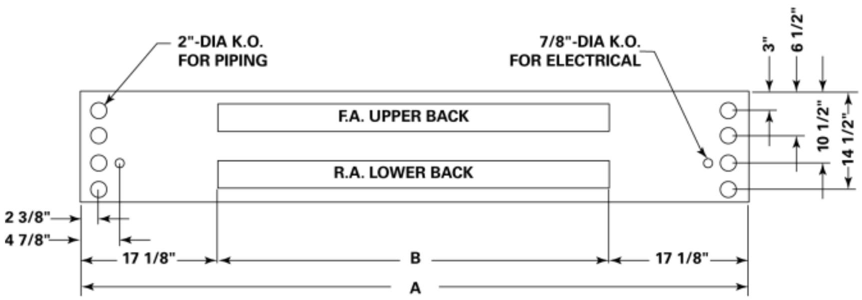
Table 34. Outside air actuator specification

Power Supply	24 Vac ± 20% 50/60 HZ 24 Vac ± 10%
Power Consumption	Running: 2.5 W Holding: 1 W
Tranformer Sizing	5 VA (class 2-power source)
Overload Protection	Electronic throughout 0° to 95° rotation
Control Signal	2 to 10 Vdc 3-point floating with Trane controls
Angle of Rotation	Maximum 95° Adjustable with mechanical stop
Torque	35 inch/lb
Direction of Rotation	Spring return reversible with CW/CCW mounting
Position Indication	Visual indicator, 0° to 95°
Noise Level	Running: 30 dB

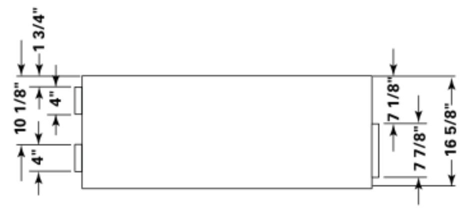
Dimensional Data

Ducted Front Discharge

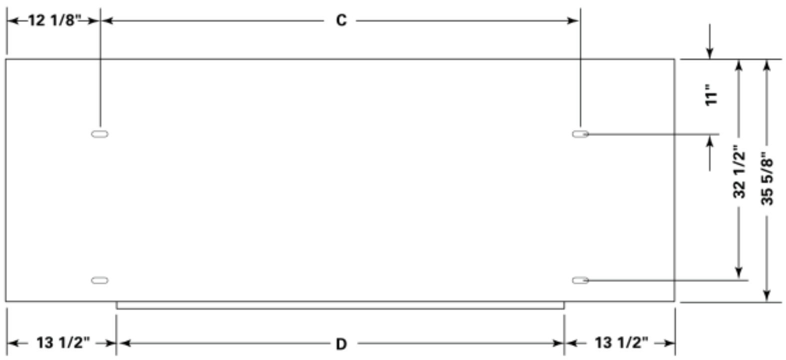
Horizontal Unit Sizes 075–150



BACK VIEW

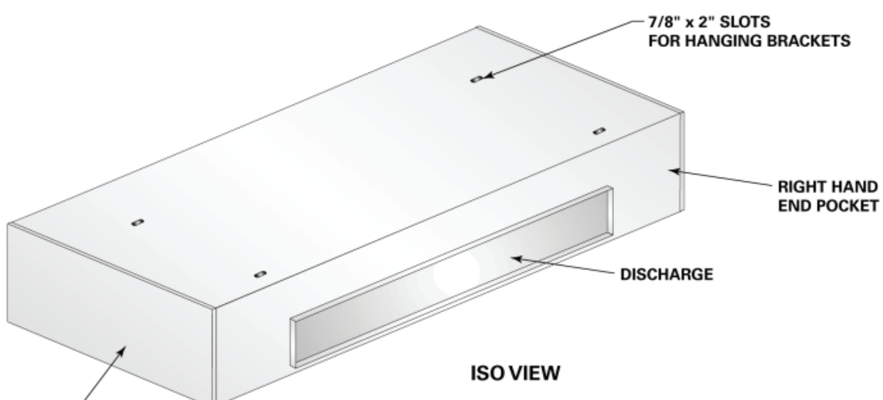


SIDE VIEW



TOP VIEW

Size	A	B	C	D
075	70-1/4"	36"	46"	43-1/4"
100	82-1/4"	48"	58"	55-1/4"
125	94-1/4"	60"	70"	67-1/4"
150	106-1/4"	72"	82"	79-1/4"

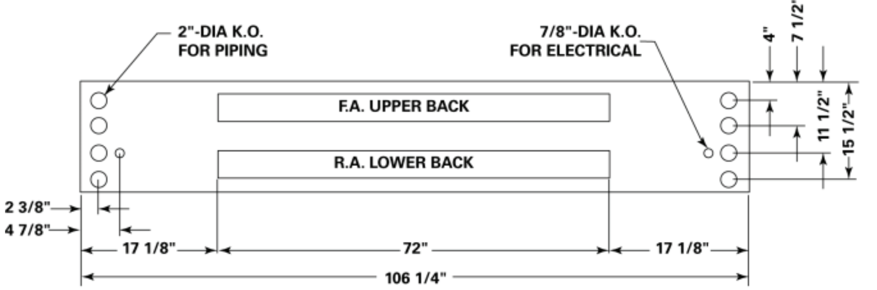


ISO VIEW

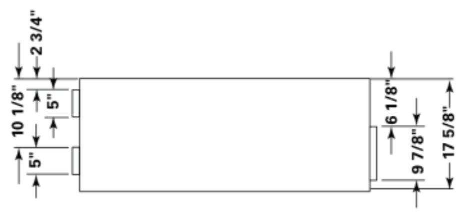
LEFT HAND
END POCKET

NOTE:
WHEN ELECTRIC HEAT IS PRESENT, ALL POWER CONNECTIONS ARE MADE IN THE RIGHT HAND END POCKET. ON ALL OTHER CONFIGURATIONS, POWER CONNECTIONS ARE MADE IN THE LEFT HAND END POCKET.

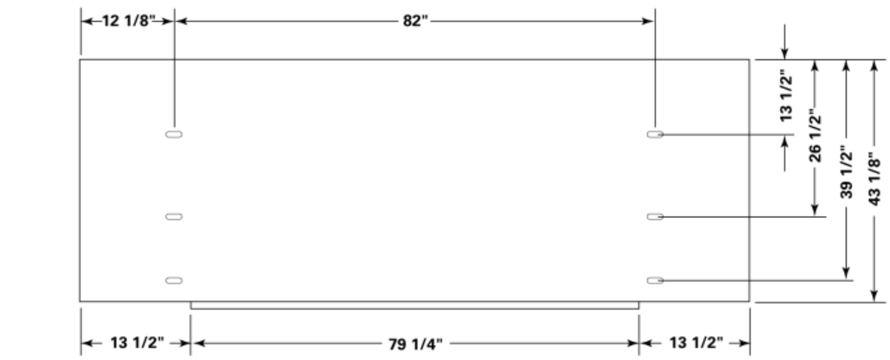
Horizontal Unit Size 200



BACK VIEW



SIDE VIEW



TOP VIEW

ISO VIEW

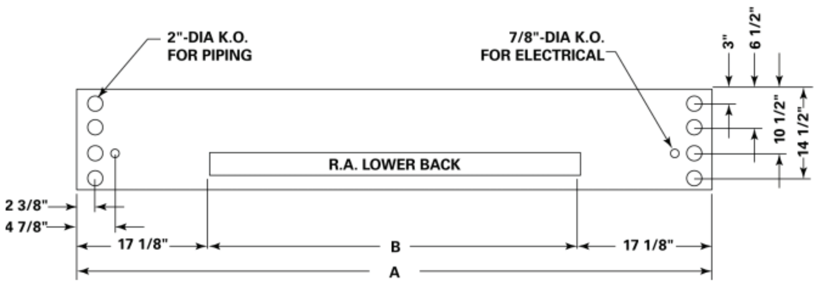
NOTE:
WHEN ELECTRIC HEAT IS PRESENT, ALL POWER CONNECTIONS ARE MADE IN THE RIGHT HAND END POCKET. ON ALL OTHER CONFIGURATIONS, POWER CONNECTIONS ARE MADE IN THE LEFT HAND END POCKET.

Dimensional Data

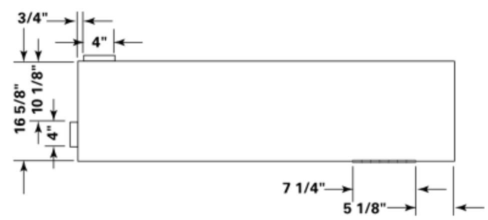
Double Deflection Discharge

Horizontal Unit Sizes 075–150

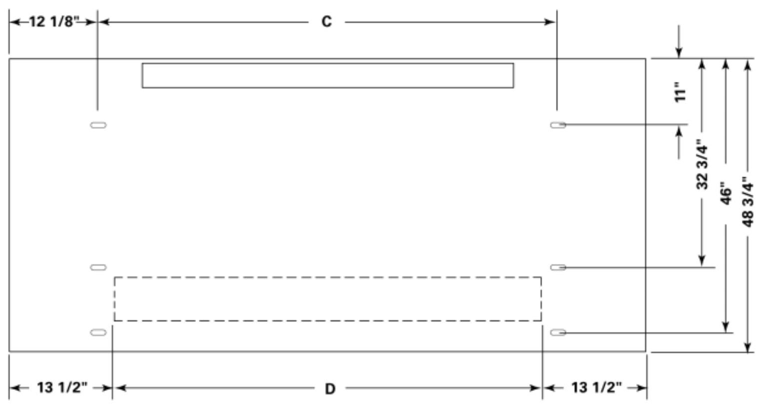
Bottom Double Deflection Discharge



BACK VIEW

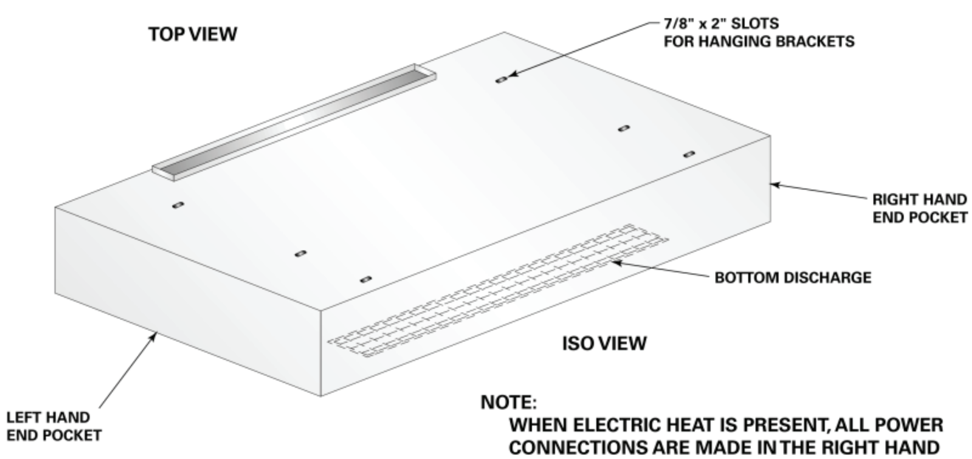


SIDE VIEW



Size	A	B	C	D
075	70-1/4"	36"	46"	43-1/4"
100	82-1/4"	48"	58"	55-1/4"
125	94-1/4"	60"	70"	67-1/4"
150	106-1/4"	72"	82"	79-1/4"

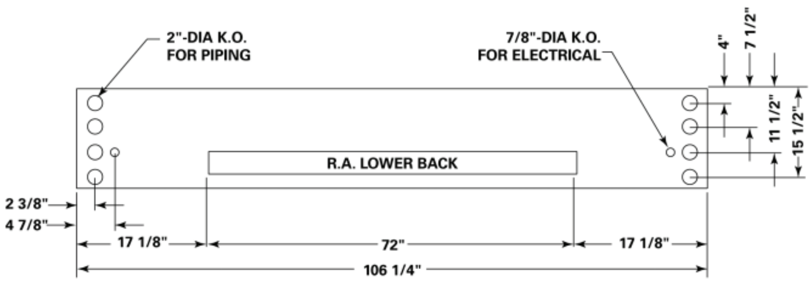
TOP VIEW



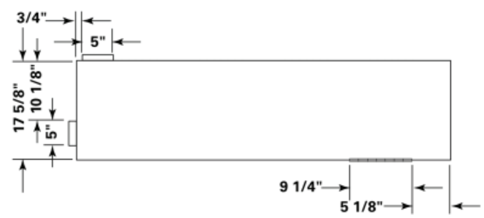
NOTE:
WHEN ELECTRIC HEAT IS PRESENT, ALL POWER CONNECTIONS ARE MADE IN THE RIGHT HAND END POCKET. ON ALL OTHER CONFIGURATIONS, POWER CONNECTIONS ARE MADE IN THE LEFT HAND END POCKET.

Horizontal Unit Size 200

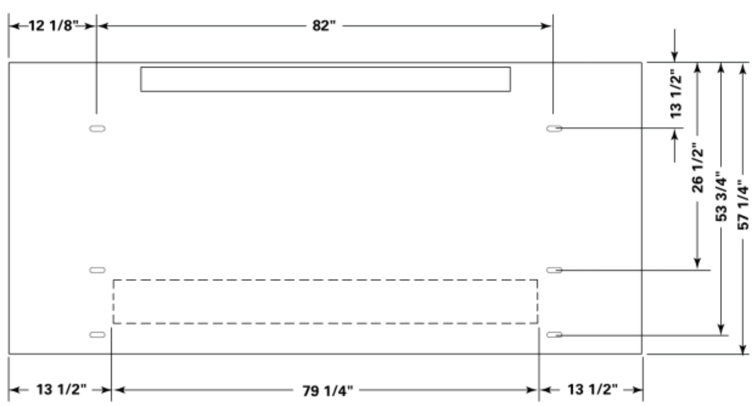
Bottom Double Deflection Discharge



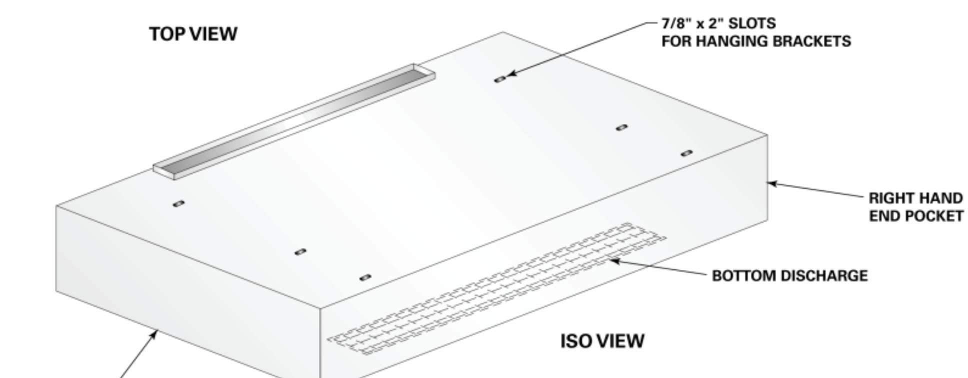
BACK VIEW



SIDE VIEW



TOP VIEW



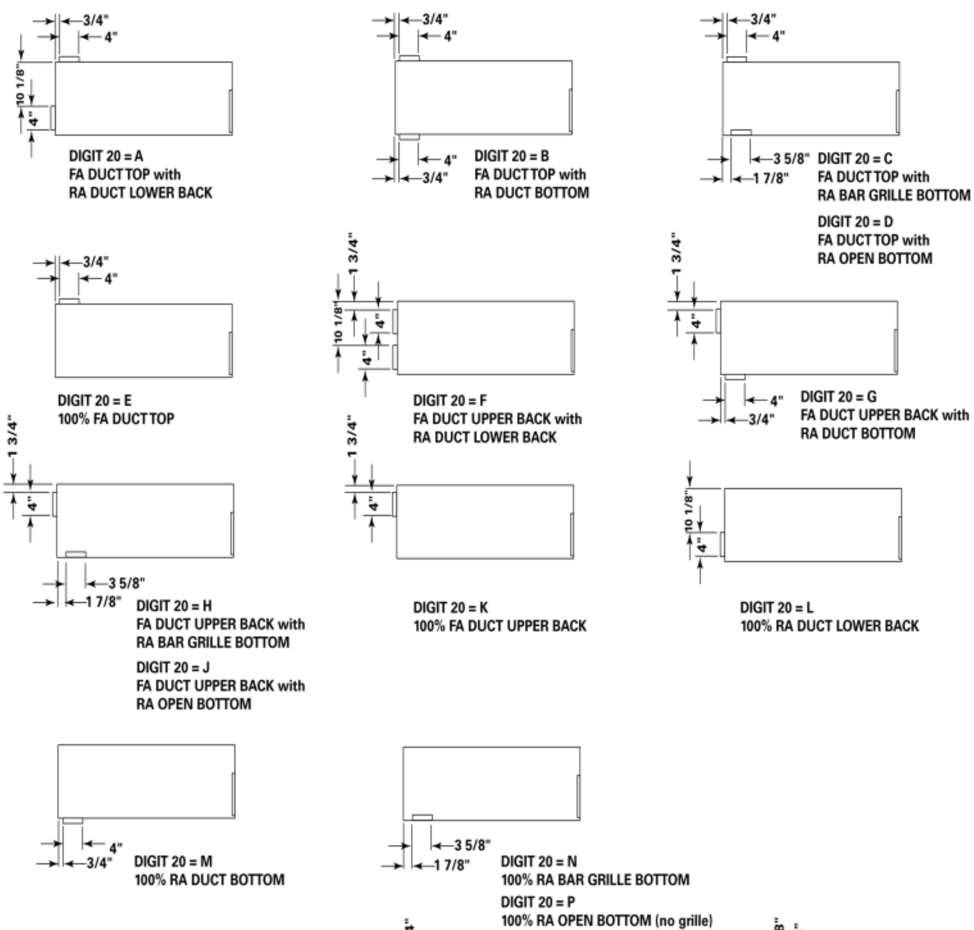
ISO VIEW

NOTE:
WHEN ELECTRIC HEAT IS PRESENT, ALL POWER CONNECTIONS ARE MADE IN THE RIGHT HAND END POCKET. ON ALL OTHER CONFIGURATIONS, POWER CONNECTIONS ARE MADE IN THE LEFT HAND END POCKET.

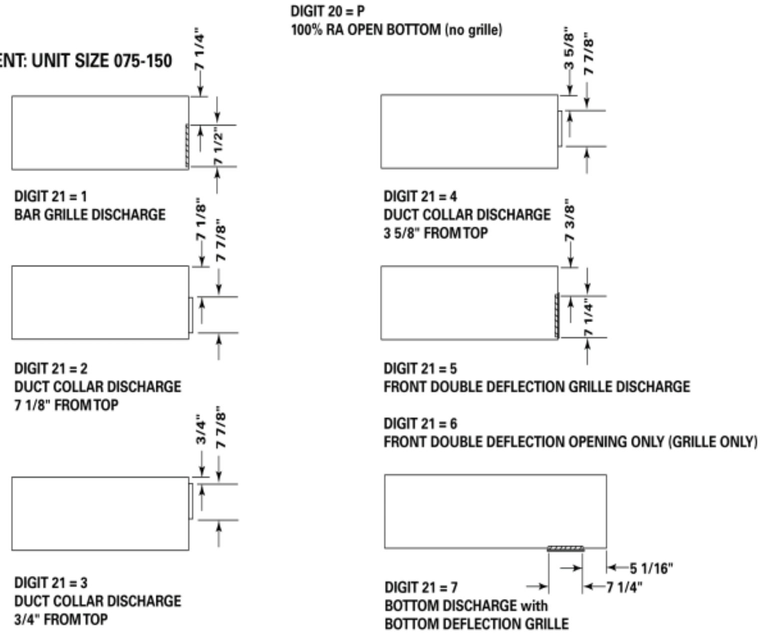
Dimensional Data

Inlet/Discharge Arrangements

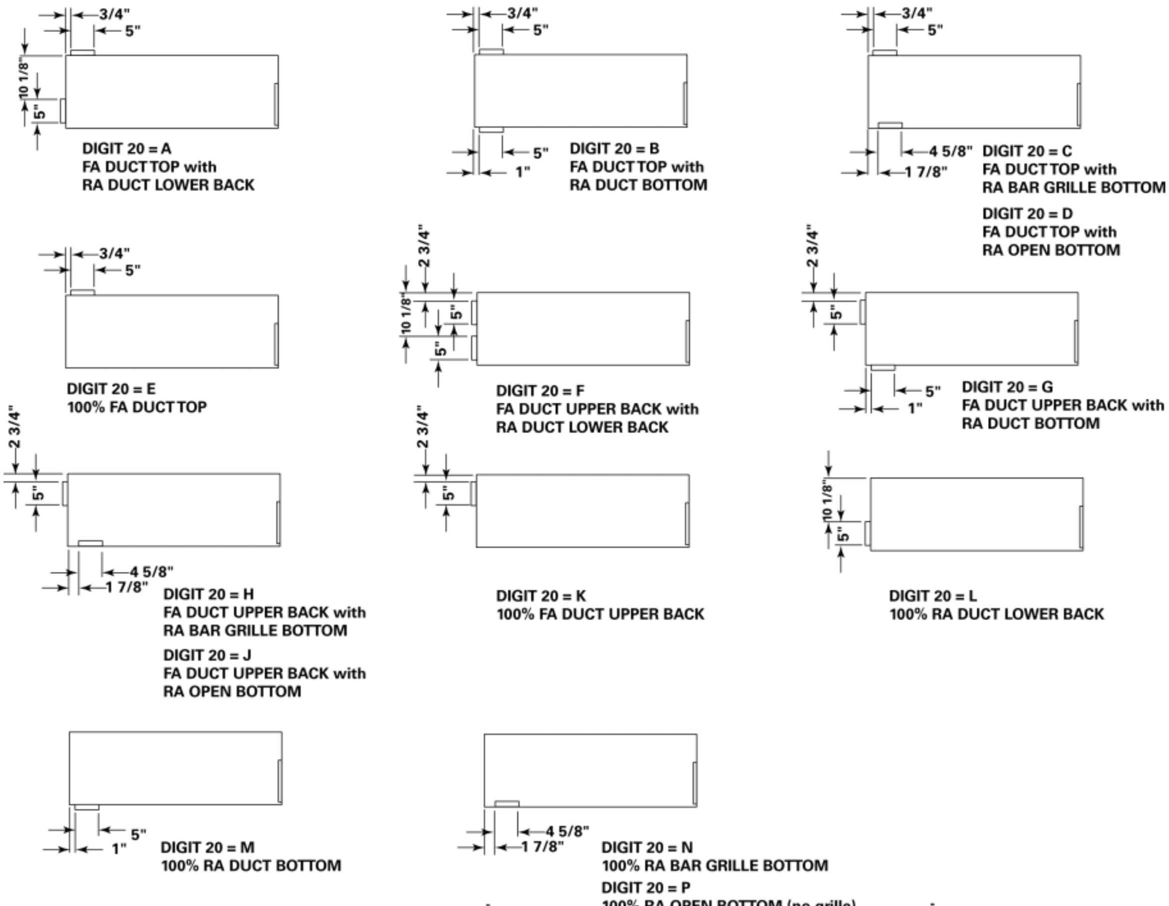
INLET ARRANGEMENT: UNIT SIZE 075-150



DISCHARGE ARRANGEMENT: UNIT SIZE 075-150



INLET ARRANGEMENT: UNIT SIZE 200



DIGIT 20 = A
FA DUCT TOP with
RA DUCT LOWER BACK

DIGIT 20 = B
FA DUCT TOP with
RA DUCT BOTTOM

DIGIT 20 = C
FA DUCT TOP with
RA BAR GRILLE BOTTOM

DIGIT 20 = D
FA DUCT TOP with
RA OPEN BOTTOM

DIGIT 20 = E
100% FA DUCT TOP

DIGIT 20 = F
FA DUCT UPPER BACK with
RA DUCT LOWER BACK

DIGIT 20 = G
FA DUCT UPPER BACK with
RA DUCT BOTTOM

DIGIT 20 = H
FA DUCT UPPER BACK with
RA BAR GRILLE BOTTOM

DIGIT 20 = J
FA DUCT UPPER BACK with
RA OPEN BOTTOM

DIGIT 20 = K
100% FA DUCT UPPER BACK

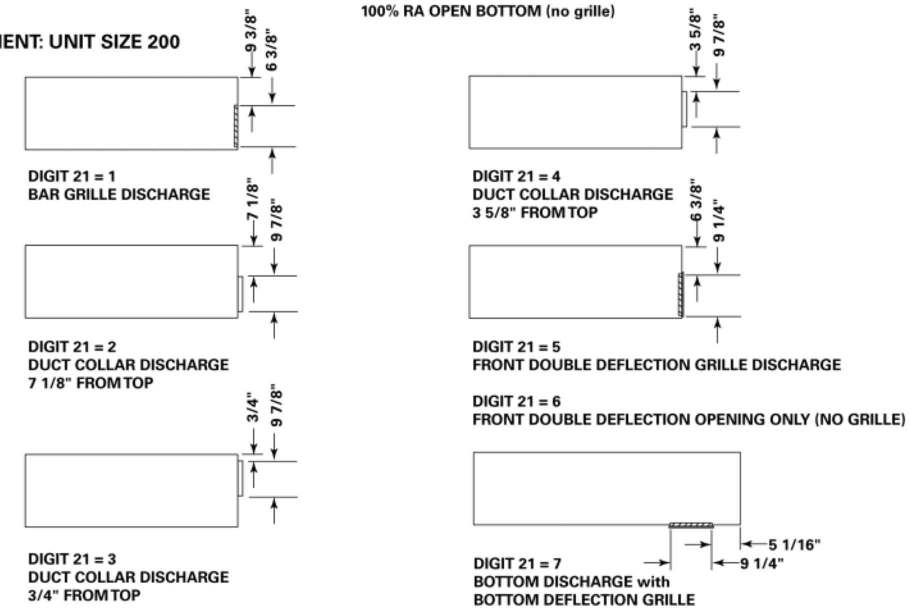
DIGIT 20 = L
100% RA DUCT LOWER BACK

DIGIT 20 = M
100% RA DUCT BOTTOM

DIGIT 20 = N
100% RA BAR GRILLE BOTTOM

DIGIT 20 = P
100% RA OPEN BOTTOM (no grille)

DISCHARGE ARRANGEMENT: UNIT SIZE 200



DIGIT 21 = 1
BAR GRILLE DISCHARGE

DIGIT 21 = 2
DUCT COLLAR DISCHARGE
7 1/8" FROM TOP

DIGIT 21 = 3
DUCT COLLAR DISCHARGE
3/4" FROM TOP

DIGIT 21 = 4
DUCT COLLAR DISCHARGE
3 5/8" FROM TOP

DIGIT 21 = 5
FRONT DOUBLE DEFLECTION GRILLE DISCHARGE

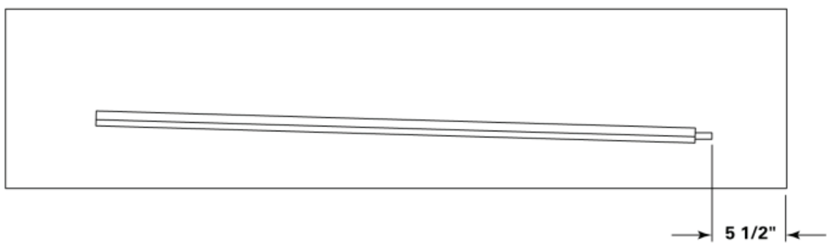
DIGIT 21 = 6
FRONT DOUBLE DEFLECTION OPENING ONLY (NO GRILLE)

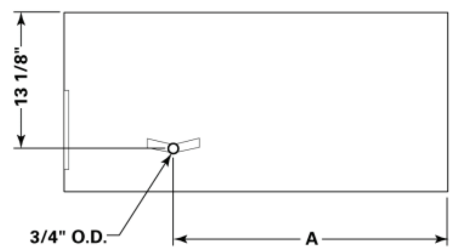
DIGIT 21 = 7
BOTTOM DISCHARGE with
BOTTOM DEFLECTION GRILLE

Dimensional Data

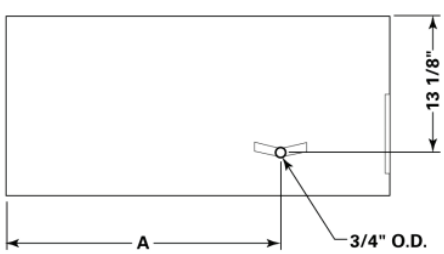
Drain Pan Connection

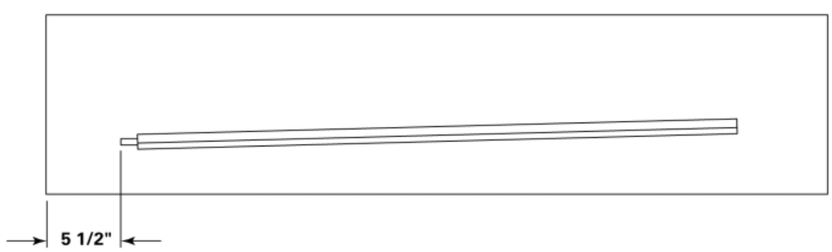
RIGHT HAND DRAIN PAN CONNECTION





LEFT HAND DRAIN PAN CONNECTION





NOTE:
DRAIN PAN CONNECTIONS TERMINATE IN THE SAME END POCKET AS THE COOLING COIL CONNECTIONS.

DRAIN PAN CONNECTIONS CAN BE CONVERTED TO THE OPPOSITE SIDE AT THE JOB SITE.

Mechanical Specifications

General

Deliver and install a complete unit ventilator certified for ventilation at AHRI-840, or tested by an independent testing and balancing lab witnessed by owner's representative. All non-AHRI manufacturers shall be within 10 percent of catalog airflow and capacities, or removal of these units from the jobsite may be required at the expense of the manufacturer or contractor.

Safety

All standard units are UL-listed in the United States and Canada and comply with NFPA 90A requirements.

The unit ventilator is certified or rated in accordance to the following listings for performance proof and safety: UL, AHRI-840, AHRI-350, LonMark®, BACnet®

Equipment Construction

Exterior cabinetry is constructed of heavy-gauge metal for strength and durability. All exposed edges are rounded to safeguard against injury. All interior sheet metal is galvanized steel to restrain against deterioration.

The bottom plane of the unit shall consist of a two panel design. A hinged panel option is provided as part of the equipment options to help alleviate hazards from falling panels during maintenance or inspection purposes. The control compartment is accessible without removing the entire bottom panel. The unit discharge grilles are welded or screwed in-place to become an integral part of the unit structure. The rounded edge steel bars are placed at a 10° slope to provide proper airflow deflection.

Access for inspection and cleaning of the unit drain pan, coils, and fan section are provided. The unit shall be installed for proper access. Procedures for proper maintenance of the unit are included in the installing, operation manual.

Cabinet insulation is 1/2-inch thick, dual density bonded glass fiber. The exposed side is a high density, erosion proof material suitable for use in air streams up to 4500 feet per minute (FPM). Insulation shall meet the Underwriters' Laboratories Fire Hazard Classification.

Piping and control end pockets are a minimum of 12 inches wide to facilitate coil piping and service access. If standard end pock is less than 12 inches wide, an extended cabinet are provided.
Final finish is cleaned, phosphatized and painted with an electrostatic powder spray system, with a minimum thickness of 1.5 mil to avoid visible runs and resist abrasion.

Unit Fans

The unit fan board assembly shall ship from the factory wired to the commission schedule for engineered cfm expectancy. A motor speed switch is on the unit or wall for motor speed adjustment.

The fan board is a single, rigid construction, made from corrosion resistive material. It is a trouble-free slide design to provide cleaning and serviceability ease to maintenance personnel.

The fans contain a double width/double inlet, forward curved centrifugal design to sustain appropriate air throw into the space. The wheels are galvanized metal to resist corrosion. The dynamically balanced fan and motor are of direct drive style.

The fan and coil arrangement are of a blow-thru configuration to supply unvarying coil face velocity avoiding cold spots on the coil.

Motors

All motors are brushless DC (BLDC)/electronically commutated motors (ECM) factory-programmed and run-tested in assembled units. The motor controller is mounted in a touch-safe control box with a built-in integrated user interface and LED tachometer. If adjustments are needed, motor parameters can be adjusted through momentary contact switches accessible without factory service personnel on the motor control board. Motors will soft-ramp between speeds to lessen the acoustics due to sudden speed changes. Motors can be operated at three speeds or with a field-supplied variable speed controller. The motor will choose the highest speed if there are simultaneous/conflicting speed requests. All motors have integral thermal overload protection with a maximum ambient operating temperature of 104°F and are permanently lubricated. Motors are capable of starting at 50 percent of rated voltage and operating at 90 percent of rated voltage on all speed settings. Motors can operate up to 10 percent over voltage.

Drain Pan(s)

The unit drain pan consist of a corrosion resistant, environmentally friendly design to facilitate condensate removal quickly. It is insulated on the bottom to prevent sweating. The pan is removable for cleaning. The drain connection is easy for the field to reverse to the opposite end.

Hydronic Coils (option)

All hydronic coils are plate-fin type, mechanically bonded to tubes. The coils are hydrostatically tested to 350 psi and burst tested to 450 psi. The coils are rated in accordance with AHRI-440 or 220. A threaded drain plug is provided at the header's lowest point, and a manual air vent provided at its highest point.

The standard four-pipe heating coil is in the preheat location. Optional four-pipe heating coils have the heating coil in the reheat position for dehumidification control.

Refrigerant Coils (option)

Direct expansion coils contain copper tubes mechanically expanded into evenly spaced aluminum fins. All coils are proof and leak tested before leaving the manufacturer. The proof test is performed at 1.5 times the maximum operating pressure, and leak tested at the maximum operating pressure. In addition, the tubes are completely evacuated of air to check for leaks in the vacuum.

The refrigerant coil distributor assemblies Venturi or orifice style with round copper distributor tubes.

Distributors are sized consistently with capacity of coil. Suction headers are fabricated from round copper pipe.

A thermostatic expansion valve (TXV) are factory selected and installed for a wide-range of control to maintain optimum control of superheat.

Refrigerant access ports are factory supplied on high and low side for ease of refrigerant pressure or temperature testing. All coils are shipped with a dry-nitrogen charge.

Electric Coil (option)

Units equipped for electric heat have a special resistance heating element design inserted in an extended surface fin-tube bundle for maximum element life and safety. Units specifying electric heat include (as standard) a high temperature cut out with a continuous sensing element. This device interrupts electrical power whenever excessive temperatures are sensed anywhere along the leaving side of the coil. A contactor is included to ensure positive disconnect of electrical power whenever the fan motor power is interrupted. A dead front switch disconnects power to the unit when the access panel is opened. All electric heat units have a power wiring console in the right hand end-pocket to facilitate field wiring of the unit.

Steam Coil (option)

Units including a steam coil are of a a 5/8-inch, sigma-flow, tube-in-tube, distributing coil design. Steam coil tubing is mechanically expanded into evenly spaced aluminum fins. The supply and return connections are on the same side, and include a 1 inch female pipe thread (FPT) termination. The coil is pitched by the manufacturer to provide condensate drainage.

Outside Air/Return Air Damper

Each unit ventilator design results in a fixed air, compressible seal to ensure proper modulation and mixing of the return and outdoor air. The damper is capable of varying proportion of mixed air from 100 percent room air to 100 percent outside air.

Face and Bypass Damper (option)

Face and bypass damper control is provided on the unit ventilator. This bypass damper design is utilized for economizing and dehumidification of the equipment during seasonal or morning warm-up. The damper is constructed of aluminum grade. The damper is tightly sealed and designed to minimize heat pickup in the bypass position.

A coil isolation valve is a selectable option. It is a 2-position, 2-way valve with 24 Vac, 60 Hz electrical, and a stroke time of 10 seconds ON/5 seconds OFF. Close off pressures include 30 psig - 1/2", 15 psig - 3/4", and 9 psig = 1".

Controls

Controls options are: unit-mounted fan speed switch, customer supplied terminal interface (CSTI), Tracer ZN520, and Tracer UC400. A variety of inputs and outputs are available for the CSTI and Tracer controller options. A disconnect switch (for non-electric heat units), fused transformer, contactor(s), and terminal strip are provided with the CSTI and Tracer controller options.

Customer Supplied Terminal Interface (CSTI)

The control interface is intended to be used with a field-supplied, low-voltage thermostat or controller. The control box contains a relay board which includes a line voltage to 24-volt transformer, and an optional disconnect switch. All end devices are wired to a low-voltage terminal block and are run-tested, so the only a power connection and thermostat/controller connection is needed to commission the unit. Changeover sensors and controls are provided whenever a change-over coil is selected. When N.O. valves are selected, inverting relays are provided for use with standard thermostats.

Unit-mounted Fan Speed Switch (FSS)

The fan speed switch is available with or without the control interface option. The unit-mounted FSS will employ a low-voltage fan switch. The low-voltage fan speed option will provide an interface to factory wiring, including variable speed/high-medium-low (HML) control. The control box contains a line voltage to 24-volt transformer, EC motor controller, and an optional disconnect switch.

Tracer ZN520

The Tracer ZN520 discrete speed controller can be used in a stand-alone application or used as part of a Trane Integrated Comfort System (ICS) with LonTalk® communication. The Tracer ZN520 offers the combined advantages of simple and dependable operation. Standard control features include options normally available on more elaborate control systems. All control options are available factory-mounted, -wired, and -configured and can also be field-configured using a service tool.

Tracer UC400

The Tracer UC400 controller delivers single zone VAV control in a stand-alone application or as part of a Trane Integrated Comfort system with BACnet® communication. The Trace UC400 offers the combined advantages of a factory-mounted, -wired, and -programmed controller for dependable out-of-the box operation. Standard control features include options normally available on more elaborate control systems. All control options are available factory-programmed with additional configuration and programming in the field using a service tool.

Zone Sensors (option)

Trane offers a full line of wired and wireless temperature sensors. Wired temperature sensors are the suitable alternative for locations that cannot accommodate wireless sensors or that require a service tool connection. Wireless temperature sensors, which provide easy and flexible installation, are a cost-effective alternative to wired sensors.

Some additional options available with the sensors include:

- Easy-to-use display interface for clear and simple monitoring and control.
- Temperature setpoint control to allow the tenant to choose a temperature setpoint that satisfies their personal preference.
- Fan speed switch to allow the tenant to locally control the fan speed to better satisfy their preference.
- Occupancy override to allow the tenant to request temporary timed override system operation that keeps the building conditions in occupied comfort conditions.
- COMM module that is compatible with all Trane® wired temperature sensors. This accessory provides a local RJ22 connection to Trane® service tools for easy, low-cost maintenance.

Factory Mounted Piping (option)

Factory mounted piping is available when selecting Trane® controls or Customer Supplied Terminal Interface (CSTI). Packages are available in 2-way or 3-way configurations with a 3-point floating valve piped to the return side of the coil. Packages are leak tested to 90 psig to ensure joint integrity.

Filter

Units equipped with a standard throwaway filter have an average resistance of 76 percent and dust holding capacity of 26 grams per square foot.

Units equipped with 1-in. MERV 8 filters have a rating based on ASHRAE Standard 52.2. The average dust spot efficiency is no less than 35 to 40 percent when tested in accordance with ASHRAE Standard 52.1 atmospheric dust spot method.

Units equipped with 1-in. MERV 13 filters have a rating based on ASHRAE Standard 52.2. The average dust spot efficiency is no less than 90 percent efficiency on 1–3 micron particles and greater than 90 percent efficiency on 3–10 micron particles when tested in accordance with ASHRAE Test Standard 52.2.

Trane optimizes the performance of homes and buildings around the world. A business of Ingersoll Rand, the leader in creating and sustaining safe, comfortable and energy efficient environments, Trane offers a broad portfolio of advanced controls and HVAC systems, comprehensive building services, and parts. For more information, visit www.Trane.com.

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Supersedes UV-PRC004-EN (18 Jun 2012)

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