TRANE

Catalog

Blower Coil Air Handler
Models BCHD and BCVD

Air Terminal Device
400-3000 CFM

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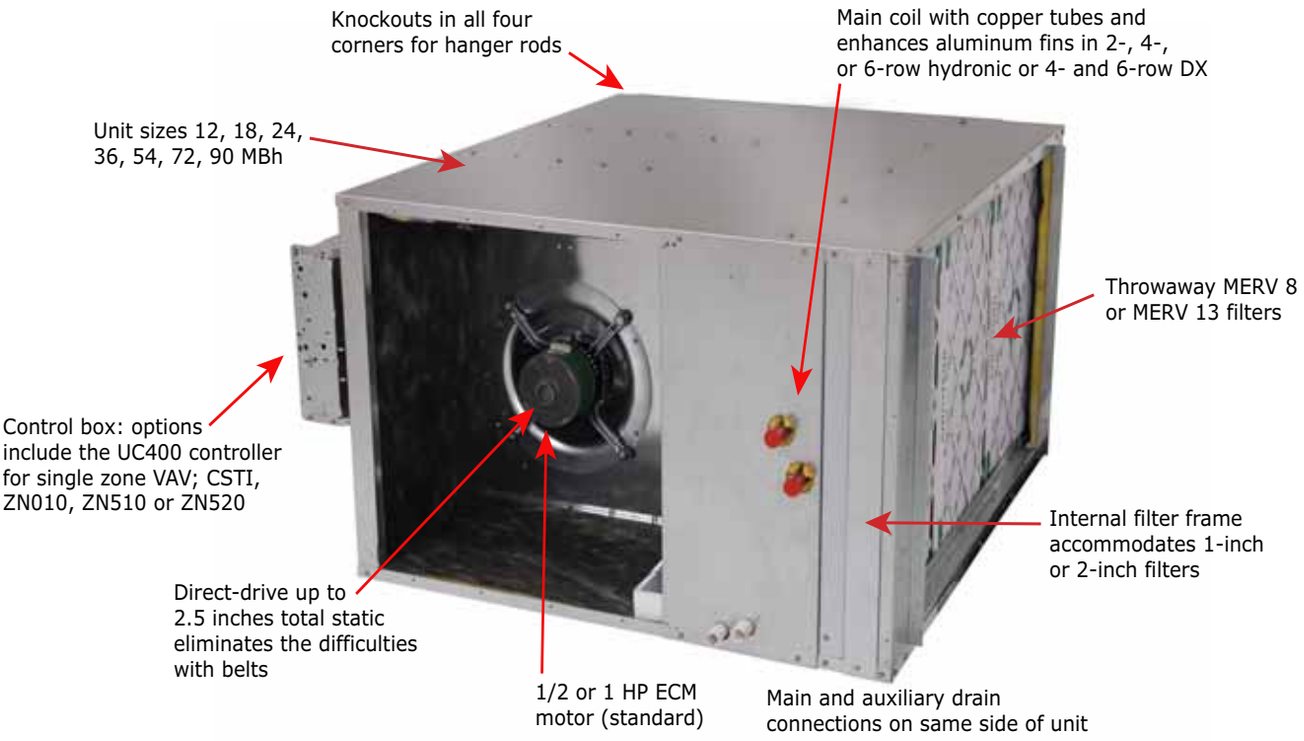
Introduction

Trane Blower Coils—Factory Packaged How You Need It—When You Need It



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Model Number Description

Following is a complete description of the blower coil model number. Each digit in the model number has a corresponding code that identifies specific unit options.

Digits 1, 2, 3, 4 — Unit Model

BCHD = Horizontal Blower Coil
BCVD = Vertical Blower Coil

Digits 5, 6, 7 — Unit Size

012 = Unit size 12 - 1 ton
018 = Unit size 18 - 1 1/2 ton
024 = Unit size 24 - 2 ton
036 = Unit size 36 - 3 ton
054 = Unit size 54 - 4 1/2 ton
072 = Unit size 72 - 6 ton
090 = Unit size 90 - 7 1/2 ton

Digit 8 — Unit Voltage

A = 115/60/1
B = 208/60/1
C = 230/60/1
D = 277/60/1
J = 220/50/1
K = 240/50/1

Digit 9 —Insulation Type

1 = 1 inch Matte-faced insulation
2 = 1 inch Foil-faced insulation

Digits 10, 11 — Design Sequence

** = Factory sets the design sequence

Digit 12 — Motor and Control Box Location

A = Same side as coil connections, horizontal or counterswirl options only
B = Opposite side from coil connections, horizontal or counterswirl options only
C = Same side as coil connections, preswirl option only
D = Opposite side from coil connections, preswirl only

Digit 13 — Coil Connection Side

1 = PVC drain pan right-hand coil and drain connections
2 = PVC drain pan left-hand coil and drain connections
3 = Stainless steel drain pan right-hand coil and drain connections
4 = Stainless steel drain pan left-hand coil and drain connections
0 = None

Digit 14 — Coil #1 First in Airstream

Note: All coils are hydronic unless stated otherwise.

0 = No coil 1
A = 1-row preheat
F = 4-row
G = 6-row
J = 4-row with autochangeover
K = 6-row with autochangeover
L = 2-row high capacity preheat
M = 4-row high capacity
N = 6-row high capacity
R = 4-row high capacity with autochangeover
T = 6-row high capacity with autochangeover
1 = 3-row DX coil 3/16-inch (0.032) dist
2 = 4-row DX coil 3/16-inch (0.032) dist
3 = 6-row DX coil 3/16-inch (0.032) dist
4 = 3-row DX coil 3/16-inch (0.049) dist
5 = 4-row DX coil 3/16-inch (0.049) dist
6 = 6-row DX coil 3/16-inch (0.049) dist
7 = 4-row DX coil 3/16-inch (0.049) dist, heat pump
8 = 6-row DX coil, 3/16-inch (0.049) dist, heat pump

Digit 15 — Unit Coil #2

Note: All coils are hydronic unless stated otherwise.

0 = No coil 2
A = 1-row reheat
F = 4-row
G = 6-row
J = 4-row with autochangeover
K = 6-row with autochangeover
L = 2-row high capacity reheat
M = 4-row high capacity
N = 6-row high capacity
R = 4-row high capacity with autochangeover
T = 6-row high capacity with autochangeover
1 = 3-row DX coil 3/16-inch (0.032) dist
2 = 4-row DX coil 3/16-inch (0.032) dist
3 = 6-row DX coil 3/16-inch (0.032) dist
4 = 3-row DX coil 3/16-inch (0.049) dist
5 = 4-row DX coil 3/16-inch (0.049) dist
6 = 6-row DX coil 3/16-inch (0.049) dist
7 = 4-row DX coil 3/16-inch (0.049) dist, heat pump
8 = 6-row DX coil, 3/16-inch (0.049) dist, heat pump

Digit 16 — Motor Horsepower

2 = 1/2 hp
4 = 1 hp

Digit 17 — RPM

A = 500 rpm
B = 600 rpm
C = 700 rpm
D = 800 rpm
E = 900 rpm
F = 1000 rpm
G = 1100 rpm
H = 1200 rpm
J = 1300 rpm
K = 1400 rpm
L = 1500 rpm
M = 1600 rpm
N = 1700 rpm
P = 1800 rpm
R = 1900 rpm
T = 2000 rpm
U = 2100 rpm
V = 2200 rpm
W = 2300 rpm
Z = TOPSS base performance

Digit 18 — Electric Heat Stages

1 = 1-stage
2 = 2-stage
0 = none

Digits 19, 20, 21 — Electric Heat

010 = 1.0 kW	
015 = 1.5 kW	060 = 6.0 kW
020 = 2.0 kW	065 = 6.5 kW
025 = 2.5 kW	070 = 7.0 kW
030 = 3.0 kW	075 = 7.5 kW
035 = 3.5 kW	080 = 8.0 kW
040 = 4.0 kW	090 = 9.0 kW
045 = 4.5 kW	100 = 10.0 kW
050 = 5.0 kW	110 = 11.0 kW
055 = 5.5 kW	000 = None

Digit 22 — Electric Heat Controls

0 = None
A = 24 volt magnetic contactors
B = 24 volt mercury contactors

Digit 23 — Electric Heat Options

0 = None
A = Line fuse
B = Door interlocking disconnect switch
C = A and B

Digit 24 — Filters

0 = None
A = 1-in. throwaway
B = 2-in. MERV 8 throwaway
C = 2-in. MERV 13 throwaway

Digit 25 — Accessory Section

0 = None
A = Mixing box only
B = Angle filter box
C = Angle filter/mixing box
D = Top access filter module
E = Bottom access filter module
F = A and D
G = A and E
H = Steam coil module
J = A and H
K = B and H
L = C and H
M = D and H
N = E and H
P = A, D and H
R = A, E and H

Digit 26 — Control Type

1 = CSTI
2 = Tracer ZN010
3 = Tracer ZN510
4 = Tracer ZN520
5 = UC400
6 = No controls (FSS)

Digit 27 — Coil #1 Control Valve Type

0 = None
A = 2-way, 2-position, N.C.
B = 2-way, 2-position, N.O.
C = 3-way, 2-position, N.C.
D = 3-way, 2-position, N.O.
E = 2-way modulating
F = 3-way, modulating
G = Field-supplied valve, 2-position, N.C.
H = Field-supplied valve, 2-position, N.O.
J = Field-supplied modulating valve
K = Field-supplied analog valve

Digit 28 — Coil #1 Control Valve Cv

0 = None
A = 3.3 Cv, 1/2-in. valve and pipe
B = 3.3 Cv, 1/2-in. valve, 3/4-in. pipe
C = 3.8 Cv, 1/2-in. valve, 3/4-in. pipe
D = 6.6 Cv, 1-in. valve and pipe
E = 7.4 Cv, 1-in. valve and pipe
F = 8.3 Cv, 1 1/4-in. valve and pipe
G = 3.5 Cv, 1/2-in. valve and pipe
H = 4.4 Cv, 1/2-in. valve and pipe
K = 8.0 Cv, 1-in. valve and pipe
Q = 1.3 Cv, 1/2-in. valve, 3/4-in. pipe
R = 1.8 Cv, 1/2-in. valve, 3/4-inc. pipe
T = 2.3 Cv, 1/2-in. valve, 3/4-in. pipe
U = 2.7 Cv, 1/2-in. valve, 3/4-in. pipe

Digit 29 — Coil #1 Piping Package

0 = None
1 = Basic piping package
2 = Deluxe piping package

Digit 30 — Coil #2 Control Valve

0 = None
A = 2-way, 2-position, N.C.
B = 2-way, 2-position, N.O.
C = 3-way, 2-position, N.C.
D = 3-way, 2-position, N.O.
E = 2-way modulating
F = 3-way modulating
G = Field-supplied valve, 2-position N.C.
H = Field-supplied valve, 2-position N.O.
J = Field-supplied modulating valve
K = Field-supplied analog valve

Digit 31— Coil #2 Control Valve Cv

0 = None
A = 3.3 Cv, 1/2-in. valve and pipe
B = 3.3 Cv, 1/2-in. valve, 3/4-in. pipe
C = 3.8 Cv, 1/2-in. valve, 3/4-in. pipe
D = 6.6 Cv, 1-in. valve and pipe
E = 7.4 Cv, 1-in. valve and pipe
F = 8.3 Cv, 1 1/4-in. valve and pipe
G = 3.5 Cv, 1/2-in. valve and pipe
H = 4.4 Cv, 1/2-in. valve and pipe
K = 8.0 Cv, 1-in. valve and pipe
Q = 1.3 Cv, 1/2-in. valve, 3/4-in. pipe
R = 1.8 Cv, 1/2-in. valve, 3/4-in. pipe
T = 2.3 Cv, 1/2-in. valve, 3/4-in. pipe
U = 2.7 Cv, 1/2-in. valve, 3/4-in. pipe

Digit 32 — Coil #2 Piping Package

0 = None
1 = Basic piping package
2 = Deluxe piping package

Digit 33 — Remote Heat Options

0 = No remote heat
1 = Remote staged electric heat
2 = Remote 2-position hot water, N.C.

Digit 34 — Mixing Box Damper Actuator

Note: The back damper is the control damper when actuators are ordered. The back damper is N.C. or N.O. as selected.

0 = None
1 = 2-position, N.O., ship loose
2 = Modulating, N.C.
3 = Modulating, N.O.
4 = Modulating, ship loose
5 = Field-supplied 2-position, N.O.
6 = Field-supplied 2-position, N.C.
7 = Field-supplied modulating

Digit 35 — Factory Mounted Control Options

0 = None
C = Condensate overflow
D = Low Limit
K = Condensate overflow and low limit

Digit 36 — Control Options 2

0 = None
A = Outside air sensor, field-mounted
B = Discharge air sensor
C = Outside air and discharge air sensor

Digit 37 — Control Options 3

0 = None
A = Dehumidification with communicated value
B = Dehumidification with local humidity sensor

Digit 38 — Zone Sensors

0 = None
1 = Wall-mounted temp sensor (SP, OA, OCC/UNCOCC, COMM)
3 = Wall-mounted temp sensor (SP, OCC/UNOCC, COMM)
4 = Wall-mounted temp sensor (OCC/UNOCC, COMM
C = Wireless temp sensor, unit-mounted receiver
E = Wall-mounted temp sensor (SP, OALMH, OCC/UNOCC, COMM)
F = Wall-mounted display sensor (SP, OALMH, COMM)
G = Wireless display sensor, unit-mounted receiver (SP, OALMH)
H = Wall-mounted FSS

Digit 39 — Seismic Certification

0 = None

Digit 40 — Extra Filter

0 = None
1 = Ship loose extra 1-in. Throwaway
2 = Ship loose extra 2-in. MERV 8 throwaway
3 = Ship loose extra 2-in. MERV 13 throwaway

Features and Benefits

Factory Packaged – What You Need – When You Need It

The Trane blower coil air handler, model BCHD/BCVD, accommodates a variety of applications while providing a low-cost method of air conditioning and/or heating buildings. These compact, low-profile units can fit in small spaces and are floor or ceiling mounted. With a minimum of effort, they can be relocated within the building as needs change.

BCHD/BCVD units are light-duty air handlers, ranging from 1.0 to 7.5 tons nominal capacity. They are typically used in schools, hospitals, offices, stores, and similar applications. BCHD/BCVD units are UL listed to U.S. and Canadian safety standards for all 115, 208, 230, and 277 volt 60 hertz motors and 220 and 240 volt 50 hertz motors.

Figure 1. Horizontal blower coil

Single Source Responsibility

Trane is the single source of responsibility because we ship BCHD/BCVD units from the factory as a total package. Included in the package are factory-mounted coils, filters, controls, direct-drive motors, and duct collars. Also, factory-provided piping packages are an available option. Because we provide the total package, this helps reduce job site labor and installation time.

Piping Packages

All blower coil air handlers are available with factory-built piping package options for field installation using field-supplied interconnecting piping. Basic or deluxe piping package options are available with a variety of control valve options:

- Two- or three-way
- 1/2-inch, 1-inch, or 1-1/4-inch
- Two-position or modulating

The basic piping package consists of two shutoff ball valves. The deluxe piping package has one shutoff ball valve, a strainer, and a circuit setter balancing valve. Basic or deluxe piping packages with a three-way control valve also include a balancing fitting on the bypass line.

Energy Efficiency

Trane's commitment to providing premium quality products has led to the exclusive use of Electronically Commutated Motors (ECM) in all blower coil (BCHD/BCVD) models. These brushless DC motors incorporate the latest technology for optimized energy efficiency, acoustical abatement, maintenance free and extended motor life. Each motor comes with a VelociTach™ motor control board that allows for programmability, soft ramp-up, better airflow control, and serial communication. Trane units equipped with ECMs are significantly more efficient than permanent split capacitor (PSC) motors.

Controls

Trane offers a broad array of control options, from a simple control interface (CSTI) to the Tracer controllers.

CSTI

The control interface is intended to be used with a field-supplied, low-voltage thermostat or controller. The control box contains a disconnect switch (optional for units with electric heat). All end devices are wired to a low-voltage terminal block and are run-tested, so 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.

Tracer Controllers

The Tracer family of controllers, ZN010, ZN510, ZN520, and UC400 offers the combined advantages of simple and dependable operation with the latest Trane-designed controller. Standard control features include options normally available on more elaborate control systems. All control options are available factory-configured or can be field-configured using Rover service software for the ZN controllers, the UC400 is serviced via Tracer TU.

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.

End Devices

Optional factory-mounted end devices such as a condensate float switch, freezestat, control valves, and actuators are available. Factory-installed and -wired electric heat features single-point power connection.

Flexibility

The Trane blower coil is available in either horizontal (model BCHD) or vertical (model BCVD) configurations. Horizontal units are typically ceiling suspended via threaded rods. Knockouts are

provided in all four corners to pass the rods through the unit. Horizontal units can also be floor mounted. Vertical units are typically floor mounted. They have a side inlet for easy duct connection, and do not require a field-fabricated inlet plenum. Vertical units ship in two pieces and can be set up in either a pre-swirl or counter-swirl configuration.

In addition, blower coils have acoustical benefits because they are typically located outside the occupied space, either in the ceiling or in a closet. This limits the amount of sound transmission (radiated) directly from the unit to the occupant. These units are applied with discharge ductwork, which is frequently lined to help reduce the sound transmission (discharge) through the ductwork into the occupied space. Blower coils (BCHD/BCVD) utilize a direct-drive motor solution for all units which eliminates the single phase motor hum which is evident in capacitor split motors in belt-drive applications.

Coil Options

Trane blower coils feature a wide variety of coil options that include:

- Two-, four-, or six-row hydronic cooling or heating
- Three-, four-, or six-row DX coils
- High capacity hydronic coils for cooling or heating
- One- or two-row heating coil in either the preheat or reheat position
- One-row steam preheat

Filter Placement Options

All hydronic units have an internal flat filter frame for 1- or 2-inch filters. Other filter placement options include:

- Angle filter box for 2-inch filters
- Combination angle filter/mixing box
- Bottom or top access filter box that accommodates 2-inch filters. This option allows easy filter access through a hinged door, from the bottom of the unit on horizontal units, and from the top on vertical units.

Motor Options

Direct-drive motors range from 1/2 to 1 horsepower in a wide range of voltages. All motors have internal current overload protection, permanently sealed ball bearings, and rubber grommets on the mounting brackets to reduce noise and vibration transmission.

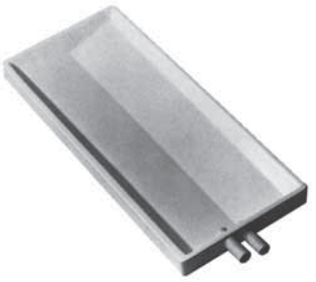
Motors come factory programmed for specific job requirements or can be programed based on standardized motor speeds. Motors speeds have the ability to be adjusted on the job site with out the requirement of specialized tools. This enables the unit to be balanced for changes to design static pressures fast and easy.

Indoor Air Quality

Indoor air quality is becoming a greater concern every day. That's why Trane provides the most complete indoor air quality options of any manufacturer.

Drain Pans

Figure 2. Drain pan



The Trane blower coil uses a polymer or optional stainless steel drain pan, sloped in both directions to drain properly. See Figure 2. The drain pans are easily removable and cleanable. Also, the main and auxiliary connections are on the same side.

Accessibility and Cleanability

Trane blower coils have 1-inch dual density insulation that meets NFPA90A and UL181, which is designed to withstand high velocities. Trane optionally offers 1-inch foil faced insulation that meets NFPA90A, UL181, and bacteriological standard ASTM C 665.

Coils mount above—not in—the drain pan and are not a structural part of the unit. The coils are easily removable and slide in and out on rails for cleaning. The drain pan is also easily removable for cleaning.

Filtration

All units have an internal flat filter frame that can accommodate 1- or 2-inch filters. An optional bottom (horizontal units) or top (vertical units) filter access box is also available to improve accessibility.

An optional angle filter box (2-inch only), or combination angle filter/mixing box, provides extra filter face area, which results in extremely low face velocities and low pressure drop. With increased face area, the angle filters have substantially more dust-holding capacity than conventional flat filters. MERV 8 and MERV 13 pleated angle or flat filters options are available.

Ventilation

The optional mixing box delivers ventilation air directly to each unit. When the unit is equipped with a Tracer ZN520 or UC400 controller, the mixing box functions as a zero to 100 percent economizer to improve energy efficiency. For units configured to automatically switch between high and low fan speeds, the Tracer ZN520 or UC 400 controller automatically adjusts the mixing box damper to provide the correct amount of fresh air to the space at all fan speeds.

Blower coil units are draw-thru configurations that use direct-drive fan motors with higher horsepower than fan coils. This makes them an excellent choice for use in an air supply ductwork system with diffusers—rather than a direct discharge system—because it enhances the space air mixing and ventilation effectiveness.

Dehumidification

For direct control of space humidity, a BCHD/BCVD unit can be configured with a hydronic heating coil in the reheat position and equipped with a Tracer ZN520 or UC400 controller. These controllers can independently modulate the cooling and heating coils to directly control both temperature and humidity in the space.

Easy to Service

The coils and motor are easily replaced within minutes, even when the unit is suspended. Coils slide in and out by removing the coil access panel and a few screws at the rear of the unit. With the bottom filter access option, filters are easily accessed from the bottom of the unit. If the motor requires servicing, only the motor side requires access.

Durability

Trane blower coils use durable materials, including heavy gage, galvanized steel for the casing.

Optional Accessory Sections

These accessory sections make the BCHD/BCVD product more flexible:

- Mixing box
- Angle filter box
- Angle filter and mixing box section
- Bottom or top hinged access filter box
- Electric heat box
- Steam coil box

Mixing Box

Figure 3. Mixing box

The mixing box option ships separately and has internal low-leak aluminum dampers and access panels on both sides. The mixing box is insulated in the same as the main unit: matte or foil, as ordered. The mixing box is easily located in field to allow "back/bottom" dampers. See Figure 3.

Angle Filter Box and Combination Angle Filter/Mixing Box

Figure 4. Angle filter box/ mixing box combo

Filter box options include an angle filter box and a bottom/top access filter box that are factory-installed. The angle filter can be combined with the mixing box as one accessory module. The flat filter frame can accommodate 1- or 2-inch filters. The angle filter frame accommodates only 2-inch filters. See Figure 4.

Electric Heat

A factory installed open-wire electric heater is available in a wide variety of voltages and kW's. All units have a single point power connection. Optional heater fuses, mercury or magnetic contactors, and a heater door interlocking disconnect switch are available.

Steam Coils

Figure 5. Steam coil

A steam coil box with one-row coil is available in the preheat position. Module includes a filter rack for 1-inch flat filters. See Figure 5.

Application Considerations

The Trane blower coil air handler offers a wide range of application flexibility between the fan coil unit and Climate Changer™ air handlers.

Units are available in seven nominal capacities ranging from 1.0 to 7.5 tons cooling and 400 to 3000 cfm airflow. The basic unit is available in horizontal (model BCHD) as well as a vertical (model BCVD) configuration.

The single-zone, constant volume applications discussed in this section are:

- Two-pipe hydronic units
- Two-pipe hydronic units with electric heat
- Four-pipe hydronic units
- Economizer

Other applications of the BCHD/BCVD are:

- DX cooling
- Two-pipe hydronic units with steam heating
- Single-zone VAV

Two-Pipe Units

The standard BCHD/BCVD unit is equipped with a hydronic coil. The unit can perform cooling only, heating and cooling (changeover system), or heating only. In a changeover system, the unit cools during the spring, summer, and fall seasons (summer mode) and heats during the winter season (winter mode).

Use the Trane Official Product Selection System (TOPSS™) program for specific design criteria such as flow rate, temperature rise/drop, pressure drop, glycol mixtures, and capacity.

When selecting two-pipe changeover units, note that TOPSS will only provide output that meets both the cooling and heating capacity requirements. Because cooling and heating capacity requirements for a given unit may differ significantly, a given coil may be optimally sized for one load and over/under sized for the other load.

Two-Pipe Units With Electric Heat

With the addition of electric heat, the two-pipe system can heat or cool. In the non-changeover system, the main coil is always used for cooling and the electric heater is always used for heating. In the changeover system, during the summer mode (spring, summer and fall), the main coil is used for cooling and electric heater is used for heating. During the winter mode, the main coil is used for heating and the electric heater is disabled.

Two-pipe systems with electric heat are an economical solution to intermediate season (spring and fall) comfort problems associated with straight two-pipe systems. In moderate climates or where electric rates are low, non-changeover systems are typically used. In climates with significant heating loads and/or high electric rates, a changeover system—to allow hydronic heating—is typically used.

All units with factory mounted electric heat are UL listed and interlocked with the fan motor switch. A call for Electric heat operation will turn the fan on. Motors controls are synchronized with fan/valve operation to ensure safe operation and that two modes of heat are not operating simultaneously. A transformer is supplied on any voltage unit, eliminating the need for field installation of a step-down transformer. Units come with either contactors or relays on the electric heat. Mercury contactors are available. A high temperature cutout with automatic reset is provided as an integral part of the elements to de-energize the electric heat in the event of a malfunction.

Changeover in Two-Pipe Systems

Changing between cooling and heating modes in a two-pipe system requires energy to heat or cool the mass of water in the piping system at switchover. ASHRAE Standard 90.1–2001 defines specific requirements for minimizing the energy impact of this switchover:

- The system must allow a deadband between changeover from one mode to the other of at least 15°F outdoor-air temperature.
- The system must include controls that allow the system to operate in one mode for at least four hours before changing to the other mode.
- Reset controls must be provided to allow heating and cooling supply-water temperatures, at the changeover point, to be no more than 30°F apart.

Four-Pipe Units

The addition of a one-row or two-row heating coil to the basic BCHD/BCVD unit makes it compatible for a four-pipe cooling and heating system. The heating coil is available factory installed in either the preheat or reheat position.

Four-pipe systems solve the intermediate season (spring and fall) comfort problems associated with straight two-pipe systems because they only either cool or heat year-round. However, they do require chiller and boiler operation to be available to operate year-round.

When making the choice between a two or four-pipe system, also consider:

- Cooling/heating loads in perimeter zones of the building
- Importance of temperature and humidity control for the zone
- First cost

TOPSS allows independent selection of the cooling and heating coils for flexibility in flow rates, pressure drops, temperature rise/drop, and fluid type.

DX Cooling Units

A BCHD/BCVD unit with a DX cooling coil will often be connected to an air-cooled condensing unit. Some condensing units have two, independent refrigeration circuits; DX coils in units sizes 12 to 54 are single-circuited.

Notes:

- *Do not manifold two independent refrigeration circuits into a single-circuited DX (evaporator) coil.*
- *DX coils in units sizes 72 and 90 are always dual-circuited.*

Dehumidification

The BCHD/BCVD has two methods for improving the dehumidification performance of the constant-volume unit - a four-pipe unit with reheat, and chilled water reset

Four-Pipe Unit with Reheat

BCHD/BCVD units equipped with a Tracer ZN520 or UC400 controller and a hydronic heating coil in the reheat position will provide direct control of space humidity. If the space humidity level does not exceed the desired upper limit, the unit responds to reduced cooling load by modulating the control valve and, if in AUTO mode, switching between fan speeds. However, if the space humidity level rises above the upper limit, the capacity of the cooling coil is increased, overcooling the air to maintain the space humidity below the upper limit. Then, the capacity of the heating coil modulates, adding a small amount of heat to temper the air and avoid overcooling the space.

The Tracer ZN520 or UC400 controller responds to a signal from a humidity sensor installed in the space or a signal from a building automation system, and independently modulates the cooling and heating coils to directly control both temperature and humidity in the space. While this configuration can directly control indoor humidity levels, it does require the boiler (or other source of heat) to be available year-round.

Chilled-Water Reset

In many constant-flow pumping systems, the leaving chilled-water temperature setpoint is reset based on either outdoor dry-bulb temperature or some indication of cooling load. Use caution when implementing a chilled-water reset strategy because space humidity control can be compromised if the water gets too warm.

A BCHD/BCVD unit equipped with a Tracer ZN520 or UC4000 can accept an input signal from a humidity sensor in the space. A building automation system will continually poll the humidity level in all spaces, or in a single representative space, to limit the amount of chilled-water reset and maintain space humidity levels.

Airside Economizer

Adding a mixing box with a damper actuator allows economizer or free cooling applications. When using blower coils for these applications, Trane highly recommends using a freeze protection device to protect the coil(s). If the unit has a Tracer ZN520 or UC400 controller, you must have an outside air temperature signal from either a hard wired outside air sensor or from the building automation system, such as Tracer Summit.

Location and Installation

Avoid locating the unit directly above spaces where sound levels may be critical, such as areas near the occupied space. Install horizontal units over false ceilings in service areas such as corridors or storage rooms. Install vertical units in closets or mechanical rooms.

Horizontal units are installed by suspending the corners of the unit with threaded rods. Use suitable vibration isolators and take the following precautions to comply with generally accepted installation practices.

- Use flexible duct connectors or supply and return sides (if ducted).
- Use acoustic lining on the inside of main supply duct for noise control.
- Do not attach ceiling suspension wires to unit or through ducts.
- Locate return air grilles as far as possible from the unit to avoid noise transmission.
- Design and install ductwork as per ASHRAE guides, SMACNA, and local code requirements.

Acoustics

Controlling outdoor and equipment noise within the occupied space is increasingly important to system designers and building occupants/owners. Therefore, give proper consideration to this subject in the application of the BCHD/BCVD unit.

Selecting fan and coil combinations is inherently flexible for sound-sensitive applications. In such instances, a fan running at low speed with a high capacity coil normally yields satisfactory results. It also may be desirable to select a larger nominal capacity unit and operate it at less than nominal airflow for further acoustic benefit.

BCHD/BCVD sound power, Lw, data for ducted discharge, inlet + casing, and casing radiated components is available from TOPSS. This sound power data is useful in estimating the sound levels in the occupied space for a given application.

Operating Limitations

Reference the General Data section for minimum and maximum operating limits. Units must not operate above maximum fan rpm or unit airflow. Unit operation above the maximum fan rpm will drastically reduce bearing life and may result in catastrophic failure. Operating the unit above the maximum airflow in the cooling mode may result in unsatisfactory operation due to water carryover from the coil. In addition, it is often uneconomical to operate a unit at its maximum rpm due to greater motor power requirements.

The unit may not perform at an optimal acoustical performance level if it operates in the fan's traditional stall region.

Do not operate units with electric heat below the minimum airflow limit to prevent excessive leaving air temperatures and electric heat limit trips.

Do not operate hydronic and electric heat simultaneously to prevent excessive leaving air temperatures and limit trips. Electric heat units have a lockout switch to disable the electric heater if the temperature off the hydronic coil is greater than 95°F.

Do not operate units with a leaving air temperature above 104°F.

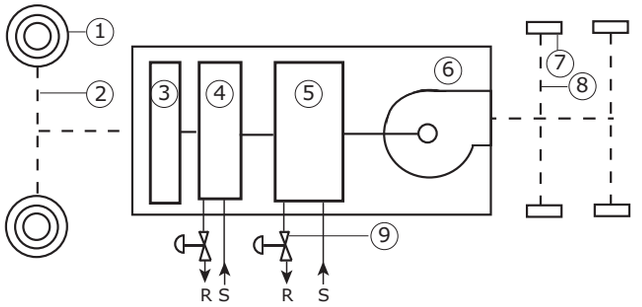
Do not operate coils above the water flow limits to prevent erosion and noise. A minimum or "self-venting" water flow rate is also listed in the General Data Section. If the coil is set to operate below this flow rate, vent it periodically by flushing at a higher flow rate.

Do not operate piping packages and water valves above the water flow limit to prevent erosion and noise. Water valves supplied with the BCHD/BCVD units as accessories are intended for use in "treated" closed loop chilled or hot water systems.

Note: Do not use valves with open or potable water systems. Untreated water may cause scaling and particulate collection interference with the valve function, and reduce the life and effectiveness of the valve.

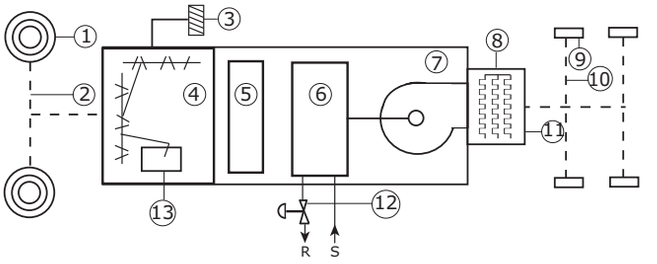
Typical Blower Coil Applications

Figure 6. Typical 4-pipe (preheat) application



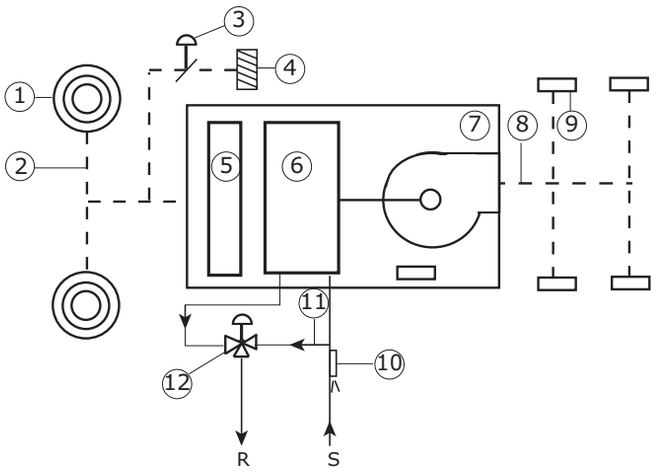
1	Return grille
2	Return ductwork
3	Filter
4	Auxiliary coil - 1 or 2 row
5	Main coil - 2, 4, or 6 row
6	Blower coil unit
7	Diffuser
8	Supply ductwork
9	2-way control valves - main and auxiliary coils

Figure 7. Typical 2-pipe application with electric heat and mixing box



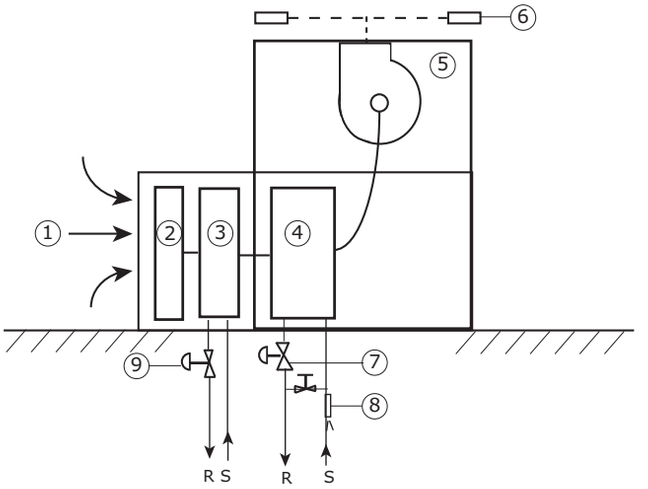
1	Return grille
2	Return ductwork
3	Outside air grille
4	Mixing box
5	Filter
6	Main coil - 2, 4, or 6 row
7	Blower coil
8	Electric heat
9	Diffuser
10	Ductwork
11	Electric heater
12	2-way control valve
13	Modulating spring return actuator

Figure 8. Typical 2-pipe changeover application



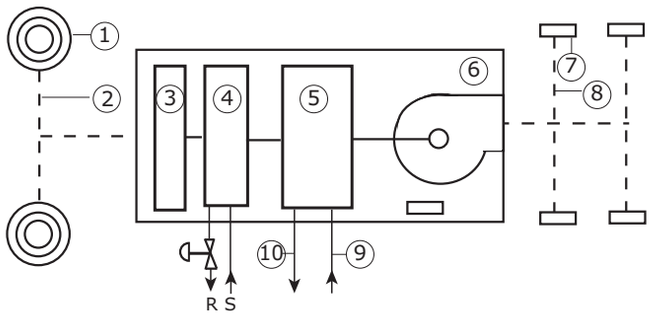
1	Return grille
2	Return ductwork
3	2-position outside air damper with spring return actuator
4	Outside air grille
5	Filter
6	Main coil - 2, 4, or 6 row
7	Blower coil unit
8	Supply ductwork
9	Diffusers
10	Auto-changeover sensor
11	Bypass line
12	3-way “mixing” control valve

Figure 9. Typical 4-pipe vertical with changeover application



1	Open return
2	Filter
3	Auxiliary coil - 1 or 2 row
4	Main coil - 2, 4, or 6 row
5	Vertical blower coil unit
6	Diffuser
7	2-way control valve
8	Auto-changeover sensor
9	2-way control valve

Figure 10. Typical DX with hot water preheat application



1	Return grille
2	Return ductwork
3	Filter
4	Hot water auxiliary coil - 1 or 2 row
5	DX main coil - 4 or 6 row
6	Blower coil unit
7	Diffuser
8	Supply ductwork
9	Discharge
10	Suction

Selection Procedure

These selection procedures are for manual computations using the general data and capacity tables in this catalog. For particular design conditions not in this catalog, use the Trane Official Product Selection System, TOPSS, or contact your local Trane office.

1. Determine unit capacity. Reference unit capacities on page 55 - page 68 to determine unit size needed for cooling and/or heating. Interpolate between given values when necessary.
2. Verify air and water flow operating limits. If design airflow equals the unit rated airflow with the chosen coil, use the waterflow rate shown in the appropriate performance table. If using interpolation to determine capacity, determine waterflow using the formula: gpm = total capacity (MBh) / [(0.5) x (water temperature rise)].

Note: Airflow and water flow must fall within the unit operating limits in general data Table 1, page 23 or you must reselect the unit.

3. Heating coils only: If entering air and water conditions are different than 60/180°F or 60/120°F respectively, refer to the associated correction factors in Table 34, page 68. Divide the required capacity by the correction factor and then refer to the table to locate the corrected capacity.
4. Calculate the water pressure drop (hydronic coils only). Determine water pressure drop using the appropriate figure on page 28 - page 34.
5. Check fan performance requirements. Reference fan performance data by unit size and configuration on page 35 - page 54. These tables and curves include pressure drops from the casing only. Reference air pressure drop for coils, filters, and accessories using Table 5, page 26 and Table 6, page 27.
6. Calculate total static pressure requirements. Add the external static pressure (ESP) of the coil, filter, and accessories to the system esp to obtain the total fan static pressure requirement. Then determine BHP and fan RPM requirements using the fan performance curves. Then determine which motor to use.
7. Determine motor size. Check motor HP and fan RPM requirements to determine the correct motor and size.
8. The fan curves and fan tables use the motor hp. Check CFM and SP to determine which motor and RPM will meet the application. Select TOPSS base performance in order to use the TOPSS calculated RPM.

Cooling Selection Example

Job example:

- Horizontal blower coil
- 2-inch pleated media filters
- Mixing box with dampers
- Total capacity required: 53.0 MBh
- Sensible capacity required: 42.9 MBh
- Airflow: 2000 cfm, 0.25” ESP
- Entering air conditions: 80°F DB/67°F WB
- Entering water: 45°F
- Water temperature rise: 10°F

1. Determine unit capacity. Using Table 18, page 48, the capacity of a BCHD 54 with a six-row coil, 10°F ΔT at 1800 cfm, is 74.51 MBh total and 52.3 MBh sensible. At 2250 cfm, it is 88.7 MBh total and 63.4 MBh sensible. Interpolate between these values for 2000 cfm to obtain 80.9 MBh total and 56.7 sensible.
2. Verify CFM and GPM limits. Using Table 18, page 48, the water flow rate = 16.1 gpm. Reference Table 1, page 23 for airflow and water limits. Both the water flow rate (16.1 gpm) and airflow (2000 cfm) fall within the range specified for a BCHD054 with a six-row cooling coil.
3. Calculate WPD. From Table 18, page 48, the water pressure drop for a size 54 unit, six-row coil at 16.1 gpm = 4.8 feet of water.
4. Check fan performance requirements. Calculate the air pressure drop for all components using Table 5, page 26 and Table 6, page 27, air pressure drop adjustment. Interpolate for 2000 cfm as follows:

6-row coil	0.934 inch wg
2-inch pleated filter	0.175 inch wg
mix. box/dampers	0.026 inch wg
	1.135 inch wg

5. Calculate TSP. Unit apd 1.135 inch wg + 0.25 inch wg ESP= 1.385 inch wg total static pressure.
6. Determine motor and drive size. Using Table 11, page 40 (fan performance), interpolate for 2000 cfm at 1.385 inches wg total static pressure to obtain 955 rpm and 1.0 HP 115/208-230V or 277V motor. Select TOPSS Base Performance to operate at 955 rpm.

Heating Selection Example

Select a heating coil for the BCHD054, selected in the cooling selection example. Operating conditions are:

- 2000 cfm
- EWT = 170°F
- EAT = 60°F
- LAT = 120°F

1. Determine unit capacity. Required capacity = CFM x 1.085 x (LAT - EAT) = 2000 x 1.085 x (120 - 60) = 130,200 Btu (130.2 MBh)

	10°F ΔT	15°F ΔT
@1800 cfm	136.4 MBh	131.3 MBh
	4.9 gpm	13.1 gpm
@2250 cfm	156.9 MBh	150.7 MBh
	6.4 gpm	15.1 gpm
@2000 cfm	145.5 MBh	139.9 MBh
	5.6 gpm	14.0 gpm

The capacity correction factor for a two-row coil is 0.917 for EAT = 60°F and EWT = 170°F. Corrected capacity required = 130.2/0.917 = 142.0 MBh

2. Verify water flow and airflow limits. Reference Table 1, page 23 for water flow limits and Table 2, page 24 for cfm limits. Both the water flow rate (10.9 gpm) and airflow (2000 cfm) fall within the range specified for a BCHD 054 with a 2-row heating coil.
3. Calculate water pressure drop (WPD). From Figure 24, page 33, the water pressure drop for a size 54 unit is 20 feet of water. The wpd correction factor for the average water temperature through the coil from Table 34, page 68 is 1.01. Corrected water pressure drop = 2.0 x 1.01 = 2.02 feet of water.
4. Calculate total static pressure and determine motor size. From Table 5, page 26, air pressure drop for a BCHD size 54 two-row coil is 0.222 inches wg.
   Adding this pressure drop to the total static pressure (calculated in the cooling example) gives a total static pressure of 1.356 inches wg. From Table 11, page 40, interpolating for 2000 cfm and 1.446 inches wg, we obtain 975 rpm and 1.0 115/208-230V or 277V motor. Select TOPSS Base Performance to operate at 975 rpm.

General Data

Table 1. BCHD/BCVD coil general data

Unit Size	12	18	24	36	54	72	90
Nominal cfm	**400**	**600**	**800**	**1200**	**1800**	**2400**	**3000**
Hydronic and DX coil data							
Area - ft^2	0.89	1.11	1.67	2.67	4.00	5.00	6.67
Width - in. [a], [b]	8	8	12	12	18	18	24
Length - in. [d]	16	20	20	32	32	40	40
Velocity - ft/min.	450	540	480	450	450	480	450
Hydronic coil data - high capacity							
Area - ft^2	0.89	1.11	1.67	2.67	3.89	4.86	6.25
Width - in. [a], [c]	8	8	12	12	17.5	17.5	22.5
Length - in. [d]	16	20	20	32	32	40	40
Velocity - ft/min.	450	540	480	450	463	494	480
1-row coil							
Minimum gpm [e]	1.0	1.0	1.0	1.0	6.1	6.1	7.9
Maximum gpm [f]	5.2	5.2	5.2	5.2	32.6	32.6	42.0
Dry coil weight - lb	4.4	5.2	6.6	9.3	17.6	20.4	25.8
Wet coil weight - lb	5.1	6.0	7.8	11.0	22.4	26.0	32.9
Internal volume - in^3	19.4	22.2	33.2	47.1	132.9	155.1	196.6
2-row coil - high capacity							
Minimum gpm [e]	1.0	1.0	2.0	2.0	6.1	6.1	7.9
Maximum gpm [f]	5.2	5.2	10.4	10.4	32.6	32.6	42.0
Dry coil weight - lb	5.9	7.0	9.9	14.1	27.2	32.1	39.4
Wet coil weight - lb (kg)	7.2	8.4	12.3	17.6	36.1	42.5	52.6
Internal volume - in^3	36.0	38.8	66.5	96.9	246.5	288.0	365.5
4-row coil - standard capacity							
Minimum gpm [e]	n/a	n/a	n/a	n/a	8.8	8.8	11.7
Maximum gpm [f]	n/a	n/a	n/a	n/a	47.0	47.0	62.6
Dry coil weight - lb [g]	n/a	n/a	n/a	n/a	37.2	44.5	58.5
Wet coil weight - lb [g]	n/a	n/a	n/a	n/a	48.3	57.7	77.0
Internal volume - in^3 [g]	n/a	n/a	n/a	n/a	307.4	365.5	512.3
4-row coil - high capacity							
Minimum gpm [e]	2.0	2.0	2.9	2.9	6.1	6.1	7.9
Maximum gpm [f]	10.4	10.4	15.7	15.7	32.6	32.6	42.0
Dry coil weight - lb	10.5	12.4	17.7	25.5	47.0	56.3	73.1
Wet coil weight - lb	13.1	15.5	22.5	32.5	62.7	74.9	97.9
Internal volume - in^3	72.0	85.8	132.9	193.8	433.0	516.7	688.3
6-row coil - standard capacity							
Minimum gpm [e]	n/a	n/a	n/a	n/a	8.8	8.8	11.7
Maximum gpm [f]	n/a	n/a	n/a	n/a	47.0	47.0	62.6
Dry coil weight - lb [g]	n/a	n/a	n/a	n/a	52.4	63.1	82.7
Wet coil weight - lb [g]	n/a	n/a	n/a	n/a	68.1	82.0	108.7
Internal volume - in^3 [g]	n/a	n/a	n/a	n/a	434.8	523.4	720.0
6-row coil - high capacity							
Minimum gpm [e]	2.0	2.0	2.9	2.9	6.1	6.1	7.9
Maximum gpm [f]	10.4	10.4	15.7	15.7	32.6	32.6	42.0
Dry coil weight - lb	14.6	17.4	24.7	36.1	65.4	78.6	101.5
Wet coil weight - lb	18.2	21.8	31.5	46.1	87.8	105.6	137.0
Internal volume - in^3	99.7	121.8	188.3	276.9	620.4	745.9	983.1
Steam coil data							
Area - ft^2	0.71	0.88	1.75	2.75	4.13	5.13	6.83
Width - in. [a]	6	6	12	12	18	18	24
Length - in. [d]	17	21	21	33	33	41	41
Velocity - ft/min.	26	25	18	17	17	16	16

Table 1. BCHD/BCVD coil general data (continued)

Unit Size	12	18	24	36	54	72	90
Nominal cfm	400	600	800	1200	1800	2400	3000
1-row coil	3	3	5	5	14	14	9
Minimum steam press - psig	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Maximum steam press - psig	15.0	15.0	15.0	15.0	15.0	15.0	15.0
Dry coil weight - lb	16.7	18.7	32.5	41.1	57.4	64.8	84.9
Wet coil weight - lb	18.2	20.4	36.0	45.8	64.5	73.2	96.1
Internal volume - in^3	41.7	47.7	95.3	130.8	196.1	231.6	308.7

(a) Coil width = Length in the direction of a coil header, typically vertical.
(b) "**Hydronic and DX coil data**" width dimensions apply only to DX coils (all unit sizes), 1-row standard capacity hydronic coils (unit sizes 012 through 036), and 4- and 6-row standard capacity hydronic coils (054 through 090).
(c) "**High-capacity hydronic coil data**" width dimensions apply only to 1-row standard capacity hydronic coils (unit sizes 054 through 090) and 2-, 4-, and 6-row high capacity hydronic coils (all unit sizes).
(d) Coil length = Length of coil in direction of the coil tubes, typically horizontal and perpendicular to airflow.
(e) The minimum waterflow at 1.5 fps tubeside velocity is to ensure the coil self-vents properly. There is no minimum waterflow limit for coils that do not require self venting.
(f) Maximum gpm limits are to prevent erosion and noise problems.
(g) DX coil height and width dimensions are same as comparable hydronic coils. Four- and six-row DX coil dry weight dimensions are same as comparable 4- and 6-row hydronic coils. A 3-row DX coil dry weight is 25% less than a comparable 4-row hydronic coil. Internal volumes are approximately 6% less than comparable hydronic coils.

Table 2. BCHD/BCVD fan, filter, and mixing box general data

Unit Size	12	18	24	36	54	72	90
Nominal cfm	400	600	800	1200	1800	2400	3000
Air flow							
Minimum cfm	250	375	500	750	1125	1500	1875
Maximum cfm	500	675	1000	1600	2400	3000	4000
Fan data							
Fan wheel, in. (dia. x width)	9.5 x 4.5	9.5 x 4.5	9.5 x 6.0	9.5 x 6.0	12.6 x 9.5	12.6 x 9.5	12.6 x 9.5
Maximum rpm	2300	2300	2000	2000	1500	1500	1500
Motor hp	0.50–1.0	0.33–1.0	0.50–1.0	0.50–1.0	0.50–1.0	0.50–1.0	0.50–1.0
Unit flat filter							
(Qty.) Size	(1) 12 x 24	(1) 12 x 24	(1) 16 x 25	(2) 16 x 20	(2) 20 x 20	(1) 20 x 20 (1) 20 x 25	(3) 16 x 25
Area, sq. ft	2.000	2.000	2.778	4.444	5.556	6.250	8.333
Velocity, ft/min.	200	300	288	270	324	384	360
Angle filter							
(Qty.) Size	(2) 12 x 24	(2) 12 x 24	(2) 12 x 24	(2) 20 x 20	(4) 16 x 20	(6) 16 x 16	(6) 16 x 20
Area, sq. ft	4.000	4.000	4.000	5.556	8.889	8.889	11.111
Velocity, ft/min.	100	150	200	216	203	270	270
Bottom / top access filter box							
(Qty.) Size	(1) 12 x 20	(1) 12 x 24	(1) 16 x 25	(1) 16 x 20 (1) 16 x 16	(1) 16 x 20 (1) 20 x 20	(1) 20 x 25 (1) 20 x 20	(1) 16 x 25 (2) 14 x 25
Area, sq. ft	1.700	2.000	2.800	4.000	5.000	6.300	8.000
Velocity, ft/min.	240	300	288	300	360	384	375
Mixing box							
Damper opening width, in.	15.5	19.5	19.5	31.5	31.5	31.5	31.5
Damper opening height, in.	7	7	7	7	12.75	12.75	12.75
Area, sq. ft	0.753	0.948	0.948	1.531	2.789	2.789	2.789
Velocity, ft/min.	531	633	844	784	645	861	1076

Note: Minimum air flow limits apply to units with hot water or electric heat only. There is no minimum airflow limit on cooling on units. Maximum airflow limits are to help prevent moisture carryover.

Valve Package Waterflow Limits

Table 3. BCHD/BCVD valve package waterflow limits

Tube Size (in.)	GPM
1/2	8.6
3/4	19.3
1	34.3
1-1/4	53.5

Figure 11. Single refrigerant coil

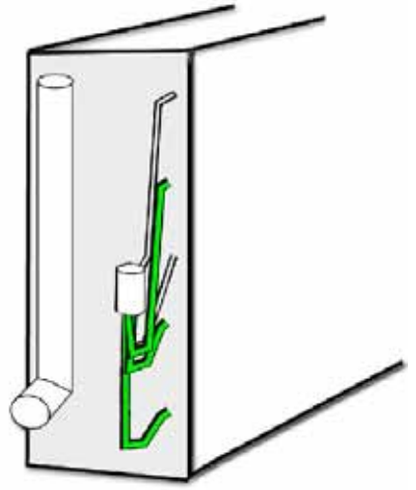
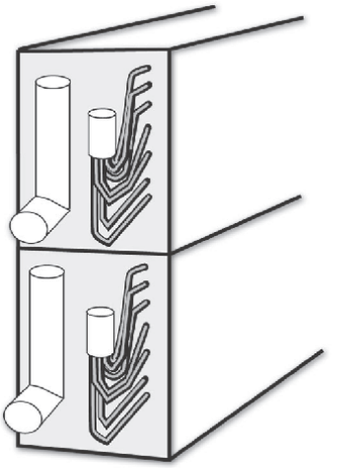


Figure 12. Horizontal face split DX coil



Coil Circuiting

Table 4. Number of circuits per coil

No. of Rows	Application Type[1]	Coil Type	Unit Size 12	18	24	36	54	72	90
1	Heating	Standard capacity	2	2	2	2	7	7	9
2		High-capacity	2	2	4	4	7	7	9
3	Refrigerant	DX	2	2	3	6	9	9	12
4	Hydronic	Standard capacity	n/a	n/a	n/a	n/a	18	18	18
		High-capacity	4	4	6	6	7	7	9
	Refrigerant	DX	2	2	3	6	9	9	12
6	Hydronic	Standard capacity	n/a	n/a	n/a	n/a	18	18	18
		High-capacity	2	2	4	4	7	7	9
	Refrigerant	DX	4	4	6	6	9	9/9[2]	12/12[2]

Note: [1]Hydronic and refrigerant coils can be applied as heating or cooling. [2]All refrigerant coils are single-circuit coils, except for sizes 72 and 90 with a 6-row coil, where there are two circuits that are face split.

Performance Data

Air pressure drop adjustments

Table 5. Coil air pressure drop adjustments (in. wg)

Unit Size	CFM	Coil Face Velocity	2-Row	4-Row		6-Row		DX Cooling			Hydronic Heating Coil		Steam Coil	Electric Heat	
			High Cap	Std Cap	High Cap	Std Cap	High Cap	3-Row	4-Row	6-Row	1-Row	2-Row	1-Row	Disch Velocity	Delta P
12	250	300	0.128	–	0.256	–	0.385	0.192	0.256	0.385	0.049	0.081	0.092	490	0.028
	300	360	0.179	–	0.358	–	0.537	0.268	0.358	0.537	0.067	0.109	0.126	588	0.034
	350	420	0.235	–	0.471	–	0.706	0.353	0.471	0.706	0.087	0.141	0.164	686	0.039
	400	480	0.296	–	0.591	–	0.887	0.443	0.591	0.887	0.110	0.176	0.207	784	0.405
	450	540	0.358	–	0.717	–	1.075	0.538	0.717	1.075	0.136	0.214	0.254	882	0.050
	500	600	0.423	–	0.845	–	1.268	0.634	0.845	1.268	0.164	0.255	0.305	980	0.056
18	375	360	0.179	–	0.358	–	0.537	0.268	0.358	0.537	0.067	0.109	0.129	735	0.042
	450	432	0.247	–	0.494	–	0.741	0.371	0.494	0.741	0.092	0.147	0.176	882	0.050
	525	504	0.321	–	0.641	–	0.962	0.481	0.641	0.962	0.120	0.190	0.230	1029	0.059
	600	576	0.397	–	0.794	–	1.191	0.595	0.794	1.191	0.152	0.238	0.290	1176	0.067
	675	648	0.474	–	0.948	–	1.423	0.711	0.948	1.423	0.188	0.290	0.356	1324	0.076
24	500	288	0.119	–	0.238	–	0.357	0.178	0.238	0.357	0.046	0.076	0.064	571	0.033
	600	346	0.166	–	0.332	–	0.499	0.249	0.332	0.499	0.062	0.102	0.088	686	0.039
	700	403	0.219	–	0.438	–	0.657	0.329	0.438	0.657	0.081	0.131	0.114	800	0.046
	800	461	0.276	–	0.552	–	0.828	0.414	0.552	0.828	0.103	0.164	0.144	914	0.052
	900	518	0.336	–	0.671	–	1.007	0.503	0.671	1.007	0.126	0.200	0.176	1029	0.059
	1000	576	0.397	–	0.794	–	1.191	0.595	0.794	1.191	0.152	0.238	0.211	1143	0.065
36	750	270	0.105	–	0.211	–	0.316	0.158	0.211	0.316	0.041	0.069	0.059	857	0.049
	900	324	0.148	–	0.295	–	0.443	0.222	0.295	0.443	0.056	0.092	0.081	1029	0.059
	1050	378	0.195	–	0.391	–	0.586	0.293	0.391	0.586	0.072	0.118	0.105	1200	0.069
	1200	432	0.247	–	0.494	–	0.741	0.371	0.494	0.741	0.092	0.147	0.133	1371	0.078
	1350	486	0.302	–	0.604	–	0.905	0.453	0.604	0.905	0.113	0.179	0.163	1543	0.092
	1500	540	0.358	–	0.717	–	1.075	0.538	0.717	1.075	0.136	0.214	0.195	1714	0.118
54	1125	289	0.124	0.240	0.249	0.359	0.373	0.180	0.240	0.359	0.053	0.089	0.059	960	0.055
	1350	347	0.168	0.335	0.336	0.503	0.504	0.251	0.335	0.503	0.073	0.118	0.081	1152	0.066
	1575	405	0.215	0.441	0.430	0.662	0.645	0.331	0.441	0.662	0.096	0.151	0.105	1344	0.077
	1800	463	0.265	0.556	0.530	0.834	0.795	0.417	0.556	0.834	0.122	0.187	0.133	1536	0.091
	2025	521	0.317	0.676	0.634	1.014	0.952	0.507	0.676	1.014	0.149	0.226	0.163	1728	0.121
	2250	579	0.371	0.799	0.741	1.199	1.112	0.600	0.799	1.199	0.180	0.269	0.195	1920	0.156
72	1500	309	0.138	0.270	0.277	0.405	0.415	0.203	0.270	0.405	0.060	0.099	0.067	1280	0.073
	1800	370	0.186	0.376	0.373	0.565	0.559	0.282	0.376	0.565	0.082	0.131	0.091	1536	0.091
	2100	432	0.238	0.494	0.476	0.741	0.714	0.371	0.494	0.741	0.108	0.167	0.119	1792	0.132
	2400	494	0.293	0.620	0.585	0.929	0.878	0.465	0.620	0.929	0.136	0.207	0.150	2048	0.182
	2700	555	0.349	0.750	0.698	1.125	1.047	0.562	0.750	1.125	0.167	0.252	0.184	2304	0.241
	3000	617	0.407	0.882	0.813	1.323	1.220	0.662	0.882	1.323	0.202	0.300	0.220	2560	0.311
90	1875	300	0.132	0.256	0.264	0.385	0.397	0.192	0.256	0.385	0.057	0.095	0.060	1600	0.100
	2250	360	0.178	0.358	0.356	0.537	0.534	0.268	0.358	0.537	0.078	0.125	0.082	1920	0.156
	2625	420	0.228	0.471	0.456	0.706	0.683	0.353	0.471	0.706	0.102	0.160	0.107	2240	0.225
	3000	480	0.280	0.591	0.561	0.887	0.841	0.443	0.591	0.887	0.130	0.198	0.134	2560	0.311
	3375	540	0.335	0.717	0.670	1.075	1.005	0.538	0.717	1.075	0.159	0.240	0.164	2880	0.412
	3750	600	0.391	0.845	0.781	1.268	1.172	0.634	0.845	1.268	0.192	0.286	0.197	3200	0.531

Note:

- Cooling coil APD is for a 100 percent fully wetted fin.
- Heating coil APD is for dry fin surface.

Table 6. Filter and mixing box air pressure drop adjustments (in. wg)

Unit Size	CFM	Flat Filters				Angle Filters			Mixing Box	
		Velocity	1-inch Throwaway	2-inch MERV 8	2-inch MERV 13	Velocity	2-inch MERV 8	2-inch MERV 13	Velocity	Pressure Drop
12	250	125	0.030	0.031	0.061	63	0.010	0.026	332	0.006
	300	150	0.039	0.042	0.076	75	0.013	0.032	398	0.008
	350	175	0.048	0.054	0.092	88	0.017	0.039	465	0.011
	400	200	0.058	0.067	0.109	100	0.022	0.046	531	0.015
	450	225	0.068	0.081	0.126	113	0.026	0.053	598	0.018
	500	250	0.078	0.096	0.143	125	0.031	0.061	664	0.022
18	375	188	0.053	0.060	0.100	94	0.019	0.042	396	0.008
	450	225	0.068	0.081	0.126	113	0.026	0.053	475	0.012
	525	263	0.083	0.104	0.152	131	0.034	0.064	554	0.016
	600	300	0.100	0.130	0.180	150	0.042	0.076	633	0.020
	675	338	0.117	0.158	0.208	169	0.051	0.088	712	0.026
24	500	180	0.050	0.056	0.095	125	0.031	0.061	527	0.014
	600	216	0.064	0.076	0.120	150	0.042	0.076	633	0.020
	700	252	0.079	0.098	0.145	175	0.054	0.092	738	0.028
	800	288	0.095	0.122	0.171	200	0.067	0.109	844	0.036
	900	324	0.111	0.147	0.198	225	0.081	0.126	949	0.045
	1000	360	0.128	0.175	0.226	250	0.096	0.143	1055	0.055
36	750	169	0.046	0.051	0.088	135	0.035	0.067	490	0.013
	900	203	0.059	0.068	0.111	162	0.047	0.084	588	0.018
	1050	236	0.072	0.088	0.134	189	0.061	0.101	686	0.024
	1200	270	0.087	0.109	0.158	216	0.076	0.120	784	0.031
	1350	304	0.102	0.133	0.183	243	0.092	0.138	882	0.039
	1500	338	0.117	0.158	0.209	270	0.109	0.158	980	0.047
54	1125	202	0.059	0.068	0.110	127	0.032	0.062	403	0.009
	1350	243	0.075	0.092	0.138	152	0.043	0.077	484	0.012
	1575	283	0.093	0.118	0.167	177	0.055	0.093	565	0.016
	1800	324	0.111	0.147	0.198	202	0.068	0.110	645	0.021
	2025	364	0.130	0.179	0.229	228	0.083	0.128	726	0.027
	2250	405	0.150	0.212	0.262	253	0.098	0.146	807	0.033
72	1500	240	0.074	0.090	0.136	169	0.051	0.088	538	0.015
	1800	288	0.095	0.122	0.171	202	0.068	0.110	645	0.021
	2100	336	0.117	0.156	0.207	236	0.088	0.134	753	0.029
	2400	384	0.140	0.195	0.245	270	0.109	0.158	861	0.037
	2700	432	0.164	0.236	0.283	304	0.133	0.183	768	0.046
	3000	480	0.189	0.281	0.323	337	0.158	0.208	1076	0.057
90	1875	225	0.068	0.081	0.126	169	0.051	0.088	672	0.023
	2250	270	0.087	0.109	0.158	203	0.068	0.110	807	0.033
	2625	315	0.107	0.141	0.191	236	0.088	0.134	941	0.044
	3000	360	0.128	0.175	0.226	270	0.109	0.158	1076	0.057
	3750	450	0.150	0.212	0.262	304	0.133	0.183	1210	0.071
	3375	405	0.173	0.252	0.298	338	0.158	0.209	1345	0.087

Note: Data based on clean filters.

Water Pressure Drop

Figure 13. Two-way basic piping package water pressure drop

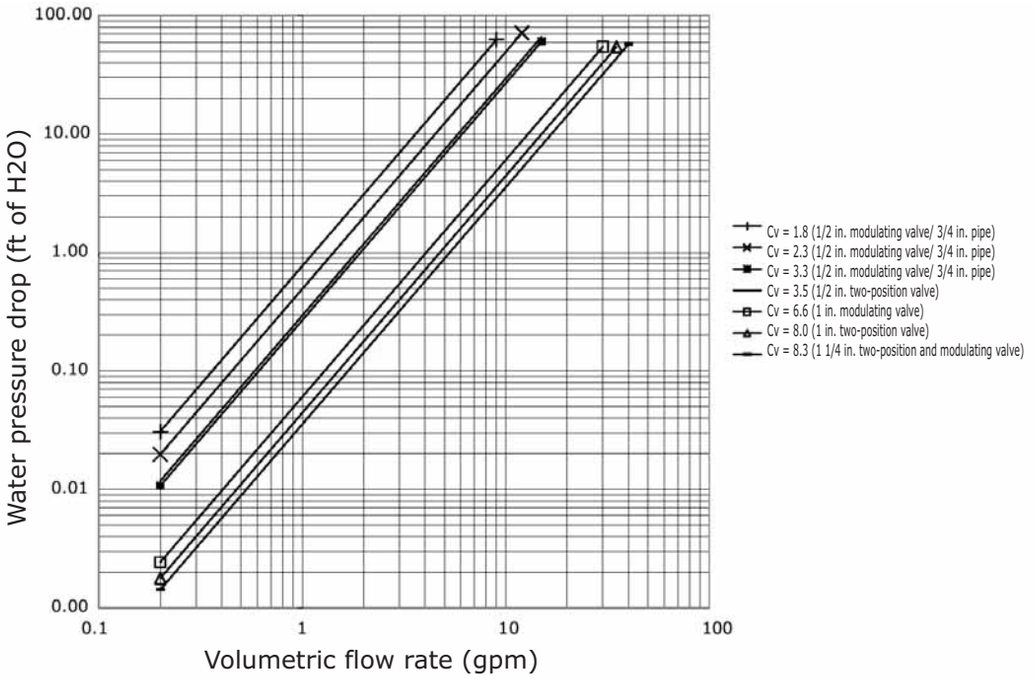


Figure 14. Two-way deluxe piping package water pressure drop

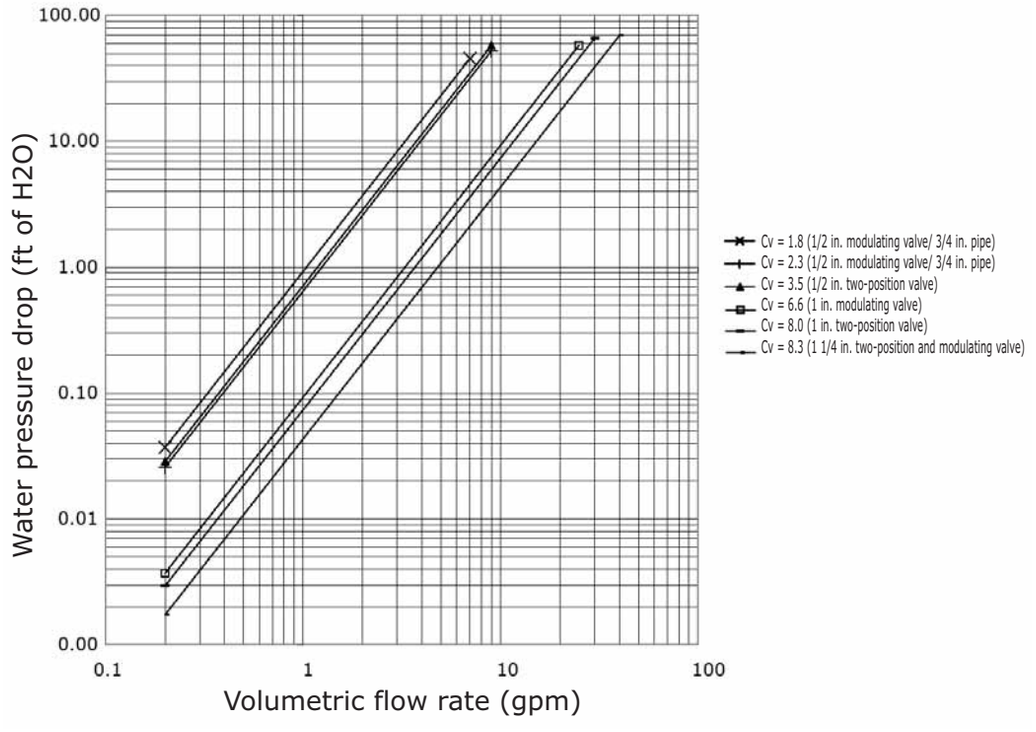


Figure 15. Three-way basic piping package water pressure drop

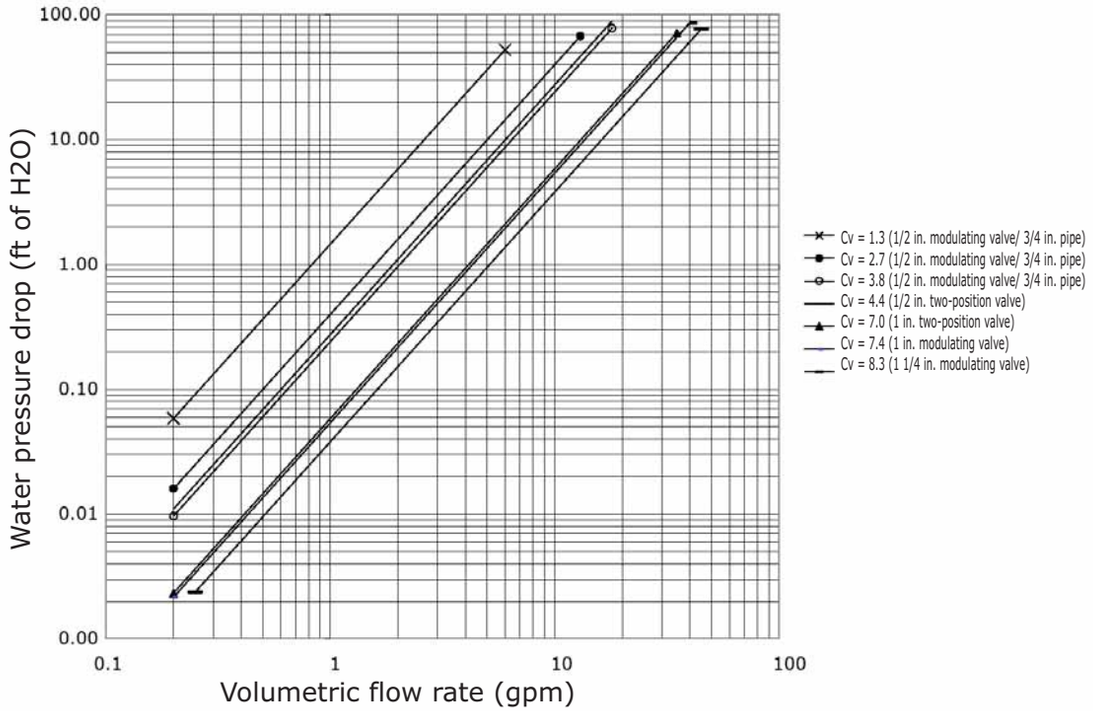


Figure 16. Three-way deluxe piping package water pressure drop

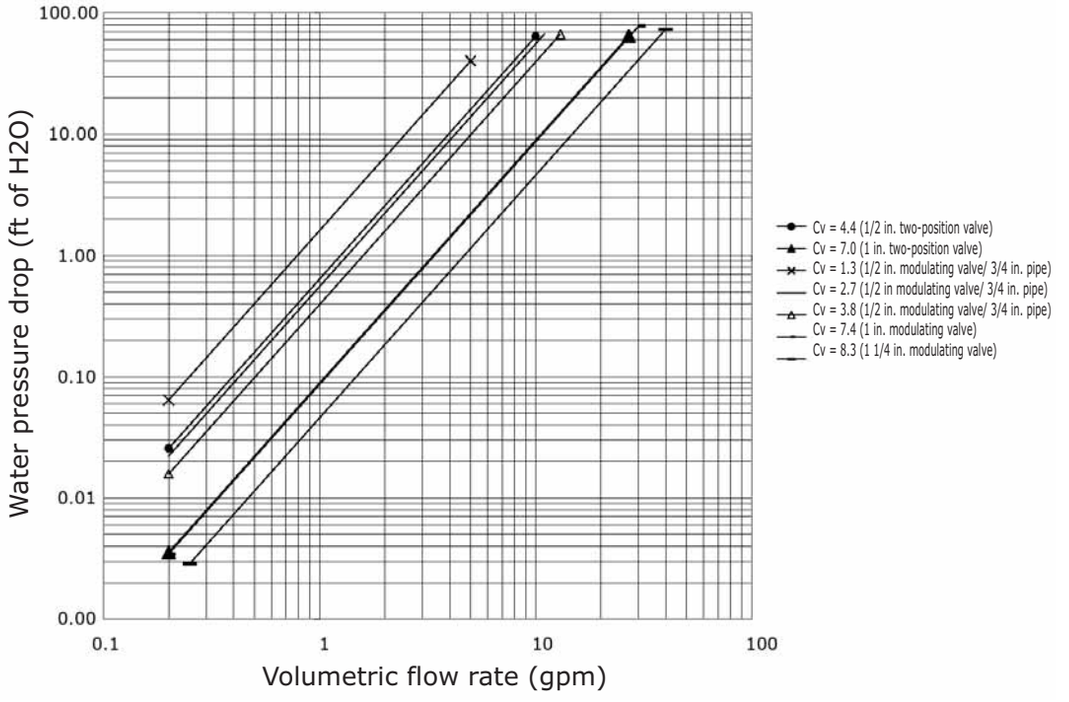


Figure 17. Four-row standard cooling coil water pressure drop

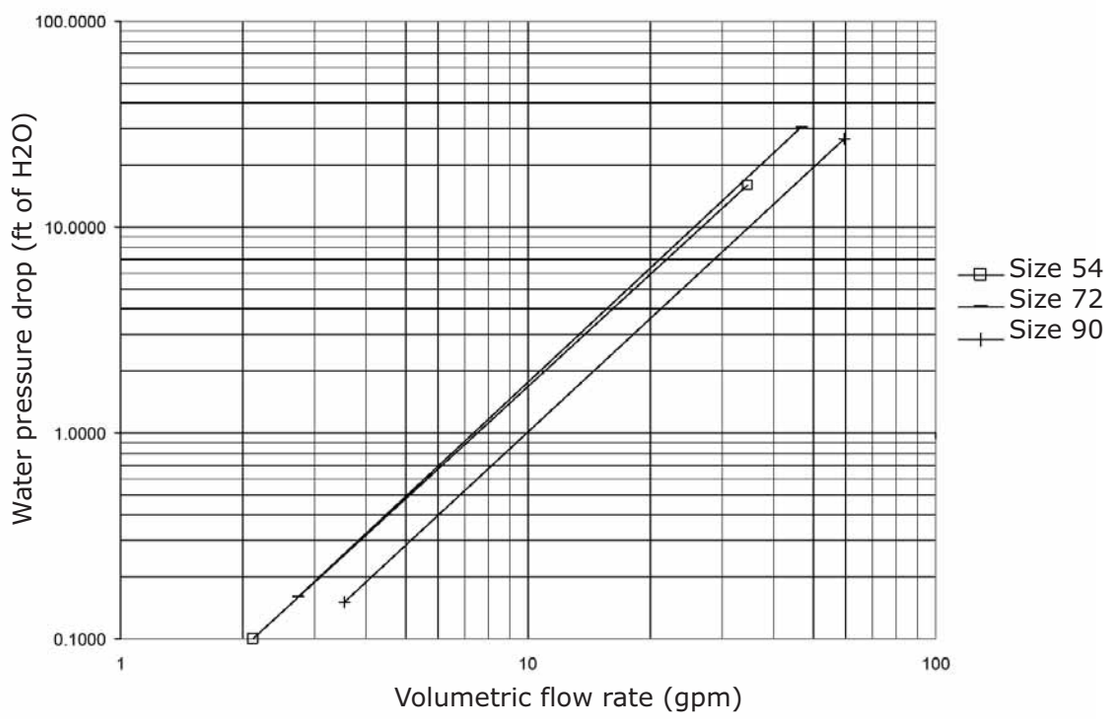


Figure 18. Six-row standard cooling coil water pressure drop

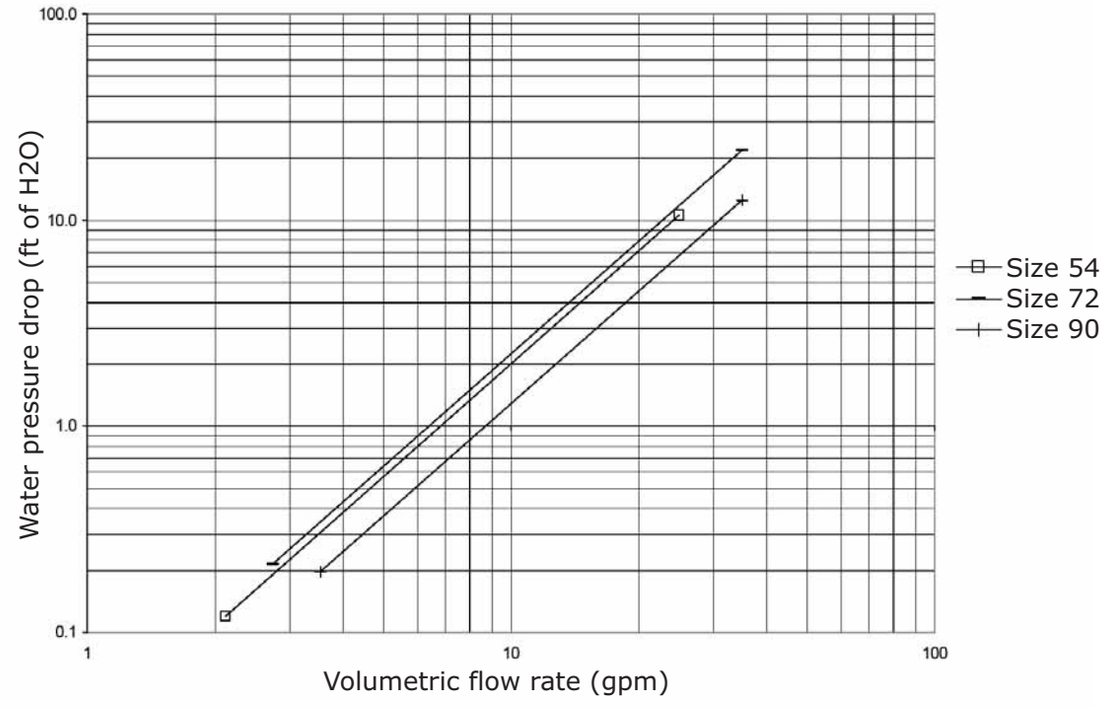


Figure 19. Four-row high-capacity cooling coil water pressure drop

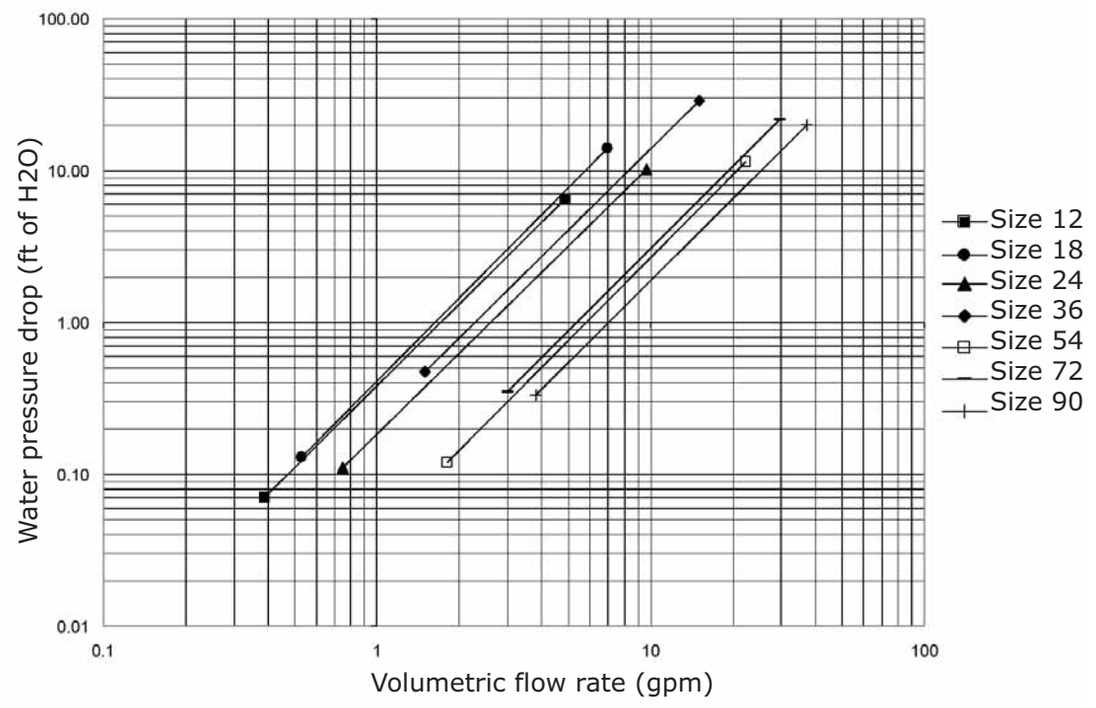


Figure 20. Six-row high-capacity cooling coil water pressure drop

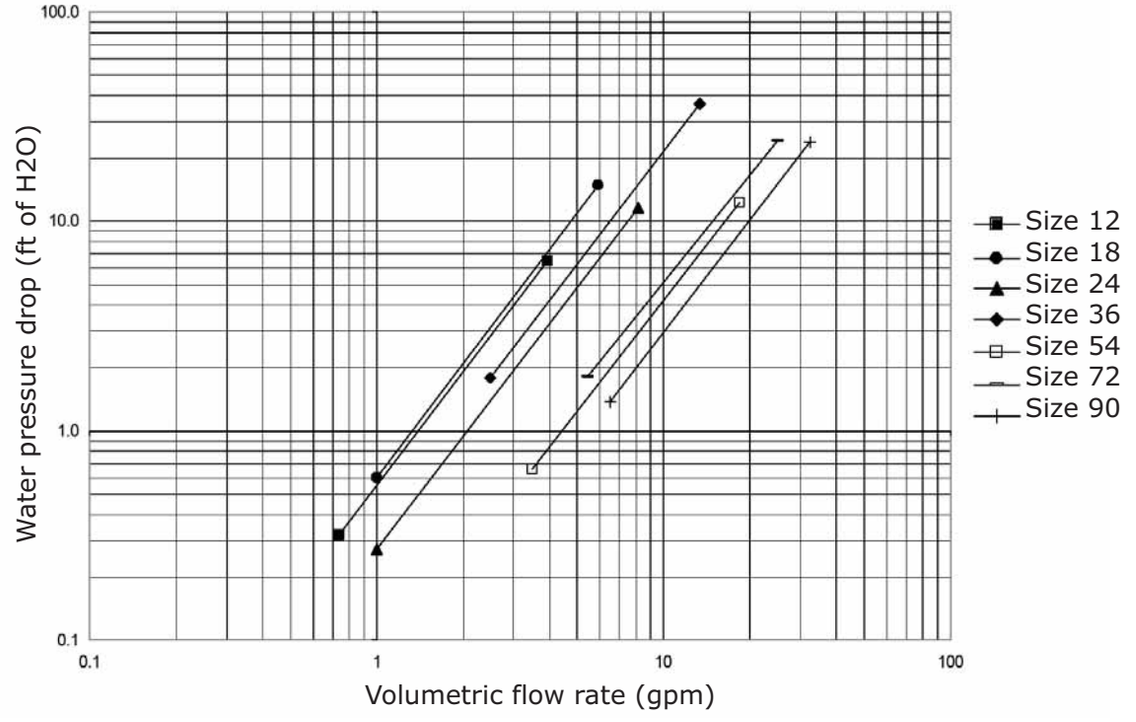


Figure 21. One-row standard heating coil water pressure drop

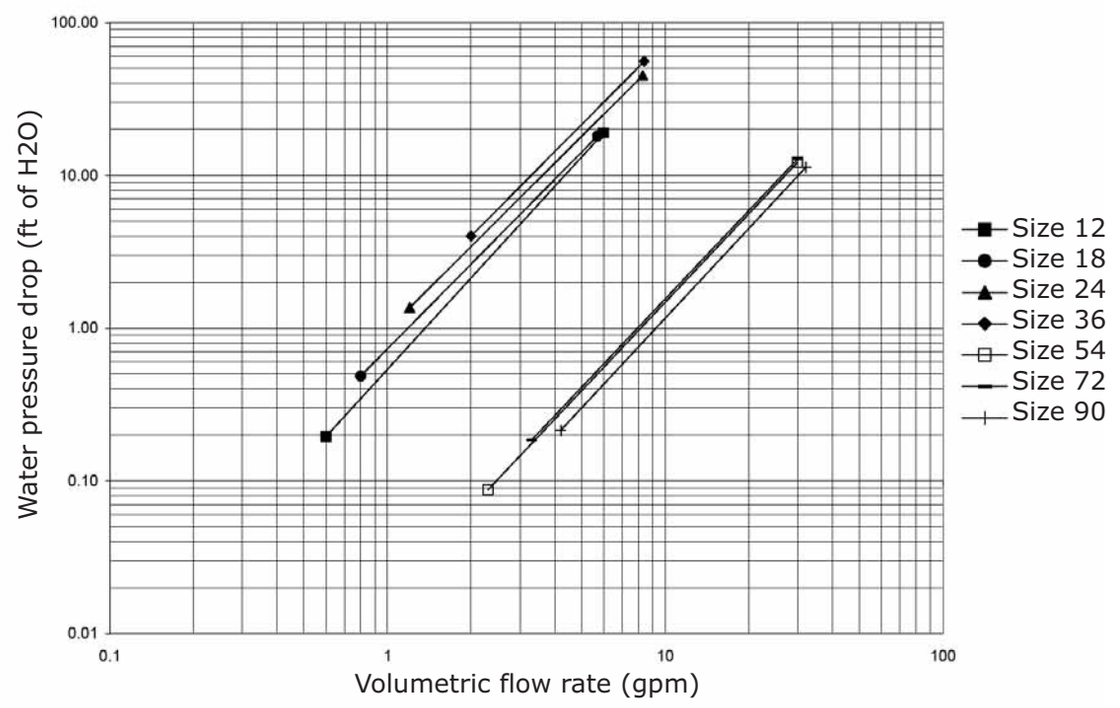


Figure 22. Four-row standard heating coil water pressure drop

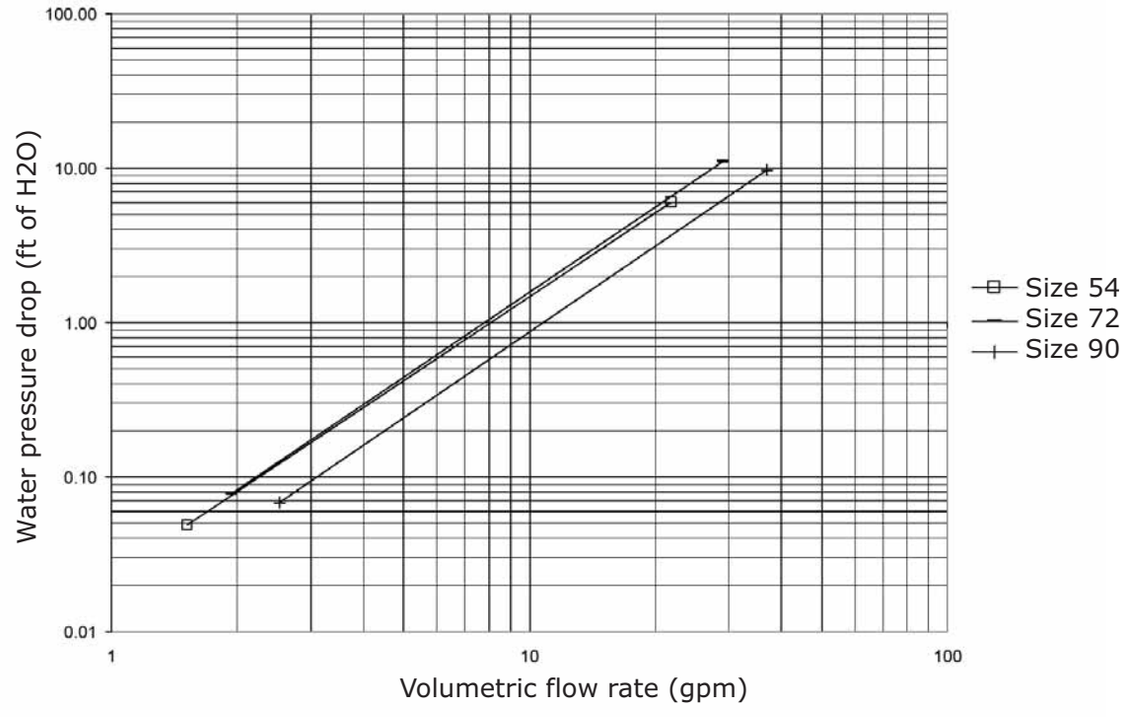


Figure 23. Six-row standard heating coil water pressure drop

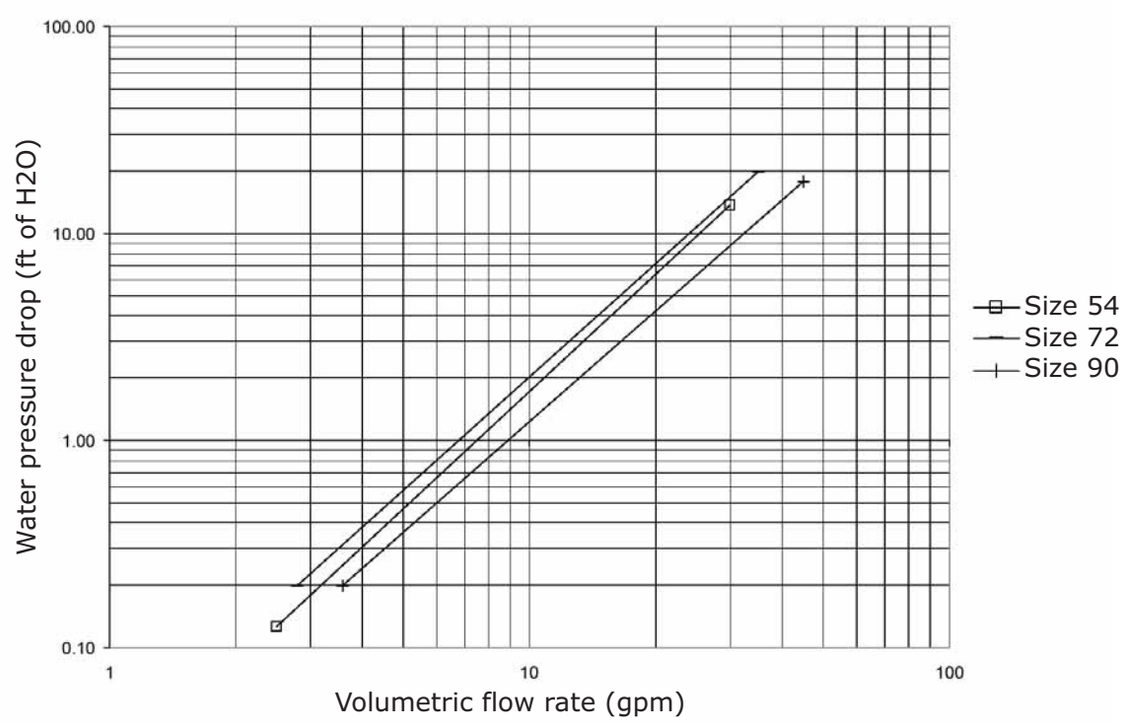


Figure 24. Two-row high-capacity heating coil water pressure drop

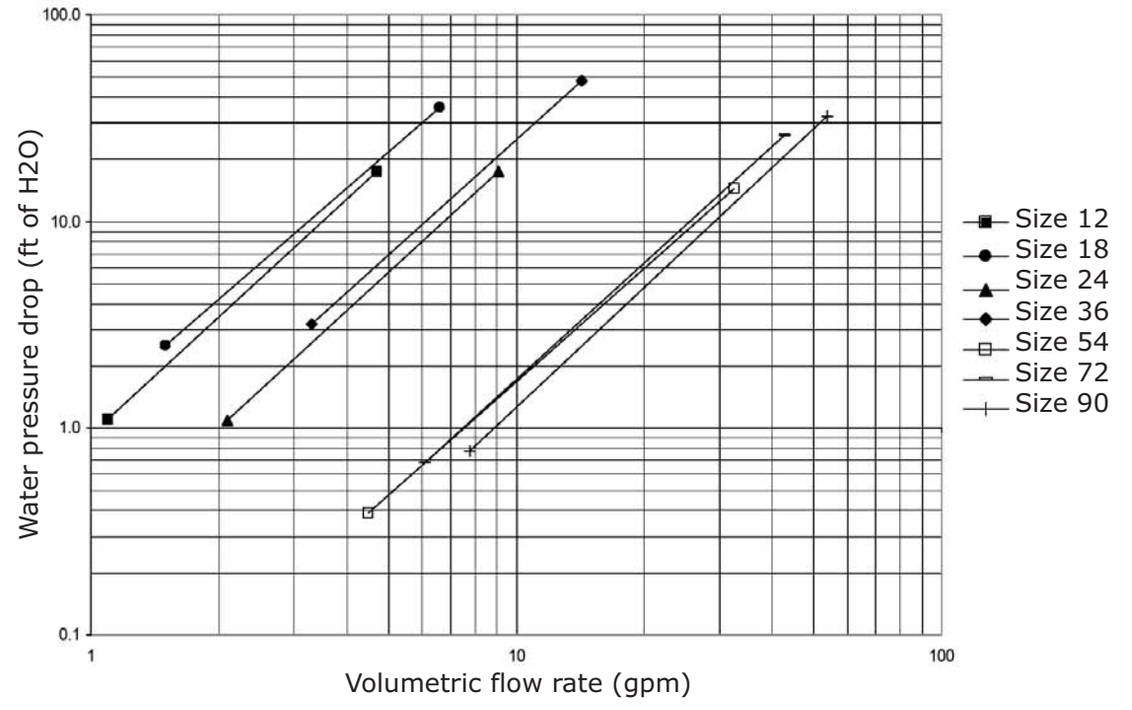


Figure 25. Four-row high-capacity heating coil water pressure drop

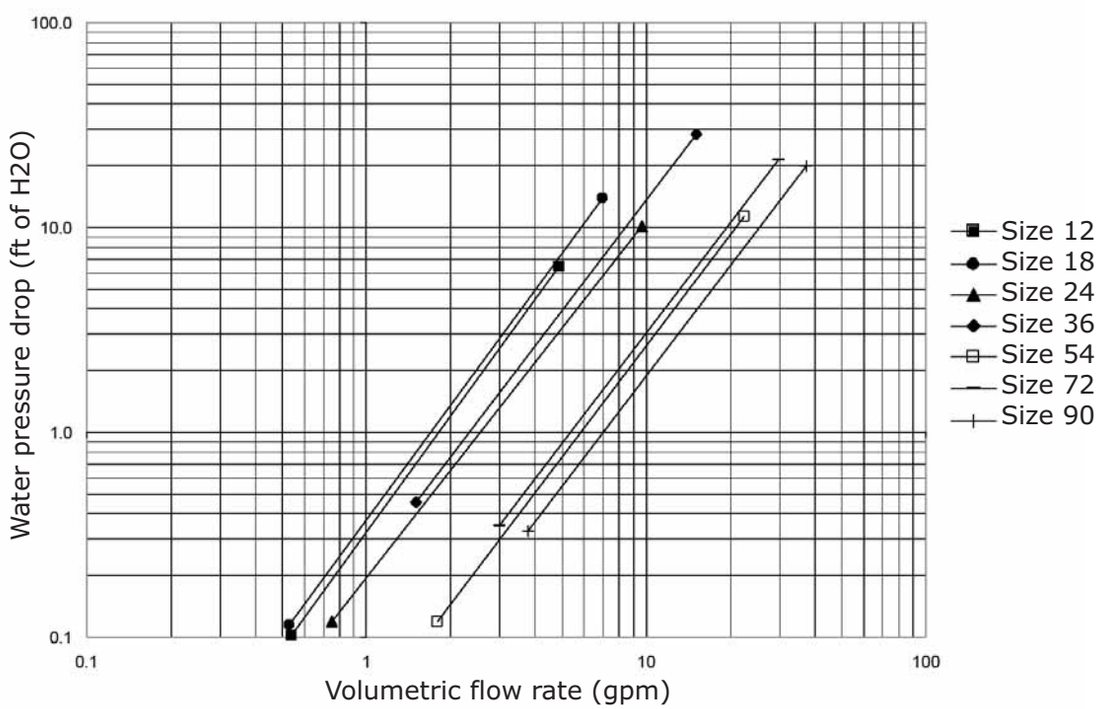
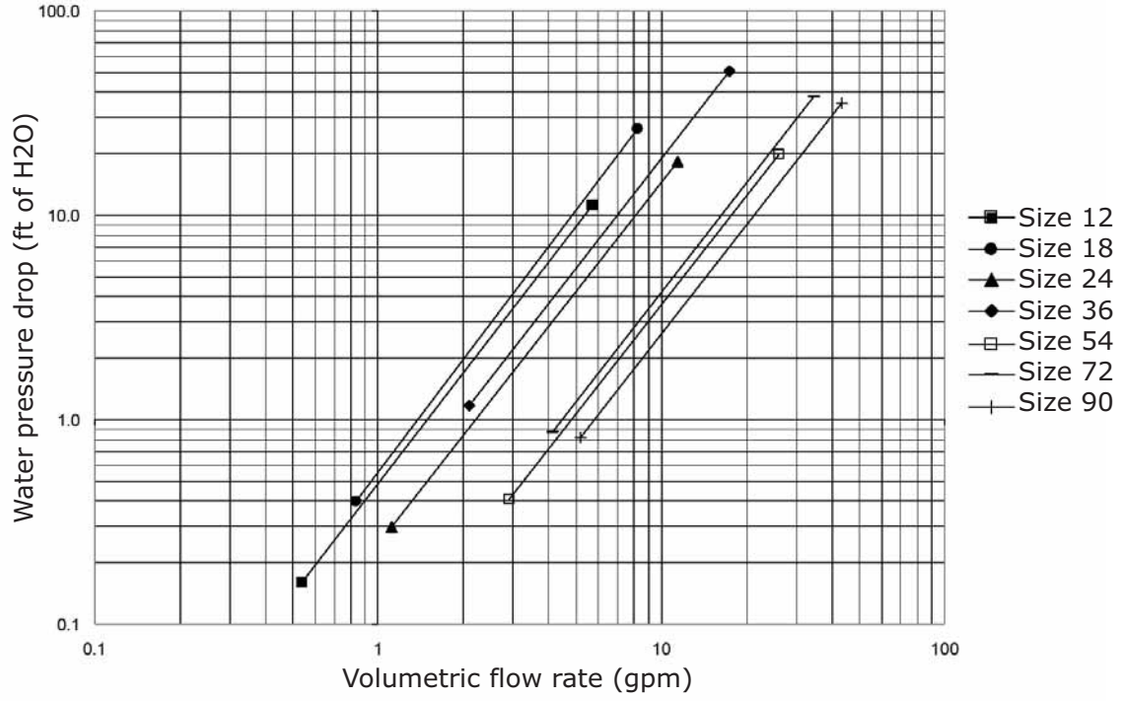
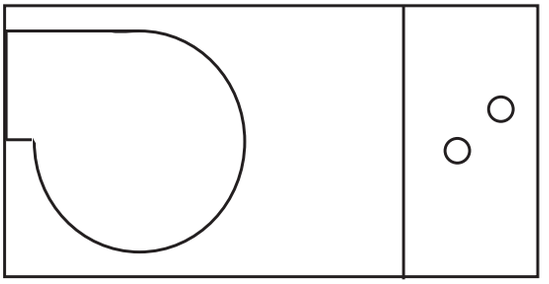


Figure 26. Six-row high-capacity heating coil water pressure drop



Fan Curves

Figure 27. Fan performance for horizontal draw-thru units size 12-18



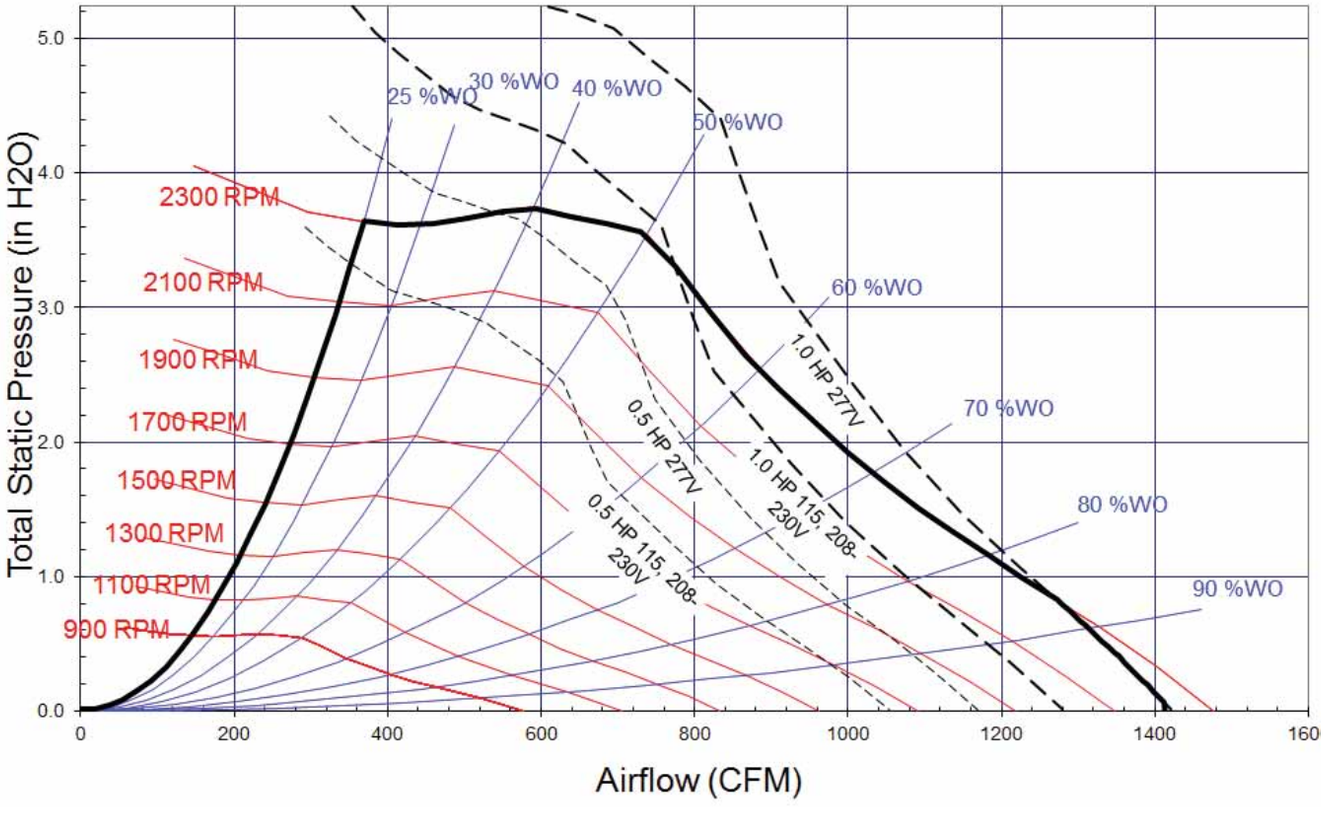


Table 7. Horizontal draw-thru size 12-18 - 115/208-230 volt motor

Unit Size	CFM	Outlet Velocity (ft./min)	Total Static Pressure (in. wg)															
			0.25		0.5		0.75		1		1.25		1.5		2		2.5	
			RPM	Motor	RPM	Motor	RPM	Motor	RPM	Motor	RPM	Motor	RPM	Motor	RPM	Motor	RPM	Motor
12	250	490	684	0.5	853	0.5	1032	0.5	1205	0.5	1354	0.5	1479	0.5	1700	0.5	1893	0.5
	300	588	751	0.5	893	0.5	1042	0.5	1187	0.5	1340	0.5	1478	0.5	1710	0.5	1905	0.5
	350	686	815	0.5	962	0.5	1070	0.5	1205	0.5	1331	0.5	1460	0.5	1705	0.5	1914	0.5
	400	784	879	0.5	1030	0.5	1138	0.5	1230	0.5	1351	0.5	1465	0.5	1688	0.5	1904	0.5
	450	882	943	0.5	1096	0.5	1209	0.5	1298	0.5	1379	0.5	1484	0.5	1687	0.5	1886	0.5
	500	980	1006	0.5	1160	0.5	1275	0.5	1368	0.5	1447	0.5	1520	0.5	1706	0.5	1885	0.5
18	375	735	848	0.5	997	0.5	1104	0.5	1215	0.5	1341	0.5	1455	0.5	1696	0.5	1913	0.5
	450	882	943	0.5	1096	0.5	1209	0.5	1298	0.5	1379	0.5	1484	0.5	1687	0.5	1886	0.5
	525	1029	1038	0.5	1192	0.5	1308	0.5	1404	0.5	1482	0.5	1554	0.5	1716	0.5	1895	0.5
	600	1176	1135	0.5	1287	0.5	1404	0.5	1502	0.5	1586	0.5	1658	0.5	1786	0.5	1924	0.5
	675	1323	1232	0.5	1382	0.5	1500	0.5	1599	0.5	1685	0.5	1761	0.5	1890	1.0	2002	1.0

Note: Shaded data provided for interpolation purposes only: below 25% wide-open cfm.

Note: Motor listed in table is the smallest motor that will work for the CFM and static pressure condition. More powerful motors are acceptable.

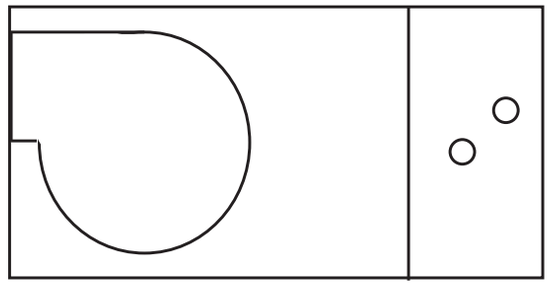
Table 8. Horizontal draw-thru size 12-18 - 277 volt motor

Unit Size	CFM	Outlet Velocity (ft./min)	Total Static Pressure (in. wg)															
			0.25		0.5		0.75		1		1.25		1.5		2		2.5	
			RPM	Motor	RPM	Motor	RPM	Motor	RPM	Motor	RPM	Motor	RPM	Motor	RPM	Motor	RPM	Motor
12	250	490	684	0.5	853	0.5	1032	0.5	1205	0.5	1354	0.5	1479	0.5	1700	0.5	1893	0.5
	300	588	751	0.5	893	0.5	1042	0.5	1187	0.5	1340	0.5	1478	0.5	1710	0.5	1905	0.5
	350	686	815	0.5	962	0.5	1070	0.5	1205	0.5	1331	0.5	1460	0.5	1705	0.5	1914	0.5
	400	784	879	0.5	1030	0.5	1138	0.5	1230	0.5	1351	0.5	1465	0.5	1688	0.5	1904	0.5
	450	882	943	0.5	1096	0.5	1209	0.5	1298	0.5	1379	0.5	1484	0.5	1687	0.5	1886	0.5
	500	980	1006	0.5	1160	0.5	1275	0.5	1368	0.5	1447	0.5	1520	0.5	1706	0.5	1885	0.5
18	375	735	848	0.5	997	0.5	1104	0.5	1215	0.5	1341	0.5	1455	0.5	1696	0.5	1913	0.5
	450	882	943	0.5	1096	0.5	1209	0.5	1298	0.5	1379	0.5	1484	0.5	1687	0.5	1886	0.5
	525	1029	1038	0.5	1192	0.5	1308	0.5	1404	0.5	1482	0.5	1554	0.5	1716	0.5	1895	0.5
	600	1176	1135	0.5	1287	0.5	1404	0.5	1502	0.5	1586	0.5	1658	0.5	1786	0.5	1924	0.5
	675	1323	1232	0.5	1382	0.5	1500	0.5	1599	0.5	1685	0.5	1761	0.5	1890	0.5	2002	0.5

Note: Shaded data provided for interpolation purposes only: below 25% wide-open cfm.

Note: Motor listed in table is the smallest motor that will work for the CFM and static pressure condition. More powerful motors are acceptable.

Figure 28. Fan performance for horizontal draw-thru units size 24-36



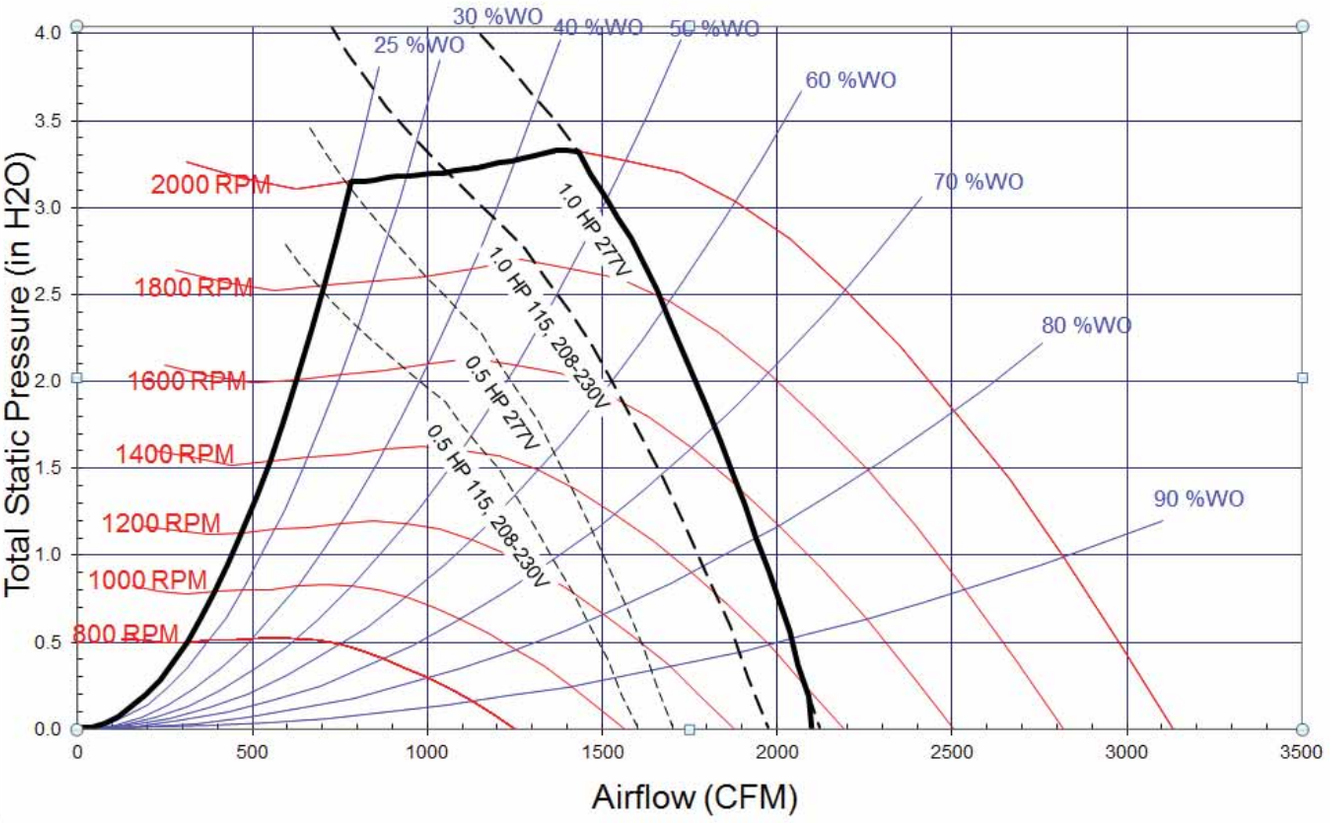


Table 9. Horizontal draw-thru size 24-36 - 115/208-230 volt motor

Unit Size	CFM	Outlet Velocity (ft./min)	Total Static Pressure (in. wg)															
			0.25		0.5		0.75		1		1.25		1.5		2		2.5	
			RPM	Motor	RPM	Motor	RPM	Motor	RPM	Motor	RPM	Motor	RPM	Motor	RPM	Motor	RPM	Motor
24	500	571	563	0.5	780	0.5	968	0.5	1123	0.5	1260	0.5	1384	0.5	1604	0.5	1789	0.5
	600	685	593	0.5	781	0.5	957	0.5	1116	0.5	1253	0.5	1377	0.5	1596	0.5	1790	0.5
	700	799	633	0.5	795	0.5	952	0.5	1104	0.5	1246	0.5	1369	0.5	1589	0.5	1783	0.5
	800	914	678	0.5	823	0.5	963	0.5	1099	0.5	1231	0.5	1360	0.5	1582	0.5	1775	1.0
	900	1028	726	0.5	857	0.5	983	0.5	1110	0.5	1229	0.5	1345	0.5	1574	0.5	1768	1.0
	1000	1142	776	0.5	900	0.5	1014	0.5	1126	0.5	1240	0.5	1348	0.5	1559	1.0	1761	1.0
36	750	857	655	0.5	808	0.5	958	0.5	1096	0.5	1239	0.5	1366	0.5	1585	0.5	1779	1.0
	900	1028	726	0.5	857	0.5	983	0.5	1110	0.5	1229	0.5	1345	0.5	1574	0.5	1768	1.0
	1050	1199	802	0.5	922	0.5	1032	0.5	1139	0.5	1246	0.5	1353	0.5	1552	1.0	1754	1.0
	1200	1370	881	0.5	991	0.5	1092	0.5	1187	0.5	1281	0.5	1374	0.5	1562	1.0	1731	1.0
	1350	1542	966	0.5	1065	0.5	1158	0.5	1245	0.5	1330	1.0	1414	1.0	1579	1.0	1747	1.0
	1500	1713	1053	0.5	1142	1.0	1228	1.0	1311	1.0	1388	1.0	1464	1.0	1615	1.0	--	--

Note: Shaded data provided for interpolation purposes only: below 25 percent wide-open cfm.

Note: Motor listed in table is the smallest motor that will work for the CFM and static pressure condition. More powerful motors are acceptable.

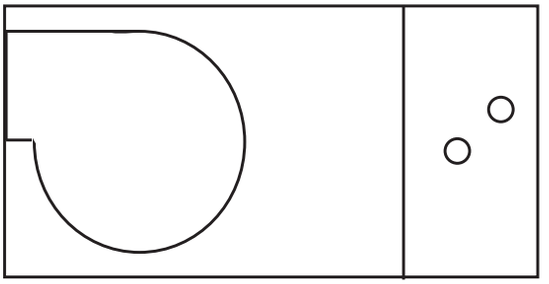
Table 10. Horizontal draw-thru size 24-36 - 277 volt motor

Unit Size	CFM	Outlet Velocity (ft./min)	Total Static Pressure (in. wg)															
			0.25		0.5		0.75		1		1.25		1.5		2		2.5	
			RPM	Motor	RPM	Motor	RPM	Motor	RPM	Motor	RPM	Motor	RPM	Motor	RPM	Motor	RPM	Motor
24	500	571	563	0.5	780	0.5	968	0.5	1123	0.5	1260	0.5	1384	0.5	1604	0.5	1789	0.5
	600	685	593	0.5	781	0.5	957	0.5	1116	0.5	1253	0.5	1377	0.5	1596	0.5	1790	0.5
	700	799	633	0.5	795	0.5	952	0.5	1104	0.5	1246	0.5	1369	0.5	1589	0.5	1783	0.5
	800	914	678	0.5	823	0.5	963	0.5	1099	0.5	1231	0.5	1360	0.5	1582	0.5	1775	0.5
	900	1028	726	0.5	857	0.5	983	0.5	1110	0.5	1229	0.5	1345	0.5	1574	0.5	1768	0.5
	1000	1142	776	0.5	900	0.5	1014	0.5	1126	0.5	1240	0.5	1348	0.5	1559	0.5	1761	0.5
36	750	857	655	0.5	808	0.5	958	0.5	1096	0.5	1239	0.5	1366	0.5	1585	0.5	1779	0.5
	900	1028	726	0.5	857	0.5	983	0.5	1110	0.5	1229	0.5	1345	0.5	1574	0.5	1768	0.5
	1050	1199	802	0.5	922	0.5	1032	0.5	1139	0.5	1246	0.5	1353	0.5	1552	0.5	1754	1.0
	1200	1370	881	0.5	991	0.5	1092	0.5	1187	0.5	1281	0.5	1374	0.5	1562	0.5	1731	1.0
	1350	1542	966	0.5	1065	0.5	1158	0.5	1245	0.5	1330	0.5	1414	0.5	1579	1.0	1747	1.0
	1500	1713	1053	0.5	1142	0.5	1228	0.5	1311	0.5	1388	1.0	1464	1.0	1615	1.0	1763	1.0

Note: Shaded data provided for interpolation purposes only: below 25 percent wide-open cfm.

Note: Motor listed in table is the smallest motor that will work for the CFM and static pressure condition. More powerful motors are acceptable.

Figure 29. Fan performance for horizontal draw-thru units size 54-72



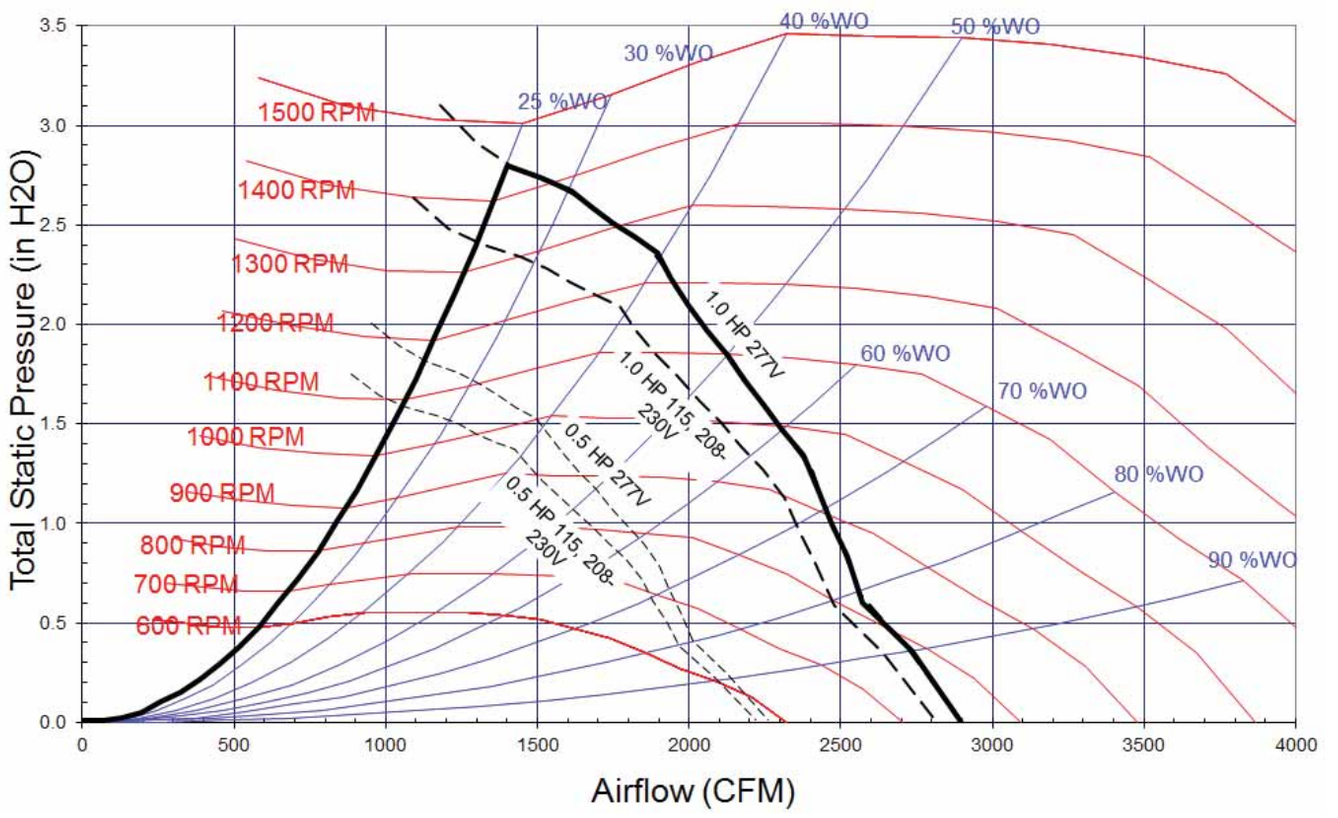


Table 11. Horizontal draw-thru size 54-72 - 115/208-230 volt motor

Unit Size	CFM	Outlet Velocity (ft./min)	Total Static Pressure (in. wg)															
			0.25		0.5		0.75		1		1.25		1.5		2		2.5	
			RPM	Motor	RPM	Motor	RPM	Motor	RPM	Motor	RPM	Motor	RPM	Motor	RPM	Motor	RPM	Motor
54	1125	960	428	0.5	572	0.5	699	0.5	822	0.5	940	0.5	1045	0.5	1231	1.0	1368	1.0
	1350	1152	463	0.5	580	0.5	700	0.5	807	0.5	905	0.5	1011	1.0	1200	1.0	--	--
	1575	1344	509	0.5	602	0.5	706	0.5	809	0.5	903	1.0	988	1.0	1165	1.0	--	--
	1800	1536	556	0.5	638	0.5	719	0.5	815	1.0	905	1.0	989	1.0	1141	1.0	--	--
	2025	1728	602	0.5	676	1.0	753	1.0	827	1.0	911	1.0	993	1.0	--	--	--	--
	2250	1920	648	1.0	725	1.0	788	1.0	855	1.0	924	1.0	--	--	--	--	--	--
72	1500	1280	493	0.5	591	0.5	704	0.5	808	0.5	902	1.0	988	1.0	1177	1.0	--	--
	1800	1536	556	0.5	638	0.5	719	0.5	815	1.0	905	1.0	989	1.0	1141	1.0	--	--
	2100	1792	617	1.0	692	1.0	764	1.0	832	1.0	915	1.0	995	1.0	--	--	--	--
	2400	2048	680	1.0	758	1.0	813	1.0	--	--	--	--	--	--	--	--	--	--
	2700	2304	746	1.0	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	3000	2560	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Note: Shaded data provided for interpolation purposes only: below 25% wide-open cfm.

Note: Motor listed in table is the smallest motor that will work for the CFM and static pressure condition. More powerful motors are acceptable.

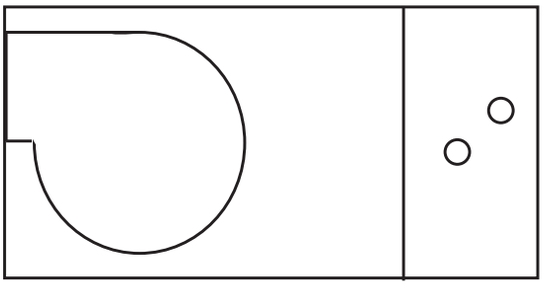
Horizontal draw-thru size 54-72 - 277 volt motor

Unit Size	CFM	Outlet Velocity (ft./min)	Total Static Pressure (in. wg)															
			0.25		0.5		0.75		1		1.25		1.5		2		2.5	
			RPM	Motor	RPM	Motor	RPM	Motor	RPM	Motor	RPM	Motor	RPM	Motor	RPM	Motor	RPM	Motor
54	1125	960	428	0.5	572	0.5	699	0.5	822	0.5	940	0.5	1045	0.5	1231	1.0	1368	1.0
	1350	1152	463	0.5	580	0.5	700	0.5	807	0.5	905	0.5	1011	0.5	1200	1.0	1364	1.0
	1575	1344	509	0.5	602	0.5	706	0.5	809	0.5	903	0.5	988	1.0	1165	1.0	1332	1.0
	1800	1536	556	0.5	638	0.5	719	0.5	815	1.0	905	1.0	989	1.0	1141	1.0	--	--
	2025	1728	602	0.5	676	1.0	753	1.0	827	1.0	911	1.0	993	1.0	1142	1.0	--	--
	2250	1920	648	1.0	725	1.0	788	1.0	855	1.0	924	1.0	1000	1.0	--	--	--	--
72	1500	1280	493	0.5	591	0.5	704	0.5	808	0.5	902	0.5	988	0.5	1177	1.0	1343	1.0
	1800	1536	556	0.5	638	0.5	719	0.5	815	1.0	905	1.0	989	1.0	1141	1.0	--	--
	2100	1792	617	0.5	692	1.0	764	1.0	832	1.0	915	1.0	995	1.0	--	--	--	--
	2400	2048	680	1.0	758	1.0	813	1.0	879	1.0	938	1.0	--	--	--	--	--	--
	2700	2304	746	1.0	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	3000	2560	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Note: Shaded data provided for interpolation purposes only: below 25% wide-open cfm.

Note: Motor listed in table is the smallest motor that will work for the CFM and static pressure condition. More powerful motors are acceptable.

Figure 30. Fan performance for horizontal draw-thru units size 90



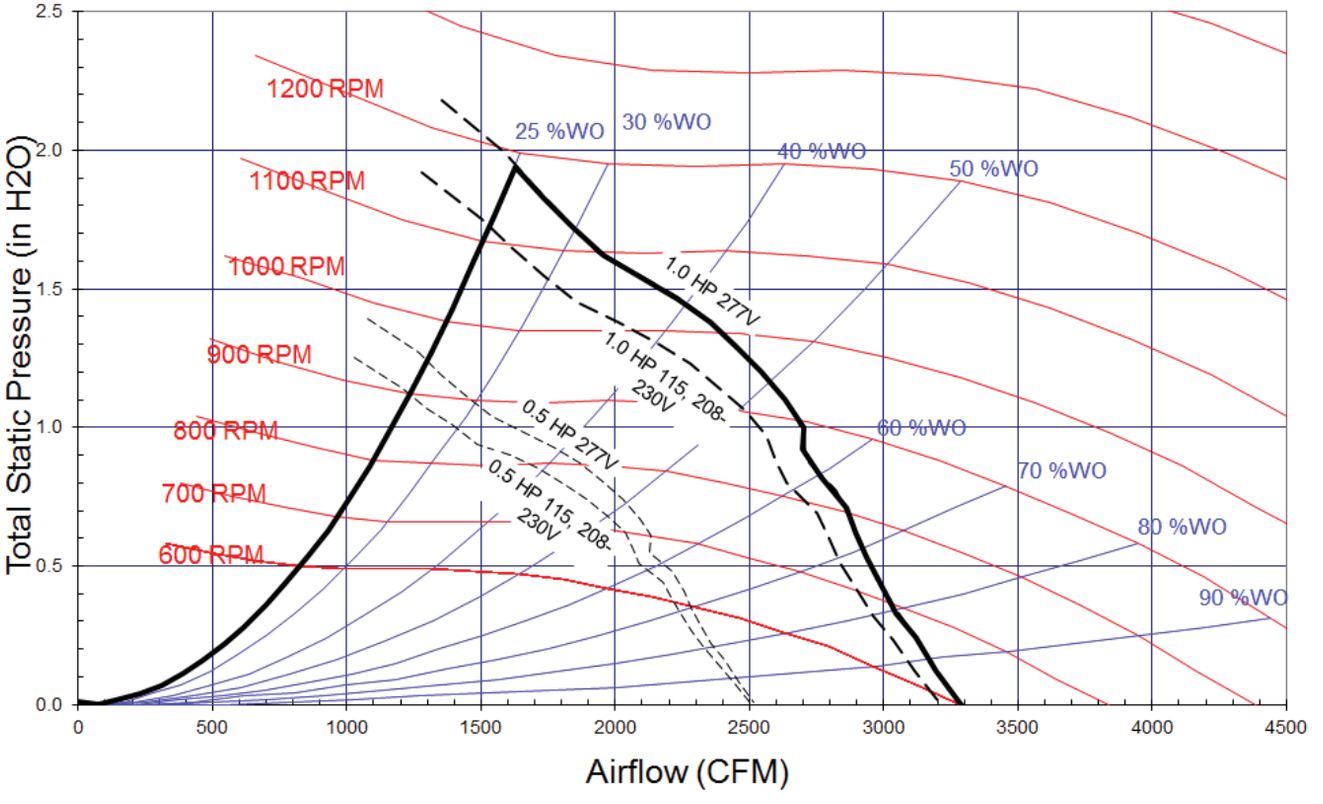


Table 12. Horizontal draw-thru size 90 - 115/208-230 volt motor

Unit Size	CFM	Outlet Velocity (ft./min)	Total Static Pressure (in. wg)															
			0.25		0.5		0.75		1		1.25		1.5		2		2.5	
			RPM	Motor	RPM	Motor	RPM	Motor	RPM	Motor	RPM	Motor	RPM	Motor	RPM	Motor	RPM	Motor
90	1875	1600	498	0.5	629	0.5	749	0.5	860	1.0	963	1.0	--	--	--	--	--	--
	2250	1920	544	0.5	661	1.0	767	1.0	867	1.0	962	1.0	--	--	--	--	--	--
	2625	2240	596	1.0	701	1.0	798	1.0	--	--	--	--	--	--	--	--	--	--
	3000	2560	650	1.0	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	3375	2880	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	3750	3200	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Note: Shaded data provided for interpolation purposes only: below 25% wide-open cfm.

Note: Motor listed in table is the smallest motor that will work for the CFM and static pressure condition. More powerful motors are acceptable.

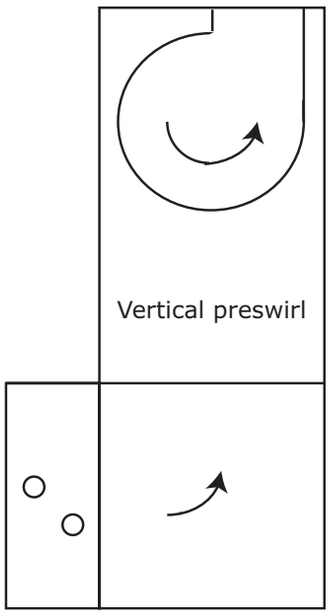
Table 13. Horizontal draw-thru size 90 - 277 volt motor

Unit Size	CFM	Outlet Velocity (ft./min)	Total Static Pressure (in. wg)															
			0.25		0.5		0.75		1		1.25		1.5		2		2.5	
			RPM	Motor	RPM	Motor	RPM	Motor	RPM	Motor	RPM	Motor	RPM	Motor	RPM	Motor	RPM	Motor
90	1875	1600	498	0.5	629	0.5	749	0.5	860	1.0	963	1.0	1057	1.0	--	--	--	--
	2250	1920	544	0.5	661	1.0	767	1.0	867	1.0	962	1.0	--	--	--	--	--	--
	2625	2240	596	1.0	701	1.0	798	1.0	888	1.0	--	--	--	--	--	--	--	--
	3000	2560	650	1.0	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	3375	2880	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	3750	3200	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Note: Shaded data provided for interpolation purposes only: below 25% wide-open cfm.

Note: Motor listed in table is the smallest motor that will work for the CFM and static pressure condition. More powerful motors are acceptable.

Figure 31. Fan performance for vertical draw-thru preswirl units size 24-36



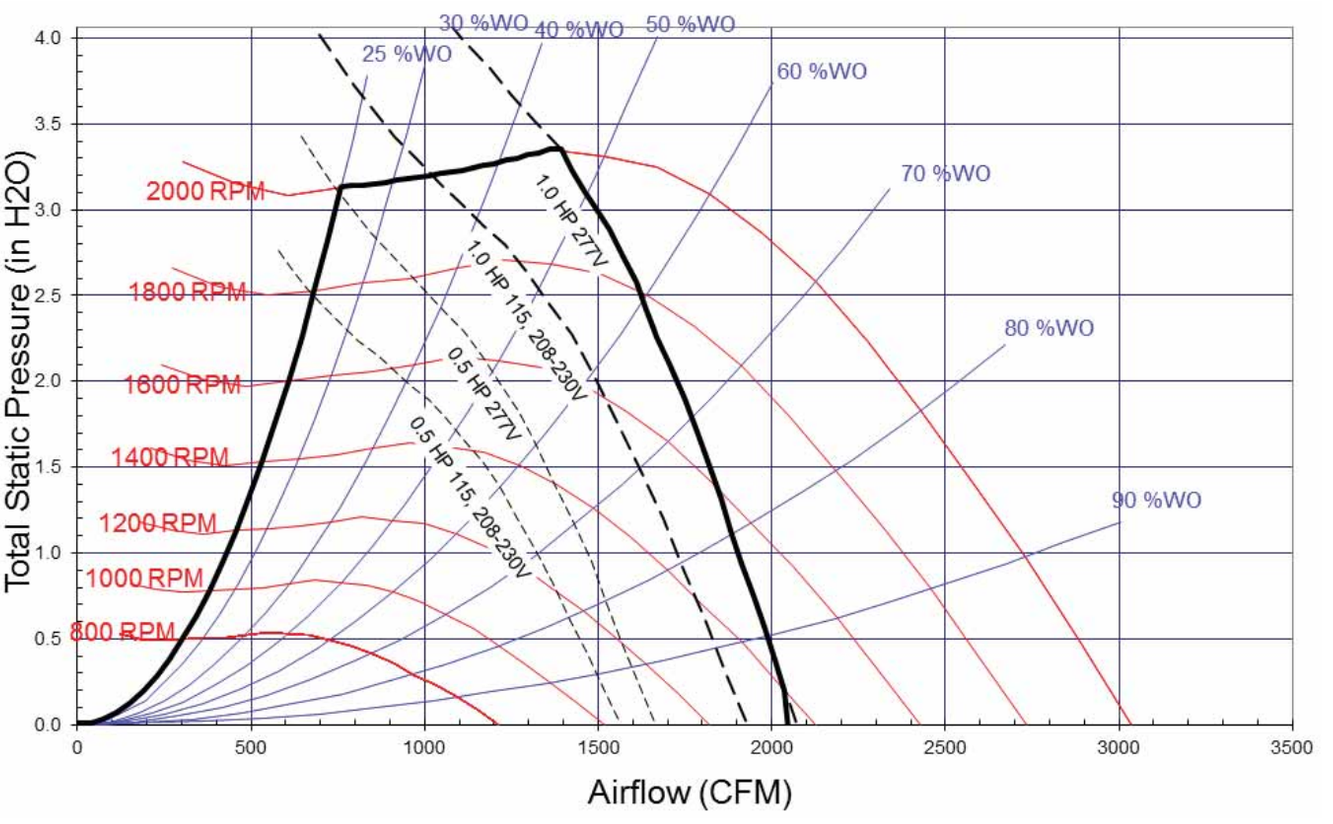


Table 14. Horizontal draw-thru preswirl size 24-36 - 115/208-230 volt motor

Unit Size	CFM	Outlet Velocity (ft./min)	Total Static Pressure (in. wg)															
			0.25		0.5		0.75		1		1.25		1.5		2		2.5	
			RPM	Motor	RPM	Motor	RPM	Motor	RPM	Motor	RPM	Motor	RPM	Motor	RPM	Motor	RPM	Motor
24	500	571	563	0.5	777	0.5	967	0.5	1124	0.5	1263	0.5	1388	0.5	1610	0.5	1806	0.5
	600	685	597	0.5	778	0.5	954	0.5	1115	0.5	1253	0.5	1378	0.5	1600	0.5	1796	0.5
	700	799	640	0.5	795	0.5	950	0.5	1100	0.5	1243	0.5	1369	0.5	1591	0.5	1786	1.0
	800	914	688	0.5	827	0.5	960	0.5	1096	0.5	1227	0.5	1356	0.5	1581	0.5	1777	1.0
	900	1028	740	0.5	865	0.5	986	0.5	1104	0.5	1226	0.5	1341	0.5	1570	0.5	1768	1.0
	1000	1142	794	0.5	910	0.5	1020	0.5	1126	0.5	1234	0.5	1344	0.5	1554	1.0	1756	1.0
36	750	857	664	0.5	810	0.5	954	0.5	1092	0.5	1235	0.5	1364	0.5	1586	0.5	1782	1.0
	900	1028	740	0.5	865	0.5	986	0.5	1104	0.5	1226	0.5	1341	0.5	1570	0.5	1768	1.0
	1050	1199	822	0.5	934	0.5	1038	0.5	1142	0.5	1243	0.5	1348	0.5	1546	1.0	1748	1.0
	1200	1370	905	0.5	1009	0.5	1103	0.5	1194	0.5	1285	0.5	1374	1.0	1555	1.0	1727	1.0
	1350	1542	992	0.5	1088	0.5	1175	0.5	1257	1.0	1338	1.0	1419	1.0	1578	1.0	--	--
	1500	1713	1082	0.5	1170	1.0	1251	1.0	1328	1.0	1402	1.0	1474	1.0	--	--	--	--

Note: Shaded data provided for interpolation purposes only: below 25 percent wide-open cfm.

Note: Motor listed in table is the smallest motor that will work for the CFM and static pressure condition. More powerful motors are acceptable.

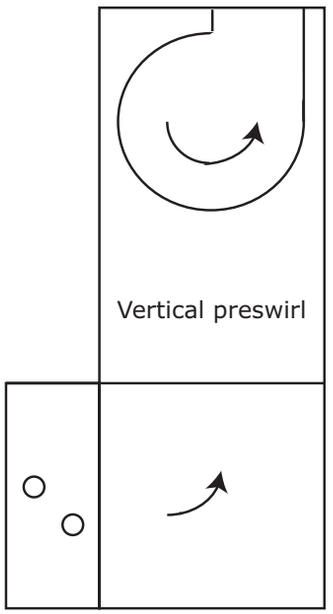
Table 15. Horizontal draw-thru preswirl size 24-36 - 277 volt motor

Unit Size	CFM	Outlet Velocity (ft./min)	Total Static Pressure (in. wg)															
			0.25		0.5		0.75		1		1.25		1.5		2		2.5	
			RPM	Motor	RPM	Motor	RPM	Motor	RPM	Motor	RPM	Motor	RPM	Motor	RPM	Motor	RPM	Motor
24	500	571	563	0.5	777	0.5	967	0.5	1124	0.5	1263	0.5	1388	0.5	1610	0.5	1806	0.5
	600	685	597	0.5	778	0.5	954	0.5	1115	0.5	1253	0.5	1378	0.5	1600	0.5	1796	0.5
	700	799	640	0.5	795	0.5	950	0.5	1100	0.5	1243	0.5	1369	0.5	1591	0.5	1786	0.5
	800	914	688	0.5	827	0.5	960	0.5	1096	0.5	1227	0.5	1356	0.5	1581	0.5	1777	0.5
	900	1028	740	0.5	865	0.5	986	0.5	1104	0.5	1226	0.5	1341	0.5	1570	0.5	1768	0.5
	1000	1142	794	0.5	910	0.5	1020	0.5	1126	0.5	1234	0.5	1344	0.5	1554	0.5	1756	0.5
36	750	857	664	0.5	810	0.5	954	0.5	1092	0.5	1235	0.5	1364	0.5	1586	0.5	1782	0.5
	900	1028	740	0.5	865	0.5	986	0.5	1104	0.5	1226	0.5	1341	0.5	1570	0.5	1768	0.5
	1050	1199	822	0.5	934	0.5	1038	0.5	1142	0.5	1243	0.5	1348	0.5	1546	0.5	1748	1.0
	1200	1370	905	0.5	1009	0.5	1103	0.5	1194	0.5	1285	0.5	1374	0.5	1555	0.5	1727	1.0
	1350	1542	992	0.5	1088	0.5	1175	0.5	1257	0.5	1338	0.5	1419	0.5	1578	1.0	1740	1.0
	1500	1713	1082	0.5	1170	0.5	1251	0.5	1328	1.0	1402	1.0	1474	1.0	1620	1.0	1762	1.0

Note: Shaded data provided for interpolation purposes only: below 25 percent wide-open cfm.

Note: Motor listed in table is the smallest motor that will work for the CFM and static pressure condition. More powerful motors are acceptable.

Figure 32. Fan performance for vertical draw-thru preswirl units size 54-72



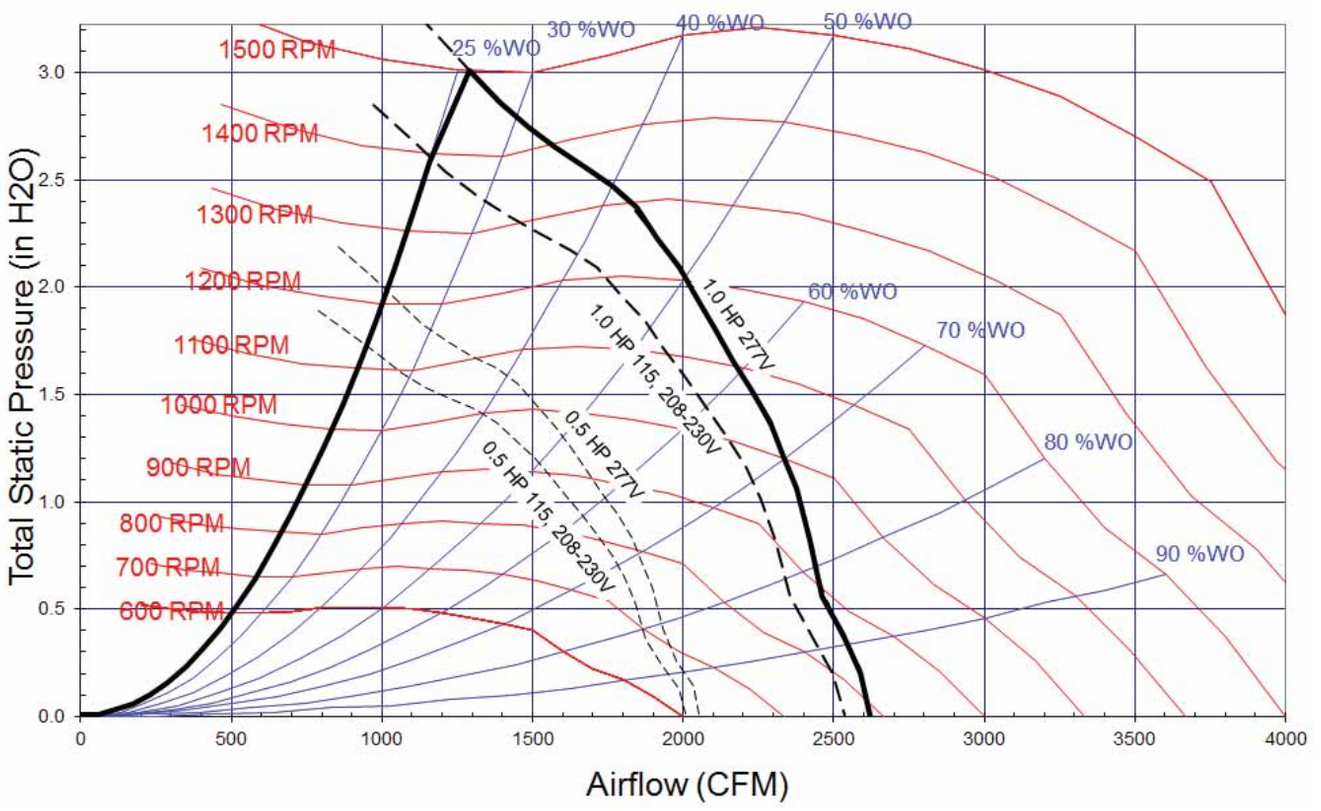


Table 16. Vertical draw-thru preswirl size 54-72 - 115/208-230 volt motor

Unit Size	CFM	Outlet Velocity (ft./min)	Total Static Pressure (in. wg)															
			0.25		0.5		0.75		1		1.25		1.5		2		2.5	
			RPM	Motor	RPM	Motor	RPM	Motor	RPM	Motor	RPM	Motor	RPM	Motor	RPM	Motor	RPM	Motor
54	1125	960	465	0.5	603	0.5	726	0.5	842	0.5	954	0.5	1055	0.5	1224	1.0	1368	1.0
	1350	1152	518	0.5	624	0.5	736	0.5	840	0.5	935	0.5	1034	1.0	1213	1.0	--	--
	1575	1344	579	0.5	656	0.5	756	0.5	851	0.5	942	1.0	1027	1.0	1192	1.0	--	--
	1800	1536	637	0.5	703	0.5	783	1.0	871	1.0	955	1.0	1035	1.0	--	--	--	--
	2025	1728	691	1.0	763	1.0	818	1.0	897	1.0	975	1.0	1051	1.0	--	--	--	--
	2250	1920	746	1.0	825	1.0	873	1.0	931	1.0	--	--	--	--	--	--	--	--
72	1500	1280	558	0.5	644	0.5	749	0.5	847	0.5	939	1.0	1025	1.0	1199	1.0	--	--
	1800	1536	637	0.5	703	0.5	783	1.0	871	1.0	955	1.0	1035	1.0	--	--	--	--
	2100	1792	709	1.0	784	1.0	833	1.0	908	1.0	983	1.0	--	--	--	--	--	--
	2400	2048	784	1.0	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	2700	2304	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	3000	2560	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Note: Shaded data provided for interpolation purposes only: below 25 percent wide-open cfm.

Note: Motor listed in table is the smallest motor that will work for the CFM and static pressure condition. More powerful motors are acceptable.

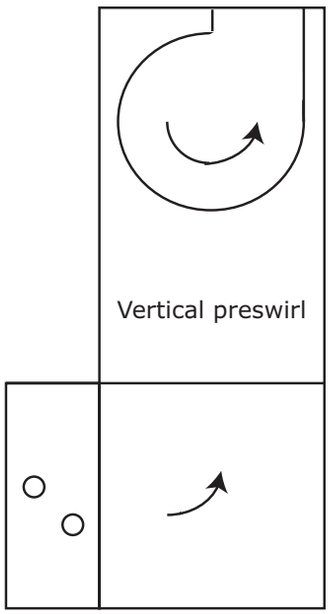
Table 17. Vertical draw-thru preswirl size 54-72 - 277 volt motor

Unit Size	CFM	Outlet Velocity (ft./min)	Total Static Pressure (in. wg)															
			0.25		0.5		0.75		1		1.25		1.5		2		2.5	
			RPM	Motor	RPM	Motor	RPM	Motor	RPM	Motor	RPM	Motor	RPM	Motor	RPM	Motor	RPM	Motor
54	1125	960	465	0.5	603	0.5	726	0.5	842	0.5	954	0.5	1055	0.5	1224	1.0	1368	1.0
	1350	1152	518	0.5	624	0.5	736	0.5	840	0.5	935	0.5	1034	0.5	1213	1.0	1369	1.0
	1575	1344	579	0.5	656	0.5	756	0.5	851	0.5	942	0.5	1027	1.0	1192	1.0	1350	1.0
	1800	1536	637	0.5	703	0.5	783	0.5	871	1.0	955	1.0	1035	1.0	1185	1.0	--	--
	2025	1728	691	1.0	763	1.0	818	1.0	897	1.0	975	1.0	1051	1.0	1193	1.0	--	--
	2250	1920	746	1.0	825	1.0	873	1.0	931	1.0	1000	1.0	--	--	--	--	--	--
72	1500	1280	558	0.5	644	0.5	749	0.5	847	0.5	939	0.5	1025	1.0	1199	1.0	1358	1.0
	1800	1536	637	0.5	703	0.5	783	0.5	871	1.0	955	1.0	1035	1.0	1185	1.0	--	--
	2100	1792	709	1.0	784	1.0	833	1.0	908	1.0	983	1.0	1057	1.0	--	--	--	--
	2400	2048	784	1.0	867	1.0	913	1.0	--	--	--	--	--	--	--	--	--	--
	2700	2304	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	3000	2560	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Note: Shaded data provided for interpolation purposes only: below 25 percent wide-open cfm.

Note: Motor listed in table is the smallest motor that will work for the CFM and static pressure condition. More powerful motors are acceptable.

Figure 33. Fan performance for vertical draw-thru preswirl units size 90



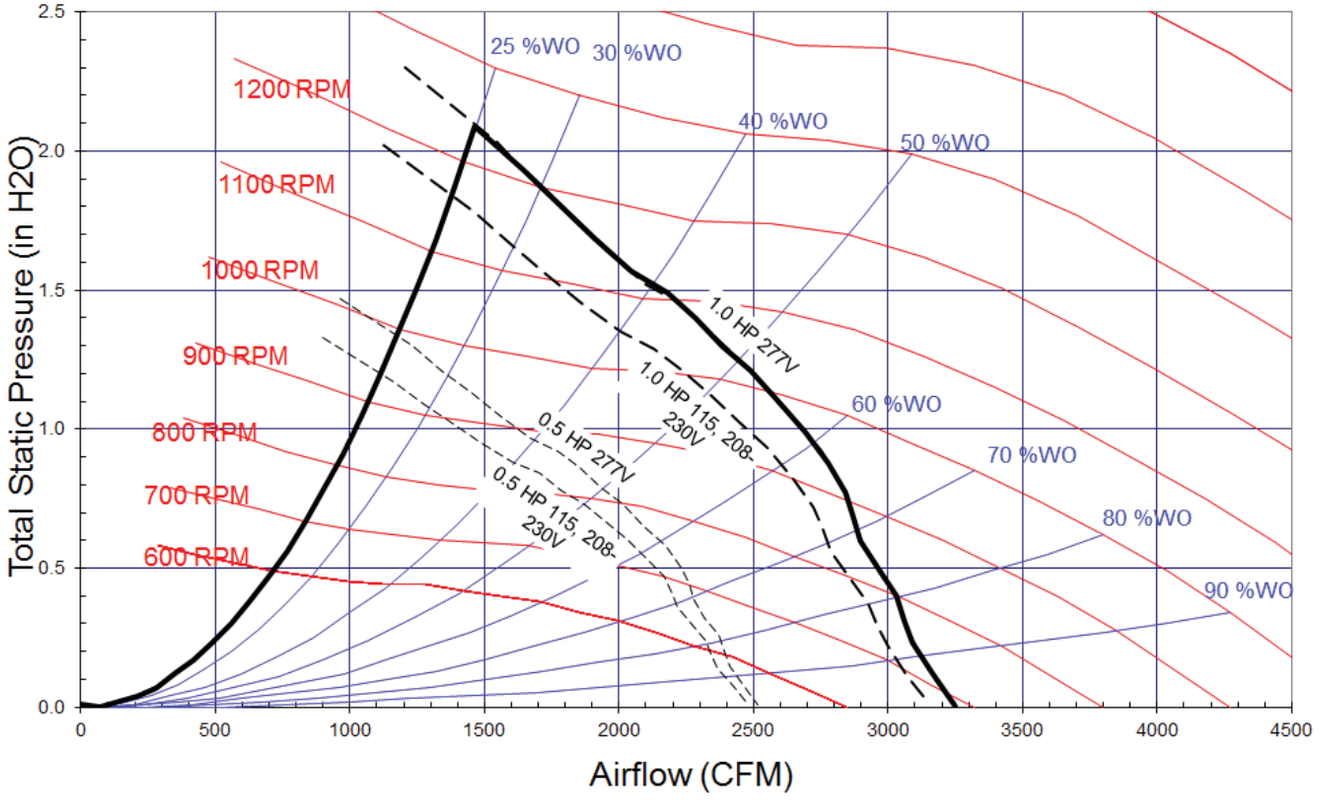


Table 18. Vertical draw-thru preswirl size 90 - 115/208-230 volt motor

Unit Size	CFM	Outlet Velocity (ft./min)	Total Static Pressure (in. wg)															
			0.25		0.5		0.75		1		1.25		1.5		2		2.5	
			RPM	Motor	RPM	Motor	RPM	Motor	RPM	Motor	RPM	Motor	RPM	Motor	RPM	Motor	RPM	Motor
90	1875	1600	553	0.5	681	0.5	797	1.0	906	1.0	1012	1.0	--	--	--	--	--	--
	2250	1920	609	0.5	727	1.0	829	1.0	925	1.0	--	--	--	--	--	--	--	--
	2625	2240	671	1.0	778	1.0	874	1.0	--	--	--	--	--	--	--	--	--	--
	3000	2560	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	3375	2880	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	3750	3200	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Note: Shaded data provided for interpolation purposes only: below 25 percent wide-open cfm.

Note: Motor listed in table is the smallest motor that will work for the CFM and static pressure condition. More powerful motors are acceptable.

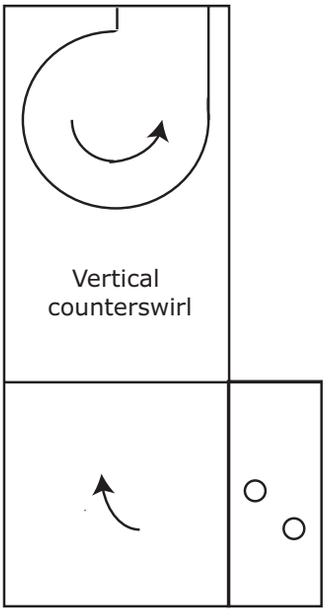
Table 19. Vertical draw-thru preswirl size 90 - 277 volt motor

Unit Size	CFM	Outlet Velocity (ft./min)	Total Static Pressure (in. wg)															
			0.25		0.5		0.75		1		1.25		1.5		2		2.5	
			RPM	Motor	RPM	Motor	RPM	Motor	RPM	Motor	RPM	Motor	RPM	Motor	RPM	Motor	RPM	Motor
90	1875	1600	553	0.5	681	0.5	797	0.5	906	1.0	1012	1.0	1096	1.0	--	--	--	--
	2250	1920	609	0.5	727	1.0	829	1.0	925	1.0	1021	1.0	--	--	--	--	--	--
	2625	2240	671	1.0	778	1.0	874	1.0	960	1.0	--	--	--	--	--	--	--	--
	3000	2560	735	1.0	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	3375	2880	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	3750	3200	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Note: Shaded data provided for interpolation purposes only: below 25 percent wide-open cfm.

Note: Motor listed in table is the smallest motor that will work for the CFM and static pressure condition. More powerful motors are acceptable.

Figure 34. Fan performance for vertical draw-thru counterswirl units size 24-36



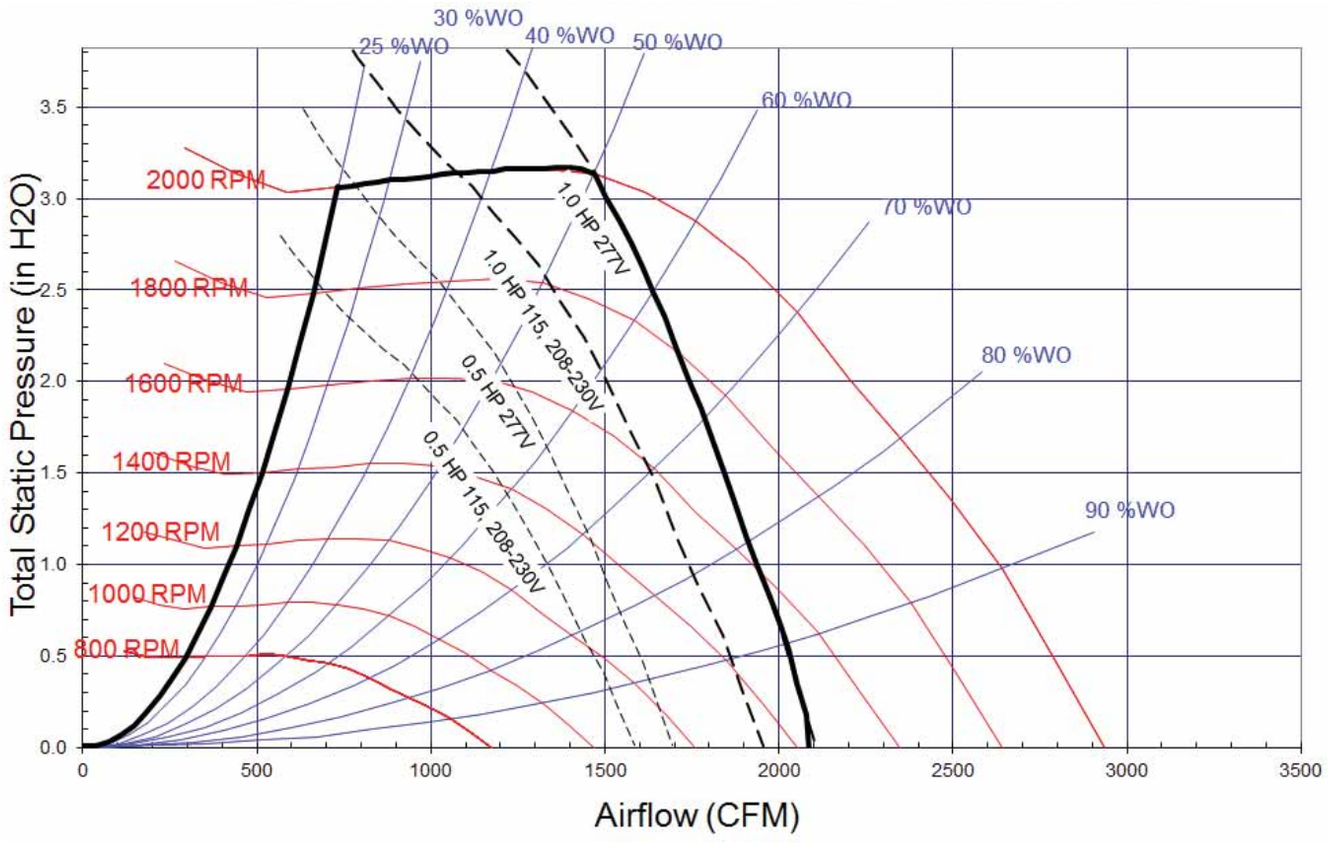


Table 20. Vertical draw-thru counterswirl size 24-36 - 115/208-230 volt motor

Unit Size	CFM	Outlet Velocity (ft./min)	Total Static Pressure (in. wg)															
			0.25		0.5		0.75		1		1.25		1.5		2		2.5	
			RPM	Motor	RPM	Motor	RPM	Motor	RPM	Motor	RPM	Motor	RPM	Motor	RPM	Motor	RPM	Motor
24	500	571	583	0.5	796	0.5	980	0.5	1137	0.5	1275	0.5	1400	0.5	1622	0.5	1818	0.5
	600	685	619	0.5	801	0.5	975	0.5	1130	0.5	1268	0.5	1393	0.5	1615	0.5	1811	0.5
	700	799	665	0.5	823	0.5	974	0.5	1125	0.5	1261	0.5	1386	0.5	1608	0.5	1804	1.0
	800	914	717	0.5	856	0.5	995	0.5	1123	0.5	1258	0.5	1379	0.5	1601	0.5	1797	1.0
	900	1028	767	0.5	898	0.5	1021	0.5	1144	0.5	1257	0.5	1377	0.5	1594	0.5	1790	1.0
	1000	1142	820	0.5	945	0.5	1057	0.5	1167	0.5	1277	0.5	1380	0.5	1591	1.0	1783	1.0
36	750	857	691	0.5	838	0.5	984	0.5	1124	0.5	1259	0.5	1383	0.5	1605	0.5	1800	1.0
	900	1028	767	0.5	898	0.5	1021	0.5	1144	0.5	1257	0.5	1377	0.5	1594	0.5	1790	1.0
	1050	1199	847	0.5	971	0.5	1077	0.5	1182	0.5	1288	0.5	1390	0.5	1590	1.0	1780	1.0
	1200	1370	932	0.5	1048	0.5	1145	0.5	1238	0.5	1330	0.5	1422	1.0	1603	1.0	1778	1.0
	1350	1542	1020	0.5	1125	0.5	1223	0.5	1305	1.0	1388	1.0	1469	1.0	1633	1.0	1793	1.0
	1500	1713	1114	0.5	1206	1.0	1299	1.0	1381	1.0	1455	1.0	1530	1.0	1676	1.0	--	--

Note: Shaded data provided for interpolation purposes only: below 25 percent wide-open cfm.

Note: Motor listed in table is the smallest motor that will work for the CFM and static pressure condition. More powerful motors are acceptable.

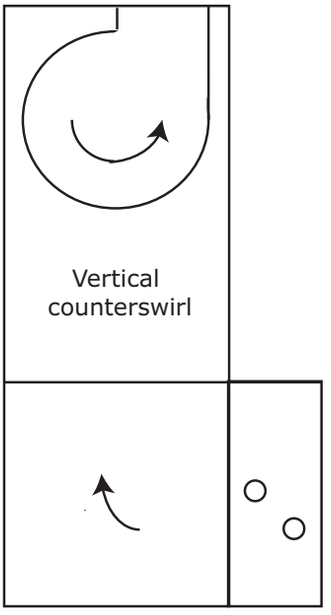
Table 21. Vertical draw-thru counterswirl size 24-36 - 277 volt motor

Unit Size	CFM	Outlet Velocity (ft./min)	Total Static Pressure (in. wg)															
			0.25		0.5		0.75		1		1.25		1.5		2		2.5	
			RPM	Motor	RPM	Motor	RPM	Motor	RPM	Motor	RPM	Motor	RPM	Motor	RPM	Motor	RPM	Motor
24	500	571	583	0.5	796	0.5	980	0.5	1137	0.5	1275	0.5	1400	0.5	1622	0.5	1818	0.5
	600	685	619	0.5	801	0.5	975	0.5	1130	0.5	1268	0.5	1393	0.5	1615	0.5	1811	0.5
	700	799	665	0.5	823	0.5	974	0.5	1125	0.5	1261	0.5	1386	0.5	1608	0.5	1804	0.5
	800	914	717	0.5	856	0.5	995	0.5	1123	0.5	1258	0.5	1379	0.5	1601	0.5	1797	0.5
	900	1028	767	0.5	898	0.5	1021	0.5	1144	0.5	1257	0.5	1377	0.5	1594	0.5	1790	0.5
	1000	1142	820	0.5	945	0.5	1057	0.5	1167	0.5	1277	0.5	1380	0.5	1591	0.5	1783	0.5
36	750	857	691	0.5	838	0.5	984	0.5	1124	0.5	1259	0.5	1383	0.5	1605	0.5	1800	0.5
	900	1028	767	0.5	898	0.5	1021	0.5	1144	0.5	1257	0.5	1377	0.5	1594	0.5	1790	0.5
	1050	1199	847	0.5	971	0.5	1077	0.5	1182	0.5	1288	0.5	1390	0.5	1590	0.5	1780	1.0
	1200	1370	932	0.5	1048	0.5	1145	0.5	1238	0.5	1330	0.5	1422	0.5	1603	0.5	1778	1.0
	1350	1542	1020	0.5	1125	0.5	1223	0.5	1305	0.5	1388	0.5	1469	0.5	1633	1.0	1793	1.0
	1500	1713	1114	0.5	1206	0.5	1299	0.5	1381	1.0	1455	1.0	1530	1.0	1676	1.0	1824	1.0

Note: Shaded data provided for interpolation purposes only: below 25 percent wide-open cfm.

Note: Motor listed in table is the smallest motor that will work for the CFM and static pressure condition. More powerful motors are acceptable.

Figure 35. Fan performance for vertical draw-thru counterswirl units size 54-72



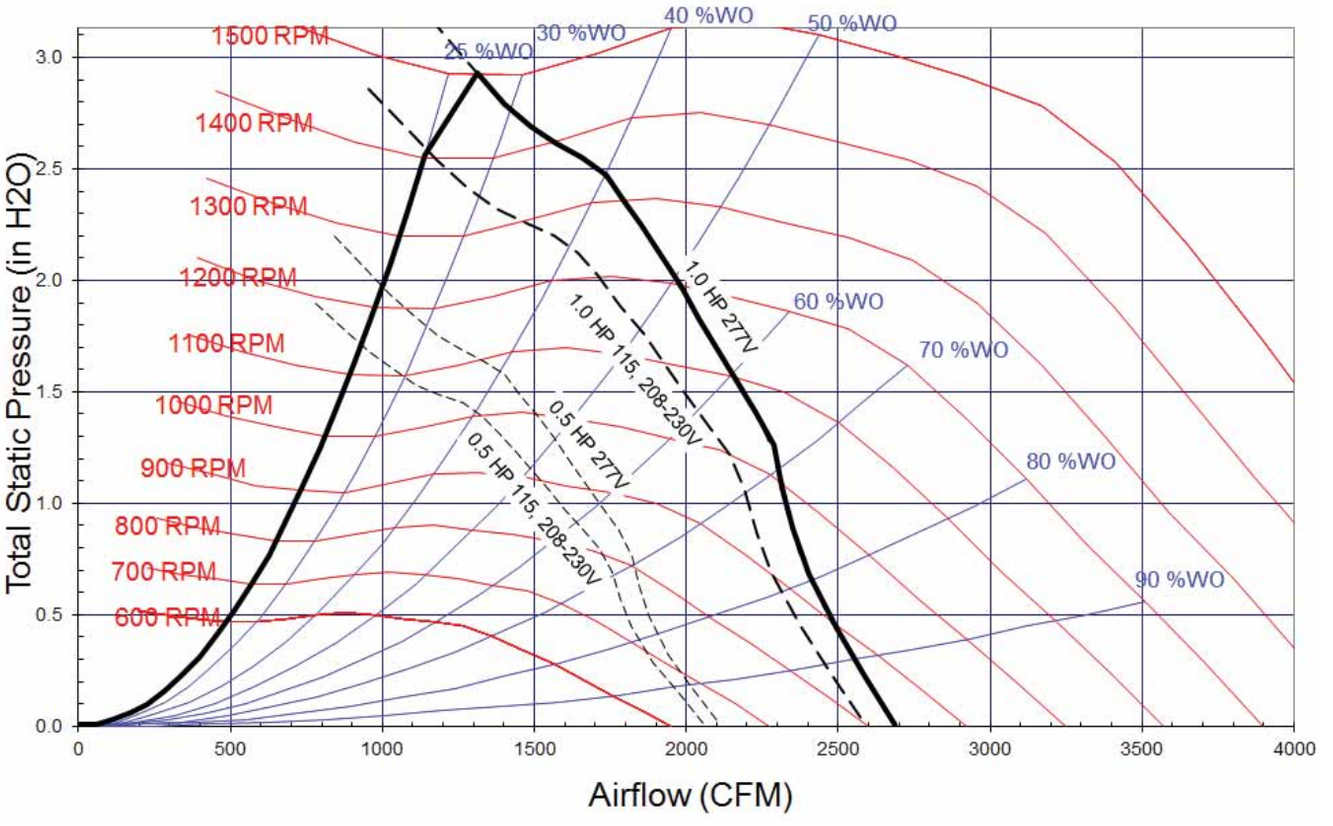


Table 22. Vertical draw-thru counterswirl size 54-72 - 115/208-230 volt motor

Unit Size	CFM	Outlet Velocity (ft./min)	Total Static Pressure (in. wg)															
			0.25		0.5		0.75		1		1.25		1.5		2		2.5	
			RPM	Motor	RPM	Motor	RPM	Motor	RPM	Motor	RPM	Motor	RPM	Motor	RPM	Motor	RPM	Motor
54	1125	960	483	0.5	614	0.5	734	0.5	847	0.5	961	0.5	1068	0.5	1240	1.0	1385	1.0
	1350	1152	536	0.5	637	0.5	750	0.5	850	0.5	944	0.5	1038	1.0	1226	1.0	--	--
	1575	1344	595	0.5	680	0.5	771	0.5	867	0.5	954	1.0	1037	1.0	1198	1.0	--	--
	1800	1536	655	0.5	732	0.5	804	1.0	888	1.0	973	1.0	1051	1.0	--	--	--	--
	2025	1728	714	1.0	788	1.0	855	1.0	916	1.0	994	1.0	--	--	--	--	--	--
	2250	1920	775	1.0	847	1.0	907	1.0	--	--	--	--	--	--	--	--	--	--
72	1500	1280	575	0.5	663	0.5	763	0.5	861	0.5	950	1.0	1033	1.0	1205	1.0	--	--
	1800	1536	655	0.5	732	0.5	804	1.0	888	1.0	973	1.0	1051	1.0	--	--	--	--
	2100	1792	734	1.0	808	1.0	872	1.0	933	1.0	1003	1.0	--	--	--	--	--	--
	2400	2048	816	1.0	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	2700	2304	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	3000	2560	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Note: Shaded data provided for interpolation purposes only: below 25 percent wide-open cfm.

Note: Motor listed in table is the smallest motor that will work for the CFM and static pressure condition. More powerful motors are acceptable.

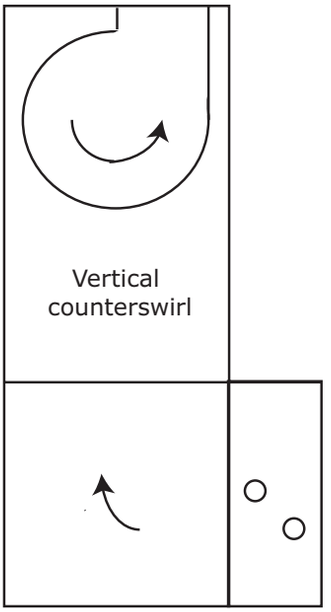
Table 23. Vertical draw-thru counterswirl size 54-72 - 277 volt motor

Unit Size	CFM	Outlet Velocity (ft./min)	Total Static Pressure (in. wg)															
			0.25		0.5		0.75		1		1.25		1.5		2		2.5	
			RPM	Motor	RPM	Motor	RPM	Motor	RPM	Motor	RPM	Motor	RPM	Motor	RPM	Motor	RPM	Motor
54	1125	960	483	0.5	614	0.5	734	0.5	847	0.5	961	0.5	1068	0.5	1240	1.0	1385	1.0
	1350	1152	536	0.5	637	0.5	750	0.5	850	0.5	944	0.5	1038	0.5	1226	1.0	1387	1.0
	1575	1344	595	0.5	680	0.5	771	0.5	867	0.5	954	0.5	1037	1.0	1198	1.0	1362	1.0
	1800	1536	655	0.5	732	0.5	804	0.5	888	1.0	973	1.0	1051	1.0	1196	1.0	--	--
	2025	1728	714	1.0	788	1.0	855	1.0	916	1.0	994	1.0	1070	1.0	--	--	--	--
	2250	1920	775	1.0	847	1.0	907	1.0	967	1.0	1021	1.0	--	--	--	--	--	--
72	1500	1280	575	0.5	663	0.5	763	0.5	861	0.5	950	0.5	1033	1.0	1205	1.0	1372	1.0
	1800	1536	655	0.5	732	0.5	804	0.5	888	1.0	973	1.0	1051	1.0	1196	1.0	--	--
	2100	1792	734	1.0	808	1.0	872	1.0	933	1.0	1003	1.0	1077	1.0	--	--	--	--
	2400	2048	816	1.0	887	1.0	--	--	--	--	--	--	--	--	--	--	--	--
	2700	2304	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	3000	2560	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Note: Shaded data provided for interpolation purposes only: below 25 percent wide-open cfm.

Note: Motor listed in table is the smallest motor that will work for the CFM and static pressure condition. More powerful motors are acceptable.

Figure 36. Fan performance for vertical draw-thru counterswirl units size 90



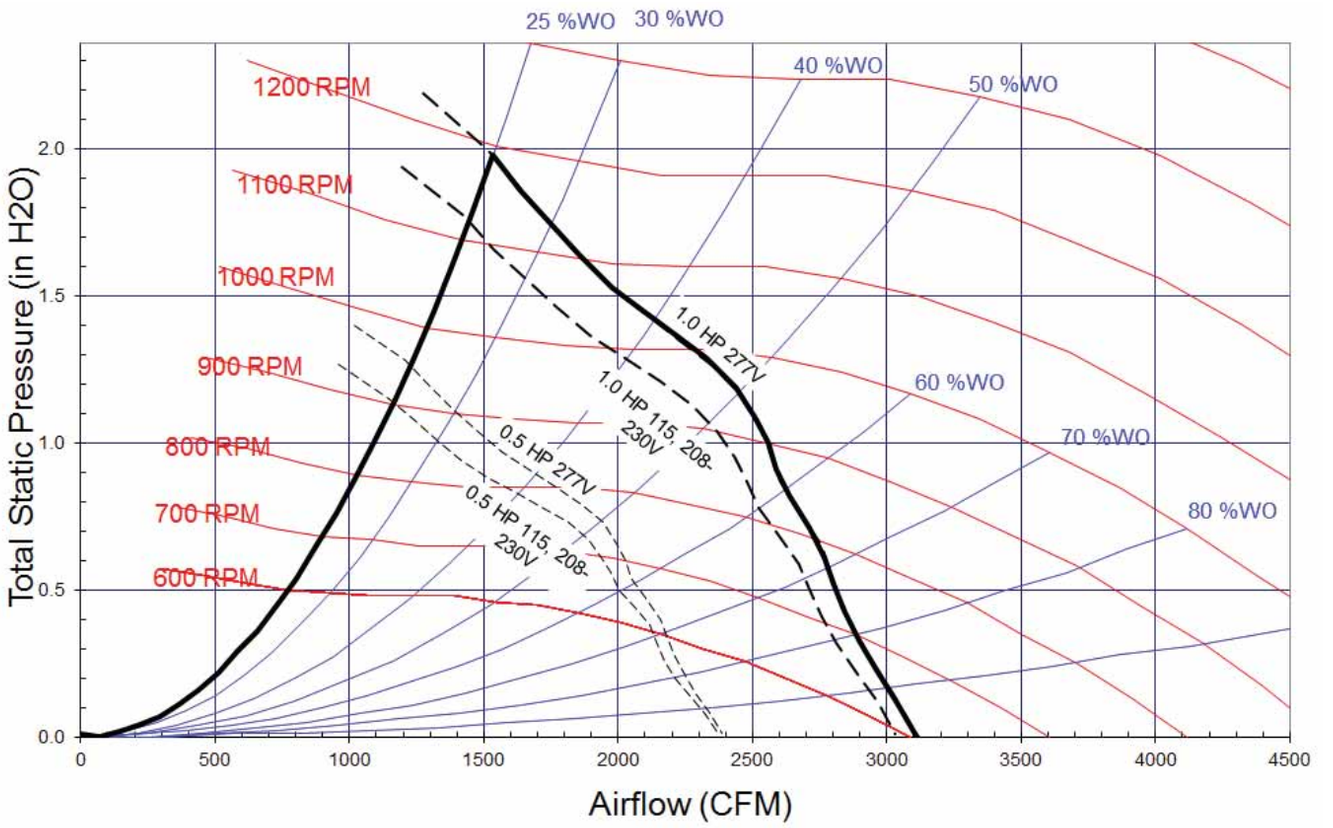


Table 24. Vertical draw-thru counterswirl size 90 - 115/208-230 volt motor

Unit Size	CFM	Outlet Velocity (ft./min)	Total Static Pressure (in. wg)															
			0.25		0.5		0.75		1		1.25		1.5		2		2.5	
			RPM	Motor	RPM	Motor	RPM	Motor	RPM	Motor	RPM	Motor	RPM	Motor	RPM	Motor	RPM	Motor
90	1875	1600	514	0.5	641	0.5	758	1.0	869	1.0	972	1.0	--	--	--	--	--	--
	2250	1920	564	1.0	678	1.0	781	1.0	879	1.0	--	--	--	--	--	--	--	--
	2625	2240	621	1.0	723	1.0	--	--	--	--	--	--	--	--	--	--	--	--
	3000	2560	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	3375	2880	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	3750	3200	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Note: Shaded data provided for interpolation purposes only: below 25 percent wide-open cfm.

Note: Motor listed in table is the smallest motor that will work for the CFM and static pressure condition. More powerful motors are acceptable.

Table 25. Vertical draw-thru counterswirl size 90 - 277volt motor

Unit Size	CFM	Outlet Velocity (ft./min)	Total Static Pressure (in. wg)															
			0.25		0.5		0.75		1		1.25		1.5		2		2.5	
			RPM	Motor	RPM	Motor	RPM	Motor	RPM	Motor	RPM	Motor	RPM	Motor	RPM	Motor	RPM	Motor
90	1875	1600	514	0.5	641	0.5	758	0.5	869	1.0	972	1.0	1061	1.0	--	--	--	--
	2250	1920	564	1.0	678	1.0	781	1.0	879	1.0	972	1.0	--	--	--	--	--	--
	2625	2240	621	1.0	723	1.0	816	1.0	--	--	--	--	--	--	--	--	--	--
	3000	2560	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	3375	2880	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	3750	3200	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Note: Shaded data provided for interpolation purposes only: below 25 percent wide-open cfm.

Note: Motor listed in table is the smallest motor that will work for the CFM and static pressure condition. More powerful motors are acceptable.

Chilled Water Cooling Capacities

Table 26. Chilled water cooling capacities, EAT = 80°F DB / 67°F WB and EWT = 40°F EWT

Unit Size	Coil Rows	Air Flow	Water Temperature Rise - °F											
			10°F						12°F					
			TC	SC	LDB	LWB	GPM	WPD	TC	SC	LDB	LWB	GPM	WPD
54	4	1350	53.8	38.0	54.5	54.0	10.7	1.8	35.5	30.8	59.3	58.8	5.9	0.6
		1800	68.9	49.0	55.3	54.6	13.7	2.8	32.1	31.4	63.8	61.6	5.3	0.7
		2250	81.4	58.8	56.3	55.4	16.2	3.8	41.2	40.3	63.4	61.4	6.9	1.0
	6	1350	75.5	47.9	47.8	47.7	15.0	4.3	67.6	44.3	50.2	50.1	11.2	2.5
		1800	96.1	61.7	48.9	48.8	19.1	6.6	87.1	57.7	50.9	50.8	14.5	4.0
		2250	114.2	74.2	50.1	49.9	22.7	9.1	104.0	69.8	51.9	51.6	17.3	5.5
72	4	1800	81.3	54.5	52.5	52.1	16.2	4.2	69.0	49.4	55.1	54.6	11.5	2.2
		2400	100.8	69.0	53.9	53.3	20.1	6.2	87.9	63.6	56.0	55.2	14.6	3.4
		3000	117.2	81.7	55.3	54.4	23.3	8.3	103.3	76.1	57.0	56.0	17.2	4.6
	6	1800	104.9	65.8	46.9	46.8	20.9	8.7	97.6	62.4	48.6	48.5	16.2	5.4
		2400	132.2	84.0	48.2	48.1	26.3	13.2	123.3	80.0	49.8	49.6	20.5	8.3
		3000	156.1	100.6	49.6	49.3	31.1	18.0	145.8	96.0	51.0	50.7	24.2	11.3
90	4	2250	102.9	68.8	52.3	51.8	20.5	3.7	86.6	62.0	55.0	54.6	14.4	1.9
		3000	128.4	87.4	53.6	53.0	25.6	5.5	111.4	80.3	55.7	55.1	18.5	3.0
		3750	149.8	103.9	54.9	54.0	29.8	7.3	131.7	96.4	56.7	55.8	21.9	4.1
	6	2250	132.4	82.8	46.6	46.5	26.4	7.6	123.0	78.5	48.4	48.3	20.4	4.7
		3000	167.6	106.2	47.9	47.8	33.4	11.7	156.3	101.0	49.4	49.3	25.9	7.3
		3750	198.6	127.5	49.2	49.0	39.6	15.9	185.4	121.6	50.6	50.4	30.8	10.0

Notes:

- Light shading = GPM is below the minimum (<1.5 fps self-venting velocity) or above the maximum (>10 ft wg) recommended for most applications.
- Dark shading = GPM is below the ARI limits (1.0 fps tube side velocity).
- Some of the volumetric flow rates are less than those required for self-venting (Table 1, p. 20).
- TC = total capacity (MBh); SC = sensible capacity (MBh); GPM = water flow rate-gallons per minute; LDB = leaving dry-bulb temperature (°F); LWB = leaving wet-bulb temperature (°F); WPD = water pressure drop at average water density (ft H_20).

Table 27. Chilled water cooling capacities, EAT = 80°F DB / 67°F WB and EWT = 45°F

Unit Size	Coil Rows	Air Flow	Water Temperature Rise - °F											
			10°F						12°F					
			TC	SC	LDB	LWB	GPM	WPD	TC	SC	LDB	LWB	GPM	WPD
54	4	1350	36.1	31.0	59.2	58.7	7.2	0.8	28.3	28.2	61.1	60.6	4.7	0.4
		1800	49.1	41.3	59.2	58.5	9.8	1.5	32.1	31.4	63.8	61.6	5.3	0.7
		2250	59.4	50.3	59.7	58.8	11.8	2.1	41.2	40.3	63.4	61.4	6.9	1.0
	6	1350	58.2	40.3	52.9	52.8	11.6	2.6	48.6	36.4	55.5	55.4	8.1	1.4
		1800	74.5	52.3	53.6	53.5	14.9	4.1	64.4	48.2	55.7	55.5	10.7	2.3
		2250	88.7	63.4	54.5	54.2	17.7	5.7	77.8	59.0	56.2	56.0	12.9	3.2
72	4	1800	60.5	46.0	56.8	56.3	12.1	2.4	46.0	40.5	59.6	59.1	7.6	1.0
		2400	76.1	58.9	57.7	57.0	15.2	3.7	62.4	53.7	59.7	58.9	10.4	1.8
		3000	89.0	70.5	58.7	57.7	17.7	4.9	75.2	65.2	60.3	59.2	12.5	2.6
	6	1800	83.0	56.0	51.8	51.7	16.5	5.6	74.4	52.4	53.6	53.5	12.4	3.3
		2400	104.5	71.8	52.8	52.7	20.8	8.5	94.7	67.8	54.4	54.2	15.7	5.1
		3000	123.2	86.4	53.9	53.6	24.6	11.5	112.2	81.9	55.2	55.0	18.6	6.9
90	4	2250	76.2	57.8	56.7	56.2	15.2	2.1	56.0	50.1	59.8	59.3	9.3	0.8
		3000	96.6	74.4	57.5	56.8	19.3	3.2	78.3	67.4	59.6	58.9	13.0	1.6
		3750	113.6	89.3	58.4	57.5	22.6	4.3	95.2	82.3	60.1	59.1	15.8	2.2
	6	2250	104.7	70.4	51.6	51.5	20.9	4.9	93.7	65.7	53.5	53.4	15.6	2.9
		3000	132.5	90.7	52.6	52.4	26.4	7.5	119.9	85.4	54.2	54.0	19.9	4.5
		3750	156.8	109.3	53.6	53.3	31.3	10.2	142.6	103.5	55.0	54.7	23.7	6.1

Notes:

- Light shading = GPM is below the minimum (<1.5 fps self-venting velocity) or above the maximum (>10 ft wg) recommended for most applications.
- Dark shading = GPM is below the ARI limits (1.0 fps tube side velocity).
- Some of the volumetric flow rates are less than those required for self-venting (Table 1, p. 20).
- TC = total capacity (MBh); SC = sensible capacity (MBh); GPM = water flow rate-gallons per minute; LDB = leaving dry-bulb temperature (°F); LWB = leaving wet-bulb temperature (°F); WPD = water pressure drop at average water density (ft H_20).

High-Capacity Chilled Water Cooling Capacities

Table 28. Chilled water high-capacity cooling capacities, EAT = 80°F DB / 67°F WB and EWT = 40°F

Unit Size	Coil Rows	Air Flow	Water Temperature Rise - °F											
			10°F						12°F					
			TC	SC	LDB	LWB	GPM	WPD	TC	SC	LDB	LWB	GPM	WPD
12	4	300	12.6	8.7	53.7	53.2	2.5	2.2	10.3	7.8	56.6	56.1	1.7	1.1
		400	15.7	11.1	54.9	54.2	3.1	3.2	13.2	10.0	57.2	56.5	2.2	1.7
		500	18.4	13.2	56.1	55.2	3.7	4.3	15.6	12.1	58.1	57.1	2.6	2.3
	6	300	16.9	10.7	47.6	47.5	3.4	4.9	15.5	10.1	49.6	49.5	2.6	3.0
		400	21.4	13.7	48.8	48.7	4.3	7.5	19.7	12.9	50.6	50.5	3.3	4.6
		500	25.4	16.5	50.0	49.8	5.1	10.3	23.3	15.6	51.7	51.5	3.9	6.3
18	4	450	20.0	13.4	52.9	52.4	4.0	5.4	17.6	12.5	54.9	54.3	2.9	3.1
		600	24.4	16.8	54.6	53.8	4.9	7.8	21.7	15.7	56.3	55.4	3.6	4.5
		750	28.1	19.8	56.0	55.0	5.6	10.1	25.1	18.6	57.5	56.4	4.2	5.9
	6	450	25.7	16.2	47.3	47.2	5.1	11.5	24.1	15.4	48.9	48.8	4.0	7.3
		600	32.1	20.6	48.9	48.7	6.4	17.2	30.0	19.6	50.3	50.1	5.0	10.9
		750	37.7	24.5	50.3	50.0	7.5	23.1	35.2	23.4	51.7	51.4	5.8	14.6
24	4	600	27.4	18.3	52.3	51.9	5.5	4.1	24.1	16.9	54.4	54.0	4.0	2.3
		800	33.8	23.1	53.9	53.2	6.7	6.0	29.9	21.5	55.7	55.0	5.0	3.4
		1000	39.1	27.3	55.3	54.3	7.8	7.8	34.9	25.5	56.8	55.9	5.8	4.5
	6	600	35.0	22.0	46.8	46.7	7.0	8.8	32.8	20.9	48.4	48.3	5.4	5.6
		800	44.1	28.0	48.2	48.1	8.8	13.3	41.2	26.7	49.7	49.5	6.8	8.5
		1000	52.0	33.6	49.6	49.3	10.4	18.0	48.6	32.0	50.9	50.7	8.1	11.4
36	4	900	46.8	30.0	49.7	49.4	9.3	13.7	43.5	28.6	51.2	50.8	7.2	8.6
		1200	57.5	37.6	51.6	51.0	11.5	19.9	53.5	35.9	52.9	52.3	8.9	12.5
		1500	66.7	44.4	53.1	52.3	13.3	26.0	61.9	42.4	54.4	53.5	10.3	16.3
	6	900	56.1	34.6	45.1	45.0	11.2	26.5	53.7	33.5	46.2	46.1	8.9	17.7
		1200	70.9	44.3	46.5	46.4	14.1	40.4	67.7	42.8	47.7	47.5	11.2	26.6
		1500	84.3	53.2	47.8	47.6	16.8	55.0	80.0	51.3	49.0	48.8	13.3	36.0
54	4	1350	62.7	41.8	51.9	51.6	12.5	4.5	56.7	39.2	53.6	53.2	9.4	2.7
		1800	76.5	52.4	53.6	53.1	15.3	6.5	69.6	49.5	55.1	54.5	11.6	3.8
		2250	88.1	62.0	55.0	54.3	17.6	8.3	80.2	58.7	56.3	55.6	13.3	5.0
	6	1350	78.9	49.5	46.8	46.7	15.8	9.4	74.6	47.5	48.1	48.0	12.4	6.1
		1800	98.9	63.1	48.2	48.1	19.8	14.1	93.3	60.5	49.5	49.4	15.5	9.0
		2250	116.6	75.5	49.6	49.4	23.3	19.0	109.5	72.3	50.9	50.7	18.2	12.0
72	4	1800	86.2	56.8	51.4	51.0	17.2	9.1	79.8	54.0	52.8	52.4	13.3	5.6
		2400	104.8	71.0	53.2	52.6	21.0	12.9	96.8	67.6	54.5	53.9	16.1	7.9
		3000	120.4	83.6	54.7	54.0	24.1	16.6	111.0	79.7	55.9	55.1	18.4	10.2
	6	1800	106.6	66.7	46.4	46.3	21.3	18.5	101.6	64.3	47.6	47.5	16.9	12.1
		2400	133.5	84.8	48.0	47.9	26.7	27.8	126.6	81.6	49.2	49.0	21.0	17.9
		3000	157.1	101.4	49.4	49.2	31.4	37.2	148.5	97.4	50.5	50.4	24.6	23.8
90	4	2250	111.8	72.8	50.7	50.3	22.4	9.0	103.9	69.3	52.1	51.7	17.2	5.6
		3000	136.6	91.2	52.5	51.9	27.3	12.9	126.6	86.8	53.8	53.2	21.0	8.0
		3750	157.6	107.6	54.0	53.3	31.5	16.7	145.6	102.5	55.2	54.4	24.2	10.3
	6	2250	136.5	84.9	45.8	45.7	27.3	18.1	130.5	81.9	47.0	46.9	21.7	11.8
		3000	171.8	108.3	47.3	47.2	34.4	27.3	163.4	104.4	48.4	48.3	27.1	17.7
		3750	203.0	129.7	48.6	48.5	40.6	36.8	192.3	124.8	49.8	49.6	31.9	23.7

Notes:

- Light shading = GPM is below the minimum (<1.5 fps self-venting velocity) or above the maximum (>10 ft wg) recommended for most applications.
- Dark shading = GPM is below the ARI limits (1.0 fps tube side velocity).
- Some of the volumetric flow rates are less than those required for self-venting (Table 1, p. 20).
- Capacities calculated with 0.00000 tube-side fouling factor.
- High-capacity coils applicable where higher water pressure differentials are acceptable and are also recommended for Earthwise™ applications.
- Earthwise™ is a trademark of Trane to identify equipment designed for applications requiring greater water temperature rises, lower entering water temperatures (EWT) and lower air supply temperatures (LDB).
- TC = total capacity (MBh); SC = sensible capacity (MBh); GPM = water flow rate-gallons per minute; LDB = leaving dry-bulb temperature (°F); LWB = leaving wet-bulb temperature (°F); WPD = water pressure drop at average water density (ft H_20).

Table 28. Chilled water high-capacity cooling capacities, EAT = 80°F DB / 67°F WB and EWT = 40°F (continued)

Unit Size	Coil Rows	Air Flow	Water Temperature Rise - °F 16°F TC	SC	LDB	LWB	GPM	WPD	20°F TC	SC	LDB	LWB	GPM	WPD
12	4	300	7.9	6.8	59.3	58.8	1.0	0.4	6.9	6.5	60.4	59.9	0.7	0.2
		400	8.9	8.4	60.9	60.1	1.1	0.5	8.2	8.2	61.5	60.7	0.9	0.3
		500	10.0	10.0	61.8	60.9	1.3	0.7	8.5	8.3	64.6	61.9	0.9	0.5
	6	300	11.6	8.4	54.6	54.5	1.4	1.1	9.7	7.6	56.9	56.8	1.0	0.5
		400	15.2	11.1	54.9	54.7	1.9	1.7	11.1	9.5	58.5	58.3	1.1	0.7
		500	18.4	13.5	55.4	55.2	2.3	2.4	12.3	11.2	59.6	59.4	1.2	0.8
18	4	450	11.3	10.0	59.9	59.2	1.4	0.8	9.4	9.3	61.3	60.6	0.93	0.4
		600	15.2	13.2	60.1	59.2	1.9	1.4	10.5	10.0	64.6	61.7	1.05	0.5
		750	18.3	16.0	60.6	59.5	2.3	2.0	11.5	11.2	66.2	62.4	1.14	0.7
	6	450	19.9	13.6	52.5	52.4	2.5	3.1	14.2	11.3	57.1	57.0	1.4	1.1
		600	25.1	17.5	53.5	53.3	3.1	4.7	19.0	15.1	57.2	57.0	1.9	1.9
		750	29.6	21.0	54.5	54.2	3.7	6.3	23.0	18.5	57.7	57.3	2.3	2.7
24	4	600	15.2	13.4	59.7	59.1	1.9	0.6	13.3	12.8	60.7	60.2	1.3	0.3
		800	20.4	17.7	59.9	59.1	2.5	1.0	14.7	14.7	63.4	61.4	1.4	0.4
		1000	25.0	21.7	60.3	59.3	3.1	1.5	16.4	15.6	65.6	62.0	1.6	0.5
	6	600	27.0	18.4	52.2	52.1	3.4	2.4	18.7	15.1	57.2	57.1	1.9	0.8
		800	34.4	23.7	53.1	52.9	4.3	3.7	25.5	20.2	57.1	56.9	2.6	1.4
		1000	40.7	28.7	54.0	53.7	5.1	4.9	31.3	24.9	57.4	57.1	3.1	2.1
36	4	900	35.9	25.3	54.5	54.0	4.5	3.6	25.4	21.2	58.7	58.2	2.5	1.3
		1200	44.7	32.2	55.7	55.0	5.6	5.4	33.9	27.9	58.9	58.2	3.4	2.2
		1500	52.0	38.3	56.8	55.9	6.5	7.0	40.7	33.9	59.5	58.6	4.1	3.0
	6	900	48.2	30.9	48.8	48.7	6.0	8.7	40.8	27.7	52.1	52.0	4.1	4.3
		1200	60.5	39.5	50.1	50.0	7.5	13.0	51.7	35.7	53.0	52.8	5.2	6.6
		1500	71.2	47.3	51.4	51.2	8.9	17.3	61.1	43.1	54.0	53.7	6.1	8.8
54	4	1350	41.2	33.0	57.8	57.4	5.2	0.9	25.9	25.9	62.6	61.2	2.6	0.3
		1800	52.9	42.9	58.4	57.8	6.6	1.4	29.6	29.6	65.1	62.0	3.0	0.3
		2250	60.9	50.7	60.0	59.1	7.6	1.8	39.5	39.5	64.1	61.7	4.0	0.6
	6	1350	63.7	42.6	51.4	51.3	8.0	2.8	49.4	36.7	55.3	55.2	4.9	1.2
		1800	79.9	54.7	52.5	52.3	10.0	4.1	64.0	48.2	55.8	55.6	6.4	1.9
		2250	93.9	65.7	53.5	53.4	11.7	5.5	76.3	58.6	56.4	56.2	7.6	2.5
72	4	1800	64.6	47.8	55.9	55.5	8.1	2.3	45.1	40.3	59.7	59.2	4.5	0.8
		2400	79.6	60.6	57.1	56.5	9.9	3.3	59.7	53.1	60.0	59.3	6.0	1.3
		3000	91.8	72.2	58.2	57.4	11.5	4.3	71.2	64.4	60.6	59.7	7.1	1.8
	6	1800	89.8	59.0	50.3	50.2	11.2	5.8	75.1	52.7	53.4	53.3	7.5	2.8
		2400	111.4	74.9	51.7	51.6	13.9	8.6	94.2	67.8	54.4	54.3	9.4	4.2
		3000	12	89.4	53.0	52.8	16.2	11.3	110.4	81.5	55.4	55.2	11.0	5.6
90	4	2250	84.7	61.3	55.3	54.9	10.6	2.3	60.2	51.8	59.1	58.7	6.0	0.9
		3000	104.6	77.9	56.5	55.9	13.1	3.4	79.3	68.1	59.4	58.8	7.9	1.4
		3750	121.0	92.7	57.6	56.8	15.1	4.4	94.4	82.5	60.0	59.2	9.4	1.9
	6	2250	115.9	75.4	49.6	49.5	14.5	5.8	97.6	67.4	52.8	52.7	9.8	2.9
		3000	144.4	95.9	51.0	50.9	18.1	8.5	122.7	86.7	53.8	53.7	12.3	4.3
		3750	168.9	114.6	52.3	52.1	21.1	11.3	144.2	104.4	54.8	54.6	14.4	5.7

Notes:

- Light shading = GPM is below the minimum (<1.5 fps self-venting velocity) or above the maximum (>10 ft wg) recommended for most applications.
- Dark shading = GPM is below the ARI limits (1.0 fps tube side velocity).
- Some of the volumetric flow rates are less than those required for self-venting (Table 1, p. 20).
- Capacities calculated with 0.00000 tube-side fouling factor.
- High-capacity coils applicable where higher water pressure differentials are acceptable and are also recommended for Earthwise™ applications.
- Earthwise™ is a trademark of Trane to identify equipment designed for applications requiring greater water temperature rises, lower entering water temperatures (EWT) and lower air supply temperatures (LDB).
- TC = total capacity (MBh); SC = sensible capacity (MBh); GPM = water flow rate-gallons per minute; LDB = leaving dry-bulb temperature (°F); LWB = leaving wet-bulb temperature (°F); WPD = water pressure drop at average water density (ft H_20).

Table 29. Chilled water high-capacity cooling capacities, EAT = 80°F DB / 67°F WB and EWT = 45°F

Unit Size	Coil Rows	Air Flow	Water Temperature Rise - °F											
			10°F						12°F					
			TC	SC	LDB	LWB	GPM	WPD	TC	SC	LDB	LWB	GPM	WPD
12	4	300	9.2	7.3	57.8	57.4	1.8	1.2	7.1	6.6	60.1	59.6	1.2	0.5
		400	11.6	9.4	58.6	57.9	2.3	1.8	9.2	8.5	60.7	59.9	1.5	0.9
		500	13.7	11.4	59.4	58.4	2.7	2.5	11.2	10.4	61.1	60.1	1.9	1.2
	6	300	13.2	9.1	52.6	52.5	2.6	3.1	11.6	8.4	54.6	54.5	1.9	1.8
		400	16.7	11.7	53.5	53.3	3.3	4.8	14.8	10.9	55.2	55.1	2.5	2.7
		500	19.8	14.1	54.4	54.1	4.0	6.5	17.7	13.3	56.0	55.7	2.9	3.8
18	4	450	15.1	11.5	56.9	56.3	3.0	3.2	12.8	10.5	58.7	58.1	2.1	1.7
		600	18.6	14.5	58.1	57.2	3.7	4.7	16.0	13.5	59.6	58.7	2.7	2.6
		750	21.5	17.2	59.2	58.0	4.3	6.1	18.7	16.2	60.5	59.3	3.1	3.4
	6	450	20.4	13.8	52.1	52.0	4.1	7.5	18.6	13.1	53.7	53.5	3.1	4.5
		600	25.4	17.6	53.4	53.1	5.1	11.1	23.2	16.7	54.7	54.5	3.9	6.8
		750	29.7	21.1	54.5	54.1	5.9	14.8	27.2	20.1	55.7	55.4	4.5	9.0
24	4	600	20.7	15.6	56.5	56.0	4.1	2.5	17.3	14.2	58.5	58.0	2.9	1.3
		800	25.7	19.8	57.6	56.8	5.1	3.6	21.9	18.3	59.2	58.5	3.6	1.9
		1000	29.9	23.6	58.6	57.6	6.0	4.7	25.8	22.0	60.0	59.0	4.3	2.6
	6	600	27.8	18.7	51.7	51.6	5.5	5.8	25.3	17.7	53.3	53.2	4.2	3.5
		800	34.9	24.0	52.8	52.6	7.0	8.6	31.8	22.7	54.3	54.1	5.3	5.3
		1000	41.1	28.8	53.9	53.6	8.2	11.6	37.5	27.4	55.2	54.9	6.2	7.1
36	4	900	36.8	25.7	54.1	53.7	7.3	8.7	33.4	24.3	55.5	55.1	5.6	5.3
		1200	45.1	32.3	55.6	54.9	9.0	12.6	41.2	30.8	56.7	56.1	6.8	7.7
		1500	52.1	38.4	56.8	55.9	10.4	16.4	47.7	36.6	57.9	57.0	7.9	10.0
	6	900	45.4	29.7	50.1	50.0	9.1	17.9	42.8	28.5	51.2	51.1	7.1	11.6
		1200	57.0	38.0	51.3	51.1	11.4	26.9	53.6	36.5	52.4	52.2	8.9	17.3
		1500	67.4	45.7	52.4	52.1	13.4	36.2	63.1	43.9	53.5	53.2	10.5	23.2
54	4	1350	48.1	35.7	56.0	55.6	9.6	2.8	42.1	33.4	57.6	57.2	7.0	1.5
		1800	58.9	45.3	57.2	56.6	11.8	4.0	52.3	42.7	58.5	57.9	8.7	2.3
		2250	67.9	53.9	58.3	57.5	13.6	5.1	60.7	51.1	59.4	58.6	10.1	3.0
	6	1350	62.9	42.3	51.6	51.5	12.6	6.2	58.2	40.3	52.9	52.8	9.7	3.8
		1800	78.5	54.1	52.8	52.7	15.7	9.2	72.7	51.6	54.0	53.9	12.1	5.7
		2250	92.1	64.9	53.8	53.7	18.4	12.2	85.1	62.1	55.0	54.8	14.1	7.6
72	4	1800	67.2	48.8	55.4	55.0	13.4	5.7	60.9	46.3	56.7	56.2	10.1	3.4
		2400	81.5	61.4	56.8	56.2	16.3	8.1	74.2	58.5	57.9	57.3	12.3	4.9
		3000	93.5	72.8	58.0	57.2	18.7	10.4	85.2	69.6	59.0	58.1	14.2	6.2
	6	1800	85.5	57.1	51.2	51.1	17.1	12.3	80.2	54.8	52.4	52.3	13.3	7.8
		2400	106.5	72.8	52.5	52.4	21.3	18.2	99.4	69.8	53.6	53.5	16.5	11.5
		3000	124.7	87.3	53.6	53.4	25.0	24.2	116.2	83.7	54.7	54.5	19.3	15.1
90	4	2250	87.4	62.4	54.9	54.4	17.5	5.7	79.4	59.2	56.1	55.7	13.2	3.4
		3000	106.5	78.6	56.3	55.6	21.3	8.1	97.2	74.9	57.4	56.7	16.1	4.9
		3750	122.6	93.3	57.4	56.6	24.5	10.5	111.9	89.1	58.5	57.6	18.6	6.3
	6	2250	109.9	72.7	50.7	50.6	22.0	12.1	103.3	69.8	51.9	51.8	17.2	7.7
		3000	137.4	92.9	51.9	51.8	27.5	18.0	128.7	89.1	53.1	52.9	21.4	11.4
		3750	161.6	111.6	53.0	52.8	32.3	24.1	150.9	107.0	54.1	53.9	25.1	15.1

Notes:

- Light shading = GPM is below the minimum (<1.5 fps self-venting velocity) or above the maximum (>10 ft wg) recommended for most applications.
- Dark shading = GPM is below the ARI limits (1.0 fps tube side velocity).
- Some of the volumetric flow rates are less than those required for self-venting (Table 1, p. 20).
- Capacities calculated with 0.00000 tube-side fouling factor.
- High-capacity coils applicable where higher water pressure differentials are acceptable and are also recommended for Earthwise™ applications.
- Earthwise™ is a trademark of Trane to identify equipment designed for applications requiring greater water temperature rises, lower entering water temperatures (EWT) and lower air supply temperatures (LDB).
- TC = total capacity (MBh); SC = sensible capacity (MBh); GPM = water flow rate-gallons per minute; LDB = leaving dry-bulb temperature (°F); LWB = leaving wet-bulb temperature (°F); WPD = water pressure drop at average water density (ft H_20).

Table 29. Chilled water high-capacity cooling capacities, EAT = 80°F DB / 67°F WB and EWT = 45°F (continued)

Unit Size	Coil Rows	Air Flow	Water Temperature Rise - °F											
			16°F						20°F					
			TC	SC	LDB	LWB	GPM	WPD	TC	SC	LDB	LWB	GPM	WPD
12	4	300	6.3	6.2	61.1	60.6	0.8	0.3	5.4	5.4	64.2	61.6	0.5	0.1
		400	7.1	7.1	63.9	61.6	0.9	0.3	6.2	6.2	66.0	62.4	0.6	0.2
		500	7.9	7.9	65.7	62.3	1.0	0.4	6.8	6.8	67.7	62.9	0.7	0.2
	6	300	8.5	7.2	58.2	58.1	1.1	0.6	7.4	6.8	59.4	59.3	0.7	0.3
		400	10.3	9.2	59.2	59.0	1.3	0.9	8.7	8.6	60.5	60.4	0.9	0.4
		500	7.9	7.9	65.7	62.3	1.0	0.4	9.8	9.8	62.3	61.0	1.0	0.6
18	4	450	8.4	8.2	63.1	61.3	1.1	0.7	7.4	7.4	65.2	62.1	0.7	0.3
		600	9.7	9.7	65.4	62.1	1.2	1.2	8.4	8.4	67.4	62.8	0.8	0.3
		750	10.8	10.8	66.9	62.7	1.3	0.7	9.1	9.1	69.0	63.4	0.9	0.4
	6	450	14.2	11.3	57.2	57.0	1.8	1.7	10.3	9.9	60.1	60.0	1.0	0.6
		600	18.2	14.8	57.7	57.4	2.3	2.6	12.9	12.8	60.6	60.4	1.3	1.0
		750	21.7	18.0	58.3	57.9	2.7	3.6	15.9	15.8	60.9	60.5	1.6	1.4
24	4	600	12.0	12.0	61.8	60.9	1.6	0.4	10.4	10.4	64.7	61.7	1.0	0.3
		800	13.9	13.9	64.3	61.7	1.8	0.5	11.9	11.9	66.5	62.5	1.2	0.3
		1000	16.4	16.4	65.1	62.0	2.1	1.1	13.1	13.1	68.2	63.1	1.3	0.3
	6	600	19.0	15.1	57.1	57.0	2.4	1.3	14.5	13.5	59.7	59.5	1.4	0.5
		800	24.8	19.9	57.4	57.2	3.1	2.0	16.6	16.6	61.3	60.7	1.7	0.7
		1000	29.7	24.3	57.9	57.7	3.7	2.8	21.2	21.2	60.8	60.5	2.1	1.1
36	4	900	25.5	21.2	58.6	58.1	3.2	1.9	16.1	16.1	63.8	61.6	1.6	0.6
		1200	32.5	27.4	59.3	58.6	4.1	3.0	21.2	21.2	64.0	61.6	2.1	0.9
		1500	38.3	33.0	60.0	59.1	4.8	4.0	26.9	26.9	63.8	61.6	2.7	1.4
	6	900	36.5	25.9	53.9	53.8	4.5	5.2	28.6	22.8	57.0	56.9	2.9	2.3
		1200	45.9	33.3	54.8	54.6	5.7	7.8	37.1	29.9	57.4	57.2	3.7	3.6
		1500	54.2	40.2	55.7	55.4	6.8	10.5	44.4	36.5	58.0	57.7	4.4	4.9
54	4	1350	25.53	25.5	62.9	61.2	3.19	0.4	20.7	20.7	66.1	62.4	2.1	0.2
		1800	35.01	35.0	62.4	61.1	4.4	0.7	23.5	23.5	68.2	63.1	2.4	0.2
		2250	49.54	47.6	61.1	60.2	6.2	1.2	25.5	25.5	69.7	63.6	2.55	0.3
	6	1350	46.32	35.5	56.2	56.1	5.8	1.5	36.2	33.7	58.7	58.6	3.6	0.7
		1800	63.10	45.9	55.9	55.8	7.9	2.7	43.5	40.5	59.6	59.5	4.4	0.9
		2250	69.86	56.3	57.3	57.2	8.7	3.2	53.4	50.2	59.8	59.7	5.3	1.3
72	4	1800	52.63	34.2	58.0	57.5	6.6	0.8	26.6	26.6	66.6	62.6	2.7	0.3
		2400	64.20	50.4	59.2	58.5	8.0	1.5	38.2	38.2	65.6	62.2	3.8	0.6
		3000	73.79	72.7	60.3	59.4	9.2	2.6	43.9	55.1	66.8	63.1	4.4	0.6
	6	1800	67.40	49.6	55.0	54.9	8.4	3.5	54.2	44.7	57.4	57.3	5.4	1.8
		2400	84.13	63.8	55.9	55.8	10.5	5.1	67.6	57.5	58.3	58.2	6.8	2.3
		3000	98.27	76.5	57.0	56.8	12.3	6.8	80.4	69.9	58.9	58.7	8.0	3.2
90	4	2250	60.23	51.8	59.1	58.7	7.5	1.3	40.3	39.5	63.9	61.4	4.0	1.8
		3000	76.23	67.0	59.8	59.1	9.5	1.9	51.0	51.0	64.6	61.9	5.1	0.6
		3750	89.48	80.7	60.5	59.6	11.2	2.5	63.9	63.9	64.6	61.8	6.4	0.9
	6	2250	87.29	63.2	54.5	54.4	10.9	3.4	68.5	55.8	57.5	57.4	6.9	1.5
		3000	109.30	81.4	55.4	55.3	13.7	5.1	88.2	73.2	57.9	57.8	8.8	2.3
		3750	128.13	97.8	56.5	56.3	16.0	6.8	105.0	89.6	58.3	58.2	10.5	3.2

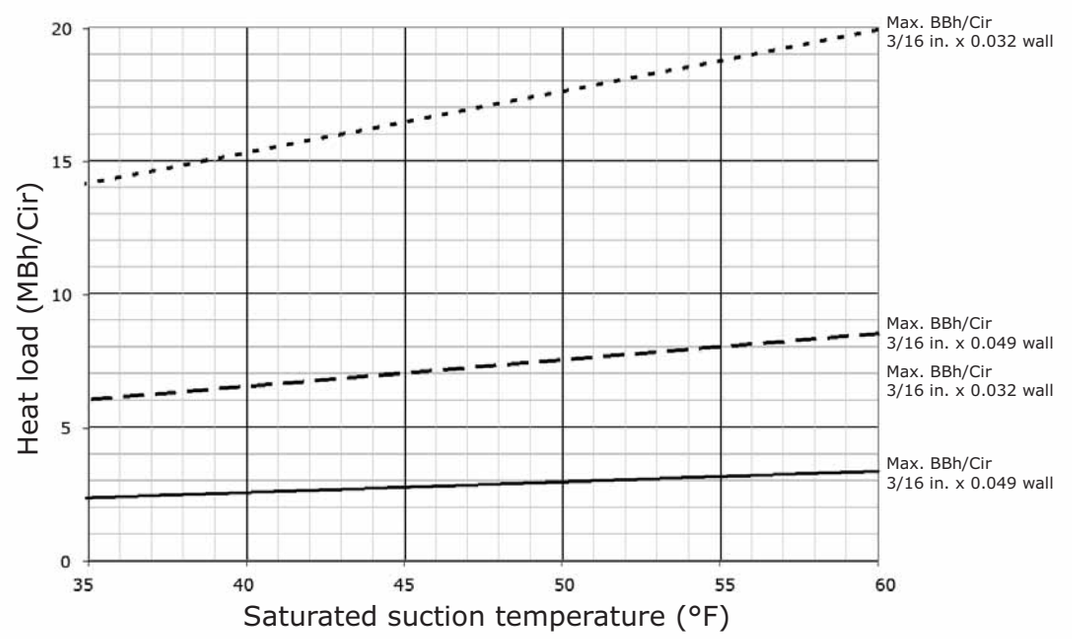
Notes:

- Light shading = GPM is below the minimum (<1.5 fps self-venting velocity) or above the maximum (>10 ft wg) recommended for most applications.
- Dark shading = GPM is below the ARI limits (1.0 fps tube side velocity).
- Some of the volumetric flow rates are less than those required for self-venting (Table 1, p. 20).
- Capacities calculated with 0.00000 tube-side fouling factor.
- High-capacity coils applicable where higher water pressure differentials are acceptable and are also recommended for Earthwise™ applications.
- Earthwise™ is a trademark of Trane to identify equipment designed for applications requiring greater water temperature rises, lower entering water temperatures (EWT) and lower air supply temperatures (LDB).
- TC = total capacity (MBh); SC = sensible capacity (MBh); GPM = water flow rate-gallons per minute; LDB = leaving dry-bulb temperature (°F); LWB = leaving wet-bulb temperature (°F); WPD = water pressure drop at average water density (ft H_20).

Distributor Selection

Select distributor size using MBh/Cir based on system analysis with matching condensing unit operating.

Figure 37. R-410A Blower coil distributor selection



R-410A, DX Cooling Capacities

Table 30. R-410A, 3-row DX cooling capacities

Unit Size	Air Flow	Suct. Temp	Entering Dry Bulb / Wet Bulb (°F) 75/63 TC	SC	LDB	LWB	80/67 TC	SC	LDB	LWB	85/71 TC	SC	LDB	LWB
12	300	40	11.8	8.3	49.8	49.0	14.9	9.5	51.2	50.3	18.2	10.6	52.7	51.8
		45	9.0	7.0	53.7	52.7	12.1	8.3	54.8	53.9	15.4	9.5	56.2	55.3
		50	6.1	5.9	57.2	56.1	9.0	7.1	58.6	57.6	12.4	8.3	59.9	58.8
		55	4.7	4.6	60.8	57.9	6.4	6.0	61.6	60.5	9.0	7.1	63.6	62.4
	400	40	14.3	10.2	51.6	50.4	17.9	11.7	53.4	52.2	21.8	13.0	55.3	54.1
		45	10.9	8.8	55.0	53.7	14.6	10.3	56.6	55.3	18.6	11.7	58.4	57.1
		50	7.6	7.5	58.0	56.7	10.9	8.8	59.9	58.5	14.9	10.3	61.6	60.1
		55	5.8	5.8	61.8	58.2	7.5	7.5	62.9	61.3	10.9	8.9	64.9	63.3
	500	40	16.3	12.0	53.2	51.7	20.4	13.6	55.3	53.7	24.8	15.1	57.5	56.0
		45	12.5	10.3	56.2	54.6	16.6	12.0	58.1	56.5	21.0	13.6	60.3	58.5
		50	8.9	8.9	58.9	57.1	12.5	10.4	61.1	59.3	16.9	12.1	63.1	61.2
		55	6.5	6.5	63.1	58.7	8.8	8.8	64.0	61.6	12.4	10.5	66.0	64.0
18	450	40	16.9	11.9	50.8	49.8	20.9	13.5	52.6	51.5	25.3	15.0	54.6	53.5
		45	13.1	10.3	54.2	53.0	17.3	12.0	55.8	54.6	21.7	13.6	57.6	56.4
		50	9.3	8.7	57.3	56.1	13.2	10.3	59.1	57.8	17.7	12.0	60.7	59.4
		55	6.7	6.7	61.5	58.1	9.2	8.9	62.1	60.8	13.2	10.4	64.0	62.6
	600	40	20.0	14.5	52.9	51.4	24.7	16.4	55.1	53.6	29.7	18.1	57.5	56.0
		45	15.5	12.7	55.8	54.2	20.4	14.6	57.8	56.2	25.6	16.5	60.0	58.3
		50	11.2	10.9	58.4	56.8	15.6	12.8	60.6	58.9	20.9	14.7	62.7	60.9
		55	8.3	8.3	62.4	58.5	11.1	11.1	63.2	61.4	15.7	12.9	65.5	63.6
	750	40	22.4	16.8	54.5	52.7	27.6	18.9	57.1	55.2	33.5	20.8	59.6	57.6
		45	17.5	14.8	57.0	55.1	22.9	17.0	59.4	57.4	28.6	19.0	62.0	59.9
		50	12.9	12.9	59.4	57.3	17.6	15.0	61.9	59.8	23.4	17.1	64.3	62.1
		55	9.8	9.8	63.2	58.8	12.9	12.8	64.5	61.8	17.6	15.1	66.7	64.4
24	600	40	23.4	16.4	50.0	49.1	29.2	18.7	51.6	50.7	35.3	20.8	53.4	52.5
		45	18.2	14.1	53.6	52.5	24.1	16.5	55.0	54.0	30.3	18.7	56.6	55.6
		50	12.8	11.9	56.9	55.9	18.3	14.2	58.5	57.4	24.7	16.5	60.0	58.8
		55	9.5	9.4	60.7	57.8	12.6	12.1	61.7	60.5	18.4	14.3	63.5	62.2
	800	40	28.0	20.1	52.0	50.7	34.7	22.8	54.0	52.7	41.8	25.2	56.3	55.0
		45	21.8	17.5	55.1	53.7	28.7	20.3	56.9	55.5	36.0	22.9	59.0	57.5
		50	15.6	15.0	58.0	56.5	21.9	17.6	60.0	58.5	29.4	20.4	61.9	60.3
		55	11.5	11.5	62.0	58.3	15.5	15.2	62.7	61.1	22.0	17.8	64.9	63.2
	1000	40	31.7	23.4	53.7	52.0	39.1	26.3	56.0	54.3	47.5	29.1	58.4	56.7
		45	24.7	20.5	56.4	54.6	32.4	23.6	58.6	56.8	40.5	26.5	60.9	59.1
		50	18.0	17.8	58.8	57.0	24.8	20.7	61.2	59.3	33.1	23.7	63.5	61.5
		55	13.5	13.5	62.8	58.6	17.9	17.9	63.8	61.6	24.9	20.9	66.1	64.0
36	900	40	36.6	25.3	49.3	48.5	45.8	28.9	50.6	49.8	55.8	32.4	52.1	51.3
		45	28.1	21.6	53.1	52.2	37.5	25.3	54.3	53.4	47.5	28.9	55.7	54.8
		50	19.5	18.0	56.7	55.7	28.3	21.6	58.1	57.1	38.4	25.4	59.4	58.3
		55	14.4	14.3	60.4	57.7	19.2	18.3	61.6	60.4	28.3	21.7	63.1	62.0
	1200	40	44.3	31.3	51.1	50.0	55.3	35.7	52.9	51.7	67.2	39.8	54.8	53.6
		45	34.0	26.9	54.6	53.3	45.3	31.4	56.2	54.8	57.2	35.7	57.9	56.6
		50	24.0	22.8	57.7	56.3	34.2	27.0	59.5	58.1	46.2	31.5	61.2	59.7
		55	18.0	17.8	61.4	58.1	23.7	23.2	62.5	61.0	34.2	27.2	64.5	62.9
	1500	40	50.6	36.6	52.7	51.2	63.1	41.5	54.8	53.2	76.5	46.1	57.0	55.4
		45	39.0	31.6	55.8	54.2	51.7	36.7	57.7	56.0	65.1	41.6	59.8	58.1
		50	27.8	27.2	58.5	56.8	39.0	31.8	60.7	58.9	52.5	36.8	62.7	60.9
		55	20.6	20.6	62.5	58.5	27.6	27.5	63.4	61.4	39.0	32.1	65.6	63.7

Table 30. R-410A, 3-row DX cooling capacities (continued)

Unit Size	Air Flow	Suct. Temp	Entering Dry Bulb / Wet Bulb (°F) 75/63 TC	SC	LDB	LWB	80/67 TC	SC	LDB	LWB	85/71 TC	SC	LDB	LWB
54	1350	40	54.9	38.0	49.3	48.5	68.7	43.4	50.6	49.8	83.7	48.7	52.1	51.3
		45	42.2	32.4	53.1	52.2	56.3	38.0	54.3	53.4	71.3	43.4	55.7	54.8
		50	29.2	27.1	56.7	55.7	42.5	32.4	58.1	57.1	57.6	38.0	59.4	58.3
		55	21.7	21.5	60.4	57.7	28.9	27.4	61.6	60.4	42.5	32.6	63.1	62.0
	1800	40	66.4	47.0	51.1	50.0	83.0	53.5	52.9	51.7	100.8	59.7	54.8	53.6
		45	51.1	40.4	54.6	53.3	67.9	47.1	56.2	54.8	85.8	53.5	57.9	56.6
		50	36.0	34.2	57.7	56.3	51.3	40.5	59.5	58.1	69.3	47.2	61.2	59.7
		55	26.9	26.7	61.4	58.1	35.6	34.8	62.5	61.0	51.3	40.8	64.5	62.9
	2250	40	75.9	54.9	52.7	51.2	94.7	62.2	54.8	53.2	114.7	69.2	57.0	55.4
		45	58.4	47.4	55.8	54.2	77.5	55.1	57.7	56.0	97.7	62.3	59.8	58.1
		50	41.7	40.7	58.5	56.8	58.5	47.8	60.7	58.9	78.8	55.3	62.7	60.9
		55	30.9	30.9	62.5	58.5	41.4	41.3	63.4	61.4	58.4	48.1	65.6	63.7
72	1800	40	72.1	50.1	49.6	48.7	89.6	56.9	51.1	50.3	108.3	63.4	52.9	52.0
		45	56.3	43.1	53.2	52.2	74.1	50.2	54.6	53.6	93.1	57.0	56.2	55.2
		50	39.8	36.3	56.6	55.6	56.8	43.2	58.2	57.0	76.1	50.3	59.6	58.5
		55	28.4	28.4	60.7	57.8	39.4	36.7	61.5	60.3	57.2	43.4	63.1	61.9
	2400	40	86.4	61.5	51.6	50.3	107.0	69.5	53.6	52.3	128.8	77.1	55.7	54.5
		45	67.6	53.4	54.7	53.4	88.6	61.8	56.6	55.1	110.9	69.7	58.6	57.1
		50	48.4	45.6	57.7	56.3	68.0	53.7	59.7	58.1	90.7	62.0	61.5	60.0
		55	35.5	35.5	35.5	61.6	48.0	46.3	62.5	60.9	68.2	54.1	64.6	62.9
	3000	40	97.9	71.5	53.3	51.7	120.9	80.4	55.6	53.9	143.8	87.0	58.5	56.5
		45	76.7	62.4	56.0	54.3	100.3	71.9	58.2	56.4	125.1	80.8	60.5	58.7
		50	55.7	54.0	58.6	56.8	77.1	62.9	60.9	59.0	102.3	72.3	63.1	61.1
		55	41.7	41.7	41.7	62.4	55.3	55.0	63.4	61.4	77.2	63.5	65.8	63.7
90	2250	40	92.0	63.6	49.2	48.3	114.4	72.3	50.6	49.8	138.4	80.7	52.3	51.5
		45	71.9	54.6	52.9	51.9	94.7	63.7	54.2	53.2	118.9	72.4	55.7	54.7
		50	50.7	45.9	56.4	55.4	72.6	54.8	57.8	56.8	97.2	63.9	59.2	58.1
		55	46.8	44.4	57.1	56.0	68.0	53.0	58.6	57.5	92.6	62.1	59.9	58.8
	3000	40	110.8	78.4	51.1	50.0	137.3	88.7	53.0	51.8	165.6	98.5	55.1	53.9
		45	86.7	67.9	54.4	53.1	113.7	78.7	56.1	54.8	142.4	89.0	58.0	56.7
		50	61.9	57.8	57.5	56.1	87.3	68.3	59.3	57.9	116.5	79.0	61.1	59.6
		55	57.5	56.1	58.0	56.6	81.8	66.2	59.9	58.5	110.9	77.0	61.7	60.2
	3750	40	126.1	91.3	52.8	51.3	155.8	102.9	55.0	53.4	192.1	115.2	56.9	55.3
		45	98.7	79.6	55.7	54.0	129.2	91.8	57.7	56.0	161.2	103.3	60.0	58.2
		50	71.4	68.6	58.3	56.7	99.2	80.2	60.6	58.8	132.0	92.3	62.7	60.8
		55	53.2	53.2	62.1	58.4	70.8	69.8	63.1	61.2	99.4	80.9	65.5	63.5

Notes: To select the correct distributor size at conditions exactly matching those shown on this table, use the shading legend below:

- No shade = 3/16 in. x 0.049 wall distributor tubes
- Light shading = 3/16 in. x 0.032 wall distributor tubes.
- Dark shading = Distributor load (MBh) per circuit is under the minimum for 3/16 in. x 0.049 distributor or over the maximum for 3/16 in. x 0.032 distributor. Use only for interpolation
- Values shown in this table are based on a liquid condensing temperature of 105°F. Capacities at liquid condensing temperatures between 90°F and 120°F will generally be within ±5 percent of capacities shown in this table
- Distributor selection is based on TC capacities divided by number of circuits (see Table 4, p. 22).
- To select the correct distributor size at conditions other than exactly shown in this table interpolate to calculate the TC MBh, divide it by the number of circuits (see Table 4, p. 22) and plot the result on Figure 37, p. 60.
- TC and SC values do not include heat generated by the fan and motor.
- TC = total capacity (MBh); SC = sensible capacity (MBh); GPM = water flow rate-gallons per minute; LDB = leaving dry-bulb temperature (°F); LWB = leaving wet-bulb temperature (°F); WPD = water pressure drop at average water density (ft H_20).

Table 31. R-410A, 4-row DX cooling capacities

Unit Size	Air Flow	Suct Temp	Entering Dry Bulb / Wet Bulb (°F) 75/63 TC	SC	LDB	LWB	80/67 TC	SC	LDB	LWB	85/71 TC	SC	LDB	LWB
12	300	40	13.4	9.1	47.2	46.8	16.7	10.4	48.2	47.9	20.2	11.7	49.5	49.2
		45	10.4	7.8	51.3	50.9	13.8	9.2	52.1	51.7	17.4	10.5	53.2	52.8
		50	7.3	6.5	55.3	54.8	10.5	7.8	56.2	55.8	14.2	9.2	57.2	56.7
		55	5.3	5.3	59.0	57.2	7.2	6.6	60.1	59.6	10.6	7.9	61.2	60.7
	400	40	16.4	11.4	48.9	48.3	20.3	13.0	50.4	49.9	24.5	14.4	52.1	51.6
		45	12.8	9.9	52.5	51.9	16.8	11.5	53.8	53.2	21.1	13.0	55.4	54.7
		50	9.1	8.3	56.0	55.4	12.9	9.9	57.5	56.8	17.3	11.5	58.8	58.1
		55	6.4	6.4	60.4	57.7	9.0	8.4	60.8	60.1	13.0	10.0	62.4	61.6
	500	40	18.8	13.4	50.4	49.7	23.3	15.2	52.3	51.5	28.0	16.8	54.4	53.6
		45	14.7	11.7	53.7	52.9	19.4	13.5	55.3	54.5	24.2	15.3	57.2	56.3
		50	10.6	10.0	56.8	55.9	14.9	11.8	58.6	57.6	19.9	13.6	60.3	59.3
		55	7.7	7.7	61.0	57.9	10.5	10.2	61.5	60.6	15.0	11.9	63.5	62.4
18	450	40	18.8	13.1	48.4	48.0	23.1	14.8	50.1	49.6	27.7	16.3	51.9	51.5
		45	15.0	11.4	51.9	51.4	19.5	13.2	53.3	52.8	24.2	14.9	54.9	54.4
		50	10.8	9.7	55.4	54.9	15.2	11.5	56.8	56.2	20.1	13.3	58.2	57.6
		55	7.7	7.7	59.5	57.4	10.7	9.8	60.3	59.6	15.4	11.5	61.7	61.1
	600	40	22.4	16.1	50.5	49.8	27.4	18.0	52.6	51.8	32.8	19.8	54.9	54.1
		45	18.0	14.2	53.5	52.7	23.2	16.3	55.3	54.5	28.7	18.2	57.4	56.6
		50	13.2	12.2	56.5	55.6	18.3	14.3	58.3	57.4	23.9	16.4	60.2	59.3
		55	9.6	9.6	60.4	57.7	13.1	12.4	61.2	60.3	18.4	14.5	63.2	62.2
	750	40	25.3	18.7	52.2	51.2	30.9	20.8	54.6	53.6	36.7	22.8	57.2	56.2
		45	20.4	16.6	54.8	53.7	26.1	19.0	57.0	55.9	32.2	21.1	59.4	58.3
		50	15.2	14.6	57.3	56.2	20.7	16.9	59.6	58.4	26.9	19.2	61.8	60.6
		55	11.4	11.4	61.2	58.0	15.2	14.9	62.0	60.8	20.9	17.1	64.4	63.1
24	600	40	26.1	17.9	47.6	47.3	32.1	20.3	49.1	48.7	38.6	22.5	50.8	50.4
		45	20.7	15.5	51.4	50.9	27.0	18.1	52.6	52.1	33.6	20.4	54.0	53.6
		50	14.9	13.1	55.1	54.6	21.1	15.6	56.3	55.8	27.9	18.2	57.5	57.0
		55	10.4	10.4	59.3	57.3	14.8	13.3	59.9	59.4	21.4	15.7	61.2	60.7
	800	40	31.4	22.2	49.6	49.0	38.5	25.0	51.5	50.9	46.0	27.5	53.7	53.0
		45	25.1	19.5	52.8	52.2	32.5	22.4	54.5	53.8	40.3	25.2	56.4	55.7
		50	18.3	16.7	56.0	55.3	25.5	19.6	57.7	56.9	33.5	22.6	59.3	58.6
		55	13.2	13.2	60.0	57.6	18.2	16.9	60.8	60.0	25.8	19.8	62.6	61.7
	1000	40	35.7	25.9	51.3	50.5	43.5	29.0	53.6	52.7	51.9	31.7	56.0	55.1
		45	28.6	22.9	54.1	53.2	36.9	26.2	56.1	55.2	45.5	29.3	58.3	57.4
		50	21.2	19.9	56.9	55.9	29.1	23.2	58.9	57.9	38.0	26.5	60.9	59.9
		55	15.7	15.7	60.8	57.8	21.1	20.3	61.6	60.5	29.4	23.5	63.7	62.6
36	900	40	41.3	27.9	46.6	46.3	51.3	31.9	47.6	47.3	62.1	35.6	48.8	48.5
		45	32.3	23.9	50.8	50.3	42.6	28.0	51.6	51.2	53.5	31.9	52.7	52.3
		50	22.8	19.9	54.8	54.4	32.8	24.0	55.8	55.3	43.9	28.0	56.7	56.2
		55	16.2	16.1	58.6	57.0	22.6	20.1	59.7	59.2	33.2	24.0	60.8	60.2
	1200	40	50.6	35.0	48.3	47.8	62.7	39.7	49.8	49.2	75.6	44.2	51.4	50.9
		45	39.8	30.2	52.1	51.5	52.2	35.1	53.3	52.7	65.3	39.8	54.8	54.2
		50	28.4	25.5	55.7	55.0	40.3	30.3	57.0	56.3	53.6	35.2	58.3	57.6
		55	20.1	20.1	59.8	57.5	28.1	25.8	60.5	59.8	40.6	30.5	62.0	61.2
	1500	40	58.4	41.2	49.9	49.1	72.2	46.6	51.7	50.9	86.8	51.6	53.6	52.9
		45	46.0	35.8	53.2	52.4	60.1	41.4	54.8	54.0	75.0	46.8	56.6	55.8
		50	33.1	30.6	56.5	55.6	46.4	36.0	58.2	57.2	61.7	41.6	59.8	58.9
		55	24.0	24.0	60.5	57.7	32.8	31.0	61.2	60.3	46.7	36.3	63.1	62.1

Table 31. R-410A, 4-row DX cooling capacities (continued)

Unit Size	Air Flow	Suct Temp	Entering Dry Bulb / Wet Bulb (°F) 75/63 TC	SC	LDB	LWB	80/67 TC	SC	LDB	LWB	85/71 TC	SC	LDB	LWB
54	1350	40	61.9	41.9	46.6	46.3	77.0	47.8	47.6	47.3	93.1	53.4	48.8	48.5
		45	48.5	35.9	50.8	50.3	63.9	42.0	51.6	51.2	80.3	47.9	52.7	52.3
		50	34.3	29.9	54.8	54.4	49.2	36.0	55.8	55.3	65.9	42.1	56.7	56.2
		55	24.6	24.2	58.6	57.0	33.9	30.2	59.7	59.2	49.8	36.1	60.8	60.2
	1800	40	76.0	52.5	48.3	47.8	94.1	59.6	49.8	49.2	113.5	66.2	51.4	50.9
		45	59.6	45.3	52.1	51.5	78.2	52.7	53.3	52.7	98.0	59.7	54.8	54.2
		50	42.6	38.2	55.7	55.0	60.4	45.5	57.0	56.3	80.4	52.8	58.3	57.6
		55	30.1	30.1	59.8	57.5	42.2	38.6	60.5	59.8	60.8	45.7	62.0	61.2
	2250	40	87.7	61.9	49.9	49.1	108.3	69.9	51.7	50.9	130.2	77.4	53.6	52.9
		45	69.0	53.7	53.2	52.4	90.1	62.1	54.8	54.0	112.5	70.1	56.6	55.8
		50	49.7	45.8	56.5	55.6	69.7	54.0	58.2	57.2	92.5	62.4	59.8	58.9
		55	36.0	36.0	60.5	57.7	49.2	46.5	61.2	60.3	70.1	54.4	63.1	62.1
72	1800	40	80.4	54.8	47.1	46.8	99.0	62.0	48.5	48.1	118.8	68.8	50.1	49.7
		45	64.0	47.5	50.9	50.5	83.2	55.1	52.1	51.6	103.5	62.3	53.4	53.0
		50	46.2	40.0	54.8	54.3	65.1	47.7	55.9	55.4	86.0	55.3	57.0	56.6
		55	32.0	32.0	58.8	57.1	45.8	40.4	59.6	59.1	66.1	47.9	60.8	60.3
	2400	40	97.2	68.0	49.1	48.5	119.2	76.5	50.9	50.3	140.7	83.1	53.3	52.6
		45	77.7	59.4	52.4	51.7	100.5	68.5	54.0	53.3	124.5	77.0	55.8	55.1
		50	56.7	50.8	55.7	55.0	78.9	59.9	57.3	56.6	103.7	68.9	58.9	58.1
		55	40.6	40.6	59.6	57.4	56.4	51.4	60.6	59.8	80.0	60.3	62.2	61.4
	3000	40	110.9	79.6	50.8	49.9	135.4	89.0	52.9	52.1	159.6	96.2	55.7	54.6
		45	88.9	70.1	53.7	52.8	114.5	80.3	55.6	54.7	141.3	89.8	57.8	56.8
		50	65.7	60.6	56.6	55.7	90.3	70.8	58.5	57.5	118.0	81.0	60.5	59.4
		55	48.3	48.3	60.4	57.7	65.3	61.6	61.4	60.3	91.2	71.5	63.4	62.3
90	2250	40	102.5	69.5	46.7	46.4	126.2	78.7	48.0	47.7	151.5	87.5	49.5	49.2
		45	81.5	60.0	50.6	50.2	106.0	69.8	51.7	51.3	132.0	79.0	53.0	52.6
		50	58.7	50.5	54.6	54.1	82.9	60.3	55.6	55.2	109.6	70.0	56.7	56.2
		55	54.1	48.6	55.3	54.9	78.0	58.4	56.4	55.9	104.8	68.2	57.4	57.0
	3000	40	124.5	86.5	48.6	48.1	152.8	97.4	50.3	49.8	182.7	107.7	52.3	51.7
		45	99.4	75.4	52.1	51.4	128.7	87.1	53.5	52.9	159.6	98.0	55.2	54.6
		50	72.4	64.2	55.5	54.8	101.0	75.9	57.0	56.3	132.9	87.6	58.5	57.8
		55	67.1	62.2	56.1	55.5	95.2	73.7	57.7	57.0	127.1	85.4	59.1	58.4
	3750	40	142.5	101.5	50.3	49.5	174.3	113.7	52.3	51.6	216.2	128.2	53.7	53.0
		45	114.2	89.2	53.3	52.5	147.2	102.4	55.1	54.3	181.9	114.6	57.2	56.3
		50	84.1	76.8	56.3	55.5	115.9	90.0	58.2	57.3	151.8	103.2	60.0	59.1
		55	61.3	61.3	60.2	57.6	83.6	78.0	61.1	60.2	117.2	90.8	63.1	62.0

Notes: To select the correct distributor size at conditions exactly matching those shown on this table, use the shading legend below:

- No shade = 3/16 in. x 0.049 wall distributor tubes
- Light shading = 3/16 in. x 0.032 wall distributor tubes.
- Dark shading = Distributor load (MBh) per circuit is under the minimum for 3/16 in. x 0.049 distributor or over the maximum for 3/16 in. x 0.032 distributor. Use only for interpolation
- Values shown in this table are based on a liquid condensing temperature of 105°F. Capacities at liquid condensing temperatures between 90°F and 120°F will generally be within ±5 percent of capacities shown in this table
- Distributor selection is based on TC capacities divided by number of circuits (see Table 4, p. 22).
- To select the correct distributor size at conditions other than exactly shown in this table interpolate to calculate the TC MBh, divide it by the number of circuits (see Table 4, p. 22) and plot the result on Figure 37, p. 60.
- TC and SC values do not include heat generated by the fan and motor.
- TC = total capacity (MBh); SC = sensible capacity (MBh); GPM = water flow rate-gallons per minute; LDB = leaving dry-bulb temperature (°F); LWB = leaving wet-bulb temperature (°F); WPD = water pressure drop at average water density (ft H_20).

Table 32. R-410A, 6-row DX cooling capacities

Unit Size	Air Flow	Suct. Temp	Entering Dry Bulb / Wet Bulb (°F) 75/63 TC	SC	LDB	LWB	80/67 TC	SC	LDB	LWB	85/71 TC	SC	LDB	LWB
12	300	40	15.0	10.0	44.5	44.4	18.9	11.6	44.8	44.7	23.1	13.1	45.1	45.0
		45	11.5	8.4	49.5	49.4	15.5	10.0	49.6	49.5	19.8	11.5	49.8	49.7
		50	8.5	7.1	53.4	53.3	12.1	8.5	54.0	53.9	16.0	10.0	54.7	54.6
		55	5.8	5.7	57.5	56.6	8.4	7.1	58.4	58.3	12.2	8.5	59.1	59.0
	400	40	19.1	12.9	45.6	45.5	24.0	14.8	46.1	46.0	29.3	16.7	46.8	46.7
		45	14.6	10.8	50.2	50.1	19.6	12.9	50.7	50.5	25.0	14.8	51.2	51.1
		50	10.6	9.1	54.1	54.0	14.8	10.9	55.3	55.1	20.2	12.9	55.8	55.6
		55	7.4	7.4	58.2	56.8	10.5	9.2	59.0	58.8	14.9	10.9	60.3	60.1
	500	40	22.7	15.5	46.7	46.5	28.5	17.8	47.5	47.3	34.7	20.0	48.5	48.3
		45	17.4	13.2	51.0	50.8	23.3	15.5	51.7	51.5	29.6	17.8	52.6	52.3
		50	12.0	10.9	55.1	54.9	17.6	13.2	56.0	55.8	23.9	15.5	56.8	56.5
		55	8.9	8.9	58.8	57.1	12.5	11.2	59.6	59.3	17.7	13.2	61.0	60.7
18	450	40	22.2	14.9	44.8	44.7	27.8	17.0	45.4	45.3	33.7	19.1	46.1	46.0
		45	17.4	12.6	49.4	49.3	23.0	14.9	49.8	49.7	29.0	17.0	50.4	50.3
		50	12.1	10.4	53.9	53.8	17.6	12.6	54.4	54.3	23.8	14.9	54.9	54.8
		55	8.6	8.6	57.6	56.6	12.5	10.6	58.5	58.3	17.9	12.7	59.4	59.3
	600	40	27.8	18.9	46.2	46.0	34.6	21.5	47.2	47.0	41.9	24.1	48.3	48.2
		45	21.8	16.2	50.4	50.2	28.7	18.9	51.2	51.0	36.1	21.6	52.2	52.0
		50	15.4	13.5	54.5	54.3	22.1	16.2	55.4	55.2	29.5	18.9	56.3	56.0
		55	11.0	11.0	58.3	56.9	15.2	13.6	59.4	59.1	22.3	16.3	60.4	60.2
	750	40	32.6	22.5	47.5	47.3	40.5	25.6	48.8	48.6	48.8	28.5	50.3	50.1
		45	25.6	19.4	51.4	51.1	33.6	22.6	52.5	52.2	42.1	25.7	53.8	53.5
		50	18.2	16.4	55.1	54.8	25.9	19.5	56.3	56.0	34.5	22.7	57.5	57.2
		55	12.9	12.9	59.4	57.3	18.0	16.6	59.9	59.6	26.1	19.6	61.3	60.9
24	600	40	30.3	20.1	44.3	44.2	37.8	23.1	44.8	44.7	45.9	26.0	45.4	45.3
		45	23.6	17.0	49.1	49.0	31.3	20.1	49.4	49.3	39.6	23.1	49.8	49.7
		50	17.2	14.3	53.2	53.1	24.0	17.1	54.1	54.0	32.4	20.1	54.4	54.3
		55	11.7	11.6	57.3	56.5	17.1	14.3	58.2	58.1	24.4	17.1	59.1	59.0
	800	40	38.2	25.7	45.6	45.4	47.5	29.4	46.4	46.3	57.6	32.9	47.4	47.2
		45	29.8	21.9	50.0	49.8	39.4	25.8	50.6	50.5	49.6	29.4	51.4	51.3
		50	20.9	18.2	54.3	54.1	30.3	22.0	55.0	54.8	40.6	25.8	55.7	55.5
		55	15.0	14.9	58.0	56.8	20.7	18.4	59.1	59.0	30.6	22.0	60.0	59.8
	1000	40	45.0	30.8	46.8	46.6	56.0	35.1	47.9	47.7	67.6	39.1	49.2	49.0
		45	35.3	26.5	50.9	50.6	46.4	30.9	51.8	51.6	58.3	35.2	52.9	52.7
		50	25.0	22.2	54.8	54.5	35.7	26.5	55.8	55.6	47.8	31.0	56.8	56.6
		55	18.1	17.9	58.6	57.0	24.7	22.4	59.6	59.3	36.1	26.7	60.8	60.5
36	900	40	45.6	30.2	44.2	44.1	56.0	34.3	45.2	45.1	67.0	38.1	46.3	46.2
		45	36.7	26.1	48.5	48.4	47.5	30.4	49.2	49.1	58.9	34.5	50.0	49.9
		50	26.7	21.9	52.9	52.8	37.6	26.2	53.4	53.3	49.4	30.5	54.1	54.0
		55	18.1	18.0	56.8	56.3	26.6	22.0	57.8	57.7	38.5	26.4	58.4	58.3
	1200	40	56.6	38.3	45.8	45.7	69.2	43.1	47.1	47.0	82.6	47.7	48.7	48.6
		45	45.8	33.4	49.6	49.5	58.9	38.6	50.6	50.5	72.8	43.5	52.0	51.8
		50	33.7	28.3	53.5	53.4	46.9	33.6	54.5	54.3	61.3	38.8	55.5	55.4
		55	23.0	23.0	57.6	56.6	33.6	28.5	58.4	58.3	47.9	33.8	59.4	59.2
	1500	40	65.9	45.5	47.3	47.1	80.2	51.0	48.9	48.8	95.3	55.9	50.9	50.7
		45	53.6	40.0	50.7	50.4	68.6	45.9	52.1	51.8	84.3	51.5	53.7	53.5
		50	39.7	34.2	54.2	54.0	54.8	40.4	55.5	55.3	71.2	46.3	56.9	56.7
		55	27.9	27.9	58.1	56.8	39.6	34.6	59.0	58.8	55.9	40.7	60.4	60.1

Table 32. R-410A, 6-row DX cooling capacities (continued)

Unit Size	Air Flow	Suct. Temp	Entering Dry Bulb / Wet Bulb (°F) 75/63 TC	SC	LDB	LWB	80/67 TC	SC	LDB	LWB	85/71 TC	SC	LDB	LWB
54	1350	40	68.4	45.3	44.2	44.1	83.9	51.4	45.2	45.1	100.5	57.1	46.3	46.2
		45	55.1	39.2	48.5	48.4	71.2	45.6	49.2	49.1	88.3	51.7	50.0	49.9
		50	40.1	32.8	52.9	52.8	56.4	39.4	53.4	53.3	74.1	45.8	54.1	54.0
		55	27.1	26.9	56.8	56.3	39.9	33.0	57.8	57.7	57.7	39.5	58.4	58.3
	1800	40	84.9	57.5	45.8	45.7	103.8	64.7	47.1	47.0	123.9	71.5	48.7	48.6
		45	68.7	50.1	49.6	49.5	88.4	57.9	50.6	50.5	109.2	65.2	52.0	51.8
		50	50.5	42.4	53.5	53.4	70.4	50.4	54.5	54.3	91.9	58.2	55.5	55.4
		55	34.5	34.5	57.6	56.6	50.3	42.7	58.4	58.3	71.9	50.7	59.4	59.2
	2250	40	98.8	68.2	47.3	47.1	120.4	76.5	48.9	48.8	142.9	83.9	50.9	50.7
		45	80.3	60.0	50.7	50.4	102.8	68.9	52.1	51.8	126.5	77.2	53.7	53.5
		50	59.6	51.4	54.2	54.0	82.3	60.5	55.5	55.3	106.8	69.5	56.9	56.7
		55	41.8	41.8	58.1	56.8	59.4	51.9	59.0	58.8	83.9	61.0	60.4	60.1
72	1800	40	92.6	61.2	43.9	43.8	115.3	70.1	44.3	44.2	139.7	78.8	44.9	44.8
		45	72.9	52.0	48.6	48.5	95.9	61.2	48.9	48.8	120.7	70.2	49.4	49.3
		50	52.3	43.0	53.1	53.0	74.2	52.1	53.6	53.5	99.3	61.3	54.0	53.9
		55	35.6	35.4	57.0	56.4	52.3	43.2	58.1	57.9	75.4	52.1	58.7	58.6
	2400	40	117.0	78.4	45.1	45.0	145.4	89.5	45.9	45.8	175.9	100.3	46.8	46.7
		45	92.1	66.9	49.5	49.4	120.9	78.4	50.2	50.0	151.8	89.5	51.0	50.8
		50	65.3	55.7	53.9	53.7	93.5	67.0	54.6	54.4	124.7	78.5	55.2	55.1
		55	45.5	45.1	57.8	56.7	64.7	56.0	58.8	58.6	94.7	67.2	59.6	59.4
	3000	40	138.3	94.0	46.3	46.1	171.6	106.9	47.4	47.2	207.2	119.3	48.6	48.5
		45	109.0	80.7	50.4	50.2	142.6	94.1	51.4	51.1	178.8	107.1	52.5	52.2
		50	77.8	67.7	54.4	54.2	110.4	80.9	55.4	55.2	146.9	94.2	56.4	56.1
		55	54.4	54.0	58.5	57.0	77.0	68.3	59.3	59.0	111.6	81.2	60.4	60.1
90	2250	40	116.9	77.0	43.7	43.6	145.6	88.4	44.0	43.9	176.5	99.4	44.5	44.4
		45	92.0	65.4	48.4	48.3	121.1	77.1	48.7	48.6	152.4	88.4	49.1	49.0
		50	67.9	54.9	52.7	52.6	93.7	65.4	53.5	53.4	125.4	77.1	53.8	53.7
		55	63.0	52.8	53.5	53.4	87.9	63.1	54.4	54.3	119.6	74.8	54.7	54.6
	3000	40	148.3	99.0	44.8	44.7	184.3	113.2	45.5	45.4	223.1	126.8	46.3	46.2
		45	116.7	84.4	49.3	49.2	153.2	99.0	49.9	49.7	192.5	113.2	50.6	50.4
		50	82.6	70.0	53.7	53.6	118.6	84.5	54.3	54.2	158.3	99.1	54.9	54.8
		55	76.0	67.3	54.6	54.4	111.3	81.6	55.2	55.1	150.9	96.2	55.8	55.7
	3750	40	175.9	119.0	46.0	45.8	218.4	135.6	46.9	46.8	263.8	151.4	48.1	47.9
		45	138.5	102.0	50.2	50.0	181.5	119.1	51.0	50.8	227.7	135.7	52.0	51.8
		50	98.7	85.3	54.3	54.0	140.5	102.2	55.2	54.9	187.0	119.3	56.1	55.8
		55	70.3	69.8	58.0	56.8	97.7	86.0	59.2	58.9	142.0	102.5	60.2	59.9

Notes: To select the correct distributor size at conditions exactly matching those shown on this table, use the shading legend below:

- No shade = 3/16 in. x 0.049 wall distributor tubes
- Light shading = 3/16 in. x 0.032 wall distributor tubes.
- Dark shading = Distributor load (MBh) per circuit is under the minimum for 3/16 in. x 0.049 distributor or over the maximum for 3/16 in. x 0.032 distributor. Use only for interpolation
- Values shown in this table are based on a liquid condensing temperature of 105°F. Capacities at liquid condensing temperatures between 90°F and 120°F will generally be within ±5 percent of capacities shown in this table
- Distributor selection is based on TC capacities divided by number of circuits (see Table 4, p. 22).
- To select the correct distributor size at conditions other than exactly shown in this table interpolate to calculate the TC MBh, divide it by the number of circuits (see Table 4, p. 22) and plot the result on Figure 37, p. 60.
- TC and SC values do not include heat generated by the fan and motor.
- TC = total capacity (MBh); SC = sensible capacity (MBh); GPM = water flow rate-gallons per minute; LDB = leaving dry-bulb temperature (°F); LWB = leaving wet-bulb temperature (°F); WPD = water pressure drop at average water density (ft H_20).

Hot Water Heating Capacities

Table 33. One-row hot water heating capacities, EAT = 60°F and EWT = 180°F

Unit Size	Air Flow	Water Temperature Drop - °F 10°F TC	LAT	GPM	WPD	15°F TC	LAT	GPM	WPD	20°F TC	LAT	GPM	WPD
	300	16.3	110.2	3.3	6.0	15.5	107.6	2.1	2.5	14.6	105.0	1.5	1.3
12	400	18.8	103.4	3.8	7.9	17.8	101.1	2.4	3.3	16.8	98.8	1.7	1.7
	500	20.9	98.5	4.2	9.6	19.8	96.4	2.6	4.0	18.7	94.4	1.9	2.1
	450	22.6	106.4	4.5	11.9	21.6	104.2	2.9	5.0	20.5	102.0	2.0	2.7
18	600	25.9	99.9	5.2	15.4	24.7	98.0	3.3	6.5	23.5	96.1	2.3	3.4
	750	28.7	95.2	5.7	18.6	27.3	93.5	3.6	7.8	25.9	91.8	2.6	4.1
	600	32.5	110.0	6.5	29.3	31.3	108.0	4.2	12.7	30.0	106.1	3.0	6.9
24	800	37.5	103.2	7.5	38.2	36.0	101.4	4.8	16.5	34.5	99.7	3.4	8.9
	1000	41.5	98.3	8.3	46.4	39.8	96.7	5.3	20.0	38.2	95.2	3.8	10.8
	900	51.0	112.3	10.2	82.1	49.3	110.5	6.6	36.1	47.6	108.7	4.8	19.8
36	1200	58.9	105.3	11.8	107.5	56.9	103.7	7.6	47.2	54.9	102.2	5.5	25.9
	1500	65.4	100.2	13.1	131.0	63.1	98.8	8.4	57.4	60.9	97.4	6.1	31.4
	1350	75.5	111.5	15.1	3.3	70.7	108.3	9.4	1.3	66.0	105.1	6.6	0.7
54	1800	87.1	104.6	17.4	4.4	81.5	101.7	10.9	1.7	76.0	98.9	7.6	0.9
	2250	96.8	99.7	19.3	5.4	90.5	97.1	12.0	2.1	84.2	94.5	8.4	1.1
	1800	99.0	110.7	19.8	5.9	93.5	107.9	12.5	2.4	88.1	105.1	8.8	1.2
72	2400	114.2	103.9	22.8	7.7	107.7	101.4	14.3	3.2	101.3	98.9	10.1	1.6
	3000	126.8	99.0	25.3	9.5	119.4	96.7	15.9	3.9	112.2	94.5	11.2	2.0
	2250	125.5	111.4	25.1	7.1	118.5	108.6	15.8	2.9	111.6	105.7	11.2	1.5
90	3000	144.8	104.5	28.9	9.4	136.6	102.0	18.2	3.8	128.5	99.5	12.8	1.9
	3750	160.9	99.6	32.1	11.6	151.6	97.3	20.2	4.7	142.5	95.0	14.2	2.4

Notes:

- Capacities calculated with 0.00025 fouling factor.
- Light shading = GPM is below the minimum (<1.5 fps self-venting velocity) or above the maximum (>10 ft wg) recommended for most applications.
- Dark shading = LAT must be less than 104°F to avoid overheating the motor.
- Fluid flow in GPM; fluid PD in feet of water
- Useful formulas:
  LAT = EAT + (TC x 922.1)/CFM
  LWT = EWT - (TC x 2.0)/CFM
- High-capacity coils applicable where higher water pressure differentials are acceptable and are also recommended for Earthwise™ applications (see Table 34, p. 68).
- Earthwise™ is a trademark of Trane to identify equipment designed for applications requiring greater water temperature rises, lower entering water temperatures (EWT) and lower air supply temperatures (LDB).
- TC = total capacity (MBh); SC = sensible capacity (MBh); GPM = water flow rate-gallons per minute; LDB = leaving dry-bulb temperature (°F); LWB = leaving wet-bulb temperature (°F); WPD = water pressure drop at average water density (ft H_20).

Table 33. One-row hot water heating capacities, EAT = 60°F and EWT = 180°F (continued)

Unit Size	Air Flow	Water Temperature Drop - °F 25°F TC	LAT	GPM	WPD	30°F TC	LAT	GPM	WPD	40°F TC	LAT	GPM	WPD
	300	13.8	102.4	1.1	0.8	12.9	99.8	0.9	0.5	11.2	94.3	0.6	0.2
12	400	15.9	96.5	1.3	1.0	14.9	94.3	1.0	0.6	12.9	89.7	0.6	0.3
	500	17.5	92.4	1.4	1.2	16.4	90.3	1.1	0.8	14.3	86.4	0.7	0.4
	450	19.4	99.8	1.6	1.6	18.4	97.7	1.2	1.0	16.3	93.4	0.8	0.5
18	600	22.2	94.2	1.8	2.0	21.0	92.3	1.4	1.3	18.7	88.7	0.9	0.6
	750	24.5	90.1	2.0	2.5	23.2	88.5	1.5	1.6	20.6	85.3	1.0	0.7
	600	28.7	104.1	2.3	4.2	27.4	102.1	1.8	2.8	24.8	98.2	1.2	1.4
24	800	33.0	98.0	2.6	5.4	31.5	96.3	2.1	3.6	28.6	93.0	1.4	1.8
	1000	36.5	93.6	2.9	6.6	34.8	92.1	2.3	4.3	31.7	89.2	1.6	2.1
	900	45.8	107.0	3.7	12.3	44.1	105.2	2.9	8.2	40.5	101.5	2.0	4.1
36	1200	52.8	100.6	4.2	16.0	50.8	99.0	3.4	10.6	46.9	96.0	2.3	5.4
	1500	58.6	96.0	4.7	19.4	56.3	94.6	3.8	12.9	52.1	92.0	2.6	6.6
	1350	61.3	101.9	4.9	0.4	56.6	98.7	3.8	0.2	45.5	91.1	2.3	0.1
54	1800	70.5	96.1	5.6	0.5	65.0	93.3	4.3	0.3	53.1	87.2	2.7	0.1
	2250	78.1	92.0	6.2	0.6	71.9	89.5	4.8	0.4	59.3	84.3	3.0	0.1
	1800	82.6	102.3	6.6	0.7	77.2	99.5	5.1	0.4	66.2	93.9	3.3	0.2
72	2400	94.9	96.5	7.6	0.9	88.5	94.0	5.9	0.6	76.3	89.3	3.8	0.2
	3000	105.1	92.3	8.4	1.1	97.9	90.1	6.5	0.7	84.5	86.0	4.2	0.3
	2250	104.8	102.9	8.4	0.8	97.9	100.1	6.5	0.5	83.9	94.4	4.2	0.2
90	3000	120.4	97.0	9.6	1.1	112.3	94.5	7.5	0.7	96.8	89.8	4.8	0.3
	3750	133.4	92.8	10.7	1.4	124.3	90.6	8.3	0.8	107.2	86.4	5.4	0.4

Notes:

- Capacities calculated with 0.00025 fouling factor.
- Light shading = GPM is below the minimum (<1.5 fps self-venting velocity) or above the maximum (>10 ft wg) recommended for most applications.
- Dark shading = LAT must be less than 104°F to avoid overheating the motor.
- Fluid flow in GPM; fluid PD in feet of water
- Useful formulas:
  LAT = EAT + (TC x 922.1)/CFM
  LWT = EWT - (TC x 2.0)/CFM
- High-capacity coils applicable where higher water pressure differentials are acceptable and are also recommended for Earthwise™ applications (see Table 34, p. 68).
- Earthwise™ is a trademark of Trane to identify equipment designed for applications requiring greater water temperature rises, lower entering water temperatures (EWT) and lower air supply temperatures (LDB).
- TC = total capacity (MBh); SC = sensible capacity (MBh); GPM = water flow rate-gallons per minute; LDB = leaving dry-bulb temperature (°F); LWB = leaving wet-bulb temperature (°F); WPD = water pressure drop at average water density (ft H_20).

Table 34. Correction factors for Table 33–Table 33

Capacity correction factors: use the correction factors listed below for different entering air conditions.																	
EAT - EWT (°F) =	180	170	160	150	140	130	120	110	100	90	80	70	60	50	40	30	20
Correction factor =	1.50	1.42	1.33	1.25	1.167	1.08	1.00	0.92	0.83	0.75	0.67	0.58	0.50	0.42	0.33	0.25	0.17

Water pressure drop (WPD) correction factors: use the correction factors listed below for entering water temperatures different than 180°F.												
Average water temp. °F =	190	180	170	160	150	140	130	120	110	100	90	80
Correction factor =	1.00	1.00	1.01	1.01	1.02	1.03	1.04	1.06	1.07	1.09	1.11	1.14

Controls

Table 35. Tracer controller input/output summary

	ZN010	ZN510	ZN520	UC400
Binary outputs				
Single zone VAV				•
3-speed fan	•	•	•	
2-position hydronic valve	•	•	•	•
2-position mixing box damper	•	•		•
1-stage electric heat	•	•	•	•
Modulating mixed air damper			•	•
Modulating hydronic valve			•	•
2-stage electric heat			•	•
Reheat (hydronic)			•	•
Generic	•	•	•	•
Binary inputs				
Condensate overflow detection	•	•	•	•
Low temperature detection	•	•	•	•
Occupancy	•	•	•	•
Generic input	•	•	•	•
Analog inputs				
Zone temperature	•	•	•	•
Setpoint	•	•	•	•
Fan mode: auto, high, medium, low	•	•	•	•
Entering water	•	•	•	•
Discharge air	•	•	•	•
Outside air			•	•
Generic				•

Note: The generic input and output are for use with a Tracer Summit systems only.

Table 36. Tracer controller function summary

Control functions	ZN010	ZN510	ZN520	UC400
Entering water temp. sampling (purge)	•	•	•	•
Timed override	•	•	•	•
Auto changeover	•	•	•	•
Fan cycling	•	•		
Warm-up	•	•	•	•
Pre-cool	•	•	•	•
Data sharing (master/slave)		•	•	
Random start	•	•	•	•
Dehumidification			•	
Staged capacity (2-stage electric supplementary)			•	•
DX cooling			•	
Two-stage DX cooling				•
Other Functions				
Manual test	•	•	•	•
Filter maintenance timer	•	•	•	•
Setpoint limits	•	•	•	•

VelociTach™ ECM Engine Controller

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

Figure 38. VelociTach ECM engine controller board

- 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 39. 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 37 and Table 38 for the graphical representation of each alphanumeric character.

Table 37. 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	g	H	I	J	H	L	m	n	O	P	q	r	S	t	U	u	w	H	y	Z

Table 38. 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

Control Options

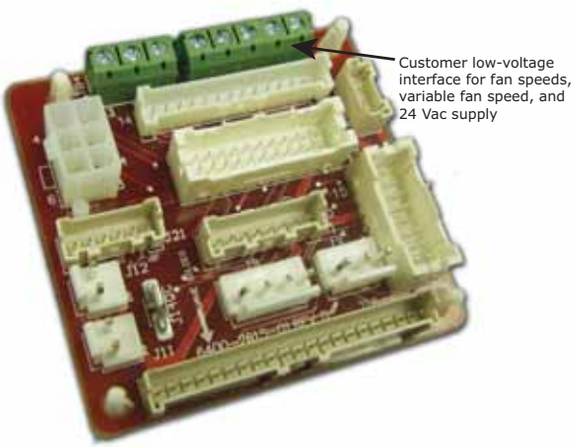
Blower coil air handlers are available with one of six different control options:

- Manual fan speed switch (FSS)
- Customer supplied thermostat interface (CSTI)
- Tracer ZN010 controller
- Tracer ZN510 controller
- Tracer ZN520 controller
- Tracer UC400 controller

Control option descriptions follow below. A complete list of controller inputs and outputs are in Table 35, page 69. See Table 39, page 81 for information on end device options.

Manual Fan Speed Switch (FSS)

Figure 40. Adapter board



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

- Fan speeds (H, M, L)
- Variable speed (2–10V) inputs

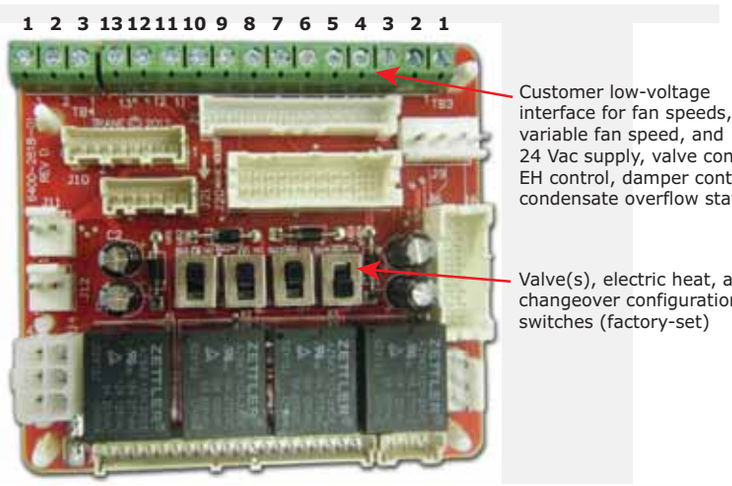
The standard adapter board eliminates many separate wiring harnesses in the panel and allows simple, mistake-proofed single-plug interfacing of:

- ECM engine controller
- Transformers
- Motors
- Valves
- Dampers
- Electric heat control
- Fan speed switches

The manual fan mode switch is available for fan-coil units 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 wall mounted. The wall-mounted option is low-voltage using a factory-wired transformer.

Customer Supplied Thermostat Interface (CSTI)

Figure 41. CSTI adapter board and 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. V1Cl (not std)
8. Not used
9. Not used
10. V2Op/EH1St/Heating
11. V2Cl/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 and disconnect switch (for non-electric heat units). 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.

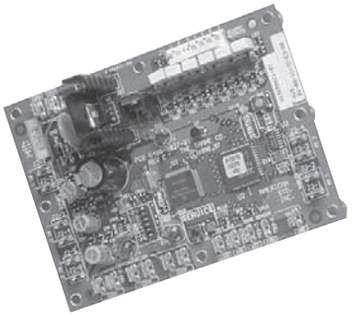
The CSTI adapter board provides all the hookups of the standard adapter board, but in addition, provides hookups for valve control (main and auxiliary coils), electric heat control, and damper control. Screw terminal blocks provide convenient access to fan controls and to end device control. In addition, 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 Controls and Controllers

The Tracer family of controllers, ZN010, ZN510, ZN520, and UC400 offer the combined advantages of simple and dependable operation with the latest Trane-designed controller. Standard control features include options normally available on more elaborate control systems. All control options are available factory-configured or can be field-configured using Rover service software, the UC400 is services via Tracer TU. For more detailed information, refer to CNT-IOP-1 (for Tracer ZN010 or ZN510) or CNT-SVX04A-EN (for Tracer ZN520), or the most recent version of the publication.

Tracer ZN010 Controller

Figure 42. Tracer ZN010 control board

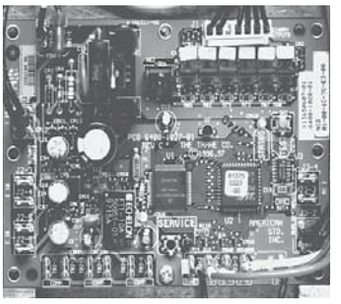


Model Number Digit 26 = 2

The Tracer ZN010 is a stand-alone microprocessor controller.

Tracer ZN510 Controller

Figure 43. Tracer ZN510 control board

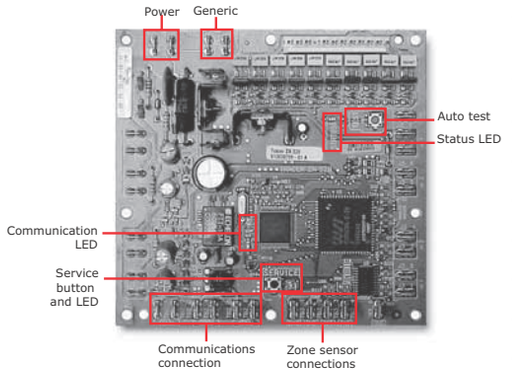


Model Number Digit 26 = 3

The Tracer ZN510 can be used as either a stand-alone or communicating microprocessor controller.

Tracer ZN520 Controller

Figure 44. Tracer ZN520 control board



Model Number Digit 26 = 4

The Tracer ZN520 is a factory-installed, -tested and -commissioned LonTalk® control designed to provide control of the classroom unit ventilator and the blower coil products (see Figure 44).Features include:

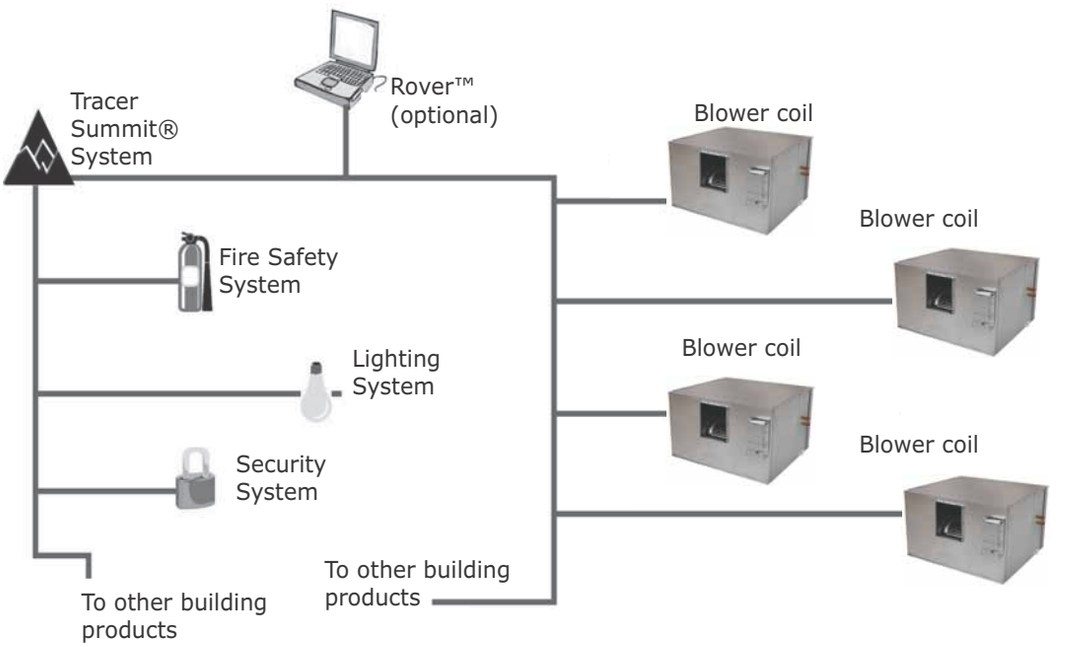
- Automatic fan-speed reset
- Automatic ventilation reset
- Active dehumidification
- Manual output test
- Filter maintenance
- Master slave
- Water valve override
- Freeze avoidance
- Interoperability
- Three generic I/O ports

The Tracer ZN520 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 45, page 74).

Figure 45. 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

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:

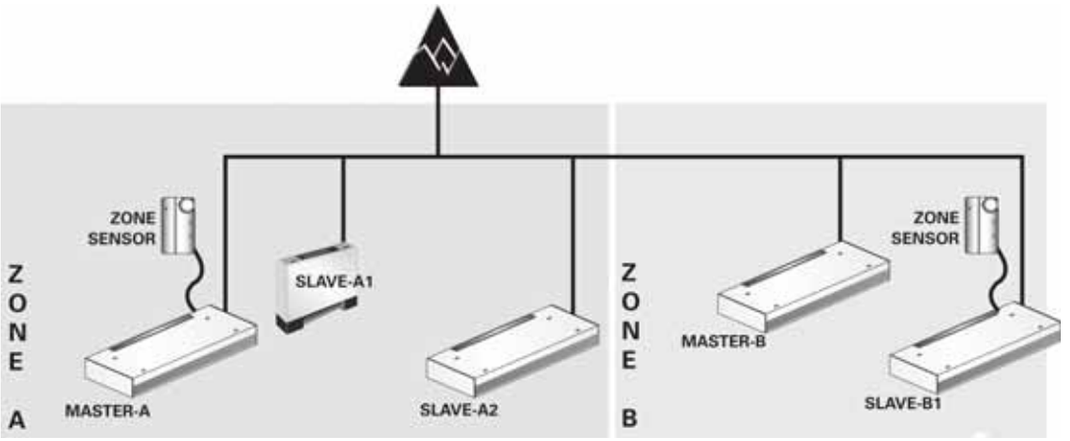
- Reset latching diagnostics
- Verify output wiring and operation
- Force the water valve(s) open to balance the hydronic system during installation set-up or service.

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 46).

Figure 46. 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). Blower coil 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 the 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 Controller

Figure 47. Tracer UC400 controller

Model Number Digit 26 = 5

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

In the stand-alone configuration, 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, blower coil units 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 UC400 control points. This includes such points as temperature and output positions.

Tracer UC400 Zone Controller Features

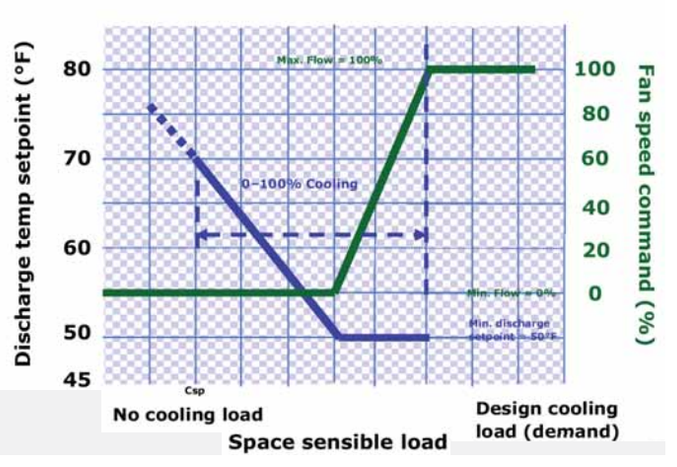
- Single Zone VAV
- Automatic ventilation reset
- Active dehumidification
- Filter maintenance
- Water valve override
- Freeze avoidance
- Interoperability
- Unused I/O can be as generic I/O

The Tracer UC400 is a factory-installed, -tested, and -commissioned BACnet® MS/TP control designed to provide control of the blower coil. 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. The Tracer UC400 is BTL listed as B-ASC profile. This ensures the controller to be used with other BACnet® building automation systems.

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 48. Cool mode nominal hydronic cooling control



Ventilation Reset. With the Tracer UC400 the blower coil 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.

Active Dehumidification. On blower coils with reheat coils, the controller can provide active dehumidification to the conditioned space. This means that the conditioned space 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 percent in order to minimize microbial growth and the life span of airborne illness causing germs.

Hydronic Coil Freeze Protection (Freeze Avoidance). Blower coil systems in cold climates need to take precautions to avoid hydronic coil freeze-up. The controller 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 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.

Tracer Controls Sequence of Operation

Fan Speed Switch (units with 3-speed fan only)

Off: Fan is turned off.

High, medium, or low: Fan runs continuously at the selected speed.

Tracer ZN010 and ZN510

Off: Fan is off; control valves and the low air temperature detection option are still active.

Auto (Fan Cycling): The fan and mixing box damper cycle with control valve option to maintain setpoint temperature. If the unit has three-speeds, in cooling mode the fan cycles from off to high and in heating mode it cycles from off to low (factory default that can be field-adjusted using Rover service software). When no heating or cooling is required, the fan is off and the mixing box damper option closes. Units with three speeds can also be field-configured using Rover to run at a defined speed when the fan speed switch is in the auto position.

Low, Medium, or High (Continuous Fan): The fan operates continuously while control valve option cycles to maintain setpoint temperature. The mixing damper option is open.

Tracer ZN520 and UC400

Off: Fan is off; control valve options and mixing box damper options close. The low air temperature detection option is still active.

Auto: Fan speed control in the auto setting allows the modulating control valve option and single- or three-speed fan to work cooperatively to meet precise capacity requirements, while minimizing fan speed (motor/energy/acoustics) and valve position (pump energy/chilled water reset). As the capacity requirement increases at low fan speed, the water valve opens. When the low fan speed capacity switch point is reached, the fan switches to the next higher speed and the water valve repositions to maintain an equivalent capacity. The reverse sequence takes place with a decrease in required capacity.

Units with three-speed fans on low, medium, or high: The fan runs continuously at the selected speed and the valve option cycles to meet setpoint.

End Device Options

See Table 39, page 81 for a complete list of end device options.

Two-Position Mixing Box Damper Actuator (available with all control options except Tracer ZN520)

This damper actuator uses a 24V signal. It allows zero to 50 percent fresh air. The damper will drive open to an adjustable mechanical stop-position whenever the fan is running during occupied mode and will spring-return closed when the fan turns off. The two-position damper ships separate for field installation.

Note: Trane highly recommends using the low temperature detection option with mixing box dampers to detect possible freeze conditions.

Low Temperature Detection

When the low temperature detection device senses an entering air temperature of 36°F to the hydronic coil, the normally-closed switch opens a corresponding set of binary input terminals. The fan disables, control valves open, and the fresh air damper closes.

The low temperature detection device is an averaging type capillary tube and will reset when it detects an entering air temperature of at least 44°F.

Condensate Overflow Detection

A float switch is factory-installed in the drain pan to detect a high condensate water level. When the float switch rises, the normally-closed input opens a corresponding set of binary input terminals. This also causes the fan to disable, and the control valve and fresh air damper options to close. Although the float switch closes when the high condensate level recedes, you must manually reset the controller before normal unit operation can occur. If you're using a Tracer ZN510 or ZN520 controller, you can reset using Tracer Summit. Use Rover service software to reset units with Tracer ZN010, ZN510, ZN520, or Tracer TU to service units with the UC400.

Discharge Air Sensor

The discharge air sensor is factory-mounted on the fan housing downstream of the coils for use as a status point or with other control algorithms. On units with optional electric heat, the sensor is field-mounted in the ductwork, downstream of the unit discharge.

End Devices On Tracer ZN520 and UC400 Controllers

The following end device options are only available on blower coil air handlers with Tracer ZN520 or UC400:

- economizer damper actuator
- humidity
- outside air

Economizer Damper Actuator

This option is a modulating, spring-return damper actuator and is factory-wired and mounted to the mixing box damper assembly. When the controller enables the economizer damper and the unit is in occupied mode, the damper modulates between its minimum position (configurable) and the full open position to maintain setpoint temperature. If economizer operation stops or if the unit is in the heating mode, the damper adjusts to its minimum position.

Note: Trane highly recommends using the low temperature detection option with a mixing box damper to detect possible freeze conditions.

Humidity Sensor

The humidity sensor is available only on blower coils with Tracer ZN520 or UC400 and communicated value or with a local humidity sensor.

Outside Air Sensor

The outside air sensor is field-mounted to sense the outside air temperature, primarily for use in economizer applications or as a status value when available for other applications.

Table 39. End device option availability

Device	Tracer ZN010	Tracer ZN510	Tracer ZN520	Tracer UC400	CSTI
Condensate float switch	•	•	•	•	•
Low limit	•	•	•	•	•
Filter run-time diagnostic	•	•	•	•	
Fan status			•	•	•
Positive proof fan status switch	•	•	•	•	•
2-position control valves	•	•	•	•	•
Modulating control valves			•	•	
2-position mixing box actuator	•	•			•
Modulating mixing box actuator			•	•	
1-stage electric heat	•	•	•	•	•
2-stage electric heat			•	•	•
Frostat protection (DX coils)			•	•	•

Note:
- The Tracer ZN010, Tracer ZN510, Tracer ZN520, and Tracer UC400 are factory-provided controls that control the end devices listed in the table.
- CSTI provides an adapter board with screw down terminals for wiring to end devices for a field-supplied controller.
- Positive proof fan status switch included with all Trane Controlled units

Zone Sensor Options

Zone sensors are available as either unit, wall, or split-mounted options for design flexibility. Blower coils 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.

A variety of wall-mounted zone sensors are available for design flexibility. Zone sensors have an internal thermistor and operate on 24 Vac. Options with setpoint knobs are available in Fahrenheit or Celsius. See Figure 49 through Figure 55for available options and model number references.

Figure 49. Digit 38 = 1
Wall-mounted zone sensor with setpoint knob, off/auto fan speeds, occupied/unoccupied, and COMM jack.

Figure 50. Digit 38 = 3
Wall-mounted temp sensor with setpoint knob, occupied/unoccupied, and COMM jack.

Figure 51. Digit 38 = 4
Wall-mounted temp sensor with occupied/ unoccupied and COMM jack.

Figure 52. Digit 38 = C
Wireless temperature sensor and unit-mounted receiver.

Figure 53. Digit 38 = E
Wall-mounted temperature sensor with setpoint knob, off/auto/low/medium/high fan speeds

Figure 54. Digit 38 = F
Wall-mounted display temperature sensor with setpoint knob, occupied/unoccupied and COMM jack.

Figure 55. Digit 38 = G
Wireless display sensor, unit-mounted receiver.

Control Valves

Blower coil air handlers with either the control interface or any of the Tracer controllers (Tracer ZN010, ZN510, ZN520, or UC400) are available with chilled and/or hot water control valves for each coil configuration. Control valve options are available as:

- Modulating
- Two-position, normally-open or -closed (n.o. or n.c.)
- Two- or three-way configurations
- With sweat connections
- Sizes 1/2-inch, 1-inch, and 1-1/4-inches

See Table 41–Table 45, page 86 for a complete list of available valve options by size.

Three-way valve options allow either full waterflow through the coil or diverted waterflow through the bypass.

See the section titled "How to Choose the Correct Control Valve," p. 84 to help you select the proper valve.

Two-Position Control Valves

Two-position valve options are available on blower coils with either Tracer ZN010, ZN510, ZN520, UC400, or the control interface. See Table 42, page 85 for complete list of valve types, options, and sizes.

Two-position valve options are spring-return and non-spring-return types. See Table 42, page 85 for a complete list of valve types by size. Spring-return valves respond to a 24 V signal and will either fully open or close. Also, these valves cannot be driven or actuated to a partially open or closed position. If the spring-return type control valve loses power, the valve returns to its de-energized position. Valves that are not spring-return will stop in their last position when they lose power.

Refer to Figure 13, page 25–Figure 16, page 26 for the pressure drop across the respective piping packages associated with these valve Cv values. For a complete list of two-position valve options and sizes, see Table 42, page 85. See the section titled "How to Choose the Correct Control Valve," p. 84 to help you select the proper valve.

Modulating Control Valves (Tracer ZN520 or UC400 only)

Modulating control valves offer an alternative for more precise capacity control by modulating or varying the water flow through the coil. The valve responds to a 24 V triac signal from the controller, which determines the valve position by a control algorithm. If the valve loses power, it remains in the position it was in when the power loss occurred.

The pressure drop across the modulating valve should fall within 25–70 percent of the pressure drop across the branch circuit. Table 43, page 85 shows the unit size, coil figuration, valve type, and the recommended valve Cv. If a different size and/or Cv is preferred, Table 44 on page 86 shows the valve size, valve type, and available Cv values. Refer to Figure 13, page 25–Figure 16, page 26 for the pressure drop across the respective piping packages associated with these valve Cv values.

For a complete list of modulating valve options and sizes, see Table 44 on page 86. See the section titled "How to Choose the Correct Control Valve," p. 84 to help you select the proper valve.

Field-Supplied Valves

When using field-supplied valves, choose this option so the unit controller is factory-configured for the valve's normal position. For more descriptive information on this option, see "Model Number Descriptions," p. 17.

Note: Trane does not recommend wild coil applications.

How to Choose the Correct Control Valve

Valve options are available in a variety of sizes and Cv values as discussed in the previous paragraphs. See Table 41–Table 45, page 86 for a complete list of valve recommendations and sizes.

Select the proper control valve using these parameters:

1. **Valve flow coefficient or Cv**, which is represented by the following formula:
   Cv = Q/square root of ΔP = $Q/\sqrt{\Delta P}$
2. **Branch authority or β (modulating valves only)**, which is represented by the following formula:
   β = pressure drop across the valve divided by the pressure drop across the *branch circuit** x 100% = ΔP valve/ΔP branch circuit.
   a. * **Branch circuit** includes the coil and piping package (control valve, circuit setter, ball valves, fittings, and piping) between the supply and return riser.

   Note: For good control, β should be between 25 and 70 percent.
3. **Consider the valve close-off pressure (two-way valves only)** to ensure close-off pressures are not exceeded by pump discharge pressure necessary to overcome system pipe resistance. See the recommendations in Table 41 and Table 42, page 85, which are based on 100 ft of 1-1/4" system piping plus branch circuit piping.

Two-Position Valve Cv Selection

The Cv value of the two-position control valve is less critical than for the modulating valve and should be as high as available to minimize branch circuit pressure drop.Table 41, page 85 shows the recommended valve size for each unit size and coil configuration. However, if a different Cv is preferred, see Table 42, page 85 for the options listed by size, type, and associated Cv values. Note that the 1-1/4", two-way, n.o. valves are not available. Refer to Figure 13, page 25–Figure 16, page 26 for the pressure drop across the respective piping packages associated with the valve Cv values.

Modulating Valve Cv Selection

For good capacity control, the pressure drop across the valve should fall within 25 and 70 percent of the pressure drop across the branch circuit. Table 43, page 85 shows the unit size, coil configuration, valve type and recommended valve Cv value. If a different size and/or Cv value is preferred, see Table 44, page 86 for valve size, type, and available Cv values. Refer to Figure 13, page 25–Figure 16, page 26 for the pressure drop across the respective piping packages associated with these valve Cv values.

Table 40. Valve availability

		A 2-way, 2-position, N.C.	B 2-way, 2-position, N.O.	C 3-way, 2-position, N.C.	D 3-way, 2-position, N.O.	E 2-way, modulating	F 3-way, modulating
A	3.3 Cv, 1/2-in. valve, 1/2-in. pipe					X	
B	3.3 Cv, 1/2-in. valve, 3/4-in. pipe					X	
C	3.8 Cv, 1/2-in. valve, 3/4-in. pipe						X
D	6.6 Cv, 1-in. valve, 1-in. pipe	X		X	X	X	
E	7.4 Cv, 1-in. valve, 1-in. pipe			X	X		X
F	8.3 Cv, 1 1/4-in. valve, 1 1/4-in. pipe	X		X	X	X	X
G	3.5 Cv, 1/2-in. valve, 1/2-in. pipe	X	X				
H	4.4 Cv, 1/2-in. valve, 1/2-in. pipe			X	X		
K	8.0 Cv, 1-in. valve, 1-in. pipe	X	X				
Q	1.3 Cv, 1/2-in. valve, 3/4-in. pipe						X
R	1.8 Cv, 1/2-in. valve, 3/4-in. pipe					X	
T	2.30 Cv, 1/2-in. valve, 3/4-in. pipe					X	
U	2.70 Cv, 1/2-in. valve, 3/4-in. pipe						X

Table 41. Two-position valve Cv recommendations

	Unit Size													
	12		18		24		36		54		72		90	
Coil	2-Way	3-Way	2-Way	3-Way	2-Way	3-Way	2-Way	3-Way	2-Way	3-Way	2-Way	3-Way	2-Way	3-Way
1-row	3.5	4.4	3.5	4.4	3.5	4.4	3.5	4.4	3.5	4.4	3.5	7.0	8.0	7.0
2-row	3.5	4.4	3.5	4.4	3.5	4.4	3.5	4.4	8.0	7.0	8.0	7.0	6.6	7.4
4-row	3.5	4.4	3.5	4.4	8.0	7.0	8.0	7.0	8.0	7.0	8.0	7.4	8.3	7.4
6-row	3.5	4.4	3.5	4.4	8.0	7.0	8.0	7.4	6.6	7.4	6.6	7.4	8.3	7.4

Table 42. Two-position valve Cv options

	2-Way			3-Way		
Valve Size (in.)	Valve Type	Cv	Close-Off ΔP (psig)	Valve Type	Cv	Close-Off ΔP (psig)
1/2	normally open / normally closed	3.5	20	spring return	4.4	25
1	normally open / normally closed	8.0	90	spring return	7.0	9
1	2-way, normally closed	6.6	60	non-spring return	7.4	60
1-1/4	2-way, normally closed	8.3	60	non-spring return	8.3	60

Table 43. Modulating valve Cv recommendations

	Unit Size			
	12, 18, & 36		54, 72, & 90	
Coil	2-Way	3-Way	2-Way	3-Way
1-row	1.8*	1.3*	8.3	8.3
4-row	n/a	n/a	8.3	8.3
6-row	n/a	n/a	8.3	8.3

Note: * 1/2" valve with 3/4" pipe.

Table 44. Modulating valve Cv recommendations (high-capacity coil)

	Unit Size					
	12 & 18		24 & 36		54, 72, & 90	
Coil	2-Way	3-Way	2-Way	3-Way	2-Way	3-Way
2-row	1.8*	1.3*	2.3*	2.7*	6.6	8.3
4-row	1.8*	2.7*	2.3*	2.7*	6.6	8.3
6-row	1.8*	2.7*	2.3*	2.7*	6.6	8.3

Note: * 1/2-inch valve with 3/4-inch pipe

Table 45. Modulating valve Cv options

Valve size (in.)	2-Way	3-Way
1/2	1.8	2.7
	2.3	3.8
	3.3	N/A
1	6.6	7.4
1-1/4	8.3	8.3

Electrical Data

Minimum Circuit Ampacity (MCA) and Maximum Fuse Size (MFS) Calculations for non-Electric Heat Units

MCA = 1.25 x motor FLAs

MFS or HACR type circuit breaker = 2.25 x motor FLA

Minimum Circuit Ampacity (MCA) and Maximum Fuse Size (MFS) Calculations for Units with Electric Heat

Heater amps = (heater kW x 1000) / heater voltage

Notes: Use 120 V heater voltage for 115 V units.
Use 240 V heater voltage for 230 V units.
Use 208 V heater voltage for 208 V units.
Use 277 V heater voltage for 277 V units.

MCA = 1.25 x (heater amps + all motor FLAs)
MFS or HACR type circuit breaker = (2.25 x motor FLA) + heater amps

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

See Table 48, p. 88 for motor FLAs.

Select a standard fuse size equal to the calculated MFS. Use the next larger smaller size if the calculated MFS does not equal a standard size.

Standard fuse sizes: 15, 20, 25, 30, 35, 40, 45, 50, 60 amps

Useful Formulas

kW = (cfm x ΔT) / 3145
ΔT = (kW x 3145) / air flow
Single phase amps = (kW x 1000) / voltage
Electric heat MBh = (Heater kW) (3.413)

Table 46. Available electric heat (kW)

Electrical heat (kW)	Voltage					
	115/60/1	208/60/1	220/50/1	230/60/1	240/50/1	277/60/1
1.0	Sizes 12–90					
1.5						
2.0, 2.5, 3.0						
3.5, 4.0						
4.5		Sizes 18–90				
5.0						
5.5, 6.0						
6.5, 7.0, 7.5, 8.0		Size 24-90				
9.0, 10.0, 11.0						Size 36-90

Notes:
- Magnetic contactors are standard. Mercury contactors are available on horizontal units only.
- Units with electric heat are available with or without door interlocking disconnect switch.
- Units with electric heat are available with or without line fuses.
- Units with electric heat must not be run below the minimum cfm listed in "General Data," p. 20.
- Electric heat is balanced staging: 1 stage = 100 percent, 2 stages = 50 percent/50 percent.

Table 47. Available motor horsepower

Motor	Unit Voltage	Motor Horsepower 0.50	1.00
60 Hz	115/1	•	•
	208/1	•	•
	230/1	•	•
	277/1	•	•
50 Hz	220/1	•	•
	240/1	•	•

Table 48. Motor electrical data

Voltage	Voltage range	RPM	Rated HP	LB	FLA
115/60/1	104–126	1725	1/2	14	7.5
			1.0	19	13.3
208–230/60/1	187–253	1725	1/2	14	4.3
			1.0	19	7.7
277/60/1	249–305	1725	1/2	14	3.8
			1.0	19	6.7
220/50/1	198–242	1725	1/2	14	4.3
			1.0	19	7.7
240/50/1	216–264	1725	1/2	14	4.3
			1.0	19	7.7

Table 49. Nominal RPM at 1-inch and 2-inch static pressure

Size	Configuration	CFM	Static Pressure	RPM	115/208-230V Motor	277V Motor	115/208-230V BHP
12 and 18	Horizontal	400	1	1230	0.5	0.5	0.13
12 and 18	Horizontal	400	2	1688	0.5	0.5	0.27
12 and 18	Horizontal	600	1	1502	0.5	0.5	0.29
12 and 18	Horizontal	600	2	1786	0.5	0.5	0.42
24 and 36	Horizontal	800	1	1099	0.5	0.5	0.23
24 and 36	Horizontal	800	2	1582	0.5	0.5	0.46
24 and 36	Horizontal	1200	1	1187	0.5	0.5	0.44
24 and 36	Horizontal	1200	2	1562	1.0	0.5	0.7
24 and 36	Vertical - Preswirl	800	1	1096	0.5	0.5	0.23
24 and 36	Vertical - Preswirl	800	2	1581	0.5	0.5	0.47
24 and 36	Vertical - Preswirl	1200	1	1194	0.5	0.5	0.45
24 and 36	Vertical - Preswirl	1200	2	1555	1.0	0.5	0.72
24 and 36	Vertical - Counterswirl	800	1	1123	0.5	0.5	0.23
24 and 36	Vertical - Counterswirl	800	2	1601	0.5	0.5	0.46
24 and 36	Vertical - Counterswirl	1200	1	1238	0.5	0.5	0.45
24 and 36	Vertical - Counterswirl	1200	2	1603	1.0	0.5	0.71
54 and 72	Horizontal	1800	1	815	1.0	1.0	0.54
54 and 72	Horizontal	1800	2	1141	1.0	1.0	0.97
54 and 72	Horizontal	2400	1	879	--	1.0	0.91
54 and 72	Horizontal	2400	2	1148	--	--	1.4
54 and 72	Vertical - Preswirl	1800	1	871	1.0	1.0	0.58
54 and 72	Vertical - Preswirl	1800	2	1185	--	1.0	1
54 and 72	Vertical - Preswirl	2400	1	956	--	--	1.02
54 and 72	Vertical - Preswirl	2400	2	1218	--	--	1.49
54 and 72	Vertical - Counterswirl	1800	1	888	1.0	1.0	0.61
54 and 72	Vertical - Counterswirl	1800	2	1196	--	1.0	1.04
54 and 72	Vertical - Counterswirl	2400	1	1001	--	--	1.11
54 and 72	Vertical - Counterswirl	2400	2	1241	--	--	1.56
90	Horizontal	3000	1	918	--	--	1.2
90	Horizontal	3000	2	1220	--	--	1.95
90	Vertical - Preswirl	3000	1	1005	--	--	1.24
90	Vertical - Preswirl	3000	2	1299	--	--	2.08
90	Vertical - Counterswirl	3000	1	939	--	--	1.32
90	Vertical - Counterswirl	3000	2	1235	--	--	2.08

Dimensions and Weights

Horizontal Blower Coil

Figure 56. Horizontal blower coil

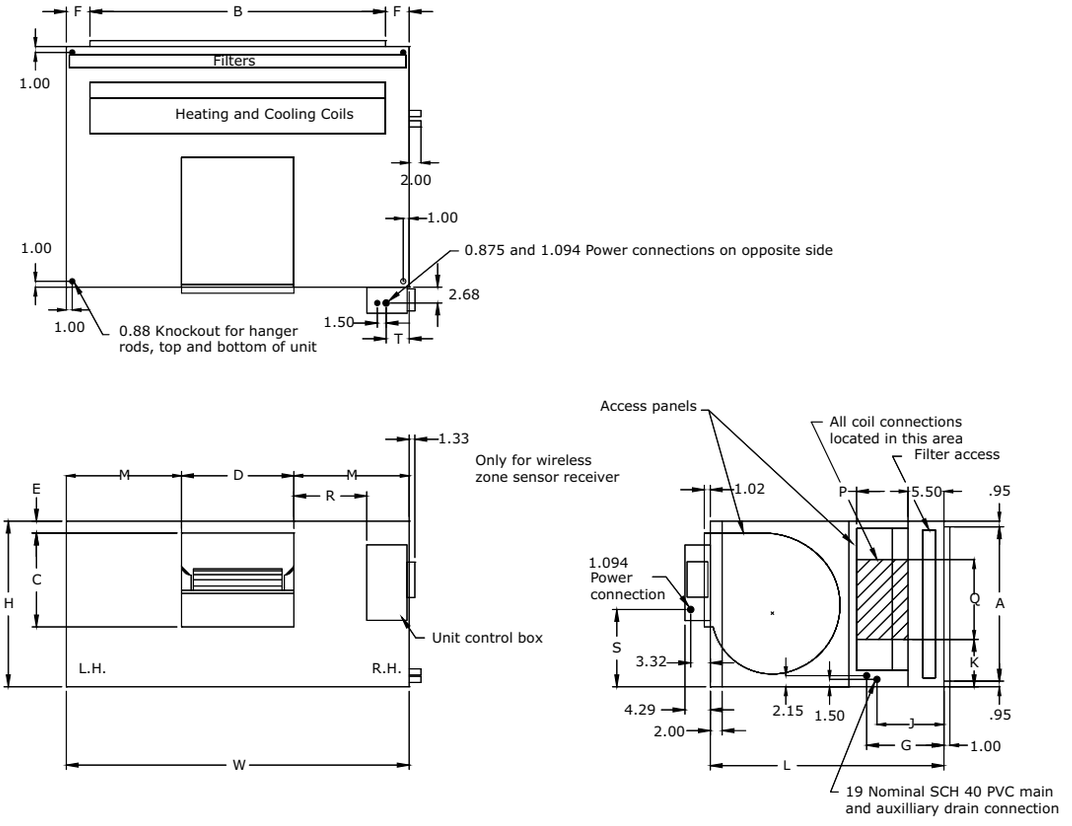


Table 50. Horizontal blower coil dimensions (in.) and weights (lb)

Unit Size	H	W	L	A	B	C	D	E	F	G (RH)	G (LH)	J (RH)	J (LH)	K	M	P	Q	R	S	T	Basic Unit Weight
12	14.00	24.00	31.15	12.09	18.00	10.56	7.47	0.55	3.00	11.42	13.42	9.42	11.42	4.20	8.24	9.00	5.75	1.35	2.91	4.01	64.0
18	14.00	28.00	31.15	12.09	22.00	10.56	7.47	0.55	3.00	11.42	13.42	9.42	11.42	4.20	10.24	9.00	5.75	3.42	2.93	3.94	69.0
24	18.00	28.00	33.72	16.09	22.00	13.57	9.04	1.30	3.00	11.42	13.42	9.42	11.42	6.20	9.68	9.00	5.75	2.73	3.09	3.84	89.6
36	18.00	40.00	33.72	16.09	34.00	13.57	9.04	1.30	3.00	11.42	13.42	9.42	11.42	6.20	15.68	9.00	5.75	8.64	2.93	3.94	104.5
54	22.00	40.00	41.57	20.09	34.00	13.58	12.57	0.72	3.00	11.42	13.42	9.42	11.42	7.43	13.72	11.00	7.27	6.87	6.93	3.94	129.0
72	22.00	48.00	41.57	20.09	40.00	13.58	12.57	0.72	4.00	11.42	13.42	9.42	11.42	7.43	17.72	11.00	7.27	10.87	6.93	3.94	142.0
90	28.00	48.00	43.94	26.09	40.00	13.58	12.57	1.66	4.00	12.79	14.79	10.79	12.79	8.24	17.72	11.25	11.64	10.92	13.06	3.89	162.8

Note:

- All coil connections are sweat style.
- Weight of basic unit includes cabinet, fan, wiring and average filter. It does not include coil, motor or shipping package. Please refer to Table 48 for motor weights. Add to basic unit weight seven pounds for weight of control box.
- Control box factory-mounted on drive side.

Vertical Blower Coil

Figure 57. Vertical blower coil

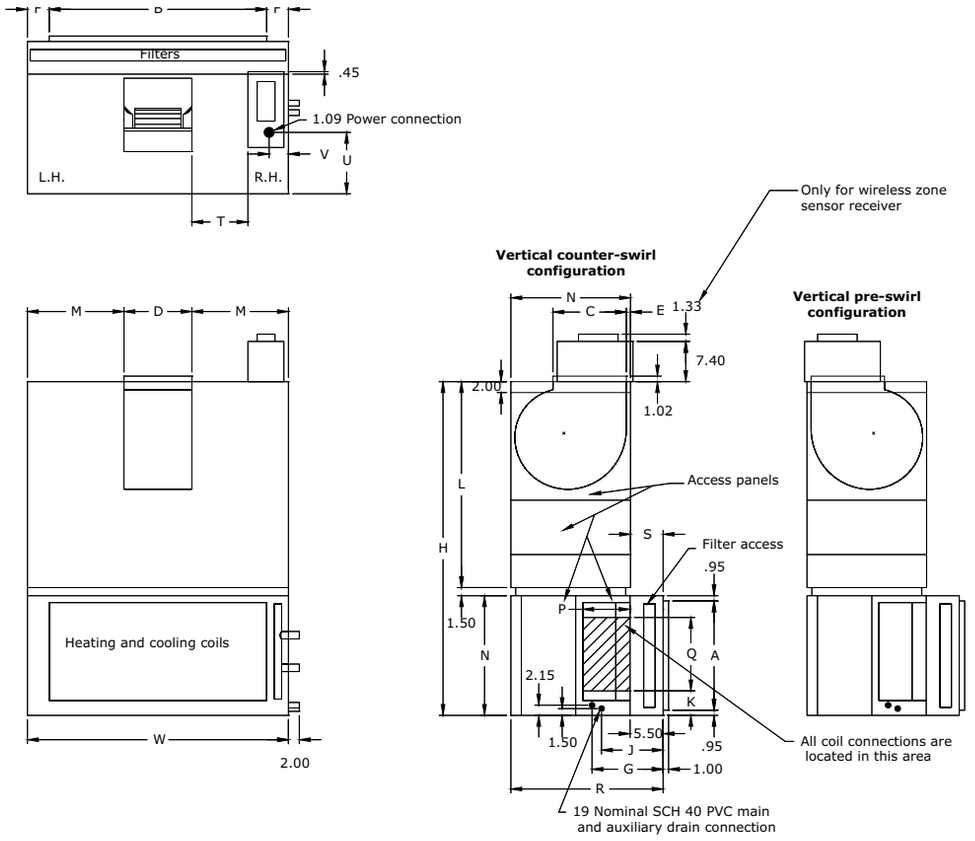


Table 51. Vertical blower coil dimensions (in.) and weights (lb)

Unit Size	H	W	L	A	B	C	D	E	F	G (RH)	G (LH)	J (RH)	J (LH)
24	51.72	28.00	32.22	16.09	22.00	13.57	9.04	1.30	3.00	11.42	13.42	9.42	11.42
36	51.72	40.00	32.22	16.09	34.00	13.57	9.04	1.30	3.00	11.42	13.42	9.42	11.42
54	63.57	40.00	40.07	20.09	34.00	13.58	12.57	0.72	3.00	11.42	13.42	9.42	11.42
72	63.57	48.00	40.07	20.09	40.00	13.58	12.57	0.72	4.00	11.42	13.42	9.42	11.42
90	71.94	48.00	42.44	26.09	40.00	13.58	12.57	1.66	4.00	12.79	14.79	10.79	12.79

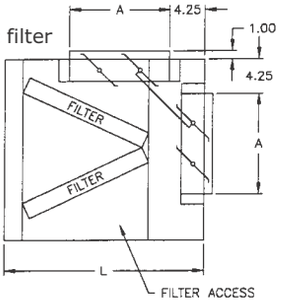
Unit Size	K	M	N	P	Q	R	S	T	U	V	Basic Unit Weight
24	6.20	9.68	18.00	9.00	5.50	28.00	10.00	1.96	6.78	3.71	141.1
36	6.20	15.68	18.00	9.00	5.50	28.00	10.00	8.63	6.78	3.04	168.80
54	4.21	13.72	22.00	11.00	7.27	30.00	8.00	6.87	10.78	3.04	197.4
72	4.18	17.72	22.00	11.00	7.27	30.00	8.00	5.83	10.78	8.08	246.4
90	4.81	17.72	28.00	11.25	11.64	30.00	2.00	7.84	16.78	6.07	258.40

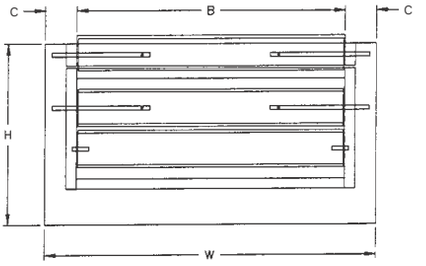
Notes:
- All coil connections are sweat style.
- Weight of basic unit includes cabinet, fan, wiring and average filter. Add to basic unit weight seven pounds for weight of control box. Control box factory-mounted on motor side.
- Vertical coil and filter section ships separate for field installation. Refer to installation and maintenance manual for instructions.
- Vertical units provided with 4-inch to 6-inch high mounting legs. Legs are seismic rated.

Angle Filter and Mixing Box

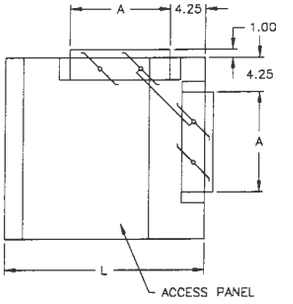
Table 52. Angle filter and mixing box dimensions

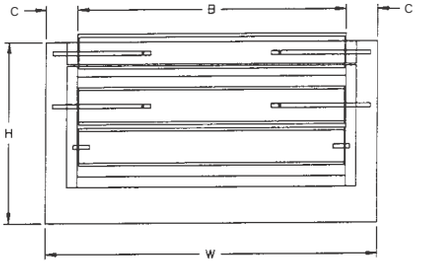
Combination angle filter and mixing box



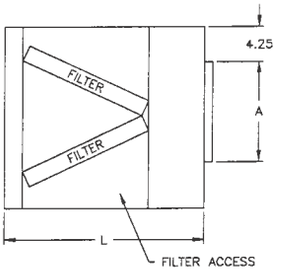


Mixing box





Angle filter box



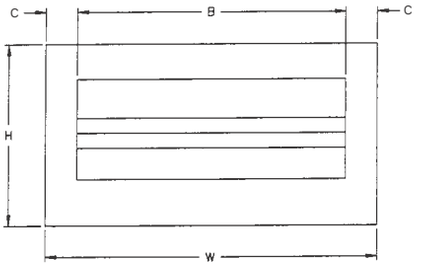
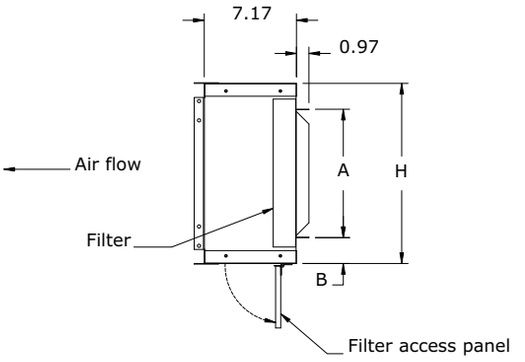


Table 53. Angle filter and mixing box dimensions (in.) and weights (lb)

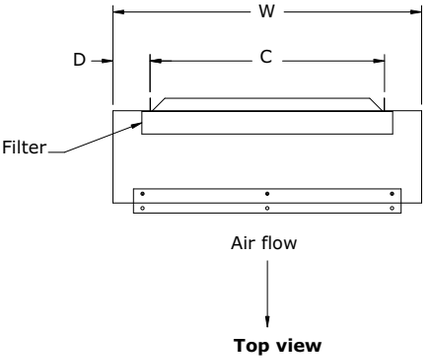
Unit Size	H	L	W	A	B	C	Weight
12	14.12	22.00	24.11	7.06	15.56	4.28	36.0
16	14.12	22.00	28.11	7.06	19.56	4.28	41.0
24	18.12	19.50	28.11	7.06	19.56	4.28	43.0
36	18.12	24.50	40.11	7.06	31.56	4.28	56.0
54	22.12	23.50	40.11	12.81	31.56	4.28	72.0
72	22.00	23.50	48.00	12.81	31.56	8.22	72.5
90	27.90	27.56	48.00	12.85	31.56	8.22	84.1

Bottom or Top Access Filter Box

Table 54. Bottom or top access filter box



Right side view



Top view

Rotate 180° for top access
Sections ship attached to the unit.

Table 55. Bottom or top access filter box dimensions (in.) and weights (lb)

Unit Size	H	W	A	B	C	D	Weight
12	14.00	24.00	9.98	2.01	18.23	2.88	15
18	14.00	28.00	9.98	2.01	21.98	3.01	17
24	18.00	28.00	14.23	1.89	23.23	2.38	18
36	18.00	40.00	14.23	1.89	33.73	3.13	25
54	22.00	40.00	18.23	1.89	33.73	3.13	28
72	22.00	48.00	18.23	1.89	42.73	2.63	32
90	28.00	48.00	23.23	1.89	41.23	3.38	37

Electric Heat

Table 56. Blower coils with electric heat

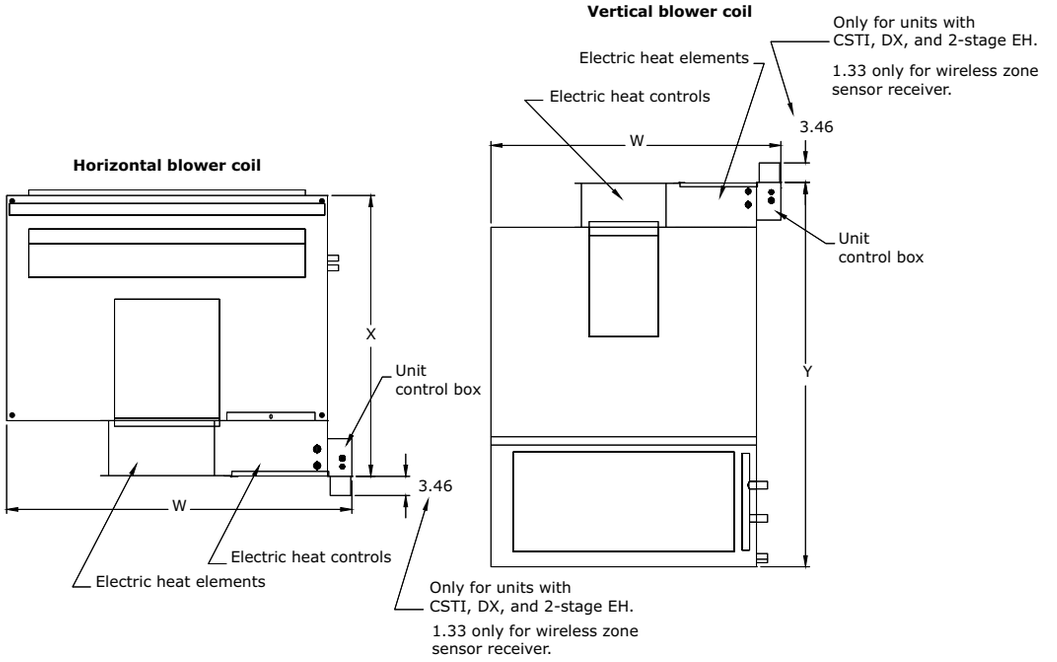


Table 57. Blower coils with electric heat dimensions (in.) and weights (lb)

Unit Size	W	X	Y
12	28.28	37.97	n/a
18	32.29	37.97	n/a
24	30.54	40.75	48.54
36	42.57	40.75	60.57
54	44.32	48.39	66.32
72	48.29	48.60	70.29
90	48.29	50.96	76.29

Table 58. Electric heat dimensions

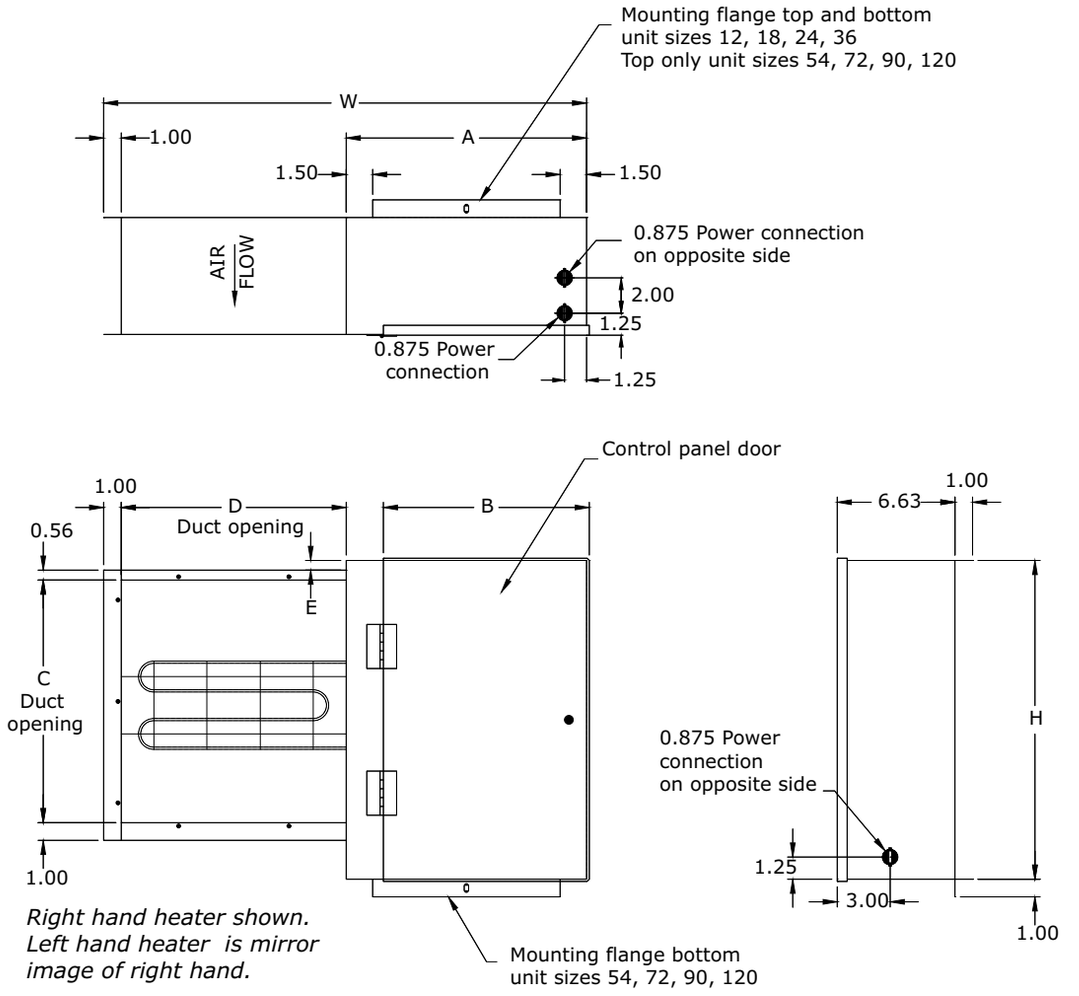


Table 59. Electric heat dimensions (in.) and weights (lb)

Unit Size	H	W	A	B	C	D	E	Weight
12	14.06	17.88	8.13	6.79	10.50	8.75	0.03	10.0
18	14.06	19.88	10.13	8.79	10.50	8.75	0.03	10.8
24	18.06	17.75	7.63	6.29	13.50	9.13	0.80	11.3
36	18.06	23.75	13.63	12.29	13.50	9.13	0.80	12.8
54	18.06	27.25	13.63	11.67	13.50	12.63	0.22	16.0
72	18.06	27.25	13.63	11.67	13.50	12.63	0.22	17.4
90	18.06	27.25	13.63	11.67	13.50	12.63	1.16	19.2

- Electric heater is factory mounted on unit discharge face and wired to unit control box.
- Heater may be mounted with horizontal or vertical up airflow.
- Optional mercury contactors cannot be used with vertical up airflow.
- Electric heat may need field-supplied externally-wrapped insulation if the unit is installed in an unconditioned space or if sweating is an issue.

Steam Coil

Table 60. Steam coil dimensions

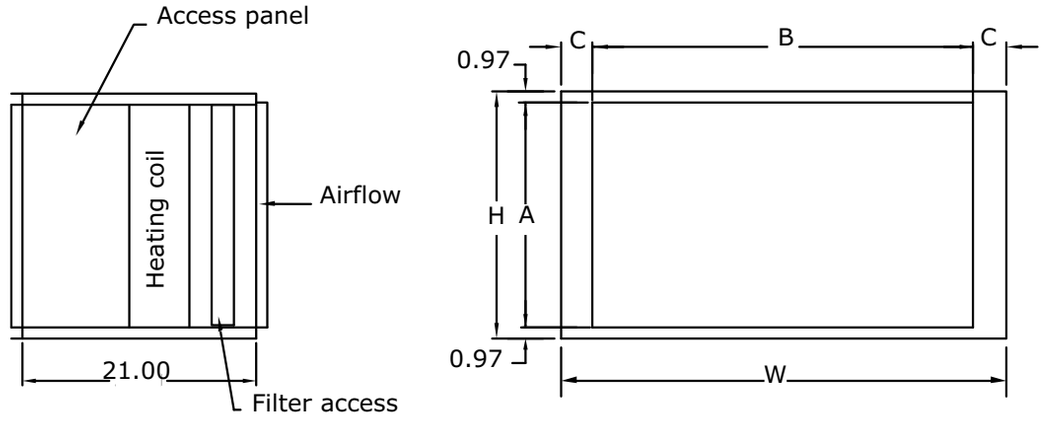


Table 61. Steam coil box dimensions (in.) and weights (lb)

Unit Size	H	W	A	B	C	Weight	Coil Connections, NPT	
							Supply	Return
12	14.00	24.00	12.06	18.04	2.98	34	1	3/4
18	14.00	28.00	12.06	22.04	2.98	37	1	3/4
24	18.00	28.00	16.06	22.04	2.98	40	1-1/2	1
36	18.00	40.00	16.06	34.04	2.98	48	1-1/2	1
54	22.00	40.00	20.06	34.04	2.98	50	2	1
72	22.00	48.00	20.06	42.04	2.98	56	2	1
90	28.00	48.00	26.06	40.04	3.98	63	2-1/2	1-1/4

Note:
- Filter access and access panel located on both sides.
- Weight includes cabinet with average filter, but does not include coil weight. See general data section for coil weights.

Coil Connections

Table 62. Hydronic coil connection sizes, OD (in.)

	Standard Capacity			High Capacity		
Unit Size	1-Row	4-Row	6-Row	2-Row	4-Row	6-Row
12	5/8	—	—	5/8	7/8	7/8
18	5/8	—	—	5/8	7/8	7/8
24	5/8	—	—	7/8	1-1/8	1-1/8
36	5/8	—	—	7/8	1-1/8	1-1/8
54	1-1/8	1-3/8	1-3/8	1-1/8	1-1/8	1-1/8
72	1-1/8	1-3/8	1-3/8	1-1/8	1-1/8	1-1/8
90	1-1/8	1-5/8	1-5/8	1-1/8	1-1/8	1-1/8

Table 63. DX coil connection sizes, OD (in.)

	3-Row and 4-Row		6-Row	
Unit Size	Suction	Liquid	Suction	Liquid
12	5/8	5/8	5/8	5/8
18	5/8	5/8	5/8	5/8
24	5/8	5/8	7/8	5/8
36	7/8	5/8	7/8	5/8
54	1-1/8	7/8	1-1/8	7/8
72	1-1/8	7/8	1-1/8	7/8
90	1-3/8	7/8	1-1/8	7/8

Table 64. Steam coil connection sizes, female connection, NPT (in.)

Unit Size	Supply	Return
12	1	3/4
18	1	3/4
24	1-1/2	1
36	1-1/2	1
54	2	1
72	2	1
90	2-1/2	1-1/4

Piping Packages

Table 65. Piping package dimensions (in.)

Piping Package	Nominal Tube Size	Actual Size	A	B	C	D	E	F
2-way	1/2	5/8	12.025	2.650	12.625	5.650	n/a	n/a
	1	1-1/8	13.295	4.260	13.220	9.288	3.020	N/A
3-way	1/2	5/8	12.088	2.097	12.688	4.497	6.351	6.351
	3/4	7/8	15.623	1.750	15.313	6.290	6.701	6.701
	1	1-1/8	13.370	3.690	13.210	9.060	9.813	9.813
	1-1/4	1-3/8	16.885	3.738	16.410	10.023	3.052	10.520

Basic Piping

Table 66. Two-way 1/2-in. and 1-in. valve basic piping package

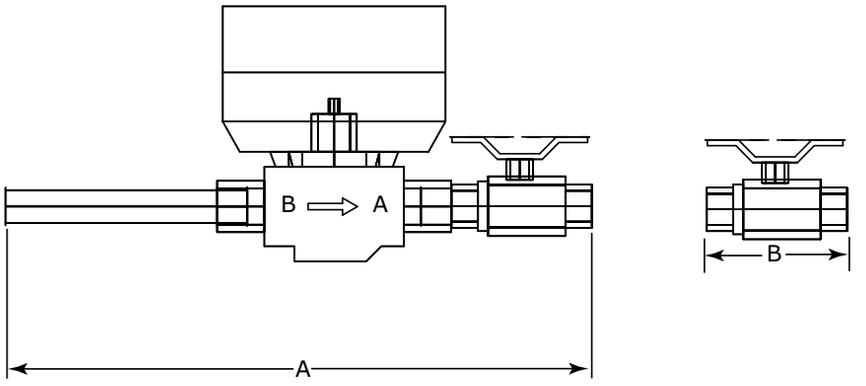


Table 67. Two-way 1 1/4-in. valve basic piping package

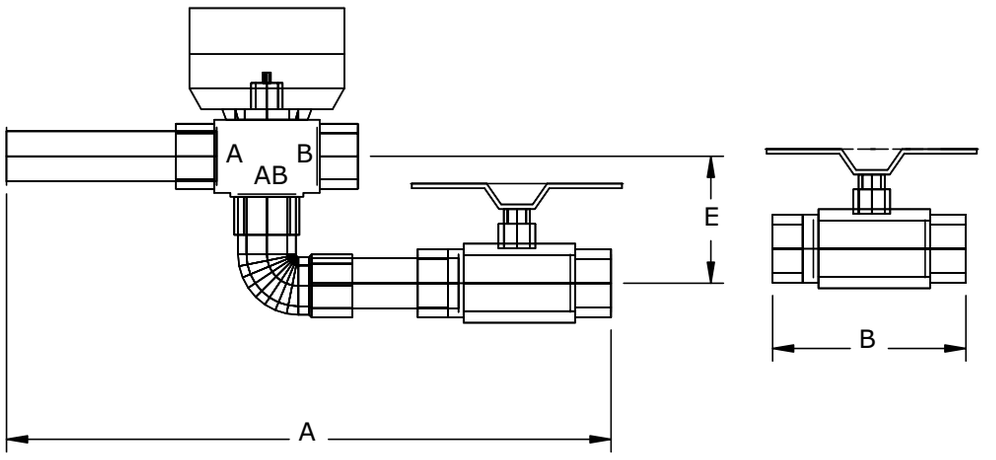
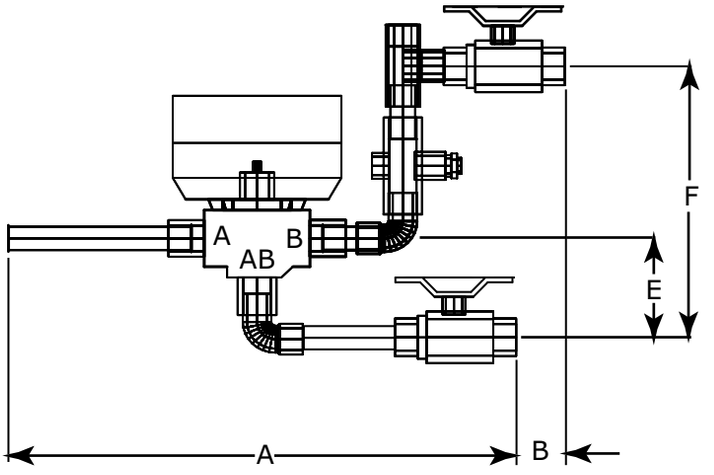


Table 68. Three-way, 1/2 in. and 1-in. valve basic piping package



Deluxe Piping

Table 69. Two-way 1/2-in. and 1-in. valve deluxe piping package

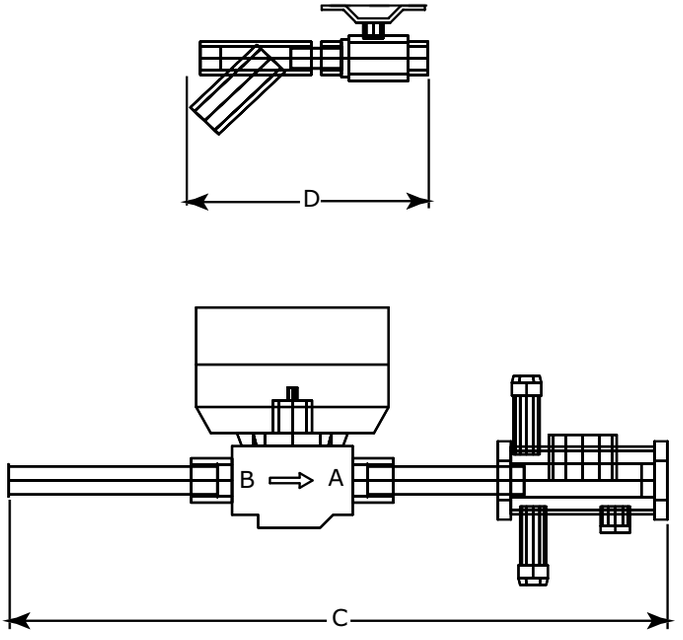


Table 70. Two-way 1 1/4-in. valve deluxe piping package

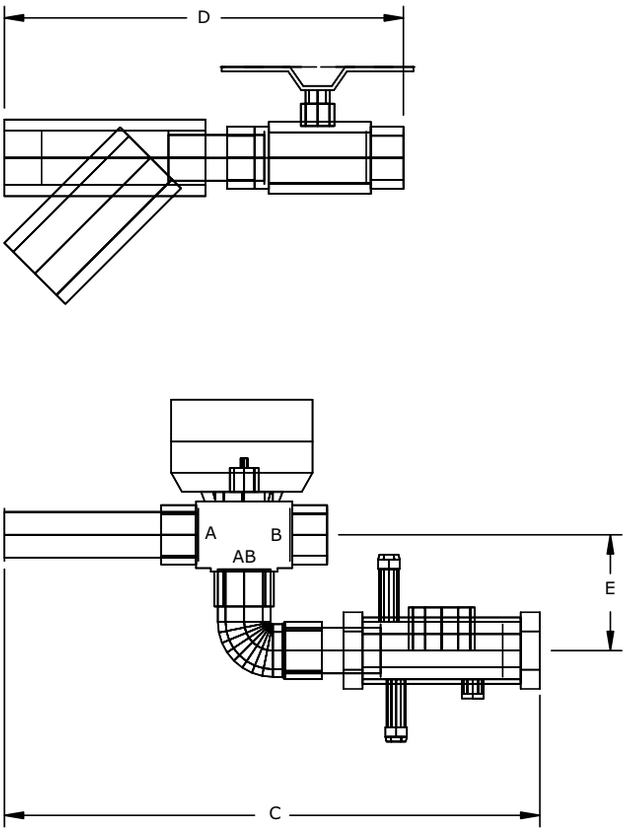
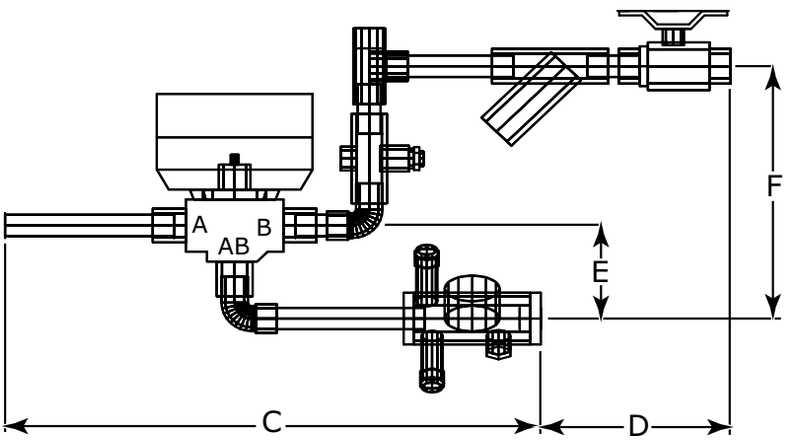


Table 71. Three-way 1/2-in. and 1-in. valve deluxe piping package



Mechanical Specifications

General

The product line consists of horizontal and vertical air handling units and mixing boxes. Units are tested and certified with ARI 430 and ARI 260. The unit complies with NFPA 90A and is UL listed to U.S. and Canadian safety standards.

Air handlers consist of a hydronic and/or DX coil, drain pan, and centrifugal fan with motor mounted in a common cabinet. Coil connections are independent for the same or opposite side location.

Air handlers are provided with knockouts in all four corners for installing the unit suspended from the ceiling with threaded rods.

Unit and accessories are insulated with 1-inch, 1-1/2 lb/ft^3 density fiberglass insulation. One-inch foil-faced insulation is also available.

Large motor access panels are provided on both sides of the unit and accessories. Vertical units ship in two pieces.

Casings

Casings (structural components) are constructed of heavy-gauge galvanized steel, insulated with one-inch, 1-1/2 lb density fiberglass fire resistant and odorless glass fiber material to provide thermal and acoustical insulation. Fan housing sides are directly attached to the air handler top and bottom panels strengthening the entire unit assembly. Coil access panels are located on both sides of the air handler and allow easy removal of the internal coils and drain pan. Main access panels provide generous access to the fan and motor from both sides of the air handler.

Coils

Hydronic Coils

Cooling coils are four- or six-row, chilled water. Heating coils are one- or two-row hot water. Heating coils are available factory-installed in the preheat or reheat position. All hydronic coils are 12 fins per inch. All hydronic coils use highly efficient aluminum fins, mechanically bonded to seamless copper tubes. All coils are specifically designed and circuited for water use. All coils are factory tested with 450 psi air under water. Maximum standard operating conditions are: 300 psig, 200°F. Sweat type connections are standard. Coils are rated and certified in accordance with ARI Standard 410.

Direct Expansion (DX) Coils

DX coils use refrigerant 410A, have 3/8” OD x 0.014” W round seamless copper tubes expanded into full fin collars for permanent fin-tube bond. Three-, four-, and six-row DX coils use highly efficient aluminum fins mechanically bonded to stainless copper tubes with 12 fins per inch fin spacing.

The coil casing is 16-gauge galvanized steel. A foam sealing strip between the casing (top and bottom) channels and fins helps eliminate air bypass and reduce potential water carryover. Coils have round, seamless, copper pipe liquid lines and suction headers with male sweat connections. Suction headers have bottom connections to aid drainage of any oil that may collect in the coil. Liquid line and suction connections are outside the unit casing (on the same side of the unit) to facilitate field piping. Connections are clearly labeled to ensure coils are piped correctly. Coils have a venturi-type distributor assembly designed with a vertical downflow feed for low pressure drops.

Coils are proof tested at 715 psig and leak tested at 650 psig air-under-water. Coils are dehydrated and sealed with a dry air charge. Maximum standard operating conditions are 650 psig at 127°F with R-410A. Coils are rated and tested in accordance with ARI Standard 410.

Steam Coils (Type NS)

A one-row steam distributing coil section is available in the pre-heat position. Steam coils are non-freezing and are pitched to ensure adequate condensate drainage. Coils have 1” OD x 0.031” W round seamless copper condensing tubes expanded into full fin collars for permanent fin-tube bond. Coil headers are cast iron for permanent leak-tight joints. Coils have continuous Sigma-Flo™ aluminum fins with full fin collars for maximum fin-tube contact and accurate spacing at 6 fpi. The coil casing is 16-gauge galvanized steel. Coil headers are gray cast iron with NPT internal thread connections.

Supply, return, and vacuum breaker connections are located at the same end of the unit and clearly labeled to ensure coils are piped correctly. Distributor tubes are 11/16” OD copper. Also, they have die-formed, accurately-spaced directional kinetic orifices that discharge steam in the direction of condensate flow (toward the return connection) to ensure even steam distribution across the coil face area and push out condensate. Distributor tubes are located concentrically within condensing tubes using corrosion resistant support clips. Supply header steam deflectors prevent impingement of steam into tubes in supply connection area.

Coils are proof tested at 300 psig and leak tested at 200 psig air-under-water. Maximum standard operating conditions are 15 psig at 400°F. Coils are rated and tested in accordance with ARI Standard 410.

Fan

The fans are DWDI (double width double inlet) forward curved centrifugal blower type. The fans are direct drive mounted directly to the motor shaft. All fans are dynamically balanced. All air handlers have a single fan.

EC Motors

A 50/60 Hertz, variable speed, multiple voltage EC motor has a plus or minus 10 percent voltage utilization range. The motor is open type with permanently sealed ball bearings, internal overload protection, and size 48 frame belly band design. The motor is factory installed, programmed, and wired to the air handler control panel.

Drain Pan

The drain pan is noncorrosive and double-sloped to allow condensate drainage. The drainpan construction is polymer or optional stainless steel. Coils mount above the drain pan—not in the drain pan—thus allowing the drain pan to be fully inspected and cleaned. The drain pan can also be removed for cleaning. The polymer drain pan connections are unthreaded 3/4-inch schedule 40 PVC for solvent bonding. The stainless steel drain pan connection is 3/4-inch NPT schedule 40 stainless steel pipe. The main drain connection is at the lowest point of the drain pan. An auxiliary drain connection is provided on the same side as the main connection.

Filters

One-inch standard efficiency throwaway, two-inch MERV 8, and two-inch MERV 13 are available on all blower coil units. Units have a standard flat filter rack that is sized for less that 500 feet per minute at nominal airflow. An optional angle filter rack is available; this is sized for less than 300 feet per minute at nominal airflow. All units and filter racks use standard filter sizes.

Units equipped with 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 52.1 atmospheric dust spot method.

Mixing Box

Mixing boxes are constructed of heavy-gauge galvanized steel. They are complete with two low-leak parallel blade dampers that are factory-linked together. A 1/2-inch extendible drive rod is provided that can be used for actuator connection, either internally or externally. Damper blades are extruded aluminum having interlocked PVC extruded edge seals. Damper frame seals are PVC extruded forms interlocked to the damper frame and provided with a continuous edge seal to the blades. Damper seals are stable in the temperature range of -50°F to 230°F.

Mixing boxes also include two side access panels as standard to provide access to the unit's internal components.

Piping Packages

The maximum entering fluid temperature to the water valves is 200°F. Insulation on the piping package is by others. The stop valves are ball type.

Electric Heater

The heater is a UL recognized resistance open-wire heater with disc-type automatic and manual reset-type thermal safety devices. The electric heater is factory-mounted and an air handler with this heater is a UL/CUL product. One or two stages of control are available. A single-point power connection to the unit is provided. Optional mercury contactors, heater fuses, and a heater door interlocking disconnect switch are available.

Controls

Controls options are: control interface, Tracer ZN010, ZN510, ZN520, and UC400. A variety of inputs and outputs are available for the control interface and Tracer controller options. A disconnect switch (for non-electric heat units), fused transformer, contactor(s), and terminal strip are provided with the control interface and Tracer controller options.

Customer Supplied Thermostat Interface (CSTI)

The control interface is intended to be used with a field-supplied, low-voltage thermostat or controller. The control box contains a line voltage to 24-volt transformer and a disconnect switch on non-electric heat units.

Tracer ZN520

The Tracer ZN520 discrete speed controller can be used as part of a building automation system 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 building automation system with BACnet communication. The UC400 ships with unit of measure over BACnet link in SI units. When a BAS system is unable to convert to other desired units a free software tool is available for changing to other unit of measure. The Tracer 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.

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